las vegas wash coordination committee

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Las Vegas Wash Tributaries Water Quality Report,

2003-2007

SOUTHERN NEVADA WATER AUTHORITY

Las Vegas Wash Coordination Committee

Tributary Water Quality Monitoring Program, 2003-2007

SOUTHERN NEVADA WATER AUTHORITY
Resource Monitoring Water Quality Team

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Tributary Water Quality Monitoring Program, 2003-2007

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1.0 INTRODUCTION

The Las Vegas Wash (Wash) is the sole drainage channel for the Las Vegas Valley. Flow in the Wash is comprised of four components: urban runoff from tributaries, treated wastewater effluent, shallow groundwater discharge, and stormwater. Discharge of the Wash into Lake Mead presents potential concerns due to the presence of certain chemical and biological constituents typical of urban influence. The Tributary Water Quality Monitoring Program was designed to quantify the effects of the urban runoff component on the water quality in Lake Mead and the overall health of the Wash and its developing wetland ecosystem. Water quality samples were collected quarterly at a total of nine sites in seven urban tributaries and two groundwater seeps to the Wash (Tributaries/Seeps). Samples were analyzed for major ions, nutrients, metals (including selenium [Se]), bacteria, perchlorate, and organic contaminants. Field parameters, including temperature, pH, dissolved oxygen (DO), specific conductance (SC), and turbidity were measured at each site during each sampling event.

This report summarizes the results for the Tributary Water Quality Monitoring Program from January 2003 to December 2007. Results for the sampling events prior to January 2003 can be found in the "Las Vegas Wash Monitoring and Characterization Study: Results for Water Quality in the Wash and Tributaries" report published in January 2004 (Zhou et al., 2004).

2.0 METHODS

2.1 Sampling Sites

Water quality monitoring has been ongoing in the Tributaries/Seeps that flow into the Wash since October 2000. Samples were collected quarterly (January, April, July and October), at eight locations from October of 2000 until October of 2002. The eight sites sampled are Meadows Detention Basin (LVC_2), Las Vegas Creek (LW12.1), Flamingo Wash (FW_0), Sloan Channel (SC_1), Monson Channel (MC_1), Duck Creek (DC_1), the Kerr-McGee Seep (Kerr-McGee; LWC6.3), and the GCS5 Seep (GCS5; LWC3.7). The data collected from this program has been used by the Clark County Regional Flood Control District (CCRCCD) as the dry weather data for their NPDES permit requirement. The wet weather data was collected by CCRFCD. This partnership has provided each entity with the data they need, while avoiding the duplication of efforts.

Since October of 2002 quarterly sampling has continued with the following changes in sites sampled. In October of 2004, the seep site LWC3.7 was lost due to erosion along the Wash. In April of 2006, Kerr-McGee (LWC6.3) was dropped from the sampling run. Kerr-McGee is routing the water that discharges at the seep through a reverse osmosis treatment system, so this is now treated water, not raw runoff. In April of 2006, the Burns Street site (BS_1) was added to the sampling program. This site carries urban runoff from the Henderson industrial area. The sample sites used for water quality monitoring in the Wash are listed in Table 1 and shown on Figure 1.

Site Name	Location	Period Sampled	Site Description
LVC_2	**Meadows Detention Basin**	October 2000-Present	Eastern outflow of Meadows Detention Basin from culvert
LW12.1	**Las Vegas Creek**	October 2000-Present	At Desert Rose Golf Course, just below golf cart bridge and above culvert
FW_0	**Flamingo Wash**	October 2000-Present	At Desert Rose Golf Course, outflow from culvert just above confluence with Las Vegas Creek
SC_1	**Sloan Channel**	October 2000-Present	At East Charleston bridge, south side
DC_1	**Duck Creek**	October 2000-Present	Downstream of Broadbent Boulevard crossing
MC_1	**Monson Channel**	October 2000-Present	Upper accessible end at east edge of development at Stephanie Road
LWC6.3	**Kerr-McGee Seeps**	October 2000-October 2004	Immediately above Kerr-McGee Perchlorate Treatment Facility north of Henderson Ponds
LWC3.7	**GCS-5 Groundwater Seeps**	October 2000-April 2006	Southwest Embankment - 200 m below Demonstration Weir
BS_1	**Burns Street**	April 2006 - Present	Downstream of crossing with Wiesner Way

Table 1: Sample locations for the Tributary Water Quality Monitoring Program.

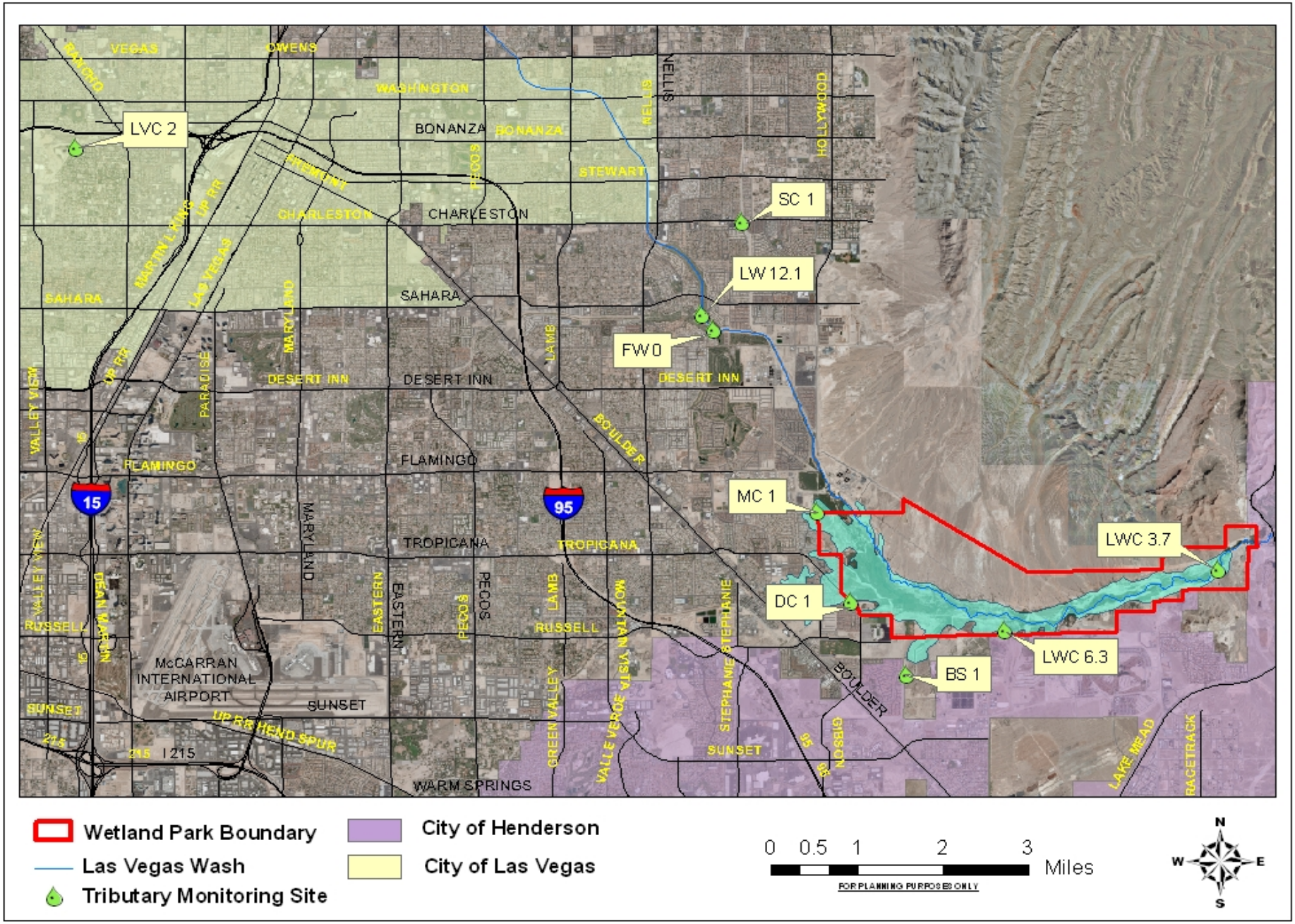


Figure 1: Location map showing sampling sites.

2.2 Parameters

Field measurements, including water temperature, DO, pH, SC, and turbidity were collected at every site. Water samples were collected for the following analyses: major cations and anions, metals, nutrients (nitrogen and phosphorus), bacteria, perchlorate, and organic contaminants. Table 2 lists a description of the methods used for each analytical group and the laboratory that performed the analyses. A complete list of the individual parameters analyzed is found in Appendix A.

Sample Type	Description	Analytical Laboratory
Metals	17 metals obtained from ICP-MS instrumentation with special emphasis on selenium, arsenic, mercury, and copper	Montgomery Watson (2003-2005) WECK (2006-present
Cation-Anion	Standard water chemistry analysis	Montgomery Watson (2003-2005) WECK (2006-present)
Perchlorate	At least one sample from each location.	SNWS
Nutrients	Filtered and unfiltered samples for analyses of organic and inorganic nitrogen and phosphorus (phosphorus, total and orth-phosphorus; nitrogen, total kjeldahl (TKN), ammonia, nitrate and nitrite)	Clark County Water Reclamation District (1/2003-4/2003), NEL (5/003-2005) WECK (2006-present)
Bacteriological	Samples of water for analyses of bacterial counts of fecal coliforms and *E.coli*	SNWS
General	Hydrolab® multi parameter water quality probe	Watershed Division Staff
Organic Priority Pollutants	Individual pollutants are listed in Appendix I. Total of 177 primary pollutants analyzed.	Montgomery Watson (2003-2005) WECK (2006-present)

Table 2: Methods and analytical laboratories.

2.3 Sample Collection and Analyses

Sampling methodology was identical at each location and sampling event. Field staff used a field notebook, which includes the following information at all sample locations for each sampling event:

- Sampling date
- Sampling time
- Weather condition (i.e., sunny, windy, cold, hot, etc.)
- Air temperature
- Meteorological conditions for sampling date and for the two days prior to sampling
- Flow rate by estimate
- Flow rate by USGS gauge or by field measurement
- Description of any and all factors that might influence the data set from each site

At each site, a multi-parameter probe (Hydrolab Corporation Model Surveyor® 4) was used to measure water quality parameters, including water temperature, DO concentration, pH value, SC, and turbidity. The Hydrolab multi-parameter probe was calibrated using standard solutions (pH = 10, pH = 7, and EC = 5000 uS/cm or 2500 uS/cm). Field measurements at each site were entered into the Southern Nevada Water System (SNWS) Laboratory Information Management Software (LIMS) database.

Where possible, samples were collected in the middle of the main channel with a pre-cleaned, large-mouth, four-liter plastic container. The large container allowed the sampling crew to collect a sufficient quantity of water for the numerous analyses conducted at each site. This large sample was then transferred into the individual sample bottles for each analyses group. The original sample was shaken before each aliquot was dispensed which provided for a homogenous sample and prevented particle matter from settling.

The sample container was rinsed three times with sample water before final sample collection. All samples were labeled specifying site and location, analysis requested, and date and time sampled. Sample bottles for organic pollutants, metals and cations-anions were prepared and delivered for use in the field by Montgomery Watson Laboratories (MWL) in Pasadena, California (2003-2005) and by Weck Laboratories (Weck) in Monrovia, California (2006-present). Sample bottles for perchlorate, and bacteria were prepared and pre-labeled by the SNWS Laboratory Support Services personnel. Labels for perchlorate and bacteria were generated by the SNWS LIMS database. If needed, preservatives were added by MWL, Weck or by SNWS. Sample bottles and labels for nutrient analysis were provided by Clark County Water Reclamation District (Jan. – Apr. 2003), Nevada Environmental Laboratories (Apr. 2003-2005), and by Weck (2006-present). After collection, all samples except bacteria were maintained in a cooler of ice to 4^{o}C. Bacteria samples were kept in a separate cooler of freezer packs to prevent the contamination by ice water. Samples were shipped immediately after the sampling event to designated laboratories for analysis. All samples were accompanied by chain of custody record.

3.0 RESULTS AND DISCUSSION

3.1 Water Quality in Tributaries and Seeps to the Las Vegas Wash

3.1.1 Field Measurements

Quarterly sampling information, field measurements (EC, pH, temperature, and DO), and turbidity results are presented in Appendix B. Annual average field measurements were calculated and are compiled in Table 3 and graphically presented in Figures 2a-e.

2003					
Site	**Temp. ^{0}C**	**pH**	**EC uS/cm**	**DO mg/L**	**Turbidity NTU**
LVC_2	17.4	8.18	2059	8.81	1.47
LW12.1	18.2	8.34	3598	10.61	4.68
FW_0	17.6	8.13	3658	7.84	1.59
SC_1	18.0	8.70	2390	9.04	1.54
MC_2	19.4	8.20	4040	7.77	1.71
DC_1	13.6	7.96	5673	9.66	6.76
LWC6.3	19.7	7.43	7750	6.84	0.22
LWC3.7	22.1	7.43	2955	3.25	5.47

2004					
Site	**Temp. ^{0}C**	**pH**	**EC uS/cm**	**DO mg/L**	**Turbidity NTU**
LVC_2	16.1	8.09	2251	10.34	1.61
LW12.1	15.0	8.24	3868	8.64	2.32
FW_0	18.0	8.25	3630	9.31	3.81
SC_1	19.3	9.08	2493	11.05	1.63
MC_2	15.5	8.08	5020	8.28	0.77
DC_1	20.9	7.98	6440	6.97	5.99
LWC6.3	21.8	6.95	7890	4.88	5.83
LWC3.7	21.9	7.33	3113	1.91	15.83*

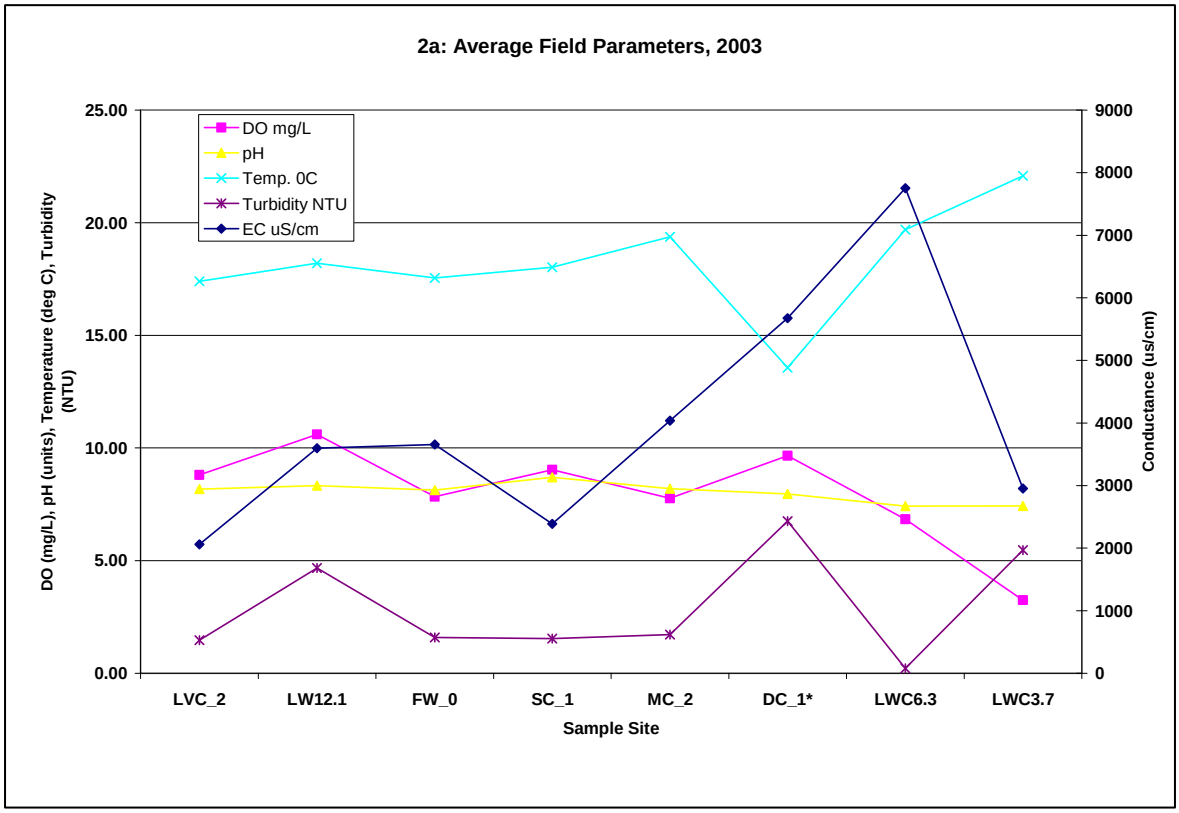
2005					
Site	**Temp. ^{0}C**	**pH**	**EC uS/cm**	**DO mg/L**	**Turbidity NTU**
LVC_2	19.2	8.20	1899	8.45	20.53
LW12.1	17.8	8.10	3023	8.53	68.83
FW_0	17.0	8.15	2906	7.82	31.31
SC_1	17.2	8.29	2286	7.95	4.75
MC_2	18.1	8.09	4930	7.73	5.04
DC_1	19.3	8.22	5797	9.72	6.54
LWC6.3	22.2	6.94	7755	5.83	19.85

2006					
Site	**Temp. ^{0}C**	**pH**	**EC uS/cm**	**DO mg/L**	**Turbidity NTU**
LVC_2	18.6	8.46	1818	8.46	5.15
LW12.1	16.4	8.32	3588	9.85	2.50
FW_0	18.0	8.25	3557	9.31	3.81
SC_1	20.4	9.00	2796	12.08	2.36
MC_2	18.9	8.27	5028	11.04	4.20
DC_1	18.5	8.15	5738	9.75	5.89
LWC6.3	21.6	6.32	9610	5.52	27.20
BS_1	20.6	8.44	5667	10.55	0.82

2007					
Site	**Temp. ^{0}C**	**pH**	**EC uS/cm**	**DO mg/L**	**Turbidity NTU**
LVC_2	11.6	8.36	2003	11.35	1.63
LW12.1	16.6	8.24	3730	10.90	3.18
FW_0	16.2	8.21	3454	10.57	1.38
SC_1	13.6	8.52	3348	11.97	0.93
MC_2	19.1	8.27	4854	14.97	0.93
DC_1	23.6	7.83	5433	10.56	0.67
BS_1	23.6	8.27	5070	9.57	0.57

Table 3. Annual average field measurements.

***Data point excluded for averaging purposes.**



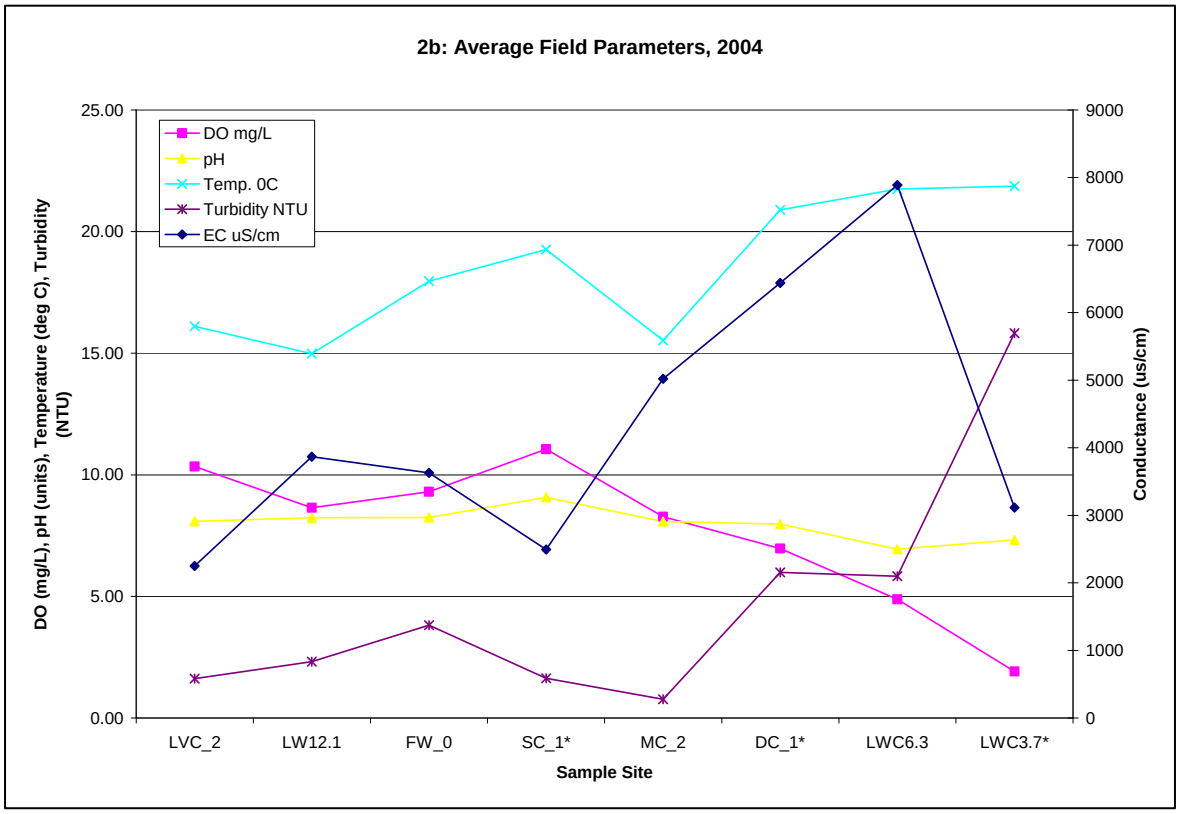
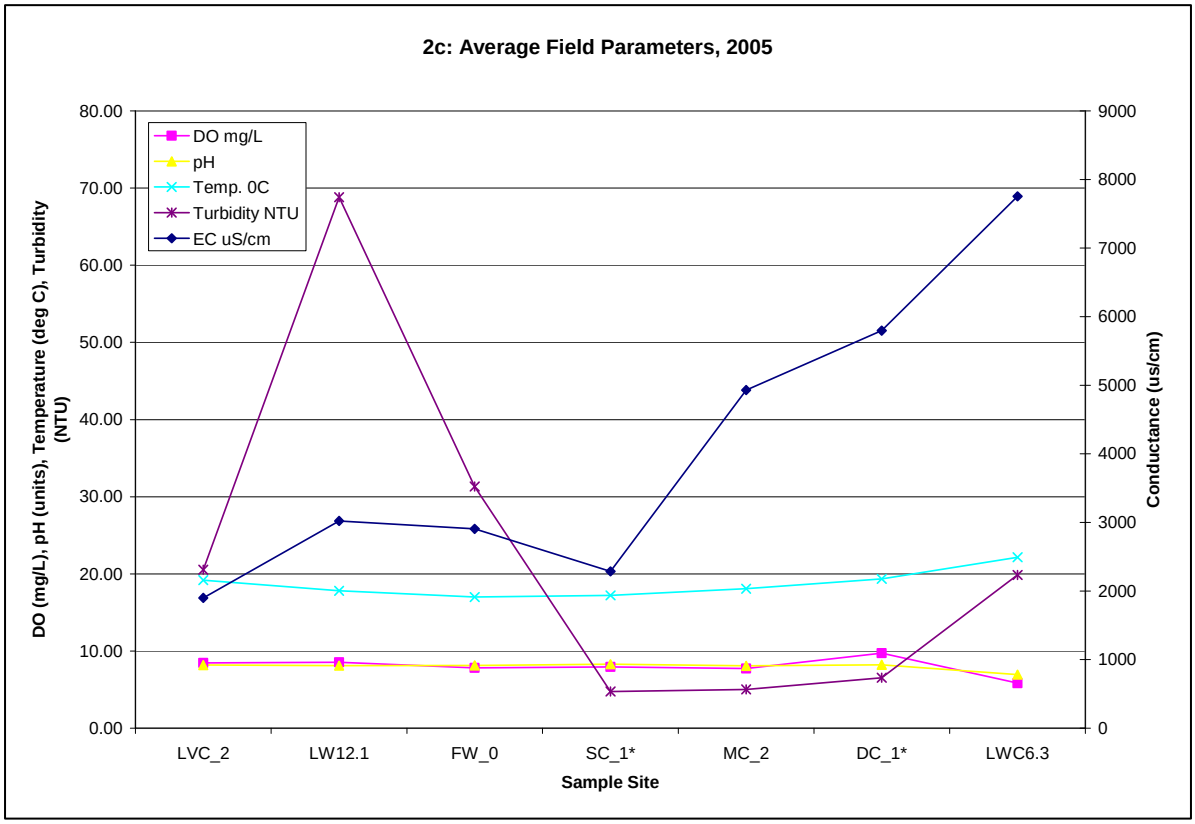


Figure 2a and 2b: Average field measurements and turbidity, 2003-2004



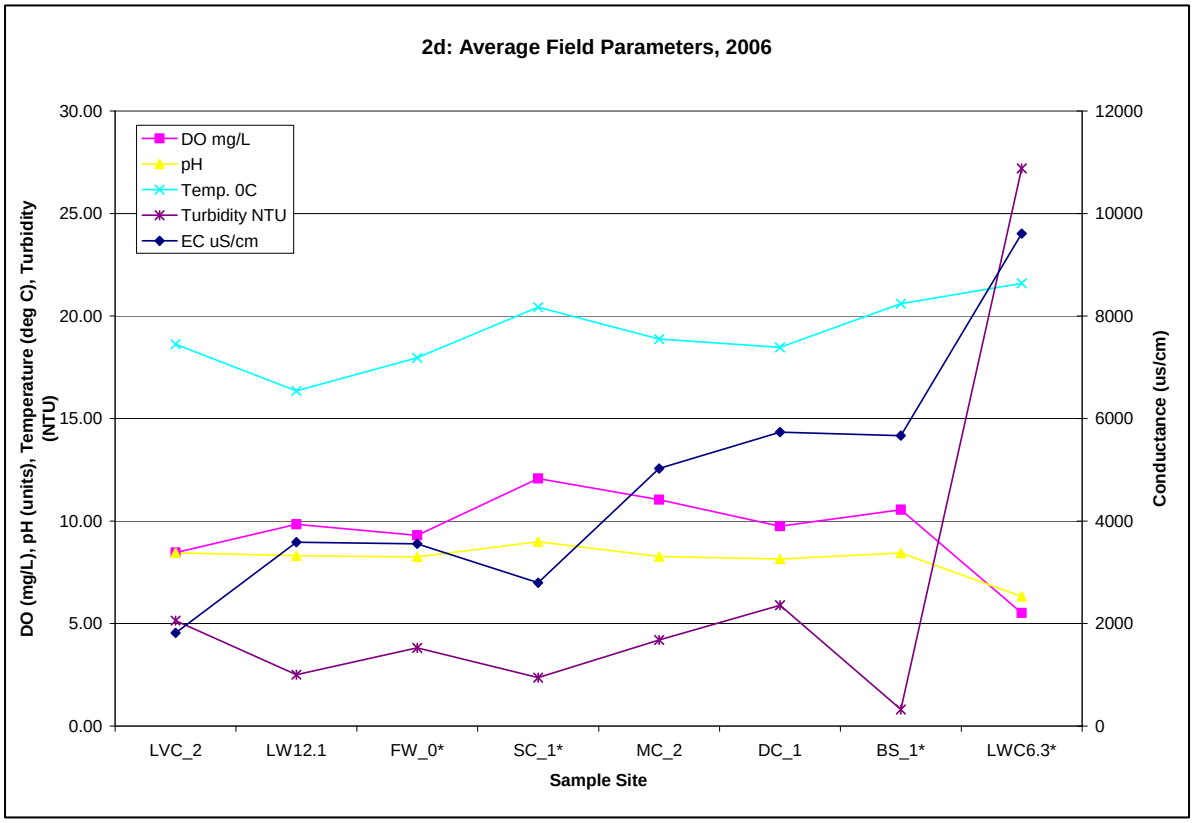


Figure 2c and 2d: Average field measurements and turbidity, 2005-2006

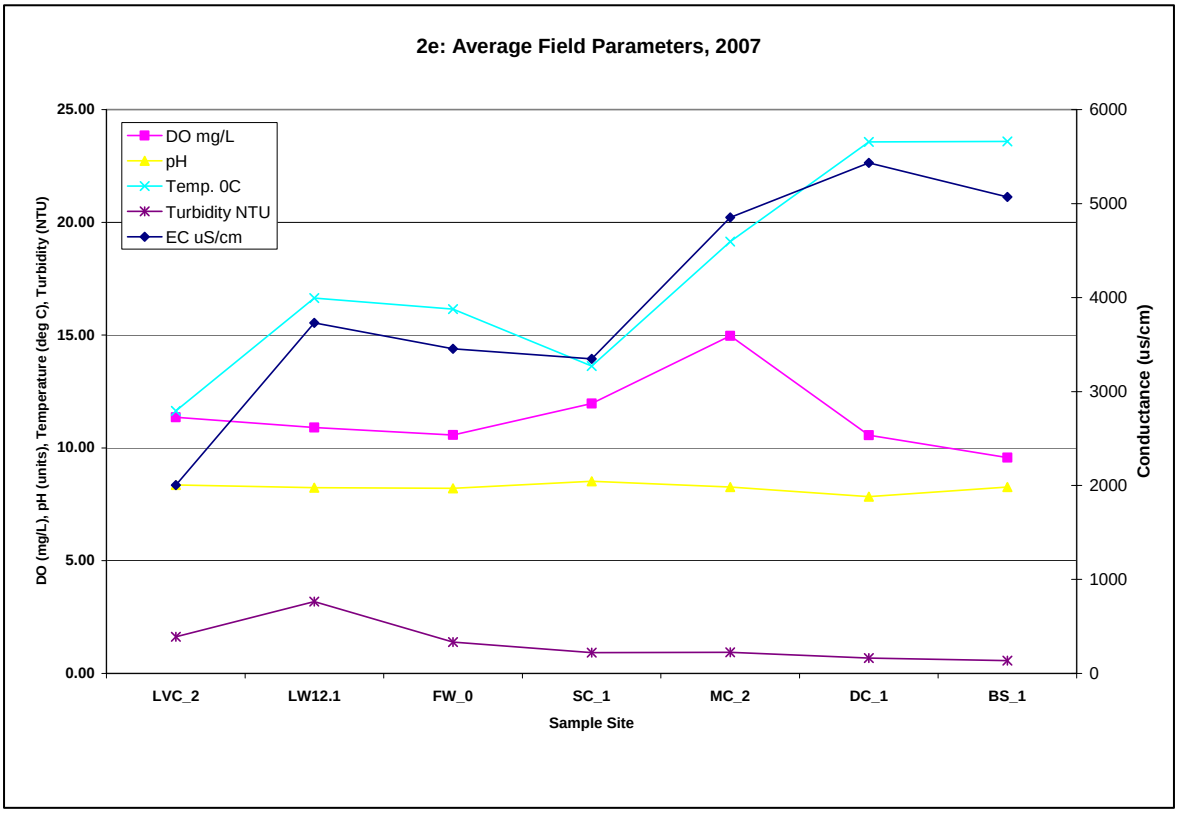


Figure 2e: Average field measurements and turbidity, 2007

At all tributary and seep sites field measurements for each sampling event include SC, DO, pH, temperature and turbidity. The pH values measured on different sample dates for the same sample site are consistent. Some sites show more seasonal changes (Sloan channel ranges from 8.06-9.45), but the values measured for the same quarter of each of the last five years at each site are very consistent. The pH values in all tributaries range from 7.5-9.4 and average 7.2 for both seeps. Water temperature varies with seasons in the tributaries. The average temperatures for all sites range from 16.6 – 22.0 ^{0}C over the last five years.

