

ATTACHMENT 1

**LABORATORY ANALYTICAL DATA COLLECTED AS PART
OF THE ADDITIONAL INVESTIGATION**

Analytical Results

Well	Screen	Sample Date	pH	Temperature	DO ^(a)	ORP ^(e)	Conductivity	DOC ^(c)	TOC	Iron	Ferrous Iron	Ferric Iron	Nitrite (as N)	Nitrate (as N)	Sulfide	Sulfate	Calcium	Sodium	Potassium	Magnesium	Chloride	TDS	Perchlorate ^(d)	Total Alkalinity	Ammonia (as NH ₃)	Total Kjeldahl Nitrogen	Specific Electrical Conductance	Dissolved Inorganic Carbon	Dissolved Nitrogen	Perchlorate (δ ¹⁸ O)	Perchlorate (Δ ¹⁷ O)	Perchlorate (δ ³⁷ Cl)	Groundwater (δ ¹⁸ O)	Groundwater (δ ² H)	Inorganic Chloride Isotope (δ ³⁷ Cl)	Del He4	Del He3 ^(b)	R(3/4)	Tritium/Helium (T ³ -He Age) ^(j)	Tritium (T ³ H)	Strontium (⁸⁷ Sr/ ⁸⁶ Sr)	Strontium	Presence of old gene ⁽ⁿ⁾	Presence of old mRNA ^(o)					
Units	No.	mm/dd/yy	S.U.	°C	mg/L	mV	mS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	μg/L	mg/L	mg/L	umhos/cm	mg/L	mg/L	mg/L	NA	NA	NA	NA	NA	NA	%	%	Ra	years	TU	NA	mg/L	Presence of old gene ⁽ⁿ⁾	Presence of old mRNA ^(o)					
MW-1	NA	06/05/05	7.6	14.1	0.8	222	0.60	14.9	0.830J (1)	0.31	ND (5)	0.30	ND (0.1)	1.3	ND (1)	54.8	68.3	30.0	3.9	21.4	26.4	360	ND (2)	200	ND (0.1)	0.1	595	470	17				-6.5	-42.7	0.06	NA ^(b)	NA ^(b)	NA ^(b)	NA ^(b)	3.902	0.7113	0.438	positive	positive					
MW-16	NA	02/09/06																												-21.8	0.023	0.4																	
MW-16	NA	11/22/06																												-20.7	-0.2	0.1																	
MW-17	1	08/15/05	7.1	24.4	11.2	204	34.1	4.32	2.39	ND (0.2)	ND (5)	ND(0.2)	ND (0.1)	0.63	ND (1)	19.4	35.5	14.4	ND (2)	11.6	6.5	190	ND (4) ^(b)	126	ND (0.1)	0.277	311	250	21				-7.5	-49.1							2.929	0.7114	0.2513						
	1 Dup	09/12/05																																															
	2	08/15/05	6.6	23.8	12.1	210	87.7	3.39	2.64	0.29	ND (5)	0.29	ND (0.1)	7.8	ND (1)	98.7	106	24.5	3.8	36.6	68.2	695	9.7	212	ND (0.1)	0.304	875	450	19				-7.7	-55.6							6.596	0.7112	0.8619						
	3	08/15/05	6.2	22.2	10.6	172	73.9	3.49	2.29	1.6	8.02	1.6	ND (0.1)	6.5	ND (1)	70.0	73.6	25.6	ND (2)	30.0	51.0	535	76.4	183	ND (0.1)	0.315	719	380	18	-21.8	0.12	NA ^(m)	-7.5	-51.0	0.17	18.5	29.0	1.073	11.7	7.750	0.7116	0.6489	positive	negative					
	4	08/15/05	6.2	19.9	11.2	178	34.3	2.79	2.31	ND (0.2)	ND (5)	ND(0.2)	ND (0.1)	0.21	ND (1)	19.0	18.1	46.9	2.4	4.8	10.1	235	ND (4)	126	ND (0.1)	0.549	323	250	22				-7.5	-52.0							0.537	0.7108	0.1851						
	5	08/15/05	5.9	18.0	11.6	233	36.8	1.87	1.85	63	8.02	55	ND (0.1)	ND (1)	ND (1)	95.3	65.7	59.8	5.1	23.5	48.1	185	ND (4) ^(b)	123	ND (0.1)	0.181	317	220	21				-7.9	-55.2							0.865	0.7110 ^(b)	0.149 ^(b)						
MW-18	1	07/21/05	6.9	30.5	12.7	195	40.0	7.82	1.91	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	1.6	ND (1)	33.1	41.9	15.8	2.6	14.0	9.5	236	ND (4) ^(b)	127	ND (0.1)	ND (0.1)	364	270	19				-7.5	-49.8							2.472	0.7114	0.312						
	2	07/21/05	6.6	31.4	12.0	162	53.5	7.02	2.48	0.27	ND (5)	0.27	ND (0.1)	1.1	ND (1)	39.3	56.8	20.3	2.4	18.8	14.3	690	ND (4) ^(b)	183	ND (0.1)	0.244	489	380	18				-6.8	-46.9							2.910	0.7113	0.404						
	2 Dup	07/21/05						3.27	1.92	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	1.3	ND (1)	39.2	56.5	19.8	2.5	18.7	14.2	665	183	ND (0.1)	ND (0.1)	488																							
	3	07/21/05	6.0	30.0	11.0	194	60.5	6.72	1.63	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	1.3	ND (1)	40.7	66.2	23.8	2.9	19.7	16.1	790	5.7	211	ND (0.1)	ND (0.1)	547	430	15				-7.0	-48.7							2.394	0.7116	0.456						
	4	07/21/05	5.9	27.3	10.9	210	44.4	7.29	1.36	0.22	ND (5)	0.22	ND (0.1)	1.1	ND (1)	24.2	39.0	29.3	2.1	13.4	10.7	560	10.2	163	ND (0.1)	ND (0.1)	405	340	22				-6.9	-42.3							0.337	0.7122	0.402						
	5	07/21/05	6.0	23.4	10.1	241	34.0	2.53	1.15	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	ND	ND (1)	4.9	9.3	53.1	ND (2)	4.4	10.4	400	ND (4)	127	ND (0.1)	ND (0.1)	288	250	21				-6.7	-44.2							0.136	0.7105	0.166						
MW-19	1	07/20/05	7.5	29.7	8.5	166	43.1	8.67	2.98	2.5	ND (5)	2.5	ND (0.1)	1.4	ND (1)	26.3	42.5	19.8	3.4	16.8	20.1	600	ND (4)	145	0.202	0.473	409	420	19				-7.7	-52.8							1.153	0.7111	0.383						
	2	07/20/05	7.0	29.3	8.6	276	0.14	8.07	1.78	0.47	ND (5)	0.47	ND (0.1)	12.0 ^(b)	ND (1)	135	115	34.4	ND (2)	43.1	92.0	736	6.7	201	0.144	0.389	1,040	280	20	-18.2	0.17	0.48	-7.8	-54.0	0.16	524	983	1.717	NA ^(k)	11.76	0.7106	0.883							
	3	07/20/05	6.6	27.3	9.1	145	0.10	8.60	1.30	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	8.5 ^(b)	ND (1)	42.2	64.8	28.9	ND (2)	25.4	39.9	426	3.2J (4)	175	ND (0.1)	0.377	629	370	18				-7.1	-46.9							2.365	0.7107	0.528						
	4	07/20/05	6.0	26.6	9.3	164	0.11	1.79	1.34	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	7.4 ^(b)	ND (1)	57.8	69.7	33.3	ND (2)	31.9	54.4	494	3.0J (4)	191	0.277	0.533	718	390	16				-7.2	-50.5							3.927	0.7109	0.672						
	4 Dup	07/20/05						1.84	1.62	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	7.3 ^(b)	ND (1)	58.1	71.5	33.9	2.2	32.7	54.8	450		186	ND (0.1)	0.611	706																						
	5	07/20/05	5.4	23.5	10.3	227	0.12	5.11	1.48	0.76	ND (5)	0.76	ND (0.1)	2.9 ^(b)	ND (1)	75.3	67.8	35.9	2.5	41.5	68.4	504	2.7J (4)	191	ND (0.1)	0.788	785	390	16				-7.4	-50.4							9.255	0.7110	0.775						
MW-20	1	08/01/05	6.8	28.8	11.1	126	66.6	3.62	1.94	ND (0.2) ^(g)	ND (5)	ND (0.2) ^(g)	ND (0.1)	6.1	ND (1)	78.7	82.3 ^(g)	20 ^(g)	2.7 ^(g)	26.3 ^(g)	31.0	440	2.2J (4)	274	ND (0.1)	0.588	636	340	18				-7.7	-51.1							4.355	0.7111	0.509						
	2	08/01/05	7.0	26.6	10.7	92	41.6	2.62	1.95	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	2.2	ND (1)	28.7	51.2	13.8	2.5	16.9	13.4	275	ND (4)	144	0.119	0.357	424	310	20				-7.2	-47.7							3.352	0.7108	0.373						
	3	08/01/05	6.0	25.8	10.9	113	60.2	2.47	2.27	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	2.9	ND (1)	25.6	50.6	58.1	ND (2)	15.6	32.5	340	ND (4)	195	0.153	0.525	576	430	21				-6.8	-45.5							2.475	0.7113	0.490						
	4	08/01/05	6.5	23.1	10.3	-35	34.7	2.10	1.58	0.50	ND (5)	0.50	ND (0.1)	ND (0.1)	3.25	14.6	12.8	59.1	ND (2)	3.5	10.1	205	ND (4)	128	ND (0.1)	0.420	331	260	21				-7.5	-51.6							1.190	0.7110	0.110						
	5	08/01/05	6.1	20.2	11.1	-39	36.6	2.62	1.78	ND (0.2)	ND (5)	ND (0.2)	ND (0.1)	ND (0.1)	ND (1)	5.2	5.3	64	ND (2)	1.3	9.2	180	ND (4)	125	ND (0.1)	0.388	307	260	23				-7.3	-48.4							0.079	0.7101	0.092						
MW-21	1	07/26/05	7.4	32.2	9.9	156	0.14	4.18	2.58	ND (0.2)	ND (5)	ND (0.2)	ND(0.1) ^(g)	14.2 ^(g)	ND(<1) ^(g)	152	126	34.2	2.7	40.9	103	760 ^(g)	3.6J (4)	147	0.159	0.430	988	340	11				-7.9	-58.3							7.591	0.7103	1.209						
	2	07/26/05	7.4	25.9	11.6	161	0.18	8.44	2.70	ND (0.2)	ND (5)	ND (0.2)	ND(0.1) ^(g)	10.7 ^(g)	ND(<1) ^(g)	178	152	70.5	2.8	50.3	133	925 ^(g)	3.2J (4)	275	ND (0.1)	0.577	1,290	610	19				-8.2	-57.4							8.040	0.7106	1.290						
	3	07/26/05	7.5	25.9	9.8	171	0.16	3.29	2.37	ND (0.2)	ND (5)	ND (0.2)	ND(0.1) ^(g)	9.5 ^(g)	ND(<1) ^(g)	140	150	44.4	3.4	47.0	108	900 ^(g)	3.0J (4)	275	ND (0.1)	0.567	1,160	590	21				-8.1	-60.0							8.229	0.7109	0.999						
	3 Dup	07/26/05						3.04	2.39	0.25	ND (5)	0.25	ND(0.1) ^(g)	9.7 ^(g)	ND(<1) ^(g)	144	156	46.3	3.0	49.3	112	825 ^(g)	3.2J (4)	277	ND (0.1)	0.745	1,160																						
	4	07/26/05	6.2	25.6	10.9	59	0.12	2.48	2.07	ND (0.2)	ND (5)	ND (0.2)	ND(0.1) ^(g)	6.5 ^(g)	ND(<1) ^(g)	96.5	96.8	30.5	2.4	29.9	64.3	545 ^(g)	2.0J (4)	178	ND (0.1)	0.514	761	400	18				-8.1	-57.9							3.878	0.7109	0.603						
	5	07/26/05	5.1	22.8	12.1	200	0.13	2.38	1.97	ND (0.2)	ND (5)	ND (0.2)	ND(0.1) ^(g)	7.1E ^(g)	ND(<1) ^(g)	117	99.6	35.3	2.3	32.9	66.5	590 ^(g)	3.3J (4)	181	ND (0.1)	0.420	808	390	19				-8.3	-62.1							4.996	0.7110	0.723						
MW-24	1	07/25/05																																															

DATA QUALITY

The data generated for this project were verified by the Battelle Project Quality Assurance Officer. The verification process for the laboratory data involved ensuring that the holding times, precision, accuracy, laboratory blanks and detection limits were within the criteria outlined in the work plan.¹

Precision was determined by calculating the relative percent difference (%RPD) between matrix spike/matrix spike duplicate (MS/MSD) pairs and laboratory control spike/laboratory control spike duplicate (LCS/LCSD) pairs in the analytical laboratory. All MS/MSD and LCS/LCSD samples met the precision (%RPD) criteria defined in the analytical methods.

Accuracy was determined by calculating the percent recovery (%R) for MS/MSD and for organic analytes, with surrogate compounds. Laboratory accuracy was also assessed from %R results generated from the periodic analysis of calibration check standards and laboratory control samples (LCS/LCSD). All MS/MSD and LCS/LCSD samples met the accuracy (% R) criteria defined in the analytical methods.

Sample analyses were conducted within the holding times specified in the work plan with the following exceptions: BioInsite performed the functional gene testing on groundwater samples from the MW-1 and the production wells 7 to 8 days post-collection. BioInsite performed the functional genenomic testing on groundwater samples from MW-24-1 and MW-25-3, 16 and 22 days post-collection. The maximum holding time requirement in the work plan was 48 hours. Samples were frozen by BioInsite at approximately -20°F upon receipt and until analysis.

In addition, dissolved organic carbon (DOC) analyzed by EMAX laboratories was consistently higher than total organic carbon (TOC) for all samples collected. EMAX conducted a special study in August 2005 by filtering both distilled water and acidified water through their 0.45-μm filters. The results for DOC were 7.6 and 20.8 mg/L for distilled and acidified water, respectively indicating leaching from the filters. Therefore, DOC results are not considered valid data.

The helium (He³) samples for productions wells (LAWC No. 3, LFWC No.2, Garfield, Sunset, and Bingham) had to be collected after an intermediate collector instead of directly at the wellhead due to the high flow rates of the production wells. In addition, University of Miami determined all He³ samples except MW-17-3 and MW-24-1, had large amounts of air components in them increasing the uncertainty of age determination. Therefore, the He³ results were not considered valid data.

Historical water quality data obtained from the various databases was evaluated for quality by doing a charge balance calculation. That is, the sum of the anions (A) and sum of the cations (C) should balance each other. Any deviation from zero is attributable to analytical error. Thus, a charge balance calculation, as show by the equation below, is a means to assess quality of older data sets.

$$\text{Charge Balance (\%)} = \frac{C - A}{C + A} \times 100$$

Samples having a charge balance within ±10% were regarded as being of good quality. Data for samples that did not meet this quality control criterion were rejected for consideration in this study.

Duplicate List

JPL GW Monitoring 3Q05 Duplicate and MSMSD Schedule

Duplicate ID	Well #	Analysis	MSMSD	Well #	Analysis
DUPE-6-3Q05	MW-26-1	perchl, voc, Cr, Cr(VI), NDMA	1	MW-3-1	perchl, voc, Cr, Cr(VI), NDMA
DUPE-3-3Q05	MW-4-2	perchl, voc, Cr, Cr(VI)	2	MW-13	perchl, voc, Cr, Cr(VI)
DUPE-8-3Q05	MW-5	perchl, voc, Cr, Cr(VI)	3	MW-6	perchl, voc, Cr, Cr(VI)
DUPE-7-3Q05	MW-10	perchl, voc, Cr, Cr(VI)	4	MW-7	perchl, voc, Cr, Cr(VI), Chloride, Nitrate, Nitrite, Orthophosphate, Sulfate
DUPE-4-3Q05	MW-11-2	perchl, voc, Cr, Cr(VI)	5	MW-8	perchl, voc, Cr, Cr(VI), Chloride, Nitrate, Nitrite, Orthophosphate, Sulfate
DUPE-9-3Q05	MW-15	perchl, voc, Cr, Cr(VI)	6	MW-12-2	perchl, voc, Cr, Cr(VI), NDMA
DUPE-5-3Q05	MW-22-3	perchl, voc, Cr, Cr(VI)	7	MW-23-3	perchl, voc, Cr, Cr(VI)
DUPE-1-3Q05	MW-24-1	perchl only			
DUPE-2-3Q05	MW-21-3	perchl only			

Shiao, Tien

From: Conner, David J
Sent: Wednesday, August 31, 2005 12:44 PM
To: Shiao, Tien
Cc: Ohart, Carolyn J
Subject: Duplicate List

Tien:

The duplicate list that I emailed you corresponded to the 3rd Quarterly sampling for APCL. I'm looking into the dupes, and I should have an answer for you soon.

MW-21-3 is DUPE-4-7/26/2005. I'll get the rest of them to you later...

I don't have the EMAX COCs with me at the hotel.

Thanks,

David J. Conner

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5/17/2006



Applied P & Ch Laboratory

Chain of Custody

APCL

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Client: BARTLETT

Contact: DAVID CORNER

Tel #: 619-574-4821 Fax #:

Address: 3990 OLD TOWN AVE, STE C102 City: SAN DIEGO State: CA Zip code: 92110

Bill to: BARTLETT - GEORGE TOWN'S 505 LINCOLN AVE COLUMBUS OH 43201

Project Name/Code: JPL GR MW 3A05 Job # 6486090 P.O. # 189895

Project Address: 4800 AVE GRIFFIN ST, PASADENA APCL Quotation #

Due Date: ☐ regular ☒ Rush: ___ days 24 hours Sampled by: MIA LLS M

Field Sample ID No.	Sample Description	Date Time Collected	Sample Matrix	Preservation	# of Containers	VOL (524.2)	100% (314.0)	Gr (100) (719.6)	Gr (200) (8.00)	Analysis Items	Remarks
MW-23-4		9/8/05 1244	H ₂ O	MW3	4	X	X	X	X		205H
MW-19-5		9/8/05 1244	H ₂ O	MW3	2						205H
MW-19-4		1233									205H
MW-19-3		1234									205H
MW-19-2		1312									205H
MW-19-1		1333									205H
MW-18-5		1445									205H
MW-18-1		1507									205H
MW-12-5		1617									205H
MW-12-4		1637									205H
MW-14-5											205H
MW-14-4											205H
MW-14-3											205H
MW-14-2											205H
MW-14-1											205H
MW-13-9	EQUIPMENT BLANK	9/8/05 1326									205H
MW-17-9	TRIP BLANK										205H

QC Requirement: ☐ Regular; ☐ QA/QC Report; ☐ WIP; ☐ Raw Data; ☐ Extended Raw Data ☐ CLP; ☐ ACE ☐ AFCEE ☐ NEBSA (E, C or D); ☐ Other (Please specify)

Sample Disposal: ☐ Return ☒ Disposal by APCL ☐ Hold for ___ days after receiving date. If not specified, samples will be discarded 45 days after samples are received.

Sample Conditions: ☐ Intact; ☐ Broken. Cooler Seal: ☐ Intact; ☐ Broken; ☐ None. Tag # _____ Temperature: ☐ Room ☐ Cold (___ °C).

Relinquished by _____ Date/Time 9/9/05 1959 Received by _____ Date/Time 9-9-05 1959

Relinquished by _____ Date/Time _____ Received by _____ Date/Time _____

APCL USE ONLY Service # _____ Note: _____

Clients understand that all terms described in the proposal, quotations for this project, and/or the general terms provided in the current APCL price schedules will be followed. APCL reserves the right to terminate its service or withhold delivery of any reports, if in APCL's sole discretion the terms of the project have been broken.



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Client: BATTLE

Contact: DAVID COLLIER

Tel #: 619-574-4821 Fax #:

Address: 3890 OLD TOWN AVE, STE C102 City: SAN DIEGO State: CA Zip code: 92110

Bill to: BATTLE-GERALD TOWERS 505 KING AVE CA 91805, OH 43201

Project Name/Code: JPL GW LAB 3005 Job # 4486090 P.O. # 1898795

Project Address: 4800 OAK GROVE DR, PASADENA APCL Quotation #

Due Date: ☐ Regular ☒ Rush: ___ days 24 hours Sampled by: M. L. M.

Field Sample ID No.	Sample Description	Date Collected	Sample Matrix	Preservation	# of Containers	VOL (524.2)	(101) (314.0)	(101) (1796)	(8) (20.8)	Analysis	Items	White - With report Yellow - Lab copy Pink - Originator
MW-23-4		9/10/05	714	14.0	4	X	X					ROSH
MW-14-5		810		14.0	2			X	X			ROSH
MW-14-4		840		14.0	2			X	X			ROSH
MW-24-4		940		14.0	4	X	X					ROSH
EB-14-9/1/05	EQUP. BEACON	827		14.0	5	X	X	X	X			ROSH
TS-18-9/1/05	TRIP BEACON			14.0	2	X						ROSH

QC Requirement: ☒ Regular; ☐ QA/QC Report; ☐ WIP; ☐ Raw Data; ☐ Extended Raw Data ☐ CLP; ☐ ACE ☐ AFCEB ☐ NEBSA (E, C or D); ☐ Other (Please specify)

Sample Disposal: ☐ Return ☒ Disposed by APCL ☐ Hold for ___ days after receiving date. If not specified, samples will be discarded 45 days after samples are received.

Sample Conditions: ☐ Intact; ☐ Broken. Cooler Seal: ☐ Intact; ☐ Broken; ☐ None. Tag # ___ Temperature: ☐ Room ☐ Cold (___ °C).

Relinquished by [Signature] Date/Time 9/14/05 1959 Received by [Signature] Date/Time 9/20/05 19:59

Relinquished by [Signature] Date/Time ___ Received by [Signature] Date/Time ___

APCL USE ONLY Service #

Note:

Client's understand that all terms described in the proposal, quotations for this project, and/or the general terms provided in the current APCL price schedule will be followed. APCL reserves the right to terminate its service or withhold delivery of any reports, if in APCL's sole discretion the terms of the project have been broken.



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Contact: DAVID CORREIA

Tel # 619-574-4821 Fax #:

Address: 3990 OLD TOWN AVE, STE C132 City: SAN DIEGO State: CA Zip code: 92113

Bill to: GEOSON, INC

Project Name/Code: JPL GW MAN 3005 Job # 6486093 P.O. # 189895

Project Address: 4800 OAK GROVE DR., PASADENA APCL Quotation #

Due Date: ☒ Regular ☐ Rush: days hours Sampled by:

Field Sample ID No.	Sample Description	Date Collected	Sample Matrix	Preservation	# of Containers	Analysis	Items	Remarks
MW-24-5		9/9/05	1025	H ₂ O	None	1	X	C104 (3141)
MW-17-5		9/12/05	741			1	X	WL (3142)
MW-17-1		9/12/05	820			1	X	
MW-12-9/14/05	DUPLICATE	9/14/05	—			1	X	
MW-11-9/14/05	DUPLICATE	9/14/05	—			1	X	
MW-10-9/14/05	TRIP BLANK	9/14/05	—			2	X	

QC Requirement: ☒ Regular; ☐ QA/QC Report; ☐ WIP; ☐ Raw Data; ☐ Extended Raw Data ☐ CUP; ☐ ACE ☐ AFCEE ☐ NEBSA (E, C or D); ☐ Other (Please specify)

Sample Disposal: ☐ Return ☒ Disposed by APCL ☐ Hold for days after receiving date. If not specified, samples will be discarded 45 days after samples are received.

Sample Conditions: ☐ Intact; ☐ Broken. Cooler Seal: ☐ Intact; ☐ Broken; ☐ None. Tag # Temperature: ☐ Room ☐ Cold (°C).

Relinquished by Date/Time 9/12/05 110200 Received by David Correia Date/Time 9/12/05 110200

Relinquished by Date/Time Received by Date/Time

APCL USE ONLY Service #

Note:

Clients understand that all terms described in the proposal, quotations for this project, and/or the general terms provided in the current APCL price schedules will be followed. APCL reserves the right to terminate its service or withhold delivery of any reports, if in APCL's sole discretion the terms of the project have been broken.

Applied P & CH Laboratories

13760 Magnolia Ave., Chino, CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:

Battelle - Columbus Operations

Attention: Ben Headington

505 King Avenue

Columbus OH 43201

Tel: (614)424-5489 Fax: (614)458-5489

Service ID #: 801-053729

Collected by: M. Mendoza

Collected on: 08/15/05

Received: 08/15/05

Extracted: N/A

Tested: 08/16/05

Reported: 08/16/05

Sample Description: Water from 9800 Oak Grove Dr.

Project Description: G486090 JPL GW Mon-3Q05

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result
				MW-17-4 05-03729-1
PERCHLORATE	314.0	$\mu\text{g/L}$	4	<4

PQL: Practical Quantitation Limit.

MDL: Method Detection Limit.

CRDL: Contract Required Detection Limit

N.D.: Not Detected or less than the practical quantitation limit.

"-": Analysis is not required.

J: Reported between PQL and MDL.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

Respectfully submitted,



Dominic Lau

Laboratory Director

Applied P & CH Laboratories

Applied P & CH Laboratories

13760 Magnolia Ave., Chino CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:

Battelle

Attention: David Conner

3990 Old Town Avenue, Suite C-205.

San Diego CA 92110

Tel: (619) 726-7311 Fax: (619) 260-0882

Service ID #: 801-053730

Collected by: M. Mendoza

Collected on: 08/15/05

Sample Description: Water

Project Description: G486090 JPL GW Mon-3Q05

Received: 08/15/05

Extracted: N/A

Tested: 08/15/05

Reported: 08/17/05

Analysis of Water Samples ^(a)

Component Analyzed	Method	Unit	PQL	Analysis Result			
				EB-12-8/15/05 05-03730-1	MW-17-2 05-03730-2	MW-17-3 05-03730-3	SB-1-3Q05 05-03730-5
Dilution Factor				1	1	1	1
PERCHLORATE	314.0	µg/L	4	<4	9.7	76.4	<4

PQL: Practical Quantitation Limit.

MDL: Method Detection Limit.

CRDL: Contract Required Detection Limit

N.D.: Not Detected or less than the practical quantitation limit.

"-": Analysis is not required.

J: Reported between PQL and MDL.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

^(a)Other analyses in progress.

Respectfully submitted,



Dominic Lau

Laboratory Director

Applied P & CH Laboratories

Applied P & CH Laboratories

13760 Magnolia Ave., Chino, CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:

Battelle - Columbus Operations

Attention: David Conner

3990 Old Town Ave., Suite C-205

San Diego CA 92110

Tel: (619)574-4827 Fax: (619)260-0882

Service ID #: 801-053444

Collected by: M. Mendoza

Collected on: 07/19/05

Received: 07/19/05

Extracted: N/A

Tested: 07/20-25/05

Reported: 07/27/05

Sample Description: Water from 4800 Oak Grove Dr.

Project Description: G486090 JPL GW Mon-3Q05

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result		
				EB-1-7/19/05 05-03444-1	MW-25-2 05-03444-3	MW-25-5 05-03444-6
Dilution Factor				1	1	1
PERCHLORATE	314.0	µg/L	4	< 4	17.4	< 4

Component Analyzed	Method	Unit	PQL	Analysis Result		
				EB-1-7/19/05 05-03444-1	MW-25-1 05-03444-2	MW-25-2 05-03444-3
CHROMIUM (VI)	7196	mg/L	0.01	< 0.01	< 0.01	< 0.01
Dilution Factor				1	1	1
CHROMIUM	200.8	µg/L	1	0.15J	6.9	5.2
VOLATILE ORGANIC COMPOUNDS						
Dilution Factor				1	1	1
BENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMOBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMOCHLOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMODICHLOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMOFORM	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMOMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
N-BUTYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
SEC-BUTYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
TERT-BUTYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
2-BUTANONE	524.2	µg/L	10	< 10	< 10	< 10
CARBON TETRACHLORIDE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLORODIBROMOMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLOROFORM	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
2-CHLOROTOLUENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
4-CHLOROTOLUENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2-DIBROMO-3-CHLOROPROPANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2-DIBROMOETHANE (EDB)	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
DIBROMOMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2-DICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,3-DICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,4-DICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
DICHLORODIFLUOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5

Applied P & CH Laboratories

13760 Magnolia Ave., Chino, CA 91710

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result		
				EB-1-7/19/05 05-03444-1	MW-25-1 05-03444-2	MW-25-2 05-03444-3
1,1-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
CIS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TRANS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,3-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
2,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
CIS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TRANS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
ETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
HEXACHLOROBUTADIENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
ISOPROPYLBENZENE (CUMENE)	524.2	µg/L	0.5	<0.5	<0.5	<0.5
P-ISOPROPYLTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
METHYLENE CHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
METHYL-T-BUTYL ETHER (MTBE)	524.2	µg/L	1	<1	<1	<1
4-METHYL-2-PENTANONE (MIBK)	524.2	µg/L	10	<10	<10	<10
NAPHTHALENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
N-PROPYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
STYRENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1,1,2-TETRACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1,2,2-TETRACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TETRACHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2,3-TRICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2,4-TRICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1,1-TRICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1,2-TRICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TRICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TRICHLOROFLUOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2,3-TRICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1,2,2-TRICHLORO-1,2,2,2-TRIFLUOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2,4-TRIMETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,3,5-TRIMETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
VINYL CHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
O-XYLENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
M/P-XYLENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5

Applied P & CH Laboratories

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result			
				MW-25-3	MW-25-4	MW-25-5	TB-1-7/19/05
				05-03444-4	05-03444-5	05-03444-6	05-03444-7
CHROMIUM (VI)	7196	mg/L	0.01	<0.01	<0.01	<0.01	-
Dilution Factor				1	1	1	1
CHROMIUM	200.8	µg/L	1	8.5	9.1	6.4	-
VOLATILE ORGANIC COMPOUNDS							
Dilution Factor				1	1	1	1
BENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOCHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMODICHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOFORM	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2-BUTANONE	524.2	µg/L	10	<10	<10	<10	<10
N-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
SEC-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TERT-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CARBON TETRACHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLORODIBROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROFORM	524.2	µg/L	0.5	0.6	<0.5	<0.5	<0.5
CHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
4-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DIBROMO-3-CHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DIBROMOETHANE (EDB)	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
DIBROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,4-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
DICHLORODIFLUOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CIS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRANS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CIS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRANS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result			
				MW-25-3	MW-25-4	MW-25-5	TB-1-7/19/05
				05-03444-4	05-03444-5	05-03444-6	05-03444-7
ETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
HEXACHLOROBUTADIENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
ISOPROPYLBENZENE (CUMENE)	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
P-ISOPROPYLTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
METHYLENE CHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
METHYL-T-BUTYL ETHER (MTBE)	524.2	µg/L	1	<1	<1	<1	<1
4-METHYL-2-PENTANONE (MIBK)	524.2	µg/L	10	<10	<10	<10	<10
NAPHTHALENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
N-PROPYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
STYRENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1,2-TETRACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-TETRACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TETRACHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-TRICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-TRICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-TRICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-TRICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRICHLOROFLUOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-TRICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2,3,3-HEPTACHLORO-1,2,2,3,3,3-HEPTACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-TRIMETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3,5-TRIMETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
VINYL CHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
O-XYLENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
M/P-XYLENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit

N.D.: Not Detected or less than the practical quantitation limit.

"-": Analysis is not required.

J: Reported between PQL and MDL.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

Respectfully submitted,



Dominic Lau

Laboratory Director

Applied P & CH Laboratories

Applied P & CH Laboratories

13760 Magnolia Ave., Chino, CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

Submitted to:

Battelle - Columbus Operations

Attention: David Conner

3990 Old Town Ave., Suite C-205.

San Diego CA 92110

Tel: (619) 574-4827 Fax: (619) 260-0882

APCL Analytical Report

Service ID #: 801-053456

Collected by: M.Mendoza

Collected on: 07/20/05

Received: 07/20/05

Extracted: N/A

Tested: 07/21/05

Reported: 07/28/05

Sample Description: Water

Project Description: G486090 JPL GW Mon-3Q05

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result	
				EB-2-7/20/05 05-03456-1	MW-19-1 05-03456-2
Dilution Factor				1	1
PERCHLORATE	314.0	µg/L	4	< 4	< 4

Component Analyzed	Method	Unit	PQL	Analysis Result		
				MW-19-3 05-03456-4	MW-19-4 05-03456-5	MW-19-5 05-03456-6
Dilution Factor				1	1	1
PERCHLORATE	314.0	µg/L	4	3.2J	3.0J	2.7J

Component Analyzed	Method	Unit	PQL	Analysis Result		
				EB-2-7/20/05 05-03456-1	MW-19-1 05-03456-2	MW-19-2 05-03456-3
VOLATILE ORGANIC COMPOUNDS						
Dilution Factor				1	1	1
BENZENE	524.2	µg/L	0.5	<0.5	0.6	<0.5
BROMOBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
BROMOCHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
BROMODICHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
BROMOFORM	524.2	µg/L	0.5	<0.5	<0.5	<0.5
BROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
N-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
SEC-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TERT-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
2-BUTANONE	524.2	µg/L	10	<10	<10	<10
CARBON TETRACHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
CHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
CHLORODIBROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
CHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
CHLOROFORM	524.2	µg/L	0.5	<0.5	<0.5	0.4J
CHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
2-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
4-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5

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Component Analyzed	Method	Unit	PQL	Analysis Result		
				EB-2-7/20/05 05-03456-1	MW-19-1 05-03456-2	MW-19-2 05-03456-3
1,2-DIBROMO-3-CHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2-DIBROMOETHANE (EDB)	524.2	µg/L	0.5	<0.5	<0.5	<0.5
DIBROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,3-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,4-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
DICHLORODIFLUOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
CIS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TRANS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,3-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
2,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
CIS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TRANS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
ETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
HEXACHLOROBUTADIENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
ISOPROPYLBENZENE (CUMENE)	524.2	µg/L	0.5	<0.5	<0.5	<0.5
P-ISOPROPYLTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
METHYLENE CHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
METHYL-T-BUTYL ETHER (MTBE)	524.2	µg/L	1	<1	0.6J	<1
4-METHYL-2-PENTANONE (MIBK)	524.2	µg/L	10	<10	<10	<10
NAPHTHALENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
N-PROPYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
STYRENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1,1,2-TETRACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1,2,2-TETRACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TETRACHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2,3-TRICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2,4-TRICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1,1-TRICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1,2-TRICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TRICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TRICHLOROFLUOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2,3-TRICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,1,2,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,2,4-TRIMETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
1,3,5-TRIMETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
VINYL CHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
O-XYLENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
M/P-XYLENE	524.2	µg/L	0.5	<0.5	<0.5	0.4J

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result			
				MW-19-3 05-03456-4	MW-19-4 05-03456-5	MW-19-5 05-03456-6	TB-2-7/20/05 05-03456-7
VOLATILE ORGANIC COMPOUNDS							
Dilution Factor				1	1	1	1
BENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOCHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMODICHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	0.4J	<0.5
BROMOFORM	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
N-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
SEC-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TERT-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2-BUTANONE	524.2	µg/L	10	<10	<10	<10	<10
CARBON TETRACHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLORODIBROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROFORM	524.2	µg/L	0.5	<0.5	0.4J	<0.5	<0.5
CHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
4-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DIBROMO-3-CHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DIBROMOETHANE (EDB)	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
DIBROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,4-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
DICHLORODIFLUOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CIS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRANS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CIS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRANS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
ETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
HEXACHLOROBUTADIENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
ISOPROPYLBENZENE (CUMENE)	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result			
				MW-19-3	MW-19-4	MW-19-5	TB-2-7/20/05
				05-03456-4	05-03456-5	05-03456-6	05-03456-7
P-ISOPROPYLTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
METHYLENE CHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
METHYL-T-BUTYL ETHER (MTBE)	524.2	µg/L	1	<1	<1	<1	<1
4-METHYL-2-PENTANONE (MIBK)	524.2	µg/L	10	<10	<10	<10	<10
NAPHTHALENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
N-PROPYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
STYRENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1,2-TETRACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-TETRACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TETRACHLOROETHENE	524.2	µg/L	0.5	<0.5	0.5J	1.7	<0.5
TOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-TRICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-TRICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-TRICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-TRICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRICHLOROFLUOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-TRICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2,3,3-HEPTACHLORO-1,2,3,4,5,6-HEXACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-TRIMETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3,5-TRIMETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
VINYL CHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
O-XYLENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
M/P-XYLENE	524.2	µg/L	0.5	<0.5	0.8	<0.5	<0.5

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit


N.D.: Not Detected or less than the practical quantitation limit.

"-": Analysis is not required.

J: Reported between PQL and MDL.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

Respectfully submitted,



Dominic Lau

Laboratory Director

Applied P & CH Laboratories

Applied P & CH Laboratories

13760 Magnolia Ave., Chino, CA 91710

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APCL Analytical Report

Submitted to:

Battelle - Columbus Operations

Attention: David Conner

3990 Old Town Ave., Ste C102.

San Diego CA 92110

Tel: (619)574-4821 Fax: (619)260-0882

Service ID #: 801-053443

Collected by: M. Mendoza

Collected on: 07/19/05

Received: 07/19/05

Extracted: N/A

Tested: 07/20/05

Reported: 07/20/05

Sample Description: Water from 4800 Oak Grove.

Project Description: G486090 JPL GW Mon-3Q05

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result		
				MW-25-1 05-03443-1	MW-25-3 05-03443-2	MW-25-4 05-03443-3
Dilution Factor				1	1	1
PERCHLORATE	314.0	µg/L	4	11.7	14.3	10.0

PQL: Practical Quantitation Limit.

MDL: Method Detection Limit.

CRDL: Contract Required Detection Limit

N.D.: Not Detected or less than the practical quantitation limit.

"-": Analysis is not required.

J: Reported between PQL and MDL.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

Respectfully submitted,


Dominic Lau

Laboratory Director

Applied P & CH Laboratories

Applied P & CH Laboratories

13760 Magnolia Ave., Chino, CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

1

Submitted to:

Battelle - Columbus Operations

Attention: David Conner

3990 Old Town Ave, Suite C102.

San Diego CA 92110

Tel: (619)726-7311 Fax: (619)260-0882

Service ID #: 801-053455

Collected by: M.Mendoza

Collected on: 07/20/05

Sample Description: Water

Project Description: G486090 JPL GW Mon-3Q05

Received: 07/20/05

Extracted: N/A

Tested: 07/20/05

Reported: 07/21/05

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result
				MW-19-2 05-03455-1
Dilution Factor				1
PERCHLORATE	314.0	$\mu\text{g/L}$	4	6.7

PQL: Practical Quantitation Limit.

MDL: Method Detection Limit.

CRDL: Contract Required Detection Limit

N.D.: Not Detected or less than the practical quantitation limit.