Water along the six main tributary sites and at BS_1 was saturated or supersaturated, with individual DO measurements ranging from 3.7 mg/L to 20.0 mg/L, and five year average DO ranging from 8.8 mg/L to 10.6 mg/L. The seeps showed lower DO levels which ranged from 0.56 mg/L to 8.68 mg/L. Conductivity was lowest at Meadows Detention Basin, below 3000 uS/cm. In the Las Vegas Creek, Flamingo Wash, Sloan Channel, and GCS5 conductance values are from 1635 uS/cm to 4070 uS/cm. In general, the tributaries with a longer flow path and/or shallow groundwater inputs have a higher conductance. Monson Channel, Duck Creek, and Burns Street conductance ranged from 3840 uS/cm to over 7000 uS/cm. Kerr-McGee has the highest conductance with levels between 6150 uS/cm and 9950 uS/cm.

3.1.2 Major Ion Chemistry

Major cation and anion data from the tributaries and seeps are presented in Appendix B. Average concentrations are presented in Table 4 and Figure 3, average total dissolved solids (TDS) values in Figure 4, and average total organic carbon (TOC) results in Figure 5.

Site	Year	Calcium (mg/l)	Magnesium (mg/l)	Sodium (mg/l)	Potassium (mg/l)	Biocarbonate as HCO3 (mg/l)	Carbonate CaCO3 (mg/L)	Sulfate (mg/l)	Chloride (mg/l)	Bromide (mg/l)	Fluoride (mg/l)	Silica (mg/L)	Total Dissolved Solids (mg/l)	TOC (mg/L)
LVC_2	2003	125	97	155	17	314	3.4	643	190	0.26	0.50	20	1490	8.2
LW12.1	2003	203	238	258	47	277	5.0	1650	278	0.63	0.50	26	3018	5.7
FW_0	2003	293	203	255	24	261	3.0	1675	323	0.79	0.58	28	3115	3.6
SC_1	2003	119	150	170	15	210	ND	820	243	0.94	1.11	50	1793	4.9
MC_2	2003	420	308	388	30	257	2.9	2625	423	1.11	0.67	35	4578	3.4
DC_1	2003	443	257	507	58	243	ND	2567	850	1.09	1.37	51	5123	2.9
LWC6.3	2003	366	143	1225	31	295	ND	1575	1725	0.82	1.40	63	5443	4.0
LWC3.7	2003	215	92	280	42	186	ND	930	378	0.38	0.97	33	2138	3.6
LVC_2	2004	155	117	178	19	296	3.2	817	223	0.36	0.46	26	1680	6.4
LW12.1	2004	235	268	305	55	259	2.9	1800	293	0.71	0.48	43	3325	4.5
FW_0	2004	330	195	275	25	243	2.4	1625	310	0.83	0.60	36	3098	2.8
SC_1	2004	127	173	197	15	181	ND	910	287	1.13	1.16	83	1980	4.0
MC_2	2004	440	303	410	33	252	2.1	2485	405	1.06	0.67	57	4593	2.3
DC_1	2004	540	285	630	74	219	ND	2600	890	0.98	1.38	68	5465	2.7
LWC6.3	2004	330	141	1115	29	312	ND	1325	1700	0.79	1.44	87	4923	3.8
LWC3.7	2004	240	102	323	46	183	ND	960	393	0.41	0.98	43	2223	5.0
LVC_2	2005	125	98	165	18	238	5.3	655	196	0.27	0.50	20	1508	21.9
LW12.1	2005	177	180	201	35	201	3.9	1158	194	0.50	0.40	29	2225	10.3
FW_0	2005	263	154	215	21	208	2.6	1243	223	0.66	0.53	27	2393	4.9
SC_1	2005	125	141	190	13	208	ND	775	245	0.74	1.00	59	1765	3.8
MC_2	2005	428	295	398	32	247	2.4	2400	393	1.10	0.68	52	4448	2.9
DC_1	2005	473	270	533	59	216	ND	2265	773	1.07	1.29	57	4703	2.9
LWC6.3	2005	358	158	1118	30	324	ND	1425	1625	0.90	1.40	81	5198	5.8
LVC_2	2006	117	91	165	16	265	15.0	558	227	0.25	0.43	15	1375	6.2
LW12.1	2006	213	240	310	53	285	10.0	1600	293	0.63	0.47	32	3250	5.9
FW_0	2006	297	183	300	28	247	ND	1400	340	0.75	0.53	27	3167	2.9
SC_1	2006	157	140	287	19	149	ND	897	373	0.82	1.14	46	2400	6.4
MC_2	2006	420	318	428	35	265	ND	2475	400	1.13	0.61	47	4800	2.7
DC_1	2006	468	290	570	67	243	ND	2500	730	0.98	1.43	63	5175	2.4
LWC6.3	2006	409	189	1209	31	317	ND	1613	1913	1.05	1.25	80	5899	4.9
BS-1	2006	450	193	630	45	143	8.1	1800	880	1.47	1.17	65	5033	2.1
LVC_2	2007	122	98	185	19	268	1.0	600	198	0.21	0.52	16	1400	5.1
LW12.1	2007	228	260	320	61	273	1.0	1775	288	0.68	0.54	36	3175	6.1
FW_0	2007	310	185	268	28	250	1.0	1550	310	0.68	0.54	30	2850	3.5
SC_1	2007	155	228	338	20	238	1.0	1300	368	1.38	1.03	61	2750	5.3
MC_2	2007	398	298	405	37	233	1.4	2500	400	1.04	0.53	46	4200	2.5
DC_1	2007	455	275	553	72	220	65.5	2500	748	1.01	1.30	58	4850	2.6
BS-1	2007	403	188	508	45	153	2.4	1825	823	1.33	1.12	59	3925	1.4

Table 4: Annual average major ion concentrations.

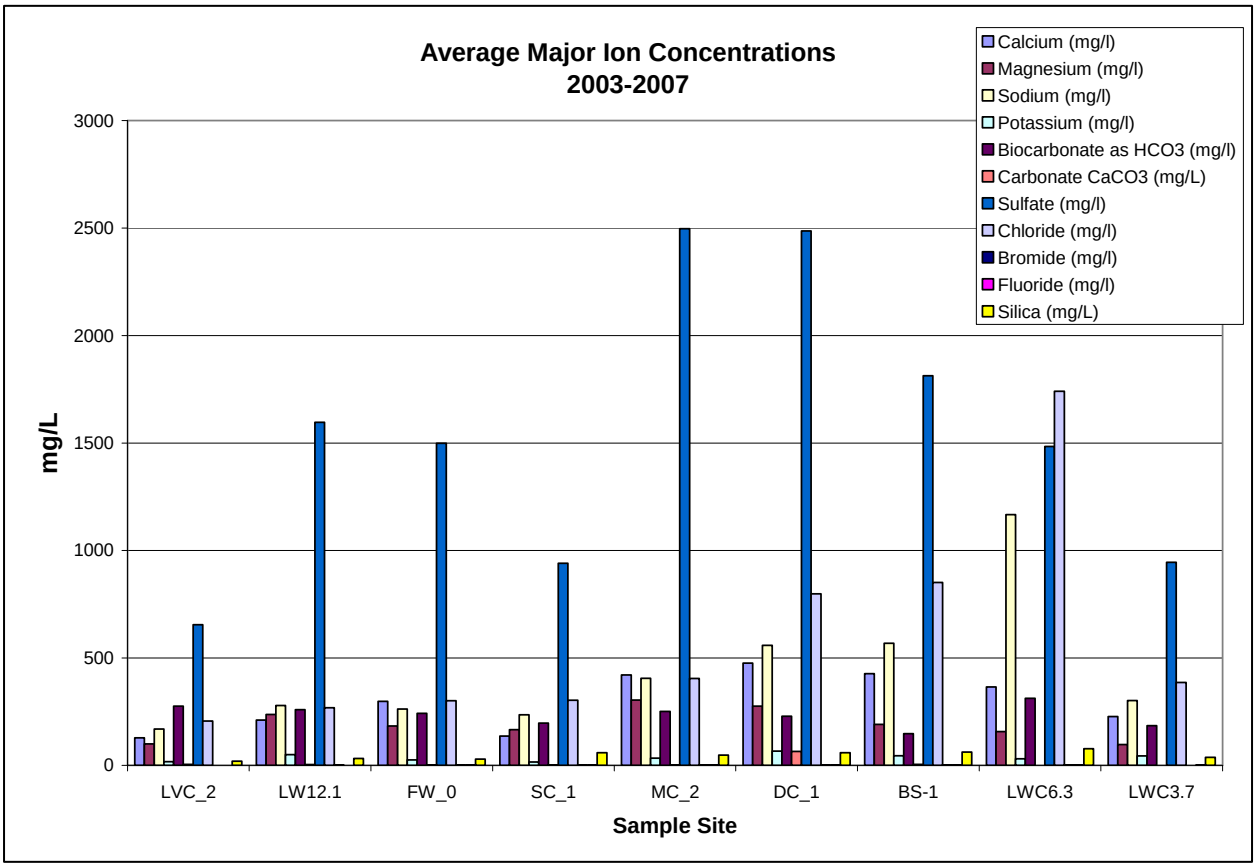


Figure 3: Average major ion concentrations.

Cations in all samples were dominated by calcium (Ca^{+2}), magnesium (Mg^{+2}) and sodium (Na^{+}). The anions were dominated by sulfate (SO_4^{-2}), chloride (Cl^{-}) and bicarbonate (HCO_3^{-}; Table 5; Figure 3). Sodium and chloride concentrations were noticeably highest at Kerr-McGee (LWC6.3), most likely due to the fact that sodium chloride was used in manufacturing processes at the Basic Management Incorporated (BMI) industrial site.

TDS are comprised of inorganic salts (principally calcium, magnesium, potassium, sodium, bicarbonate, carbonate, chloride and sulfate) and small amounts of organic matter that are dissolved in water (Hem, 1992). TDS in natural water originates from natural sources, such as rocks, sewage, urban runoff and industrial wastewater. Out of the tributary sites, Monson Channel (MC_1), Duck Creek (DC-1), Kerr-McGee (LWC6.3), and Burns Street (BS-1) have higher TDS concentrations ranging from 4,000-5,400 mg/L. The remaining sites had lower TDS concentrations ranging from 1,500 to 3,000 mg/L (Table 4; Figure 4).

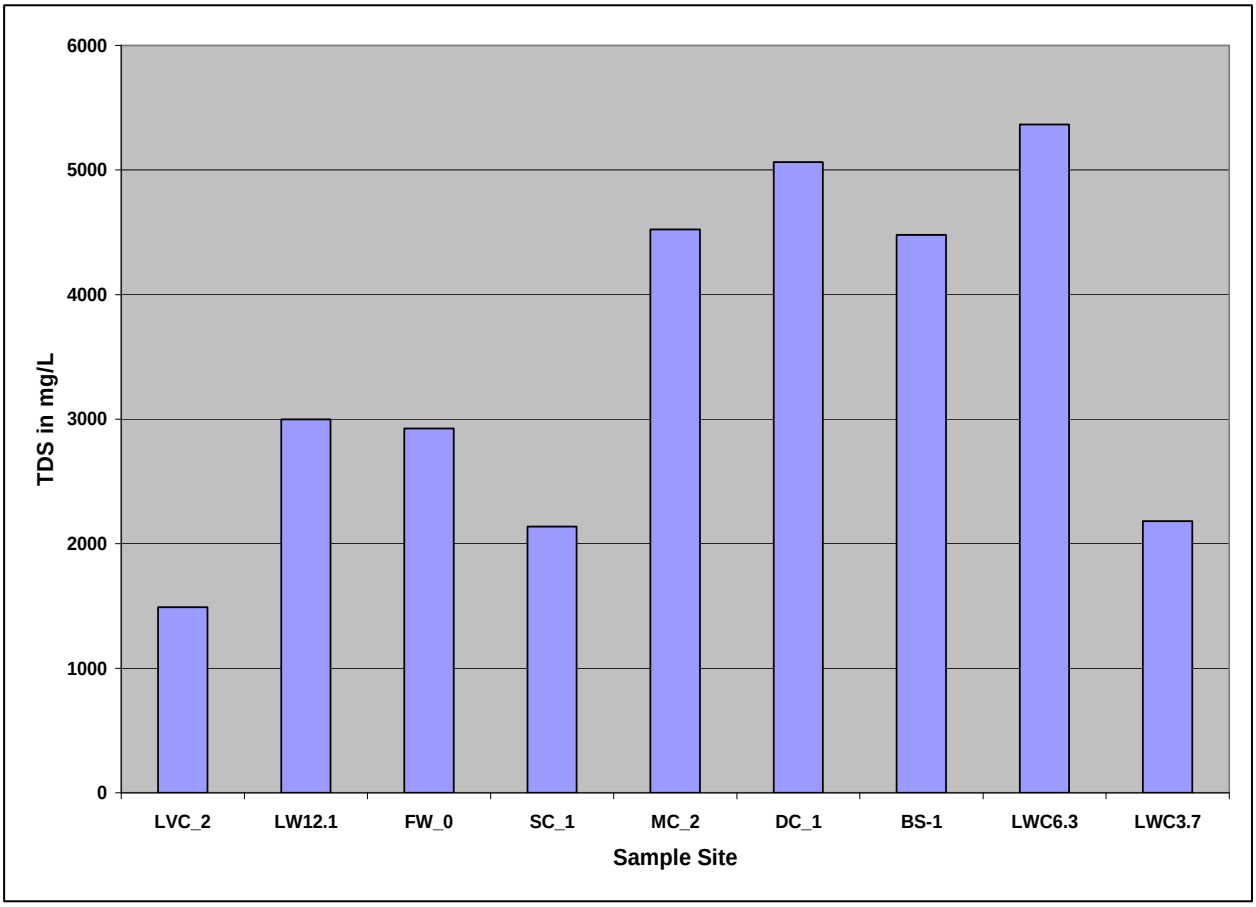


Figure 4: Average TDS concentrations.

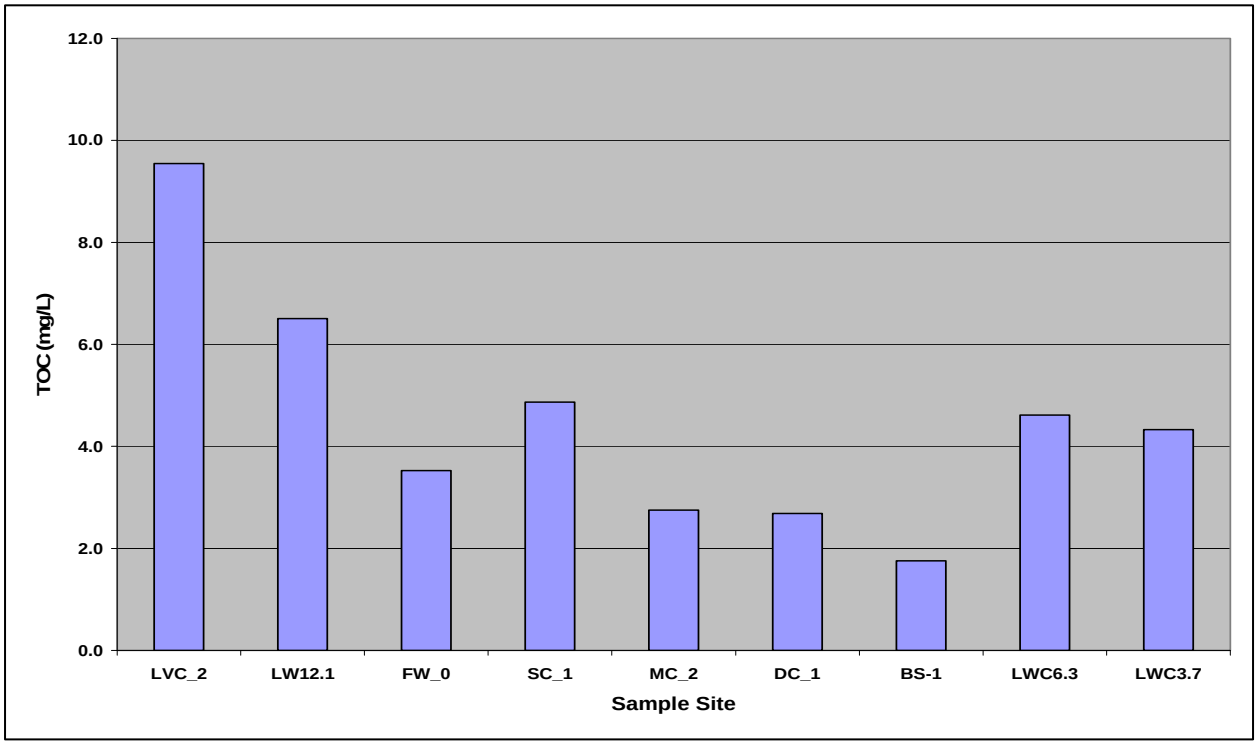


Figure 5: Average TOC concentrations.

Sample Site	Year	NH4 mg N/L	NO2 mg N/L	NO3 mg N/L	NO3NO2 mg N/L	TKN mg N/L	OP mg P/L	TP mg P/L
LVC_2	2003	0.04	0.04	2.99	2.99	1.16	0.05	0.15
LW12.1	2003	0.04	0.04	2.92	2.94	0.83	0.02	0.06
FW_0	2003	0.04	0.04	4.26	4.26	0.59	0.02	0.04
SC_1	2003	0.11	0.07	2.84	2.89	0.84	0.02	0.03
MC_2	2003	0.05	0.04	4.41	4.48	0.56	0.02	0.05
DC_1	2003	0.04	0.04	5.32	5.32	0.81	0.02	0.05
LWC6.3	2003	0.04	0.04	7.03	7.03	0.35	0.04	0.04
LWC3.7	2003	0.06	0.04	10.91	10.93	1.58	0.02	0.25
LVC_2	2004	ND	ND	4.50	4.50	1.20	0.01	0.04
LW12.1	2004	0.05	ND	3.55	3.55	0.72	0.01	0.06
FW_0	2004	ND	ND	4.53	4.53	0.44	0.01	ND
SC_1	2004	0.06	ND	4.45	4.45	0.58	0.02	ND
MC_2	2004	ND	ND	4.88	4.95	1.48	0.02	0.03
DC_1	2004	0.17	ND	5.05	5.05	0.88	0.01	0.01
LWC6.3	2004	0.66	ND	0.84	0.84	1.44	0.05	0.12
LWC3.7	2004	0.07	ND	11.00	11.00	1.11	0.02	0.24
LVC_2	2005	0.57	0.53	3.97	4.14	2.63	0.04	0.22
LW12.1	2005	0.22	ND	2.97	2.97	1.27	0.03	0.15
FW_0	2005	0.13	ND	4.77	4.77	0.75	0.03	0.08
SC_1	2005	0.13	ND	3.50	3.50	1.25	0.01	0.03
MC_2	2005	0.22	ND	4.67	4.67	0.52	0.02	0.02
DC_1	2005	0.17	ND	6.00	6.00	0.48	0.01	0.04
LWC6.3	2005	2.56	ND	ND	ND	3.00	0.18	0.61
LVC_2	2006	0.15	0.13	3.36	3.43	1.10	0.02	0.07
LW12.1	2006	ND	0.16	3.44	3.55	0.91	0.01	0.07
FW_0	2006	ND	0.17	4.76	4.80	0.38	0.00	0.03
SC_1	2006	0.52	ND	3.40	3.47	25.00	0.00	0.03
MC_2	2006	0.11	0.17	4.89	5.00	0.53	0.01	0.03
DC_1	2006	ND	ND	6.57	6.58	0.32	0.01	0.01
LWC6.3	2006	ND	ND	ND	ND	ND	0.28	ND
BS-1	2006	ND	ND	7.53	7.53	0.36	0.01	0.02
LVC_2	2007	0.09	0.07	2.47	2.50	1.04	0.03	0.06
LW12.1	2007	0.09	0.11	3.65	3.73	0.75	0.01	0.03
FW_0	2007	0.09	0.07	5.19	5.23	0.43	0.01	0.01
SC_1	2007	0.13	0.26	6.38	6.58	0.60	0.01	0.03
MC_2	2007	0.10	0.09	5.08	5.15	0.43	0.01	0.01
DC_1	2007	0.07	0.07	6.83	6.84	0.52	0.01	0.01
BS-1	2007	0.07	0.07	7.23	7.26	0.28	0.01	0.01

ND= Not Detected

Table 5: Annual average nutrient concentrations.

TOC concentrations were less than 6.5 mg/L for all sites with the exception of the Meadows Detention Basin (LVC_2). The highest average concentration of TOC was detected at Meadows Detention Basin of 9.5 mg/L (Table 4; Figure 5). The highest single TOC value was also seen at Meadows Detention Basin and was detected at 69.1 mg/L on January 26, 2005 (Appendix B).

3.1.3 Nutrients

Nutrients including ammonia nitrogen (NH_4^+-N), nitrite (NO_2-N), nitrate (NO_3^--N), nitrate plus Nitrite (NO_2^- + NO_3^--N), total Kjeldahl nitrogen (TKN), orthophosphate (PO_4-P) and total phosphate (TP), were analyzed for this program. Data from the individual quarterly samples are presented in Appendix B. Annual average concentrations of nutrients are presented in Table 5 and overall average concentrations are listed in Table 6 and shown in Figures 6 and 7.

Ammonia nitrogen concentrations were lower than the detection limit (0.08 mg/L) for most samples analyzed (Appendix B). The average ammonia nitrogen concentrations in Meadows Detention Basin (LVC_2) and Sloan Channel (SC_1) were 0.19 and 0.17 mg N/L, respectively (Figure 6). The highest single ammonia concentration (4.00 mg N/L) was found at Kerr-McGee (LWC6.3) on July 20, 2005 (Appendix B).

As a chemically unstable species of nitrogen in aerated water, nitrite concentrations were generally not detected at all sites. In contrast, nitrate, the stable species in natural water, was detected in all tributaries and seeps. The average nitrate concentrations ranged from 3 mg N/L to 7 mg N/L in the tributaries and from 5 mg N/L to 11 mg N/L in the seeps.

The average concentrations of TKN varied from 0.30 mg N/L to 3.21 mg N/L. Several sites had individual samples that showed high concentrations: 6.30 mg N/L at Meadows Detention Basin (LVC_2), 3.70 mg N/L at Monson Channel (MC_2), 6.80 mg N/L at Kerr-McGee (LWC6.3), and Sloan Channel (SC_1) had the highest single TKN concentration of 25.0 mg N/L from a sample taken on July 27, 2006. This single value is definitely an outlier as all other samples taken at this site from 2003 – 2007 had TKN concentrations ranging from Non-Detect to a high of 1.70 mg N/L. (Appendix B; Table 5; Figure 6).

Average TP and PO_4-P concentrations for the tributary locations were highest at the Meadows Detention Basin (LVC_2) and Burns Street (BS_1). Kerr-McGee (LWC 6.3) and GCS-5 (LWC3.7) had notably higher average TP and PO_4-P concentrations than the other tributaries with concentrations of 0.23 mg P/L and 0.25 mg P/L, respectively (Figure 7).

Sample Site	Period Sampled	NH4 mg N/L	NO2 mg N/L	NO3 mg N/L	NO3NO2 mg N/L	TKN mg N/L	OP mg P/L	TP mg P/L
LVC_2	2003-2007	0.19	0.13	3.37	3.42	1.58	0.03	0.11
LW12.1	2003-2007	0.11	0.10	3.32	3.37	0.91	0.02	0.07
FW_0	2003-2007	0.09	0.08	4.69	4.71	0.55	0.01	0.03
SC_1	2003-2007	0.17	0.18	4.20	4.28	3.21	0.02	0.03
MC_2	2003-2007	0.11	0.10	4.79	4.86	0.69	0.01	0.02
DC_1	2003-2007	0.09	0.06	6.12	6.12	0.55	0.01	0.02
LWC6.3	2003-Jan 2006	0.76	0.06	5.50	5.49	1.54	0.09	0.23
LWC3.7	2003-July 2004	0.07	0.04	10.95	10.96	1.30	0.02	0.24
BS-1	2006-2007	0.07	0.07	7.33	7.35	0.30	0.01	0.02

Table 6: Average nutrient concentrations.

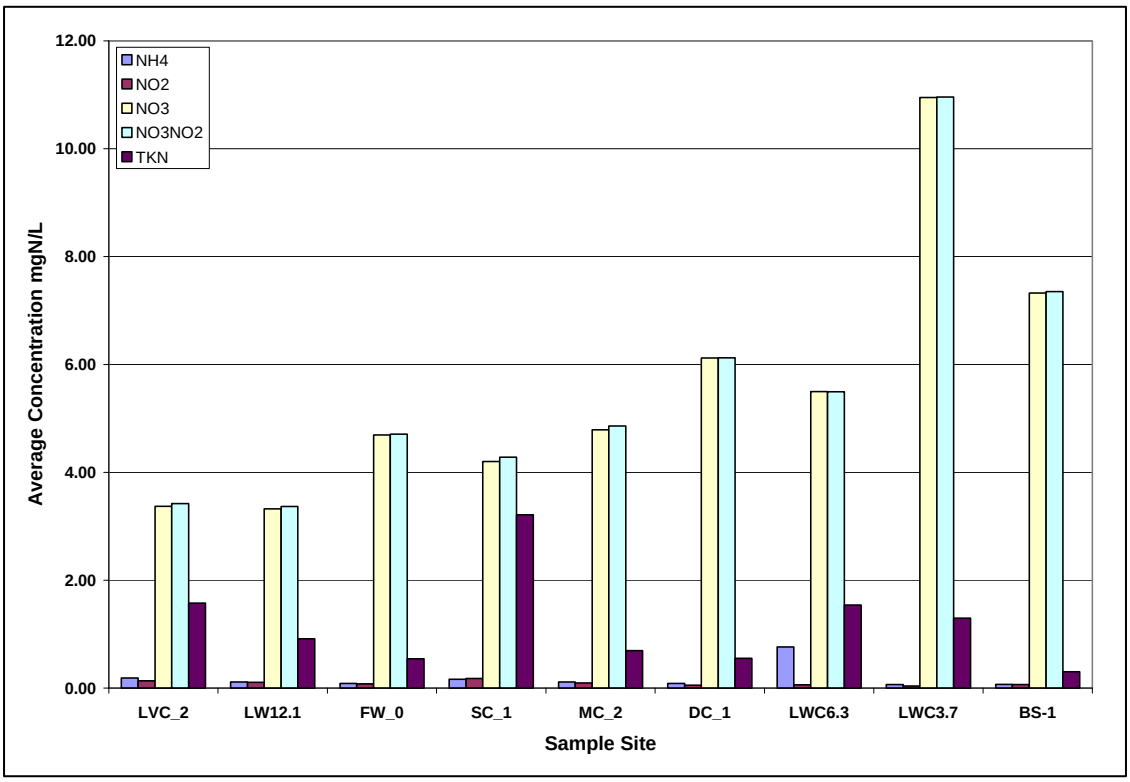


Figure 6: Average nitrogen nutrient concentrations.

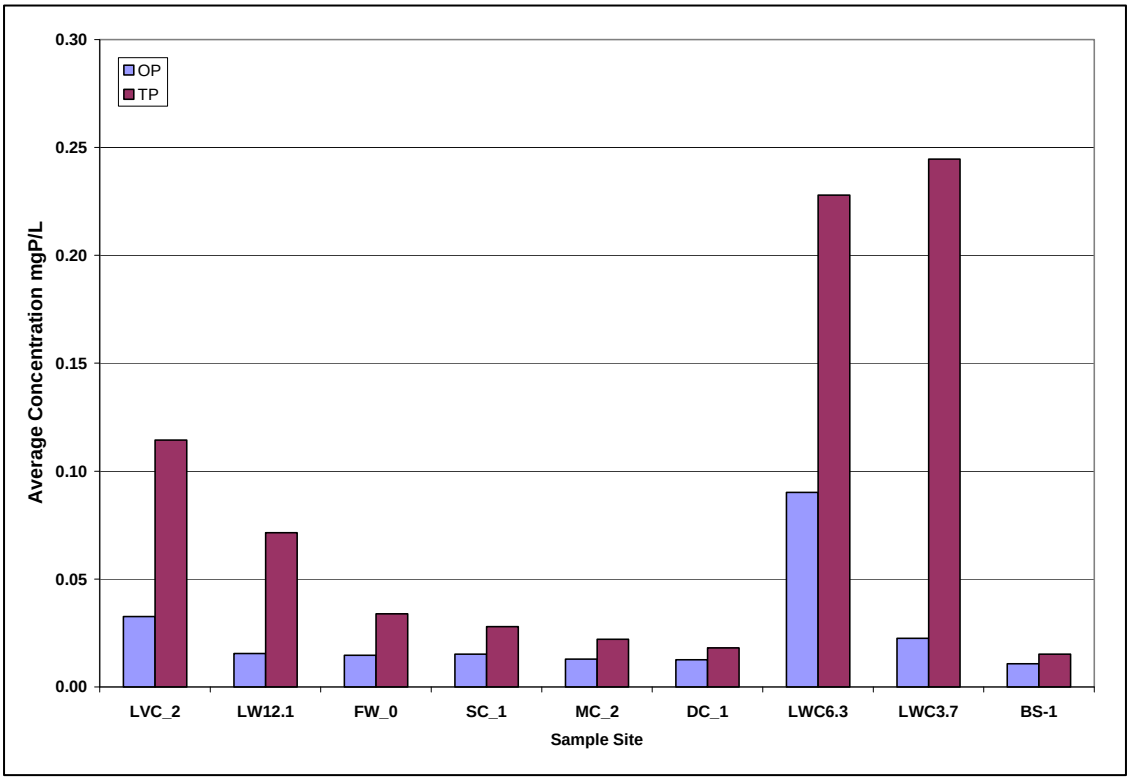


Figure 7: Average phosphorus nutrient concentrations.

3.1.4 Metals

Seventeen metals were analyzed and six metals were below the detection limit at all locations. Individual quarterly sample data for metals from the Tributary/Seep locations are in Appendix B. Average concentrations of metals were calculated and are presented in Table 7. Due to the higher concentration values, aluminum and manganese are shown graphically in Figures 8 and the remaining metals are shown in Figure 9. Metals not detected at any sampling location are not included in the graphs. Se is discussed separately and in further detail in a separate section.

Sample Site	Period Sampled	Aluminum (ug/l)	Arsenic (ug/l)	Barium (ug/l)	Chromium (ug/l)	Copper (ug/l)	Iron (mg/l)	Lead (ug/l)	Manganese (ug/l)	Nickel (ug/l)	Selenium (ug/l)	Zinc (ug/l)
LVC_2	2003-2007	82.5	2.6	64.0	1.2	8.0	0.2	0.9	7.4	3.1	4.6	37.7
LW12.1	2003-2007	365.1	6.0	45.6	0.8	3.0	0.3	0.9	34.1	4.1	8.1	16.3
FW_0	2003-2007	95.7	5.1	47.7	1.3	10.7	0.1	0.3	7.1	5.7	11.3	16.0
SC_1	2003-2007	76.7	11.8	52.4	2.6	2.4	0.1	0.1	6.6	0.9	6.4	8.5
MC_2	2003-2007	29.9	16.7	24.6	0.6	4.4	2.3	0.1	3.6	7.7	19.6	5.5
DC_1	2003-2007	77.0	41.3	22.7	0.8	1.4	0.1	0.0	21.9	8.5	16.1	8.2
LWC6.3	2003-Jan 2006	2.7	75.3	20.3	5.5	1.8	1.0	0.0	447.4	33.1	3.9	6.4
LWC3.7	2003-July 2004	841.6	21.6	28.9	2.5	4.5	0.9	8.7	252.9	7.6	1.6	7.8
BS-1	2006-2007	9.0	35.6	33.3	15.9	2.6	4.4	0.0	2.7	5.0	11.2	1.9

ND= Not Detected

Table 7: Average metal concentrations.

Aluminum and manganese have a wide range of concentrations for most locations (Appendix B). The concentration of manganese was much higher in both seeps than in the tributaries. It is interesting to note that manganese is used at the BMI industrial site, and naturally occurring manganese can be found in close proximity to the Wash (Zhou et al, 2004). Concentrations of aluminum were much higher in GCS-5 (LWC3.7) than any other location (Table 7; Figure 8).

Arsenic was detected at all locations. The tributary sites with higher average concentrations were Duck Creek (DC_1) and Burns Street (BS_1) at 41.3 ug/L and 35.6 ug/L respectively (Table 7). Arsenic concentrations for the two seeps, GCS-5 (LWC3.7) Kerr-McGee (LWC6.3), were 21.6 ug/L and 75.3 ug/L, respectively (Table 7). Average concentrations for the remaining sites ranged from 2.6 to 16.7 ug/L

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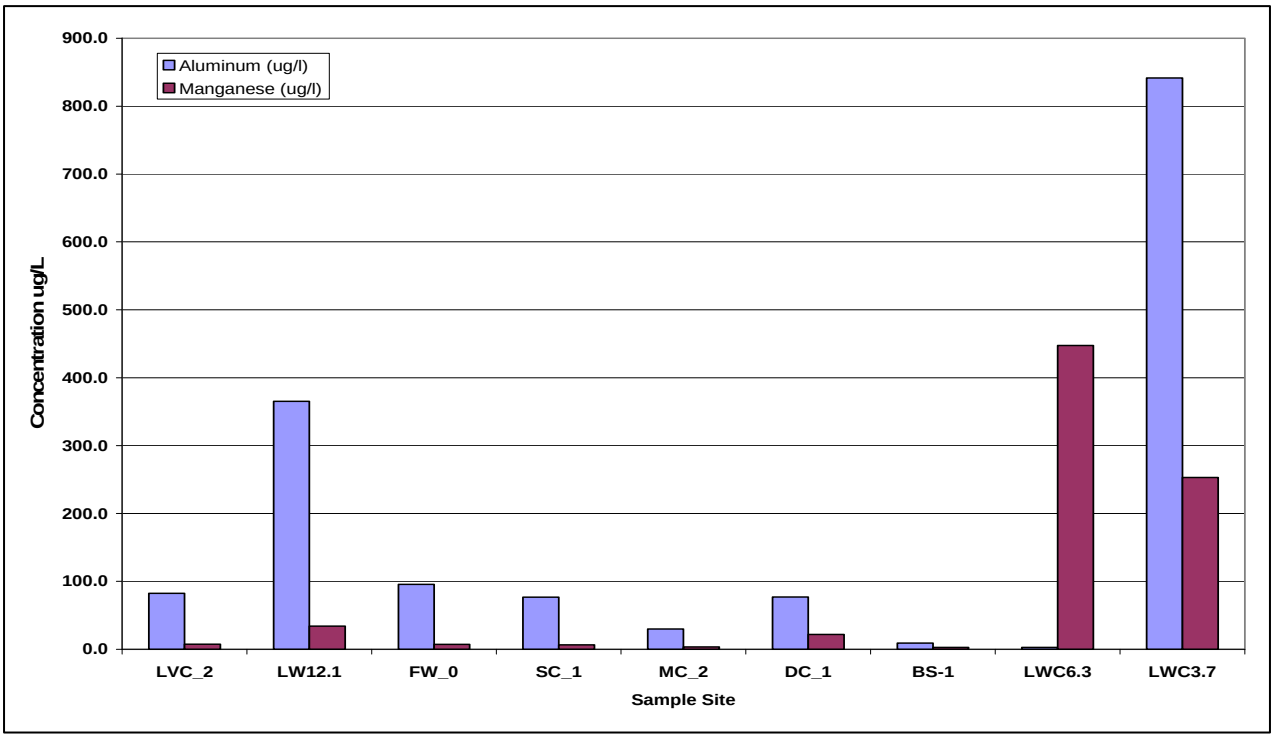

Figure 8. Average aluminum (Al) and manganese (Mn) concentrations.

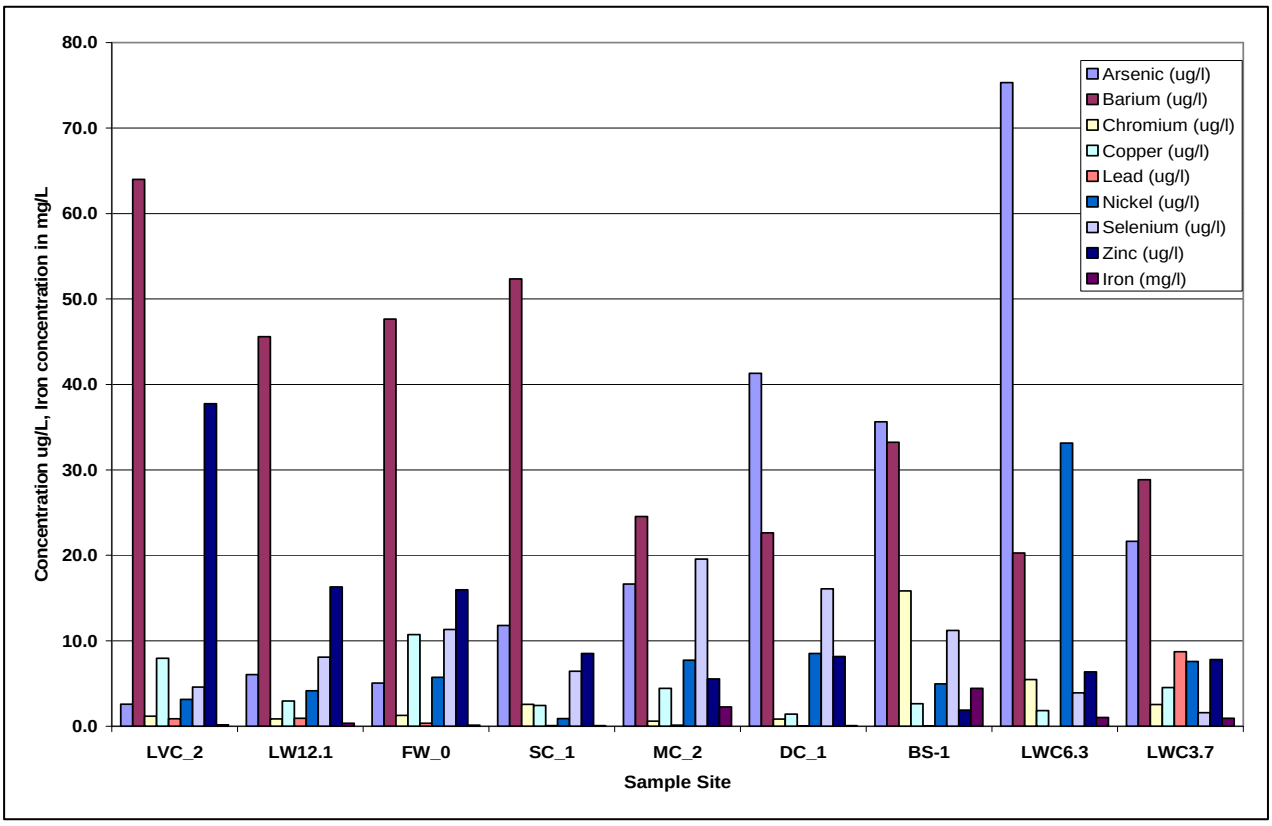

Figure 9. Average concentrations of other metals.

3.1.5 Selenium

Se is a metalloid that is of particular interest when evaluating water quality along the mainstream Wash. Se has a tendency to bioaccumulate in wetland systems and can have detrimental effects to the ecosystem, mainly fish and birds. The tributaries are the major source of Se to the mainstream Wash as (during dry weather conditions) their flow is comprised solely of shallow groundwater discharge and urban runoff. Results from sample collections at sites are presented in Table 8 and average Se concentrations are shown in Figure 10.

Sample Date	LVC_2	LW12.1	FW_0	SC_1	MC_1	DC_1	LWC6.3	LWC3.7	BS-1
1/22/2003	6.3	11.0	15.2	7.8	23.4	23.0	5.6	3.6	NS
4/23/2003	5.5	11.4	14.8	6.0	23.9	22.4	5.4	5.1	NS
7/23/2003	ND	ND	ND	ND	ND	ND	ND	5.56	NS
10/22/2003	4.7	9.0	15.8	8.0	22.9	ND	8.9	3.62	NS
1/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	NS
4/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	NS
7/21/2004	7.0	9.3	13.6	8.7	21.6	25.9	1.7	4.2	NS
10/27/2004	4.3	11.5	16.0	ND	23.6	24.2	1.9	NS	NS
1/26/2005	3.0	6.4	13.4	ND	21.3	ND	19.6	NS	NS
4/19/2005	8.5	11.4	16.2	9.9	21.2	21.6	4.1	NS	NS
7/20/2005	6.1	9.4	13.2	4.6	21.1	21.0	2.6	NS	NS
10/26/2005	6.2	1.7	6.3	ND	21.7	22.1	2.4	NS	NS
1/19/2006	7.9	11.6	ND	ND	22.9	16.8	2.6	NS	NS
4/18/2006	5.8	7.7	14.0	5.6	23.8	20.3	NS	NS	12.1
7/27/2006	4.0	9.2	13.2	10.8	22.2	18.4	NS	NS	12.5
10/25/2006	1.3	9.3	13.9	10.3	21.6	19.2	NS	NS	9.6
1/23/2007	7.9	13.0	16.0	12.0	25.0	23.0	NS	NS	11.0
4/18/2007	5.9	9.6	15.0	12.0	25.0	22.0	NS	NS	9.9
7/18/2007	4.3	8.2	14.0	13.0	24.0	21.0	NS	NS	11.0
10/24/2007	2.8	12.0	16.0	20.0	26.0	21.0	NS	NS	12.0
Average	4.6	8.1	11.3	6.4	19.6	16.1	3.9	1.6	11.2

ND=Non Detected: NS=Not Sampled

Table 8: Se concentrations (μg/L).

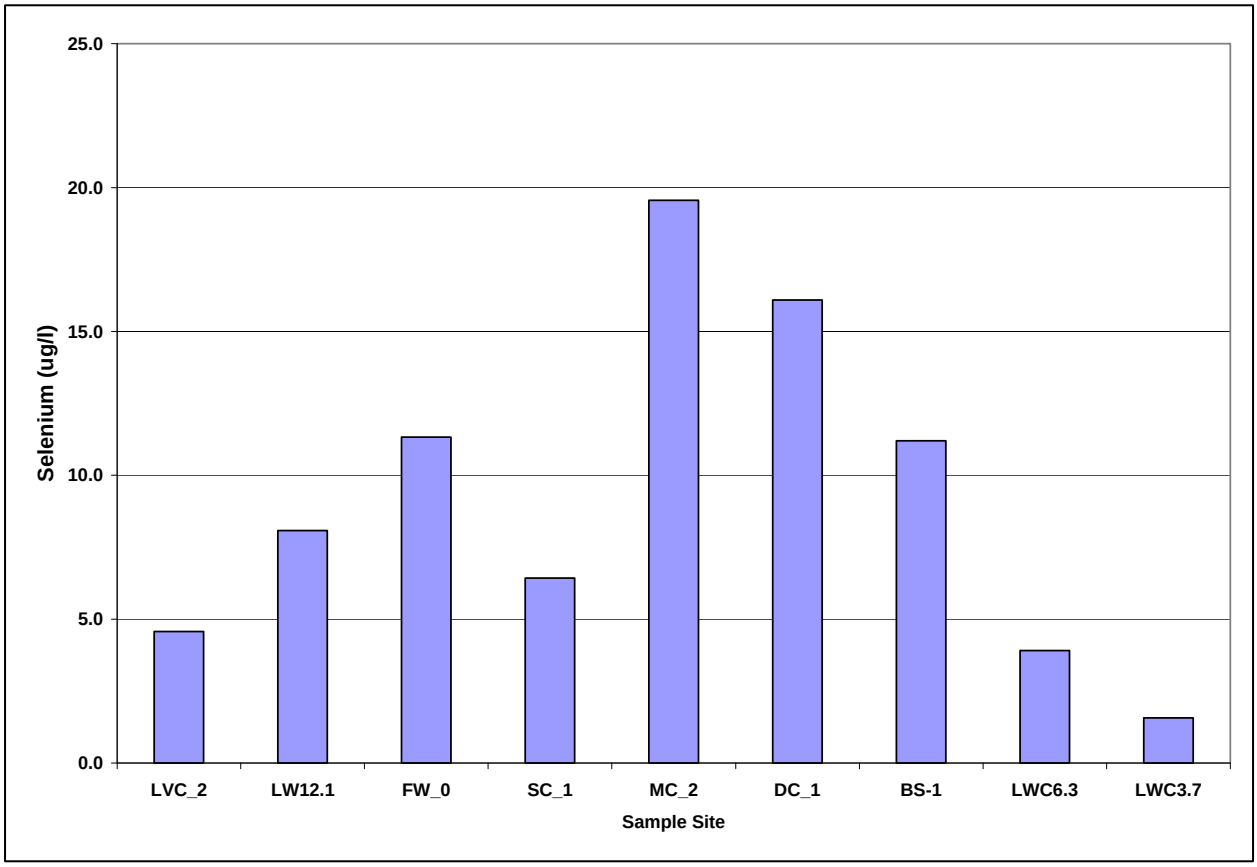

Figure 10: Average selenium concentrations.

Se concentrations were fairly consistent at each sample site. Meadows Detention Basin (LVC_2) and Sloan Channel (SC_1) had lower Se concentrations with averages of 4.6 ug/L and 6.4 ug/L respectively (Table 8; Figure 10). Flamingo Wash (FW_0), Las Vegas Creek (LW12.1), and Burns Street (BS_1) had higher Se concentrations, with average concentrations of 8.1ug/L, 11.3 ug/L, and 11.2 ug/L, respectively.

Tributaries with large localized shallow groundwater contributions, such as Monson Channel (MC_1) and Duck Creek (DC_1), have the highest Se concentrations averaging 19.6 µg/L and 16.1 µg/L. Detailed investigations of Se in tributaries suggest that there is a source of elevated Se levels in groundwater seeps located within a relatively narrow band on the southeast side of the Las Vegas Valley (Cizdziel and Zhou, 2005). Se values from Monson Channel and Duck Creek support this conclusion. The two seeps sampled have fairly low Se concentrations (Table 8) with averages below 4ug/L.

3.1.6 Bacteria

Fecal coliforms and *E. coli* were analyzed. The results at each site were variable from one sampling event to another. Quarterly data for fecal coliforms and *E. coli* are included in Appendix B. Using membrane filtration, three replicate samples were performed in order to provide for analytical validity. Results were reported as average colony forming units (CFU) per 100 milliliters (mL). Subsequently, the average of the average concentrations of fecal coliforms and *E. coli* was then calculated. Table 9 and Figure 11 show the ranges and average

concentrations of fecal coliform and *E. coli.* Analytical results that were lower than the detection limit were graphed and averaged as zero.

Sample Site	Period Sampled	Range of Fecal Coliforms cfu/100mL	Average of Fecal Coliforms cfu/100mL	Range of *E. coli* cfu/100mL	Average of *E. coli* cfu/100mL
LVC_2	2003-2007	ND-64000	8816	ND-28000	2208
LW12.1	2003-2007	ND-94000	12264	33-10700	1445
FW_0	2003-2007	ND-21000	3931	20-5300	963
SC_1	2003-2007	100-36000	5674	66-3700	711
MC_2	2003-2007	60-13100	2872	48-1487	291
DC_1	2003-2007	ND-12100	1807	16-773	224
BS_1	2006-2007	15-4700	935	30-145	81
LWC6.3	2003-Jan 2006	3-16800	1627	3-1740	398
LWC3.7	2003-July 2004	ND-6800	1574	20-200	130

Table 9: Ranges and average fecal coliform and *E. coli* concentrations.

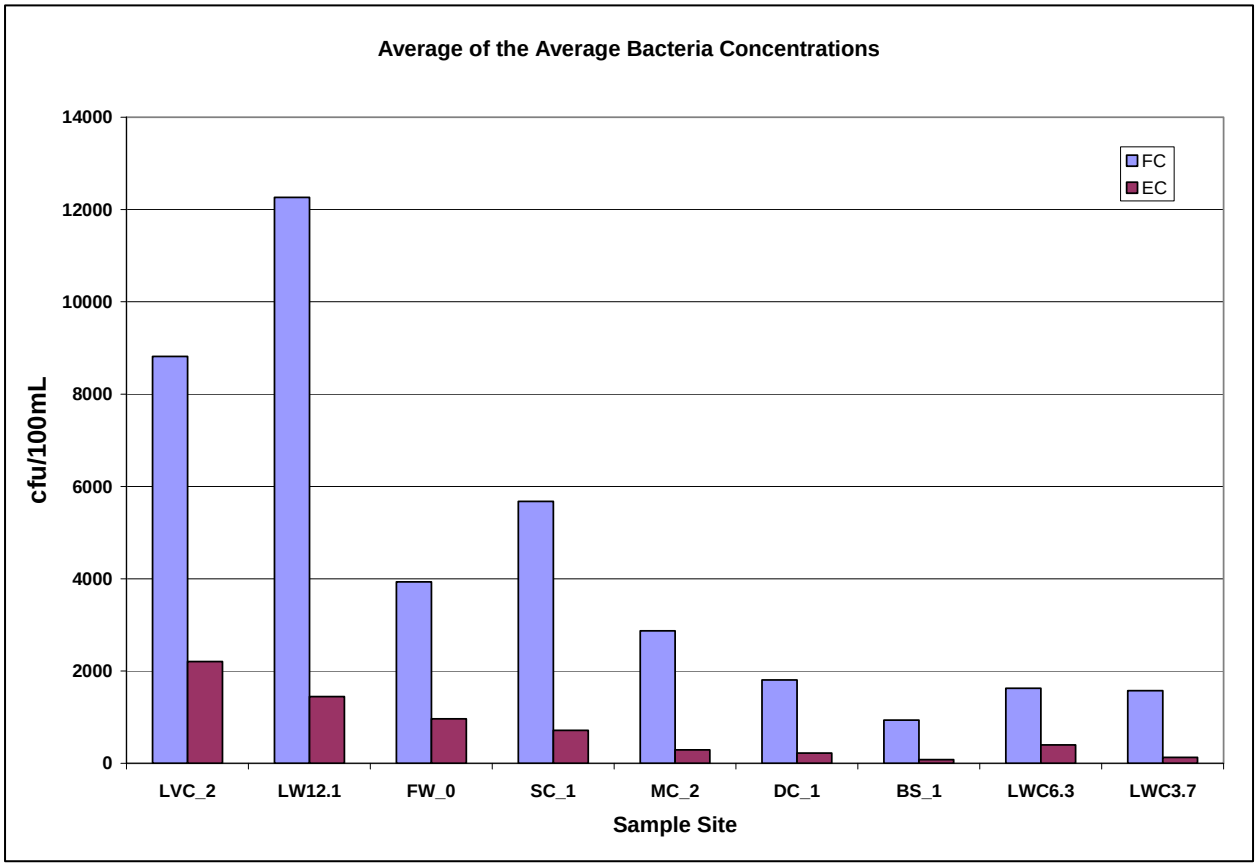

Figure 11: Average of the average bacteria.

More abundant bacteria were generally detected in the tributary water during the hot and warm seasons, particularly summer and early fall. Fewer bacteria occurred during cold and cool seasons, such as winter and spring. Monson Channel, Duck Creek, Burns Street, and the two seeps show significantly lower average bacteria concentrations than the other tributary sites. These lower concentrations may be resulted from the higher TDS values at each of these sites, since bacteria cannot survive long in higher salinity environments. The greatest fecal coliform concentration was found in the Las Vegas Creek (LW12.1) with an average value of 12,264 cfu/100ml, and the greatest *E. coli* concentration was found in the Meadows Detention Basin (LVC_2) with an average value of 2,208 cfu/100ml.

Meadows Detention Basin (LVC_2), Las Vegas Creek (LW12.1), and Flamingo Wash (FW_0) are strongly influenced by the commercial development along Las Vegas Boulevard (Montgomery Watson, 2000). These areas have the highest densities of hotels, tourists, impervious surfaces, traffic and transient populations in the monitoring area. Tributaries such as Duck Creek (DC_1), Sloan Channel (SC_1) and Monson Channel (MC_2) are more strongly influenced by residential areas, pets, urban wildlife and waterfowl. Residential versus commercial land use does not seem to determine whether fecal coliform or *E. coli* counts will be elevated in the urban run-off from these areas.

3.1.7 Perchlorate

In 1998, the perchlorate levels in the Wash became a significant environmental concern. Perchlorate enters the Wash via a shallow groundwater plume originating in the vicinity of an industrial complex (Kerr-McGee), approximately two miles southwest of the Wash. Perchlorate was manufactured at Kerr-McGee from the 1940's through the 1990's and by American Pacific

from 1958 to 1988. Treatment to remove perchlorate from the shallow groundwater began in 1998.

Perchlorate has been analyzed quarterly from six tributaries and two seeps to the Wash since July of 2001. All of the six main tributary sites have low concentrations of perchlorate with average concentrations ranging from 9 ug/L in Las Vegas Creek (LW12.1) to 30 ug/L in Duck Creek (DC_1). The two seeps, which are main contributors of perchlorate to the Wash, have much higher perchlorate concentrations. The average concentration at Kerr-McGee (LWC6.3) and GCS5 were 12,600 ug/L and 620 ug/L respectively. The Burns Street site (BS_1), added in 2006, also has higher perchlorate concentrations, approximately 2,800 ug/L. The Burns Street site drains urban run-off from the Henderson industrial area.

Quarterly perchlorate data from tributaries and seeps is presented in Appendix B. Average perchlorate concentrations from these sites are presented in Table 10. Annual average perchlorate concentrations from 2003-2007 for the main tributaries are shown in Figure 12. Annual average perchlorate concentrations from 2001- end of sampling for the two seeps are shown in Figure 13.

Sample Site	Period Sampled	Perchlorate µg/L
LVC_2	2003-2007	13.4
LW12.1	2003-2007	9.1
FW_0	2003-2007	11.0
SC_1	2003-2007	14.4
MC_2	2003-2007	14.9
DC_1	2003-2007	30.1
BS_1	2006-2007	2852
LWC6.3	2003-Jan 2006	12646.3
LWC3.7	2003-July 2004	619.4

Table 10: Average perchlorate concentrations.