"-": Analysis is not required.

J: Reported between PQL and MDL.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

Respectfully submitted,



Dominic Lau

Laboratory Director

Applied P & CH Laboratories

Applied P & CH Laboratories

13760 Magnolia Ave., Chino, CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:

Battelle - Columbus Operations

Attention: David Conner

3990 Old Town Ave., Ste C102

San Diego CA 92110

Tel: (619)574-4482 Fax: (619)260-0882

Service ID #: 801-053510

Received: 07/25/05

Collected by: M. Mendoza

Extracted: N/A

Collected on: 07/25/05

Tested: 07/26/05

Reported: 07/27/05

Sample Description: Water from 4800 Oak Grove Dr.

Project Description: G486090 JPL GW Mon-3Q05

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result		
				DUPE-1-3Q05 05-03510-1	MW-24-1 05-03510-2	MW-24-2 05-03510-3
Dilution Factor				10	10	1
PERCHLORATE	314.0	µg/L	4	670	683	79.1

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit

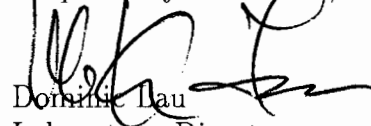
N.D.: Not Detected or less than the practical quantitation limit.

"-": Analysis is not required.

J: Reported between PQL and MDL.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

Respectfully submitted,



Dominic Lau
Laboratory Director

Applied P & CH Laboratories

Applied P & CH Laboratories

13760 Magnolia Ave., Chino, CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:

Battelle

Attention: David Conner

3990 Old Town Ave., Suite C-205.

San Diego CA 92110

Tel: (619) 574-4827 Fax: (619) 260-0882

Service ID #: 801-053591

Collected by: MM

Collected on: 08/01/05

Received: 08/01/05

Extracted: N/A

Tested: 08/01-09/05

Reported: 08/11/05

Sample Description: Water

Project Description: G486090 JPL GW Mon-3Q05

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result		
				EB-8-8/1/05 05-03591-1	MW-20-1 05-03591-2	MW-20-2 05-03591-3
CHROMIUM (VI)	7196	mg/L	0.01	< 0.01	< 0.01	< 0.01
Dilution Factor				1	1	1
PERCHLORATE	314.0	µg/L	4	< 4	2.2J	< 4
Dilution Factor				1	1	1
CHROMIUM	200.8	µg/L	1	0.64J	7.0	6.3
VOLATILE ORGANIC COMPOUNDS						
Dilution Factor				1	1	1
BENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMOBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMOCHLOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMODICHLOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMOFORM	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMOMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
N-BUTYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
SEC-BUTYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
TERT-BUTYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
2-BUTANONE	524.2	µg/L	10	5J	< 10	< 10
CARBON TETRACHLORIDE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLORODIBROMOMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLOROFORM	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
2-CHLOROTOLUENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
4-CHLOROTOLUENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2-DIBROMO-3-CHLOROPROPANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2-DIBROMOETHANE (EDB)	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
DIBROMOMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2-DICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,3-DICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,4-DICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
DICHLORODIFLUOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,1-DICHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2-DICHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,1-DICHLOROETHENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CIS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result			TB-8-8/1/05 05-03591-7
				MW-20-3 05-03591-4	MW-20-4 05-03591-5	MW-20-5 05-03591-6	
CHROMIUM (VI)	7196	mg/L	0.01	<0.01	<0.01	<0.01	-
Dilution Factor				1	1	1	1
PERCHLORATE	314.0	µg/L	4	<4	<4	<4	-
Dilution Factor				1	1	1	1
CHROMIUM	200.8	µg/L	1	11.6	5.8	4.7	-
VOLATILE ORGANIC COMPOUNDS							
Dilution Factor				1	1	1	1
BENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOCHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMODICHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOFORM	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
N-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
SEC-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TERT-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2-BUTANONE	524.2	µg/L	10	<10	<10	<10	<10
CARBON TETRACHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLORODIBROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROFORM	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
4-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DIBROMO-3-CHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DIBROMOETHANE (EDB)	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
DIBROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,4-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
DICHLORODIFLUOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CIS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRANS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5

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APCL Analytical Report

Submitted to:

Battelle

Attention: David Conner

3990 Old Town Ave., Suite C-205.

San Diego CA 92110

Tel: (619)574-4827 Fax: (619)260-0882

Service ID #: 801-053529

Collected by: M. Mendoza

Collected on: 07/26/05

Received: 07/26/05

Extracted: N/A

Tested: 07/26-29/05

Reported: 08/11/05

Sample Description: Water

Project Description: G486090 JPL GW Mon-3Q05

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	DUPE-2-3Q05 05-03529-1	Analysis Result		
					EB-5-7/26/05 05-03529-2	MW-21-1 05-03529-3	MW-21-2 05-03529-4
CHROMIUM (VI)	7196	mg/L	0.01	-	<0.01	<0.01	<0.01
Dilution Factor				1	1	1	1
PERCHLORATE	314.0	µg/L	4	3.2J	<4	3.6J	3.2J
Dilution Factor				1	1	1	1
CHROMIUM	200.8	µg/L	1	-	0.36J	7.9	11.3
VOLATILE ORGANIC COMPOUNDS							
Dilution Factor				1	1	1	1
BENZENE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
BROMOBENZENE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
BROMOCHLOROMETHANE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
BROMODICHLOROMETHANE	524.2	µg/L	0.5	-	<0.5	0.4J	<0.5
BROMOFORM	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
BROMOMETHANE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
2-BUTANONE	524.2	µg/L	10	-	<10	<10	<10
N-BUTYLBENZENE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
SEC-BUTYLBENZENE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
TERT-BUTYLBENZENE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
CARBON TETRACHLORIDE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
CHLOROBENZENE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
CHLORODIBROMOMETHANE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
CHLOROETHANE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
CHLOROFORM	524.2	µg/L	0.5	-	<0.5	0.5	0.5J
CHLOROMETHANE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
2-CHLOROTOLUENE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
4-CHLOROTOLUENE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
1,2-DIBROMO-3-CHLOROPROPANE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
1,2-DIBROMOETHANE (EDB)	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
DIBROMOMETHANE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
1,2-DICHLOROBENZENE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
1,3-DICHLOROBENZENE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
1,4-DICHLOROBENZENE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
DICHLORODIFLUOROMETHANE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
1,1-DICHLOROETHANE	524.2	µg/L	0.5	-	<0.5	0.5J	<0.5
1,2-DICHLOROETHANE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
1,1-DICHLOROETHENE	524.2	µg/L	0.5	-	<0.5	<0.5	<0.5
CIS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	-	<0.5	<0.5	0.4J

MW 21 - 3 Dup = Dupe - 4 - 7/26/05

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result			TB-5-7/26/05 05-03529-8
				MW-21-3 05-03529-5	MW-21-4 05-03529-6	MW-21-5 05-03529-7	
CHROMIUM (VI)	7196	mg/L	0.01	<0.01	<0.01	<0.01	-
Dilution Factor				1	1	1	1
PERCHLORATE	314.0	µg/L	4	3.0J	2.0J	3.3J	-
Dilution Factor				1	1	1	1
CHROMIUM	200.8	µg/L	1	12.9	9.4	9.2	-
VOLATILE ORGANIC COMPOUNDS							
Dilution Factor				1	1	1	1
BENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOCHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMODICHLOROMETHANE	524.2	µg/L	0.5	0.4J	0.5	<0.5	<0.5
BROMOFORM	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2-BUTANONE	524.2	µg/L	10	<10	<10	<10	<10
N-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
SEC-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TERT-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CARBON TETRACHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLORODIBROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROFORM	524.2	µg/L	0.5	1.1	2.7	3.6	<0.5
CHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
4-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DIBROMO-3-CHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DIBROMOETHANE (EDB)	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
DIBROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,4-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
DICHLORODIFLUOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CIS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	0.8	<0.5	<0.5
TRANS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5

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APCL Analytical Report

Submitted to:
Battelle - Columbus Operations
Attention: David Conner
3990 Old Town Ave., Suite C-205.
San Diego CA 92110
Tel: (619)574-4827 Fax: (619)260-0882

Service ID #: 801-053456
Collected by: M.Mendoza
Collected on: 07/20/05
Sample Description: Water
Project Description: G486090 JPL GW Mon-3Q05
Received: 07/20/05
Extracted: N/A
Tested: 07/21/05
Reported: 07/28/05

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result	
				EB-2-7/20/05 05-03456-1	MW-19-1 05-03456-2
Dilution Factor				1	1
PERCHLORATE	314.0	µg/L	4	<4	<4

Component Analyzed	Method	Unit	PQL	Analysis Result		
				MW-19-3 05-03456-4	MW-19-4 05-03456-5	MW-19-5 05-03456-6
Dilution Factor				1	1	1
PERCHLORATE	314.0	µg/L	4	3.2J	3.0J	2.7J

Component Analyzed	Method	Unit	PQL	Analysis Result		
				EB-2-7/20/05 05-03456-1	MW-19-1 05-03456-2	MW-19-2 05-03456-3
VOLATILE ORGANIC COMPOUNDS						
Dilution Factor				1	1	1
BENZENE	524.2	µg/L	0.5	<0.5	0.6	<0.5
BROMOBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
BROMOCHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
BROMODICHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
BROMOFORM	524.2	µg/L	0.5	<0.5	<0.5	<0.5
BROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
N-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
SEC-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
TERT-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
2-BUTANONE	524.2	µg/L	10	<10	<10	<10
CARBON TETRACHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
CHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
CHLORODIBROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
CHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
CHLOROFORM	524.2	µg/L	0.5	<0.5	<0.5	0.4J
CHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
2-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5
4-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5

MW19-4 Dup? Dupe ~~8/15/05~~ -1-7/20/05 ✓

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APCL Analytical Report

Submitted to:
Battelle - Columbus Operations
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3990 Old Town Ave, Suite C-205.
San Diego CA 92110
Tel: (619)726-7311 Fax: (619)260-0882

Service ID #: 801-053472
Collected by: M.Mendoza
Collected on: 07/21/05
Sample Description: Water
Project Description: G486090 JPL GW Mon-3Q05
Received: 07/21/05
Extracted: 07/27/05
Tested: 07/22-28/05
Reported: 08/01/05

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result			
				EB-3-7/21/05 05-03472-1	MW-18-2 05-03472-3	MW-18-3 05-03472-4	MW-18-4 05-03472-5
CHROMIUM (VI)	7196	mg/L	0.01	<0.01	<0.01	<0.01	<0.01
Dilution Factor				1	1	1	1
PERCHLORATE	314.0	µg/L	4	<4	<4	5.7	10.2
Dilution Factor				1	1	1	1
CHROMIUM	200.8	µg/L	1	0.16J	7.7	11.8	7.0

Component Analyzed	Method	Unit	PQL	Analysis Result
				MW-18-5 05-03472-6
Dilution Factor				1
PERCHLORATE	314.0	µg/L	4	<4

Component Analyzed	Method	Unit	PQL	Analysis Result		
				EB-3-7/21/05 05-03472-1	MW-18-1 05-03472-2	MW-18-2 05-03472-3
Dilution Factor				1	1	1
1,2,3-TRICHLOROPROPANE	504.1	µg/L	0.005	<0.005	<0.005	<0.005
VOLATILE ORGANIC COMPOUNDS						
Dilution Factor				1	1	1
BENZENE	524.2	µg/L	0.5	<0.5	-	<0.5
BROMOBENZENE	524.2	µg/L	0.5	<0.5	-	<0.5
BROMOCHLOROMETHANE	524.2	µg/L	0.5	<0.5	-	<0.5
BROMODICHLOROMETHANE	524.2	µg/L	0.5	<0.5	-	<0.5
BROMOFORM	524.2	µg/L	0.5	<0.5	-	<0.5
BROMOMETHANE	524.2	µg/L	0.5	<0.5	-	<0.5
N-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	-	<0.5
SEC-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	-	<0.5
TERT-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	-	<0.5
2-BUTANONE	524.2	µg/L	10	<10	-	<10
CARBON TETRACHLORIDE	524.2	µg/L	0.5	<0.5	-	<0.5
CHLOROBENZENE	524.2	µg/L	0.5	<0.5	-	<0.5
CHLORODIBROMOMETHANE	524.2	µg/L	0.5	<0.5	-	<0.5
CHLOROETHANE	524.2	µg/L	0.5	<0.5	-	<0.5
CHLOROFORM	524.2	µg/L	0.5	<0.5	-	<0.5
CHLOROMETHANE	524.2	µg/L	0.5	<0.5	-	<0.5

MW 18-1?
MW 18-2 Dupe = dupe - 2 - 7/21/05 ✓

Applied P & CH Laboratories

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APCL Analytical Report

Submitted to:

Battelle - Columbus Operations

Attention: David Conner

3990 Old Town Avenue, Suite C-205.

San Diego CA 92110

Tel: (619)726-7311 Fax: (619)260-0882

Service ID #: 801-053511

Collected by: MM

Collected on: 07/25/05

Sample Description: Water

Project Description: G486090 JPL GW Mon-3Q05

Received: 07/25/05

Extracted: N/A

Tested: 07/25-29/05

Reported: 08/01/05

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result	
				MW-24-1	05-03511-2
Dilution Factor				10	
CHLORIDE	300.0	mg/L	0.2	28.2	
NITRATE AS N	300.0	mg/L	0.04	1.7	
NITRITE AS N	300.0	mg/L	0.05	<0.5	
ORTHOPHOSPHATE AS P	300.0	mg/L	0.1	<1	
SULFATE SO ₄ ²⁻	300.0	mg/L	0.5	40.7	

Component Analyzed	Method	Unit	PQL	Analysis Result	
				EB-4-7/25/05 05-03511-1	MW-24-3 05-03511-4
Dilution Factor				1	1
PERCHLORATE	314.0	µg/L	4	<4	<4

Component Analyzed	Method	Unit	PQL	Analysis Result		
				EB-4-7/25/05 05-03511-1	MW-24-1 05-03511-2	MW-24-2 05-03511-3
CHROMIUM (VI)	7196	mg/L	0.01	<0.01	<0.01	<0.01
Dilution Factor				1	1	1
CHROMIUM	200.8	µg/L	1	0.36J	9.8	7.9

MW 24-4
MW 24-5

Dupe -3-7125105 ✓

MISSIV

683 684
41, 1 Dup
2

Applied P & CH Laboratories

13760 Magnolia Ave., Chino, CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:

Battelle

Attention: David Conner

3990 Old Town Ave, Suite C-205

San Diego CA 92110

Tel: (619)726-7311 Fax: (619)260-0882

Service ID #: 801-053930

Collected by: MM

Collected on: 09/08-09/05

Received: 09/09/05

Extracted: N/A

Tested: 09/09-12/05

Reported: 09/12/05

Sample Description: Water from 4800 Oak Grove Dr., Pasadena.

Project Description: G486090 JPL GW Mon 3Q05

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result		
				EB-13-9/8/05 05-03930-1	EB-14-9/9/05 05-03930-2	MW-18-1 05-03930-7
Dilution Factor				1	1	1
PERCHLORATE	314.0	µg/L	4	< 4	< 4	< 4
VOLATILE ORGANIC COMPOUNDS						
Dilution Factor				1	1	1
BENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMOBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMOCHLOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMODICHLOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMOFORM	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
BROMOMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
N-BUTYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
SEC-BUTYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
TERT-BUTYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
2-BUTANONE	524.2	µg/L	10	< 10	10	< 10
CARBON TETRACHLORIDE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLORODIBROMOMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLOROFORM	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CHLOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
2-CHLOROTOLUENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
4-CHLOROTOLUENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2-DIBROMO-3-CHLOROPROPANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2-DIBROMOETHANE (EDB)	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
DIBROMOMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2-DICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,3-DICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,4-DICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
DICHLORODIFLUOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,1-DICHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2-DICHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,1-DICHLOROETHENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CIS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result		
				EB-13-9/8/05	EB-14-9/9/05	MW-18-1
				05-03930-1	05-03930-2	05-03930-7
TRANS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2-DICHLOROPROPANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,3-DICHLOROPROPANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
2,2-DICHLOROPROPANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,1-DICHLOROPROPENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
CIS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
TRANS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
ETHYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
HEXACHLOROBUTADIENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
ISOPROPYLBENZENE (CUMENE)	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
P-ISOPROPYLTOLUENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
METHYLENE CHLORIDE	524.2	µg/L	0.5	1.2	1.2	1.2
METHYL-T-BUTYL ETHER (MTBE)	524.2	µg/L	1	< 1	< 1	< 1
4-METHYL-2-PENTANONE (MIBK)	524.2	µg/L	10	< 10	< 10	< 10
NAPHTHALENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
N-PROPYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
STYRENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,1,1,2-TETRACHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-TETRACHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
TETRACHLOROETHENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
TOLUENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2,3-TRICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2,4-TRICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,1,1-TRICHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,1,2-TRICHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
TRICHLOROETHENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
TRICHLOROFLUOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2,3-TRICHLOROPROPANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
112TRICHLORO-122TRIFLUOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,2,4-TRIMETHYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
1,3,5-TRIMETHYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
VINYL CHLORIDE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
O-XYLENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5
M/P-XYLENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result			
				MW-23-4	MW-24-4	TB-17-9/8/05	TB-18-9/9/05
				05-03930-14	05-03930-15	05-03930-16	05-03930-17
Dilution Factor				1	1	1	1
PERCHLORATE	314.0	µg/L	4	< 4	< 4	-	-
VOLATILE ORGANIC COMPOUNDS							
Dilution Factor				1	1	1	1
BENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
BROMOBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
BROMOCHLOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
BROMODICHLOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
BROMOFORM	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
BROMOMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
N-BUTYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
SEC-BUTYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
TERT-BUTYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
2-BUTANONE	524.2	µg/L	10	< 10	< 10	< 10	< 10
CARBON TETRACHLORIDE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
CHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
CHLORODIBROMOMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
CHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
CHLOROFORM	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
CHLOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
2-CHLOROTOLUENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
4-CHLOROTOLUENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-DIBROMO-3-CHLOROPROPANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-DIBROMOETHANE (EDB)	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
DIBROMOMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-DICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,3-DICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,4-DICHLOROBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
DICHLORODIFLUOROMETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-DICHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-DICHLOROETHANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-DICHLOROETHENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
CIS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
TRANS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-DICHLOROPROPANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,3-DICHLOROPROPANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
2,2-DICHLOROPROPANE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-DICHLOROPROPENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
CIS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
TRANS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5
ETHYLBENZENE	524.2	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result			
				MW-23-4	MW-24-4	TB-17-9/8/05	TB-18-9/9/05
				05-03930-14	05-03930-15	05-03930-16	05-03930-17
HEXACHLOROBUTADIENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
ISOPROPYLBENZENE (CUMENE)	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
P-ISOPROPYLTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
METHYLENE CHLORIDE	524.2	µg/L	0.5	1.2	<0.5	1.3	1.3
METHYL-T-BUTYL ETHER (MTBE)	524.2	µg/L	1	<1	<1	<1	<1
4-METHYL-2-PENTANONE (MIBK)	524.2	µg/L	10	<10	<10	<10	<10
NAPHTHALENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
N-PROPYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
STYRENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1,2-TETRACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-TETRACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TETRACHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-TRICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-TRICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-TRICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-TRICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRICHLOROFLUOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-TRICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
112TRICHLORO-122TRIFLUOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-TRIMETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3,5-TRIMETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
VINYL CHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
O-XYLENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
M/P-XYLENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5

Component Analyzed	Method	Unit	PQL	Analysis Result			
				EB-13-9/8/05	EB-14-9/9/05	MW-12-4	MW-12-5
				05-03930-1	05-03930-2	05-03930-3	05-03930-4
CHROMIUM (VI)	7196	mg/L	0.01	<0.01	<0.01	<0.01	<0.01
Dilution Factor				1	1	1	1
CHROMIUM	200.8	µg/L	1	0.27J	0.59J	10.1	9.9

Component Analyzed	Method	Unit	PQL	Analysis Result		
				MW-14-4	MW-14-5	MW-18-1
				05-03930-5	05-03930-6	05-03930-7
CHROMIUM (VI)	7196	mg/L	0.01	<0.01	<0.01	<0.01
Dilution Factor				1	1	1
CHROMIUM	200.8	µg/L	1	9.8	7.6	8.2

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result		
				MW-18-5 05-03930-8	MW-19-1 05-03930-9	MW-19-2 05-03930-10
CHROMIUM (VI)	7196	mg/L	0.01	<0.01	<0.01	<0.01
Dilution Factor				1	1	1
CHROMIUM	200.8	µg/L	1	6.9	6.3	14.1

Component Analyzed	Method	Unit	PQL	Analysis Result		
				MW-19-3 05-03930-11	MW-19-4 05-03930-12	MW-19-5 05-03930-13
CHROMIUM (VI)	7196	mg/L	0.01	<0.01	<0.01	<0.01
Dilution Factor				1	1	1
CHROMIUM	200.8	µg/L	1	9.8	10.1	9.0

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit

N.D.: Not Detected or less than the practical quantitation limit.

"-": Analysis is not required.

J: Reported between PQL and MDL.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

Respectfully submitted,


Dominic Lat

Laboratory Director

Applied P & CH Laboratories

Applied P & CH Laboratories

13760 Magnolia Ave. Chino CA 91710

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APCL Analytical Report

Submitted to:

Battelle

Attention: David Conner

3990 Old Town Avenue, Suite C-205

San Diego CA 92110

Tel: (619)726-7311 Fax: (619)260-0882

Service ID #: 801-053957

Collected by:

Collected on: 09/09-12/05

Received: 09/12/05

Extracted: N/A

Tested: N/A

Reported: 09/19/05

Sample Description: Water

Project Description: G486090 JPL GW Mon 3Q05

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result	
				DUPE-10-9/9/05 05-03957-1	DUPE-11-9/12/05 05-03957-2
Dilution Factor				1	1
PERCHLORATE	314.0	$\mu\text{g/L}$	4	< 4	< 4

Component Analyzed	Method	Unit	PQL	Analysis Result		
				MW-17-1 05-03957-3	MW-17-5 05-03957-4	MW-24-5 05-03957-5
Dilution Factor				1	1	1
PERCHLORATE	314.0	$\mu\text{g/L}$	4	< 4	< 4	< 4

PQL: Practical Quantitation Limit.

MDL: Method Detection Limit.

CRDL: Contract Required Detection Limit

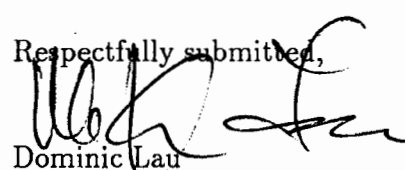
N.D.: Not Detected or less than the practical quantitation limit.

"-": Analysis is not required.

J: Reported between PQL and MDL.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

Respectfully submitted,


Dominic Lau

Laboratory Director

Applied P & CH Laboratories

Applied P & CH Laboratories

13760 Magnolia Ave., Chino, CA 91710

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result			
				MW-23-4	MW-24-4	TB-17-9/8/05	TB-18-9/9/05
				05-03930-14	05-03930-15	05-03930-16	05-03930-17
Dilution Factor				1	1	1	1
PERCHLORATE	314.0	µg/L	4	<4	<4	-	-
VOLATILE ORGANIC COMPOUNDS							
Dilution Factor				1	1	1	1
BENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOCHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMODICHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOFORM	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
BROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
N-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
SEC-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TERT-BUTYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2-BUTANONE	524.2	µg/L	10	<10	<10	<10	<10
CARBON TETRACHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLORODIBROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROFORM	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CHLOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
4-CHLOROTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DIBROMO-3-CHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DIBROMOETHANE (EDB)	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
DIBROMOMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,4-DICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
DICHLORODIFLUOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CIS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRANS-1,2-DICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
2,2-DICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
CIS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRANS-1,3-DICHLOROPROPENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
ETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5

Applied P & CH Laboratories

13760 Magnolia Ave., Chino, CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result			
				MW-23-4	MW-24-4	TB-17-9/8/05	TB-18-9/9/05
				05-03930-14	05-03930-15	05-03930-16	05-03930-17
HEXACHLOROBUTADIENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
ISOPROPYLBENZENE (CUMENE)	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
P-ISOPROPYLTOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
METHYLENE CHLORIDE	524.2	µg/L	0.5	1.2	<0.5	1.3	1.3
METHYL-T-BUTYL ETHER (MTBE)	524.2	µg/L	1	<1	<1	<1	<1
4-METHYL-2-PENTANONE (MIBK)	524.2	µg/L	10	<10	<10	<10	<10
NAPHTHALENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
N-PROPYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
STYRENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1,2-TETRACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-TETRACHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TETRACHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TOLUENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-TRICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-TRICHLOROBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-TRICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-TRICHLOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRICHLOROETHENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRICHLOROFLUOROMETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-TRICHLOROPROPANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-TRIMETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
1,3,5-TRIMETHYLBENZENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
VINYL CHLORIDE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
O-XYLENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
M/P-XYLENE	524.2	µg/L	0.5	<0.5	<0.5	<0.5	<0.5

Component Analyzed	Method	Unit	PQL	Analysis Result			
				EB-13-9/8/05	EB-14-9/9/05	MW-12-4	MW-12-5
				05-03930-1	05-03930-2	05-03930-3	05-03930-4
CHROMIUM (VI)	7196	mg/L	0.01	<0.01	<0.01	<0.01	<0.01
Dilution Factor				1	1	1	1
CHROMIUM	200.8	µg/L	1	0.27J	0.59J	10.1	9.9

Component Analyzed	Method	Unit	PQL	Analysis Result		
				MW-14-4	MW-14-5	MW-18-1
				05-03930-5	05-03930-6	05-03930-7
CHROMIUM (VI)	7196	mg/L	0.01	<0.01	<0.01	<0.01
Dilution Factor				1	1	1
CHROMIUM	200.8	µg/L	1	9.8	7.6	8.2



Proj. No.

Form No.

Page _____ of _____



Battelle

Columbus Laboratories

CHAIN OF CUSTODY RECORD

Form No. _____

Proj. No.		Project Title		SAMPLE TYPE (✓)		Container No.	Number of Containers	Remarks		
G486111-T3		Source Determination Study		<div>FUNCTIONAL GENE TEST</div>			1	PC# 191770		
SAMPLERS: (Signature) <i>Greg Hendrix</i>		DATE							TIME	SAMPLE I.D.
03JUN05		0930	LFWC-2						03JUN05	1330	LAWC-3
Relinquished by: (Signature) <i>Greg Hendrix</i>		Date/Time 03JUN05 1620		Received by: (Signature)		Relinquished by: (Signature)		Date/Time	Received by: (Signature)	
Relinquished by: (Signature)		Date/Time		Received by: (Signature)		Relinquished by: (Signature)		Date/Time	Received by: (Signature)	
Relinquished by: (Signature)		Date/Time		Received for Laboratory by: (Signature)		Date/Time		Remarks		

SENT TO: BioTaste



Battelle

Columbus Laboratories

CHAIN OF CUSTODY RECORD

Form No. _____

Proj. No.

Project Title

G486111-13

Source Determination Study

SAMPLES: (Signature)

D. Loney

DATE

TIME

SAMPLE I.D.

3/19/2005

15:10

MW-25-3

Function /
Gate Test

SAMPLE TYPE (V)

Container No.

Number
of
Containers

Remarks

PD #
191770

Relinquished by: (Signature)

Date/Time

3/19/05 17:00

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received for Laboratory by: (Signature)

Date/Time

Remarks

sent to: B&I NSIC



BIOINSITE LLC, POST OFFICE BOX 1503, MURPHYSBORO, ILLINOIS 62966

Tel. (618) 549 6868, Fax (618) 687-4801, URL: WWW.BIOINSITE.COM

SUMMARY REPORT:

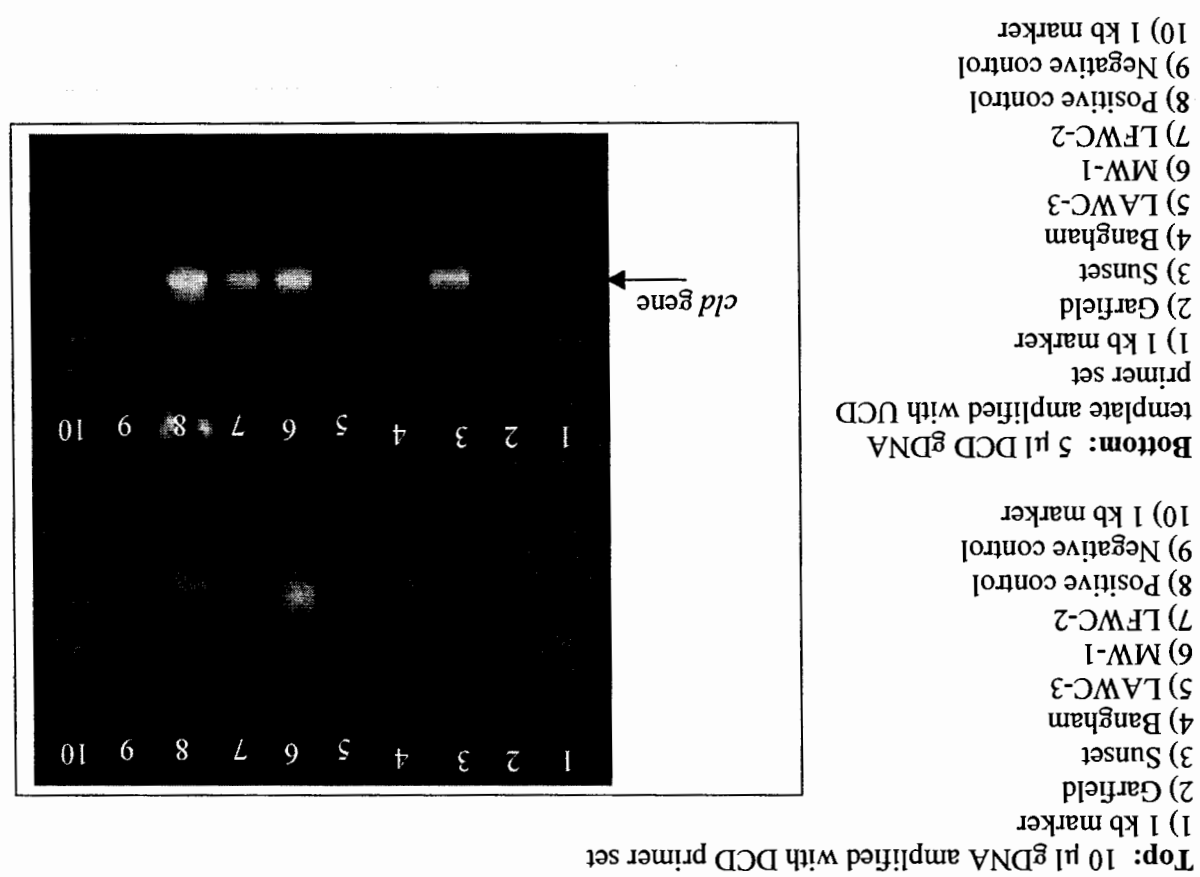
The genomic DNAs for samples Sunset, MW-1, and LFWC-2 were positive for the chlorite dismutase gene *cld* indicating the presence of (per)chlorate-reducing bacteria in these samples. Samples of genomic DNA from Garfield, Bangham, and LAWC-3 were negative for the chlorite dismutase gene.

Analysis of the presence of the *cld* mRNA resulted in a weak positive result for the MW-1 sample which may indicate active (per)chlorate reduction occurring at that site. The other five samples were negative for the *cld* mRNA, indicating that active (per)chlorate reduction is not occurring at these sites. However, this conclusion must be tempered by the observation that the low biomass of the samples could have biased the experimental outcome.

Samples received on: 4 June - 7 June, 2005
Analyzed on: 10 June - 28 June, 2005
Samples stored at: -20° C (DNA and RNA)

One-liter water samples were received from each site. The lid on the LFWC-2 sample was cracked during shipping and over half the sample leaked out, leaving ~300 ml for analysis. Each sample was filtered to concentrate the biomass and split into two equal parts to prepare genomic DNA (gDNA) and total RNA from each.

Amplifications of chlorite dismutase gene *cld* using nested primer sets on gDNA:



Result

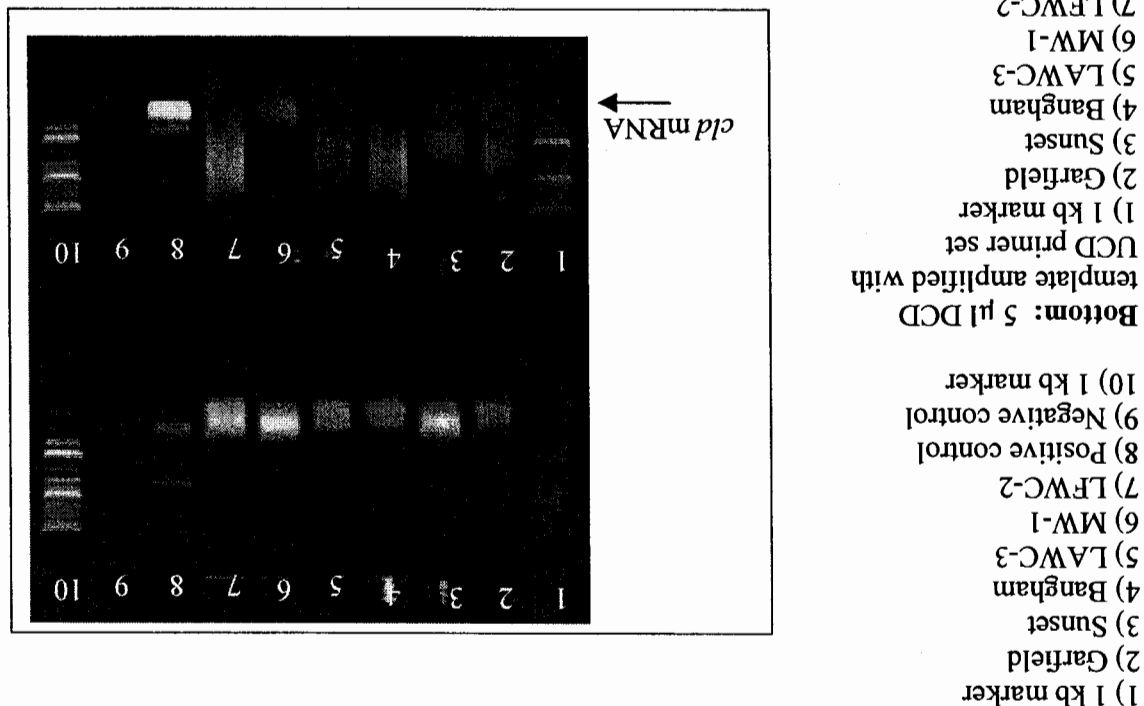
Positive for chlorite dismutase gene: Sunset, MW-1, and LFWC-2.

Negative for chlorite dismutase gene: Garfield, Bangham, and LAWC-3.

Not shown: Amplifications using the standard 1 µl gDNA did not work; likely due to extremely low biomass.

Nested *cld* amplifications using cDNA prepared by reverse transcription of total RNA

Top: 10 µl cDNA amplified with DCD primer set



Result

The presence of a faint band of the expected size is detectable in the MW-1 sample nested with the UCD primer set which may indicate the presence of *cld* mRNA in that sample (lane 6, bottom). The other five samples were all negative. (Bands present in those samples are not of the expected size and are considered negative results.)

QCQA

Sample	Type	Presence of <i>cld</i> gene	Presence of <i>cld</i> mRNA
Garfield	Experimental sample	–	–
Sunset	Experimental sample	+	–
Bangham	Experimental sample	–	–
LAWC-3	Experimental sample	–	–
MW-1	Experimental sample	+	+
LFWC-2	Experimental sample	+	–
<i>D. aromatica</i>	Positive control	+	+
<i>E. coli</i>	Negative control	–	–

The genomic DNAs for samples MW-24-1 and MW-25-3 were positive for the chlorite dismutase gene *cld* indicating the presence of (per)chlorate-reducing bacteria in these samples. Analysis of the presence of the *cld* mRNA resulted in a positive result for the MW-24-1 sample which indicates that active (per)chlorate reduction occurs at that site. Sample MW-25-3 was negative for the *cld* mRNA, indicating that active (per)chlorate reduction is not occurring at this site.

SUMMARY REPORT:

BIOINSITE LLC, POST OFFICE BOX 1503, MURPHYSBORO, ILLINOIS 62966
Tel. (618) 549 6868, Fax (618) 687-4801, URL: WWW.BIOINSITE.COM



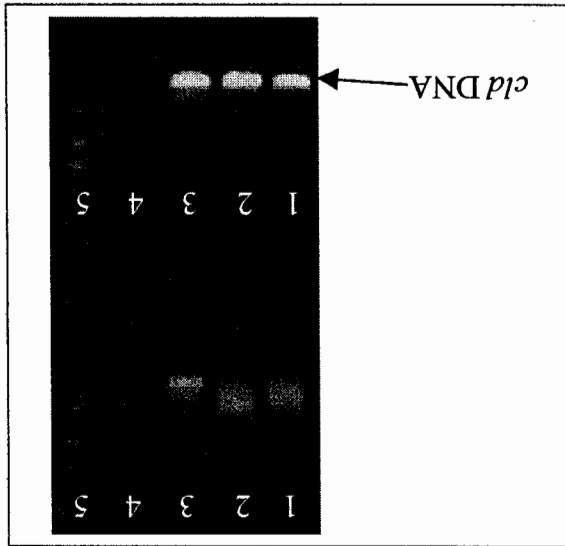
Samples received on: 21 July - 27 July, 2005
Analyzed on: 10 Aug - 12 Aug, 2005
Samples stored at: -20° C (DNA and RNA)

One-liter water samples were received from each site. Each sample was filtered to concentrate the biomass and split into two equal parts to prepare genomic DNA (gDNA) and total RNA from each.

Amplifications of chlorite dismutase gene *cld* using nested primer sets on gDNA:

Top: Amplifications with DCDF/DCDR
 1) MW-24-1
 2) MW-25-3
 3) Positive control (RCB)
 4) Negative control
 5) 1 kb marker

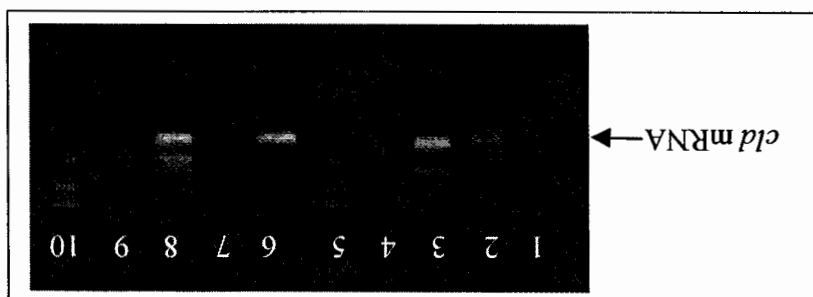
Bottom: Amplifications with UCDF/UCDR
 1) MW-24-1
 2) MW-25-3
 3) Positive control (RCB)
 4) Negative control
 5) 1 kb marker



Results: Samples MW-24-1 and MW-25-3 both positive for *cld* gene (bottom lanes 1 and 2).