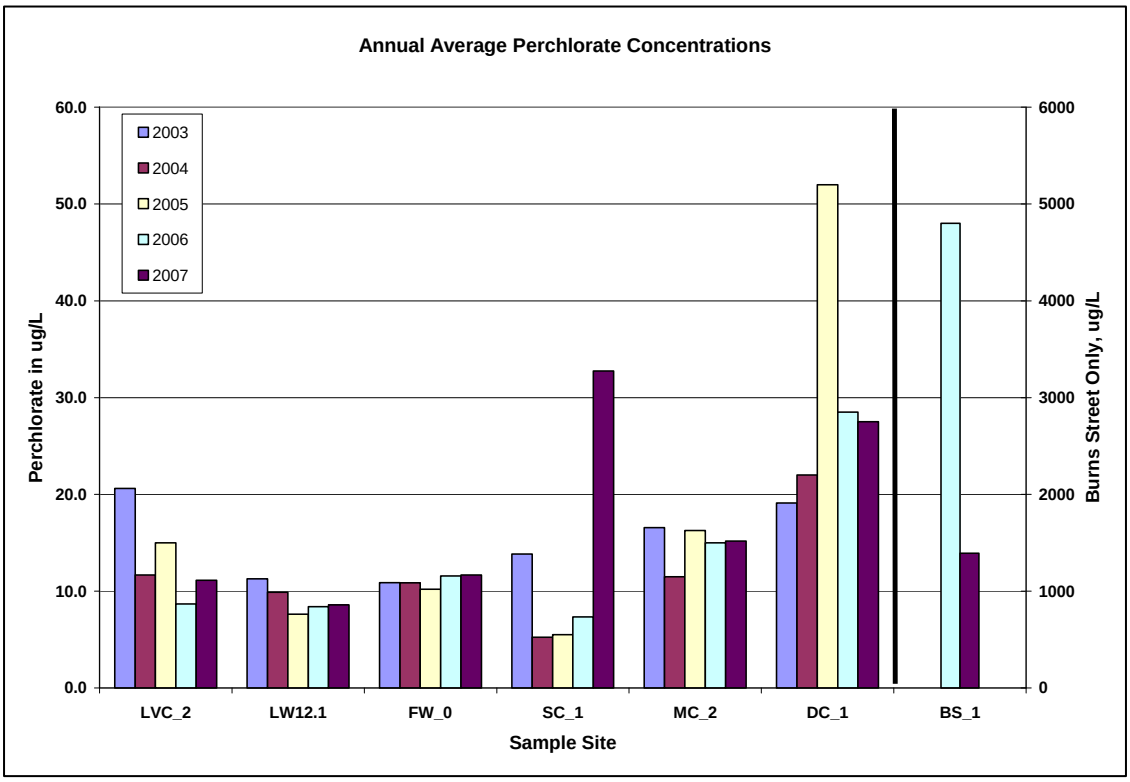

Figure 12: Annual average perchlorate concentrations at the tributary locations.

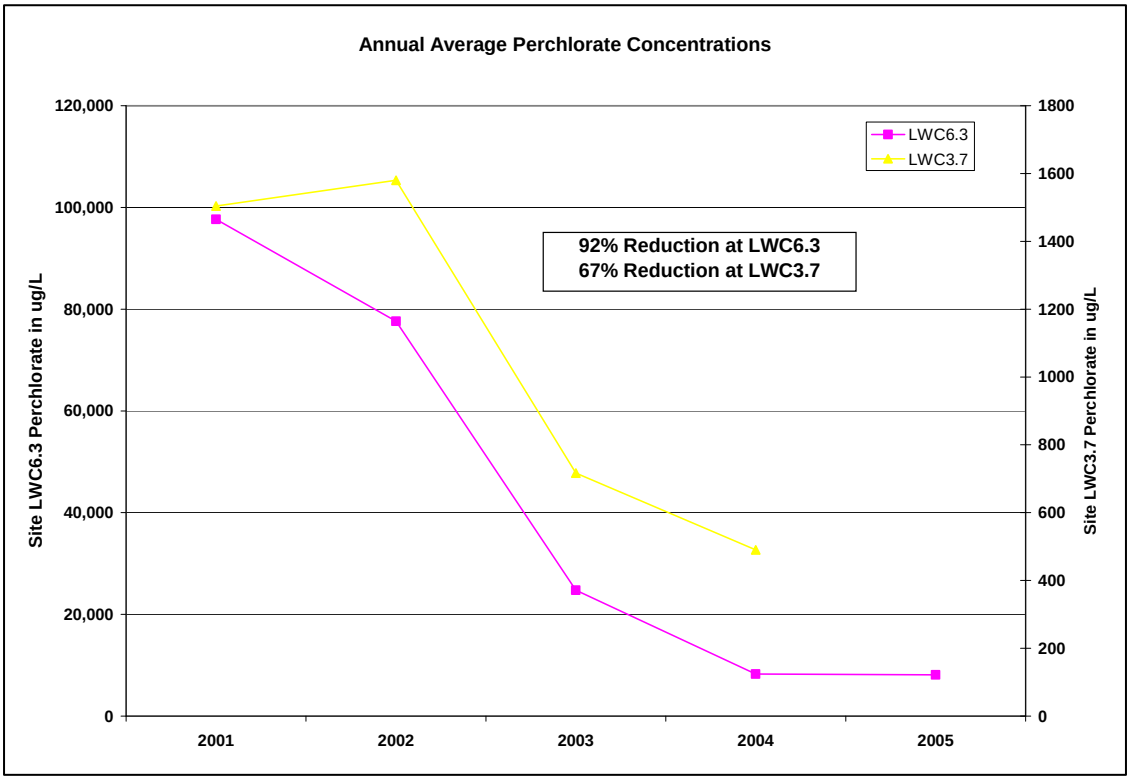

Figure 13: Annual average perchlorate concentrations in the seep locations.

Due to the remediation efforts of Kerr-McGee, perchlorate concentrations have decreased over time at both seeps. The average perchlorate concentration at the beginning of the sampling program was 97686 μg/L at Kerr-McGee (LWC6.3) and 1503.85 ug/L at GCS5 (LWC3.7; Zhou et al, 2004). The average concentration has decreased 92 percent to 8097 μg/L in 2005 at Kerr-McGee (LWC6.3) and 67 percent to 490 ug/L in 2004 at GCS5 (LWC3.7; Figure 13).

3.1.8 Organic Compounds

A total of 177 priority organic compounds have been analyzed for all water samples collected from all locations. The complete list of priority organic compounds along with the method and detection limit is presented in Appendix A. Most of these organic compounds were below the analytical detection limits in the samples. Appendix B lists the detected organic compound concentrations found in the individual quarterly samples from the locations. Table 11 shows the average concentrations of the organic compounds that were detected from more than one sample location. Concentrations of the most common organic compounds detected are presented in Figure 14.

Sample Site	Period Sampled	2,4-D	Acetaldehyde	Beta-BHC	Butanal	Butylbenzylphthalate	Caffeine	Chloroform (Trichloromethane)	Di(2-Ethylhexyl)phthalate	Diethylphthalate	Di-n-Butylphthalate	Diuron	Formaldehyde
LVC_2	2003-2007	0.78	11.03	ND	2.55	12.23	1.11	1.00	4.33	1.57	0.90	ND	21.34
LW12.1	2003-2007	ND	11.46	ND	1.00	0.90	0.23	1.00	3.16	0.95	ND	1.76	18.68
FW_0	2003-2007	ND	13.71	ND	1.00	3.56	0.58	1.90	1.12	1.32	4.15	3.14	14.99
SC_1	2003-2007	1.29	7.96	ND	1.10	ND	0.11	0.70	ND	ND	0.60	ND	13.30
MC_2	2003-2007	ND	6.25	ND	ND	ND	0.13	ND	0.70	ND	ND	14.10	9.14
DC_1	2003-2007	ND	5.10	ND	1.00	0.80	0.12	ND	ND	ND	ND	ND	12.18
BS_1	2006-2007	ND	18.00	0.29	ND	ND	ND	ND	ND	ND	ND	ND	9.45
LWC6.3	2003-Jan 2006	ND	1.46	0.23	1.60	ND	ND	15.28	ND	ND	ND	ND	14.60
LWC3.7	2003-July 2004	ND	1.50	0.02	ND	ND	ND	0.60	0.67	ND	0.60	ND	ND

ND = Not Detected

*Numbers in the chart reflects organic contaminants that were detected from more than one sample location.

Table 11: Average organic contaminant concentrations (μg/L).

Sample Site	Period Sample	Glyoxal	M-Glyoxal(Pyruvic Aldehyde)	Molybdenum	Pentanal	Phenanthrene	Propanal	Tot DCPA Mono&Diacid Degradate	Total Trihalomethanes	Total THM	Unknown (Total)	Unknown alcohol (Total)	Vanadium
LVC_2	2003-2007	10.98	7.38	7.61	5.16	0.14	2.90	0.20	1.00	0.97	8.70	3.00	4.53
LW12.1	2003-2007	8.15	6.41	28.00	3.50	0.07	2.00	1.60	ND	ND	4.50	2.10	8.23
FW_0	2003-2007	6.83	3.44	20.60	2.00	0.06	1.50	1.26	ND	2.20	6.50	2.20	4.55
SC_1	2003-2007	6.46	3.89	47.71	4.00	ND	2.00	0.30	4.00	3.50	6.13	5.15	8.27
MC_2	2003-2007	4.08	1.73	10.71	ND	ND	ND	0.31	0.64	ND	2.70	ND	7.83
DC_1	2003-2007	8.13	1.00	ND	ND	ND	ND	0.33	0.60	ND	21.50	ND	14.22
BS_1	2006-2007	31.00	2.50	18.00	ND	ND	ND	ND	ND	ND	23.00	ND	23.83
LWC6.3	2003-Jan 2006	2.93	2.61	240.00	3.00	0.03	1.10	0.45	8.64	12.20	ND	ND	29.00
LWC3.7	2003-July 2004	2.00	1.67	ND	2.00	ND	ND	ND	0.50	0.60	ND	ND	ND

ND = Not Detected

*Numbers in the chart reflects organic contaminants that were detected from more than one sample location.

Table 11 (con't): Average organic contaminant concentrations (μg/L).

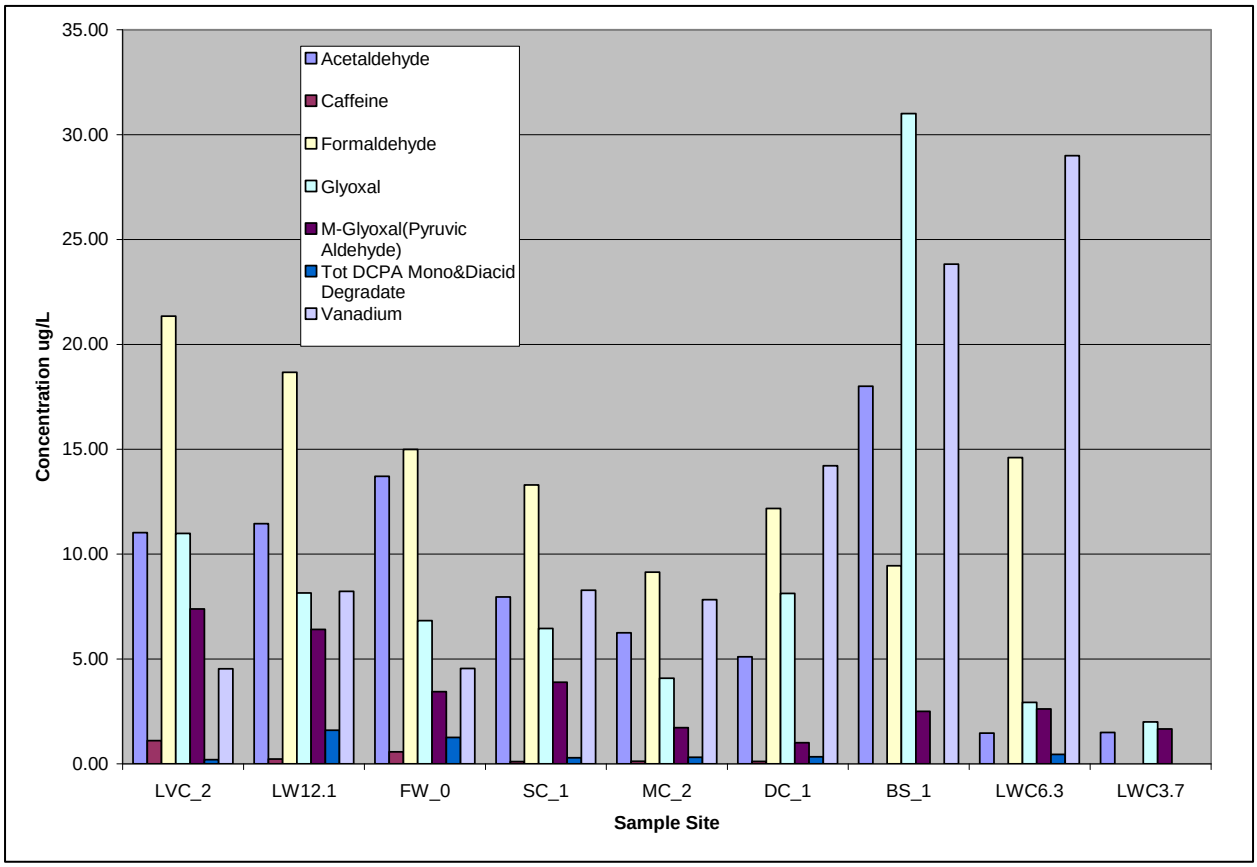

Figure 14: Average concentrations of several common organic compounds.

A total of 89 organic compounds were detected from at least one sampling location. There were 54 organic compounds detected at Kerr-McGee (LWC6.3), 46 at the Meadows Detention Basin (LVC_2), 43 at Sloan Channel (SC_1), 37 at Flamingo Wash (FW_0), 31 at Las Vegas Creek (LW12.1), 23 at Duck Creek (DC_1), 22 at Monson Channel (MC_2), 17 at GCS-5 (LWC3.7), and 15 at Burns Street (BS_1).

Four organic pollutants, including acetaldehyde, formaldehyde, glyoxal, and M-glyoxal (pyruvic aldehyde), were detected at all sites. Formaldehyde was the most common organic compound detected. The average concentration of formaldehyde ranged from 79.14 µg/L to 18.68 µg/L in all samples collected. Less common organic pollutants, such as 2,4-D, caffeine, di (2-ethylhexyl) phthalate, propanal and total DCPA were also found at very low (< 1 µg/L) or fairly low (< 15 µg/L) concentrations. Unknown organic compounds, some of which are unknown alcohol compounds, are presented as various unidentified organic pollutants (Appendix B).

3.1.9 Flow Rates

Flow rates along the six major tributaries have been measured monthly since April of 2001, and at the Burns Street site since it was added to the sampling program in 2006. Flows at each of the sites were measured using one of two devices, the USGS Parshall Flume or the Price pygmy current meter, depending on the hydrological conditions at the site. When water depth was too shallow and flow velocity was too low for the Price pygmy current meter, the USGS Parshall flume was used. The flume has been used at Meadows Detention Basin (LVC_2) and Sloan Channel (SC-1). The flow at the remaining sites is sufficient to use the current meter. The

methods for measurement and computation of streamflow developed by USGS (Rantz et al., 1982) have been followed.

Flow data at each of the six tributary locations was consistently collected on the last week of each month with the following exceptions: flow data was not collected in February and December of 2003 and in July and August of 2007; Sloan channel (SC_1) was unable to be measured in 2006 due to construction on the channel, and Duck Creek (DC_1) was unable to be measured in 2005 and 2006 due to construction. Data for Duck Creek (DC-1) used in Figures 15 and 17, for 2005 and 2006 are from the USGS gaging station 09419696 Duck Creek at Broadbent Boulevard at East Las Vegas (NWIS 2007).

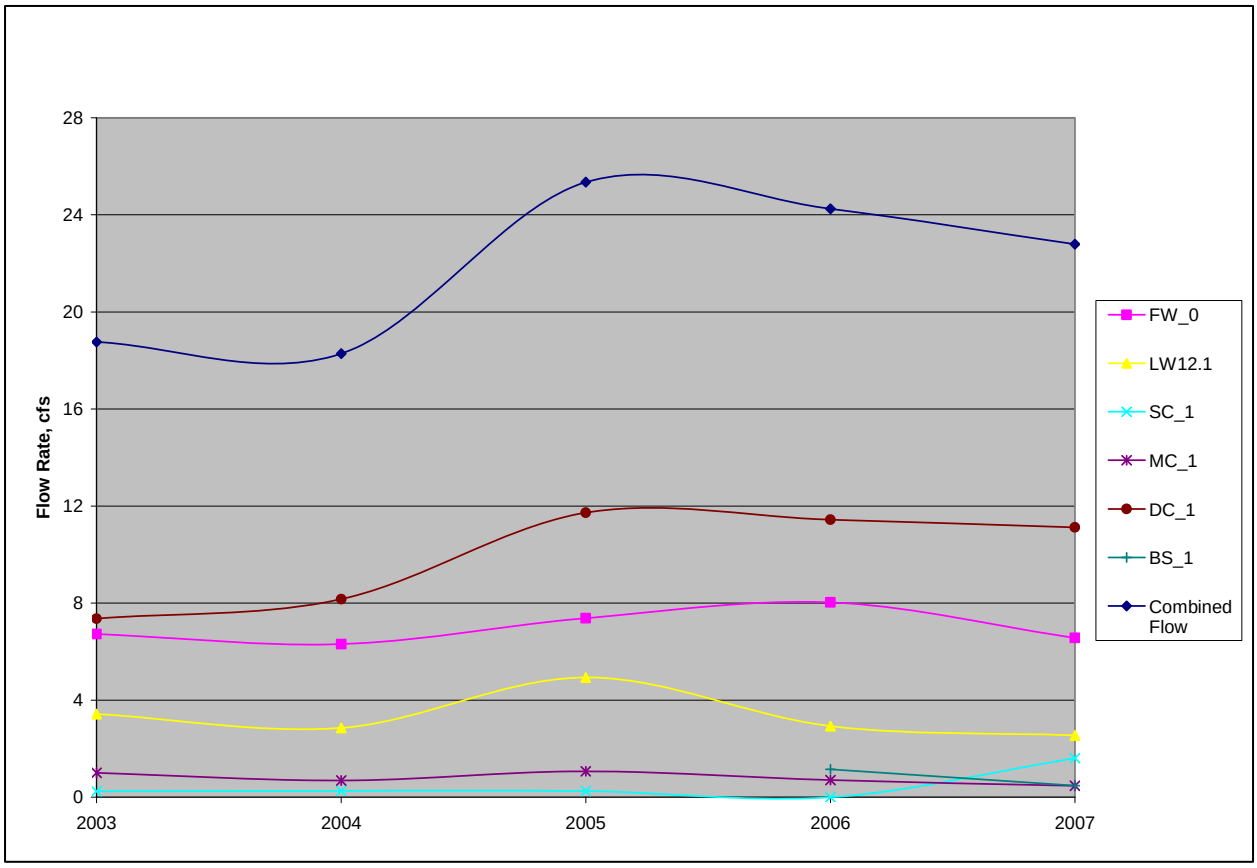

Figure 15: Average flow rates.

The flow measurements made from 2003 to 2007 show that, under dry weather conditions, the six main tributaries contribute an average of 22 cfs (or 14 MGD) of flow to the Wash (Figure 15). This constitutes approximately eight percent of the total flow from the Wash to Lake Mead (Figure 16). The six tributaries contribute an average of 15,835 acre-feet flow to the Wash annually (Figures 17 and 18)

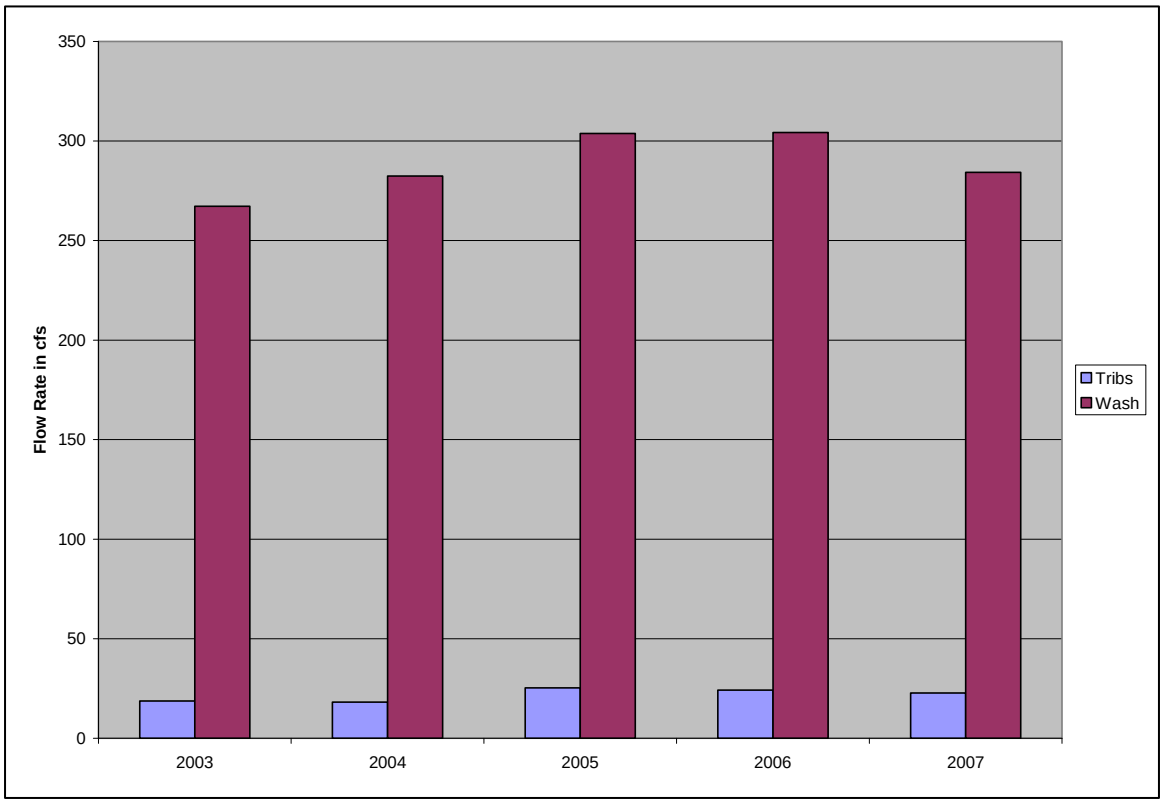

Figure 16: Average daily flow rates.

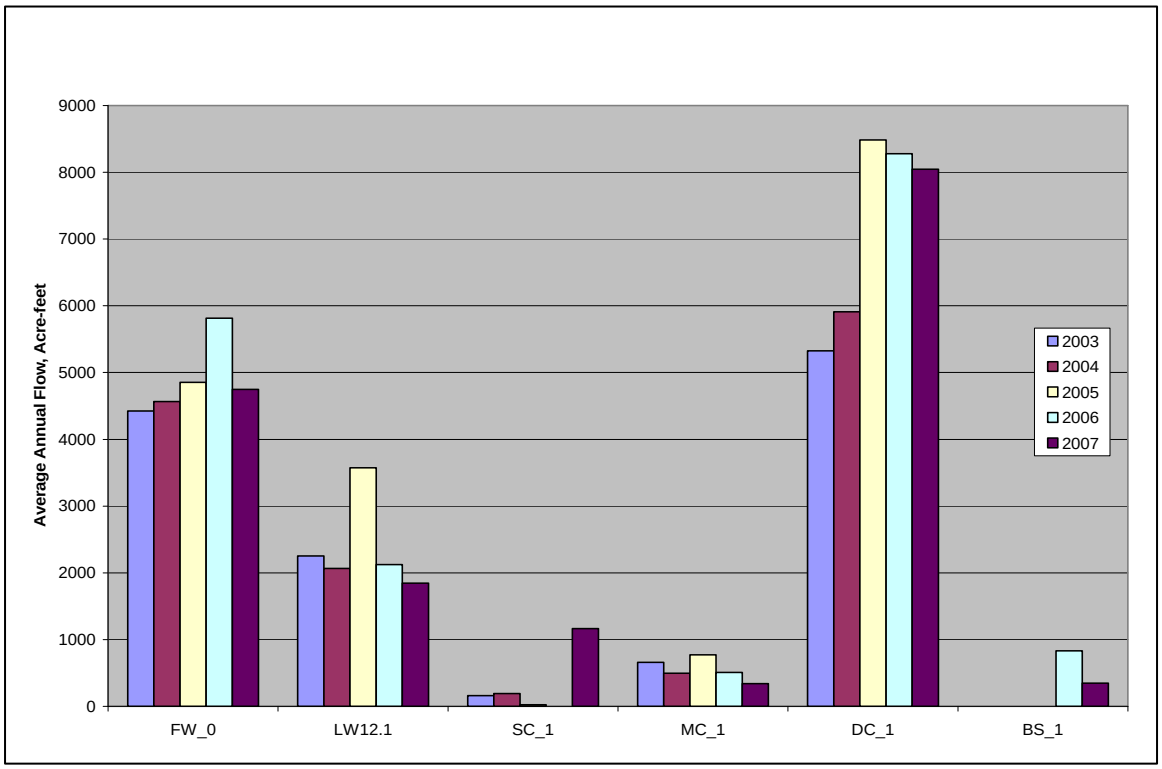

Figure 17: Average annual flow volume (acre-feet).

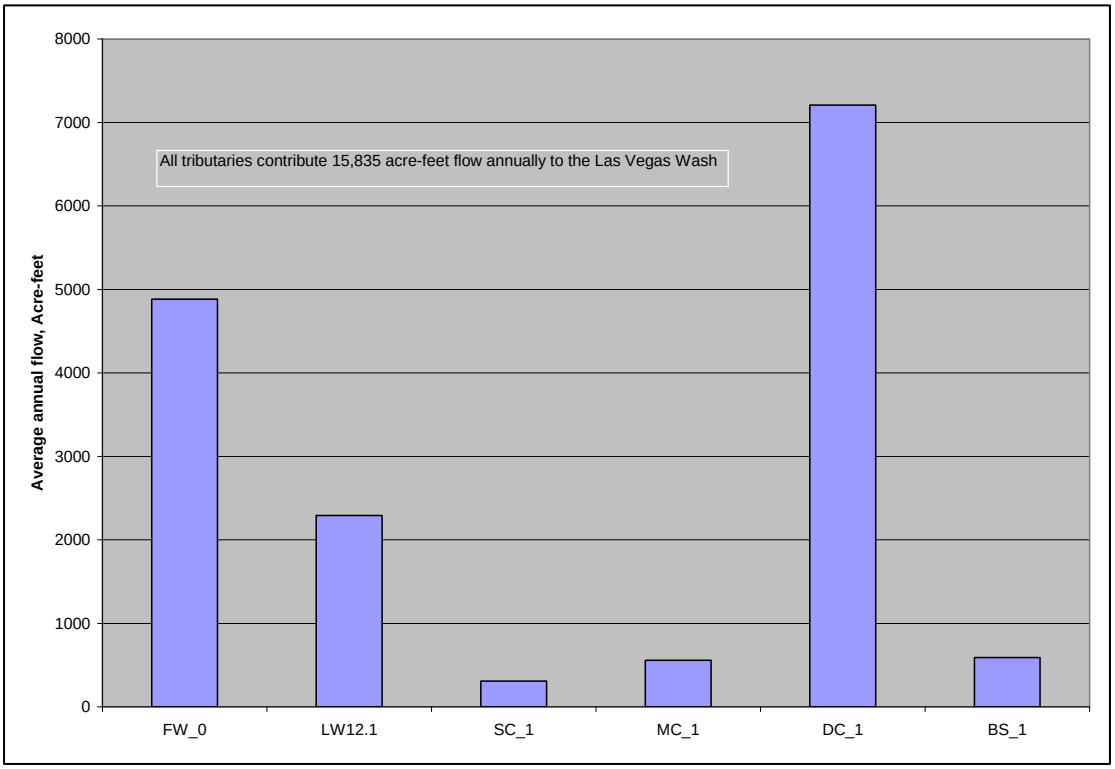

Figure 18: Overall average flow volume (acre-feet).

3.2.0 Mass Loading

The daily mass loading rates (lbs/day or tons/day) of TDS, heavy metals, and nutrients from each tributary were calculated using the average concentrations of these chemical constituents and the average flow rate in each tributary. The relative percentages of the total daily load (TDL) of each chemical constituent from all seven tributaries vs. that in the Wash were also computed (Table 12). Flow rates and concentrations from Site LW0.8 (Wash below Lake Las Vegas, USGS site number 09419800) was used as the Wash site for the mass loading computations. Comprising approximately 8% of the Wash total flow, the tributaries together contribute approximately 18% of total TDS, 31% of Se, 20% of arsenic, 2% of total metals, 3% of nitrogen nutrient, and 1% of phosphorus nutrient mass loading to the Wash (Table 12). Duck Creek and the Flamingo Wash are the two major sources of TDS, Metals (especially Se and arsenic) and nutrients from the tributaries to the Wash (Table 13). LW12.1 contributes the third largest overall mass loading and the greatest mass loading of aluminum and BS_1 contributes the greatest mass loading of iron (Table 13).

Parameter		Tribs	Wash	%Trib to Wash
TDS(tons/day)		241.4	1322.0	18.3
Metals (lbs/day)	Aluminum	14.8	532.4	2.8
	Arsenic	2.8	13.7	20.8
	Barium	4.3	100.6	4.3
	Chromium	0.2	2.2	9.1
	Copper	0.6	7.5	7.8
	Iron	46.6	555.7	8.4
	Lead	0.0	1.7	1.9
	Manganese	2.1	86.2	2.5
	Nickel	0.8	15.4	5.3
	Selenium	1.6	5.2	30.6
	Zinc	1.4	58.8	2.5
Nutrients (lbs/day)	NH_4	11.6	229.8	5.0
	NO_2	9.1	174.8	5.2
	NO_3	633.9	22286.8	2.8
	NO_2+NO_3	636.1	22379.6	2.8
	TKN	81.7	952.2	8.6
	OP	1.7	141.4	1.2
	TP	3.9	280.7	1.4

Table 12: Daily mass loading of TDS, metals, and nutrients.

	Parameter	LVC_2	LW12.1	FW_1	SC-1	MC_1	DC_1	BS_1
Mass Load (LBS/Day)	Aluminum	0.13	6.57	3.61	0.20	0.13	4.13	0.04
	Arsenic	0.00	0.11	0.19	0.03	0.07	2.22	0.18
	Barium	0.10	0.82	1.80	0.13	0.10	1.22	0.17
	Chromium	0.00	0.02	0.05	0.01	0.00	0.04	0.08
	Copper	0.01	0.05	0.40	0.01	0.02	0.08	0.01
	Iron	0.27	6.12	4.15	0.19	9.63	3.54	22.69
	Lead	0.00	0.02	0.01	0.00	0.00	0.00	0.00
	Manganese	0.01	0.61	0.27	0.02	0.02	1.18	0.01
	Nickel	0.00	0.07	0.22	0.00	0.03	0.46	0.03
	Selenium	0.01	0.15	0.43	0.02	0.08	0.86	0.05
	Zinc	0.06	0.29	0.60	0.02	0.02	0.44	0.01
TDS (Tons/Day)		1.2	27.0	55.2	2.7	9.6	135.9	9.8
Mass Load (LBS/Day)	NH4	0.30	2.01	3.29	0.42	0.48	4.75	0.31
	NO2	0.21	1.88	2.83	0.46	0.41	3.01	0.29
	NO3	5.36	59.80	177.07	10.72	20.30	328.48	32.15
	NO3NO2	5.44	60.60	177.59	10.93	20.59	328.71	32.26
	TKN	2.51	16.44	20.61	8.20	2.94	29.69	1.33
	OP	0.05	0.28	0.55	0.04	0.05	0.68	0.05
	TP	0.18	1.29	1.28	0.07	0.09	0.97	0.07

Table 13: Daily mass loading of metals, TDS, and nutrients from individual sampling sites.

4.0 CONCLUSIONS

The Tributary Water Quality Monitoring Program has helped quantify the effects of urban runoff on the Wash. Data from the program is essential in monitoring and tracking non-point sources of contamination to the Wash. As one of four flow components in the Wash, urban runoff from the Las Vegas Valley contributes approximately 15,800 acre-feet/yr (LVWCC, 2008) of flow to the Wash, approximately 8 percent of the total Wash flow.

Generally, tributary and seep water have high TDS due to high evaporation rates in the Las Vegas Valley watershed and groundwater inputs. Duck Creek (DC_1), Monson Channel (MC_2), Burns Street (BS_1), and Kerr-McGee (LWC6.3) have the highest TDS concentrations above 3000 mg/L. All tributaries contribute nutrients, heavy metals, and organic contaminants to the Wash at varying levels. All tributary waters have varying concentrations of bacteria, including fecal coliform and *E. coli*, but the values vary greatly over time indicating there is no consistent source of bacteria.

The shallow groundwater discharges from GCS-5 (LWC3.7), and in particular Kerr-McGee (LWC 6.3), have a negative effect on water quality of the Wash. They are not only the major sources for perchlorate but also contribute other inorganic and organic constituents. Remediation efforts have significantly reduced the perchlorate levels in the seeps. Average perchlorate concentrations have been reduced 92 percent since 2001 at Kerr-McGee (LWC6.3), and 67 percent since 2001 at GCS5 (LWC3.7).

The tributaries are also the major source of Se to the Wash. Detailed investigations of Se in tributaries suggest that there is a source of elevated Se levels in groundwater seeps located within a relatively narrow band on the southeast side of the Las Vegas Valley (Cizdziel and Zhou, 2005). The tributary sites with the highest Se concentrations are Monson Channel (MC_2) and Duck Creek (DC_1) with average Se concentrations above 15 ug/L, followed by Flamingo Wash (FW_0) and Burns Street (BS_1) with average Se concentrations above 10 ug/L. Overall the tributaries contribute 31 percent of the TDL of Se to the Wash.

The long-term monitoring in the tributaries allows for characterization of the water quality of urban runoff within the Las Vegas Valley watershed. Data from this monitoring program, along with the data from the Mainstream water quality monitoring program, are used by the Las Vegas Wash Coordination Committee to evaluate the current state of heath of urban runoff from the tributaries to the Wash, to monitor variations over time in water quality, and to help better manage the Wash and Lake Mead.

5.0 REFERENCES

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Appendix A

Individual Parameters to be Analyzed for the Tributary Water Quality Monitoring Program

Ia. Organic Group and Detection Limits

Ib. Heavy Metals Group

Ic. Cation-Anion Group

Id. Bacteriological Group

Ie. Nutrient Group

Ia. Organic Group

Organic Contaminant	Detection Limit (µg/L)	Organic Contaminant	Detection Limit (µg/L)
Diazinon (Basudin, Neocidol)	0.10	2-Chloronaphthalene	5.00
Methyl bromide (bromomethane)	0.50	2-Chlorophenol	5.00
1,1,1,2-Tetrachloroethane	0.50	2-Chlorotoluene	0.50
1,1,2,2-Tetrachloroethane	0.50	2-Nitrophenol	5.00
1,1,2-Benzofluoranthene (benzo(b)fluoranthene)	0.02	3,4-Benzofluoranthene (benzo(b)fluoranthene)	0.02
1,1,2-Benzoperylene (benzo(ghi)perylene)	0.05	3-Hydroxycarbofuran	2.00
1,1-Dichloroethane	0.50	4,4-DDD (p,p-TDE)	0.01
1,1-Dichloroethylene	0.50	4,4-DDT	0.01
1,1-Dichloropropanone	0.50	4,6-Dinitro-o-cresol	50.00
1,1-Dichloropropene	0.50	4-Bromophenyl phenyl ether	5.00
1,2,5,6-Dibenzanthracene Dibenzo(h)anthracene)	0.05	4-Chlorophenyl phenyl ether	5.00
1,2-Benzanthracene (benzo(a) anthracene)	0.05	4-Chlorotoluene	0.50
1,2-Dibromo-3-chloropropane (DBCP)	0.01	4-Nitrophenol	1.00
1,2-Dichlorobenzene	0.50	a-Benzene Hexachloride (a-BHC)	0.01
1,2-Dichloroethane	0.50	Acenaphthene	5.00
1,2-Dichloropropane	0.50	Acenaphthylene	0.10
1,2-Diphenylhydrazine	10.00	Acrolein	50.00
1,3-Dichlorobenzene	0.50	Acrylonitrile	50.00
1,3-Dichloropropane	0.50	Alachlor (Alanex)	0.05
1,4-Dichlorobenzene	0.50	Aldicarb (Temik)	0.50
1-Phenylpropane	0.50	Aldicarb sulfone	0.70
2,2-Dichloropropane	0.50	Aldicarb sulfoxide	0.50
2,4,5-TP (Silvex)	0.20	Aldrin	0.01
2,4-D	0.10	Alpha-endosulfan	0.01
2,4-Dichlorophenol	5.00	Anthracene	0.02

2,4-Dimethylphenol	5.00	Atrazine (Aatrex)	0.05
2,4-Dinitrophenol	50.00	Baygon	2.00
2,4-Dinitrotoluene	0.10	b-Benzene Hexachloride (b-BHC)	0.01
2,6-Dinitrotoluene	5.00	Bentazon (Basagran)	0.50
2-Chloroethyl vinyl ether (mixed)	0.50	Benzene	0.50
Benzidine	50.00	Dibromoacetonitrile	0.50
Benzo(a)pyrene	0.02	Dibromochloromethane	0.50
Beta-endosulfan	0.01	Dibromomethane	0.50
Bis(2-chloroethoxy) methane	10.00	Dicamba (Banax, Banvel, Dianat)	0.08
Bis(2-chloroethyl) ether	10.00	Dichloroacetonitrile	0.50
Bis(2-chloroisopropyl) ether	10.00	Dichlorobromomethane	0.50
Bromacil (Hyvar X, Hyvar XL)	0.20	Dichlorodifluoromethane	0.50
Bromoacetic Acid	0.50	Dichloromethane (Methylene chloride)	0.50
Bromochloroacetonitrile	0.50	Dieldrin	0.01
Bromochloromethane (Chlorobromomethane)	0.50	Diethyl phthalate	0.50
Bromodichloromethane (Dichlorobromomethane)	0.50	Difluorodichloromethane	0.50
Bromoform (Tribromomethane)	0.50	Dimethoate (Cygon)	10.00
Bromomethane (Methyl bromide)	0.50	Dimethyl phthalate	0.50
Butachlor (Butanex, Lambast, Machete)	0.05	Di-N-Butyl phthalate	10.00
Butyl benzyl phthalate	0.50	Di-n-octyl phthalate	10.00
Carbaryl (Sevin)	2.00	Dinoseb	0.20
Carbofuran (Furadan)	0.90	Diquat	0.40
Carbon tetrachloride	0.50	Diuron (Karmex, Krovar)	1.00
Chlordane	0.10	Endosulfan sulfate	0.01
Chlorobenzene (Monochlorobenzene)	0.50	Endothal	1.00
Chlorodibromomethane	0.50	Endrin	0.01
Chloroethane	0.50	Endrin aldehyde	0.01
Chloroform	0.50	Ethion	0.50

Chloromethane	0.50	Ethylbenzene	0.50
Chloropicrin	0.50	Ethylene dibromide (EDB)	0.01
Chlorothalonil (Bravo)	0.01	Fluoranthene	0.10
Chrysene	0.02	Fluorene	0.05
Cis-1,2-Dichloroethylene	0.50	Formaldehyde	5.00
Dalapon	1.00	Glyphosate	6.00
Di(2-ethylhexyl)adipate	0.60	Heptachlor	0.01
Di(2-ethylhexyl)phthalate (DEHP)	4.00	Heptachlor epoxide	0.01
Hexachlorobenzene	0.05	Oxamyl	2.00
Hexachlorobutadiene	0.50	Parathion	0.50
Hexachlorocyclopentadiene	0.05	Pentachlorophenol	0.04
Hexachloroethane	5.00	Phenanthrene	0.02
Indeno(1,2,3-cd)pyrene(2,3-o-phenylene pyrene)	0.05	Phenol	5.00
Isophorone	0.50	Picloram	0.10
Isopropylbenzene (Cumene)	0.50	p-Isopropyltoluene (p-Cymene)	0.50
Lindane (gamma-BHC)	0.01	Polychlorinated biphenyls (PCBs)	0.10
Malathion	0.50	Prometryn (Caparol)	0.50
Methoxychlor (Lannate)	0.05	Propachlor (Albrass, Ramrod)	0.05
Methyl Isobutyl Ketone (MIBK)	5.00	Pyrene	0.05
Methyl-tert-butyl ether (MTBE)	3.00	sec-Butylbenzene (2-Phenylbutane)	0.50
Metribuzin (Lexone, Sencor, Sencoral)	0.05	Simazine (Princep)	0.05
Molinate (Ordam)	0.20	Styrene	0.50
Naphthalene (Naphthalin)	0.50	tert-Butylbenzene (2-Methyl-2-phenylpropane)	0.50
n-Butylbenzene	0.50	Tetrachloroethylene	0.50
Nitrobenzene	5.00	Thiobencarb (Bolero)	0.20
N-Nitrosodimethylamine	5.00	Toluene	0.50
N-Nitrosodi-n-propylamin	5.00	Trans-1,2-Dichloroethylene	0.50
N-Nitrosodiphenylamine	5.00	Vanadium	0.50

Ib. Heavy Metals Group

Aluminum
Antimony
Arsenic
Barium
Beryllium
Cadmium
Copper
Chromium
Iron
Lead
Manganese
Mercury
Nickel
Selenium
Silver
Thallium
Zinc

Ic. Cation-Anion Group

Sodium
Potassium
Calcium
Magnesium
Bicarbonate
Chloride
Fluoride
Sulfate
Chlorate
Bromide
Silica (SiO_2)
Total Dissolved Solids (TDS)
Total suspended Solids (TSS)
Total Organic Carbon (TOC)

Id. Bacteriological Group

Fecal coliforms
E. coli

Ie. Nutrient Group

Nitrate Nitrogen (NO_3-N)
Nitrite Nitrogen (NO_2-N)
Total Kjeldahl Nitrogen (TKN)
Ammonia Nitrogen (NH_3-N)
Total Phosphorus (TP)
Ortho-Phosphorus (PO_4-P)

Appendix B

Quarterly Water Quality Data from Tributaries and Seeps to the Las Vegas Wash

IIa. Quarterly Field Measurements, Perchlorate, and Bacteria Concentrations in Tributary/Seep Locations

IIb. Quarterly Major Ion Chemistry of Water Samples from Tributary/Seep Locations

IIc. Quarterly Nutrient Concentrations of Water Samples from Tributary/Seep Locations

IId. Quarterly Heavy Metal Concentrations (μg/L) from Tributary/Seep Locations

IIe. Quarterly Organic Pollutant Concentrations (μg/L) of Water Samples from Tributary/Seep Locations

Appendix IIa. Quarterly Field Measurements, Perchlorate, and Bacteria Data of Tributary/Seep Locations									
Site Location	Date	Conductivity uS/cm	DO mg/L	pH Units	Temperature °C	Turbidity NTU	Perchlorate ug/L	Ave # FC /100 mL	Ave # E. coli /100 mL
LVC_2	1/22/2003	2370	10.12	8.41	8.8	0.75	14.3	10	10
	4/23/2003	2180	13.02	8.32	15.5	0.83	11.5	<400	>2000
	7/23/2003	1853	3.71	7.90	28.0	2.62	50.0	64000	28000
	10/22/2003	1832	8.38	8.09	17.3	1.69	6.7	2200	530
	1/21/2004	2510	10.62	8.27	7.5	1.13	15.0	387	520
	4/21/2004	2580	8.70	7.46	14.2	0.77	15.0	600	<200
	7/21/2004	1774	12.64	8.52	26.1	2.15	7.7	18100	3080
	10/27/2004	2140	9.40	8.09	16.6	2.40	9.0	NA	NA
	1/26/2005	565	7.88	7.64	14.7	68.50	20.0	413	520
	4/19/2005	2700	8.95	8.14	15.1	0.90	16.0	<200	<200
	7/20/2005	2070	6.55	8.81	29.8	3.22	12.0	1580	279
	10/26/2005	2260	10.43	8.20	17.1	9.51	12.0	5400	814
	1/19/2006	2610	9.42	8.26	6.4	0.83	14.0	<200	< 200
	4/18/2006	2290	9.25	8.77	22.9	12.4	11.0	1360	192
	7/27/2006	1809	6.1	8.44	25.1	2.66	7.1	80000	4600
	10/25/2006	563	9.07	8.35	20.1	4.70	2.6	<2000	<400
	1/23/2007	2608	13.26	8.3	0.4	0.74	16.0	<667	<400
	4/18/2007	2357	12.08	8.21	8.4	1.66	9.8	1360	340
	7/18/2007	1803	8.53	8.67	23.1	3.91	15.0	29800	600
	10/24/2007	1242	11.54	8.25	14.7	0.2	3.7	<50	<10
LW12.1	1/22/2003	3470	10.76	8.72	10.7	2.42	8.2	260	255
	4/23/2003	3830	15.90	8.52	19.0	1.58	11.6	240	150
	7/23/2003	3590	7.64	8.07	26.7	2.70	16.0	83000	3300
	10/22/2003	3500	8.14	8.04	16.4	12.00	9.3	94000	10700
	1/21/2004	3580	9.72	8.29	7.2	2.21	11.0	<200	<200
	4/21/2004	3980	8.65	8.11	15.5	1.13	11.0	547	380
	7/21/2004	3850	8.38	8.18	23.8	2.87	8.0	9100	2500
	10/27/2004	4060	7.82	8.37	13.4	3.05	9.5	1683	500
	1/26/2005	2560	8.38	8.16	14.1	132.00	8.5	3600	2113
	4/19/2005	4040	11.68	8.49	15.2	1.54	11.0	<200	<200
	7/20/2005	3750	5.78	8.02	26.7	1.76	9.0	4600	1967
	10/26/2005	1740	8.28	7.74	15.2	140.00	<4	16800	1740
	1/19/2006	3720	9.17	8.28	9.6	3.05	9.6	450	<200
	4/18/2006	3090	10.75	8.34	13.6	1.28	5.9	<200	187
	7/27/2006	3940	10.51	8.58	26.8	2.96	8.3	3400	550
	10/25/2006	3600	8.96	8.06	15.4	2.72	9.8	17200	2875
	1/23/2007	3951	12.65	8.38	8.0	1.21	11.0	<100	<667
	4/18/2007	3493	10.51	8.04	15.6	1.82	7.7	3600	623
	7/18/2007	3558	7.04	8.11	26.5	5.29	6.1	3900	350
	10/24/2007	3917	13.41	8.43	16.5	4.40	9.5	2600	380
FW_0	1/22/2003	3690	8.13	8.35	10.4	1.11	13.1	110	115
	4/23/2003	3430	9.42	8.23	16.4	3.21	7.9	<400	80
	7/23/2003	3730	6.52	7.89	26.1	1.37	14.0	4800	710
	10/22/2003	3780	7.30	8.06	17.3	0.66	8.5	430	<200
	1/21/2004	3770	9.19	8.24	8.9	1.25	15.0	<200	<200
	4/21/2004	3610	8.86	8.12	14.9	1.20	9.7	450	<200
	7/21/2004	3590	7.74	8.00	22.9	5.04	9.0	16600	2920
	10/27/2004	3550	8.52	8.24	14.7	2.41	9.7	593	200
	1/26/2005	2910	9.33	8.18	14.6	89.70	10.0	4000	1769
	4/19/2005	3620	7.61	8.21	13.1	0.69	14.0	<200	<200
	7/20/2005	3460	5.55	8.05	25.3	2.86	11.0	2100	451
	10/26/2005	1635	8.77	8.14	15.0	32.00	5.8	9100	953
	1/19/2006	NS	NS	NS	NS	NS	NS	NS	NS
	4/18/2006	3460	10.98	8.45	12.5	2.46	9.7	<200	<133
	7/27/2006	3640	7.41	8.09	25.5	3.41	14.0	4200	1200
	10/25/2006	3570	9.53	8.20	15.9	5.57	11.0	4600	1300
	1/23/2007	3347	10.14	8.26	9.4	0.63	14.0	<100	<400
	4/18/2007	3467	11.89	8.23	14.0	1.72	10.0	4200	5300
	7/18/2007	3569	7.67	8.14	25.1	1.5	9.7	21000	2020
	10/24/2007	3434	12.57	8.19	16.1	1.68	13.0	<4000	800

Appendix IIa. Quarterly Field Measurements, Perchlorate, and Bacteria Data of Tributary/Seep Locations									
Site Location	Date	Conductivity uS/cm	DO mg/L	pH Units	Temperature °C	Turbidity NTU	Perchlorate ug/L	Ave # FC /100 mL	Ave # E. coli /100 mL
SC_1	1/22/2003	2350	12.01	8.57	7.5	0.76	7.0	1390	1500
	4/23/2003	2260	5.94	8.06	11.9	2.29	32.0	300	160
	7/23/2003	2510	8.31	9.27	31.0	1.32	12.0	36000	3700
	10/22/2003	2440	9.88	8.90	21.7	1.80	4.4	2400	940
	1/21/2004	2560	12.88	9.32	8.6	2.16	5.7	<200	<200
	4/21/2004	2550	8.90	8.67	15.9	0.52	5.0	633	240
	7/21/2004	2370	11.37	9.24	33.3	2.21	5.0	NA	NA
	10/27/2004	NS	NS	NS	NS	NS	NS	NS	NS
	1/26/2005	NS	NS	NS	NS	NS	NS	NS	NS
	4/19/2005	2770	10.41	8.37	11.4	7.84	5.1	553	380
	7/20/2005	1802	5.48	8.21	23.0	1.66	5.9	24000	346
	1/19/2006	NS	NS	NS	NS	NS	NS	NS	NS
	4/18/2006	1888	12.93	9.21	17.1	3.50	5.5	<200	<133
	10/25/2006	2950	10.40	8.35	13.1	0.72	6.5	6667	900
	1/23/2007	2990	13	8.51	6.4	1.07	7.0	<2000	<400
	4/18/2007	3057	12.68	8.36	9.1	0.42	6.1	330	210
	7/18/2007	3271	8.96	8.65	25.5	0.98	7.9	9600	260
	10/24/2007	4072	13.23	8.57	13.6	1.23	110.0	4500	290
MC_2	1/22/2003	4970	10.24	8.18	10.8	4.56	15.0	185	210
	4/23/2003	1269	5.06	8.53	20.2	0.72	14.2	260	60
	7/23/2003	4920	6.17	7.91	26.8	0.42	17.0	8600	470
	10/22/2003	5000	9.60	8.18	19.7	1.15	20.0	2300	320
	1/21/2004	4970	7.62	8.10	10.0	0.29	14.0	<200	<200
	4/21/2004	5140	9.73	8.13	15.0	0.40	<4	740	807
	7/21/2004	5060	7.91	7.91	22.1	1.49	15.0	<400	<400
	10/27/2004	4910	7.87	8.18	15.0	0.90	15.0	700	<200
	1/26/2005	4720	7.02	8.17	15.7	17.90	18.0	<200	<200
	4/19/2005	5110	11.57	8.15	13.7	0.37	18.0	<200	<200
	7/20/2005	5010	5.54	7.98	25.3	0.85	15.0	13100	154
	10/26/2005	4880	6.79	8.04	17.6	1.02	14.0	9200	1487
	1/19/2006	5090	10.74	8.18	12.4	0.77	15.0	<200	<200
	4/18/2006	5030	14.60	8.53	18.0	0.77	15.0	<200	<133
	10/25/2006	5010	8.96	8.22	17.0	1.35	18.0	7800	600
	1/24/2007	4932	11.25	8.17	9.8	0.63	18.0	<400	180
	4/18/2007	4975	18.95	8.31	15.9	0.44	16.0	<100	<100
	7/18/2007	4750	9.67	8.07	29.6	1.46	13.0	3800	<200
	10/24/2007	4758	19.99	8.52	21.3	1.19	14.0	<1000	<200
DC_1	1/22/2003	4970	10.46	8.00	10.4	5.74	19.9	80	90
	4/23/2003	6050	9.60	7.98	4.6	12.69	11.5	<400	100
	7/23/2003	6000	8.92	7.90	25.7	1.84	26.0	5100	230
	10/22/2003	NS	NS	NS	NS	NS	NS	NS	NS
	1/21/2004	NS	NS	NS	NS	NS	NS	NS	NS
	4/21/2004	NS	NS	NS	NS	NS	NS	NS	NS
	7/21/2004	5860	7.40	8.24	26.8	10.20	20.0	2800	773
	10/27/2004	7020	6.54	7.71	15.0	1.77	24.0	<200	<200
	10/27/2004	7020	6.54	7.71	15.0	1.77	24.0	<200	<200
	1/26/2005	NS	NS	NS	NS	NS	NS	NS	NS
	4/19/2005	6030	10.91	8.34	14.9	0.72	47.0	<200	<200
	7/20/2005	5980	8.52	8.11	26.7	16.70	28.0	2300	427
	10/26/2005	5380	9.73	8.22	16.4	2.21	81.0	1917	723
	1/19/2006	5730	12.38	8.21	9.6	19.50	24.0	210	<200
	4/18/2006	5680	9.34	8.23	17.9	1.22	30.0	<200	<133
	10/25/2006	5590	11.60	8.41	19.2	1.56	34.0	1400	250
	1/24/2007	5975	9.87	7.82	16.6	0.46	31.0	<10	<40
	4/18/2007	3840	10.82	7.85	20.3	0.94	28.0	210	245
	7/18/2007	5681	8.21	8.13	32.4		29.0	12100	<200
	10/24/2007	6237	13.35	7.53	25.0	0.62	22.0	<1000	<200

Appendix IIa. Quarterly Field Measurements, Perchlorate, and Bacteria Data of Tributary/Seep Locations									
Site Location	Date	Conductivity uS/cm	DO mg/L	pH Units	Temperature °C	Turbidity NTU	Perchlorate ug/L	Ave # FC /100 mL	Ave # E. coli /100 mL
LWC6.3	1/22/2003	7380	6.17	7.55	15.2	0.11	55109.0	60	10
	4/23/2003	6900	7.27	7.70	16.6	0.61	43843.7	<400	<400
	7/23/2003	8420	7.34	7.15	24.4	0.05	13.0	<100	<100
	10/22/2003	8300	6.57	7.30	22.6	0.09	40.0	<200	<10
	1/21/2004	8000	6.72	7.25	19.5	0.19	13000.0	<5	<5
	4/21/2004	5920	6.03	7.63	17.5	0.33	20000.0	<10	<200
	7/21/2004	8610	3.87	6.65	27.1	12.30	<4	56	<20
	10/27/2004	9030	2.89	6.26	22.9	10.50	4.1	<10	<10
	1/26/2005	6150	5.74	7.45	15.9	0.58	18000.0	<10	<200
	4/19/2005	5860	8.68	7.65	18.8	0.91	14371.0	<200	<200
	7/20/2005	9950	4.36	6.43	28.8	43.80	15.0	3600	2640
	10/26/2005	9060	4.55	6.22	25.1	34.10	<4	170	213
	1/19/2006	9610	5.52	6.32	21.6	27.20	<4	16800	1740
	4/18/2006	NS	NS	NS	NS	NS	NS	NS	NS
	7/27/2006	NS	NS	NS	NS	NS	NS	NS	NS
	10/25/2006	NS	NS	NS	NS	NS	NS	NS	NS
	1/23/2007	NS	NS	NS	NS	NS	NS	NS	NS
	4/18/2007	NS	NS	NS	NS	NS	NS	NS	NS
	7/18/2007	NS	NS	NS	NS	NS	NS	NS	NS
	10/24/2007	NS	NS	NS	NS	NS	NS	NS	NS
LWC3.7	1/22/2003	2930	3.87	7.55	20.9	0.79	1377.0	0	20
	4/23/2003	3120	4.83	7.51	19.3	0.81	368.7	<400	<400
	7/23/2003	2990	2.69	7.35	24.9	2.58	630.0	6800	<200
	10/22/2003	2780	1.6	7.31	23.2	17.7	490.0	<200	<400
	1/21/2004	3600	4.33	7.37	20.5	2.55	810.0	175	135
	4/21/2004	2750	0.85	7.28	20.8	287	350.0	220	<200
	7/21/2004	2990	0.56	7.33	24.3	29.1	310.0	3520	155
	10/27/2004	NS	NS	NS	NS	NS	NS	NS	NS
	1/26/2005	NS	NS	NS	NS	NS	NS	NS	NS
	4/19/2005	NS	NS	NS	NS	NS	NS	NS	NS
	1/19/2006	NS	NS	NS	NS	NS	NS	NS	NS
	4/18/2006	NS	NS	NS	NS	NS	NS	NS	NS
	7/27/2006	NS	NS	NS	NS	NS	NS	NS	NS
	10/25/2006	NS	NS	NS	NS	NS	NS	NS	NS
	1/23/2007	NS	NS	NS	NS	NS	NS	NS	NS
	4/18/2007	NS	NS	NS	NS	NS	NS	NS	NS
	7/18/2007	NS	NS	NS	NS	NS	NS	NS	NS
	10/24/2007	NS	NS	NS	NS	NS	NS	NS	NS
BS_1	4/18/2006	5790	11.30	8.29	13.2	0.65	5700.0	149	102
	7/27/2006	5720	10.60	8.44	26.6	1.14	6100.0	880	32
	10/25/2006	5490	9.75	8.59	22.0	0.66	2600.0	420	119
	1/24/2007	5182	8.94	8.37	18.2	1.02	3800.0	<200	<100
	4/18/2007	4984	10.31	8.17	21.7	0.33	740.0	<100	145
	7/18/2007	5140	8.63	8.21	28.5	0.5	960.0	4700	<200
	10/24/2007	4973	10.39	8.31	25.9	0.42	62.0	<1000	<200