Nested *cld* amplifications using cDNA prepared by reverse transcription of total RNA

- 1) MW-24-1 cDNA touchdown
- 2) MW-25-3 cDNA touchdown
- 3) Touchdown positive control
- 4) Touchdown negative control
- 5) 1 kb marker
- 6) MW-24-1 cDNA nested
- 7) MW-25-3 cDNA nested
- 8) Nested positive control
- 9) Nested negative control
- 10) 1 kb marker



Results: Sample MW-24-1 positive for *cld* mRNA (lane 6). Sample MW-25-3 negative for *cld* mRNA (lane 7).

OCQA

Sample	Type	Presence of <i>cld</i> gene	Presence of <i>cld</i> mRNA
MW-24-1	Experimental sample	+	+
MW-25-3	Experimental sample	+	-
<i>D. aromatica</i>	Positive control	+	+
<i>E. coli</i>	Negative control	-	-



BIOINSITE LLC, POST OFFICE BOX 1503, MURPHYSBORO, ILLINOIS 62966
Tel. (618) 549 6868, Fax (618) 687-4801, URL: WWW.BIOINSITE.COM

SUMMARY REPORT:

The genomic DNA for sample MW-17-3 was positive for the chlorite dismutase gene *cld* indicating the presence of (per)chlorate-reducing bacteria in this sample.

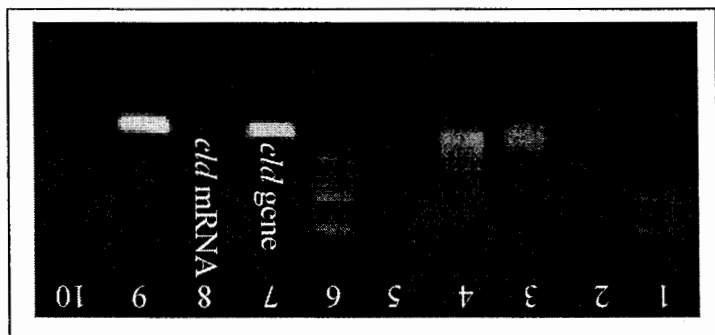
Analysis of the presence of the *cld* mRNA resulted in a negative result for the MW-17-3 sample which indicates that active (per)chlorate reduction is not occurring at this site.

Samples received on: 17 Aug, 2005
 Analyzed on: 17 Aug - 26 Aug, 2005
 Samples stored at: -20° C (DNA and RNA)

A one-liter water sample was received. The sample was filtered to concentrate the biomass and split into two equal parts to prepare genomic DNA (gDNA) and total RNA.

gDNA and RNA nested *cld* amplifications:

- 1) 1 kb marker
- 2) MW-17-3 gDNA with DCD primers
- 3) MW-17-3 cDNA with DCD primers
- 4) Positive control for DCD primers
- 5) Negative control for DCD primers
- 6) 1 kb marker
- 7) MW-17-3 gDNA with UCD primers
- 8) MW-17-3 cDNA with UCD primers
- 9) Positive control for UCD primers
- 10) Negative control for UCD primers



Results: Sample MW-17-3 positive for *cld* gene (lane 7). Sample MW-17-3 negative for *cld* mRNA (lane 8).

QCQA

Sample	Type	Presence of <i>cld</i> gene	Presence of <i>cld</i> mRNA
MW-17-3	Experimental sample	+	-
<i>D. aromatica</i>	Positive control	+	+
<i>E. coli</i>	Negative control	-	-

TABLE OF CONTENTS

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05F064**

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GC-VOA **	4000 –
GC-SVOA **	5000 –
HPLC **	6000 –
METALS METHOD 200.7	7000 – 7013
WET	
METHOD 310.1	8000 – 8005
METHOD 350.2	8006 – 8011
METHOD 120.1	8012 – 8014
METHOD 300.0	8015 – 8039
METHOD 314.0	8040 – 8057
METHOD 376.1	8058 – 8061
METHOD 351.3	8062 – 8067
METHOD 160.1	8068 – 8073
SM3500	8074 – 8080
METHOD 415.1 (DOC)	8081 – 8089
METHOD 415.1 (TOC)	8090 – 8098
OTHERS **	9000 –

** - Not Requested



LABORATORIES, INC.

1835 W. 205th Street
Torrance, CA 90501

Tel: (310) 618-8889

Fax: (310) 618-0818

Date: 06-27-2005

EMAX Batch No.: 05F064

Attn: Tien Shao

Battelle Memorial Institute
505 King Ave.
Columbus OH 43201

Subject: Laboratory Report
Project: JPL

Enclosed is the Laboratory report for samples received on
06/07/05. The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
MW1	F064-01	06/05/05	WATER	ANIONS BY IC FERROUS IRON PERCHLORATE BY IC METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON SOLIDS TOTAL DISSOLVED SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE ALKALINITY TKN

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning
these results.

Sincerely yours,

Kam Y. Pang, Ph.D.
Laboratory Director

[illegible]

Hanh Bui

From: Shiao, Tien [shiaoh@BATTELLE.ORG]
Sent: Thursday, June 16, 2005 12:40 PM
To: Hanh Bui
Cc: Ohart, Carolyn J; Headington, Gregory; Conner, David J
Subject: RE: Review Login Sheet SDG: 05F064 (Battelle/JPL)

Hi Hanh,

Based on recent discussions, we have reverted to our original list of analytes for MW-1. If you wouldn't mind, could we get the list of analytes below analyzed? The analytes below should be the same as the original COC for MW-1 to you.

- (1) DOC, TOC, Ferrous Iron, Sulfide, Anion (Nitrite), Metals (Iron, Sodium), Perchlorate, Ammonia, TKN, Specific Electrical Conductance
- (2) TDS, Alkalinity, Anions (Nitrate, Sulfate, Chloride), Metals (Calcium, Potassium, Magnesium).

I can send the original COC to you or the original login sheet if you need.

Sorry for the trouble. Please give me a call if you have any questions or need any clarification.

Best Regards,

Tien

Tien Shiao
Battelle Memorial Institute
Environmental Restoration Dept.
505 King Ave., Columbus, OH 43204
Room: 10-1-80
Business: (614) 424-3754
Mobile: (614) 370-3939
Fax: (614) 458-3754
shiaoh@battelle.org
www.battelle.org

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Friday, June 10, 2005 5:03 PM
To: Shiao, Tien
Subject: Review Login Sheet SDG: 05F064 (Battelle/JPL)

Hi Tien,
Please find the attached of revised review login sheet SDG 05F064, thanks.
Hanh

-----Original Message-----

From: Shiao, Tien [mailto:shiaoh@BATTELLE.ORG]
Sent: Friday, June 10, 2005 7:18 AM
To: Hanh Bui
Cc: Ohart, Carolyn J; Headington, Gregory; Conner, David J
Subject: RE: Review Login Sheet SDG: 05F064 (Battelle/JPL)

Hanh,

1002

6/16/2005

After discussing the list of analytes, I need to make a correction on the analytes requested for MW-1. The analytes we need analyzed and should keep are:

- (1) DOC, TOC, Ferrous Iron, Sulfide, Anion (Nitrite), Metals (Iron, Sodium), Perchlorate, Ammonia, TKN, Specific Electrical Conductance

The analytes which we do not need analyzed and should be taken out of Battelle's COC and your login sheet are:

- (2) TDS, Alkalinity, Anions (Nitrate, Sulfate, Chloride), Metals (Calcium, Potassium, Magnesium)

I hope this doesn't cause any problems and thanks for your help. Please let me know if you have any questions.

Thanks,
Tien

1003

Hanh Bui

From: Shiao, Tien [shiaoh@BATTELLE.ORG]
Sent: Friday, June 10, 2005 7:18 AM
To: Hanh Bui
Cc: Ohart, Carolyn J; Headington, Gregory; Conner, David J
Subject: RE: Review Login Sheet SDG: 05F064 (Battelle/JPL)

Hanh,

After discussing the list of analytes, I need to make a correction on the analytes requested for MW-1. The analytes we need analyzed and should keep are:

- (1) DOC, TOC, Ferrous Iron, Sulfide, Anion (Nitrite), Metals (Iron, Sodium), Perchlorate, Ammonia, TKN, Specific Electrical Conductance

The analytes which we do not need analyzed and should be taken out of Battelle's COC and your login sheet are:

- (2) TDS, Alkalinity, Anions (Nitrate, Sulfate, Chloride), Metals (Calcium, Potassium, Magnesium)

I hope this doesn't cause any problems and thanks for your help. Please let me know if you have any questions.

Thanks,
Tien

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Thursday, June 09, 2005 5:26 PM
To: Shiao, Tien
Subject: RE: Review Login Sheet SDG: 05F064 (Battelle/JPL)

Hi Tien,

Yes, besides Perchlorate 24 hour, the other analysis is 14 days TAT. PQL is the same as RL (reporting limit) which is usually 3 to 10 times MDL, thanks.

Hanh

-----Original Message-----

From: Shiao, Tien [mailto:shiaoh@BATTELLE.ORG]
Sent: Thursday, June 09, 2005 2:14 PM
To: Hanh Bui
Cc: Ohart, Carolyn J; Headington, Gregory
Subject: RE: Review Login Sheet SDG: 05F064 (Battelle/JPL)

Hanh,

The login sheet for MW-1 looks good. All the analytes we requested are accounted for. The login review sheet for Garfield, Sunset, Bangham, LFWC-2, and LAW-3 also look good. I wanted to double check the turnaround time (TAT). Besides perchlorate, is the TAT for the results of all other analytes 14 days? Also, what is the difference between MDL (Method Detection Limit) and PQL (Practical Quantization Limit)?

Thanks,
Tien

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Thursday, June 09, 2005 4:19 PM
To: Shiao, Tien

1004

6/10/2005

Subject: Review Login Sheet SDG: 05F064 (Battelle/JPL)

Hi Tien,

Thanks for your information, enclosed COC and review Login sheet for samples we received on June/7. For Anions 300 (Cl/ NO3, NO2, SO4), Metals 200-7 included Ca, Fe, Mg, K, and Na. Please review that, thanks.

Hanh

-----Original Message-----

From: Shiao, Tien [mailto:shiaoh@BATTELLE.ORG]

Sent: Thursday, June 09, 2005 12:54 PM

To: hdbui@emaxlabs.com

Subject: EMAX Chain of Custody

Hanh,

Thanks for faxing the chain of custodies and the EMAX laboratories review sheet. So far everything looks good at my end. However I want to double check something. Can you tell me which metals are included in the analysis "Metals in Water and Waste" and which analytes are included in "Anions" by IC?

Below is my contact information.

Best Regards,

Tien Shiao

Battelle Memorial Institute
Environmental Restoration Dept.
505 King Ave., Columbus, OH 43204
Room: 10-1-80
Business: (614) 424-3754
Mobile: (614) 370-3939
Fax: (614) 458-3754
shiaoh@battelle.org
www.battelle.org

1005

6/10/2005

Type of Delivery	Delivered By/Airbill	ECN	OST064
<input checked="" type="checkbox"/> EMAX Courier		Receipient	J. LUNA
<input type="checkbox"/> Client Delivery		Date	06-7-05
<input type="checkbox"/> Third Party		Time	09:25

COC Inspection		
<input type="checkbox"/> Client Name	<input checked="" type="checkbox"/> Sampler Name	<input checked="" type="checkbox"/> Sampling Date/Time/Location
<input checked="" type="checkbox"/> Address	<input type="checkbox"/> Courier Signature/Date/Time	<input type="checkbox"/> Analysis Required
<input type="checkbox"/> Client PM/FC	<input type="checkbox"/> TAT	<input type="checkbox"/> Matrix
<input checked="" type="checkbox"/> Tel #/Fax #	<input checked="" type="checkbox"/> Sample ID	<input type="checkbox"/> Preservative (if any)
Safety Issues	<input type="checkbox"/> None	<input type="checkbox"/> Superfund Site Samples
Comments:	<input type="checkbox"/> High Concentrations expected	
<input type="checkbox"/> Rad Screening Required		

Packaging Inspection			
Container	<input checked="" type="checkbox"/> Cooler	<input type="checkbox"/> Box	<input type="checkbox"/>
Condition	<input type="checkbox"/> Custody Seal	<input type="checkbox"/> Intact	<input type="checkbox"/> Damaged
Packaging	<input checked="" type="checkbox"/> Bubble Pack	<input type="checkbox"/> Styrofoam	<input type="checkbox"/> Sufficient
Temperatures	<input checked="" type="checkbox"/> Cooler 1 <u>7-2.8°C</u>	<input checked="" type="checkbox"/> Cooler 2 _____	<input type="checkbox"/> Cooler 3 _____
	<input type="checkbox"/> Cooler 5 _____	<input type="checkbox"/> Cooler 6 _____	<input type="checkbox"/> Cooler 7 _____
	<input type="checkbox"/> Cooler 9 _____	<input type="checkbox"/> Cooler 10 _____	<input type="checkbox"/> Cooler 11 _____
Comments:			

[illegible]

Sample Labeling MS
Date 6-7-05

SRF Clifford
Date 6/7/05

PM
Date 6/7/5

1006

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

METHOD 200.7
METALS BY ICP-AES

SDG#: 05F064

7000

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05F064**

METHOD 200.7 METALS BY ICP-AES

One (1) water sample was received on 06/07/05 for Metals analysis by Method 200.7 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample F027-01 from another SDG was analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

MS/MSD sample was not designated in this SDG.

6. Sample Analysis

Sample was analyzed according to the prescribed QC procedure. All criteria were met.

7001

LAB CHRONICLE
METALS BY ICP-AES

SDG NO. : 05F064
Instrument ID : I-107

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	WATER		Extraction DateTime	Sample Data FN	Calibration Prep.		Notes
									Data FN	Batch	
MBLK1W	IPF029WB	1	NA	06/09/0519:25			06/09/0508:00	107F029012	107F029010	IPF029W	Method Blank
LCS1W	IPF029WL	1	NA	06/09/0519:29			06/09/0508:00	107F029013	107F029010	IPF029W	Lab Control Sample (LCS)
LCS1W	IPF029WC	1	NA	06/09/0519:33			06/09/0508:00	107F029014	107F029010	IPF029W	LCS Duplicate
MW1	F064-01	1	NA	06/09/0520:24			06/09/0508:00	107F029026	107F029022	IPF029W	Field Sample
GARFJELD	F027-01	1	NA	06/09/0519:55			06/09/0508:00	107F029019	107F029010	IPF029W	Field Sample
GARFJELDDL	F027-01T	5	NA	06/09/0519:59			06/09/0508:00	107F029020	107F029010	IPF029W	Diluted Sample
GARFJELDAS	F027-01A	1	NA	06/09/0520:03			06/09/0508:00	107F029021	107F029010	IPF029W	Analytical Spike Sample

FN - Filename
% Moist - Percent Moisture

7002

22

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 06/05/05
  ect       : JPL                         Date Received: 06/07/05
Sub NO.     : 05F064                     Date Extracted: 06/09/05 08:00
Sample ID: MW1                           Date Analyzed: 06/09/05 20:24
Lab Samp ID: F064-01                     Dilution Factor: 1
Lab File ID: I07F029026                  Matrix       : WATER
Ext Btch ID: IPF029W                     % Moisture   : NA
Calib. Ref.: I07F029022                  Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	68.3	1	.1
Iron	.311	.2	.04
Magnesium	21.4	1	.1
Potassium	3.93	2	1.4
Sodium	30	1	.25

7603

pr

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: NA
  ect       : JPL                          Date Received: 06/09/05
Sub NO.     : 05F064                      Date Extracted: 06/09/05 08:00
Sample ID:  MBLK1W                        Date Analyzed: 06/09/05 19:25
Lab Samp ID: IPF029WB                     Dilution Factor: 1
Lab File ID: I07F029012                   Matrix       : WATER
Ext Btch ID: IPF029W                      % Moisture    : NA
Calib. Ref.: I07F029010                   Instrument ID : EMAXT107
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	ND	1	.1
Iron	ND	.2	.04
Magnesium	ND	1	.1
Potassium	ND	2	1.4
Sodium	ND	1	.25

7604

pu

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
NO.: 05F064
METHOD: 200.7

MATRIX: WATER % MOISTURE: NA
DILT N FACTR: 1 1 1
SAMPLE ID: MBLK1W
CONTROL NO.: IPF029WB IPF029WL IPF029WC
LAB FILE ID: 107F029012 107F029013 107F029014
DATE TIME EXTRCTD: 06/09/0508:00 06/09/0508:00 06/09/0508:00 DATE COLLECTED: NA
DATE TIME ANALYZD: 06/09/0519:25 06/09/0519:29 06/09/0519:33 DATE RECEIVED: 06/09/05
PREP. BATCH: IPF029W IPF029W IPF029W
CALIB. REF: 107F029010 107F029010 107F029010

ACCESSION:

PARAMETER	BLNK RSLT mg/L	SPIKE AMT mg/L	BS RSLT mg/L	BS % REC	SPIKE AMT mg/L	BSD RSLT mg/L	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	ND	50	48.7	97	50	48.7	97	0	85-115	20
Iron	ND	10	10.2	102	10	10.2	102	0	85-115	20
Magnesium	ND	50	49.2	98	50	49.3	99	0	85-115	20
Potassium	ND	50	48.3	97	50	48.6	97	1	85-115	20
Sodium	ND	50	48.4	97	50	48.8	98	1	85-115	20

7005

PH

EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05F064
METHOD: METHOD 200.7

=====

MATRIX:	WATER	% MOISTURE:	NA
DILUTION FACTOR:	1		
SAMPLE ID:	GARFIELD	GARFIELD	DDL
EMAX SAMP ID:	F027-01	F027-01T	
LAB FILE ID:	I07F029019	I07F029020	
DATE EXTRACTED:	06/09/0508:00	06/09/0508:00	DATE COLLECTED: 06/02/05
DATE ANALYZED:	06/09/0519:55	06/09/0519:59	DATE RECEIVED: 06/02/05
PREP. BATCH:	IPF029W	IPF029W	
CALIB. REF:	I07F029010	I07F029010	

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SERIAL DIL RSLT (mg/L)	DIF RSLT %	QC LIMIT (%)
Calcium	41.6	41.3	1	10
Iron	ND	ND	0	10
Magnesium	12.5	12.2	3	10
Potassium	ND	10.1	NA	10
Sodium	35.1	36	2	10

7006

pu

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05F064
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILTN FACTR: 1 1
SAMPLE ID: GARFIELD
CONTROL NO.: F027-01 F027-01A
LAB FILE ID: 107F029019 107F029021
DATIME EXTRCTD: 06/09/0508:00 06/09/0508:00 DATE COLLECTED: 06/02/05
DATIME ANALYZD: 06/09/0519:55 06/09/0520:03 DATE RECEIVED: 06/02/05
PREP. BATCH: 1PF029W 1PF029W
CALIB. REF: 107F029010 107F029010

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	AS RSLT (mg/L)	AS % REC	QC LIMIT (%)
Calcium	41.6	50	88.3	93	70-130
Iron	ND	10	10.1	101	70-130
Magnesium	12.5	50	60.8	97	70-130
Potassium	ND	50	50.3	101	70-130
Sodium	35.1	50	81.8	93	70-130

7007

AM

REGULAR ICP QC CHECK TABLE

QC Limit%	ICV HIGH 95-105	ICV 90-110	CCV 90-110	ICSAB 80-120	ICSA 80-120
Comp	mg/L	mg/L	mg/L	mg/L	mg/L
Al	10	5	5	500	500
Sb	2	1	1	1	0
As	2	1	1	1	0
Ba	2	1	1	0.5	0
Be	2	1	1	0.5	0
B	2	1	1	0.5	0
Cd	2	1	1	1	0
Ca	100	50	50	500	500
Cr	2	1	1	0.5	0
Co	2	1	1	0.5	0
Cu	2	1	1	0.5	0
Fe	10	5	5	200	200
Pb	2	1	1	1	0
Mg	100	50	50	500	500
Mn	2	1	1	0.5	0
Mo	2	1	1	1	0
Ni	2	1	1	1	0
K	100	50	50	50	0
Se	2	1	1	3.6	0
Ag	2	1	1	1	0
Na	100	50	50	10	0
Sr	2	1	1	0.5	0
Tl	2	1	1	3.6	0
Sn	10	5	5	1	0
Ti	2	1	1	1	0
V	2	1	1	0.5	0
Zn	2	1	1	1	0

ANALYSIS RUN LOG FOR ICP

SOP □ EMAX-6010-Rev. 3 □ EMAX-CLP-TAL 200.7 Method File: 601001 Autosampler Table: 800

Matrix: Water		Start Date: 06/09/05		Time: 18:37		End Date: 06/09/05		Time: 20:50		Book# A24 -037	
Data File Name	Prep. Batch	Lab Sample ID	DF	Matrix	Notes	Data File Name	Prep. Batch	Lab Sample ID	DF	Matrix	Notes
01		50				26	PP6029w	F064-01			F455-01
02		53				27		ICSAF			9/10/05
03		56				28		ICSAF			6/9/05
04		ICV (GCS)				29		CCV			
05		ICP				30		CCP			
06		CCV (IC)				31					
07		CCP				32					
08		ICSAF				33					
09		ICSAF				34					
10		CCV (IC)				35					
11		CCP				36					
12	IP6029w	IP6029w	1		(LRF)	37					
13		MC	1		(LRF)	38					
14		MC	1		(LRF)	39					
15		F410-04	1			40					
16		↓ 05	1			41					
17		F041-01	1			42					
18		↓ 02	1			43					
19		F027-01	1			44					
20		↓ 017	5			45					
21		↓ 01A	1			46					
22		CCV2 (IC)	1			47					
23		CCP2	1			48					
24		F027-02	1			49					
25		↓ 03	1			50					

ANALYTICAL BATCH *

ANALYTICAL BATCH* 2009

Analyzed By: AWM
Date Disposed:

This page is checked during data review.

SEQUENCE FILE : I07F029

4-18	19-33	34-43	44-53	54-63
LFID	LSID	TIME	DATE	DF
I07F029001	S0	18:37	06/09/05	1
I07F029002	S3	18:41	06/09/05	1
I07F029003	S6	18:45	06/09/05	1
I07F029004	ICV	18:49	06/09/05	1
I07F029005	IC8	18:55	06/09/05	1
I07F029006	CCV	18:59	06/09/05	1
I07F029007	CCB	19:03	06/09/05	1
I07F029008	ICSAI	19:07	06/09/05	1
I07F029009	ICSAB1	19:11	06/09/05	1
I07F029010	CCV1	19:17	06/09/05	1
I07F029011	CCB1	19:21	06/09/05	1
I07F029012	IPF029WB	19:25	06/09/05	1
I07F029013	IPF029WL	19:29	06/09/05	1
I07F029014	IPF029WC	19:33	06/09/05	1
I07F029015	F410-04	19:38	06/09/05	1
I07F029016	F410-05	19:42	06/09/05	1
I07F029017	F041-01	19:46	06/09/05	1
I07F029018	F041-02	19:50	06/09/05	1
I07F029019	F027-01	19:55	06/09/05	1
I07F029020	F027-01T	19:59	06/09/05	5
I07F029021	F027-01A	20:03	06/09/05	1
I07F029022	CCV2	20:07	06/09/05	1
I07F029023	CCB2	20:12	06/09/05	1
I07F029024	F027-02	20:16	06/09/05	1
I07F029025	F027-03	20:20	06/09/05	1
I07F029026	F064-01	20:24	06/09/05	1
I07F029027	F455-01	20:28	06/09/05	1
I07F029028	ICSAF	20:36	06/09/05	1
I07F029029	ICSABF	20:40	06/09/05	1
I07F029030	CCV3	20:46	06/09/05	1
I07F029031	CCB3	20:50	06/09/05	1

SDG : 051 69

UNIT : *

ICP CHECK : I07F029

DATE : 06/09/05

INST : EMAXT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
S0																											
S3							S3																				
S6																											
ICW	99	101	102	91	100	102	97	103	98	97	97	102	98	104	98	99	96	101	103	96	103	97	92	97	100	98	98
ICB																											
CCV	98	99	101	97	97	97	98	101	97	97	96	100	95	100	97	99	95	99	107	97	99	96	94	97	97	97	97
CCB							CCB																				
ICSAI	95							91				89		97													
ICSAFI	96	91	94	94	93	94	91	92	88	86	96	89	92	97	90	90	85	99	104	96	103	90	90	92	92	98	93
CCVI	98	99	96	96	97	96	98	100	96	96	96	99	96	98	96	98	95	97	103	97	98	96	94	96	96	96	97
CCBI							CCBI																				
IPF029WB																											
IPF029WL																											
IPF029WC																											
F410-04																											
F410-05																											
F041-01																											
F041-02																											
F027-01																											
F027-01T																											
F027-01A																											
CCV2	97	97	99	96	96	95	97	99	96	95	95	99	95	98	95	96	94	98	99	96	99	95	92	96	96	96	96
CCB2							CCB2																				
F027-02																											
F027-03																											
F064-01																											
F455-01																											
ICSAF	89							89				85		92													
ICSABF	89	85	88	84	88	88	89	89	84	82	88	85	91	92	85	84	82	91	97	91	93	82	81	85	85	92	91
CCV3	92	94	92	88*	92	91	95	98	93	92	88*	95	95	94	92	93	91	92	99	92	90	88*	93	94	90	91	95
CCB3							CCB3																				

QC limit of each parameter are listed in a table attached next to all the ICP check forms

* : Out of QC Limit

SDG = 05,069

UNIT : UG/L

SUMMARY of CALIBRATION BLANKS : I07F029 (WATER)

DATE : 06/09/05

INST : EMAX1107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
S0
S3
S6
ICV
ICB	2.59	1.32	.000	.000	.060	-1.31	-790	1.82	1.13	-1.25	-1.53	-1.03	17.2	-10.6	.000	1.25	-6.64	588	31.7	-2.95	.000	.000	-24.5	-31.4	.590	-780	.720
CCV
CCB	-9.43	-2.38	-15.3	-180	.000	-1.31	.260	.080	.560	-.490	-.380	-1.81	7.51	-5.90	-.120	1.25	-5.62	-187	5.54	-2.79	.000	.000	-31.4	-8.15	-.290	.970	-.880
ICSAI	...	17.6	-46.3	-170	.060	9.74	1.17	...	-8.80	-1.22	5.47	...	56.3	...	...	-4.16	-8.06	457	315	8.57	7.35	-2.09	-50.2	11.9	-14.5	-4.66	.030
ICSAI
ICSAI
CCV1
CCB1	-8.83	10.1	8.12	-.280	-.060	-1.31	.130	.250	-1.69	-1.62	-1.91	-1.03	5.06	-13.1	-.370	-2.50	-5.10	226	54.0	-4.66	.000	.000	-9.41	-13.9	.000	-1.51	-1.11
IPF029AB
IPF029AL
IPF029AC
F410-04
F410-05
F041-01
F041-02
F027-01
F027-01T
F027-01A
CCV2
CCB2	-7.86	-.770	-7.18	.000	-.130	-1.74	.720	-4.20	1.13	-1.62	-1.53	-.770	13.0	-8.27	.500	1.25	-9.02	222	28.6	.000	.000	.000	-18.2	-29.1	-.140	.980	-1.29
F027-02
F027-03
F054-01
F455-01
ICSAF	...	5.96	65.9	-.010	-.060	13.4	-.420	...	-6.82	-3.87	4.43	...	34.5	...	...	-2.95	-4.27	115	296	6.84	-29.4	-1.84	-115	-7.90	-13.3	-3.16	.100
ICSAF
CCV3
CCB3	-9.49	20.8	-.880	.000	.000	.000	.810	.610	.000	.370	-.760	.250	1.11	-11.7	-.250	5.01	-2.89	807	15.1	-6.21	-73.5	.960	-15.7	-17.4	.310	.820	-.610

QC Limit of each parameter are listed in a table attached next to all the ICP check forms

* : Out of QC Limit

7012

DIGESTION LOG FOR ICP METALS

SOP ☐ EMAX-3005 Rev. No.3 ☐ EMAX-3010 Rev. No.2 ☐ EMAX-3050 Rev. No.2 ☐ EMAX-CLP-TAL ☒ 200.7 Book # EIP-045

Matrix: WATER Start Date: 6-9-05 Time: 8:00 Temp: 95°C Ending Date: 6-9-05 Time: 10:00 Temp: 85°C

Sample Prep ID	Lab Sample ID	Matrix Description	Turbidity <1 NTU	Sample Amount (g)	pH	Extract Volume (ml)	Digestate Description	Standards	ID	Amount Added (ml)
01	IPF029-WB			50	-	50		LCS -1	SMIA - 09 - 27	0.5
02	WL			50	-	50		LCS -2	SMIA - 09 - 28	0.5
03	WC			50	-	50		LCS -3	SMIA - 09 - 29	0.5
04	F910-04			50	12	50		MS	N/A	
05	F041-01			50	1	50		Reagent		Amount Added (ml)
06	F027-01			50		50		HNO ₃	SWIA - 03 - 089	0.5
07				50		50		HCl	SWIA - 03 - 093	0.25
08				50		50		H ₂ O ₂		
09				50		50		HNO ₃ (1:1)		
10				50		50		Digestate Location	ICP LAB	
11				50		50		Extract Location		
12								Legend:		
13								Texture	Cs = Coarse	Md = Medium
14								Clarity	Cr = Clear	Cy = Cloudy
15								Artifacts	Rk = rocks	Sl = Shale
16								Color	Bu = blue	Bk = Black
17									Gn = Green	Og = Orange
18									Yw = Yellow	Cl = Colorless
19										
20										
21										
22										
23										
24										
25										

Comments: Samples for Methods 200.7 or 200.8 Analyses

If turbidity ≤ 1 NTU no digestion is required unless otherwise required by the project

Prepared By: inc Standard Added By: inc
 Witnessed By: NT Extracts Revd. By: A2 6/9/05
 Checked By: A2
 Date Disposed: _____ Disposed by: _____

BATCH: TPF029-W

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

WET CHEMICAL ANALYSES

SDG#: 05F064

8000

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05F064**

METHOD 310.1 TOTAL ALKALINITY

One (1) water sample was received on 06/07/05 for Total Alkalinity analysis by Method 310.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 310.1
TOTAL ALKALINITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F064

Matrix : WATER
Instrument ID : 153

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ALF009WB	ND	1	NA	5	1	06/14/0513:10	NA	ALF009W-03	ALF009W-01	ALF009W	NA	NA
LCS1W	ALF009WL	54.6	1	NA	5	1	06/14/0513:15	NA	ALF009W-04	ALF009W-01	ALF009W	NA	NA
LCD1W	ALF009WC	57.2	1	NA	5	1	06/14/0513:20	NA	ALF009W-05	ALF009W-01	ALF009W	NA	NA
MW1	F064-01	200	1	NA	5	1	06/14/0514:40	NA	ALF009W-21	ALF009W-13	ALF009W	06/05/05	06/07/05

8002

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 310.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05F064
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: ALF0094L/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 06/14/05 13:15/13:20

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Total Alkalinity	ND	58.90	54.60	93	58.90	57.20	97	5	80-120	20

8003

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ANALYSIS LOG FOR ALKALINITY

Page 22

SOP ☒ EMAX-310.1 Rev. No. 2 ☐ SM2320B Rev. No. 0 ☐

Book # AAL-009

Start Date: 6/14/05 Time: 13:00 Ending Date: 6/14/05 Time: 15:30 Instrument No: 5153 □ 97

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Initial pH	Acid Titrant			Final pH	ALKALINITY (mg/L)			Notes	Standard Reagent	ID	Conc. mg/L
					pH=8.3	pH=4.5	pH=4.2		Total	Calcium (mg)	Magnesium (mg)				
*01	ICV	13:00	20	10.05	NA	1.10	NA	4.48	57.2	NA	57.2		LCS	SW7A-06-146	58.9
*02	ICB	13:05		5.14		0.010		4.42	ND	ND	ND		Spike	SW7A-06-120	57.6
*03	AL F009 NB	13:10		5.12		0.010		4.41	ND	ND	ND		Na ₂ CO ₃ Soln	SW7A-06-120	2360
*04	WLC	13:15		8.85		1.05		4.52	54.6	NA	54.6		Acid Titrant. HCL	SW7B-02-711	0.02N
*05	WLC	13:20		8.85		1.10		4.47	57.2	NA	57.2				
*06	F046-01	13:25		7.73		2.40		4.49	125	ND	125				
*07	-02	13:30		7.67		2.45		4.47	127	ND	127		Na ₂ CO ₃ Soln. (ml)	Acid Titrant (ml)	Normality, N
*08	-04	13:35		8.10		5.70		4.47	247	ND	247		PAK	0.010	ND
*09	-04D	13:40	↓	8.06		5.70		4.48	247	ND	247		5	11.30	0.02087
*10	-04M	13:45	20 to 5	8.81		6.90		4.47	350	NA	350		5	11.35	0.02078
*11	↓ -05	13:50	20	8.01		5.85		4.50	304	ND	304		5	11.35	0.02078
*12	F046-06	13:55		8.10		5.80		4.52	302	ND	302			Ave N: 0.02081	
*13	CCV1	14:00		10.01		1.10		4.48	57.2	NA	57.2				
*14	CCB1	14:05		5.08		0.010		4.42	ND	ND	ND		pH Buffer	ID	Reading
*15	F047-01	14:10	↓	6.86		70+		overrun	-	-	-		pH 4	SW7A-06-097	4.01
*16	-01R	14:15	10	6.85		9.40		4.53	978				pH 7	-098	7.02
*17	-02	14:20	20	7.07		18+		overrun					pH 10	↓ -100	10.01
*18	-02R	14:25	10	6.93		8.20		4.53	853				Slope	-101.0	
*19	-03	14:30	20	7.67		3.45		4.47	179						
*20	↓ -04	14:35	↓	6.80		1.85		4.50	96.2						
*21	F048-01	14:40	↓	8.15		3.85	↓	4.48	200				Comments:	100/cor TV: 600 mg/L	
*22	F048-02	14:45	100	5.84		0.15	0.30	4.22	ND	ND	ND				
*23	↓ -04	14:50	20	11.32		3.45	NA	4.49	179	ND	179				
*24	↓ -06	14:55	↓	9.07		1.30	↓	4.48	67.6	ND	67.6				
*25	CCV2	15:00	↓	10.08	↓	1.15	↓	4.47	59.8	NA	59.8			Analyzed By: PM	

This page is checked during data review.

ANALYTICAL BATCH *

AL F009 W

8004

ANALYSIS LOG FOR ALKALINITY

Book # AAL-009

SOP EMAX-310.1 Rev. No. 2 □ SM2320B Rev. No. 0 □

Instrument No: 253 □ 97

Start Date: 6/14/05 Time: 13:40 Ending Date: 6/14/05 Time: 15:30

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Initial pH	Acid Titrant			Final pH	ALKALINITY (mg/L)				Notes	Standard Reagent	ID	Conc. mg/L
					pH=8.3	pH=4.5	pH=4.2		Total	Hydroxide (OH)	Carbonate (CO3)	Bicarbonate (HCO3)				
2604	CCB-2	15:05	70	5.06	NA	0.010	NA	4.42	ND	ND	ND	ND	LCS	SN7A-06-166	58.9	
2704	F054-01	15:10		8.04		6.00		4.47	312	ND	ND	312	Spike			
2804	↓ -02	15:15		7.85		5.85		4.91	304	ND	ND	304	Na2CO3 Sola			
2904	F054-03	15:20		7.97		5.95		4.48	310	ND	ND	310	Acid Titrant			
3004	CCV-3	15:25		10.06	NA	1.10	NA	4.93	57.3	NA	NA	57.3				
3104	CCB-3	15:30	✓	5.07	↓	0.010	↓	4.42	ND	ND	ND	ND				
*07																
*08																
*09																
*10																
*11																
*12																
*13																
*14																
*15																
*16																
*17																
*18																
*19																
*20																
*21																
*22																
*23																
*24																
*25																

ave. N: 0.02081

pH METER CALIBRATION		
pH Buffer	ID	Reading
pH 4	Sample as p. 22/10/01	
pH 7		
pH 10		
Slope		

Comments:

Analyzed By: PM

This page is checked during data review.