Appendix IIb. Quarterly Major Ion Chemistry of Water Samples from Tributary/Seep Locations														
Sample Site	Date	Calcium (mg/l)	Magnesium (mg/l)	Sodium (mg/l)	Potassium (mg/l)	Biocarbonate as HCO3 (mg/l)	Carbonate CaCO3 (mg/L)	Sulfate (mg/l)	Chloride (mg/l)	Bromide (mg/l)	Fluoride (mg/l)	Silica (mg/L)	Total Dissolved Solids (mg/l)	TOC (mg/L)
LVC_2	1/22/2003	150	130	190	21	366	3.0	790	210	0.4	0.3	17	1770	4.1
	4/23/2003	120	107	160	17	321	5.2	720	200	0.3	0.5	17	1620	6.0
	7/23/2003	110	69	120	13	292	2.4	470	190	0.18	0.51	23	1280	12.9
	10/22/2003	120	81	150	15	275	2.8	590	160	0.2	0.69	23	1290	9.6
	1/21/2004	200	150	210	24	352	2.29	860	240	0.41	0.33	27	1920	4.6
	4/21/2004	160	140	220	24	339	2.8	890	250	0.39	0.39	29	1960	7.4
	7/21/2004	120	66	120	12	208	5.4	700	210	0.36	0.59	23	1350	8.8
	10/27/2004	140	110	160	17	283	2.3	ND	190	0.26	0.51	25	1490	4.9
	1/26/2005	99	53	90	12	133	ND	310	94	0.13	0.56	11	820	69.1
	4/19/2005	170	150	230	25	332	2.7	910	260	0.44	0.41	25	2040	4.6
	7/20/2005	120	110	190	21	193	7.9	680	200	0.30	0.50	25	1540	9.5
	10/26/2005	110	79	150	15	293	ND	720	230	0.21	0.52	20	1630	4.2
	1/19/2006	160	150	240	26	260	ND	940	270	0.42	0.33	10	2000	4.2
	4/18/2006	140	99	220	19	300	ND	650	270	0.29	0.60	16	1700	9.9
	7/27/2006	110	86	150	15	290	15.0	470	140	0.21	0.42	22	1300	9.1
	10/25/2006	58	30	51	5.2	210	ND	170	ND	0.08	0.38	12	500	1.6
	1/23/2007	170	160	270	26	350	ND	870	270	0.33	0.39	16	2000	3.5
	4/18/2007	140	110	210	25	340	<2.0	690	230	0.26	0.54	19	1600	8.0
	7/18/2007	93	80	150	16	200	<2.0	510	170	0.21	0.49	20	1100	5.8
	10/24/2007	86	43	110	8.2	180	<2.0	330	120	0.04	0.66	10	900	3.1
LW12.1	1/22/2003	210	220	250	46	281	4.6	1600	260	0.65	0.5	16	2990	4.8
	4/23/2003	200	250	260	48	296	7.7	1800	300	0.67	0.5	33	3210	5.1
	7/23/2003	180	220	250	43	266	5.5	1600	270	0.65	0.52	22	2940	7.0
	10/22/2003	220	260	270	50	266	2.2	1600	280	0.55	0.54	32	2930	5.7
	1/21/2004	240	250	280	51	278	2.86	1600	260	0.7	0.46	39	3050	2.8
	4/21/2004	220	280	320	57	240	2.0	1900	320	0.73	0.49	44	3490	3.4
	7/21/2004	230	270	300	53	243	3.2	1800	290	0.65	0.50	39	3200	8.1
	10/27/2004	250	270	320	60	276	3.6	1900	300	0.75	0.46	49	3560	3.7
	1/26/2005	180	130	140	27	161	ND	780	130	0.36	0.44	27	1730	24.8
	4/19/2005	240	280	320	55	281	5.8	1900	310	0.78	0.47	37	3470	4.1
	7/20/2005	220	270	300	48	259	2.1	1700	290	0.77	0.45	39	3200	4.6
	10/26/2005	67	40	45	9.7	104	ND	250	44	0.10	0.23	12	500	7.9
	1/19/2006	230	270	310	50	290	ND	2000	330	0.74	0.48	37	3300	3.2
	4/18/2006	180	190	270	39	350	ND	1200	270	0.54	0.43	21	2600	5.9
	7/27/2006	220	250	330	61	230	10.0	1700	290	0.66	0.42	28	3200	5.8
	10/25/2006	220	250	330	60	270	ND	1500	280	0.59	0.53	40	3900	8.8
	1/23/2007	260	310	380	64	300	ND	1900	300	0.79	0.48	45	3300	3.8
	4/18/2007	210	230	270	60	320	<2.0	1600	260	0.66	0.52	34	3100	10.0
	7/18/2007	210	220	300	53	230	<2.0	1700	290	0.58	0.73	26	2300	5.4
	10/24/2007	230	280	330	67	240	<2.0	1900	300	0.70	0.42	40	4000	5.2

Appendix IIb. Quarterly Major Ion Chemistry of Water Samples from Tributary/Seep Locations														
Sample Site	Date	Calcium (mg/l)	Magnesium (mg/l)	Sodium (mg/l)	Potassium (mg/l)	Biocarbonate as HCO3 (mg/l)	Carbonate CaCO3 (mg/L)	Sulfate (mg/l)	Chloride (mg/l)	Bromide (mg/l)	Fluoride (mg/l)	Silica (mg/L)	Total Dissolved Solids (mg/l)	TOC (mg/L)
FW_0	1/22/2003	300	200	270	29	276	2.8	1700	300	0.8	0.5	17	3200	3.0
	4/23/2003	270	260	230	20	255	3.3	1600	290	0.6	0.6	34	2910	3.4
	7/23/2003	270	160	250	22	256	3.3	1600	350	0.77	0.58	26	3140	4.9
	10/22/2003	330	190	270	26	256	2.6	1800	350	0.95	0.63	33	3210	2.9
	1/21/2004	360	210	300	26	248	2.55	1700	340	0.89	0.59	31	3240	2.0
	4/21/2004	320	190	280	24	231	2.4	1700	320	0.74	0.59	35	3100	2.4
	7/21/2004	330	190	260	24	241	2.0	1500	290	0.88	0.64	38	2980	4.4
	10/27/2004	310	190	260	25	253	2.6	1600	290	0.80	0.57	41	3070	2.4
	1/26/2005	270	150	200	20	203	ND	1300	180	0.66	0.56	30	2310	7.8
	4/19/2005	330	200	270	29	244	3.2	1600	280	0.78	0.57	33	3090	2.4
	7/20/2005	300	190	280	24	244	2.0	1400	320	0.81	0.60	27	2910	3.5
	10/26/2005	150	76	110	12	140	ND	670	110	0.39	0.37	18	1260	6.0
	1/19/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/18/2006	290	190	280	27	270	ND	1300	320	0.73	0.48	23	2900	2.2
	7/27/2006	300	180	300	27	240	ND	1400	330	0.66	0.53	29	2900	3.6
	10/25/2006	300	180	320	30	230	ND	1500	370	0.9	0.6	29	3700	3.0
	1/23/2007	330	200	290	27	240	ND	1500	260	0.83	0.46	32	2800	2.1
	4/18/2007	290	180	250	30	290	<.20	1600	310	0.7	0.5	26	3100	4.3
	7/18/2007	310	180	260	27	240	<2.0	1600	350	0.64	0.75	32	2500	3.6
	10/24/2007	310	180	270	29	230	<2.0	1500	320	0.53	0.46	31	3000	3.8
SC_1	1/22/2003	130	180	180	13	222	3.6	840	240	1.1	1.1	17	1810	2.1
	4/23/2003	110	140	150	19	258	1.7	780	210	0.8	0.9	47	1710	5.1
	7/23/2003	100	110	170	13	171	17.6	700	230	0.82	1.2	52	1750	9.9
	10/22/2003	136	170	180	13	187	6.1	960	290	1.1	1.2	85	1900	2.5
	1/21/2004	130	180	200	15	171	11.1	880	280	1.2	1.2	77	1990	3.0
	4/21/2004	120	180	190	14	206	4.2	920	290	1.1	1.1	92	2000	1.5
	7/21/2004	130	160	200	15	167	13.7	930	290	1.1	1.2	79	1950	7.5
	10/27/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/26/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/19/2005	130	190	220	15	228	3.7	990	310	1.1	1.1	81	2210	3.0
	7/20/2005	120	92	160	10	187	1.9	560	180	0.4	0.9	37	1320	4.6
	10/26/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/19/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/18/2006	130	80	170	14	160	ND	640	200	0.4	0.8	17	1400	4.7
	7/27/2006	210	150	410	27	68	80.0	950	610	0.7	1.4	46	2900	12.0
	10/25/2006	130	190	280	15	220	ND	1100	310	1.4	1.2	75	2900	2.4
	1/23/2007	150	210	320	17	210	ND	1100	340	1.2	1.2	74	2400	1.8
	4/18/2007	130	200	280	18	280	<2.0	1100	340	1.4	1.0	69	2500	2.7
	7/18/2007	150	210	310	17	190	<2.0	1300	380	1.4	1.2	65	2200	4.5
	10/24/2007	190	290	440	27	270	<2.0	1700	410	1.5	0.7	34	3900	12.0

Appendix IIb. Quarterly Major Ion Chemistry of Water Samples from Tributary/Seep Locations														
Sample Site	Date	Calcium (mg/l)	Magnesium (mg/l)	Sodium (mg/l)	Potassium (mg/l)	Biocarbonate as HCO3 (mg/l)	Carbonate CaCO3 (mg/L)	Sulfate (mg/l)	Chloride (mg/l)	Bromide (mg/l)	Fluoride (mg/l)	Silica (mg/L)	Total Dissolved Solids (mg/l)	TOC (mg/L)
MC_2	1/22/2003	400	280	370	28	268	2.2	2700	430	1.1	0.7	13	4570	3.1
	4/23/2003	430	330	410	31	250	4.1	2600	410	1.1	0.6	33	4560	3.2
	7/23/2003	370	280	340	28	268	2.2	2600	400	1.1	0.67	37	4550	4.6
	10/22/2003	480	340	430	34	242	3.1	2600	450	1.1	0.69	58	4630	2.5
	1/21/2004	450	320	450	35	254	2.1	2300	390	1.2	0.68	52	4610	2.0
	4/21/2004	440	300	410	32	259	2.1	2640	440	1.1	0.65	57	4710	2.3
	7/21/2004	430	300	390	31	248	1.6	2500	410	1.0	0.70	60	4530	2.7
	10/27/2004	440	290	390	32	248	2.6	2500	380	1.0	0.64	59	4520	2.1
	1/26/2005	430	280	370	32	238	ND	2300	360	1.0	0.68	51	4310	3.9
	4/19/2005	450	320	430	35	246	3.2	2500	400	1.2	0.67	47	4620	2.3
	7/20/2005	420	300	400	30	252	2.1	2400	410	1.2	0.67	56	4520	3.2
	10/26/2005	410	280	390	30	252	2.1	2400	400	1.0	0.71	54	4340	2.1
	1/19/2006	420	320	410	32	270	ND	2700	420	1.1	0.63	46	4600	2.2
	4/18/2006	430	340	440	29	270	ND	2300	400	1.2	0.53	44	5000	2.0
	7/27/2006	420	300	420	38	260	ND	2400	380	1.1	0.53	48	4400	3.5
	10/25/2006	410	310	440	40	260	ND	2500	400	1.1	0.73	51	5200	3.2
	1/24/2007	400	300	460	37	260	ND	2500	400	1.1	0.60	47	4400	2.7
	4/18/2007	400	320	390	41	280	<2.0	2600	430	1.1	0.40	39	4400	2.5
	7/18/2007	400	280	380	33	210	<2.0	2500	400	1.0	0.67	48	3200	2.9
	10/24/2007	390	290	390	36	180	2.1	2400	370	1.0	0.44	50	4800	2.0
DC_1	1/22/2003	480	270	540	60	247	1.3	2500	830	1.0	1.4	41	5150	2.3
	4/23/2003	430	260	510	54	247	1.3	2600	860	1.1	1.3	64	5000	3.0
	7/23/2003	420	240	470	59	236	1.5	2600	860	1.15	1.4	47	5220	3.3
	10/22/2003	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/21/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/21/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/21/2004	490	270	540	60	200	2.6	2300	780	1.0	1.4	58	4830	3.4
	10/27/2004	590	300	720	87	238	1.0	2900	1000	1.0	1.4	78	6100	1.9
	1/26/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/19/2005	500	290	550	62	227	2.9	2500	780	1.0	1.4	56	5080	2.1
	7/20/2005	490	280	540	64	211	2.2	2300	770	1.1	1.3	61	4880	3.4
	10/26/2005	430	240	510	51	211	2.2	1996	770	1.1	1.2	54	4150	3.3
	1/19/2006	480	320	580	60	250	ND	3000	760	1.0	1.5	77	5200	1.8
	4/18/2006	450	290	540	63	290	ND	2200	720	1.0	1.4	55	5200	1.8
	7/27/2006	490	280	580	81	230	ND	2400	730	1.0	1.3	60	4500	2.3
	10/25/2006	450	270	580	65	200	ND	2400	710	1.0	1.5	60	5800	3.5
	1/24/2007	440	270	600	70	230	ND	2400	700	1.1	1.4	57	5000	2.3
	4/18/2007	460	270	540	79	260	<2.0	2500	780	1.0	1.1	51	5100	2.5
	7/18/2007	440	250	500	67	160	130.0	2500	780	1.0	1.5	52	3900	3.5
	10/24/2007	480	310	570	72	230	<2.0	2600	730	1.0	1.2	71	5400	2.2

Appendix IIb. Quarterly Major Ion Chemistry of Water Samples from Tributary/Seep Locations														
Sample Site	Date	Calcium (mg/l)	Magnesium (mg/l)	Sodium (mg/l)	Potassium (mg/l)	Biocarbonate as HCO3 (mg/l)	Carbonate CaCO3 (mg/L)	Sulfate (mg/l)	Chloride (mg/l)	Bromide (mg/l)	Fluoride (mg/l)	Silica (mg/L)	Total Dissolved Solids (mg/l)	TOC (mg/L)
LWC6.3	1/22/2003	350	150	1200	34	312	1.0	1500	1600	0.7	1.5	53	5260	5.5
	4/23/2003	280	110	1100	29	336	1.1	1300	1500	0.6	1.4	46	4610	6.3
	7/23/2003	410	150	1300	29	266	1.1	1700	1900	0.99	1.3	64	6060	1.4
	10/22/2003	425	160	1300	30	266	0.5	1800	1900	0.9	1.4	88	5840	2.7
	1/21/2004	210	95	960	32	330	0.9	1000	1000	0.59	1.6	84	3580	3.2
	4/21/2004	240	100	900	30	341	1.1	1100	1200	0.57	1.6	88	3960	3.8
	7/21/2004	410	180	1300	27	284	0.1	1600	2300	0.99	1.4	89	5950	4.7
	10/27/2004	460	190	1300	28	294	0.1	1600	2300	1	1.2	87	6200	3.3
	1/26/2005	260	110	890	31	352	ND	1100	1300	0.65	1.6	77	4220	5.1
	4/19/2005	240	110	883	29	365	3.0	1100	1200	0.55	1.6	82	3960	4.5
	7/20/2005	490	220	1300	31	295	0.1	1800	2000	1.20	1.1	86	6430	7.5
	10/26/2005	440	190	1400	29	285	ND	1700	2000	1.20	1.3	79	6180	6.0
	1/19/2006	460	220	1300	32	310	ND	1800	2200	1.20	1.1	78	6600	4.1
	4/18/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/25/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/24/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/18/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/18/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/24/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LWC3.7	1/22/2003	200	85	280	37	181	0.7	930	380	0.3	0.9	24	2100	2.6
	4/23/2003	250	100	280	45	173	0.4	1100	360	0.4	0.9	22	2290	2.8
	7/23/2003	220	94	280	44	198	1.02	870	390	0.46	1	39	2230	5
	10/22/2003	190	87	280	42	191	0.393	820	380	0.33	1.1	45	1930	4.1
	1/21/2004	300	120	370	58	184	0.378	1200	420	0.52	0.95	45	2660	2.5
	4/21/2004	220	97	290	38	178	0.291	810	370	0.31	0.95	40	1900	7.5
	7/21/2004	200	89	310	43	187	0.153	870	390	0.39	1.04	43	2110	5.1
	10/27/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/26/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/19/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/20/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/26/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/19/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/18/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/25/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/24/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/18/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/18/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/24/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
BS-1	4/18/2006	450	200	630	36	200	ND	1800	920	1.7	1.1	64	5200	1.2
	7/27/2006	480	190	690	45	110	14	1800	930	1.3	1.1	67	4500	2.6
	10/25/2006	420	190	570	55	120	2.2	1800	790	1.4	1.3	63	5400	2.4
	1/24/2007	390	180	570	45	140	ND	1800	870	1.4	1.2	61	3800	1.6
	4/18/2007	390	190	430	47	190	<2.0	1700	670	1.3	1	54	3700	0.77
	7/18/2007	420	190	480	42	170	<2.0	1900	850	1.1	1.3	59	3300	1.5
	10/24/2007	410	190	550	45	110	5.3	1900	900	1.5	0.96	63	4900	1.9

Appendix IIc. Nutrient Concentrations of Water Samples from Tributary/Seeps Locations

Site Location	DATE	NH4 mg N/L	NO2 mg N/L	NO3 mg N/L	NO3NO2 mg N/L	TKN mg N/L	OP mg P/L	TP mg P/L
LVC_2	1/22/2003	<0.08	<0.08	3.94	3.94	NA	0.032	0.055
	4/23/2003	<0.08	<0.08	2.90	2.90	NA	0.045	NA
	7/23/2003	0.032	NA	1.70	1.70	1.50	0.008	0.080
	10/22/2003	ND	ND	3.40	3.40	0.82	0.115	0.310
	1/21/2004	ND	ND	5.0	5.0	1.20	0.007	0.050
	4/21/2004	ND	ND	5.10	5.10	1.20	0.007	0.030
	7/21/2004	NS	NS	NS	NS	NS	NS	NS
	10/27/2004	NS	ND	3.40	3.40	NS	NS	NS
	1/26/2005	1.10	0.53	3.70	4.23	6.30	0.080	0.560
	4/19/2005	ND	ND	6.20	6.20	0.71	0.004	ND
	7/20/2005	ND	ND	2.00	2.00	1.50	0.005	0.046
	10/26/2005	0.03	ND	ND	ND	2.00	0.061	0.053
	1/19/2006	NA	0.14	5.42	5.60	NA	ND	NA
	4/18/2006	NA	ND	6.00	6.00	NA	0.005	NA
	7/27/2006	0.15	0.12	1.11	1.20	1.10	0.036	0.089
	10/25/2006	ND	ND	0.90	0.91	ND	NA	0.047
	1/23/2007	ND	ND	5.19	5.20	1.00	0.003	ND
	4/18/2007	<0.1	<0.1	2.94	3.00	1.50	0.044	0.064
	7/18/2007	0.13	<0.1	0.58	0.58	1.30	0.007	0.038
	10/24/2007	<0.1	<0.1	1.17	1.20	0.36	0.063	0.065
LW12.1	1/22/2003	<0.08	<0.08	3.29	3.29	NA	0.032	0.053
	4/23/2003	<0.08	<0.08	3.17	3.17	NA	0.013	NA
	7/23/2003	0.038	NA	1.90	2.00	0.92	0.007	0.090
	10/22/2003	ND	ND	3.30	3.30	0.74	0.008	0.030
	1/21/2004	ND	ND	4.20	4.20	0.59	0.015	ND
	4/21/2004	ND	ND	3.30	3.30	0.48	0.010	0.010
	7/21/2004	0.05	NA	2.40	2.40	1.10	0.009	0.110
	10/27/2004	NA	NA	4.30	4.30	NA	NA	NA
	1/26/2005	0.38	ND	2.60	2.60	2.70	0.044	0.390
	4/19/2005	ND	ND	4.30	4.30	0.96	0.005	0.015
	7/20/2005	0.13	ND	2.00	2.00	0.68	0.007	ND
	10/26/2005	0.16	ND	ND	ND	0.73	0.056	0.052
	1/19/2006	NA	ND	4.40	4.40	NA	0.007	NA
	4/18/2006	NA	ND	2.60	2.60	NA	0.006	NA
	7/27/2006	ND	0.20	2.71	3.00	0.92	ND	0.060
	10/25/2006	ND	0.11	4.06	4.20	0.89	NA	0.083
	1/23/2007	ND	ND	4.97	5.00	0.64	ND	0.030
	4/18/2007	<0.1	<0.1	3.16	3.20	1.40	0.020	0.032
	7/18/2007	0.12	0.19	1.72	1.90	0.56	0.005	0.024
	10/24/2007	0.11	<0.1	4.74	4.80	0.39	0.005	0.021
FW_0	1/22/2003	<0.08	<0.08	4.39	4.39	NA	0.031	0.042
	4/23/2003	<0.08	<0.08	4.24	4.24	NA	0.023	NA
	7/23/2003	ND	NA	3.50	3.50	0.70	0.006	0.030
	10/22/2003	ND	ND	4.90	4.90	0.47	0.008	ND
	1/21/2004	ND	ND	5.10	5.10	0.38	0.011	ND
	4/21/2004	ND	ND	4.10	4.10	0.40	0.008	ND
	7/21/2004	ND	NA	4.00	4.00	0.53	0.008	ND
	10/27/2004	NA	NA	4.90	4.90	NA	NA	NA
	1/26/2005	0.13	ND	4.60	4.60	1.10	0.036	0.110
	4/19/2005	ND	ND	5.90	5.90	0.67	0.009	ND
	7/20/2005	ND	ND	3.80	3.80	0.51	0.005	ND
	10/26/2005	0.12	ND	ND	ND	0.73	0.056	0.052
	1/19/2006	NS	NS	NS	NS	NS	NS	NS
	4/18/2006	ND	ND	4.80	4.80	ND	0.004	ND
	7/27/2006	ND	0.17	4.74	4.80	0.50	ND	0.022
	10/25/2006	ND	ND	4.74	4.80	0.26	NA	0.046
	1/23/2007	ND	ND	5.87	5.90	ND	<0.002	<0.001
	4/18/2007	<0.1	<0.1	4.29	4.30	0.80	0.006	<0.001
	7/18/2007	0.13	<0.1	4.29	4.40	<0.10	0.016	0.017
	10/24/2007	<0.1	<0.1	6.32	6.30	<0.20	0.007	0.019

Appendix IIc. Nutrient Concentrations of Water Samples from Tributary/Seeps Locations

Site Location	DATE	NH4 mg N/L	NO2 mg N/L	NO3 mg N/L	NO3NO2 mg N/L	TKN mg N/L	OP mg P/L	TP mg P/L
SC_1	1/22/2003	<0.08	<0.08	3.72	3.72	NA	0.028	0.052
	4/23/2003	0.19	0.09	2.35	2.54	NA	0.041	NA
	7/23/2003	ND	NA	1.40	1.40	1.00	0.007	0.010
	10/22/2003	ND	ND	3.90	3.90	0.67	0.018	0.020
	1/21/2004	ND	ND	4.40	4.40	0.75	0.024	ND
	4/21/2004	0.055	ND	4.50	4.50	0.40	0.018	ND
	7/21/2004	NS	NS	NS	NS	NS	NS	NS
	10/27/2004	NS	NS	NS	NS	NS	NS	NS
	1/26/2005	NS	NS	NS	NS	NS	NS	NS
	4/19/2005	ND	ND	5.30	5.30	0.79	0.010	0.017
	7/20/2005	0.130	ND	1.70	1.70	1.70	0.010	0.033
	10/26/2005	NS	NS	NS	NS	NS	NS	NS
	1/19/2006	NS	NS	NS	NS	NS	NS	NS
	4/18/2006	ND	ND	1.40	1.40	ND	0.004	ND
	7/27/2006	0.520	ND	3.16	3.30	25.00	0.003	0.052
	10/25/2006	ND	ND	5.65	5.70	ND	NA	0.016
	1/23/2007	ND	ND	5.65	5.70	ND	0.014	ND
	4/18/2007	<0.1	<0.1	6.32	6.32	<0.10	0.008	0.011
	7/18/2007	0.100	<0.1	5.19	5.20	0.26	0.015	0.016
	10/24/2007	0.240	0.67	8.35	9.10	1.50	0.013	0.053
MC_2	1/22/2003	<0.08	<0.08	4.80	4.80	NA	0.028	0.049
	4/23/2003	<0.08	<0.08	4.53	4.53	NA	0.017	NA
	7/23/2003	0.078	NA	3.10	3.40	0.58	0.007	NA
	10/22/2003	ND	ND	5.20	5.20	0.54	0.015	ND
	1/21/2004	ND	ND	5.40	5.40	0.42	0.017	ND
	4/21/2004	ND	ND	4.80	5.10	0.32	0.013	0.030
	7/21/2004	ND	ND	4.30	4.30	3.70	0.016	ND
	10/27/2004	NA	ND	5.00	5.00	NA	NA	NA
	1/26/2005	ND	ND	4.90	4.90	0.46	0.026	0.020
	4/19/2005	ND	ND	4.80	4.80	0.44	0.010	NA
	7/20/2005	0.09	ND	4.30	4.30	0.74	0.011	ND
	10/26/2005	0.35	ND	ND	ND	0.44	0.020	ND
	1/19/2006	ND	ND	6.40	6.40	ND	0.007	ND
	4/18/2006	ND	0.12	2.98	3.10	ND	0.005	ND
	7/27/2006	0.11	0.21	4.52	4.80	0.69	0.006	0.042
	10/25/2006	ND	ND	5.65	5.70	0.36	NA	0.013
	1/24/2007	ND	ND	5.42	5.50	1.00	<0.002	<0.01
	4/18/2007	<0.1	<0.1	5.42	5.50	0.31	0.003	<0.01
	7/18/2007	0.16	0.11	3.84	3.90	0.14	0.015	0.018
	10/24/2007	<0.1	<0.1	5.65	5.70	0.25	0.014	0.017
DC_1	1/22/2003	<0.08	<0.08	5.77	5.77	NA	0.037	0.051
	4/23/2003	<0.08	<0.08	5.28	5.28	NA	0.023	NA
	7/23/2003	ND	NA	4.90	4.90	0.81	0.008	NA
	10/22/2003	NA	NA	NA	NA	NA	NA	NA
	1/21/2004	NA	NA	NA	NA	NA	NA	NA
	4/21/2004	NA	NA	NA	NA	NA	NA	NA
	7/21/2004	0.17	NA	6.00	6.00	0.88	0.014	0.010
	10/27/2004	NA	ND	4.10	4.10	NA	NA	NA
	1/26/2005	NS	NS	NS	NS	NS	NS	NS
	4/19/2005	ND	ND	ND	ND	0.40	0.009	ND
	7/20/2005	ND	ND	6.00	6.00	0.57	0.013	0.037
	10/26/2005	0.17	ND	ND	ND	0.46	0.015	ND
	1/19/2006	ND	ND	6.60	6.60	ND	0.015	ND
	4/18/2006	ND	ND	7.50	7.50	ND	0.002	ND
	7/27/2006	ND	ND	5.42	5.42	ND	0.002	0.002
	10/25/2006	ND	ND	6.77	6.80	0.32	ND	0.024
	1/24/2007	ND	ND	6.55	6.55	0.38	0.003	<0.01
	4/18/2007	<0.1	<0.1	7.23	7.30	0.84	0.010	<0.01
	7/18/2007	<0.1	<0.1	6.77	6.80	0.40	0.012	0.015
	10/24/2007	<0.1	<0.1	6.77	6.70	0.47	0.014	0.014

Appendix IIc. Nutrient Concentrations of Water Samples from Tributary/Seeps Locations								
Site Location	DATE	NH4 mg N/L	NO2 mg N/L	NO3 mg N/L	NO3NO2 mg N/L	TKN mg N/L	OP mg P/L	TP mg P/L
LWC6.3	1/22/2003	<0.08	<0.08	5.85	5.85	NA	0.037	0.054
	4/23/2003	<0.08	<0.08	3.58	3.58	NA	0.024	NA
	7/23/2003	ND	NA	9.20	9.20	0.33	0.044	0.040
	10/22/2003	ND	ND	9.50	9.50	0.37	0.055	0.030
	1/21/2004	ND	ND	0.57	0.57	0.66	0.050	0.020
	4/21/2004	ND	ND	1.10	1.10	0.67	0.036	0.040
	7/21/2004	0.66	NA	ND	ND	3.00	0.078	0.310
	10/27/2004	NA	ND	ND	ND	NA	NA	NA
	1/26/2005	ND	ND	ND	ND	0.63	0.056	0.021
	4/19/2005	ND	ND	ND	ND	0.77	0.024	0.031
	7/20/2005	4.00	ND	ND	ND	6.80	0.610	2.000
	10/26/2005	1.12	ND	ND	ND	3.80	0.021	0.370
	1/19/2006	ND	ND	ND	ND	ND	0.280	ND
	4/18/2006	NS	NS	NS	NS	NS	NS	NS
	7/27/2006	NS	NS	NS	NS	NS	NS	NS
	10/25/2006	NS	NS	NS	NS	NS	NS	NS
	1/24/2007	NS	NS	NS	NS	NS	NS	NS
	4/18/2007	NS	NS	NS	NS	NS	NS	NS
	7/18/2007	NS	NS	NS	NS	NS	NS	NS
	10/24/2007	NS	NS	NS	NS	NS	NS	NS
LWC3.7	1/22/2003	<0.08	<0.08	11.15	11.15	NA	0.035	0.053
	4/23/2003	0.09	<0.08	11.47	11.56	NA	0.018	NA
	7/23/2003	0.06	NA	10.00	10.00	2.20	0.029	0.600
	10/22/2003	ND	ND	11.00	11.00	0.95	0.016	0.100
	1/21/2004	ND	ND	13.00	13.00	0.74	0.023	ND
	4/21/2004	ND	ND	10.00	10.00	1.30	0.027	0.350
	7/21/2004	0.07	NA	10.00	10.00	1.30	0.010	0.120
	10/27/2004	NS	NS	NS	NS	NS	NS	NS
	1/26/2005	NS	NS	NS	NS	NS	NS	NS
	4/19/2005	NS	NS	NS	NS	NS	NS	NS
	7/20/2005	NS	NS	NS	NS	NS	NS	NS
	10/26/2005	NS	NS	NS	NS	NS	NS	NS
	1/19/2006	NS	NS	NS	NS	NS	NS	NS
	4/18/2006	NS	NS	NS	NS	NS	NS	NS
	7/27/2006	NS	NS	NS	NS	NS	NS	NS
	10/25/2006	NS	NS	NS	NS	NS	NS	NS
	1/24/2007	NS	NS	NS	NS	NS	NS	NS
	4/18/2007	NS	NS	NS	NS	NS	NS	NS
	7/18/2007	NS	NS	NS	NS	NS	NS	NS
	10/24/2007	NS	NS	NS	NS	NS	NS	NS
BS-1	1/19/2006	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	8.50	8.50	ND	0.009	ND
	7/27/2006	ND	ND	6.55	6.55	0.26	0.004	0.017
	10/25/2006	ND	ND	ND	ND	0.46	ND	0.026
	1/24/2007	ND	ND	6.55	6.55	0.41	0.003	<0.01
	4/18/2007	<0.1	<0.1	8.35	8.40	<0.10	0.017	0.015
	7/18/2007	<0.1	<0.1	7.68	7.70	0.16	0.015	0.012
	10/24/2007	0.11	<0.1	6.32	6.40	0.48	0.016	0.016
	1/22/2008	0.12	<0.1	6.32	6.40	<0.10	0.007	0.018

Appendix IId. Quarterly Heavy Metal Concentrations (ug/L) from Tributary/Seep Locations												
Site Location	Date	Aluminum (ug/l)	Arsenic (ug/l)	Barium (ug/l)	Chromium (ug/l)	Copper (ug/l)	Iron (mg/l)	Lead (ug/l)	Manganese (ug/l)	Nickel (ug/l)	Selenium (ug/l)	Zinc (ug/l)
LVC_2	1/22/2003	ND	2.8	26.0	1.3	6.4	ND	ND	ND	5.9	6.3	15.0
	4/23/2003	ND	2.7	40.0	ND	10.0	ND	0.7	ND	ND	5.5	13.0
	7/23/2003	49.0	3.3	78.0	3.4	24.0	0.17	1.5	7.4	5.9	ND	23.0
	10/22/2003	50.0	3.4	65.0	1.1	8.9	0.074	0.83	2.4	7.4	4.7	41.0
	1/21/2004	460.0	4.7	54	ND	4.2	0.29	1.3	12	6.7	ND	33
	4/21/2004	ND	ND	35.0	ND	ND	0.017	ND	ND	ND	ND	ND
	7/21/2004	ND	2.7	92.0	1.0	12.0	0.070	ND	ND	5.7	7.0	28.0
	10/27/2004	ND	ND	38.0	ND	ND	0.066	ND	ND	ND	4.3	37.0
	1/26/2005	880.0	ND	94.0	7.1	43.0	1.500	11.0	55.0	ND	3.0	210.0
	4/19/2005	ND	3.3	37.0	3.1	3.2	0.040	ND	ND	9.0	8.5	12.0
	7/20/2005	ND	ND	63.0	ND	10.0	0.110	ND	ND	ND	6.1	55.0
	10/26/2005	34.0	3.1	69.0	ND	5.1	0.065	ND	2.7	ND	6.2	19.0
	1/19/2006	ND	2.8	34.0	0.8	2.5	ND	ND	3.9	6.9	7.9	10.0
	4/18/2006	57.0	3.4	180.0	1.0	9.4	0.120	0.52	27.0	8.6	5.8	29.0
	7/27/2006	12.0	3.8	63.0	0.5	6.0	ND	0.3	3.0	1.2	4.0	12.0
	10/25/2006	26.0	4.7	47.0	0.7	1.1	0.570	ND	24.0	2.1	1.3	45.0
	1/23/2007	ND	2.8	35.0	0.6	1.6	ND	ND	1.3	0.9	7.9	4.7
	4/18/2007	29.0	3.1	59.0	0.7	5.3	0.056	0.3	6.0	1.3	5.9	20.0
	7/18/2007	44.0	3.6	41.0	1.1	5.5	0.046	0.3	2.0	ND	4.3	8.0
	10/24/2007	8.9	1.6	130.0	ND	0.8	ND	ND	0.3	1.0	2.8	140.0
LW12.1	1/22/2003	45.0	4.7	25.0	1.8	5.4	ND	ND	8.3	7.0	11.0	13.0
	4/23/2003	ND	4.6	37.0	1.1	4.4	ND	ND	ND	6.4	11.4	5.7
	7/23/2003	54.0	6.2	69.0	ND	13.0	ND	0.96	31.0	7.3	ND	23.0
	10/22/2003	290.0	6.5	56.0	1.2	4.8	0.28	1.1	36.0	14.0	9.0	15.0
	1/21/2004	ND	6.9	32.0	ND	ND	0.05	ND	32.0	ND	ND	ND
	4/21/2004	ND	7.5	31.0	ND	ND	0.043	ND	ND	ND	ND	ND
	7/21/2004	65.0	6.1	52.0	1.0	ND	0.120	0.5	53.0	10.0	9.3	11.0
	10/27/2004	ND	7.4	40.0	ND	ND	0.066	ND	36.0	ND	11.5	34.0
	1/26/2005	4400.0	ND	130.0	ND	ND	4.20	11.0	190.0	ND	6.4	130.0
	4/19/2005	ND	8.4	31.0	2.3	3.3	0.047	ND	5.9	10.0	11.4	8.2
	7/20/2005	ND	7.7	37.0	ND	ND	0.047	ND	37.0	ND	9.4	ND
	10/26/2005	2100.0	3.3	57.0	3.7	8.8	1.60	2.7	53.0	ND	1.7	24.0
	1/19/2006	19.0	5.6	31.0	1.0	3.4	0.02	0.3	25.0	9.7	11.6	5.5
	4/18/2006	24.0	4.6	36.0	0.59	2.1	0.022	ND	6.8	10.0	7.7	7.0
	7/27/2006	18.0	8.0	39.0	0.5	2.4	ND	0.2	21.0	2.1	9.2	5.4
	10/25/2006	27.0	6.5	47.0	1.0	2.8	0.045	0.3	15.0	ND	9.3	9.1
	1/23/2007	61.0	6.4	28.0	0.9	2.9	0.065	0.3	28.0	1.4	13.0	5.6
	4/18/2007	31.0	6.9	57.0	0.6	3.1	0.033	<.20	57.0	2.0	9.6	7.8
	7/18/2007	97.0	6.2	45.0	0.6	1.4	0.097	0.3	20.0	1.4	8.2	6.7
	10/24/2007	70.0	7.2	32.0	0.7	1.4	0.069	ND	26.0	1.5	12.0	15.0

Appendix IId. Quarterly Heavy Metal Concentrations (ug/L) from Tributary/Seep Locations												
Site Location	Date	Aluminum (ug/l)	Arsenic (ug/l)	Barium (ug/l)	Chromium (ug/l)	Copper (ug/l)	Iron (mg/l)	Lead (ug/l)	Manganese (ug/l)	Nickel (ug/l)	Selenium (ug/l)	Zinc (ug/l)
FW_0	1/23/2003	43.0	5.2	29.0	1.9	8.9	ND	ND	4.1	10.0	15.2	12.0
	4/23/2003	ND	4.8	39.0	1.3	13.0	ND	ND	4.6	7.0	14.8	15.0
	7/23/2003	ND	5.8	48.0	1.2	9.5	ND	ND	14.0	8.8	ND	9.8
	10/22/2003	ND	4.9	49.0	1.2	3.9	ND	ND	ND	19.0	15.8	ND
	1/21/2004	ND	7.4	41.0	ND	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	5.4	40.0	ND	ND	0.052	ND	ND	ND	ND	ND
	7/21/2004	78.0	5.1	56.0	1.2	2.6	0.097	0.5	16.0	13.0	13.6	16.0
	10/27/2004	ND	6.8	52.0	ND	150.0	0.160	ND	ND	ND	16.0	38.0
	1/26/2005	1000.0	ND	68.0	ND	ND	1.100	3.3	41.0	ND	13.4	74.0
	4/19/2005	ND	7.0	41.0	2.4	5.1	ND	1.4	ND	14.0	16.2	82.0
	7/20/2005	ND	8.5	62.0	ND	ND	0.034	ND	ND	ND	13.2	ND
	10/26/2005	590.0	4.4	63.0	2.6	6.6	0.480	0.7	25.0	6.2	6.3	12.0
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	15.0	5.2	46.0	1.4	2.4	0.020	ND	2.2	19.0	14.0	7.2
	7/27/2006	36.0	5.5	54.0	0.9	2.7	ND	ND	9.0	2.3	13.2	8.7
	10/25/2006	99.0	5.8	55.0	4.7	2.2	0.110	0.3	6.5	9.9	13.9	9.1
	1/23/2007	8.0	4.1	35.0	2.1	1.2	ND	ND	1.3	1.3	16.0	4.0
	4/18/2007	9.6	4.9	57.0	1.0	2.4	<0.020	<0.2	12.0	1.6	15.0	11.0
	7/18/2007	17.0	5.5	59.0	1.0	1.7	0.028	<0.2	3.6	1.2	14.0	8.2
	10/24/2007	19.0	4.7	59.0	2.5	2.1	ND	ND	1.8	1.4	16.0	12.0
SC_1	1/22/2003	ND	19.0	40.0	4.9	ND	ND	ND	ND	ND	7.8	ND
	4/23/2003	ND	17.0	56.0	2.4	3.9	ND	ND	77.0	ND	6.0	5.4
	7/23/2003	29.0	11.0	72.0	3.4	6.9	ND	ND	2.4	ND	ND	7.3
	10/22/2003	1200.0	19.0	68.0	5.8	ND	1.0	ND	24.0	ND	8.0	ND
	1/21/2004	110.0	20.0	42.0	4.2	ND	0.065	ND	6.0	ND	ND	ND
	4/21/2004	ND	16.0	37.0	ND	ND	0.051	ND	ND	ND	ND	ND
	7/21/2004	33.0	13.0	46.0	3.9	4.0	0.054	ND	2.4	ND	8.7	10.0
	10/27/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/19/2005	54.0	17.0	41.0	5.4	2.5	0.068	ND	2.7	6.0	9.9	ND
	7/20/2005	ND	8.4	135.0	ND	ND	0.089	ND	ND	ND	4.6	66.0
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	11.0	7.6	110.0	1.5	2.2	0.022	ND	3.7	6.4	5.6	19.0
	7/27/2006	20.0	12.0	150.0	3.4	18.0	ND	1.1	2.6	1.6	10.8	24.0
	10/25/2006	6.7	15.0	46.0	3.6	1.7	ND	ND	1.0	2.3	10.3	8.0
	1/23/2007	8.9	14.0	60.0	3.6	0.9	0.032	ND	2.0	ND	12.0	5.5
	4/18/2007	11.0	17.0	39.0	3.8	1.8	<0.020	<.20	1.5	<.80	12.0	<5.0
	7/18/2007	17.0	16.0	45.0	4.0	2.2	0.036	<.20	1.0	<.80	13.0	<5.0
	10/24/2007	33.0	14.0	60.0	1.3	4.4	0.062	ND	5.7	1.0	20.0	20.0

Appendix IId. Quarterly Heavy Metal Concentrations (ug/L) from Tributary/Seep Locations												
Site Location	Date	Aluminum (ug/l)	Arsenic (ug/l)	Barium (ug/l)	Chromium (ug/l)	Copper (ug/l)	Iron (mg/l)	Lead (ug/l)	Manganese (ug/l)	Nickel (ug/l)	Selenium (ug/l)	Zinc (ug/l)
MC_2	1/22/2003	78.0	18.0	21.0	1.7	4.5	ND	0.7	5.2	14.0	23.4	9.6
	4/23/2003	ND	14.0	21.0	ND	3.6	ND	ND	2.6	8.2	23.9	ND
	7/23/2003	ND	19.0	29.0	ND	4.6	ND	ND	ND	11.0	ND	7.5
	10/22/2003	ND	17.0	24.0	ND	ND	0.071	ND	ND	25.0	22.9	ND
	1/21/2004	ND	20.0	20.0	ND	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	21.0	20.0	ND	ND	0.013	ND	ND	ND	ND	ND
	7/21/2004	26.0	17.0	30.0	ND	2.2	0.065	ND	11.0	16.0	21.6	12.0
	10/27/2004	ND	19.0	24.0	ND	ND	ND	ND	ND	ND	23.6	ND
	1/26/2005	200.0	21.0	26.0	ND	ND	0.230	ND	10.0	ND	21.3	40.0
	5/25/2005	ND	22.0	22.0	ND	10.0	ND	ND	ND	10.0	21.2	5.3
	7/20/2005	ND	19.0	36.0	ND	ND	ND	ND	ND	ND	21.1	ND
	10/26/2005	ND	14.0	34.0	4.20	ND	ND	ND	7.5	12.0	21.7	ND
	1/19/2006	ND	12.0	21.0	0.68	0.79	ND	ND	1.2	15.0	22.9	2.3
	4/18/2006	ND	12.0	16.0	0.86	0.57	ND	ND	0.58	19.0	23.8	ND
	7/27/2006	190.0	16.0	29.0	0.9	3.0	ND	1.1	9.6	2.4	22.2	11.0
	10/25/2006	21.0	16.0	27.0	0.8	1.5	0.042	0.2	4.5	13.0	21.6	6.6
	1/24/2007	9.3	13.0	20.0	0.7	1.8	ND	ND	2.2	ND	25.0	2.5
	4/18/2007	10.0	14.0	21.0	0.7	2.1	<0.020	<0.2	0.9	<.80	25.0	<5.0
	7/18/2007	42.0	15.0	30.0	0.6	53.0	45.000	<0.2	16.0	0.9	24.0	5.7
	10/24/2007	21.0	14.0	20.0	0.7	1.1	0.024	ND	1.0	ND	26.0	ND
DC_1	1/22/2003	76.0	50.0	21.0	1.8	6.7	ND	ND	33.0	14.0	23.0	8.3
	4/23/2003	59.0	46.0	28.0	1.2	8.1	ND	ND	34.0	11.0	22.4	6.3
	7/23/2003	160.0	51.0	30.0	1.1	2.8	0.18	ND	55.0	13.0	ND	ND
	10/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/21/2004	140.0	42.0	32.0	1.4	2.9	0.2	ND	15.0	20.0	25.9	9.5
	10/27/2004	ND	58.0	31.0	ND	ND	ND	ND	130.0	27.0	24.2	ND
	1/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/19/2005	ND	53.0	25.0	2.8	ND	ND	ND	6.5	20.0	21.6	ND
	7/20/2005	830.0	54.0	46.0	ND	ND	0.7	ND	55.0	ND	21.0	ND
	10/26/2005	ND	43.0	43.0	ND	ND	0.1	ND	12.0	ND	22.1	ND
	1/19/2006	140.0	57.0	22.0	1.3	1.0	0.1	0.2	25.0	19.0	16.8	2.2
	4/18/2006	5.5	49.0	23.0	1.1	0.8	ND	ND	6.1	23.0	20.3	20.0
	7/27/2006	36.0	59.0	29.0	0.8	1.2	ND	ND	26.0	3.1	18.4	100.0
	10/25/2006	18.0	54.0	27.0	1.1	1.1	0.0	ND	7.7	14.0	19.2	3.8
	1/24/2007	26.0	49.0	21.0	1.0	1.0	0.0	ND	5.7	1.5	23.0	ND
	4/18/2007	24.0	49.0	26.0	1.0	<1.0	<0.020	<0.2	6.9	1.4	22.0	<5.0
	7/18/2007	15.0	46.0	27.0	1.0	0.8	<0.020	<0.2	5.0	1.2	21.0	<5.0
	10/24/2007	9.6	66.0	22.0	0.8	ND	ND	ND	16.0	1.7	21.0	ND

Appendix IId. Quarterly Heavy Metal Concentrations (ug/L) from Tributary/Seep Locations												
Site Location	Date	Aluminum (ug/l)	Arsenic (ug/l)	Barium (ug/l)	Chromium (ug/l)	Copper (ug/l)	Iron (mg/l)	Lead (ug/l)	Manganese (ug/l)	Nickel (ug/l)	Selenium (ug/l)	Zinc (ug/l)
LWC6.3	1/22/2003	ND	150.0	19.0	4.6	4.2	ND	ND	500.0	27.0	5.6	ND
	4/23/2003	ND	105.0	16.0	ND	7.1	ND	ND	320.0	21.0	5.4	ND
	7/23/2003	ND	110.0	24.0	33.0	ND	ND	ND	340.0	28.0	ND	ND
	10/22/2003	ND	104.0	25.0	35.0	ND	0.045	ND	540.0	31.0	8.9	ND
	1/21/2004	ND	110.0	14.0	ND	ND	ND	ND	180.0	28.0	ND	ND
	4/21/2004	ND	120.0	15.0	ND	ND	0.015	ND	63.0	34.0	ND	ND
	7/21/2004	ND	43	29	1.3	4.9	0.74	ND	540	47	1.7	28
	10/27/2004	ND	7.6	24	ND	ND	2.4	ND	610	57	1.9	48
	1/26/2005	ND	120	22	ND	ND	ND	ND	500	32	19.6	ND
	4/19/2005	26	130	17	1.2	6.1	0.06	ND	190	30	4.1	ND
	7/20/2005	ND	26	31	ND	ND	3.5	ND	840	39	2.6	ND
	10/26/2005	ND	17	26	ND	ND	4.8	ND	790	40	2.4	ND
	1/19/2006	12	12	22	1.2	3.2	2.7	ND	850	50	2.6	13
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/24/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/18/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/18/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/24/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LWC3.7	1/22/2003	92.0	38.0	39.0	3.6	8.3	ND	0.8	410.0	18.0	3.6	ND
	4/23/2003	ND	50.0	17.0	1.1	6.8	ND	ND	9.7	11.0	5.1	ND
	7/23/2003	7000	46	150	13	16	7	23	1600	26	5.56	54
	10/22/2003	1200.0	38.0	57.0	8.4	11.0	1.7	4.2	730.0	18.0	3.62	16.0
	1/21/2004	ND	52	25	ND	ND	0.012	ND	11	ND	ND	ND
	4/21/2004	2700.0	36.0	75.0	6.7	12.0	3.6	16.0	420.0	16.0	ND	26.0
	7/21/2004	790.0	43.0	41.0	2.8	9.4	0.610	78.0	360.0	17.0	4.2	13.0
	10/27/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/19/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/24/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/18/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/18/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/24/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
BS-1	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	44.0	33.0	32.0	4.8	ND	ND	3.7	22.0	12.1	ND
	7/27/2006	ND	50.0	31.0	30.0	1.3	ND	ND	8.4	1.9	12.5	3.1
	10/25/2006	20.0	43.0	40.0	16.0	0.9	31.0	ND	1.8	10.0	9.6	2.7
	1/24/2007	16.0	38.0	37.0	13.0	ND	ND	ND	4.3	ND	11.0	2.4
	4/18/2007	9.0	33.0	44.0	7.8	<1.0	<0.020	<0.20	0.7	<0.80	9.9	<5.0
	7/18/2007	18.0	37.0	42.0	13.0	11.0	<0.020	<0.20	1.4	<0.80	11.0	<5.0
	10/24/2007	8.7	40.0	39.0	15.0	ND	ND	ND	1.1	ND	12.0	ND

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	1,1,2,2-Tetrachloroethane	1,1,1-Trichloropropanone	1,1-Dichloroethane	1,2-Dichloroethane	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,2,4,-Trimethylbenzene	2-Butanone (MEK)	2-(2-(2-butoxyethoxy)ethoxyeth	2,4-D	2-Butoxyethanol phosphate (3:1	3,6,9,12-tetraoxahexadecan-1-o	2,3,5,6-Tetrafluorobenzaldehyd	4-Methylphenol	4,4'-DDD	Acetaldehyde	Acetone	Aldrin	Alpha-BHC
LVC_2	1/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			1	ND	ND	ND
	4/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			2	ND	ND	ND
	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.78	ND	ND	98			4	ND	ND	ND
	10/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	96			2	ND	ND	ND
	1/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	4/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			1	ND	ND	ND
	7/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			3	ND	ND	ND
	10/27/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			2	ND	ND	ND
	1/26/2005	ND	ND	ND	ND	ND	ND	ND	5.4	ND	ND	ND	ND	ND			35	ND	ND	ND
	4/19/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			2	ND	ND	ND
	7/20/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	4.1	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.6	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	88	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.1	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	ND
	10/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					ND	5.2	ND	ND	ND
DC_1	1/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	4/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100			ND	ND	ND	ND
	10/22/2003	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA			NA	NA	NA	NA
	1/21/2004	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA			NA	NA	NA	NA
	4/21/2004	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA			NA	NA	NA	NA
	7/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			2	ND	ND	ND
	10/27/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	1/26/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			NA	NA	NA	NA
	4/19/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			2	ND	ND	ND
	7/20/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		1.3	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.2	13	ND	ND
	1/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					ND		ND	ND	
FW_0	1/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	4/23/2003	ND	0.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			1	ND	ND	ND
	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	98			2	ND	ND	ND
	10/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	99			ND	ND	ND	ND
	1/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	4/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	7/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			1	ND	ND	ND
	10/27/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	1/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			4	ND	ND	ND
	4/19/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			3	ND	ND	ND
	7/20/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	54	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	84	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					ND		ND	ND	ND

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	1,1,2,2-Tetrachloroethane	1,1,1-Trichloropropanone	1,1-Dichloroethane	1,2-Dichloroethane	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,2,4,-Trimethylbenzene	2-Butanone (MEK)	2-(2-(2-butoxyethoxy)ethoxyeth	2,4-D	2-Butoxyethanol phosphate (3:1	3,6,9,12-tetraoxahexadecan-1-o	2,3,5,6-Tetrafluorobenzaldehyd	4-Methylphenol	4,4'-DDD	Acetaldehyde	Acetone	Aldrin	Alpha-BHC
LW12.1	1/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			1	ND	ND	ND
	4/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			2	ND	ND	ND
	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	95			2	ND	ND	ND
	10/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100			2	ND	ND	ND
	1/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	4/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	7/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			2	ND	ND	ND
	10/27/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	1/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			18	14	ND	ND
	4/19/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			2	ND	ND	ND
	7/20/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.1	ND	ND	ND
	1/23/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	99	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.9	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					ND	ND	ND	ND	ND
LWC6.3	1/22/2003	ND	ND	2.8	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND
	4/23/2003	ND	ND	1.6	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND
	7/23/2003	ND	ND	4.9	6	ND	ND	ND	ND	ND	ND	ND	ND	94	ND		ND	ND	ND	0.11
	10/22/2003	ND	ND	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	101	ND		ND	ND	ND	0.11
	1/21/2004	ND	ND	1.4	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	0.43
	4/21/2004	ND	ND	1.2	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	0.4
	7/21/2004	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		2	19	ND	ND
	10/27/2004	ND	ND	1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		1	13	ND	ND
	1/26/2005	ND	ND	1.2	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	0.46
	4/19/2005	ND	ND	1.6	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND		1	ND	ND	0.58
	7/20/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	69		2.2	ND	ND	ND
	10/26/2005	ND	ND	2.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1	25	ND	0.04*
	1/19/2006	ND	ND	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.3	ND	ND
LWC3.7	1/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	4/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100			1	ND	ND	ND
	10/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	97			ND	ND	ND	ND
	1/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	4/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	7/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			2	ND	ND	ND

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	1,1,2,2-Tetrachloroethane	1,1,1-Trichloropropanone	1,1-Dichloroethane	1,2-Dichloroethane	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,2,4,-Trimethylbenzene	2-Butanone (MEK)	2-(2-(2-butoxyethoxy)ethoxyeth	2,4-D	2-Butoxyethanol phosphate (3:1	3,6,9,12-tetraoxahexadecan-1-o	2,3,5,6-Tetrafluorobenzaldehyd	4-Methylphenol	4,4'-DDD	Acetaldehyde	Acetone	Aldrin	Alpha-BHC
MC_2	1/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	4/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	99			3	ND	ND	ND
	10/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	97			ND	ND	ND	ND
	1/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	4/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	7/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			2	ND	ND	ND
	10/27/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	1/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	4/19/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	7/20/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		1	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					ND	ND	ND	ND	ND
SC_1	1/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			2	ND	ND	ND
	4/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	17	2.2	ND	4.1	ND			ND	ND	ND	ND
	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.37	ND	ND	95			6	ND	ND	ND
	10/22/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	101			ND	ND	ND	ND
	1/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	4/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
	7/21/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			3	ND	ND	ND
	10/27/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			NA	NA	NA	NA
	1/26/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			NA	NA	NA	NA
	4/19/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			6	ND	ND	ND
	7/20/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.6	ND	ND	ND
	10/26/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1/19/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.1	6.7	ND	ND
	1/23/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	38	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.4	ND	ND	ND
	10/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					ND	2.5	17	ND	ND
BS_1	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.2	ND	ND
	1/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					ND		ND	ND	ND

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	Baygon	Benzo (k) Fluoranthene	Beta-BHC	Bromodichloromethane	Bromoform	Butanal	Baygon	Butylbenzylphthalate	Caffeine	Carbon disulfide	Chlorodibromomethane	Chloroform	Chloroform (Trichloromethane)	Dalapon	Diazinon	Dieldrin	Delta-BHC	Dibromoacetonitrile	Dibromochloromethane
LVC_2	1/22/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND	ND		ND	ND	ND	0.6	0.14		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/23/2003	ND	ND	ND		ND	ND	ND	31	0.7		ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	0.8	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND	ND		ND	ND	ND	ND	0.21		ND	ND	ND	ND	0.15	ND	ND	ND	ND
	4/21/2004	ND	ND	ND		ND	ND	ND	ND	0.17		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	ND	ND		ND	ND	ND	5.08	ND		ND	1	ND	ND	ND	ND	ND	ND	ND
	10/27/2004	ND	ND	ND		ND	ND	ND	ND	ND		ND	0.9	ND	ND	ND	ND	ND	ND	ND
	1/26/2005	ND	ND	ND		ND	4	ND	ND	7.42		ND	1.4	1.4	ND	ND	ND	ND	ND	ND
	4/19/2005	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND	ND		ND	1.1	ND	ND	0.33	5.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	0.22	1.2	ND	1.1	0.8	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	0.37	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	0.45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.7	ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007	ND	ND	ND	1.9	0.87	ND	ND	ND	ND	ND		1.6		0.79	ND	ND	ND	ND	2.4
DC_1	1/22/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/23/2003	ND	ND	ND		ND	ND	ND	0.8	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	NA	NA		NA	NA	ND	NA	NA		NA	NA	NA	NA	NA	NA	NA	ND	NA
	1/21/2004	ND	NA	NA		NA	NA	ND	NA	NA		NA	NA	NA	NA	NA	NA	NA	ND	NA
	4/21/2004	ND	NA	NA		NA	NA	ND	NA	NA		NA	NA	NA	NA	NA	NA	NA	ND	NA
	7/21/2004	ND	ND	ND		ND	ND	ND	ND	ND		ND	0.6	ND	ND	ND	ND	ND	0.8	ND
	10/27/2004	ND	ND	ND		ND	ND	ND	ND	0.11		ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/26/2005	ND	NA	NA		NA	NA	ND	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/19/2005	ND	ND	ND		ND	1	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007		ND	ND		ND				ND	ND		ND		ND			ND		
FW_0	1/22/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND	ND		ND	ND	ND	ND	0.16		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/23/2003	ND	ND	ND		0.6	ND	ND	ND	ND		0.6	0.9	1.9	5.7	ND	ND	ND	ND	0.6
	10/22/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	ND	ND		ND	ND	ND	1.36	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/27/2004	ND	ND	ND		ND	ND	ND	ND	0.19		ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/26/2005	ND	ND	ND		ND	ND	ND	1.41	1.45		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/19/2005	ND	ND	ND		ND	1	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	0.52	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007		ND	ND		ND	ND		7.9	ND	ND		ND		ND	ND		ND		ND