ANALYTICAL BATCH * AL F054 W

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05F064**

METHOD 350.2 AMMONIA (NH₃-N)

One (1) water sample was received on 06/07/05 for Ammonia analysis by Method 350.2 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 350.2
AMMONIA (NH3-N)

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F064

Matrix : WATER
Instrument ID : I70

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATETIME	Extraction DATETIME	LFID	CAL REF	PREP BATCH	Collection DATETIME	Received DATETIME
MBLK1W	NHF004WB	ND	1	NA	.1	.03	06/16/0516:41	06/16/0509:00	NHF004W-12	NHF004W-10	NHF004W	NA	06/16/05
LCS1W	NHF004WL	1.02	1	NA	.1	.03	06/16/0516:42	06/16/0509:00	NHF004W-13	NHF004W-10	NHF004W	NA	06/16/05
LCD1W	NHF004WC	1.01	1	NA	.1	.03	06/16/0516:43	06/16/0509:00	NHF004W-14	NHF004W-10	NHF004W	NA	06/16/05
MW1	F064-01	ND	1	NA	.1	.03	06/16/0516:54	06/16/0509:00	NHF004W-25	NHF004W-22	NHF004W	06/05/05	06/07/05

8007

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BAYTELLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: METHOD 350.2

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05F064

SAMPLE ID: LCS1W/LCD1W

CONTROL NO.: NHF004WL/C

DATE RECEIVED: 06/16/05

DATE EXTRACTED: 06/16/05 09:00

DATE ANALYZED: 06/16/05 16:42/16:43

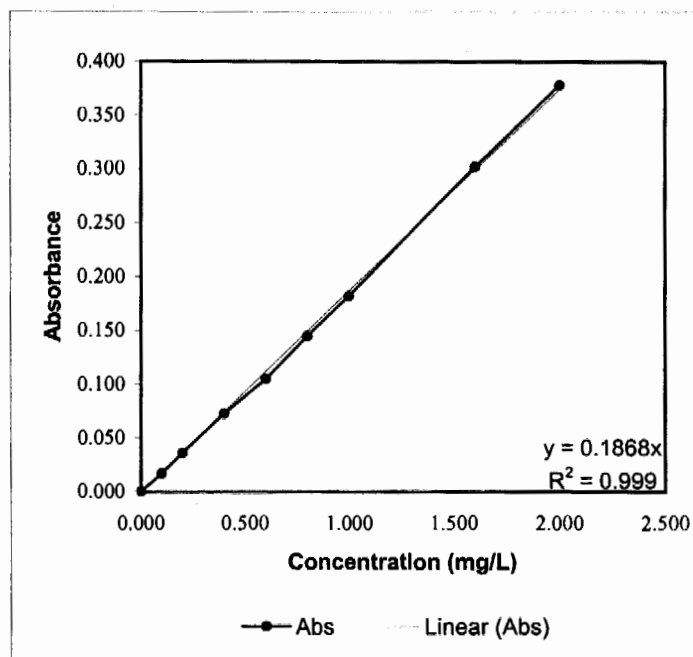
ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Ammonia (NH3-N)	ND	1.00	1.02	102	1.00	1.01	101	1	80-120	20

8008

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.017
0.200	0.036
0.400	0.073
0.600	0.105
0.800	0.145
1.000	0.182
1.600	0.302
2.000	0.378



R^2 0.999397

y 0.1868

CF 5.3531

Comments: **PASSED**

Analyzed by: LA

8009

ANALYSIS LOG FOR AMMONIA-N

SOP # EMAX-350.2 Rev. No. 2 □ EMAX-350.1 □ Rev. No. 9 □

Book # A70-NH₃-005

Time: 16:57

Ending Date: 16-08

Time: 16:30

Starting Date: 6-16-08

Data File Name	Prep. Batch	Lab Sample ID	Matrix S W	Time	Vol. Colored (ml)	DF	Absorbance	Noted mg/L
* 1	NHFO04W	S-00		16:30	20	1	0.000	
* 2		S-0.1		31			0.017	
* 3		S-0.2		32			0.036	
* 4		S-0.4		33			0.073	
* 5		S-0.6		34			0.105	
* 6		S-0.8		35			0.143	
* 7		S-1.0		36			0.182	
* 8		S-1.2		37			0.220	
* 9		S-2.0		38			0.378	
* 10		10.1		39			0.185	0.990
* 11		10.2		40			0.000	NP
* 12		NHF 00 400		41			0.000	NP
* 13		↓ W		42			0.190	1.017
* 14		↓ W		43			0.188	1.006
* 15		F039-08		44			0.002	NP
* 16		↓ W		45			0.001	NP
* 17		↓ W		46			0.192	1.028
* 18		↓ W		47			0.001	NP
* 19		↓ W		48			0.002	NP
* 20		↓ W		49			0.001	NP
* 21		↓ W		50			0.003	NP
* 22		CCV1		51			0.187	1.001
* 23		CCV1		52			0.000	NP
* 24		F034-13		53			0.002	NP
* 25		F044-01		54			0.010	NP
* 26		CCV2		55			0.185	0.990
* 27		CCV2		56			0.000	NP
* 28								
* 29								
* 30								

Standard	ID	Wavelength: 425 nm	Conc. (mg/L)
S ₀	2000 pure		0.0
S ₁	5000-03-152		0.1
S ₂			0.2
S ₃			0.4
S ₄			0.6
S ₅			0.8
S ₆			1.0
S ₇			1.6
S ₈	5000-03-152		2.0
ICV/MS	-151		1.0
CCV	-152		1.0
LCS	-157		1.0
Reagent	ID		
Color Reagent	SW7A-06-141		

Standard Curve	R	Y	CF
	0.9994	0.1908	5.8781

Comments:
Results are based on: <input type="checkbox"/> Dry Weight <input type="checkbox"/> Wet Weight

Analyzed By:
de

ANALYTICAL BATCH * NHF004W

8610

DISTILLATION LOG FOR NH_3 / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-005

SOP ☒ EMAX-350.2 Rev. No.: 2 ☐ EMAX-351.3 Rev. No.: 2 ☐Start Date 6-16-05 Time 9:00 End Date 6-16-05 Time 16:00

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	S-0-0	9.5	0.1	10	5	100	100		ICV/MS	S02B-08-151	10 ml
*02	S-0-1								LCS	↓ -157	10 ml
*03	S-1-0										
*04	S-2-0										
*05	100										
*06	100										
*07	NH F 004 W B								Reagent	Lot# / ID	
*08	W C								NaOH	S07A-06-112	
*09	W C								Borate Buffer	↓ -152	
*10	F-037-08		0.1						H_3BO_3	S07B-04-2157A	
*11	-08D		0.7						Digestion Mixture	NA	
*12	-08M		0.8						Distilling Soln.	↓	
*13	-09		0.7								
*14	-10		0.6								
*15	-11		0.8								
*16	-12		0.8								
*17	-13		0.7								
*18	F-009-01	9.5	0.6	10	5	100	100		SDG #	NA	Extract Location
*19											
*20											
*21											
*22											
*23											
*24											
*25											
*26											

Comments

Prepared By: dh

Standard Added By: dh

Checked By:

PREPARATION BATCH * NH F 004 W

8011

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05F064

METHOD 120.1 SPECIFIC CONDUCTIVITY

One (1) water sample was received on 06/07/05 for Specific Conductivity analysis by Method 120.1 in accordance with "Methods for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

3. Duplicate

No duplicate sample was designated in this SDG.

4. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

METHOD J.1
SPECIFIC CONDUCTIVITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F064

Matrix : WATER
Instrument ID : 129

SAMPLE ID	EMAX SAMPLE ID	RESULTS (umhos/cm)	DLF	MOIST	RL (umhos/cm)	MDL (umhos/cm)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
LCS1W	ECF001WL	683	1	NA	1	.5	06/14/0514:12	NA	ECF001W-02	NA	ECF001W	NA	NA
LCD1W	ECF001WC	683	1	NA	1	.5	06/14/0514:14	NA	ECF001W-03	NA	ECF001W	NA	NA
MW1	F064-01	595	1	NA	1	.5	06/14/0514:38	NA	ECF001W-15	NA	ECF001W	06/05/05	06/07/05

8013

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 120.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05F064
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: ECF001WL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 06/14/05 14:12/14:14

ACCESSION:

PARAMETER	BLNK RSLT (umhos/cm)	SPIKE AMT (umhos/cm)	BS RSLT (umhos/cm)	BS % REC	SPIKE AMT (umhos/cm)	BSD RSLT (umhos/cm)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Specific Conductivity	ND	682	683	100	682	683	100	0	80-120	20

8014

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05F064

METHOD 300.0 ANIONS

One (1) water sample was received on 06/07/05 for Chloride, Nitrate-N, Nitrite-N and Sulfate analyses by method 300.0 in accordance with "Method for Determination of Inorganic Anions by Ion Chromatography", EPA 600/84-017.

1. Holding Time

Analyses met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limits.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

SAMPLE RESULTS

METHOD 300.0
CHLORIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F064

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICF011WB	ND	1	NA	.2	.1	06/07/0510:32	NA	AF07-04	AF07-01	ICF011W	NA	NA
LCST1W	ICF011WL	4.96	1	NA	.2	.1	06/07/0510:46	NA	AF07-05	AF07-01	ICF011W	NA	NA
LCST1W	ICF011WC	4.96	1	NA	.2	.1	06/07/0511:00	NA	AF07-06	AF07-01	ICF011W	NA	NA
HW1	F064-01	26.4	5	NA	1	.5	06/07/0511:28	NA	AF07-07	AF07-01	ICF011W	06/05/05	06/07/05

8017

see

METHOD 300.0
NITRATE-N

Matrix : WATER
Instrument ID : 100

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F064

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICF011WB	ND	1	NA	.1	.05	06/07/0510:32	NA	AF07-04	AF07-01	ICF011W	NA	NA
LCS1W	ICF011WL	4.82	1	NA	.1	.05	06/07/0510:46	NA	AF07-05	AF07-01	ICF011W	NA	NA
LCD1W	ICF011WC	4.83	1	NA	.1	.05	06/07/0511:00	NA	AF07-06	AF07-01	ICF011W	NA	NA
MW1	F064-01	1.32	1	NA	.1	.05	06/07/0510:17	NA	AF07-03	AF07-01	ICF011W	06/05/05	06/07/05

6018

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METHOD 300.0
NITRITE-N

Matrix : WATER
Instrument ID : 100

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F064

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICF011WB	ND	1	NA	.1	.05	06/07/0510:32	NA	AF07-04	AF07-01	ICF011W	NA	NA
LCS1W	ICF011WL	4.88	1	NA	.1	.05	06/07/0510:46	NA	AF07-05	AF07-01	ICF011W	NA	NA
LCD1W	ICF011WC	4.89	1	NA	.1	.05	06/07/0511:00	NA	AF07-06	AF07-01	ICF011W	NA	NA
MW1	F064-01	ND	1	NA	.1	.05	06/07/0510:17	NA	AF07-03	AF07-01	ICF011W	06/05/05	06/07/05

8019

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METHOD 300.0
SULFATE

Matrix : WATER
Instrument ID : 100

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F064

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICF011WB	ND	1	NA	.5	.25	06/07/0510:32	NA	AF07-04	AF07-01	ICF011W	NA	NA
LCS1W	ICF011WL	14.8	1	NA	.5	.25	06/07/0510:46	NA	AF07-05	AF07-01	ICF011W	NA	NA
LCD1W	ICF011WC	14.9	1	NA	.5	.25	06/07/0511:00	NA	AF07-06	AF07-01	ICF011W	NA	NA
MW1	F064-01	54.8	5	NA	2.5	1.25	06/07/0511:28	NA	AF07-07	AF07-01	ICF011W	06/05/05	06/07/05

8020

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QC SUMMARIES

BATTELLE MEMORIAL INSTITUTE

CLIENT:

PROJECT:

BATCH NO.:

METHOD: 300.0

MATRIX:

DILUTION FACTOR: 1

SAMPLE ID: MBLK1W

SAMPLE ID: ICF011WB

LAB SWF ID: AFD7-04

LAB FILE ID: A181 37
DATE EXTRACTED: NA

DATE EXTRACTED: 06/07/05
DATE ANALYZED: 06/07/05

DATE ANALYZED: 00/01/03
CDED BATCH: ICF011W

PREP. BA1CH: ICF011W
CALL TO DEF: AEOZ-01

CALIB. REF: AF07-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Chloride-Cl	ND	5	4.96	99	5	4.96	99	0	90-110	20

8022

11

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05F064

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICF011WC
LAB FILE ID: AF07-06
DATE EXTRACTED: NA
DATE ANALYZED: 06/07/0510:46
PREP. BATCH: ICF011W
CALIB. REF: AF07-01

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	5	4.82	96	5	4.83	97	0	90-110	20

8023

787

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

BATTELLE MEMORIAL INSTITUTE

CLIENT:

PROJECT: JPL

BATCH NO.: 05F064

METHOD: METHOD 300.0

% MOISTURE: NA

MATRIX: WATER

DILUTION FACTOR: 1

SAMPLE ID: MBLK1W

LAB SAMP ID: ICF011WB

LAB FILE ID: AF07-04

DATE EXTRACTED: NA

DATE ANALYZED: 06/07/0510:32

PREP. BATCH: ICF011W

CALIB. REF: AF07-01

ICF011WL

AF07-05

NA

06/07/0510:46

ICF011W

AF07-01

ICF011WC

AF07-06

NA

06/07/0511:00

ICF011W

AF07-01

DATE COLLECTED: NA

DATE RECEIVED: NA

ACCESSION:

PARAMETER

Nitrite-N

BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
ND	5	4.88	98	5	4.89	98	0	90-110	20

8024

km

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05F064

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICF011WL ICF011WC
LAB FILE ID: AF07-05 AF07-06
DATE EXTRACTED: NA
DATE ANALYZED: 06/07/0510:32 06/07/0511:00
PREP. BATCH: ICF011W ICF011W
CALIB. REF: AF07-01 AF07-01

% MOISTURE: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Sulfate	ND	15	14.8	99	15	14.9	99	0	90-110	20

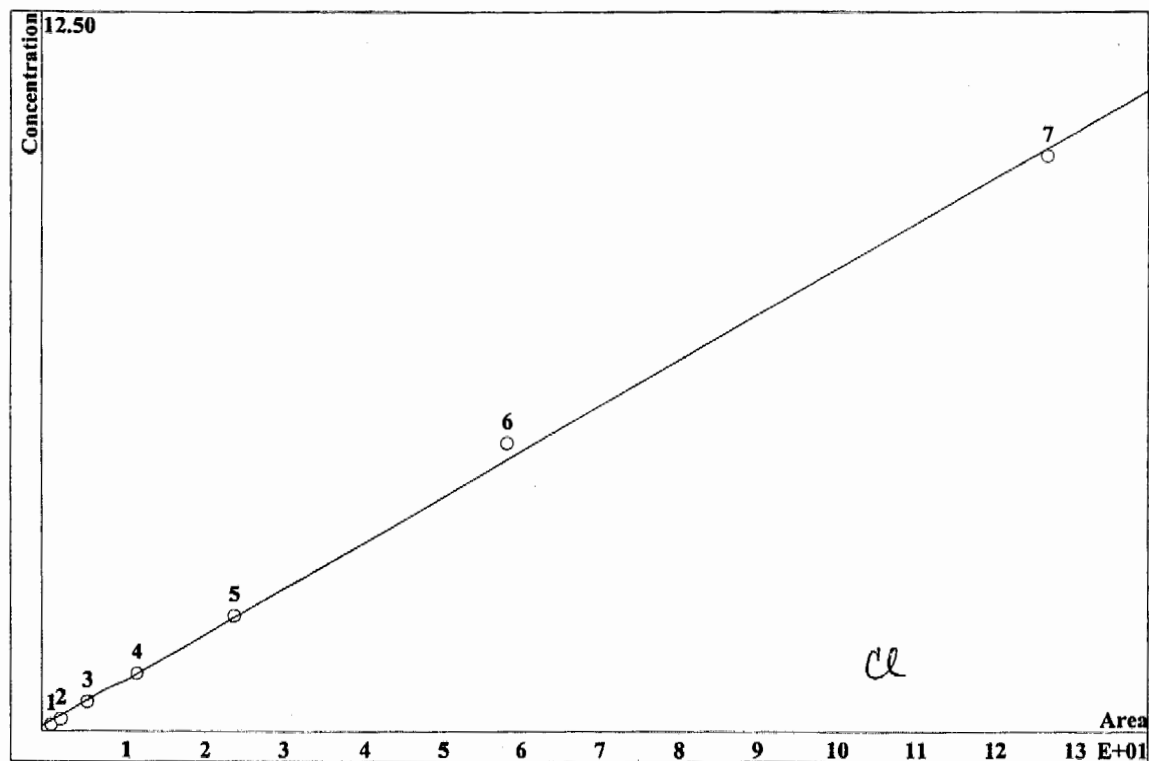
8025

721

INITIAL CALIBRATION

CALIBRATION OF COMPONENT chloride

Method: IC100-E23.mtw
 Equation: $Q = 0.0794095 \cdot A + 0.0841087$
 RSD: 5.497 %
 Correlation coefficient: 0.999317

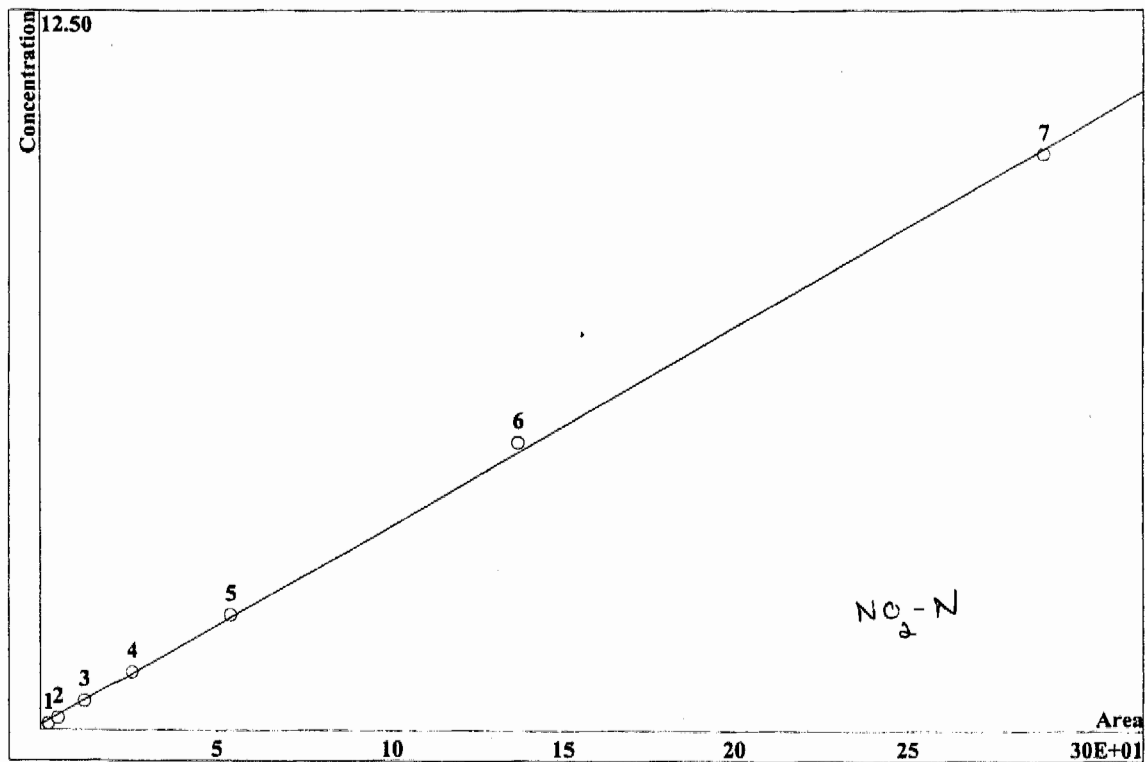


K3 = 0 K2 = 0 K1 = 0.0794095 K0 = 0.0841087
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.144	1.201 ✓	0.1	1	3.54	Yes	p5231616.chw
2	0.2844	2.348 ✓	0.2	1	3.54	Yes	p5231630.chw
3	0.691	5.671 ✓	0.5	1	3.54	Yes	p5231644.chw
4	1.368	11.4 ✓	1	1	3.54	Yes	p5231658.chw
5	2.938	23.82 ✓	2	1	3.54	Yes	p5231712.chw
6	7.344	58.38 ✓	5	1	3.54	Yes	p5231726.chw
7	16.43	126.5 ✓	10	1	3.54	Yes	p5231755.chw

CALIBRATION OF COMPONENT nitrite

Method: IC100-E23.mtw
 Equation: $Q = 0.034601 \cdot A + 0.0821293$
 RSD: 3.606 %
 Correlation coefficient: 0.999706



K3 = 0 K2 = 0 K1 = 0.034601 K0 = 0.0821293

Base: Area

Ref.channel: Cond

ISTD:

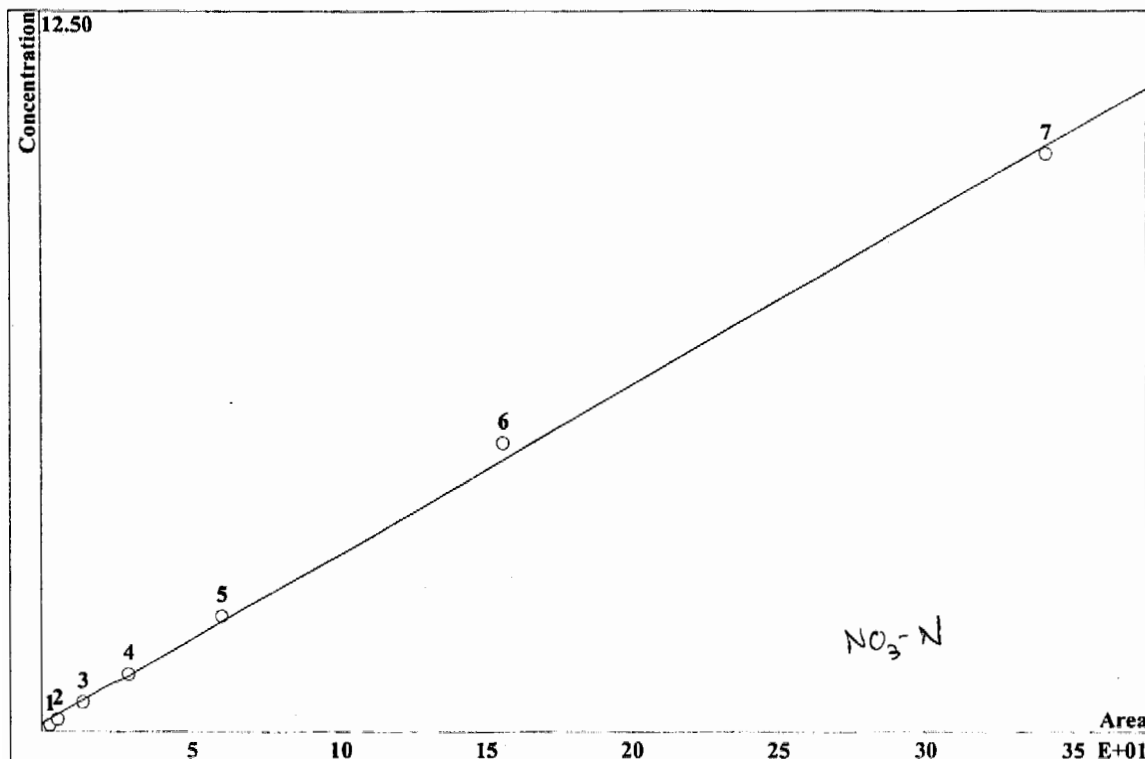
Formula: Linear

Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.253	2.457 ✓	0.1	1	4.24	Yes	p5231616.chw
2	0.53	5.182 ✓	0.2	1	4.24	Yes	p5231630.chw
3	1.3	12.79 ✓	0.5	1	4.24	Yes	p5231644.chw
4	2.581	25.57 ✓	1	1	4.24	Yes	p5231658.chw
5	5.528	54.26 ✓	2	1	4.24	Yes	p5231712.chw
6	13.58	137.3 ✓	5	1	4.24	Yes	p5231726.chw
7	27.15	289.1 ✓	10	1	4.24	Yes	p5231755.chw

CALIBRATION OF COMPONENT nitrate

Method: IC100-E23.mtw
 Equation: $Q = 0.0293514 \cdot A + 0.132291$
 RSD: 6.208 %
 Correlation coefficient: 0.999129



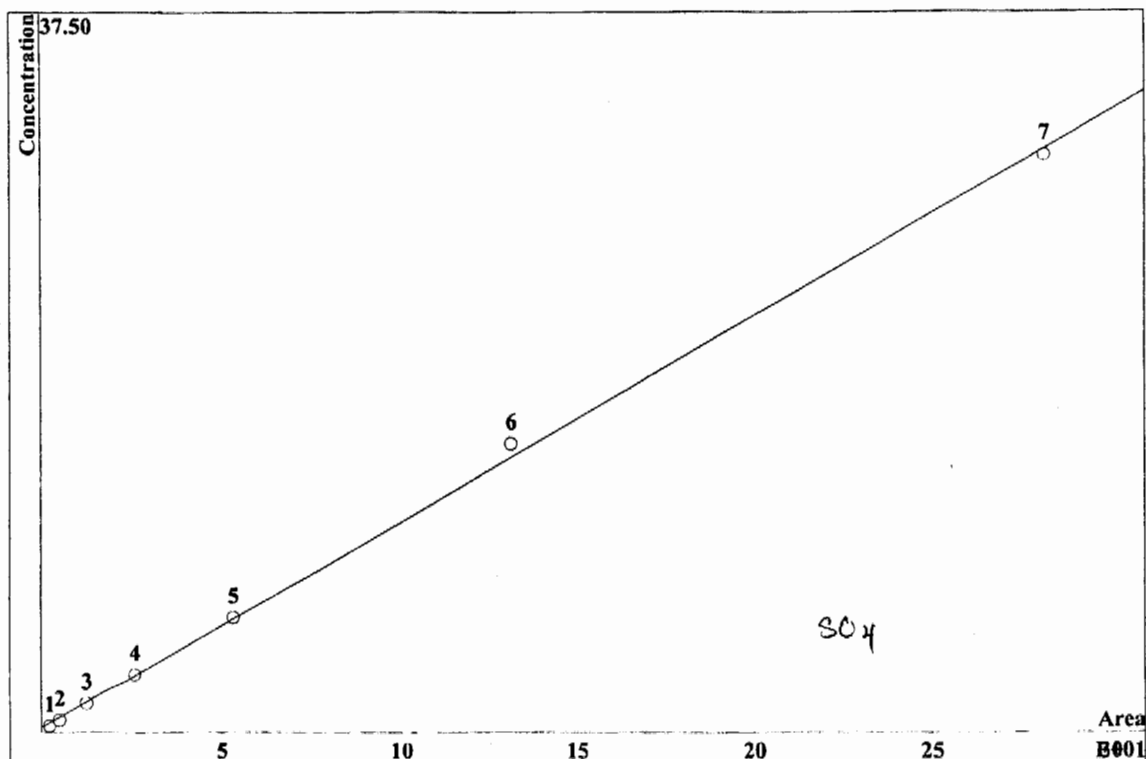
K3 = 0 K2 = 0 K1 = 0.0293514 K0 = 0.132291
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2107	2.88 ✓	0.1	1	6.07	Yes	p5231616.chw
2	0.4297	5.634 ✓	0.2	1	6.07	Yes	p5231630.chw
3	1.068	14.14 ✓	0.5	1	6.07	Yes	p5231644.chw
4	2.165	28.55 ✓	1	1	6.07	Yes	p5231658.chw
5	4.699	60.6 ✓	2	1	6.07	Yes	p5231712.chw
6	12.37	156 ✓	5	1	6.07	Yes	p5231726.chw
7	27.53	341.2 ✓	10	1	6.07	Yes	p5231755.chw

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CALIBRATION OF COMPONENT sulfate

Method: IC100-E23.mtw
 Equation: $Q = 0.106939 \cdot A + 0.221575$
 RSD: 4.572 %
 Correlation coefficient: 0.999528



K3 = 0 K2 = 0 K1 = 0.106939 K0 = 0.221575

Base: Area

Ref.channel: Cond

ISTD:

Formula: Linear

Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.1462	2.505 ✓	0.3	1	8.98	Yes	p5231616.chw
2	0.3032	5.252 ✓	0.6	1	8.98	Yes	p5231630.chw
3	0.7444	12.87 ✓	1.5	1	8.98	Yes	p5231644.chw
4	1.483	25.51 ✓	3	1	8.98	Yes	p5231658.chw
5	3.146	53.53 ✓	6	1	8.98	Yes	p5231712.chw
6	7.889	131.7 ✓	15	1	8.98	Yes	p5231726.chw
7	17.28	281.6 ✓	30	1	8.98	Yes	p5231755.chw

all
5/26/05

8030

SECOND SOURCE

IC Result Check Form											
LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AE23-01	1B	FCIBNPS	0	0	0	0	0	0	0	p5231548	1
AE23-02	S0	FCIBNPS	0	0	0	0	0	0	0	p5231602	1
AE23-03	S1	FCIBNPS	0.14971	0.1795	0.16713	0.11545	0.21682	0.15242	0.48945	p5231616	1
AE23-04	S2	FCIBNPS	0.23859	0.27058	0.26142	0.21108	0.29766	0.2482	0.78322	p5231630	1
-05	S3	FCIBNPS	0.50007	0.53447	0.52479	0.50327	0.54746	0.51511	1.5975	p5231644	1
-06	S4	FCIBNPS	0.99644	0.98902	0.9668	0.99627	0.97025	0.97995	2.9492	p5231658	1
AE23-07	S5	FCIBNPS	2.0111	1.9753	1.9595	2.0554	1.9109	1.9657	5.9457	p5231712	1
AE23-08	S6	FCIBNPS	4.8228	4.7198	4.8335	4.8645	4.7111	4.8697	14.304	p5231726	1
AE23-09	S7	FCIBNPS	10.081	10.131	10.087	10.054	10.146	10.069	30.331	p5231755	1
AE23-10	ICV	FCIBNPS	95.2%	94.5%	94.3%	97.1%	92.6%	93.6%	93.9%	p5231809	1
AE23-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p5231823	1

Report date: 5/23/2005 7:25:58 PM
Printed by: Cherry Dam

Ident: AE23-10 ICV
Analysis from: 5/23/2005 6:09:09 PM
File: p5231809.CHW

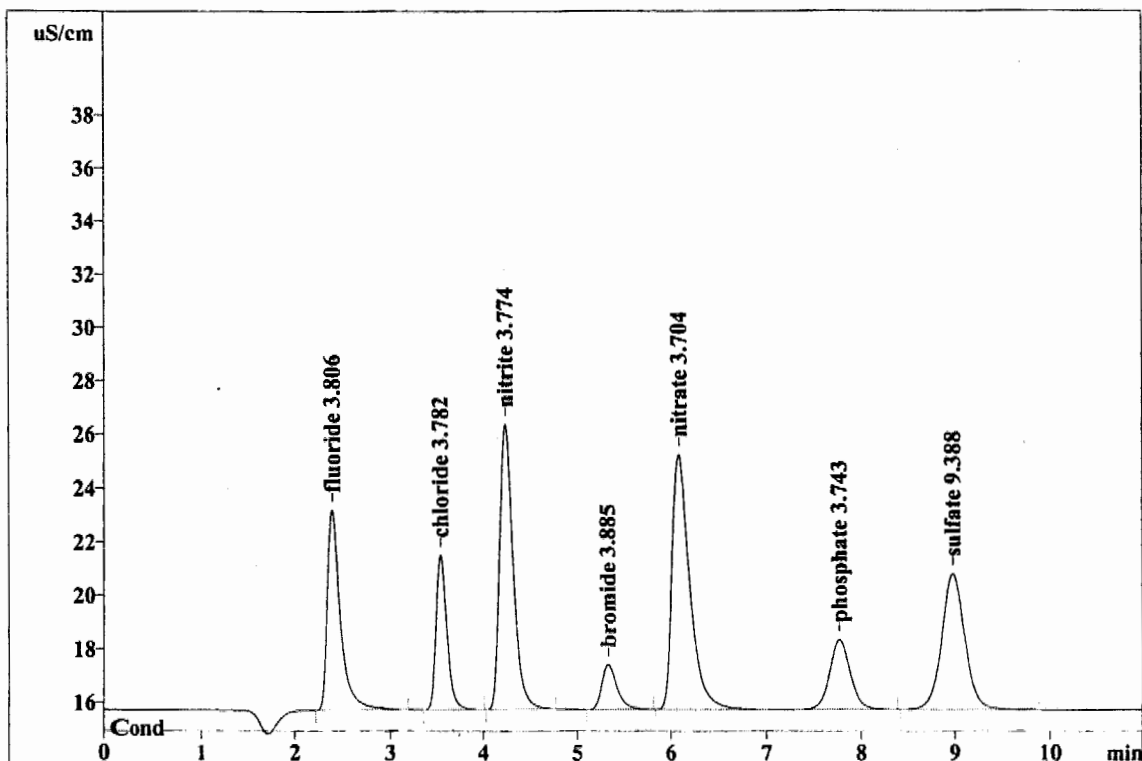
Last save: 5/23/2005 7:25:58 PM

Method: IC100-E23.mtw
Run operator: Cherry Dam
Analysis number: 1694

Last save: 5/23/2005 5:08:00 PM

SAMPLE:

Vial number: 10
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000



Quantitation method: Custom

No	Retention min	Height uS/cm	Area uS/cm*sec	Conc. mg/L	Name	% Rec.
1	2.39	7.48	71.163	3.806✓	fluoride	95
2	3.55	5.80	46.565	3.782✓	chloride	95
3	4.25	10.62	106.691	3.774✓	nitrite	94
4	5.34	1.68	19.215	3.885✓	bromide	97
5	6.09	9.52	121.691	3.704✓	nitrate	93
6	7.77	2.60	40.208	3.743✓	phosphate	94
7	8.98	5.08	85.716	9.388✓	sulfate	94
7	11.00	42.78	491.249	32.082		

This report has been created by IC Net
METROHM LTD

TV = 4 except SO₄ = 10

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5/26/05

8033

Report date: 5/23/2005 7:25:59 PM
Printed by: Cherry Dam

Ident: AE23-11 ICB
Analysis from: 5/23/2005 6:23:14 PM
File: p5231823.CHW

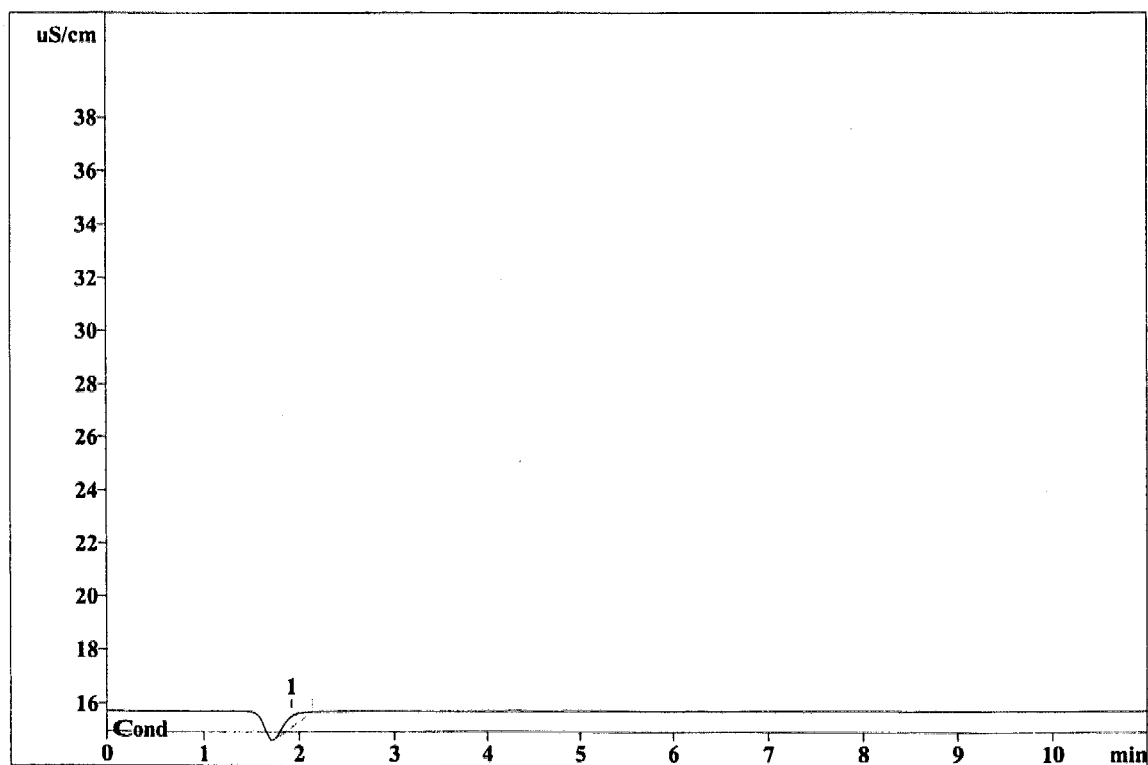
Last save: 5/23/2005 7:25:59 PM

Method: IC100-E23.mtw
Run operator: Cherry Dam
Analysis number: 1695

Last save: 5/23/2005 5:08:00 PM

SAMPLE:

Vial number: 11
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000



Quantitation method: Custom

No	Retention min	Height uS/cm	Area uS/cm*sec	Conc. mg/L	Name
1	1.92	0.41	5.585	0.000	

This report has been created by IC Net
METROHM LTD

per
5/26/05

8034

DAILY CALIBRATION

IC Result Check FormVersion : QE2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AF07-01	CCV60	FCIBNPS	99.2%	98.5%	97.3%	101.9%	94.6%	98.8%	99.2%	p6070949	1
AF07-02	CCB60	FCIBNPS	0	0	0	0	0	0	0	p6071003	1
AF07-13	CCV61	FCIBNPS	101.9%	98.8%	98.1%	102.5%	95.4%	98.3%	99.6%	p6071326	1
AF07-14	CCB61	FCIBNPS	0	0	0	0	0	0	0	p6071340	1
AF07-25	CCV62	FCIBNPS	100%	98.9%	97.2%	102.6%	95.6%	100.1%	99.9%	p6071637	1
AF07-26	CCB62	FCIBNPS	0	0	0	0	0	0	0	p6071651	1
AF07-33	CCV63	FCIBNPS	99.9%	98.8%	97.4%	102.7%	95.7%	100.6%	99.8%	p6071829	1
AF07-34	CCB63	FCIBNPS	0	0	0	0	0	0	0	p6071843	1
AF07-43	CCV64	FCIBNPS	101.2%	98.9%	97%	102.5%	95.5%	99%	99.8%	p6072119	1
AF07-44	CCB64	FCIBNPS	0	0	0	0	0	0	0	p6072133	1
AF07-55	CCV65	FCIBNPS	100.6%	99.2%	97.4%	102.6%	95.5%	99.2%	99.8%	p6080008	1
AF07-56	CCB65	FCIBNPS	0	0	0	0	0	0	0	p6080022	1
AF07-57	CCV66	FCIBNPS	95.9%	99.4%	97.6%	101.9%	96.7%	97.9%	99.2%	p6080036	1
AF07-58	CCB66	FCIBNPS	0	0	0	0	0	0	0	p6080050	1

ANALYTICAL LOG

8037

ANALYSIS RUN LOG FOR IC

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 05/23/05 Time: 15:43 Ending Date: 05/23/05 Time: 21:12 Book # A22-025

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Notes
* 1	AE23-01	ICB	1	✓	
* 2	02	SD			
* 3	03	1			
* 4	04	2			
* 5	05	3			
* 6	06	4			
* 7	07	5			
* 8	08	6			
* 9	09	7			
* 10	10	ICV			
* 11	11	ICB			
* 12	12				
* 13	13				
* 14	14				
* 15	15				
* 16	16				
* 17	17				
* 18	18				
* 19	19				
* 20	20				

ANALYTICAL BATCH * IC

Instrument Number		22100 06/05/05						
INITIAL CALIBRATION REFERENCE								
Method File	IC 100 - E23.mhw	Date						
ICAL ID	SW5B-12-298-294	05/23/05						
ICV ID	295-301	↓						
Standards-A								
Name	ID	Conc. (mg/L)						
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄
ICAL	S ₁	SW5B-12-298	0.1					0.3
	S ₂	294	0.2					0.6
	S ₃	290	0.5					1.5
	S ₄	291	1					3
	S ₅	292	2					6
	S ₆	293	5					15
	S ₇	294	10					30
ICV	ICV	SW5B-12-295-301	0.1					10
CCV	CCV							
LCS	LCS							
AMS	AMS							
Standards-B								
Name	ID	Conc. (mg/L)						
		BrO ₃	DCA	ClO ₃				
ICAL	S ₁							
	S ₂							
	S ₃							
	S ₄							
ICV	ICV	SW5B-12-295-301	0.1					
CCV	CCV							
LCS	LCS							

Comments:

Analyzed By: 02

This page is checked during the data review process.