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	Baygon	Benzo (k) Fluoranthene	Beta-BHC	Bromodichloromethane	Bromoform	Butanal	Baygon	Butylbenzylphthalate	Caffeine	Carbon disulfide	Chlorodibromomethane	Chloroform	Chloroform (Trichloromethane)	Dalapon	Diazinon	Dieldrin	Delta-BHC	Dibromoacetonitrile	Dibromochloromethane
LW12.1	1/22/2003	ND	ND	ND		ND	ND	ND	0.9	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND	ND		ND	ND	ND	ND	0.14		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/23/2003	ND	ND	ND		ND	ND	ND	ND	0.3		ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	1	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND	ND		ND	ND	ND	ND	0.08		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND	ND		ND	ND	ND	ND	0.13		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/27/2004	ND	ND	ND		ND	ND	ND	ND	0.17		ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/26/2005	ND	ND	ND		ND	ND	ND	ND	0.6		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/19/2005	ND	ND	ND		ND	1	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	0.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007		ND	ND		ND	ND			ND	ND		ND	ND	ND		ND	ND	ND	
LWC6.3	1/22/2003	ND	ND	0.18		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	0.17	ND	ND
	4/23/2003	ND	ND	0.26		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	0.93	ND	ND
	7/23/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	28	28	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	26	24	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND	0.21		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	0.68	ND	ND
	4/21/2004	ND	ND	0.32		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	0.1	0.73	ND	ND
	7/21/2004	ND	ND	ND		ND	ND	ND	ND	ND		ND	2.7	ND	ND	ND	ND	ND	0.8	ND
	10/27/2004	ND	ND	ND		ND	ND	ND	ND	ND		ND	4.5	3.5	ND	ND	ND	ND	ND	ND
	1/26/2005	ND	ND	0.31		ND	ND	ND	ND	ND		ND	0.6	ND	ND	ND	ND	0.58	ND	ND
	4/19/2005	ND	ND	0.28		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	0.11	0.86	ND	ND
	7/20/2005	ND	ND	0.03*		ND	1.6	ND	ND	ND		ND	6.2	ND	ND	ND	ND	0.033*	ND	ND
	10/26/2005	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	5.9	5.6	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.58	ND	4.8	ND	ND	ND	ND	ND	ND	ND
LWC3.7	1/22/2003	ND	ND	0.03		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND	0.02		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/23/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	0.6	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	ND	0.01		ND	ND	ND	ND	ND		ND	ND	0.6	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND	0.02		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND	0.02		ND	ND	ND	ND	ND		ND	0.5	0.6	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	Baygon	Benzo (k) Fluoranthene	Beta-BHC	Bromodichloromethane	Bromoform	Butanal	Baygon	Butylbenzylphthalate	Caffeine	Carbon disulfide	Chlorodibromomethane	Chloroform	Chloroform (Trichloromethane)	Dalapon	Diazinon	Dieldrin	Delta-BHC	Dibromoacetonitrile	Dibromochloromethane
MC_2	1/22/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND	ND		ND	ND	ND	ND	0.05		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/23/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND	ND		ND	ND	ND	ND	0.06		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	ND	ND		ND	ND	ND	ND	ND		ND	0.6	ND	ND	ND	ND	ND	0.7	ND
	10/27/2004	ND	ND	ND		ND	ND	ND	ND	0.11		ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/26/2005	2.4	ND	ND		ND	ND	2.4	ND	0.12		ND	ND	ND	ND	ND	ND	ND	ND	ND
	5/25/2005	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	0.22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	0.22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007		ND	ND	ND	ND			ND	ND	ND		ND	ND	ND	ND		ND	ND	
SC_1	1/22/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND	ND		ND	ND	ND	ND	0.13		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/23/2003	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	1.4	ND	ND	ND	ND	ND
	10/22/2003	ND	ND	ND		ND	ND	ND	ND	0.05		ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/27/2004	NA	NA	NA		NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA
	1/26/2005	NA	NA	NA		NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/19/2005	ND	ND	ND		ND	1	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND	ND	0.6	1.4	1.2	ND	ND	ND	1.7	0.8	0.8	0.7	ND	ND	ND	ND	ND	0.9
	10/26/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1/19/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/18/2006	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	0.51	ND	ND	ND	ND	ND	ND	0.74
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.61	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	DN	ND	ND	ND	ND	0.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007		ND	ND	ND	ND	ND		ND	ND	ND		ND		ND	ND	ND	ND	ND	
BS_1	4/18/2006	ND	ND	0.37	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007		ND		ND	ND	ND		ND	ND	ND		ND		ND	ND		ND	ND	

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	Di(2-Ethylhexyl)phthalate	Dichloroiodomethane	Dichlorobromomethane	Dichloromethane	Dichlorprop	Diethylphthalate	Dicamba	Di-n-Butylphthalate	Di-N-Octylphthalate	Disulfoton	Diuron	Dodecane	Endrin	Endrin Aldehyde	Formaldehyde	Glyoxal	Glyphosate	Hexadecanoic acid	Lindane	Lindane (gamma-BHC)	Oxamyl (Vydate)	Methylene Chloride	Methyl Tert-butyl ether (MTBE)
LVC_2	1/22/2003	ND	ND		ND	ND	ND	ND	0.7	ND	ND	ND		ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	0.9	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	5	2	ND	ND	ND	ND	ND	ND	ND
	7/23/2003	4.7	ND		ND	ND	ND	ND	1.1	ND	ND	ND		ND	ND	ND	6	ND	ND	ND	ND	ND	ND	ND
	10/22/2003	2	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND
	1/21/2004	0.9	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	5	ND	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	8	4	ND	ND	ND	ND	ND	ND	ND
	10/27/2004	6.5	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND
	1/26/2005	11	ND		ND	ND	1.6	ND	ND	ND	ND	ND		0.05	ND	78	71	ND	ND	ND	ND	ND	ND	ND
	4/19/2005	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	31	7.8	ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.1	ND	ND	ND	ND	DN	ND	ND	ND
	1/23/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	25	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007					ND	ND	ND	ND	ND	ND	ND		ND	ND	22	14	ND				ND	ND	ND
DC_1	1/22/2003	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND
	7/23/2003	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/22/2003	NA	NA		ND	NA	NA	NA	NA	NA	ND	NA		NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA
	1/21/2004	NA	NA		ND	NA	NA	NA	NA	NA	ND	NA		NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA
	4/21/2004	NA	NA		ND	NA	NA	NA	NA	NA	ND	NA		NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA
	7/21/2004	ND	ND		ND	ND	ND	ND	ND	NA	ND	ND		ND	ND	ND	3	ND	ND	ND	ND	ND	ND	ND
	10/27/2004	ND	ND		ND	ND	ND	ND	ND	NA	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/26/2005	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/19/2005	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	24	1.5	ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND
	1/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.9	27	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007					ND		ND	ND	ND	ND			ND	ND	9	ND	ND				ND	ND	ND
FW_0	1/22/2003	ND	ND		ND	ND	ND	ND	0.6	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	40	1	ND	ND	ND	ND	ND	ND	ND
	7/23/2003	0.7	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	13	1	ND	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	3	ND	ND	ND	ND	ND	ND	ND
	10/27/2004	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/26/2005	1.5	ND		ND	ND	1.3	ND	ND	0.3	ND	3.1		ND	ND	13	5	ND	ND	ND	ND	ND	ND	ND
	4/19/2005	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	20	ND	ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.2	ND	ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	ND	ND	ND	ND	0.2	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9	29	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.9	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007					ND		ND	7.7	ND				ND	ND	9.8	ND	ND				ND	ND	

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	Di(2-Ethylhexyl)phthalate	Dichloroiodomethane	Dichlorobromomethane	Dichloromethane	Dichlorprop	Diethylphthalate	Dicamba	Di-n-Butylphthalate	Di-N-Octylphthalate	Disulfoton	Diuron	Dodecane	Endrin	Endrin Aldehyde	Formaldehyde	Glyoxal	Glyphosate	Hexadecanoic acid	Lindane	Lindane (gamma-BHC)	Oxamyl (Vydate)	Methylene Chloride	Methyl Tert-butyl ether (MTBE)
LW12.1	1/22/2003	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	7	2	ND	ND	ND	ND	ND	ND	ND
	7/23/2003	ND	ND		ND	ND	0.7	ND	ND		ND	ND		ND	ND	ND	2	15	ND	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	4	ND	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	5	ND	ND	ND	ND	ND	ND	ND
	10/27/2004	5	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND
	1/26/2005	1.3	ND		ND	ND	1.2	ND	ND	ND	ND	2.4		ND	ND	50	20	ND	ND	ND	ND	ND	ND	ND
	4/19/2005	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	19	4.5	ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	23	39	15	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007						ND	ND	ND					ND	ND	11	ND	ND				ND	ND	ND
LWC6.3	1/22/2003	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	2	ND	ND	0.2	0	ND	ND	ND
	7/23/2003	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.2
	1/21/2004	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		0.16	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	9.5		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	6	3	ND	ND	ND	ND	ND	9.9	ND
	10/27/2004	ND	ND		5.4	ND	ND	ND	ND	ND	ND	ND		ND	ND	8	2	ND	ND	ND	ND	ND	5.4	1
	1/26/2005	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	4.1	ND	ND
	4/19/2005	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	34	4.7	ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND	ND	3.5	ND	ND	ND	ND	ND	ND	ND		ND	ND	10	ND	ND	ND	ND	ND	ND	3.2	1
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.5	ND	ND	15	ND	ND	ND	ND	ND	ND	4.4	ND
LWC3.7	1/22/2003	ND	ND		ND	ND	ND	ND	0.6		ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND	ND	0	ND	ND	ND	ND
	7/23/2003	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/21/2004	0.7	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	Di(2-Ethylhexyl)phthalate	Dichloroiodomethane	Dichlorobromomethane	Dichloromethane	Dichlorprop	Diethylphthalate	Dicamba	Di-n-Butylphthalate	Di-N-Octylphthalate	Disulfoton	Diuron	Dodecane	Endrin	Endrin Aldehyde	Formaldehyde	Glyoxal	Glyphosate	Hexadecanoic acid	Lindane	Lindane (gamma-BHC)	Oxamyl (Vydate)	Methylene Chloride	Methyl Tert-butyl ether (MTBE)
MC_2	1/22/2003	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND
	7/23/2003	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND
	10/27/2004	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/26/2005	0.7	ND		ND	ND	ND	ND	ND	ND	ND	27		ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND
	5/25/2005	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	18	2.5	ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.6	ND	ND	ND	ND	ND	ND	ND	ND
	1/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.2	17	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.8	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007					ND	ND		ND		ND			ND	ND	9.1	ND					ND		
SC_1	1/22/2003	ND	ND		ND	ND	ND	ND	0.6		ND	ND		ND	ND	5	ND	ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/23/2003	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	7	5	ND	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	3	ND	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND	ND		ND	ND		ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	ND		ND	ND	ND	ND	ND		0.5	ND		ND	ND	13	4	ND	ND	ND	ND	ND	ND	ND
	10/27/2004	NA	NA		NA	NA	NA	NA	NA		NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1/26/2005	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/19/2005	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND		0.6	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	32	4.1	ND	ND	ND	ND	ND	ND	ND
	10/26/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1/19/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	###	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.7	ND	ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	25	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	13	ND	ND	ND	ND	ND	ND	ND
	10/24/2007					ND	ND	ND	ND	ND		ND		ND	ND	15	ND	ND				ND		ND
BS_1	4/18/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND
	1/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13	31	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.1	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007							ND	ND	ND				ND	ND	7.7	ND	ND				ND	ND	ND

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	m-Dichlorobenzene (1,3-DCB)	M-Glyoxal(Pyruvic Aldehyde)	Molybdenum	Naphthalene	Nonadecane	p-Dichlorobenzene (1,4-DCB)	Pentachlorophenol	Pentanal	Phenanthrene	Propanal	Tetrachloroethylene (PCE)	Tetradecane	Simazine	Toluene	Tot DCPA Mono&Diacid Degradate	Total Trihalomethanes	Total THM	Tri(2-chloroethyl)phosphate	Trichloroethylene (TCE)
LVC_2	1/22/2003	ND	ND		ND		ND	ND	ND	ND	ND	0.8		ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	2		ND		ND	ND	ND	ND	2	1		ND	ND	ND	ND	ND	4.9	ND
	7/23/2003	ND	5		ND		ND	ND	ND	ND	1	0.5		ND	ND	0.2	ND	ND	ND	ND
	10/22/2003	ND	3		ND		ND	ND	1	ND	ND	1.3		ND	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	1		ND		ND	ND	ND	ND	4	1.3		ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	2		ND		ND	ND	ND	ND	ND	0.8		ND	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	3		ND		ND	ND	2	ND	1	ND		ND	ND	ND	1	ND	ND	ND
	10/27/2004	ND	2		ND		ND	ND	1	0.14	1	0.6		ND	ND	ND	0.9	ND	ND	ND
	1/26/2005	ND	47		ND		ND	ND	18	ND	9	0.5		ND	ND	ND	1.4	1.3	ND	ND
	4/19/2005	ND	1		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	0.6	0.7	ND	ND
	7/20/2005	ND	ND		ND		ND	ND	3.8	ND	2.3	ND		ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND		ND		ND	ND	ND	ND	ND	0.7		ND	ND	ND	1.1	0.9	ND	ND
	1/19/2006	ND	ND	9.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.61	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	N	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	2.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND	7.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	8.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	7.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007	ND	7.8	6.3			ND	ND	ND	ND	ND	ND		ND	ND					
DC_1	1/22/2003	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	0.36	ND	ND	ND	ND
	4/23/2003	ND	1		ND		ND	ND	ND	ND	ND	ND		ND	ND	0.33	ND	ND	ND	ND
	7/23/2003	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	0.39	ND	ND	ND	ND
	10/22/2003	NA	NA		NA		NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
	1/21/2004	NA	NA		NA		NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
	4/21/2004	NA	NA		NA		NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
	7/21/2004	ND	2		ND		ND	ND	ND	ND	ND	ND		ND	ND	0.25	0.6	ND	ND	ND
	10/27/2004	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	1/26/2005	NA	NA		NA		NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
	4/19/2005	ND	1		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	9.5	26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007	ND	2.6	28	ND					ND				ND	ND					
FW_0	1/22/2003	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	1.12	ND	ND	ND	ND
	4/23/2003	ND	1		ND		ND	ND	ND	ND	ND	ND		ND	ND	1.3	ND	ND	ND	ND
	7/23/2003	ND	2		ND		ND	ND	ND	ND	ND	ND		ND	ND	1.6	ND	2.2	ND	ND
	10/22/2003	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	1.4	ND	ND	ND	ND
	1/21/2004	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	1.5	ND	ND	ND	ND
	4/21/2004	ND	1		ND		ND	ND	ND	ND	ND	ND		ND	ND	1	ND	ND	ND	ND
	7/21/2004	ND	2		ND		ND	ND	1	ND	ND	ND		ND	ND	1.1	ND	ND	ND	ND
	10/27/2004	ND	ND		ND		ND	ND	ND	ND	1	ND		ND	ND	1.93	ND	ND	ND	ND
	1/26/2005	ND	4		ND		ND	ND	3	0.06	2	ND		ND	ND	ND	ND	ND	ND	ND
	4/19/2005	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	2		ND		ND	ND	ND	ND	ND	ND		ND	ND	1.14	ND	ND	ND	ND
	10/26/2005	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	1/19/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/18/2006	ND	ND	40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	13	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.5	ND	ND	ND	ND
	10/24/2007	ND	2.5	16	ND									ND	ND					

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	m-Dichlorobenzene (1,3-DCB)	M-Glyoxal(Pyruvic Aldehyde)	Molybdenum	Naphthalene	Nonadecane	p-Dichlorobenzene (1,4-DCB)	Pentachlorophenol	Pentanal	Phenanthrene	Propanal	Tetrachloroethylene (PCE)	Tetradecane	Simazine	Toluene	Tot DCPA Mono&Diacid Degradate	Total Trihalomethanes	Total THM	Tri(2-chloroethyl)phosphate	Trichloroethylene (TCE)
LW12.1	1/22/2003	ND	1		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	2		ND		ND	ND	ND	ND	2	ND		ND	ND	ND	ND	ND	ND	ND
	7/23/2003	ND	3		ND		ND	ND	2	ND	ND	ND		ND	ND	1.6	ND	ND	ND	ND
	10/22/2003	ND	4		ND		ND	ND	2	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	7/21/2004	ND	3		ND		ND	ND	2	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	10/27/2004	ND	1		ND		ND	ND	ND	ND	2	ND		ND	ND	ND	ND	ND	ND	ND
	1/26/2005	ND	17		0.17		ND	ND	8	0.07	2	ND		ND	ND	ND	ND	ND	ND	ND
	4/19/2005	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	2.7		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND	28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	28	27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007	ND	2.4	29	ND			ND				ND		ND						
LWC6.3	1/22/2003	ND	ND		ND		0.5	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	0.5
	4/23/2003	ND	1		ND		0.6	ND	ND	ND	ND	ND		ND	ND	0.48	ND	ND	ND	ND
	7/23/2003	ND	1		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	25	ND	1
	10/22/2003	ND	2		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	26	24	ND	1
	1/21/2004	1	1		ND		0.6	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	0.42	ND	ND	ND	ND
	7/21/2004	ND	2		0.11		ND	ND	ND	0.03	ND	ND		ND	ND	ND	ND	2.4	ND	ND
	10/27/2004	ND	3		ND		ND	ND	3	ND	ND	ND		ND	ND	ND	4.5	3.5	ND	ND
	1/26/2005	ND	ND		ND		0.7	ND	ND	ND	ND	ND		ND	ND	ND	0.6	ND	ND	ND
	4/19/2005	ND	1		ND		0.7	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	9.9		ND		ND	ND	ND	ND	1.1	ND		ND	ND	ND	6.2	ND	ND	ND
	10/26/2005	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	5.9	6.1	ND	ND
	1/19/2006	ND	ND	240	ND	2.6	ND	ND	ND	ND	ND	ND	2.9	ND	ND	ND	ND	ND	ND	ND
LWC3.7	1/22/2003	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	4/23/2003	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	7/23/2003	ND	1		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	0.6	ND	ND
	1/21/2004	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	2		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	0.5	0.6	ND	ND
	7/21/2004	ND	2		ND		ND	ND	2	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	m-Dichlorobenzene (1,3-DCB)	M-Glyoxal(Pyruvic Aldehyde)	Molybdenum	Naphthalene	Nonadecane	p-Dichlorobenzene (1,4-DCB)	Pentachlorophenol	Pentanal	Phenanthrene	Propanal	Tetrachloroethylene (PCE)	Tetradecane	Simazine	Toluene	Tot DCPA Mono&Diacid Degradate	Total Trihalomethanes	Total THM	Tri(2-chloroethyl)phosphate	Trichloroethylene (TCE)
MC_2	1/22/2003	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	0.3	ND	ND	ND	ND
	4/23/2003	ND	1		ND		ND	ND	ND	ND	ND	ND		ND	ND	0.35	ND	ND	ND	ND
	7/23/2003	ND	2		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	10/22/2003	ND	1		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	1/21/2004	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	1		ND		ND	ND	ND	ND	ND	ND		ND	ND	0.28	ND	ND	ND	ND
	7/21/2004	ND	2		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	0.64	ND	ND	ND
	10/27/2004	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	1/26/2005	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	5/25/2005	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	1.4		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	10/26/2005	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	1/19/2006	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2006	ND	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/24/2007	ND	ND	9.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	3	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007	ND	2.4	9.9	ND			ND	ND	ND	ND			ND						ND
SC_1	1/22/2003	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	0.27	ND	ND	ND	ND
	4/23/2003	ND	ND		ND		ND	ND	ND	ND	ND	ND		ND	ND	0.24	ND	ND	ND	ND
	7/23/2003	ND	6		ND		ND	ND	4	ND	2	ND		ND	ND	0.28	ND	ND	ND	ND
	10/22/2003	ND	3		ND		ND	ND	ND	ND	ND	ND		ND	ND	0.27	ND	ND	ND	ND
	1/21/2004	ND	3		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	4/21/2004	ND	2		ND		ND	ND	ND	ND	ND	ND		ND	ND	0.41	ND	ND	ND	ND
	7/21/2004	ND	4		ND		ND	0.3	ND	ND	ND	ND		ND	ND	0.4	ND	ND	ND	ND
	10/27/2004	NA	NA		NA		NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
	1/26/2005	NA	NA		NA		NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
	4/19/2005	ND	2		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	7/20/2005	ND	5.5		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	4	3.5	ND	ND
	10/26/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1/19/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/18/2006	ND	ND	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	36	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND	46	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	7.3	52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	2	52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ND	ND	ND	ND
	10/24/2007	ND	4.1	76	ND					ND				ND						
BS_1	4/18/2006	ND	ND	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/27/2006	ND	ND	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/24/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/18/2007	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2007	ND	ND	16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/24/2007	ND	2.5	16	ND					ND				ND	ND					

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	Unknown (Total)	Unknown alcohol (Total)	Unknown	Surrogate: DECA(%)	Surrogate: TCmX(%)	Surrogate: Tributylphosphate(%)	Surrogate: Triphenylphosphate(%)	Vanadium	2,3,7,8-TCDD	Malathion
LVC_2	1/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	4/23/2003	11.1	ND		ND	ND	ND	ND		ND	ND
	7/23/2003	ND	ND		ND	ND	ND	ND		ND	ND
	10/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	1/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	7/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	10/27/2004	ND	ND		ND	ND	ND	ND		ND	ND
	1/26/2005	ND	ND		ND	ND	ND	ND		ND	ND
	4/19/2005	ND	ND		ND	ND	ND	ND		ND	ND
	7/20/2005	ND	ND		84.4	86.8	114	113		ND	ND
	10/26/2005	ND	ND		61.7	49.2	69.6	65.5		ND	ND
	1/19/2006	ND	ND		ND	ND	ND	ND	4.7	ND	ND
	4/18/2006	6.3	3	24	ND	ND	ND	ND	5.6	ND	ND
	7/27/2006	ND	ND		ND	ND	ND	54.7	ND	ND	ND
	10/25/2006	ND	ND		ND	ND	ND	ND	ND	ND	ND
	1/23/2007	ND	ND		111	119		126	4.1	ND	ND
	4/18/2007	ND	ND		ND	ND	ND	ND	4.4	ND	ND
	7/18/2007	ND	ND		ND	ND	ND	ND	6.1	ND	ND
	4/23/2003	12.1	ND		ND	ND	ND	ND		ND	ND
DC_1	1/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	4/23/2003	4.5	ND		ND	ND	ND	ND		ND	ND
	7/23/2003	ND	ND		ND	ND	ND	ND		ND	ND
	10/22/2003	NA	NA		ND	ND	ND	ND		ND	ND
	1/21/2004	NA	NA		ND	ND	ND	ND		ND	ND
	4/21/2004	NA	NA		ND	ND	ND	ND		ND	ND
	7/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	10/27/2004	ND	ND		ND	ND	ND	ND		ND	ND
	1/26/2005	NA	NA		ND	ND	ND	ND		ND	ND
	4/19/2005	ND	ND		ND	ND	ND	ND		ND	ND
	7/20/2005	ND	ND		69.1	87.1	109	111		ND	
	10/26/2005	ND	ND		77.4	80.5	93.4	92.4		ND	0.12
	1/19/2006	ND	ND		ND	ND	ND	ND	17	ND	ND
	4/18/2006	27	ND	ND	ND	ND	ND	ND	13	ND	ND
		ND	ND	ND	ND	ND	ND	69.8	14	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	9.3	ND	ND
	1/24/2007	33	ND	ND	107	112	NA	69.9	13	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	15	ND	ND
	7/18/2007	ND	ND	21	94	108	ND	92	16	ND	ND
	10/24/2007					87			19	ND	
FW_0	1/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	4/23/2003	6.5	ND		ND	ND	ND	ND		ND	ND
	7/23/2003	ND	ND		ND	ND	ND	ND		ND	ND
	10/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	1/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	7/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	10/27/2004	ND	ND		ND	ND	ND	ND		ND	ND
	1/26/2005	ND	ND		ND	ND	ND	ND		ND	ND
	4/19/2005	ND	ND		ND	ND	ND	ND		ND	ND
	7/20/2005	ND	ND		83.6	86.7	116	116		ND	ND
	10/26/2005	ND	ND		76.1	82.1	93.8	96.4		ND	ND
	1/19/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/18/2006	ND	ND	ND	ND	ND	ND	ND	4.7	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	2.4	ND	ND
	1/23/2007	ND	ND	ND	126	111	ND	71	4.3	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	4.6	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	6.3	ND	ND
	10/24/2007		2.2			90			5	ND	

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	Unknown (Total)	Unknown alcohol (Total)	Unknown	Surrogate: DECA(%)	Surrogate: TCmX(%)	Surrogate: Tributylphosphate(%)	Surrogate: Triphenylphosphate(%)	Vanadium	2,3,7,8-TCDD	Malathion
LW12.1	1/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	4/23/2003	5.4	ND		ND	ND	ND	ND		ND	ND
	7/23/2003	ND	ND		ND	ND	ND	ND		ND	ND
	10/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	1/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	7/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	10/27/2004	ND	ND		ND	ND	ND	ND		ND	ND
	1/26/2005	ND	ND		ND	ND	ND	ND		ND	ND
	4/19/2005	ND	ND		ND	ND	ND	ND		ND	ND
	7/20/2005	ND	ND		81.5	85.8	112	111		ND	ND
	10/26/2005	ND	ND		70.6	84.9	90.5	93.6		ND	ND
	1/19/2006	ND	ND		ND	ND	ND	ND	9.3	ND	ND
	4/18/2006	ND	2.10	3.00	ND	ND	ND	ND	7	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	7.4	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	6.2	ND	ND
	1/23/2007	3.6	ND	ND	98.3	96.1	ND	64.4	9.2	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	9.2	ND	ND
	7/18/2007	ND	ND	ND	ND	ND	ND	ND	7.5	ND	ND
	10/24/2007					87			10	ND	
LWC6.3	1/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	4/23/2003	ND	ND		ND	ND	ND	ND		ND	ND
	7/23/2003	ND	ND		ND	ND	ND	ND		ND	ND
	10/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	1/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	7/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	10/27/2004	ND	ND		ND	ND	ND	ND		ND	ND
	1/26/2005	ND	ND		ND	ND	ND	ND		ND	ND
	4/19/2005	ND	ND		ND	ND	ND	ND		ND	ND
	7/20/2005	ND	ND		39.2	64.6	94.8	88.4		ND	
	10/26/2005	ND	ND		63.9	87.1	97.1	96.6		ND	
	1/19/2006	ND	ND		ND	ND	ND	ND	29	ND	ND
LWC3.7	1/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	4/23/2003	ND	ND		ND	ND	ND	ND		ND	ND
	7/23/2003	ND	ND		ND	ND	ND	ND		ND	ND
	10/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	1/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	7/21/2004	ND	ND		ND	ND	ND	ND		ND	ND

Appendix IIe. Organic Compound Concentrations (ug/L) of Water Samples from Tributary/Seep Locations

Site Location	Date	Unknown (Total)	Unknown alcohol (Total)	Unknown	Surrogate: DECA(%)	Surrogate: TCmX(%)	Surrogate: Tributylphosphate(%)	Surrogate: Triphenylphosphate(%)	Vanadium	2,3,7,8-TCDD	Malathion
MC_2	1/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	4/23/2003	ND	ND		ND	ND	ND	ND		ND	ND
	7/23/2003	ND	ND		ND	ND	ND	ND		ND	ND
	10/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	1/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	7/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	10/27/2004	ND	ND		ND	ND	ND	ND		ND	ND
	1/26/2005	ND	ND		ND	ND	ND	ND		ND	ND
	5/25/2005	ND	ND		ND	ND	ND	ND		ND	ND
	7/20/2005	ND	ND		84.3	89.9	121	121		ND	ND
	10/26/2005	ND	ND		69.0	85.4	93.4	94		ND	ND
	1/19/2006	ND	ND		ND	ND	ND	ND	9.1	ND	ND
	4/18/2006	ND	ND		ND	ND	ND	ND	7.9	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	7	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	4.7	ND	ND
	1/24/2007	2.7	ND		103	119	ND	132	7.3	ND	ND
	4/18/2007	ND	ND		ND	ND	ND	ND	8.5	ND	ND
	7/18/2007	ND	ND		80%	116%	ND	91%	9	ND	ND
	10/24/2007					95%			9.1	ND	
SC_1	1/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	4/23/2003	6.6	ND		ND	ND	ND	ND		ND	ND
	7/23/2003	ND	ND		ND	ND	ND	ND		ND	ND
	10/22/2003	ND	ND		ND	ND	ND	ND		ND	ND
	1/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	4/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	7/21/2004	ND	ND		ND	ND	ND	ND		ND	ND
	10/27/2004	NA	NA		ND	ND	ND	ND		ND	ND
	1/26/2005	NA	NA		ND	ND	ND	ND		ND	ND
	4/19/2005	ND	ND		ND	ND	ND	ND		ND	ND
	7/20/2005	ND	ND		87.4	90.7	116	111		ND	
	10/26/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1/19/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/18/2006	9.30	6.30	ND	ND	ND	ND	ND	9.0	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	ND	8.8	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	4.4	ND	ND
	1/23/2007	2.5	ND	ND	103	114	ND	106	10	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	8.5	ND	ND
	7/18/2007	ND	ND	ND	82	82	ND	98	13	ND	ND
	10/24/2007		4			50			4.2	ND	
BS_1	4/18/2006	25	ND	ND	ND	97.4	91.9	119	24	ND	ND
	7/27/2006	ND	ND	ND	ND	ND	ND	121	ND	ND	ND
	10/25/2006	ND	ND	ND	ND	ND	ND	ND	20	ND	ND
	1/24/2007	21	ND	ND	110	103	ND	121	25	ND	ND
	4/18/2007	ND	ND	ND	ND	ND	ND	ND	19	ND	ND
	7/18/2007	ND	ND	ND	87	99	ND	87	26	ND	ND
	10/24/2007					90			29	ND	