ANALYSIS LOG FOR IC

age 9

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0

Time: 01:04

Book # A100-001

Ending Date: 06/08/05

Time: 04:40

Start Date: 06/07/05

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix		Notes
				S	W	
* 1	AF07-01	QCV60	1		✓	
* 2	01	QCB60				
* 3	03	F064-01				
* 4	04	ICF011WB				
* 5	05	WL				
* 6	06	WL				
* 7	07	F064-01	5			
* 8	08	F063-01	1			
* 9	09	02				
* 10	10	03				
* 11	11	04				
* 12	12	RINSE				
* 13	13	QCV61				
* 14	14	QCB61				
* 15	15	F063-04D				
* 16	16	04M				
* 17	17	05				
* 18	18	E103-01	5			
* 19	19	F067-02	1			
* 20	20	03				
* 21	21	05				
* 22	22	15				
* 23	23	F441-01				
* 24	24	RINSE				
* 25	25	QCV62				
* 26	26	QCB62				
* 27	27	F441-02				
* 28	28	RINSE				
* 29	29	ICF012WB				
** 30	30	WL				

ANALYTICAL BATCH * IC F011W ** IC F012W

6039

Instrument Number		22 100 OL OL							
INITIAL CALIBRATION REFERENCE									
Method File	IC100-E23.mtw	Date							
ICAL ID	SW5B-12-208-294	05/23/05							
ICV ID	SW5B-12-245-301	05/23/05							
Standards-A									
Name	ID	Conc. (mg/L)							
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄	
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
	S ₅								
ICV									
CCV	SW5B-12-435-438	5	5	5	5	5	5	5	15
LCS	SW5B-12-439-442								
MS xDF	LCS SOURCE								
Standards-B									
Name	ID	Conc. (mg/L)							
		BrO ₃	DCA	ClO ₃					
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
ICV									
CCV									
LCS									
Comments:									

Comments:

Analyzed By: OL

This page is checked during the data review process.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05F064**

METHOD 314.0 PERCHLORATE

One (1) water sample was received on 06/07/05 for Perchlorate analysis by Method 314.0 in accordance with "Method for Determination of Perchlorate by Ion Chromatography", EPA 600/98-118.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at half of the method reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control sample results were within QC limits.

4. Duplicate

No Duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

SAMPLE RESULTS

METHOD --+.0
PERCHLORATE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F064

Matrix : WATER
Instrument ID : T1057

SAMPLE ID	EMAX SAMPLE ID	RESULTS (ug/L)	DLF	MOIST	RL (ug/L)	MDL (ug/L)	Analysis DATETIME	Extraction DATETIME	LFID	CAL REF	PREP BATCH	Collection DATETIME	Received DATETIME
MBLK1W	PCF004WB	ND	1	NA	2	.5	06/07/0501:06	NA	JF06-28	JF06-27	PCF004W	NA	NA
LCS1W	PCF004WL	8.44	1	NA	2	.5	06/07/0501:26	NA	JF06-29	JF06-27	PCF004W	NA	NA
LCD1W	PCF004WC	9.78	1	NA	2	.5	06/07/0501:46	NA	JF06-30	JF06-27	PCF004W	NA	NA
MU1	F064-01	ND	1	NA	2	.5	06/07/0511:55	NA	JF06-44	JF06-43	PCF004W	06/05/05	06/07/05

8042

W

QC SUMMARY

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05F064
METHOD: METHOD 314.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: PCF004WB
LAB FILE ID: JF06-28
DATE EXTRACTED: NA
DATE ANALYZED: 06/07/0501:06
PREP. BATCH: PCF004W
CALIB. REF: JF06-27

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Perchlorate	ND	10	8.44	84	10	9.78	98	15	80-120	20

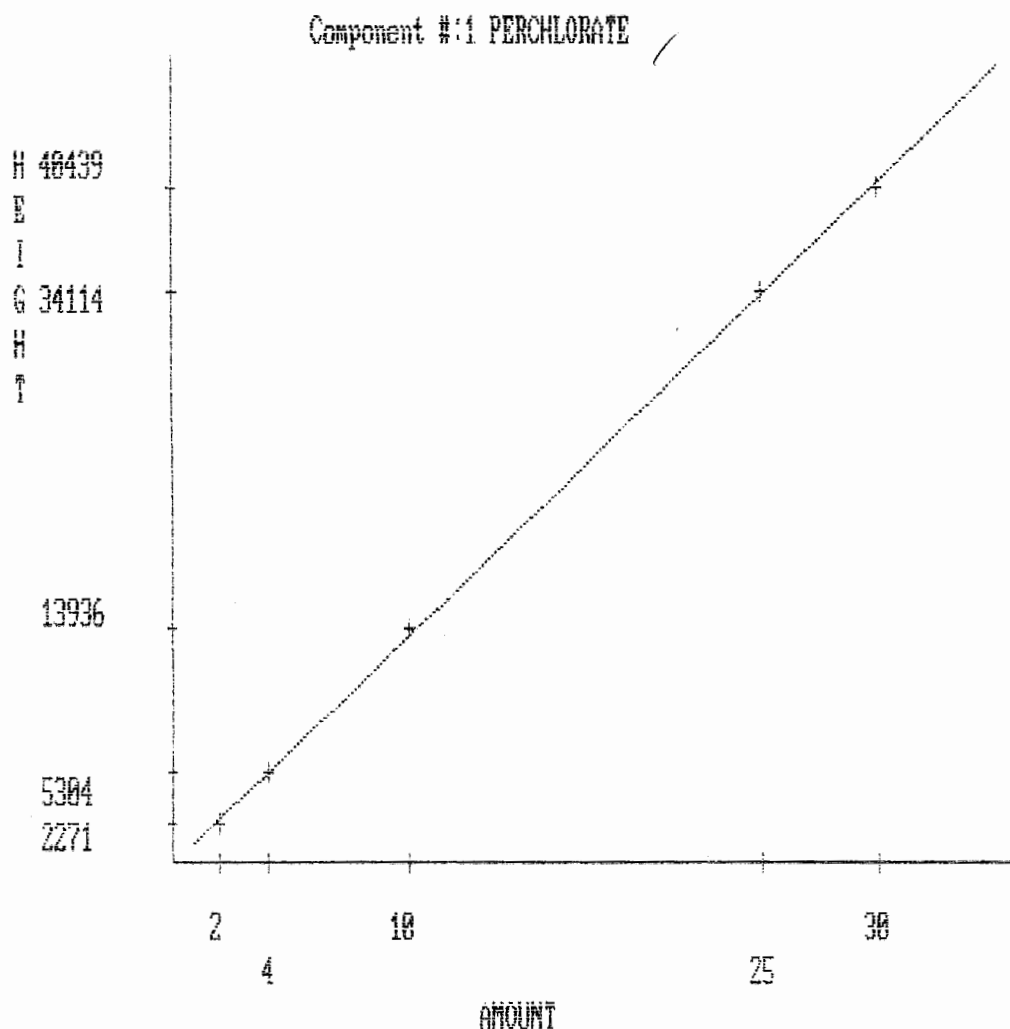
8044

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INITIAL CALIBRATION

INDX	LSID	LFID	DF	METNAME	SELCOMP	DateTime
1	IB	JC22-1	1	IC57C22	ALL	03/22/0512:32
2	S-0.0	JC22-2	1	IC57C22	ALL	03/22/0512:52
3	S-2.0	JC22-3	1	IC57C22	ALL	02/22/0522:36
	S-4.0	JC22-4	1	IC57C22	ALL	03/22/0513:33
5	S-10.0	JC22-5	1	IC57C22	ALL	03/22/0513:53
6	S-25.0	JC22-6	1	IC57C22	ALL	03/22/0514:13
7	S-30.0	JC22-7	1	IC57C22	ALL	03/22/0514:33
8	ICV	JC22-8	1	IC57C22	ALL	03/22/0515:52
9	ICB	JC22-9	1	IC57C22	ALL	03/22/0516:12
10	IPCS	JC22-10	1	IC57C22	ALL	03/22/0516:34
11	PC007WB	JC22-11	1	IC57C22	ALL	03/22/0516:55
12	MRL	JC22-12	1	IC57C22	ALL	03/22/0517:15
13	PCC007WL	JC22-13	1	IC57C22	ALL	03/22/0517:35
14	PCC007WC	JC22-14	1	IC57C22	ALL	03/22/0518:22
15	C135-01	JC22-15	1	IC57C22	ALL	03/22/0518:42
16	C135-02	JC22-16	1	IC57C22	ALL	03/22/0519:38
17	C135-02D	JC22-17	1	IC57C22	ALL	03/22/0519:59
18	C135-02M	JC22-18	1	IC57C22	ALL	03/22/0520:19
19	CCV1-15	JC22-19	1	IC57C22	ALL	03/22/0520:39
20	C141-11	JC22-20	1	IC57C22	ALL	03/22/0520:59
21	C141-12	JC22-21	1	IC57C22	ALL	03/22/0521:20
22	C141-13	JC22-22	1	IC57C22	ALL	03/22/0521:40
23	C141-14	JC22-23	1	IC57C22	ALL	03/22/0522:00
24	CCV2-30	JC22-24	1	IC57C22	ALL	03/22/0522:20
25	PCC008SB	JC22-25	1	IC57C22	ALL	03/22/0522:41
26	PCC008SL	JC22-26	1	IC57C22	ALL	03/22/0523:01
27	PCC008SC	JC22-27	1	IC57C22	ALL	03/22/0523:21
28	C041-01	JC22-28	10	IC57C22	ALL	03/22/0523:41
29	C041-02	JC22-29	10	IC57C22	ALL	03/23/0500:02
30	C041-03	JC22-30	10	IC57C22	ALL	03/23/0500:22
31	C041-04	JC22-31	10	IC57C22	ALL	03/23/0500:42
32	C041-05	JC22-32	10	IC57C22	ALL	03/23/0501:02
33	C041-06	JC22-33	10	IC57C22	ALL	03/23/0501:23
34	C041-07	JC22-34	10	IC57C22	ALL	03/23/0501:43
35	CCV3-15	JC22-35	1	IC57C22	ALL	03/23/0502:03
3	C041-08	JC22-36	10	IC57C22	ALL	03/23/0502:23
3	C041-09	JC22-37	10	IC57C22	ALL	03/23/0502:44
38	C041-10	JC22-38	10	IC57C22	ALL	03/23/0503:04
39	C041-11	JC22-39	10	IC57C22	ALL	03/23/0503:24
40	C041-11D	JC22-40	10	IC57C22	ALL	03/23/0503:44
41	C041-11M	JC22-41	10	IC57C22	ALL	03/23/0504:05
42	C041-12	JC22-42	10	IC57C22	ALL	03/23/0504:25
43	C041-13	JC22-43	10	IC57C22	ALL	03/23/0504:45
44	C041-14	JC22-44	10	IC57C22	ALL	03/23/0505:05
45	C041-15	JC22-45	10	IC57C22	ALL	03/23/0505:26
46	CCV4-30	JC22-46	1	IC57C22	ALL	03/23/0505:46
47	PCC009SB	JC22-47	1	IC57C22	ALL	03/23/0506:06
48	PCC009SL	JC22-48	1	IC57C22	ALL	03/23/0506:26
49	PCC009SC	JC22-49	1	IC57C22	ALL	03/23/0506:47
50	C041-16	JC22-50	10	IC57C22	ALL	03/23/0507:07
51	C041-17	JC22-51	10	IC57C22	ALL	03/23/0507:27
52	C041-18	JC22-52	10	IC57C22	ALL	03/23/0507:47
53	C041-19	JC22-53	10	IC57C22	ALL	03/23/0508:08
54	C041-20	JC22-54	10	IC57C22	ALL	03/23/0508:28
55	C041-21	JC22-55	10	IC57C22	ALL	03/23/0508:48
56	C041-22	JC22-56	10	IC57C22	ALL	03/23/0509:08
57	C041-23	JC22-57	10	IC57C22	ALL	03/23/0509:29
58	CCV5-15	JC22-58	1	IC57C22	ALL	03/23/0509:50

Method IC57C22 ✓
Sample CL04
Operator JKN
Run date 03-22-2005 14:53:31 Version: 142
Printed on 03-22-2005 AT 14:53:44
Straight Line fit



Component 1 = PERCHLORATE
EXTERNAL STANDARD CALIBRATION

LEVEL	AMOUNT	HEIGHT
1	2.0000	2271 ✓
2	4.0000	5304 ✓
3	10.0000	13936 ✓
4	25.0000	34114 ✓
5	30.0000	40439 ✓

Handwritten signature 3/22/05

Y = SLOPE * X + INTERCEPT

Height = $1.3615E+03 * \text{Amount} + -1.2108E+02$
Amount = $7.3446E-04 * \text{Height} + 8.8928E-02$
R squared = 0.9996 ✓

8047

SECOND SOURCE

IC RESULT FORM

LFID\$	LSID\$	DF\$	PERCHLORATE
JC22-1	IB	1	ND
JC22-2	S-0.0	1	ND
JC22-3	S-2.0	1	111%
JC22-4	S-4.0	1	127%
JC22-5	S-10.0	1	133%
JC22-6	S-25.0	1	129%
JC22-7	S-30.0	1	128%
JC22-8	ICV	1	99.3%
JC22-9	ICB	1	ND
JC22-10	IPCS	1	87%
JC22-11	PC007WB	1	ND
JC22-12	MRL	1	118%
JC22-13	PCC007WL	1	9.93
JC22-14	PCC007WC	1	9.35
JC22-15	C135-01	1	ND
JC22-16	C135-02	1	ND
JC22-17	C135-02D	1	ND
JC22-18	C135-02M	1	7.5
JC22-19	CCV1-15	1	88.3%
JC22-20	C141-11	1	7.35
JC22-21	C141-12	1	ND
JC22-22	C141-13	1	ND
JC22-23	C141-14	1	ND
JC22-24	CCV2-30	1	101%
JC22-25	PCC008SB	1	ND
JC22-26	PCC008SL	1	10.4
JC22-27	PCC008SC	1	10.3
JC22-28	C041-01	10	ND
JC22-29	C041-02	10	ND
JC22-30	C041-03	10	ND
JC22-31	C041-04	10	ND
JC22-32	C041-05	10	ND
JC22-33	C041-06	10	ND
JC22-34	C041-07	10	ND
JC22-35	CCV3-15	1	100%
JC22-36	C041-08	10	ND
JC22-37	C041-09	10	ND
JC22-38	C041-10	10	ND
JC22-39	C041-11	10	ND
JC22-40	C041-11D	10	ND
JC22-41	C041-11M	10	97.2
JC22-42	C041-12	10	43.1
JC22-43	C041-13	10	ND
JC22-44	C041-14	10	ND
JC22-45	C041-15	10	ND
JC22-46	CCV4-30	1	99.7%
JC22-47	PCC009SB	1	ND
JC22-48	PCC009SL	1	10.3
JC22-49	PCC009SC	1	10.1
JC22-50	C041-16	10	ND
JC22-51	C041-17	10	ND
JC22-52	C041-18	10	ND
JC22-53	C041-19	10	ND
JC22-54	C041-20	10	ND
JC22-55	C041-21	10	ND
JC22-56	C041-22	10	ND
JC22-57	C041-23	10	ND
JC22-58	CCV5-15	1	99.9%

DAILY CALIBRATION

8050

INDX	LSID	LFID	DF	METNAME	SELCOMP	DateTime
1	IPCS	JF06-1	1	IC57C22	ALL	06/06/0514:45
2	PCF003WB	JF06-2	1	IC57C22	ALL	06/06/0515:05
3	MRL	JF06-3	1	IC57C22	ALL	06/06/0515:25
4	PCF003WL	JF06-4	1	IC57C22	ALL	06/06/0515:45
5	PCF003WC	JF06-5	1	IC57C22	ALL	06/06/0516:06
6	E116-08	JF06-6	1	IC57C22	ALL	06/06/0516:26
7	E140-01	JF06-7	1	IC57C22	ALL	06/06/0516:46
8	E140-02	JF06-8	1	IC57C22	ALL	06/06/0517:06
9	E140-03	JF06-9	1	IC57C22	ALL	06/06/0517:27
10	E140-04	JF06-10	1	IC57C22	ALL	06/06/0517:47
11	E140-05	JF06-11	1	IC57C22	ALL	06/06/0518:07
12	E140-05D	JF06-12	1	IC57C22	ALL	06/06/0518:27
13	E140-05M	JF06-13	1	IC57C22	ALL	06/06/0518:48
14	E153-01	JF06-14	1	IC57C22	ALL	06/06/0520:00
15	E153-02	JF06-15	1	IC57C22	ALL	06/06/0520:43
16	CCV33-15	JF06-16	1	IC57C22	ALL	06/06/0521:03
17	E153-03	JF06-17	1	IC57C22	ALL	06/06/0521:23
18	E153-04	JF06-18	1	IC57C22	ALL	06/06/0521:43
19	E153-05	JF06-19	1	IC57C22	ALL	06/06/0522:04
20	E175-01	JF06-20	1	IC57C22	ALL	06/06/0522:24
21	E175-02	JF06-21	1	IC57C22	ALL	06/06/0522:44
22	E175-03	JF06-22	1	IC57C22	ALL	06/06/0523:04
23	E175-04	JF06-23	1	IC57C22	ALL	06/06/0523:25
24	E175-05	JF06-24	1	IC57C22	ALL	06/06/0523:45
25	E175-06	JF06-25	1	IC57C22	ALL	06/07/0500:05
26	E175-07	JF06-26	1	IC57C22	ALL	06/07/0500:25
27	CCV34-30	JF06-27	1	IC57C22	ALL	06/07/0500:46
28	PCF004WB	JF06-28	1	IC57C22	ALL	06/07/0501:06
29	PCF004WL	JF06-29	1	IC57C22	ALL	06/07/0501:26
30	PCF004WC	JF06-30	1	IC57C22	ALL	06/07/0501:46
31	E189-01	JF06-31	1	IC57C22	ALL	06/07/0502:07
32	E189-02	JF06-32	1	IC57C22	ALL	06/07/0502:27
33	E189-03	JF06-33	1	IC57C22	ALL	06/07/0502:47
34	E189-04	JF06-34	1	IC57C22	ALL	06/07/0503:07
35	E183-01	JF06-35	1	IC57C22	ALL	06/07/0503:28
36	E183-02	JF06-36	1	IC57C22	ALL	06/07/0503:48
37	E183-02D	JF06-37	1	IC57C22	ALL	06/07/0504:08
38	E183-02M	JF06-38	1	IC57C22	ALL	06/07/0504:28
39	E183-03	JF06-39	1	IC57C22	ALL	06/07/0504:49
40	E183-04	JF06-40	1	IC57C22	ALL	06/07/0505:09
41	CCV35-15	JF06-41	1	IC57C22	ALL	06/07/0505:29
42	CCB35-15	JF06-42	1	IC57C22	ALL	06/07/0505:49
43	CCV36-30	JF06-43	1	IC57C22	ALL	06/07/0511:35
44	F064-01	JF06-44	1	IC57C22	ALL	06/07/0511:55
45	E244-01	JF06-45	1	IC57C22	ALL	06/07/0512:19
46	E244-02	JF06-46	1	IC57C22	ALL	06/07/0512:39
47	E244-03	JF06-47	1	IC57C22	ALL	06/07/0512:59
48	E244-04	JF06-48	1	IC57C22	ALL	06/07/0513:20
49	E244-05	JF06-49	1	IC57C22	ALL	06/07/0513:40
50	E244-06	JF06-50	1	IC57C22	ALL	06/07/0514:00
51	E244-06D	JF06-51	1	IC57C22	ALL	06/07/0514:20
52	E244-06M	JF06-52	1	IC57C22	ALL	06/07/0514:41
53	E244-06S	JF06-53	1	IC57C22	ALL	06/07/0515:01
54	CCV37-15	JF06-54	1	IC57C22	ALL	06/07/0515:21
55	PCF005WB	JF06-55	1	IC57C22	ALL	06/07/0515:41
56	PCF005WL	JF06-56	1	IC57C22	ALL	06/07/0516:02
57	PCF005WC	JF06-57	1	IC57C22	ALL	06/07/0516:22
58	E200-01	JF06-58	1	IC57C22	ALL	06/07/0516:42
59	E200-02	JF06-59	1	IC57C22	ALL	06/07/0517:04
60	E200-03	JF06-60	1	IC57C22	ALL	06/07/0517:24
61	E200-04	JF06-61	1	IC57C22	ALL	06/07/0517:44
62	E200-05	JF06-62	1	IC57C22	ALL	06/07/0518:05
63	E200-06	JF06-63	1	IC57C22	ALL	06/07/0518:25
64	E200-07	JF06-64	1	IC57C22	ALL	06/07/0518:46
65	E213-08	JF06-65	1	IC57C22	ALL	06/07/0519:06
66	E200-05	JF06-66	10	IC57C22	ALL	06/07/0519:26
67	E200-03	JF06-67	4	IC57C22	ALL	06/07/0519:46
68	E200-08	JF06-68	20	IC57C22	ALL	06/07/0520:07
69	CCV38-30	JF06-69	1	IC57C22	ALL	06/07/0520:27

IC RESULT FORM

LFID\$	LSID\$	DF\$	PERCHLORATE
JF06-1	IPCS	1	87%
JF06-2	PCF003WB	1	ND
JF06-3	MRL	1	117%
JF06-4	PCF003WL	1	10.5
JF06-5	PCF003WC	1	10.3
JF06-6	E116-08	1	ND
JF06-7	E140-01	1	ND
JF06-8	E140-02	1	ND
JF06-9	E140-03	1	ND
JF06-10	E140-04	1	ND
JF06-11	E140-05	1	ND
JF06-12	E140-05D	1	.993
JF06-13	E140-05M	1	10.8
JF06-14	E153-01	1	ND
JF06-15	E153-02	1	ND
JF06-16	CCV33-15	1	102%
JF06-17	E153-03	1	ND
JF06-18	E153-04	1	ND
JF06-19	E153-05	1	ND
JF06-20	E175-01	1	ND
JF06-21	E175-02	1	ND
JF06-22	E175-03	1	ND
JF06-23	E175-04	1	ND
JF06-24	E175-05	1	ND
JF06-25	E175-06	1	ND
JF06-26	E175-07	1	ND
JF06-27	CCV34-30	1	94.9%
JF06-28	PCF004WB	1	ND
JF06-29	PCF004WL	1	8.44
JF06-30	PCF004WC	1	9.78
JF06-31	E189-01	1	1.07
JF06-32	E189-02	1	ND
JF06-33	E189-03	1	1.4
JF06-34	E189-04	1	ND
JF06-35	E183-01	1	4.05
JF06-36	E183-02	1	2.49
JF06-37	E183-02D	1	2.31
JF06-38	E183-02M	1	12.7
JF06-39	E183-03	1	.842
JF06-40	E183-04	1	1.13
JF06-41	CCV35-15	1	101%
JF06-42	CCB35-15	1	ND
JF06-43	CCV36-30	1	102%
JF06-44	F064-01	1	ND
JF06-45	E244-01	1	ND
JF06-46	E244-02	1	ND
JF06-47	E244-03	1	2.51
JF06-48	E244-04	1	ND
JF06-49	E244-05	1	ND
JF06-50	E244-06	1	ND
JF06-51	E244-06D	1	ND
JF06-52	E244-06M	1	9.82
JF06-53	E244-06S	1	10.1
JF06-54	CCV37-15	1	102%
JF06-55	PCF005WB	1	ND
JF06-56	PCF005WL	1	10.1
JF06-57	PCF005WC	1	10.1
JF06-58	E200-01	1	ND
JF06-59	E200-02	1	1.34
JF06-60	E200-03	1	41.4
JF06-61	E200-04	1	12.5
JF06-62	E200-05	1	32.7
JF06-63	E200-06	1	ND
JF06-64	E200-07	1	ND
JF06-65	E213-08	1	52.5
JF06-66	E200-05	10	43
JF06-67	E200-03	4	40.4
JF06-68	E200-08	20	138
JF06-69	CCV38-30	1	101%

ANALYTICAL LOGS

ANALYSIS RUN LOG FOR IC - PERCHLORATE

SOP ☒ EMAX-314.0 Revision No. 2.0

Book # A57-008

Start Date 3/22/05 Time 12:32 Ending Date 3/23/05 Time 09:50

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Conductivity, (us/cm)	Notes	Instrument Number	57
* 1	IC22-1	1B	1	X				
* 2	2	S-0.0						
* 3	3	S-0.0						
* 4	4	S-4.0						
* 5	5	S-10.0						
* 6	6	S-25.0						
* 7	7	S-30.0						
* 8	8	ICV						
* 9	9	ICV						
* 0	10	ICV						
* 1	11	ICV						
* 2	12	MRL						
* 3	13	PC0007W						
* 4	14	W						
* 5	15	CL35-01						
* 6	16	02						
* 7	17	02D						
* 8	18	02M						
* 9	19	CCV1-15						
* 0	20	0141-11						
* 1	21	12						
* 2	22	13						
* 3	23	14						
* 4	24	CCV2-30						
* 5	25	PC0007W						
* 6	26	24						
* 7	27	56						
* 8	28	0041-01	10					
* 9	29	02						
* 0	30	03						

INITIAL CALIBRATION REFERENCE	
Method File	1057022.MET
ICAL ID	SWBB-02-695
ICV ID	SWBB-02-696

Standards	
Name	ID
ICAL S1	SWBB-02-695
S2	
S3	
S4	
S5	
Conc. (ug/L)	
	2
	4
	10
	25
	30
	25
	15
	30
	10
	10
	600/25
	1413.45/cm

Comments:	
CMC Reading (us/cm)	1404
QC Criteria (us/cm)	±30
Temp. (°C)	25°C
Electronic Data Archival	
Location	Date

Analyzed By: <u> r </u>	
This page is checked during the data review process.	

ANALYSIS RUN LOG FOR IC - PERCHLORATE

SOP ☒ EMAX-314.0 Revision No. 2 ☐

Book # A57-008

Start Date 6/6/05		Time 14:45		Ending Date 6/7/05		Time 20:27	
Sample Prep ID		Data File Name	Lab Sample ID	DF	Matrix S W	Conductivity, (us/cm)	Notes
* 1	JF06-1		1805	1	X		
* 2		2	PCF003WB				* BAH
* 3		3	MPL				
* 4		4	PCF003WL				* BAH
* 5		5	↓ WC				
* 6		6	E116-08			1450	
* 7		7	E140-01			1121	
* 8		8	02			7100	
* 9		9	03			854	
* 0		10	04			581	
* 1		11	05				
* 2		12	↓ 05D				
* 3		13	05M				
* 4		14	E153-01			1432	
* 5		15	↓ 02			1425	✓
* 6		16	CCV33-15				
* 7		17	E153-03				
* 8		18	↓ 04			531	* BAH
* 9		19	↓ 05			762	
* 0		20	E175-01			719	
* 1		21	02			2060	
* 2		22	03			549	
* 3		23	04			470	
* 4		24	05			985	
* 5		25	06			1030	
* 6		26	↓ 07			1215	✓
* 7		27	CCV34-30			1258	
* 8		28	PCF004WB				* BAH
* 9		29	↓ WL				
* 0		30	↓ WC				

INITIAL CALIBRATION REFERENCE	
Method File	IC57C22
ICAL ID	S608B-02-695
ICV ID	↓ 696

Standards		Conc. (ug/L)
Name	ID	
ICAL	S1	
	S2	
	S3	
	S4	
	S5	
ICV		
CCV-15	S608B-02-309	15
CCV-30	710	30
LCS	713	10
MS	712	10
IPC	708	600/25
CMC	S608B-02-565	1413 ug/cm

Comments:		
CMC Reading (us/cm)	QC Criteria (us/cm)	Temp. (°C)
1401	±30	25°C
Electronic Data Archival		
Location		Date

Analyzed By: <u> ✓ </u>	
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ANALYSIS RUN LOG FOR IC - PERCHLORATE

SOP **EMAX-314.0** **Revision No. 2** **□**

EMAX-314.0 Revision No. 2 □

Book # A57-008

Start Date	Time
6/6/05	(4:45)

Ending Date 6/7/05

Time 20:27

Sample		Data File Name	Lab Sample ID	DF	Matrix		Conductivity, (us/cm)	Notes
Prep ID	ID				S	W		
*1	1	DF06-31	E189-01	1	X		580	* BAH
*2	2	32	02				1780	*
*3	3	33	03				1800	*
*4	4	34	04				582	*
*5	5	35	E183-01				801	*
*6	6	36	02				835	*
*7	7	37	020					*
*8	8	38	02M					*
*9	9	39	03				748	*
*0	0	40	04				753	*
*1	1	41	CEV35-15					
*2	2	42	CB35-					
*3	3	43	CEV36-30					
*4	4	44	F064-01				738	* BAH
*5	5	45	E244-01				10.27	*
*6	6	46	02				150.6	*
*7	7	47	03				43.0	*
*8	8	48	04				151.3	*
*9	9	49	05				130.6	*
*0	0	50	06				130.2	*
*1	1	51	06D					*
*2	2	52	06M					*
*3	3	53	06S					*
*4	4	54	CEV37-15					
*5	5	55	PEF005UB					* BAH
*6	6	56	WL					*
*7	7	57	WL					*
*8	8	58	E20D-01				2.47	*
*9	9	59	02				6.13	*
*0	0	60	03				821	*

BATCH # PEF004W

*** PEF005W

Analyzed By:

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ANALYSIS RUN LOG FOR IC - PERCHLORATE

SOP ☒ EMAX-314.0 Revision No. 2 ☐

Book # AS7-008

Start Date 6/16/05

Time 14:45

Ending Date 6/17/05

Time 20:27

Instrument Number	57
-------------------	----

INITIAL CALIBRATION REFERENCE	
Method File	IC57C22
ICAL ID	SW88-02-675
ICV ID	↓ 676

Standards	
Name	ID
ICAL	S1
	S2
	S3
	S4
	S5
Conc. (ug/L)	

ICAL	S1	
	S2	
	S3	
	S4	
	S5	
ICV		
CCV-15	SW88-02-709	15
CCV-30	710	30
LCS	713	10
MS	712	10
IPC	708	600/25
CMC	SW38-02-565	1413 μs/cm

Comments:	
CMC Reading (us/cm)	QC Criteria (us/cm)
1401	±30
Temp. (°C)	
25°C	
Electronic Data Archival	
Location	Date

Analyzed By: Y

This page is checked during the data review process.

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Conductivity (us/cm)	Notes
* 1	JF06-61	E200-04	1	X	862	X B44
* 2	62	05	1		850.1	X
* 3	63	06	1		1656	X
* 4	64	07	1		652	X
* 5	65	08	1		904	X
* 6	66	05	10			X
* 7	67	03	4			X
* 8	68	08	20			X
* 9	69	SW38-30	1			X
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						

BATCH ***P2F005W **

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05F064**

METHOD 376.1 SULFIDE

One (1) water sample was received on 06/07/05 for Sulfide analysis by Method 376.1 in accordance with "Methods for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

8038

METHO. J.1
SULFIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F064

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	SDF003WB	ND	1	NA	1	.4	06/07/0511:30	NA	SDF003W-01	NA	SDF003W	NA	NA
LCS1W	SDF003WL	5.15	1	NA	1	.4	06/07/0511:33	NA	SDF003W-02	NA	SDF003W	NA	NA
LCD1W	SDF003WC	5.06	1	NA	1	.4	06/07/0511:36	NA	SDF003W-03	NA	SDF003W	NA	NA
MWT	F064-01	ND	1	NA	1	.4	06/07/0511:45	NA	SDF003W-06	NA	SDF003W	06/05/05	06/07/05

8059

24

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 376.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05F064
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: SDF003NL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 06/07/05 11:33/11:36

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Sulfide	ND	5.00	5.15	103	5.00	5.06	101	2	80-120	20

8060

7/1

ANALYSIS LOG FOR SULFIDE

SOP ☒ EMAX-376.1 Rev. No. 1 ☐ EMAX-9034 Rev. No. 0 ☐ Starting Date: 6-07-05 Time: 11:20 Ending Date: 6-07-05 Time: 11:45 Book # ASD-006

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Volume of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Notes	Standard	ID	Conc. (mg/L)
* 1	SDF-003 WB	11:20	100	10	10.2	NP	LCS	2074-06-178	5.0
* 2	WL	-33			4.9	5.15	Spike	NA	
* 3	WC	-36			4.8	5.06	Na ₂ S ₂ O ₃	5013B-02-697	0.00587
* 4	F037-12	-39			10.0	ND	PAO I ₂	↓ -696	0.00587
* 5	↓ -12 P	-42			10.1	ND	Indicator	2073-06-206	NA
* 6	F044-01	-45	100	10	10.2	NP			
* 7							STANDARDIZATION		
* 8							Vol. Of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Conc. Of Iodine (N)
* 9							10	10.4	0.00587
* 0							10	10.4	0.00587
* 1							10	10.4	0.00587
* 2									
* 3									
* 4									
* 5									
* 6									
* 7									
* 8									
* 9									
* 0									
* 1									
* 2									
* 3									
* 4									
* 5									
* 6									
* 7									
* 8									
* 9									
* 0									

ANALYTICAL BATCH * SDF 003W

8001

Comments:

Analyzed By: ku

This page is checked during data review.

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05F064

METHOD 351.3 TKN

One (1) water sample was received on 06/07/05 for TKN analysis by Method 351.3 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 351.3

TKN

Client : BATTELLE MEMORIAL INSTITUTE
 Project : JPL
 Batch No. : 05F064

Matrix : WATER
 Instrument ID : I70

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	KNF004WB	ND	1	NA	.1	.035	06/16/0518:10	06/16/0510:00	KNF004W-11	KNF004W-09	KNF004W	NA	06/16/05
LCS1W	KNF004WL	1.04	1	NA	.1	.035	06/16/0518:11	06/16/0510:00	KNF004W-12	KNF004W-09	KNF004W	NA	06/16/05
LCD1W	KNF004WC	1.06	1	NA	.1	.035	06/16/0518:12	06/16/0510:00	KNF004W-13	KNF004W-09	KNF004W	NA	06/16/05
MW1	F064-01	.135	1	NA	.1	.035	06/16/0518:23	06/16/0510:00	KNF004W-24	KNF004W-21	KNF004W	06/05/05	06/07/05

8083

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: METHOD 351.3

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05F064

SAMPLE ID: LCS1W/LCD1W

CONTROL NO.: KNF004ML/C

DATE RECEIVED: 06/16/05
DATE EXTRACTED: 06/16/05 10:00
DATE ANALYZED: 06/16/05 18:11/18:12

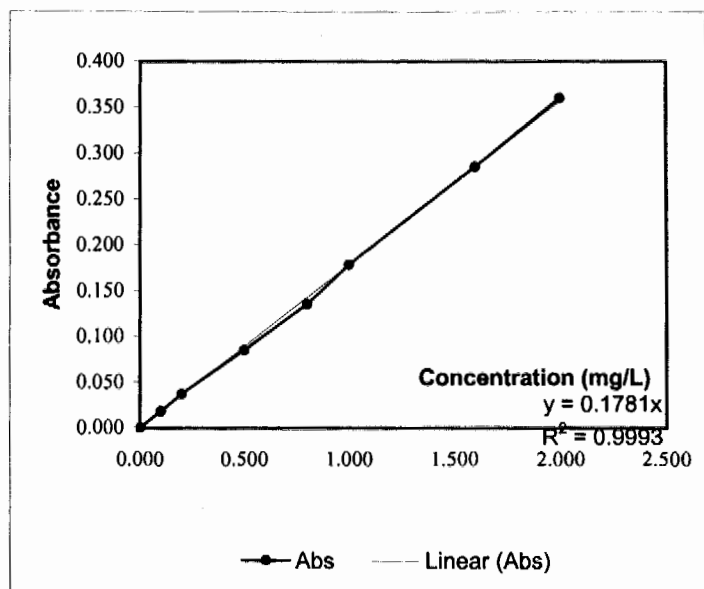
ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TKN	ND	1.00	1.04	104	1.00	1.06	106	2	80-120	20

8064

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.018
0.200	0.037
0.500	0.085
0.800	0.135
1.000	0.178
1.600	0.285
2.000	0.360



R^2 0.999344

y 0.1781

CF 5.6154

Comments: **PASSED**

Analyzed by: LA

8065

ANALYSIS LOG FOR TOTAL KJELDAHL NITROGEN (TKN)

Page 71

SOP ☒ EMAX-351.3 Rev. No. 1 ☐

Start Date: 6-16-05

Time: 18:00

End Date: 6-16-05

Time: 18:25

Book # A70-KN-004

Data File Name		Prep. Batch	Lab Sample ID	Matrix	Time	Vol. Colored (ml)	DF	Absorbance	Notes
S	W								
* 1		KNF004W	3-0.0		18:00	20		0.000	W/L
* 2			3-0.1		-01			0.000	
* 3			3-0.2		-02			0.000	
* 4			3-0.5		-03			0.000	
* 5			3-0.8		-04			0.135	
* 6			3-1.0		-05			0.174	
* 7			3-1.4		-06			0.285	
* 8			3-2.0		-07			0.360	
* 9			10V		-08			0.180	1.011
* 0			10V		-09			0.000	ND
* 11			KNF004W		-10			0.000	ND
* 12			W/L		-11			0.185	1.039
* 13			W/L		-12			0.188	1.057
* 4			F037-08		-13			0.000	0.112
* 5			-08D		-14			0.019	0.107
* 6			-08M		-15			0.208	1.468
* 7			-09		-16			0.043	0.241
* 8			-10		-17			0.026	0.146
* 9			-11		-18			0.060	0.337
* 0			-12		-19			0.066	0.371
* 1			CCV		-20			0.182	1.022
* 2			CCV		-21			0.000	ND
* 3			F037-13		-22			0.027	0.152
* 24			F06401		-23			0.024	0.135
* 5			CCV		-24			0.181	1.016
* 6			CCV		-25			0.000	ND
* 7									
* 8									
* 9									
* 0									

Instrument No: 70		Wavelength: 425 nm	
Standard	ID	Conc. (mg/L)	
S ₀	WATER	0.0	
S ₁	SW28-03-152	0.1	
S ₂		0.2	
S ₃		0.5	
S ₄		0.8	
S ₅		1.0	
S ₆		1.6	
S ₇	SW28-03-152	2.0	
ICV/MS		1.0	
OCV		1.0	
LCS		1.0	
Reagent	ID		
Color Reagent	SW7A-06-141		
	Standard Curve		
R ²	0.9999	0.9994	
Y	0.0000	0.1791	
CF	0.0000	5.6154	
Comments:			
Results are based on: <input type="checkbox"/> Dry Weight <input type="checkbox"/> Wet Weight			
Analyzed By: <u>te</u>			

This page is checked during data review.

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKNSOP ☐ EMAX-350.2 Rev. No.: 2 ☒ EMAX-351.3 Rev. No.: 2 ☐

Book # EKN-005

Start Date	Time	End Date	Time	Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
6-16-06	10:00	6-16-06	17:30	*01	5-0.0	9.6	10	5	4	50	50		ICV/MS	5W28-03-151	5 ml/4
				*02	5-0.1								LCS	↓-156	10 ppm 50 ml
				*03	5-1.0								Reagent		
				*04	5-2.0								NaOH		
				*05	10.0								Borate Buffer	5W7A-06-152	
				*06	10.0								H ₂ BO ₃	5W7B-06-315A	
				*07	KNF004WB								Digestion Mixture	5W7A-06-055	
				*08	↓ WL								Distilling Soln.	5W7B-06-215B	
				*09	↓ WL										
				*10	F037-08										
				*11	-08D								SDG #	N/A	Extract Location
				*12	-08M										
				*13	-09										
				*14	-10										
				*15	-11										
				*16	-12										
				*17	↓ -13								Comments		
				*18	F004-01	9.5	10	5	4	50	50				
				*19											
				*20											
				*21											
				*22											
				*23											
				*24											
				*25											
				*26											

PREPARATION BATCH * KNF004W

Prepared By: SA
Standard Added By: SA
Checked By: SA

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05F064**

METHOD 160.1 TOTAL DISSOLVED SOLIDS

One (1) water sample was received on 06/07/05 for Total Dissolved Solids analysis by Method 160.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 100.1
TOTAL DISSOLVED SOLIDS

Matrix : WATER
Instrument ID : NA

Client : BATTELLE MEMORIAL INSTITUTE

Project : JPL

Batch No. : 05F064

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TDF012WB	ND	1	NA	10	5	06/09/0516:15	NA	TDF012W-01	NA	TDF012W	NA	NA
LCS1W	TDF012WL	164	1	NA	10	5	06/09/0516:16	NA	TDF012W-02	NA	TDF012W	NA	NA
LCD1W	TDF012WC	162	1	NA	10	5	06/09/0516:17	NA	TDF012W-03	NA	TDF012W	NA	NA
MW1	F064-01	360	1	NA	10	5	06/09/0516:20	NA	TDF012W-06	NA	TDF012W	06/05/05	06/07/05

8069

PM

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: 160.1

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05F064

SAMPLE ID: LCS1W/LCD1W

CONTROL NO.: TDF012WL/C

DATE RECEIVED: NA

DATE EXTRACTED: NA

DATE ANALYZED: 06/09/05 16:16:17

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TDS	ND	162.00	164.00	101	162.00	162.00	100	1	80-120	20

8070

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GRAVIMETRIC ANALYSIS LOG

Page 31

Book # AGV-017

SOP □ EMAX-160.1 Rev. No. 3 □ EMAX-160.2 Rev. No. 2 □ EMAX-160.3 Rev. No. 1 □ EMAX-160.4 Rev. No. 0 □ EMAX-160.5 Rev. No. 0

Oven/Furnace Temp. 105°C		Starting Date 6/8/05		Time 2115		Ending Date 6/9/05		Time 1545		Comments: 180°C	
Data File Name	Lab Sample ID	Sample Amt. (ml)	Dish Wt. (g)	Dry Wt. Dish + Solids (g)			Solids (mg)	Result (mg/L)	Settleable Solids Vol. of SS	Result (ml/L)	Balance:
				1st	2nd	3rd					
1	TD F012 WB	100	62.4182	62.4182	14.5	62.4182	16.5	-0.2	ND		LCSTV 162 mg/L
2		50	60.5117	60.5207	16	60.5199	16	8.2	164		
3		50	66.0825	66.0915	17	66.0906	17	8.1	162		
4	F442-01	50	63.9642	63.9849	18	63.9840	18	11.8	396		
5		50	66.5243	66.5449	19	66.5440	19	19.7	594		
6	F064-01	50	62.9219	62.9406	20	62.9398	20	18.0	360		
7	F063-01	50	62.9686	63.0088	21	63.0079	21	39.0	780		
8		50	66.0374	66.0815	22	66.0804	22	42.1	854		
9		50	66.0960	66.1257	23	66.1248	23	28.8	576		
10		50	63.0899	63.0695	24	63.0686	24	28.7	574		
11		50	66.8329	66.8643	25	66.8635	25	30.2	604		
12	F070-01	5	13.0373	13.3815	26	13.3800	26	342.7	6854.0		
13		5	13.0163	13.2825	27	13.2809	27	264.2	5284.0		
14		5	13.0376	13.3318	28	13.3303	28	292.5	5850.0		
15		5	13.0670	13.2596	29	13.2308	29	171.4	3428.0		
16		1	13.2121	13.2816	30	13.2807	30	68.6	686.0		
17		1	13.0367	13.1108	31	13.1097	31	53.0	530.0		
18		1	12.9915	13.0511	32	13.0502	32	58.6	586.0		
19		1	12.0378	12.0739	33	12.0730	33	35.0	350.0		
20	F063-01D	50	64.0819	66.1220	34	66.1215	34	39.3	786	RPD 19	

Analyzed By: AB/PA

This page is checked during the data review process.

BALANCE CALIBRATION VERIFICATION LOG (DOE)

Page 31

SOP □ EMAX-QC04 Revision No.: 1

QC04-036

Balance ID 10601202

Date 6-9-05

Range	Min:	1	Max:	600	g
TV	200	100	30	5	1
1	200.003	100.001	30.000	5.000	1.000
2	200.002	100.001	29.999	5.000	1.000
3	200.002	100.001	29.999	5.000	1.000
Criteria (±0.1%)	0.2	0.1	0.03	0.005	0.001
LL	199.8	99.9	29.97	4.995	0.999
UL	200.2	100.1	30.03	5.005	1.001

Comment:

passed

Balance ID J77299

Date 6-9-05

Range	Min:	1	Max:	300	g
TV	200	100	50	30	20
1	199.99	100.00	50.00	30.00	20.00
2	199.99	100.00	50.00	30.00	20.00
3	199.99	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

passed

Balance ID 10203192

Date 6-9-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.00	100.00	50.00	30.00	20.00
2	200.00	100.00	50.00	30.00	20.00
3	200.00	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

passed

Balance ID 10304418

Date 6-9-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.05	100.03	50.00	30.00	20.00
2	200.05	100.03	50.00	30.00	20.00
3	200.05	100.03	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

passed

Balance ID 40706360

Date 6-9-05

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1	199.9972	99.9985	29.9999	1.0000	0.0200
2	199.9974	99.9987	29.9998	1.0000	0.0200
3	199.9977	99.9988	29.9998	1.0000	0.0200
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

passed

Balance ID 40706360

Date

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:



EMAX LABORATORIES, INC. 1835 W. 205th St. Torrance, CA 90501

Verified by: *mc*

Checked by:

8072

BALANCE CALIBRATION VERIFICATION LOG (DOE)

Page 30

SOP ☐ EMAX-QC04 Revision No.: 1

QC04-036

Balance ID 10601202

Date 6-8-05

Range	Min:	1	Max:	600	g
TV	200	100	30	5	1
1	199.995	99.998	30.000	5.000	1.000
2	199.997	99.996	30.000	5.000	1.000
3	199.997	99.996	30.000	5.000	1.000
Criteria (±0.1%)	0.2	0.1	0.03	0.005	0.001
LL	199.8	99.9	29.97	4.995	0.999
UL	200.2	100.1	30.03	5.005	1.001

Comment: *pass*

Balance ID J77299

Date 6-8-05

Range	Min:	1	Max:	300	g
TV	200	100	50	30	20
1	200.00	100.00	50.00	30.00	20.00
2	200.00	100.00	50.00	30.00	20.00
3	200.00	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment: *pass*

Balance ID 10203192

Date 6-8-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.00	100.00	50.00	30.00	20.00
2	200.00	100.00	50.00	30.00	20.00
3	200.00	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment: *pass*

Balance ID 10304418

Date 6-8-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.04	100.03	50.00	30.00	20.00
2	200.04	100.03	50.00	30.00	20.00
3	200.04	100.03	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment: *pass*

Balance ID 40706360

Date

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1	199.9976	99.9991	30.0001	1.0000	0.0200
2	199.9978	99.9992	30.0001	1.0000	0.0200
3	199.9974	99.9993	30.0001	1.0000	0.0200
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment: *pass*

Balance ID 40706360

Date

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

EMAX LABORATORIES, INC. 1825 W. 205th St. Torrance, CA 90501

Verified by: *JMC*

Checked by:

8073

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05F064

SM3500 FERROUS IRON

One (1) water sample was received on 06/07/05 for Ferrous Iron analysis by Method SM3500 in accordance with "Standard Methods for the Examination of Water and Wastewater", 18th edition (1990).

1. Holding Time

Analysis met holding time criteria. Sample was analyzed upon receipt.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample

Lab control result was within QC limit.

4. Duplicate

Sample F064-01 was analyzed for duplicate. %RPD was within QC limit.

5. Matrix Spike

Sample F064-01 was spiked. %Recovery was within QC limit.

6. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

8074

SM300
FERROUS IRON

Client : BATTIELE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F064

Matrix : WATER
Instrument ID : 170

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE TIME	Extraction DATE TIME	LFID	CAL REF	PREP BATCH	Collection DATE TIME	Received DATE TIME
MBLK1W	FEF005WB	ND	1	NA	5	2.5	06/07/0510:08	NA	FEF005W-09	FEF005W-07	FEF005W	NA	NA
LCS1W	FEF005WL	21.6	1	NA	5	2.5	06/07/0510:09	NA	FEF005W-10	FEF005W-07	FEF005W	NA	NA
MM1	F064-01	ND	1	NA	5	2.5	06/07/0510:10	NA	FEF005W-11	FEF005W-07	FEF005W	06/05/05	06/07/05
MM1DUP	F064-01D	ND	1	NA	5	2.5	06/07/0510:11	NA	FEF005W-12	FEF005W-07	FEF005W	06/05/05	06/07/05
MM1MS	F064-01M	21.6	1	NA	5	2.5	06/07/0510:12	NA	FEF005W-13	FEF005W-07	FEF005W	06/05/05	06/07/05

8075

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EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT:	BATTELLE MEMORIAL INSTITUTE	DATE RECEIVED:	NA
PROJECT:	JPL	DATE EXTRACTED:	NA
METHOD:	SM3500	DATE ANALYZED:	06/07/05 10:09
MATRIX:	WATER		
% MOISTURE:	NA		

BATCH NO.:	05F064
SAMPLE ID:	LCS1W
CONTROL NO.:	FEF005WL

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	LCS RSLT (mg/L)	LCS % REC	QC LIMIT (%)
Ferrous Iron	ND	20.00	21.60	108	80-120

8076

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EMAX QUALITY CONTROL DATA

MS ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
 PROJECT: JPL
 METHOD: SM3500
 MATRIX: WATER
 % MOISTURE: NA
 =====
 BATCH NO.: 05F064
 SAMPLE ID: MW1MS
 CONTROL NO.: F064-01M
 DATE RECEIVED: 06/07/05
 DATE EXTRACTED: NA
 DATE ANALYZED: 06/07/05 10:12

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Ferrous Iron	ND	20.00	21.60	108	75-125

8077

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EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: SM3500

MATRIX: WATER

% MOISTURE: NA

=====

BATCH NO.: 05F064 DATE RECEIVED: 06/07/05
SAMPLE ID: MW1DUP DATE EXTRACTED: NA
CONTROL NO.: F064-01D DATE ANALYZED: 06/07/05 10:11

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Ferrous Iron	ND	ND	0	20

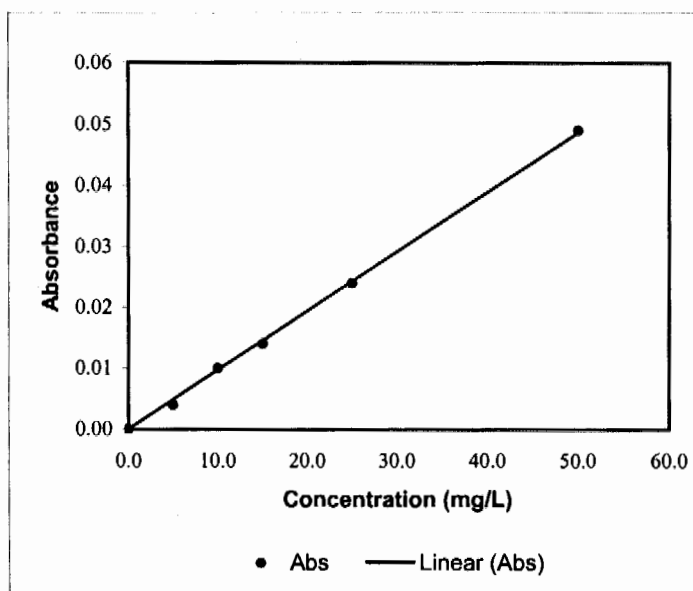
F

8078

24

CALIBRATION CURVE FERROUS FE

Conc.	Abs
0.0	0.000
5.0	0.004
10.0	0.010
15.0	0.014
25.0	0.024
50.0	0.049



R ²	0.9994
Eq.Line	0.0010
CF	1028.1065

Comments: **PASSED**

Analyzed by: LA

Data File Name		Preparative Batch	Lab Sample ID	Matrix		Sample Amount (ml)	DF	Abs. (510 nm)	Time	Ferrous Iron (mg/L)	Notes
				S	W						
* 1	FEF005W		5-0.0		✓	50	1	0.000	10.10		
* 2			5-5					0.004	01		
* 3			5-10					0.010	02		
* 4			5-15					0.014	03		
* 5			5-25					0.024	04		
* 6			5-50					0.049	05		
* 7			1CV					0.099	06	19.5	
* 8			1CB					0.000	07	N/D	
* 9			PEF005W					0.000	08	N/D	
* 0			↓ WC					0.021	09	21.59	
* 1			F004-01					0.002	10	N/D	
* 2			↓ -01D					0.002	11	N/D	
* 3			↓ -01M					0.021	12	21.59	
* 4			OCV			✓	✓	0.020	13	20.56	
* 5		✓	OCB		✓	50	1	0.000	14	N/D	
* 6											
* 7											
* 8											
* 9											
* 0											
* 1											
* 2											
* 3											
* 4											
* 5											
* 6											
* 7											
* 8		the									
* 9			6-07-05								
* 0											

ANALYTICAL BATCH * FEF005W

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05F064**

METHOD 415.1 DISSOLVED ORGANIC CARBON

One (1) water sample was received on 06/07/05 for Dissolved Organic Carbon analysis by Method 415.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

It was noticed that result of Dissolved Organic Carbon was higher than Total Organic Carbon. The sample was analyzed according to bottle label.

Matrix : WATER
Instrument ID : 62

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F064

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TCF005WB	ND	1.00	NA	1	.5	06/10/0518:13	NA	TCF005-5	TCF005-2	TCF005W	NA	NA
LCS1W	TCF005WL	24.5	1.00	NA	1	.5	06/10/0518:24	NA	TCF005-6	TCF005-2	TCF005W	NA	NA
LCD1W	TCF005WC	24	1.00	NA	1	.5	06/10/0518:34	NA	TCF005-7	TCF005-2	TCF005W	NA	NA
NW1	F064-01	14.9	1.00	NA	1	.5	06/10/0520:44	NA	TCF005-21	TCF005-14	TCF005W	06/05/05	06/07/05

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05F064

METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1.00 1.00 1.00
SAMPLE ID: MBLK1W
LAB SAMP ID: TCF005WB TCF005WC
LAB FILE ID: TCF005-5 TCF005-6 TCF005-7
DATE EXTRACTED: NA NA
DATE ANALYZED: 06/10/0518:13 06/10/0518:24 06/10/0518:34
PREP. BATCH: TCF005W TCF005W
CALIB. REF: TCF005-2 TCF005-2 TCF005-2

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
DOC	ND	25	24.5	98	25	24	96	2	80-120	20

8083

	Type	Analysis	Sample Name	Sample ID	ObjectID	Origin	Dilution	Result	Notes
1	Standard	NPOC	ICAL	TCF005-1	0A-123456-0	C:\Pro	1.000		
2	Control	NPOC	ICV	TCF005-2	0A-123456-0	C:\Pro	1.000	NPOC:25.15 mg/L	Control value:
3	Unknown	NPOC	ICB	TCF005-3	0A-123456-0	C:\Pro	1.000	NPOC:0.06167 m	
4	Unknown	NPOC	HCO3/CO3	TCF005-4	0A-123456-0	C:\Pro	1.000	NPOC:0.1932 mg	
5	Unknown	NPOC	TCF005WB	TCF005-5	0A-123456-0	C:\Pro	1.000	NPOC:0.05997 m	
6	Unknown	NPOC	TCF005WL	TCF005-6	0A-123456-0	C:\Pro	1.000	NPOC:24.53 mg/L	
7	Unknown	NPOC	TCF005WC	TCF005-7	0A-123456-0	C:\Pro	1.000	NPOC:24.01 mg/L	
8	Unknown	NPOC	05E175-01	TCF005-8	0A-123456-0	C:\Pro	1.000	NPOC:1.663 mg/L	
9	Unknown	NPOC	05E175-02	TCF005-9	0A-123456-0	C:\Pro	1.000	NPOC:1.693 mg/L	
10	Unknown	NPOC	05E175-03	TCF005-10	0A-123456-0	C:\Pro	1.000	NPOC:0.4687 mg	
11	Unknown	NPOC	05E175-04	TCF005-11	0A-123456-0	C:\Pro	1.000	NPOC:1.003 mg/L	
12	Unknown	NPOC	05E175-05	TCF005-12	0A-123456-0	C:\Pro	1.000	NPOC:1.089 mg/L	
13	Unknown	NPOC	05E175-06	TCF005-13	0A-123456-0	C:\Pro	1.000	NPOC:1.302 mg/L	
14	Control	NPOC	CCV1	TCF005-14	0A-123456-0	C:\Pro	1.000	NPOC:24.79 mg/L	Control value:
15	Unknown	NPOC	CCB1	TCF005-15	0A-123456-0	C:\Pro	1.000	NPOC:0.000 mg/L	
16	Unknown	NPOC	05E175-07	TCF005-16	0A-123456-0	C:\Pro	1.000	NPOC:0.3987 mg	
17	Unknown	NPOC	05E189-01	TCF005-17	0A-123456-0	C:\Pro	1.000	NPOC:0.6302 mg	
18	Unknown	NPOC	05E189-02	TCF005-18	0A-123456-0	C:\Pro	1.000	NPOC:1.183 mg/L	
19	Unknown	NPOC	05E189-03	TCF005-19	0A-123456-0	C:\Pro	1.000	NPOC:1.710 mg/L	
20	Unknown	NPOC	05E189-04	TCF005-20	0A-123456-0	C:\Pro	1.000	NPOC:0.5658 mg	
21	Unknown	NPOC	05F064-01	TCF005-21	0A-123456-0	C:\Pro	1.000	NPOC:14.91 mg/L	
22	Unknown	NPOC	05F027-01	TCF005-22	0A-123456-0	C:\Pro	1.000	NPOC:9.288 mg/L	
23	Unknown	NPOC	05F027-02	TCF005-23	0A-123456-0	C:\Pro	1.000	NPOC:17.13 mg/L	
24	Unknown	NPOC	05F027-03	TCF005-24	0A-123456-0	C:\Pro	1.000	NPOC:6.665 mg/L	
25	Unknown	NPOC	05F041-01	TCF005-25	0A-123456-0	C:\Pro	1.000	NPOC:0.9232 mg	
26	Control	NPOC	CCV2	TCF005-26	0A-123456-0	C:\Pro	1.000	NPOC:24.49 mg/L	Control value:
27	Unknown	NPOC	CCB2	TCF005-27	0A-123456-0	C:\Pro	1.000	NPOC:0.000 mg/L	
28	Unknown	NPOC	05F041-02	TCF005-28	0A-123456-0	C:\Pro	1.000	NPOC:12.76 mg/L	
29	Unknown	NPOC	05F041-02D	TCF005-29	0A-123456-0	C:\Pro	1.000	NPOC:12.87 mg/L	
30	Unknown	NPOC	05F041-02M	TCF005-30	0A-123456-0	C:\Pro	1.000	NPOC:35.76 mg/L	
31	Unknown	NPOC	05F064-01	TCF005-31	0A-123456-0	C:\Pro	1.000	NPOC:0.8298 mg	
32	Unknown	NPOC	TCF006WB	TCF005-32	0A-123456-0	C:\Pro	1.000	NPOC:0.1326 mg	
33	Unknown	NPOC	TCF006WL	TCF005-33	0A-123456-0	C:\Pro	1.000	NPOC:24.77 mg/L	
34	Unknown	NPOC	TCF006WC	TCF005-34	0A-123456-0	C:\Pro	1.000	NPOC:24.73 mg/L	
35	Unknown	NPOC	05E175-01	TCF005-35	0A-123456-0	C:\Pro	1.000	NPOC:1.451 mg/L	
36	Unknown	NPOC	05E175-02	TCF005-36	0A-123456-0	C:\Pro	1.000	NPOC:0.6567 mg	
37	Unknown	NPOC	05E175-03	TCF005-37	0A-123456-0	C:\Pro	1.000	NPOC:0.4543 mg	
38	Control	NPOC	CCV3	TCF005-38	0A-123456-0	C:\Pro	1.000	NPOC:24.57 mg/L	Control value:
39	Unknown	NPOC	CCB3	TCF005-39	0A-123456-0	C:\Pro	1.000	NPOC:0.05422 m	
40	Unknown	NPOC	05E175-04	TCF005-40	0A-123456-0	C:\Pro	1.000	NPOC:0.4391 mg	
41	Unknown	NPOC	05E175-05	TCF005-41	0A-123456-0	C:\Pro	1.000	NPOC:1.097 mg/L	
42	Unknown	NPOC	05E175-06	TCF005-42	0A-123456-0	C:\Pro	1.000	NPOC:1.008 mg/L	
43	Unknown	NPOC	05E175-07	TCF005-43	0A-123456-0	C:\Pro	1.000	NPOC:0.3261 mg	
44	Unknown	NPOC	05E189-01	TCF005-44	0A-123456-0	C:\Pro	1.000	NPOC:0.5660 mg	
45	Unknown	NPOC	05E189-02	TCF005-45	0A-123456-0	C:\Pro	1.000	NPOC:1.110 mg/L	
46	Unknown	NPOC	05E189-03	TCF005-46	0A-123456-0	C:\Pro	1.000	NPOC:1.839 mg/L	
47	Unknown	NPOC	05E189-04	TCF005-47	0A-123456-0	C:\Pro	1.000	NPOC:0.4890 mg	
48	Unknown	NPOC	05F027-01	TCF005-48	0A-123456-0	C:\Pro	1.000	NPOC:0.3541 mg	
49	Unknown	NPOC	05F027-02	TCF005-49	0A-123456-0	C:\Pro	1.000	NPOC:0.9690 mg	
50	Control	NPOC	CCV4	TCF005-50	0A-123456-0	C:\Pro	1.000	NPOC:24.22 mg/L	Control value:
51	Unknown	NPOC	CCB4	TCF005-51	0A-123456-0	C:\Pro	1.000	NPOC:0.05882 m	
52	Unknown	NPOC	05F027-03	TCF005-52	0A-123456-0	C:\Pro	1.000	NPOC:0.7103 mg	
53	Unknown	NPOC	05F041-01	TCF005-53	0A-123456-0	C:\Pro	1.000	NPOC:0.5763 mg	
54	Unknown	NPOC	05F041-02	TCF005-54	0A-123456-0	C:\Pro	1.000	NPOC:0.5965 mg	
55	Unknown	NPOC	05F041-02D	TCF005-55	0A-123456-0	C:\Pro	1.000	NPOC:0.6222 mg	
56	Unknown	NPOC	05F041-02M	TCF005-56	0A-123456-0	C:\Pro	1.000	NPOC:24.42 mg/L	
57	Unknown	NPOC	05F048-02	TCF005-57	0A-123456-0	C:\Pro	1.000	NPOC:2.061 mg/L	
58	Unknown	NPOC	05F048-04	TCF005-58	0A-123456-0	C:\Pro	1.000	NPOC:18.25 mg/L	
59	Unknown	NPOC	05F048-06	TCF005-59	0A-123456-0	C:\Pro	1.000	NPOC:5.965 mg/L	
60	Unknown	NPOC	05E526-01	TCF005-60	0A-123456-0	C:\Pro	5.000	NPOC:118.0 mg/L	
61	Control	NPOC	CCV5	TCF005-61	0A-123456-0	C:\Pro	1.000	NPOC:24.76 mg/L	Control value:
62	Unknown	NPOC	CCB5	TCF005-62	0A-123456-0	C:\Pro	1.000	NPOC:0.000 mg/L	
63									
64									
65									
66								8084	

Instr. Information

System toc
Detector Combustion
Catalyst Regular Sensitivity
Cell Length long

Cal. Curve

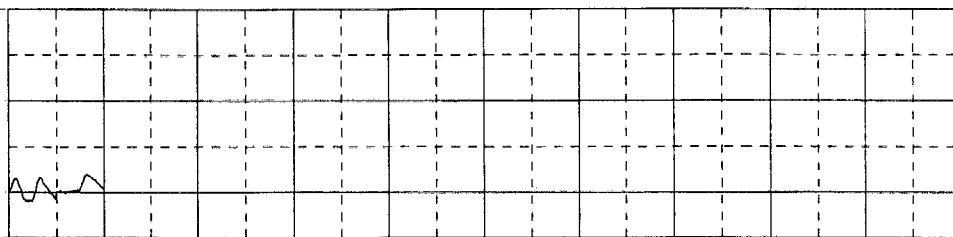
Sample Name: ICAL
Sample ID: TCF005-1
Cal. Curve: tcf005.2005_06_10_16_40_16.cal

Type	Anal.
Standard	NPOC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	0.3586	50uL	1	*****		06/10/05 04:47:30 PM
2	0.2707	50uL	1	*****		06/10/05 04:48:40 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 0.3146

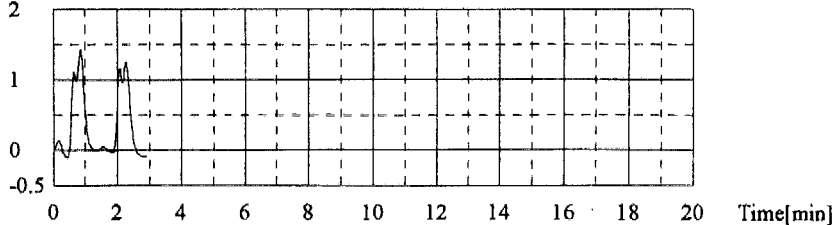


Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	3.482	50uL	10	*****		06/10/05 04:57:17 PM
2	3.214	50uL	10	*****		06/10/05 04:58:57 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 3.348

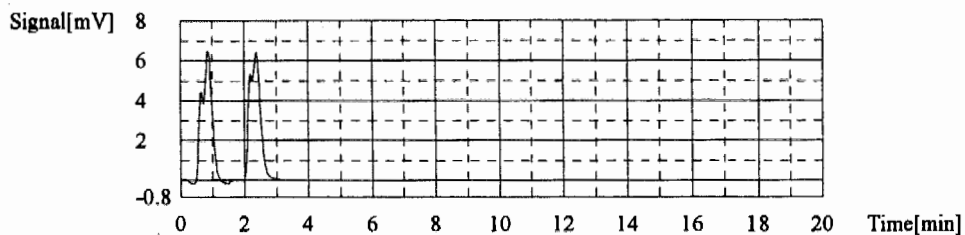
Signal[mV] 2



Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	15.04	50uL	2	*****		06/10/05 05:05:47 PM
2	15.17	50uL	2	*****		06/10/05 05:07:35 PM

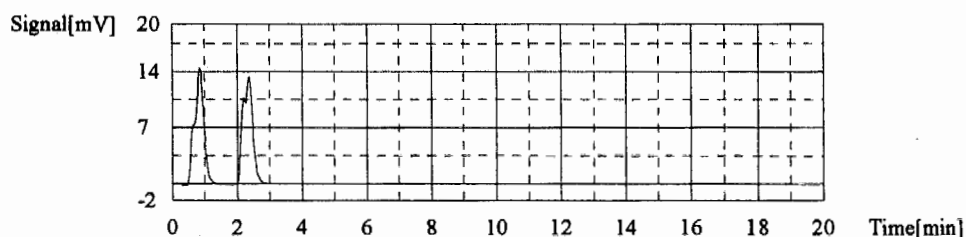
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 15.11



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	29.63	50uL	1	*****		06/10/05 05:13:42 PM
2	30.03	50uL	1	*****		06/10/05 05:15:22 PM

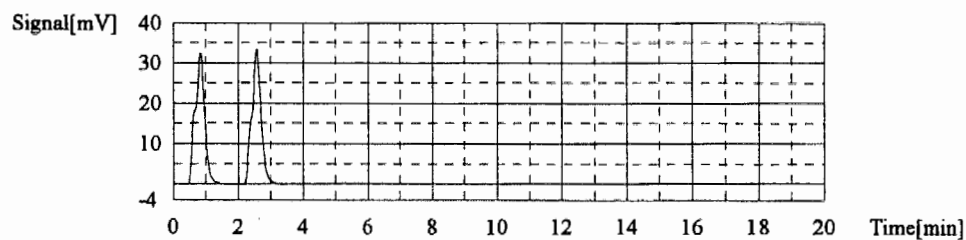
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 29.83



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	67.87	50uL	2	*****		06/10/05 05:24:19 PM
2	67.50	50uL	2	*****		06/10/05 05:26:13 PM

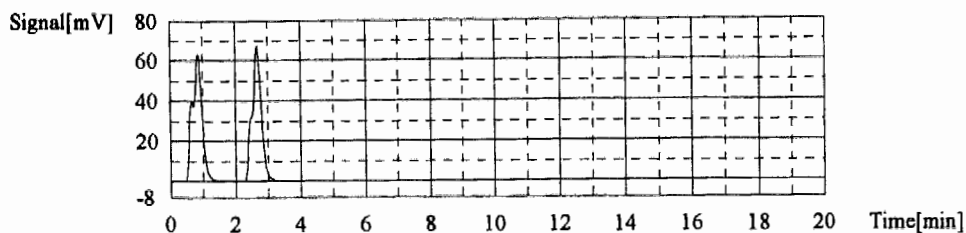
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 67.69



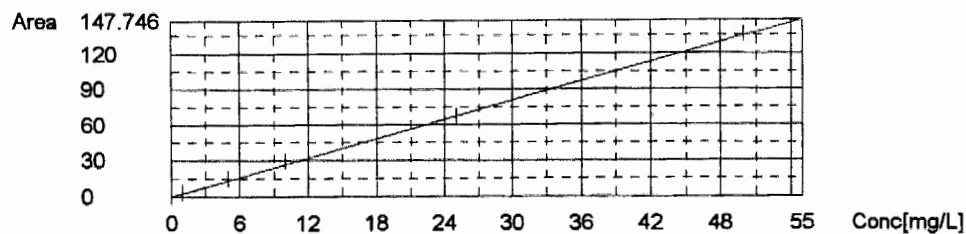
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	135.6	50uL	1	*****		06/10/05 05:32:37 PM
2	135.4	50uL	1	*****		06/10/05 05:34:36 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 135.5



Slope: 2.686
Intercept 0.000
 r^2 0.999639



Control Sample

Sample Name: ICV
Sample ID: TCF005-2
Method: tcf005.tpi
Chk. Result: Control value: 3.30% / Control within range!

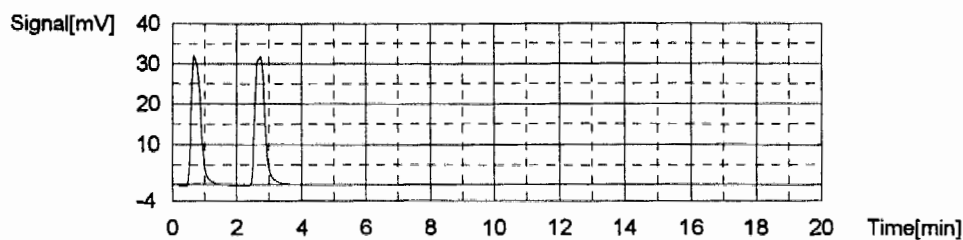
Type	Anal.	Dil.	Result
Control	NPOC	1.000	NPOC:25.15 mg/L

1. Det.

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	66.45	24.74mg/L	50uL	1		tc005.2005_06_10_16_40_16.cal	06/10/05 05:43:20 PM
2	68.68	25.57mg/L	50uL	1		tc005.2005_06_10_16_40_16.cal	06/10/05 05:45:30 PM

Mean Area 67.56
Mean Conc. 25.15mg/L



Sample

Sample Name: ICB
Sample ID: TCF005-3
Origin: tcf005.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.06167 mg/L

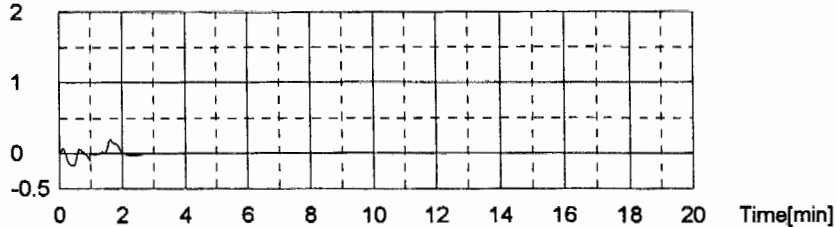
1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.3313	0.1233mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 05:53:00 PM
2	0.000	0.000mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 05:55:05 PM

Mean Area 0.1657
Mean Conc. 0.06167mg/L

Signal[mV] 2



Sample

Sample Name: HCO3/CO3
Sample ID: TCF005-4
Origin: tcf005.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.1932 mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.5246	0.1953mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 06:02:44 PM
2	0.5136	0.1912mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 06:04:02 PM

ANALYSIS RUN LOG FOR TOC

SOP: o EMAX-9060 Revision No. 1 ✓ EMAX-415.1 Revision No. 1 o

Book # A62-006

Start Date: 6/10/05

Time: 04:16:47

Ending Date: 06/11/05

Time: 03:13

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix S W	Run Time	Notes
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						

ANALYTICAL BATCH * TCF005W ** TCF006W

Instrument No.	62
Method File	TCF005
ICAL ID	SW10B-01-594
ICV ID	↓ 593

STANDARDS

ICAL Level	Conc. (mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	25
ICV/LCS	SW10B-01-593
CCV	↓ 595

Comments:

Analyzed By: *r*

This page is checked during data review.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**
PROJECT: **JPL**
SDG: **05F064**

METHOD 415.1 TOTAL ORGANIC CARBON

One (1) water sample was received on 06/07/05 for Total Organic Carbon analysis by Method 415.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

It was noticed that result of Total Organic Carbon was lower than Dissolved Organic Carbon. The sample was analyzed according to bottle label.

8090

METHOD 415.1
TOC

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F064

Matrix : WATER
Instrument ID : 62

SAMPLE ID	ENAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TCF005WB	ND	1.00	NA	1	.5	06/10/0518:13	NA	TCF005-5	TCF005-2	TCF005W	NA	NA
LCS1W	TCF005WL	24.5	1.00	NA	1	.5	06/10/0518:24	NA	TCF005-6	TCF005-2	TCF005W	NA	NA
LCD1W	TCF005WC	24	1.00	NA	1	.5	06/10/0518:34	NA	TCF005-7	TCF005-2	TCF005W	NA	NA
MMT	F064-01	.83J	1.00	NA	1	.5	06/10/0522:21	NA	TCF005-31	TCF005-26	TCF005W	06/05/05	06/07/05

8091

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05F064
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1.00
SAMPLE ID: MBLK1W
LAB SAMP ID: TCF005WB
LAB FILE ID: TCF005-5
DATE EXTRACTED: NA
DATE ANALYZED: 06/10/0518:13
PREP. BATCH: TCF005W
CALIB. REF: TCF005-2

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPO (%)	QC LIMIT (%)	MAX RPD (%)
TOC	ND	25	24.5	98	25	24	96	2	80-120	20

8092

201

	Type	Analysis	Sample Name	Sample ID	ObjectID	Origin	Dilution	Result	Notes
1	Standard	NPOC	ICAL	TCF005-1	0A-123456-0	C:\Pro	1.000		
2	Control	NPOC	ICV	TCF005-2	0A-123456-0	C:\Pro	1.000	NPOC:25.15 mg/L	Control value:
3	Unknown	NPOC	ICB	TCF005-3	0A-123456-0	C:\Pro	1.000	NPOC:0.06167 m	
4	Unknown	NPOC	HCO3/CO3	TCF005-4	0A-123456-0	C:\Pro	1.000	NPOC:0.1932 mg	
5	Unknown	NPOC	TCF005WB	TCF005-5	0A-123456-0	C:\Pro	1.000	NPOC:0.05997 m	
6	Unknown	NPOC	TCF005WL	TCF005-6	0A-123456-0	C:\Pro	1.000	NPOC:24.53 mg/L	
7	Unknown	NPOC	TCF005WC	TCF005-7	0A-123456-0	C:\Pro	1.000	NPOC:24.01 mg/L	
8	Unknown	NPOC	05E175-01	TCF005-8	0A-123456-0	C:\Pro	1.000	NPOC:1.663 mg/L	
9	Unknown	NPOC	05E175-02	TCF005-9	0A-123456-0	C:\Pro	1.000	NPOC:1.693 mg/L	
10	Unknown	NPOC	05E175-03	TCF005-10	0A-123456-0	C:\Pro	1.000	NPOC:0.4687 mg	
11	Unknown	NPOC	05E175-04	TCF005-11	0A-123456-0	C:\Pro	1.000	NPOC:1.003 mg/L	
12	Unknown	NPOC	05E175-05	TCF005-12	0A-123456-0	C:\Pro	1.000	NPOC:1.089 mg/L	
13	Unknown	NPOC	05E175-06	TCF005-13	0A-123456-0	C:\Pro	1.000	NPOC:1.302 mg/L	
14	Control	NPOC	CCV1	TCF005-14	0A-123456-0	C:\Pro	1.000	NPOC:24.79 mg/L	Control value:
15	Unknown	NPOC	CCB1	TCF005-15	0A-123456-0	C:\Pro	1.000	NPOC:0.000 mg/L	
16	Unknown	NPOC	05E175-07	TCF005-16	0A-123456-0	C:\Pro	1.000	NPOC:0.3987 mg	
17	Unknown	NPOC	05E189-01	TCF005-17	0A-123456-0	C:\Pro	1.000	NPOC:0.6302 mg	
18	Unknown	NPOC	05E189-02	TCF005-18	0A-123456-0	C:\Pro	1.000	NPOC:1.183 mg/L	
19	Unknown	NPOC	05E189-03	TCF005-19	0A-123456-0	C:\Pro	1.000	NPOC:1.710 mg/L	
20	Unknown	NPOC	05E189-04	TCF005-20	0A-123456-0	C:\Pro	1.000	NPOC:0.5658 mg	
21	Unknown	NPOC	05F064-01	TCF005-21	0A-123456-0	C:\Pro	1.000	NPOC:14.91 mg/L	✓
22	Unknown	NPOC	05F027-01	TCF005-22	0A-123456-0	C:\Pro	1.000	NPOC:9.288 mg/L	
23	Unknown	NPOC	05F027-02	TCF005-23	0A-123456-0	C:\Pro	1.000	NPOC:17.13 mg/L	
24	Unknown	NPOC	05F027-03	TCF005-24	0A-123456-0	C:\Pro	1.000	NPOC:6.665 mg/L	
25	Unknown	NPOC	05F041-01	TCF005-25	0A-123456-0	C:\Pro	1.000	NPOC:0.9232 mg	
26	Control	NPOC	CCV2	TCF005-26	0A-123456-0	C:\Pro	1.000	NPOC:24.49 mg/L	Control value:
27	Unknown	NPOC	CCB2	TCF005-27	0A-123456-0	C:\Pro	1.000	NPOC:0.000 mg/L	
28	Unknown	NPOC	05F041-02	TCF005-28	0A-123456-0	C:\Pro	1.000	NPOC:12.76 mg/L	
29	Unknown	NPOC	05F041-02D	TCF005-29	0A-123456-0	C:\Pro	1.000	NPOC:12.87 mg/L	
30	Unknown	NPOC	05F041-02M	TCF005-30	0A-123456-0	C:\Pro	1.000	NPOC:35.76 mg/L	
31	Unknown	NPOC	05F064-01	TCF005-31	0A-123456-0	C:\Pro	1.000	NPOC:0.8298 mg	
32	Unknown	NPOC	TCF006WB	TCF005-32	0A-123456-0	C:\Pro	1.000	NPOC:0.1326 mg	
33	Unknown	NPOC	TCF006WL	TCF005-33	0A-123456-0	C:\Pro	1.000	NPOC:24.77 mg/L	
34	Unknown	NPOC	TCF006WC	TCF005-34	0A-123456-0	C:\Pro	1.000	NPOC:24.73 mg/L	
35	Unknown	NPOC	05E175-01	TCF005-35	0A-123456-0	C:\Pro	1.000	NPOC:1.451 mg/L	
36	Unknown	NPOC	05E175-02	TCF005-36	0A-123456-0	C:\Pro	1.000	NPOC:0.6567 mg	
37	Unknown	NPOC	05E175-03	TCF005-37	0A-123456-0	C:\Pro	1.000	NPOC:0.4543 mg	
38	Control	NPOC	CCV3	TCF005-38	0A-123456-0	C:\Pro	1.000	NPOC:24.57 mg/L	Control value:
39	Unknown	NPOC	CCB3	TCF005-39	0A-123456-0	C:\Pro	1.000	NPOC:0.05422 m	
40	Unknown	NPOC	05E175-04	TCF005-40	0A-123456-0	C:\Pro	1.000	NPOC:0.4391 mg	
41	Unknown	NPOC	05E175-05	TCF005-41	0A-123456-0	C:\Pro	1.000	NPOC:1.097 mg/L	
42	Unknown	NPOC	05E175-06	TCF005-42	0A-123456-0	C:\Pro	1.000	NPOC:1.008 mg/L	
43	Unknown	NPOC	05E175-07	TCF005-43	0A-123456-0	C:\Pro	1.000	NPOC:0.3261 mg	
44	Unknown	NPOC	05E189-01	TCF005-44	0A-123456-0	C:\Pro	1.000	NPOC:0.5660 mg	
45	Unknown	NPOC	05E189-02	TCF005-45	0A-123456-0	C:\Pro	1.000	NPOC:1.110 mg/L	
46	Unknown	NPOC	05E189-03	TCF005-46	0A-123456-0	C:\Pro	1.000	NPOC:1.839 mg/L	
47	Unknown	NPOC	05E189-04	TCF005-47	0A-123456-0	C:\Pro	1.000	NPOC:0.4890 mg	
48	Unknown	NPOC	05F027-01	TCF005-48	0A-123456-0	C:\Pro	1.000	NPOC:0.3541 mg	
49	Unknown	NPOC	05F027-02	TCF005-49	0A-123456-0	C:\Pro	1.000	NPOC:0.9690 mg	
50	Control	NPOC	CCV4	TCF005-50	0A-123456-0	C:\Pro	1.000	NPOC:24.22 mg/L	Control value:
51	Unknown	NPOC	CCB4	TCF005-51	0A-123456-0	C:\Pro	1.000	NPOC:0.05882 m	
52	Unknown	NPOC	05F027-03	TCF005-52	0A-123456-0	C:\Pro	1.000	NPOC:0.7103 mg	
53	Unknown	NPOC	05F041-01	TCF005-53	0A-123456-0	C:\Pro	1.000	NPOC:0.5763 mg	
54	Unknown	NPOC	05F041-02	TCF005-54	0A-123456-0	C:\Pro	1.000	NPOC:0.5965 mg	
55	Unknown	NPOC	05F041-02D	TCF005-55	0A-123456-0	C:\Pro	1.000	NPOC:0.6222 mg	
56	Unknown	NPOC	05F041-02M	TCF005-56	0A-123456-0	C:\Pro	1.000	NPOC:24.42 mg/L	
57	Unknown	NPOC	05F048-02	TCF005-57	0A-123456-0	C:\Pro	1.000	NPOC:2.061 mg/L	
58	Unknown	NPOC	05F048-04	TCF005-58	0A-123456-0	C:\Pro	1.000	NPOC:18.25 mg/L	
59	Unknown	NPOC	05F048-06	TCF005-59	0A-123456-0	C:\Pro	1.000	NPOC:5.965 mg/L	
60	Unknown	NPOC	05E526-01	TCF005-60	0A-123456-0	C:\Pro	5.000	NPOC:118.0 mg/L	
61	Control	NPOC	CCV5	TCF005-61	0A-123456-0	C:\Pro	1.000	NPOC:24.76 mg/L	Control value:
62	Unknown	NPOC	CCB5	TCF005-62	0A-123456-0	C:\Pro	1.000	NPOC:0.000 mg/L	
63									
64									
65									
66									

8003

Instr. Information

System toc
Detector Combustion
Catalyst Regular Sensitivity
Cell Length long

Cal. Curve

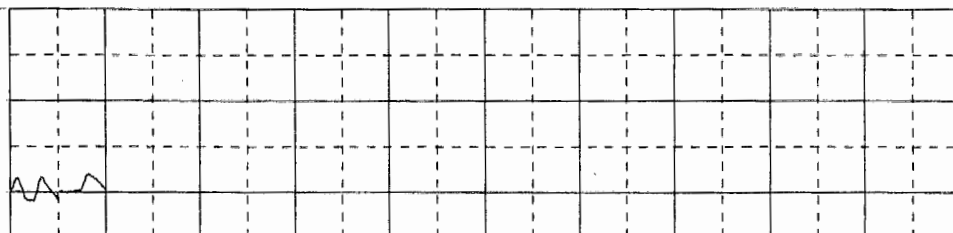
Sample Name: ICAL
Sample ID: TCF005-1
Cal. Curve: tcf005.2005_06_10_16_40_16.cal

Type	Anal.
Standard	NPOC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	0.3586	50uL	1	*****		06/10/05 04:47:30 PM
2	0.2707	50uL	1	*****		06/10/05 04:48:40 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 0.3146

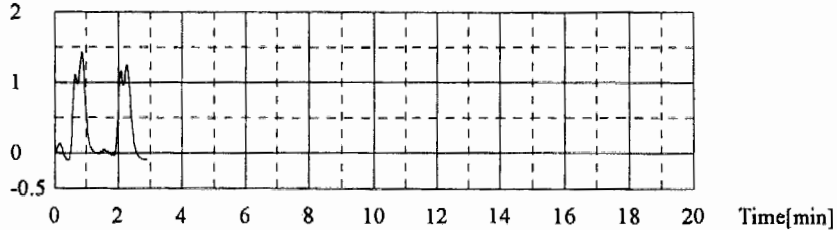


Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	3.482	50uL	10	*****		06/10/05 04:57:17 PM
2	3.214	50uL	10	*****		06/10/05 04:58:57 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 3.348

Signal[mV] 2

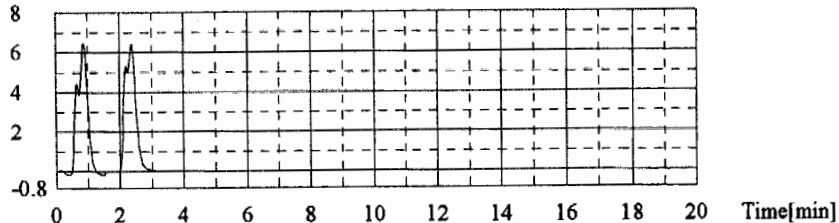


Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	15.04	50uL	2	*****		06/10/05 05:05:47 PM
2	15.17	50uL	2	*****		06/10/05 05:07:35 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 15.11

Signal[mV] 8

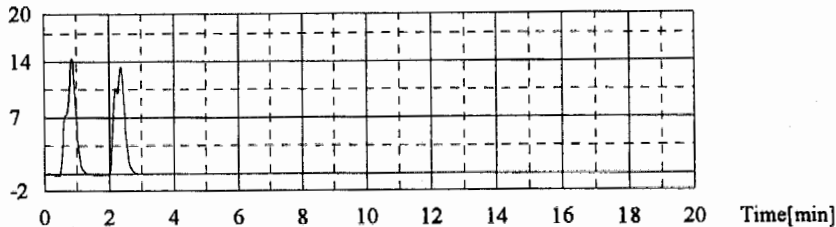


Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	29.63	50uL	1	*****		06/10/05 05:13:42 PM
2	30.03	50uL	1	*****		06/10/05 05:15:22 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 29.83

Signal[mV] 20

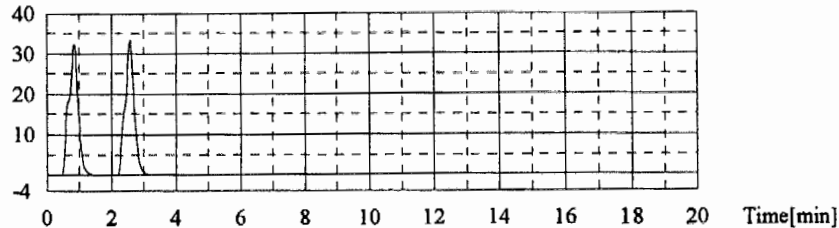


Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	67.87	50uL	2	*****		06/10/05 05:24:19 PM
2	67.50	50uL	2	*****		06/10/05 05:26:13 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 67.69

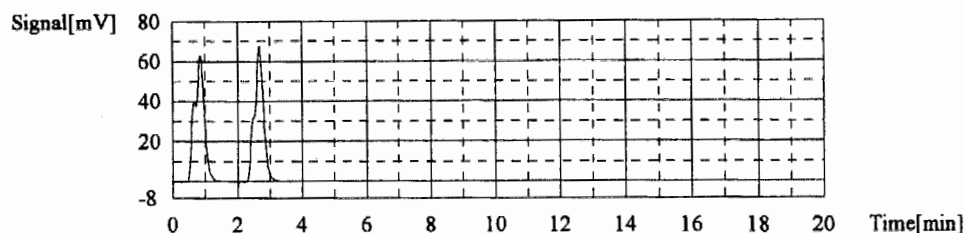
Signal[mV] 40



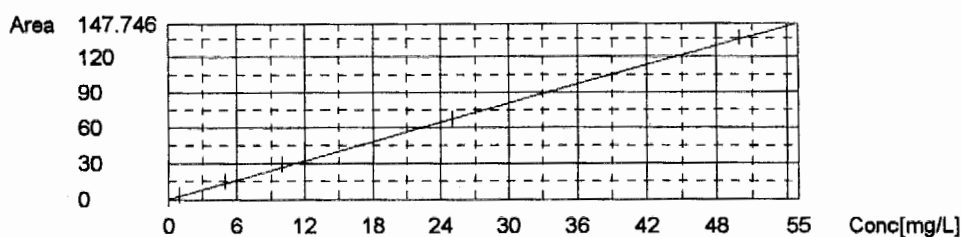
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	135.6	50uL	1	*****		06/10/05 05:32:37 PM
2	135.4	50uL	1	*****		06/10/05 05:34:36 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 135.5



Slope: 2.686
Intercept 0.000
 r^2 0.999639



Control Sample

Sample Name: ICV
Sample ID: TCF005-2
Method: tcf005.tpl
Chk. Result: Control value: 3.30% / Control within range!

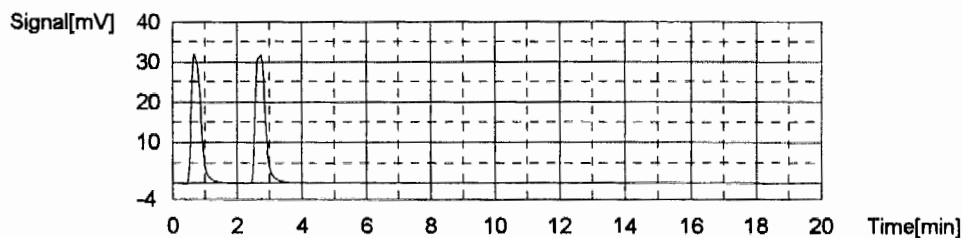
Type	Anal.	Dil.	Result
Control	NPOC	1.000	NPOC:25.15 mg/L

1. Det.

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	66.45	24.74mg/L	50uL	1		tdf005.2005_06_10_16_40_16.cal	06/10/05 05:43:20 PM
2	68.68	25.57mg/L	50uL	1		tdf005.2005_06_10_16_40_16.cal	06/10/05 05:45:30 PM

Mean Area 67.56
Mean Conc. 25.15mg/L



Sample

Sample Name: ICB
Sample ID: TCF005-3
Origin: tcf005.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.06167 mg/L

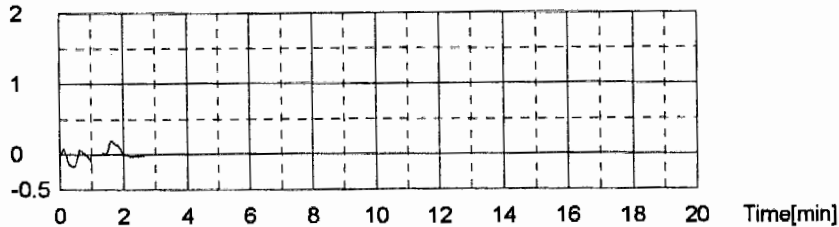
1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.3313	0.1233mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 05:53:00 PM
2	0.000	0.000mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 05:55:05 PM

Mean Area 0.1657
Mean Conc. 0.06167mg/L

Signal[mV] 2



Sample

Sample Name: HCO3/CO3
Sample ID: TCF005-4
Origin: tcf005.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.1932 mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.5246	0.1953mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 06:02:44 PM
2	0.5136	0.1812mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 06:04:02 PM

ANALYSIS RUN LOG FOR TOC

SOP: o EMAX-9060 Revision No. 1 ✓ EMAX-415.1 Revision No. 1 o

Start Date: 6/10/05 Time: 04:16:47 Ending Date: 06/11/05 Time: 03:13

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix	Run Time	Notes
				S	W	
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						

SEE ATTACHED INSTRUMENT STD. 6/10/05

Instrument No.	62
Method File	TCF005
ICAL ID	SW10B-01-S94
ICV ID	↓ S93

STANDARDS

ICAL Level	Conc. (mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	2-67/05
ICV/LCS	SW10B-01-S93
CCV	↓ S95

Comments:

Analyzed By: r jdr

This page is checked during data review.

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CLIENT: **BATTELLE MEMORIAL INSTITUTE**
PROJECT: **JPL**
SDG: **05F027**

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HPLC **	6000 –
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METHOD 310.1	8040 – 8046
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** - Not Requested



1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889
Fax: (310) 618-0818

Date: 06-27-2005
EMAX Batch No.: 05F027

Attn: Tien Shao

Battelle Memorial Institute
505 King Ave.
Columbus OH 43201

Subject: Laboratory Report
Project: JPL

Enclosed is the Laboratory report for samples received on
06/02/05 and 06/03/05. The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
GARFIELD	F027-01	06/02/05	WATER	ANIONS BY IC FERROUS IRON PERCHLORATE BY IC METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
SUNSET	F027-02	06/02/05	WATER	ANIONS BY IC FERROUS IRON PERCHLORATE BY IC METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY

Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
				SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
BANGHAM	F027-03	06/02/05	WATER	ANIONS BY IC FERROUS IRON PERCHLORATE BY IC METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
LFWC-2	F041-01	06/03/05	WATER	ANIONS BY IC FERROUS IRON PERCHLORATE BY IC METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
LAWC-3	F041-02	06/03/05	WATER	ANIONS BY IC FERROUS IRON PERCHLORATE BY IC METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,

K. Y. Pang

Kam Y. Pang, Ph.D.
Laboratory Director

1001



Battelle

Columbus Laboratories

CHAIN OF CUSTODY RECORD

Form No. _____

05F041

Proj. No.

Project Title

G406111-T3 Source Determination Study

SAMPLERS: (Signature)

6066 HEADWATER / DAVE CORNER / BEN HEADWATER

DATE

TIME

SAMPLE I.D.

①
②

03 JUN 05 0930
03 JUN 05 1330

LFWC-2
LAWC-3

SAMPLE TYPE (V)

DOC (f: fixed)
TOC
FERRUS IRON
NITRATE, NITRATE
SULFATE, CHLORIDE
PERCHLORATE 24 HR
SPECIFIC ELECTRICAL CONDUCTIVITY
FERRIC IRON
CALCIUM, SODIUM
PERMANENT MAGNESIUM
SULFIDE
AMMONIA
TOTAL KJELDAHL NITROGEN

Container No.

Number of Containers

PO #
191943

Remarks

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received for Laboratory by: (Signature)

Date/Time

Remarks

Sent to: EMAX LABORATORIES

perchlorate - 24 HR - TAT, CALL
Dave corner with results (619) 726-7311

Type of Delivery	Delivered By/Airbill	ECN	05F027
<input checked="" type="checkbox"/> EMAX Courier	GEORGE BEE C.O.C.	Receipient	SIKHNIKOV
<input type="checkbox"/> Client Delivery		Date	6-2-05
<input type="checkbox"/> Third Party		Time	17:10

COC Inspection		
<input checked="" type="checkbox"/> Client Name	<input type="checkbox"/> Sampler Name	<input checked="" type="checkbox"/> Sampling Date/Time/Location
<input checked="" type="checkbox"/> Address	<input type="checkbox"/> Courier Signature/Date/Time	<input checked="" type="checkbox"/> Analysis Required
<input type="checkbox"/> Client PM/FC	<input checked="" type="checkbox"/> TAT	<input type="checkbox"/> Matrix
<input checked="" type="checkbox"/> Tel #/Fax #	<input checked="" type="checkbox"/> Sample ID	<input type="checkbox"/> Preservative (if any)
Safety Issues	<input type="checkbox"/> None	<input type="checkbox"/> Superfund Site Samples
Comments:	<input type="checkbox"/> High Concentrations expected	
	<input type="checkbox"/> Rad Screening Required	

Packaging Inspection			
Container	<input checked="" type="checkbox"/> Cooler	<input type="checkbox"/> Box	<input type="checkbox"/>
Condition	<input type="checkbox"/> Custody Seal	<input checked="" type="checkbox"/> Intact	<input type="checkbox"/> Damaged
Packaging	<input type="checkbox"/> Bubble Pack	<input type="checkbox"/> Styrofoam	<input checked="" type="checkbox"/> Sufficient
Temperatures	<input checked="" type="checkbox"/> Cooler 1 <u>4.2°C</u>	<input checked="" type="checkbox"/> Cooler 2 _____	<input type="checkbox"/> Cooler 3 _____
	<input type="checkbox"/> Cooler 5 _____	<input type="checkbox"/> Cooler 6 _____	<input type="checkbox"/> Cooler 4 _____
	<input type="checkbox"/> Cooler 9 _____	<input type="checkbox"/> Cooler 10 _____	<input type="checkbox"/> Cooler 7 _____
			<input type="checkbox"/> Cooler 8 _____
			<input type="checkbox"/> Cooler 11 _____
			<input type="checkbox"/> Cooler 12 _____
Comments:			

[illegible]

Sample Labeling _____
Date 6-2-05

SRF Clifford
Date 6/3/05

PM 01
Date 6/6/07

Type of Delivery	Delivered By/Airbill	ECN	05 F041
<input checked="" type="checkbox"/> EMAX Courier	SEE C.O.C.	Recipient	J. LUNA
<input type="checkbox"/> Client Delivery		Date	06.03.05.
<input type="checkbox"/> Third Party		Time	17:01

COC Inspection		
<input checked="" type="checkbox"/> Client Name	<input checked="" type="checkbox"/> Sampler Name	<input checked="" type="checkbox"/> Sampling Date/Time/Location
<input type="checkbox"/> Address	<input checked="" type="checkbox"/> Courier Signature/Date/Time	<input checked="" type="checkbox"/> Analysis Required
<input checked="" type="checkbox"/> Client PM/FC	<input checked="" type="checkbox"/> TAT	<input checked="" type="checkbox"/> Matrix
<input checked="" type="checkbox"/> Tel #/Fax #	<input checked="" type="checkbox"/> Sample ID	<input type="checkbox"/> Preservative (if any)
Safety Issues	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Superfund Site Samples
Comments:	<input type="checkbox"/> High Concentrations expected	
	<input type="checkbox"/> Rad Screening Required	

[illegible]

Date _____

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

METHOD 200.7
METALS BY ICP-AES

SDG#: 05F027

7000

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05F027

METHOD 200.7 METALS BY ICP-AES

Five (5) water samples were received on 06/02/05 and 06/03/05 for Metals analysis by Method 200.7 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample F027-01 was analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

MS/MSD sample was not designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedure. All criteria were met.

LAB CHRONICLE
METALS BY ICP-AES

SDG NO. : 05F027
Instrument ID : I-107

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	WATER					
				Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W LCS1W LCD1W LFWC-2 LAWC-3 GARF1ELD GARF1ELDDL GARF1ELDAS SUNSET BANCHAM	IPF029WB	1	NA	06/09/0519:25	06/09/0508:00	107F029012	107F029010	IPF029W	Method Blank
	IPF029WL	1	NA	06/09/0519:29	06/09/0508:00	107F029013	107F029010	IPF029W	Lab Control Sample (LCS)
	IPF029WC	1	NA	06/09/0519:33	06/09/0508:00	107F029014	107F029010	IPF029W	LCS Duplicate
	F041-01	1	NA	06/09/0519:46	06/09/0508:00	107F029017	107F029010	IPF029W	Field Sample
	F041-02	1	NA	06/09/0519:50	06/09/0508:00	107F029018	107F029010	IPF029W	Field Sample
	F027-01	1	NA	06/09/0519:55	06/09/0508:00	107F029019	107F029010	IPF029W	Field Sample
	F027-01T	5	NA	06/09/0519:59	06/09/0508:00	107F029020	107F029010	IPF029W	Diluted Sample
	F027-01A	1	NA	06/09/0520:03	06/09/0508:00	107F029021	107F029010	IPF029W	Analytical Spike Sample
	F027-02	1	NA	06/09/0520:16	06/09/0508:00	107F029024	107F029022	IPF029W	Field Sample
	F027-03	1	NA	06/09/0520:20	06/09/0508:00	107F029025	107F029022	IPF029W	Field Sample

FN - Filename
% Moist - Percent Moisture

7002

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METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 06/02/05
Project     : JPL                         Date Received: 06/02/05
Sample NO.  : 05F027                     Date Extracted: 06/09/05 08:00
Sample ID:  GARFIELD                     Date Analyzed: 06/09/05 19:55
Lab Samp ID: F027-01                     Dilution Factor: 1
Lab File ID: I07F029019                 Matrix          : WATER
Ext Btch ID: IPPF029W                   % Moisture      : NA
Calib. Ref.: I07F029010                 Instrument ID   : EMAXTI07
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	41.6	1	.1
Iron	ND	.2	.04
Magnesium	12.5	1	.1
Potassium	ND	2	1.4
Sodium	35.1	1	.25

7003

44

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 06/02/05
  iect      : JPL                         Date Received: 06/02/05
  NO.       : 05F027                     Date Extracted: 06/09/05 08:00
Sample ID: SUNSET                       Date Analyzed: 06/09/05 20:16
Lab Samp ID: F027-02                   Dilution Factor: 1
Lab File ID: I07F029024                Matrix       : WATER
Ext Btch ID: IPF029W                   % Moisture    : NA
Calib. Ref.: I07F029022                Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	108	1	.1
Iron	ND	.2	.04
Magnesium	34.6	1	.1
Potassium	3.52	2	1.4
Sodium	36.7	1	.25

7004

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METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 06/02/05
Project     : JPL                         Date Received: 06/02/05
NO.         : 05F027                     Date Extracted: 06/09/05 08:00
Sample ID: BANGHAM                       Date Analyzed: 06/09/05 20:20
Lab Samp ID: F027-03                     Dilution Factor: 1
Lab File ID: I07F029025                  Matrix          : WATER
Ext Btch ID: IPF029W                     % Moisture       : NA
Calib. Ref.: I07F029022                  Instrument ID    : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	55.5	1	.1
Iron	ND	.2	.04
Magnesium	19.8	1	.1
Potassium	3.66	2	1.4
Sodium	49.9	1	.25

7005

20

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 06/03/05
  ect       : JPL                         Date Received: 06/03/05
  NO.       : 05F027                     Date Extracted: 06/09/05 08:00
Sample ID: LFWC-2                       Date Analyzed: 06/09/05 19:46
Lab Samp ID: F041-01                   Dilution Factor: 1
Lab File ID: 107F029017                Matrix       : WATER
Ext Btch ID: IPF029W                   % Moisture    : NA
Calib. Ref.: 107F029010                 Instrument ID : EMAXTI07
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	73.5	1	.1
Iron	ND	.2	.04
Magnesium	24.8	1	.1
Potassium	ND	2	1.4
Sodium	24	1	.25

7006

mm

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 06/03/05
  ect       : JPL                         Date Received: 06/03/05
  NO.       : 05F027                     Date Extracted: 06/09/05 08:00
Sample ID: LAWG-3                       Date Analyzed: 06/09/05 19:50
Lab Samp ID: F041-02                   Dilution Factor: 1
Lab File ID: I07F029018                Matrix       : WATER
Ext Btch ID: IPF029W                   % Moisture    : NA
Calib. Ref.: I07F029010                Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	61.2	1	.1
Iron	ND	.2	.04
Magnesium	20.6	1	.1
Potassium	ND	2	1.4
Sodium	19.3	1	.25

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: NA
  ect       : JPL                          Date Received: 06/09/05
S. NO.      : 05F027                      Date Extracted: 06/09/05 08:00
Sample ID:  MBLK1W                        Date Analyzed: 06/09/05 19:25
Lab Samp ID: IPF029WB                    Dilution Factor: 1
Lab File ID: 107F029012                  Matrix       : WATER
Ext Btch ID: IPF029W                      % Moisture    : NA
Calib. Ref.: 107F029010                  Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	ND	1	.1
Iron	ND	.2	.04
Magnesium	ND	1	.1
Potassium	ND	2	1.4
Sodium	ND	1	.25

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
VOL.: 05F027
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILT N FACTR: 1 1 1
SAMPLE ID: MBLK1W
CONTROL NO.: IPF029WB IPF029WL IPF029WC
LAB FILE ID: 107F029012 107F029013 107F029014
DATIME EXTRCTD: 06/09/0508:00 06/09/0508:00 06/09/0508:00 DATE COLLECTED: NA
DATIME ANALYZD: 06/09/0519:25 06/09/0519:29 06/09/0519:33 DATE RECEIVED: 06/09/05
PREP. BATCH: IPF029W IPF029W IPF029W
CALIB. REF: 107F029010 107F029010 107F029010

ACCESSION:

PARAMETER	BLNK RSLT mg/L	SPIKE AMT mg/L	BS RSLT mg/L	BS % REC	SPIKE AMT mg/L	BSD RSLT mg/L	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	ND	50	48.7	97	50	48.7	97	0	85-115	20
Iron	ND	10	10.2	102	10	10.2	102	0	85-115	20
Magnesium	ND	50	49.2	98	50	49.3	99	0	85-115	20
Potassium	ND	50	48.3	97	50	48.6	97	1	85-115	20
Sodium	ND	50	48.4	97	50	48.8	98	1	85-115	20

7000

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EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05F027
METHOD: METHOD 200.7

=====

MATRIX:	WATER		% MOISTURE:	NA
DILUTION FACTOR:	1	5		
SAMPLE ID:	GARFIELD	GARFIELDL		
EMAX SAMP ID:	F027-01	F027-01T		
LAB FILE ID:	I07F029019	I07F029020		
DATE EXTRACTED:	06/09/0508:00	06/09/0508:00	DATE COLLECTED:	06/02/05
DATE ANALYZED:	06/09/0519:55	06/09/0519:59	DATE RECEIVED:	06/02/05
PREP. BATCH:	IPF029W	IPF029W		
CALIB. REF:	I07F029010	I07F029010		

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SERIAL DIL RSLT (mg/L)	DIF RSLT %	QC LIMIT (%)

Calcium	41.6	41.3	1	10
Iron	ND	ND	0	10
Magnesium	12.5	12.2	3	10
Potassium	ND	10.1	NA	10
Sodium	35.1	36	2	10

7010

2/11

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05F027
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILTN FACTR: 1 1
SAMPLE ID: GARFIELD
CONTROL NO.: F027-01 F027-01A
LAB FILE ID: I07F029019 I07F029021
DATIME EXTRACTD: 06/09/0508:00 06/09/0508:00 DATE COLLECTED: 06/02/05
DATIME ANALYZD: 06/09/0519:55 06/09/0520:03 DATE RECEIVED: 06/02/05
PREP. BATCH: IPF029W IPF029W
CALIB. REF: I07F029010 I07F029010

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	AS RSLT (mg/L)	AS % REC	QC LIMIT (%)
Calcium	41.6	50	88.3	93	70-130
Iron	ND	10	10.1	101	70-130
Magnesium	12.5	50	60.8	97	70-130
Potassium	ND	50	50.3	101	70-130
Sodium	35.1	50	81.8	93	70-130

7011

mm

REGULAR ICP QC CHECK TABLE

QC Limit%	ICV HIGH 95-105	ICV 90-110	CCV 90-110	ICSAB 80-120	ICSA 80-120
Comp	mg/L	mg/L	mg/L	mg/L	mg/L
Al	10	5	5	500	500
Sb	2	1	1	1	0
As	2	1	1	1	0
Ba	2	1	1	0.5	0
Be	2	1	1	0.5	0
B	2	1	1	0.5	0
Cd	2	1	1	1	0
Ca	100	50	50	500	500
Cr	2	1	1	0.5	0
Co	2	1	1	0.5	0
Cu	2	1	1	0.5	0
Fe	10	5	5	200	200
Pb	2	1	1	1	0
Mg	100	50	50	500	500
Mn	2	1	1	0.5	0
Mo	2	1	1	1	0
Ni	2	1	1	1	0
K	100	50	50	50	0
Se	2	1	1	3.6	0
Ag	2	1	1	1	0
Na	100	50	50	10	0
Sr	2	1	1	0.5	0
Tl	2	1	1	3.6	0
Sn	10	5	5	1	0
Ti	2	1	1	1	0
V	2	1	1	0.5	0
Zn	2	1	1	1	0

ANALYSIS RUN LOG FOR ICP

SOP □ EMAX-6010-Rev. 3 □ EMAX-CLP-TAL □ 20.7 Method File: 0010P1 Autosampler Table: 00P

Matrix: Water		Start Date: 06/09/05		Time: 18:37		End Date: 06/09/05		Time: 20:50		Book# A24 -037	
Data File Name	Prep. Batch	Lab Sample ID	DF	Matrix	Notes	Data File Name	Prep. Batch	Lab Sample ID	DF	Matrix	Notes
01		SC				26	PP6029w	F004-01			F455-d
02		SC				27		ICSAF			quar
03		SC				28		ICSAF			6/9/05
04		ICV (GIS)				29		CCV			
05		ICP				30		CCV			
06		CCV (TR)				31					
07		CCV				32					
08		ICSAF				33					
09		ICSAF				34					
10		CCV (TR)				35					
11		CCV				36					
12	IP6029w	IP6029w	1	W	(LFD)	37					
13		W	1		(LFD)	38					
14		W	1		(LFD)	39					
15		F410-04	1			40					
16		05	1			41					
17		F041-01	1			42					
18		02	1			43					
19		F027-01	1			44					
20		017	5			45					
21		01A	1			46					
22		CCV2 (TR)	1			47					
23		CCV2	1			48					
24		F027-02	1			49					
25		03	1			50					

ANALYTICAL BATCH *											
Data File Name	Prep. Batch	Lab Sample ID	DF	Matrix	Notes	Data File Name	Prep. Batch	Lab Sample ID	DF	Matrix	Notes
ANALYTICAL BATCH *											
Comments:											

Instrument No.		ID
S ₀	8711309-38-01	
S ₁	N/A	
S ₂	↓	
S ₃	8711309-44-04	
S ₄	N/A	
S ₅	↓	
S ₆	8711309-45-02	
ICV	↓ -42-01	
ICVH1	N/A	
ICVH2	↓	
CCV	8711309-60-02	
ICSA	8711309-63-03	
ICSAB	↓ -60-01	
MRL	N/A	

Analyzed By:	Date Disposed:
qin	

This page is checked during data review.

SEQUENCE FILE : I07F029

4-18	19-33	34-43	44-53	54-63
LFID	LSID	TIME	DATE	DF
I07F029001	S0	18:37	06/09/05	1
I07F029002	S3	18:41	06/09/05	1
I07F029003	S6	18:45	06/09/05	1
I07F029004	ICV	18:49	06/09/05	1
I07F029005	ICB	18:55	06/09/05	1
I07F029006	CCV	18:59	06/09/05	1
I07F029007	CCB	19:03	06/09/05	1
I07F029008	ICSAI	19:07	06/09/05	1
I07F029009	ICSA8I	19:11	06/09/05	1
I07F029010	CCV1	19:17	06/09/05	1
I07F029011	CCB1	19:21	06/09/05	1
I07F029012	IPF029WB	19:25	06/09/05	1
I07F029013	IPF029WL	19:29	06/09/05	1
I07F029014	IPF029WC	19:33	06/09/05	1
I07F029015	F410-04	19:38	06/09/05	1
I07F029016	F410-05	19:42	06/09/05	1
I07F029017	F041-01	19:46	06/09/05	1
I07F029018	F041-02	19:50	06/09/05	1
I07F029019	F027-01	19:55	06/09/05	1
I07F029020	F027-01T	19:59	06/09/05	5
I07F029021	F027-01A	20:03	06/09/05	1
I07F029022	CCV2	20:07	06/09/05	1
I07F029023	CC82	20:12	06/09/05	1
I07F029024	F027-02	20:16	06/09/05	1
I07F029025	F027-03	20:20	06/09/05	1
I07F029026	F064-01	20:24	06/09/05	1
I07F029027	F455-01	20:28	06/09/05	1
I07F029028	ICSAF	20:36	06/09/05	1
I07F029029	ICSA8F	20:40	06/09/05	1
I07F029030	CCV3	20:46	06/09/05	1
I07F029031	CCB3	20:50	06/09/05	1

SDG : 051-27

UNIT : %

ICP CHECK : 107F029

DATE : 06/09/05

INST : ERMACT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
S0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICV	99	101	102	91	100	102	97	103	98	97	97	102	98	104	98	99	96	101	103	96	103	97	92	97	100	98	98
IC8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV	98	99	101	97	97	97	98	101	97	97	96	100	95	100	97	99	95	99	107	97	99	96	94	97	97	97	97
CC8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAI	95	...	...	...	...	...	...	91	...	...	...	89	...	97	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA8I	96	91	94	94	93	94	91	92	88	86	96	89	92	97	90	90	85	99	104	96	103	90	90	92	92	98	93
CCV1	98	99	96	96	97	96	98	100	96	96	96	99	96	98	96	98	95	97	103	97	98	96	94	96	96	96	97
CC81	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPF029AB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPF029AL	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPF029AC	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F410-04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F410-05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F041-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F041-02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F027-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F027-01T	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F027-01A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV2	97	97	99	96	96	95	97	99	96	95	95	99	95	98	95	96	94	98	99	96	99	95	92	96	96	96	96
CC82	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F027-02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F027-03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F064-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F455-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAF	89	...	...	...	...	...	...	89	...	...	...	85	...	92	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA8F	89	85	88	84	88	88	89	89	84	82	88	85	91	92	85	84	82	91	97	91	93	82	81	85	85	92	91
CCV3	92	94	92	88*	92	91	95	98	93	92	88*	95	95	94	92	93	91	92	99	92	90	88*	93	94	90	91	95
CC83	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

QC limit of each parameter are listed in a table attached next to all the ICP check forms

* : Out of QC Limit

7015

SDG : 051-27

UNIT : UG/L

SUMMARY of CALIBRATION BLANKS : 107F029 (WATER)

DATE : 06/09/05 INST : EMMA1107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn	
S0	2.59	1.32	0.00	0.00	0.00	0.00	1.31	0.790	1.82	1.13	1.25	1.53	1.03	17.2	10.6	0.00	1.25	6.64	588	31.7	2.95	0.00	0.00	24.5	31.4	590	780	720
S3	9.43	2.38	15.3	180	0.00	1.31	260	0.80	0.560	0.490	0.380	1.81	7.51	5.90	1.20	1.25	5.62	187	5.54	2.79	0.00	0.00	31.4	8.15	290	970	880	
S6	17.6	46.3	170	0.60	9.74	1.17	1.17	8.80	1.22	5.47	56.3	56.3	56.3	4.16	8.06	8.85	457	315	8.57	7.35	2.09	50.2	11.9	14.5	4.66	0.30	0.30	
ICV																												
ICB																												
CCV																												
ICSA1																												
ICSA61																												
CCV1																												
CCB1	8.83	10.1	8.12	280	0.060	1.31	1.130	250	1.69	1.62	1.91	1.03	5.06	13.1	3.70	2.50	5.10	226	54.0	4.66	0.00	0.00	9.41	13.9	0.00	1.51	1.11	
IPF029WB																												
IPF029WL																												
IPF029WC																												
F410-04																												
F410-05																												
F041-01																												
F041-02																												
F027-01																												
F027-01T																												
F027-01A																												
CCV2																												
CCB2	7.86	7.70	7.18	0.00	1.30	1.74	7.20	4.20	1.13	1.62	1.53	7.70	13.0	8.27	5.00	1.25	9.02	222	28.6	0.00	0.00	0.00	18.2	29.1	140	980	1.29	
F027-02																												
F027-03																												
F064-01																												
F455-01																												
ICSAF	5.96	65.9	0.10	0.60	13.4	4.20	4.20	6.82	3.87	4.43	4.43	34.5	34.5	2.95	4.27	1.36	115	296	6.84	29.4	1.84	115	7.90	13.3	3.16	100	100	
ICSA6F																												
CCV3																												
CCB3	9.49	20.8	880	0.00	0.00	0.00	810	610	0.00	370	760	250	1.11	11.7	250	5.01	2.89	807	15.1	6.21	73.5	960	15.7	17.4	310	820	610	

QC limit of each parameter are listed in a table attached next to all the ICP check forms

* : Out of QC Limit

7016

DIGESTION LOG FOR ICP METALS

SOP ☐ EMAX-3005 Rev. No. 3 ☐ EMAX-3010 Rev. No. 2 ☐ EMAX-CLP-TAL ☒ 200.7 Book # EIP-045

Matrix: WATER Start Date: 6-9-05 Time: 8:00 Temp: 95°C Ending Date: 6-9-05 Time: 10:00 Temp: 85°C

Sample Prep ID	Lab Sample ID	Matrix Description		Turbidity <1 NTU	Sample Amount (g | ml)	pH	Extract Volume (ml)	Digestate Description		Standards	ID	Amount Added (ml)	
		Color	Texture / Clarity					Color	Clarity				
01	IPFO2-IPFO29-WB				SD	-	SD			LCS-1	SMIA - 09 - 27	0.5	
02	↓ - WL				SD	-	SD			LCS-2	SMIA - 09 - 28	0.5	
03	↓ - WC				SD	-	SD			LCS-3	SMIA - 09 - 29	0.5	
04	F910-04				SD	<2	SD			MS	N/A		
05	↓ - 05				SD		SD			Reagent	Lot# / ID	Amount Added (ml)	
06	F041-01				SD		SD			HNO ₃	SWIA - 03 - 089	0.5	
07	↓ - 02				SD		SD			HCl	SWIA - 03 - 093	0.25	
08	F027-01				SD		SD			H ₂ O ₂			
09	↓ - 02				SD		SD			HNO ₃ (1:1)			
10	↓ - 03				SD	↓	SD			Digestate Location	ICP LAB		
11	F064-01				SD	↓	SD			Extract Location			
12										Legend:			
13										Texture	Cs = Coarse	Md = Medium	Fn = Fine
14										Clarity	Cr = Clear	Cy = Cloudy	Td = Turbid
15										Artifacts	Rk = rocks	Sl = Shale	Vg = Vegetation
16										Color	Bu = blue	Bk = Black	Bn = Brown
17											Gn = Green	Og = Orange	Rd = Red
											Yw = Yellow	Cl = Colorless	

BATCH: TPFO 29-W

BATCH: TPFO 29-W

2017

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

WET CHEMICAL ANALYSES

SDG#: 05F027

8000

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**
PROJECT: **JPL**
SDG: **05F027**

METHOD 120.1 SPECIFIC CONDUCTIVITY

Five (5) water samples were received on 06/02/05 and 06/03/05 for Specific Conductivity analysis by Method 120.1 in accordance with "Methods for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

3. Duplicate

No duplicate sample was designated in this SDG.

4. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

8001

METHOD 1000-1
SPECIFIC CONDUCTIVITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F027

Matrix : WATER
Instrument ID : 129

SAMPLE ID	EMAX SAMPLE ID	RESULTS (umhos/cm)	DLF	MOIST	RL (umhos/cm)	MDL (umhos/cm)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
LCS1W	ECF001WL	683	1	NA	1	.5	06/14/0514:12	NA	ECF001W-02	NA	ECF001W	NA	NA
LCD1W	ECF001WC	683	1	NA	1	.5	06/14/0514:14	NA	ECF001W-03	NA	ECF001W	NA	NA
GARFIELD	F027-01	472	1	NA	1	.5	06/14/0514:20	NA	ECF001W-06	NA	ECF001W	06/02/05	06/02/05
SUNSET	F027-02	875	1	NA	1	.5	06/14/0514:22	NA	ECF001W-07	NA	ECF001W	06/02/05	06/02/05
BANGHAM	F027-03	631	1	NA	1	.5	06/14/0514:24	NA	ECF001W-08	NA	ECF001W	06/02/05	06/02/05
LFWC-2	F041-01	638	1	NA	1	.5	06/14/0514:26	NA	ECF001W-09	NA	ECF001W	06/03/05	06/03/05
LFWC-3	F041-02	511	1	NA	1	.5	06/14/0514:28	NA	ECF001W-10	NA	ECF001W	06/03/05	06/03/05

8002

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: METHOD 120.1

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05F027

SAMPLE ID: LCS1W/LCD1W

CONTROL NO.: ECF001WL/C

ACCESSION:

DATE RECEIVED: NA

DATE EXTRACTED: NA

DATE ANALYZED: 06/14/05 14:12/14:14

PARAMETER	BLNK RSLT (umhos/cm)	SPIKE AMT (umhos/cm)	BS RSLT (umhos/cm)	BS % REC	SPIKE AMT (umhos/cm)	BSD RSLT (umhos/cm)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Specific Conductivity	ND	682	682	100	682	683	100	0	80-120	20

8003

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ANALYSIS LOG FOR SPECIFIC CONDUCTIVITY

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Book # AEC-002

SOP ☒ EMAX-120.1 Revision No. 1 ☐

Start Date	6/14/03	Time	1400	End Date	6/14/05	Time	1408
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Data File Name	Lab Sample ID	Time	Temp. °C	Temp. Correction Factor QT @ 25 °C	DF	Measured Resistance (ohms)	Notes
* 1	STD HIGH 7065	14 10	20.1	0.906	1	6910	EC @ 25°C
* 2	EC F001 WL	12	20.1	0.906		668	µmhos/cm
* 3	WL	14	20.1	0.906		668	
* 4	F004-13	16	20.2	0.908		1824	1860 (1801)
* 5	1-13D	18	20.2	0.908		1824	1860
* 6	F027-01	20	20.2	0.908		462	472
* 7	-02	22	20.3	0.910		859	845
* 8	-03	24	20.2	0.908		618	631
* 9	F041-01	26	20.2	0.908		625	638
* 0	-02	28	20.2	0.908		501	511
* 1	F048-02	30	20.1	0.906		444	454
* 2	-04	32	20.1	0.906		826	845
* 3	-04B	34	20.1	0.906		826	845
* 4	-06	36	20.1	0.906		215	220
* 5	F064-01	38	20.2	0.908		583	595
* 6	F441-01	40	20.2	0.908		573	585
* 7	-02	42	20.3	0.910		598	609
* 8	-02B	44	20.3	0.910		598	609
* 9	F087-12	46	20.1	0.906	✓	1310	1340
* 0	STD LOW DL	48	20.3	0.910	1	1.18	1.20

ANALYTICAL BATCH * EC F001 WL

Instrument No:	29
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Trial	ID	Resistance ohms
KCI Standard	SW2A-01-55	ASSAY
1	SW3B-02-654	722
2	Q _t 0.908	722
3		722
LCS	SW7A-06-116	682 µmhos/cm
Calibration Temperature	20.2 °C	
True Value	1413	µmhos/cm
Cell Constant (C)	0.927	

KCI Standard	Temp. °C	µmhos/cm
Low-point	DI Water	0.5 - 4
Mid-point	SW3B-02-654	1413
High-point	SW3B-06-316A	7065

Comments:

Analyzed By: NO/LP

This page is checked during the data review process.

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05F027

METHOD 300.0 ANIONS

Five (5) water samples were received on 06/02/05 and 06/03/05 for Chloride, Nitrate-N, Nitrite-N and Sulfate analyses by method 300.0 in accordance with "Method for Determination of Inorganic Anions by Ion Chromatography", EPA 600/84-017.

1. Holding Time

Analyses met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limits.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

SAMPLE RESULTS

METHOD 300.0
CHLORIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F027

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICF005WB	.22	1	NA	.2	.1	06/02/0523:35	NA	AF02-44	AF02-37	ICF005W	NA	NA
LCS1W	ICF005WL	5.09	1	NA	.2	.1	06/02/0523:49	NA	AF02-45	AF02-37	ICF005W	NA	NA
LCD1W	ICF005WC	5.12	1	NA	.2	.1	06/03/0500:03	NA	AF02-46	AF02-37	ICF005W	NA	NA
GARFIELD	F027-01	28.3	10	NA	2	1	06/03/0502:38	NA	AF02-57	AF02-49	ICF005W	06/02/05	06/02/05
SUNSET	F027-02	58.4	10	NA	2	1	06/03/0502:52	NA	AF02-58	AF02-49	ICF005W	06/02/05	06/02/05
BANCHAM	F027-03	35.3	10	NA	2	1	06/03/0503:06	NA	AF02-59	AF02-49	ICF005W	06/02/05	06/02/05
MBLK2W	ICF006WB	ND	1	NA	.2	.1	06/03/0515:16	NA	AF03-03	AF03-01	ICF006W	NA	NA
LCS2W	ICF006WL	5.03	1	NA	.2	.1	06/03/0515:30	NA	AF03-04	AF03-01	ICF006W	NA	NA
LCD2W	ICF006WC	5.05	1	NA	.2	.1	06/03/0515:44	NA	AF03-05	AF03-01	ICF006W	NA	NA
LFWC-2	F041-01	38.9	10	NA	2	1	06/03/0521:06	NA	AF03-27	AF03-25	ICF006W	06/03/05	06/03/05
LAWC-3	F041-02	23.1	10	NA	2	1	06/03/0521:20	NA	AF03-28	AF03-25	ICF006W	06/03/05	06/03/05

8007

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METHOD 300.0
NITRATE-N

Matrix : WATER
Instrument ID : 100

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F041

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICF004WB	ND	1	NA	.1	.05	06/02/0516:03	NA	AF02-17	AF02-13	ICF004W	NA	NA
LCS1W	ICF004WL	4.77	1	NA	.1	.05	06/02/0516:17	NA	AF02-18	AF02-13	ICF004W	NA	NA
LCD1W	ICF004WC	4.77	1	NA	.1	.05	06/02/0516:40	NA	AF02-19	AF02-13	ICF004W	NA	NA
GARFIELD	F027-01	7.28	1	NA	.1	.05	06/02/0520:03	NA	AF02-29	AF02-26	ICF004W	06/02/05	06/02/05
SUNSET	F027-02	8.52	1	NA	.1	.05	06/02/0520:17	NA	AF02-30	AF02-26	ICF004W	06/02/05	06/02/05
BANGHAM	F027-03	5.22	1	NA	.1	.05	06/02/0520:32	NA	AF02-31	AF02-26	ICF004W	06/02/05	06/02/05
MBLK2W	ICF006WB	ND	1	NA	.1	.05	06/03/0515:16	NA	AF03-03	AF03-01	ICF006W	NA	NA
LCS2W	ICF006WL	4.8	1	NA	.1	.05	06/03/0515:30	NA	AF03-04	AF03-01	ICF006W	NA	NA
LCD2W	ICF006WC	4.81	1	NA	.1	.05	06/03/0515:44	NA	AF03-05	AF03-01	ICF006W	NA	NA
LFWC-2	F041-01	8.99	1	NA	.1	.05	06/03/0519:55	NA	AF03-22	AF03-13	ICF006W	06/03/05	06/03/05
LAVC-3	F041-02	2.72	1	NA	.1	.05	06/03/0520:09	NA	AF03-23	AF03-13	ICF006W	06/03/05	06/03/05

8008

R1

METHOD 3u.0
NITRITE-N

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F041

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE	Extraction DATE	LFID	CAL REF	PREP BATCH	Collection DATE	Received DATE
MBLK1W	ICF004WB	ND	1	NA	.1	.05	06/02/0516:03	NA	AF02-17	AF02-13	ICF004W	NA	NA
LCS1W	ICF004WL	4.77	1	NA	.1	.05	06/02/0516:17	NA	AF02-18	AF02-13	ICF004W	NA	NA
LCD1W	ICF004WC	4.78	1	NA	.1	.05	06/02/0516:40	NA	AF02-19	AF02-13	ICF004W	NA	NA
GARFIELD	F027-01	ND	1	NA	.1	.05	06/02/0520:03	NA	AF02-29	AF02-26	ICF004W	06/02/05	06/02/05
SUNSET	F027-02	ND	1	NA	.1	.05	06/02/0520:17	NA	AF02-30	AF02-26	ICF004W	06/02/05	06/02/05
BANGHAM	F027-03	ND	1	NA	.1	.05	06/02/0520:32	NA	AF02-31	AF02-26	ICF004W	06/02/05	06/02/05
MBLK2W	ICF006WB	ND	1	NA	.1	.05	06/03/0515:16	NA	AF03-03	AF03-01	ICF006W	NA	NA
LCS2W	ICF006WL	4.85	1	NA	.1	.05	06/03/0515:30	NA	AF03-04	AF03-01	ICF006W	NA	NA
LCD2W	ICF006WC	4.85	1	NA	.1	.05	06/03/0515:44	NA	AF03-05	AF03-01	ICF006W	NA	NA
LFWC-2	F041-01	ND	1	NA	.1	.05	06/03/0519:55	NA	AF03-22	AF03-13	ICF006W	06/03/05	06/03/05
LAWC-3	F041-02	ND	1	NA	.1	.05	06/03/0520:09	NA	AF03-23	AF03-13	ICF006W	06/03/05	06/03/05

8009

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METHOD 300.0
SULFATE

Client : BATTLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F041

Matrix : WATER
Instrument ID : 100

SAMPLE ID	ENAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICF005WB	ND	1	NA	.5	.25	06/02/0523:35	NA	AF02-44	AF02-37	ICF005W	NA	NA
LCSTW	ICF005WL	15.5	1	NA	.5	.25	06/02/0523:49	NA	AF02-45	AF02-37	ICF005W	NA	NA
LCSTW	ICF005WC	13.9	1	NA	.5	.25	06/03/0500:03	NA	AF02-46	AF02-37	ICF005W	NA	NA
GARFIELD	F027-01	56.7	10	NA	5	2.5	06/03/0502:38	NA	AF02-57	AF02-49	ICF005W	06/02/05	06/02/05
SUNSET	F027-02	119	10	NA	5	2.5	06/03/0502:52	NA	AF02-58	AF02-49	ICF005W	06/02/05	06/02/05
BANGHAM	F027-03	70.8	10	NA	5	2.5	06/03/0503:06	NA	AF02-59	AF02-49	ICF005W	06/02/05	06/02/05
MBLK2W	ICF006WB	ND	1	NA	.5	.25	06/03/0515:16	NA	AF03-03	AF03-01	ICF006W	NA	NA
LCSTW	ICF006WL	15.2	1	NA	.5	.25	06/03/0515:30	NA	AF03-04	AF03-01	ICF006W	NA	NA
LCSTW	ICF006WC	15.2	1	NA	.5	.25	06/03/0515:44	NA	AF03-05	AF03-01	ICF006W	NA	NA
LFMC-2	F041-01	73	10	NA	5	2.5	06/03/0521:06	NA	AF03-27	AF03-25	ICF006W	06/03/05	06/03/05
LAMC-3	F041-02	45.7	10	NA	5	2.5	06/03/0521:20	NA	AF03-28	AF03-25	ICF006W	06/03/05	06/03/05

8010

Re

QC SUMMARIES

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05F027

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICF005WB
LAB FILE ID: AF02-44
DATE EXTRACTED: NA
DATE ANALYZED: 06/02/0523:35
PREP. BATCH: ICF005W
CALIB. REF: AF02-37

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Chloride-Cl	.22	5	5.09	97	5	5.12	98	1	90-110	20

8012

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05F027
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK2W
LAB SAMP ID: ICF006WB ICF006WC
LAB FILE ID: AF03-03 AF03-04 AF03-05
DATE EXTRACTED: NA NA
DATE ANALYZED: 06/03/0515:16 06/03/0515:30 06/03/0515:44
PREP. BATCH: ICF006W ICF006W ICF006W
CALIB. REF: AF03-01 AF03-01 AF03-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Chloride-Cl	ND	5	5.03	101	5	5.05	101	0	90-110	20

8013

20

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05F041

METHOD: METHOD 300.0

MATRIX: WATER % MOISTURE: NA

DILUTION FACTOR: 1

SAMPLE ID: MBLK1W

LAB SAMP ID: ICF004WB ICF004WC

LAB FILE ID: AF02-17 AF02-18 AF02-19

DATE EXTRACTED: NA DATE COLLECTED: NA

DATE ANALYZED: 06/02/0516:03 06/02/0516:17 06/02/0516:40

PREP. BATCH: ICF004W ICF004W

CALIB. REF: AF02-13 AF02-13

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	5	4.77	95	5	4.77	95	0	90-110	20

8014

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05F041
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK2W
LAB SAMP ID: ICF006WB ICF006WL ICF006WC
LAB FILE ID: AF03-03 AF03-04 AF03-05
DATE EXTRACTED: NA NA NA
DATE ANALYZED: 06/03/0515:16 06/03/0515:30 06/03/0515:44
PREP. BATCH: ICF006W ICF006W ICF006W
CALIB. REF: AF03-01 AF03-01 AF03-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	5	4.8	96	5	4.81	96	0	90-110	20

8015

74

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05F041

METHOD: METHOD 300.0

MATRIX: WATER

DILUTION FACTOR: 1

SAMPLE ID: HBLK1W

LAB SAMP ID: ICF004WB

LAB FILE ID: AF02-17

DATE EXTRACTED: NA

DATE ANALYZED: 06/02/0516:03

PREP. BATCH: ICF004W

CALIB. REF: AF02-13

% MOISTURE: NA

1

ICF004MC

AF02-19

NA

DATE COLLECTED: NA

DATE RECEIVED: NA

ICF004W

AF02-13

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrite-N	ND	5	4.77	95	5	4.78	96	0	90-110	20

8016

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05F041
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK2W
LAB SAMP ID: ICF006WL ICF006WC
LAB FILE ID: AF03-04 AF03-05
DATE EXTRACTED: NA
DATE ANALYZED: 06/03/0515:16 06/03/0515:30
PREP. BATCH: ICF006W ICF006W
CALIB. REF: AF03-01 AF03-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrite-N	ND	5	4.85	97	5	4.85	97	0	90-110	20

8017

74

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05F041
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICF005WB ICF005WC
LAB FILE ID: AF02-44 AF02-45 AF02-46
DATE EXTRACTED: NA NA
DATE ANALYZED: 06/02/0523:35 06/02/0523:49 06/03/0500:03
PREP. BATCH: ICF005W ICF005W ICF005W
CALIB. REF: AF02-37 AF02-37 AF02-37

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Sulfate	ND	15	15.5	103	15	13.9	93	11	90-110	20

8018

74

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05F041

METHOD: METHOD 300.0

MATRIX: WATER DILUTION FACTOR: 1 1 % MOISTURE: NA

SAMPLE ID: MBLK2W

LAB SAMP ID: ICF006WL ICF006WC

LAB FILE ID: AF03-03 AF03-04 AF03-05

DATE EXTRACTED: NA DATE COLLECTED: NA

DATE ANALYZED: 06/03/0515:16 06/03/0515:30 06/03/0515:44

PREP. BATCH: ICF006W ICF006W ICF006W

CALIB. REF: AF03-01 AF03-01 AF03-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Sulfate	ND	15	15.2	101	15	15.2	101	0	90-110	20

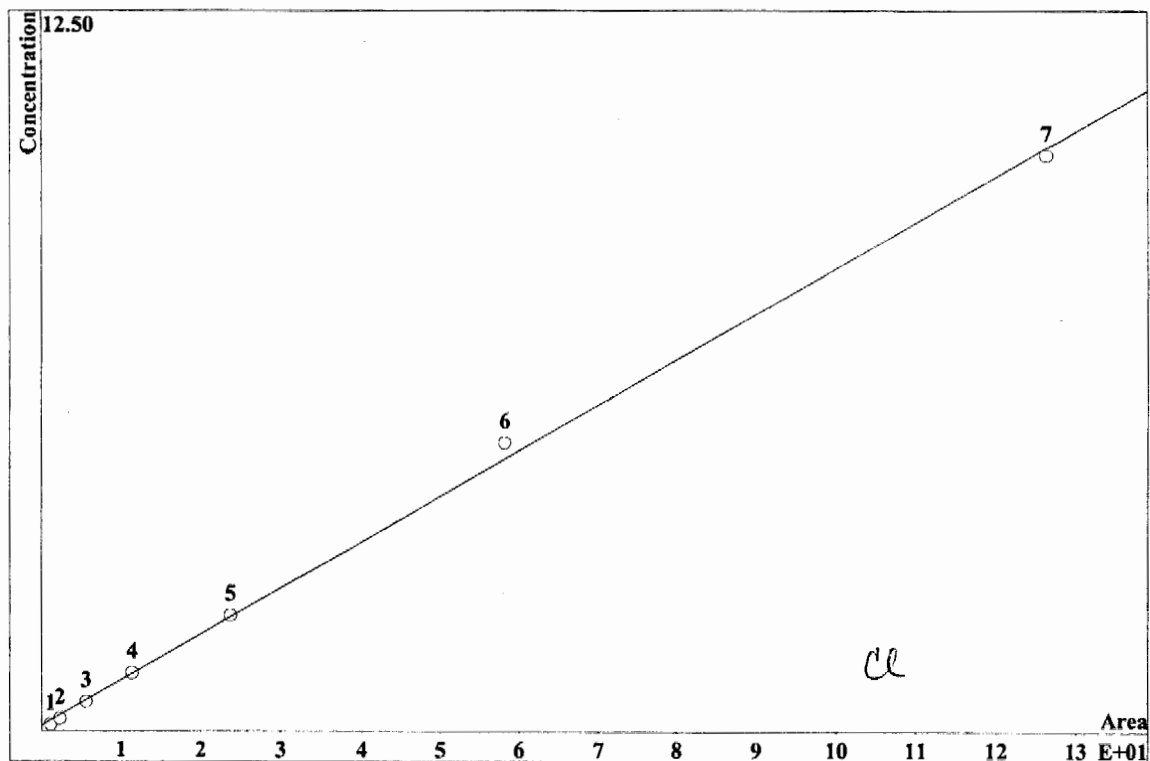
8019

27

INITIAL CALIBRATION

CALIBRATION OF COMPONENT chloride

Method: IC100-E23.mtw
 Equation: $Q = 0.0794095 \cdot A + 0.0841087$
 RSD: 5.497 %
 Correlation coefficient: 0.999317



K3 = 0 K2 = 0 K1 = 0.0794095 K0 = 0.0841087

Base: Area

Ref.channel: Cond

ISTD:

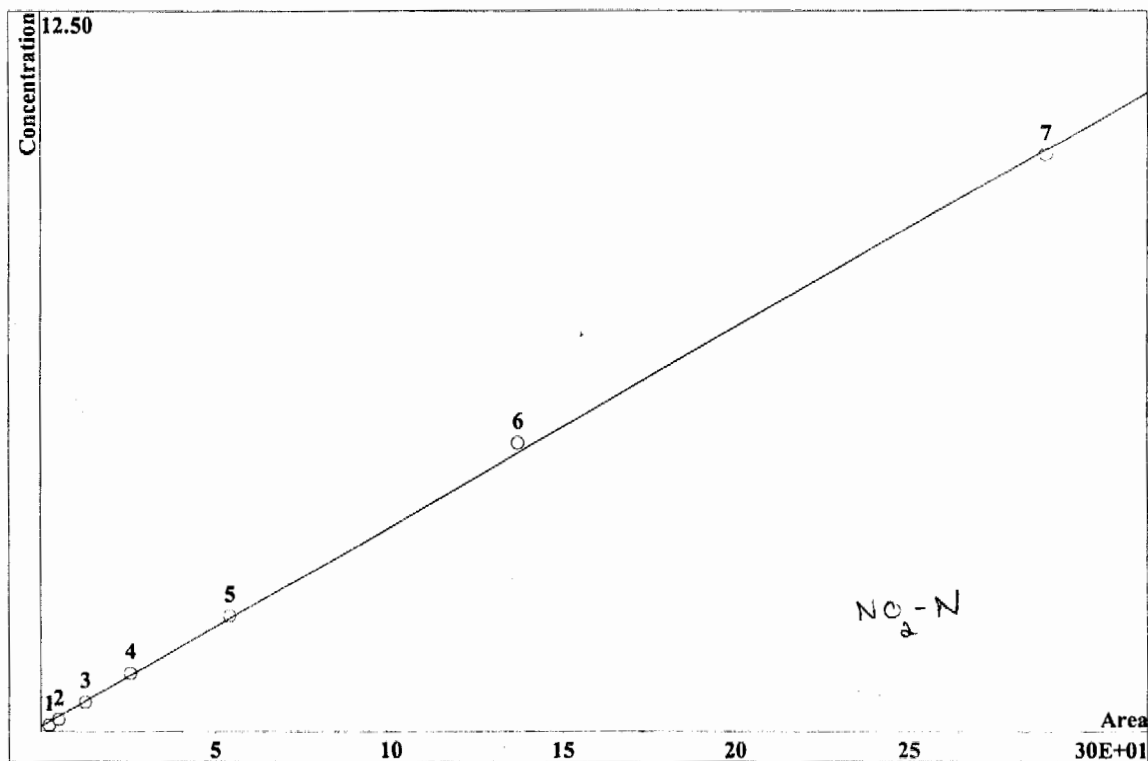
Formula: Linear

Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.144	1.201 ✓	0.1	1	3.54	Yes	p5231616.chw
2	0.2844	2.348 ✓	0.2	1	3.54	Yes	p5231630.chw
3	0.691	5.671 ✓	0.5	1	3.54	Yes	p5231644.chw
4	1.368	11.4 ✓	1	1	3.54	Yes	p5231658.chw
5	2.938	23.82 ✓	2	1	3.54	Yes	p5231712.chw
6	7.344	58.38 ✓	5	1	3.54	Yes	p5231726.chw
7	16.43	126.5 ✓	10	1	3.54	Yes	p5231755.chw

CALIBRATION OF COMPONENT nitrite

Method: IC100-E23.mtw
 Equation: $Q = 0.034601 \cdot A + 0.0821293$
 RSD: 3.606 %
 Correlation coefficient: 0.999706

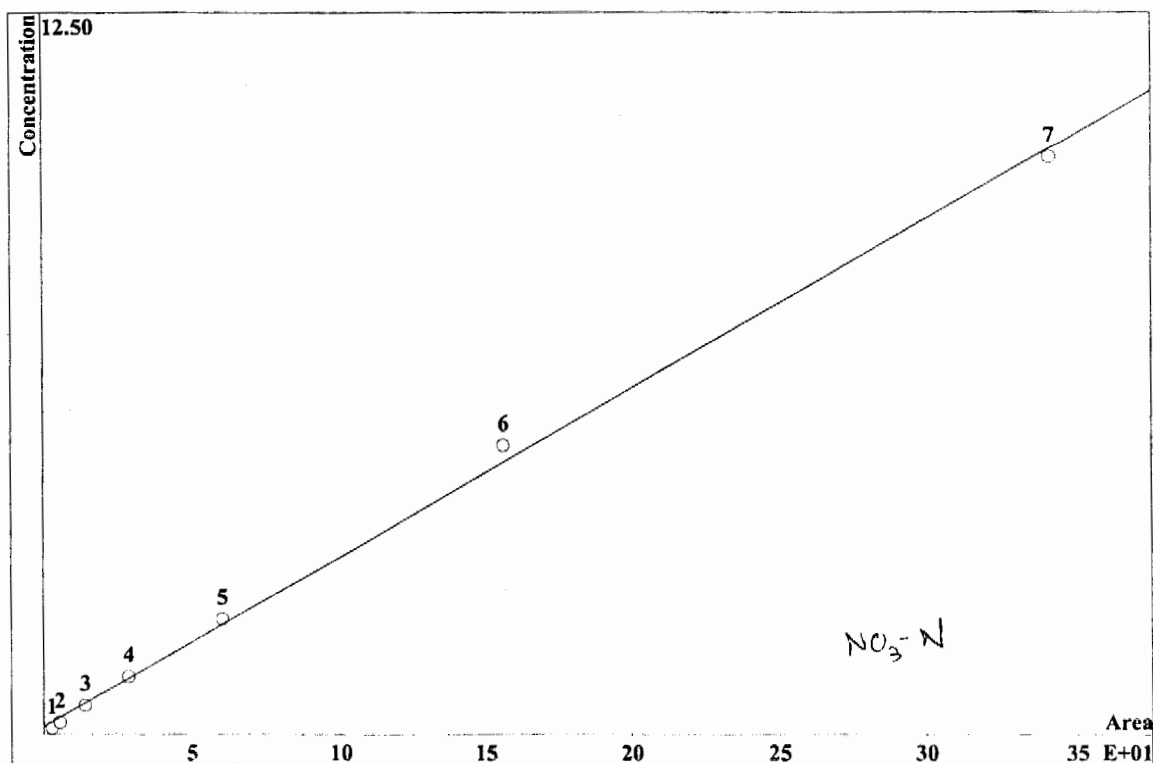


K3 = 0 K2 = 0 K1 = 0.034601 K0 = 0.0821293
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.253	2.457 ✓	0.1	1	4.24	Yes	p5231616.chw
2	0.53	5.182 ✓	0.2	1	4.24	Yes	p5231630.chw
3	1.3	12.79 ✓	0.5	1	4.24	Yes	p5231644.chw
4	2.581	25.57 ✓	1	1	4.24	Yes	p5231658.chw
5	5.528	54.26 ✓	2	1	4.24	Yes	p5231712.chw
6	13.58	137.3 ✓	5	1	4.24	Yes	p5231726.chw
7	27.15	289.1 ✓	10	1	4.24	Yes	p5231755.chw

CALIBRATION OF COMPONENT nitrate

Method: IC100-E23.mtw
 Equation: $Q = 0.0293514 \cdot A + 0.132291$
 RSD: 6.208 %
 Correlation coefficient: 0.999129



K3 = 0 K2 = 0 K1 = 0.0293514 K0 = 0.132291

Base: Area

Ref.channel: Cond

ISTD:

Formula: Linear

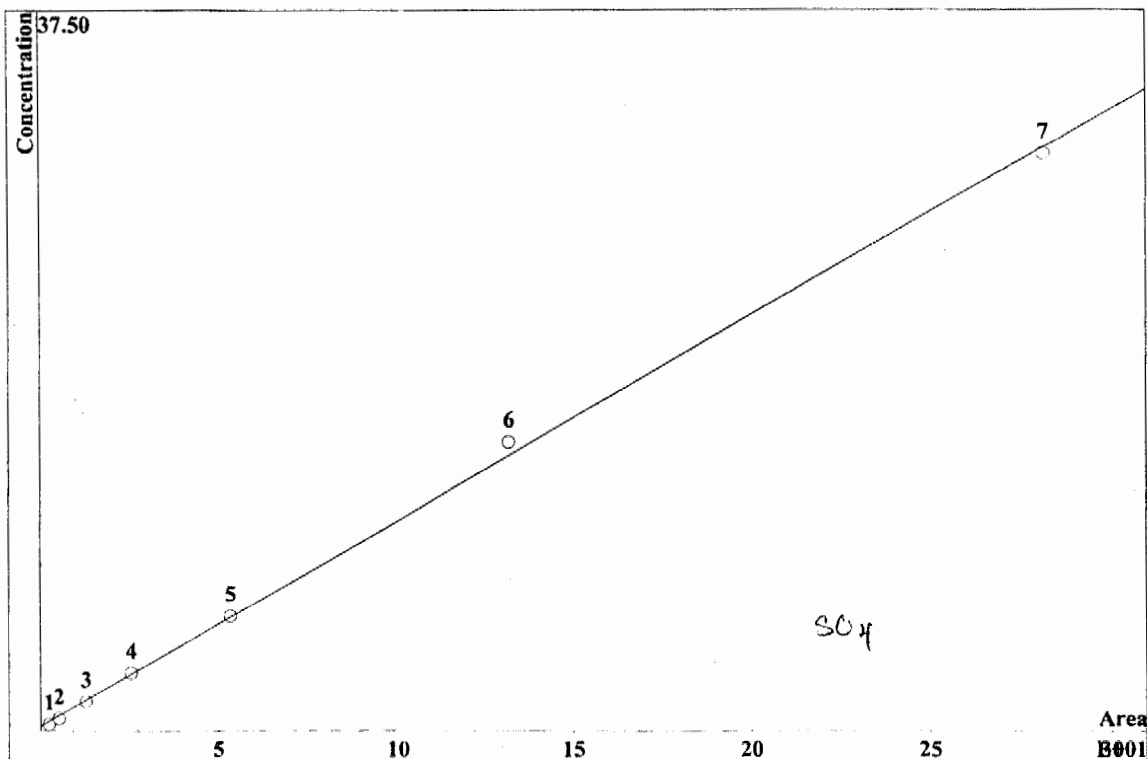
Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2107	2.88 ✓	0.1	1	6.07	Yes	p5231616.chw
2	0.4297	5.634 ✓	0.2	1	6.07	Yes	p5231630.chw
3	1.068	14.14 ✓	0.5	1	6.07	Yes	p5231644.chw
4	2.165	28.55 ✓	1	1	6.07	Yes	p5231658.chw
5	4.699	60.6 ✓	2	1	6.07	Yes	p5231712.chw
6	12.37	156 ✓	5	1	6.07	Yes	p5231726.chw
7	27.53	341.2 ✓	10	1	6.07	Yes	p5231755.chw

see 5/26/05

CALIBRATION OF COMPONENT sulfate

Method: IC100-E23.mtw
 Equation: $Q = 0.106939 \cdot A + 0.221575$
 RSD: 4.572 %
 Correlation coefficient: 0.999528



K3 = 0 K2 = 0 K1 = 0.106939 K0 = 0.221575
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.1462	2.505 ✓	0.3	1	8.98	Yes	p5231616.chw
2	0.3032	5.252 ✓	0.6	1	8.98	Yes	p5231630.chw
3	0.7444	12.87 ✓	1.5	1	8.98	Yes	p5231644.chw
4	1.483	25.51 ✓	3	1	8.98	Yes	p5231658.chw
5	3.146	53.53 ✓	6	1	8.98	Yes	p5231712.chw
6	7.889	131.7 ✓	15	1	8.98	Yes	p5231726.chw
7	17.28	281.6 ✓	30	1	8.98	Yes	p5231755.chw

all
5/26/05

SECOND SOURCE

IC Result Check Form											
LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AE23-01	1B	FCIBNPS	0	0	0	0	0	0	0	p5231548	1
AE23-02	S0	FCIBNPS	0	0	0	0	0	0	0	p5231602	1
AE23-03	S1	FCIBNPS	0.14971	0.1795	0.16713	0.11545	0.21682	0.15242	0.48945	p5231616	1
3-04	S2	FCIBNPS	0.23859	0.27058	0.26142	0.21108	0.29766	0.2482	0.78322	p5231630	1
-05	S3	FCIBNPS	0.50007	0.53447	0.52479	0.50327	0.54746	0.51511	1.5975	p5231644	1
AE23-06	S4	FCIBNPS	0.99644	0.98902	0.9668	0.99627	0.97025	0.97995	2.9492	p5231658	1
AE23-07	S5	FCIBNPS	2.0111	1.9753	1.9595	2.0554	1.9109	1.9657	5.9457	p5231712	1
AE23-08	S6	FCIBNPS	4.8228	4.7198	4.8335	4.8645	4.7111	4.8697	14.304	p5231726	1
AE23-09	S7	FCIBNPS	10.081	10.131	10.087	10.054	10.146	10.069	30.331	p5231755	1
AE23-10	ICV	FCIBNPS	95.2%	94.5%	94.3%	97.1%	92.6%	93.6%	93.9%	p5231809	1
AE23-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p5231823	1

Report date: 5/23/2005 7:25:58 PM
Printed by: Cherry Dam

Ident: AE23-10 ICV
Analysis from: 5/23/2005 6:09:09 PM
File: p5231809.CHW

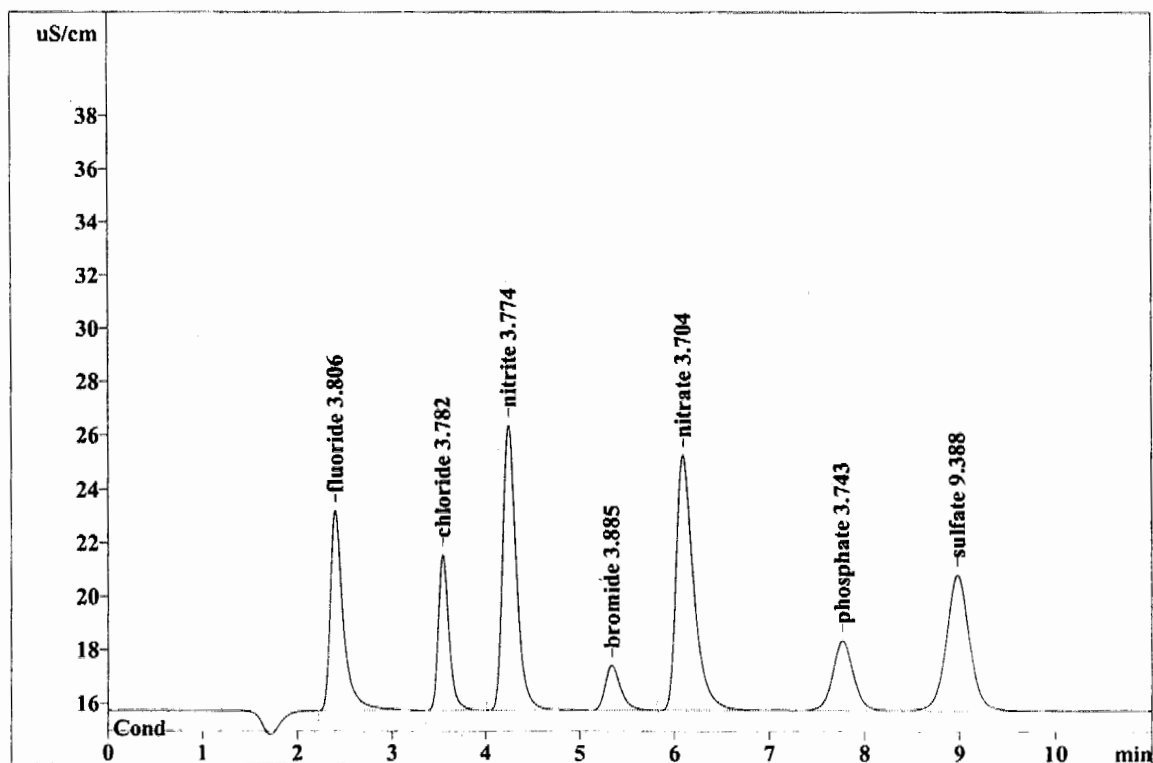
Last save: 5/23/2005 7:25:58 PM

Method: IC100-E23.mtw
Run operator: Cherry Dam
Analysis number: 1694

Last save: 5/23/2005 5:08:00 PM

SAMPLE:

Vial number: 10
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000



Quantitation method: Custom

No	Retention min	Height uS/cm	Area uS/cm*sec	Conc. mg/L	Name	% Rec.
1	2.39	7.48	71.163	3.806✓	fluoride	95
2	3.55	5.80	46.565	3.782✓	chloride	95
3	4.25	10.62	106.691	3.774✓	nitrite	94
4	5.34	1.68	19.215	3.885✓	bromide	97
5	6.09	9.52	121.691	3.704✓	nitrate	93
6	7.77	2.60	40.208	3.743✓	phosphate	94
7	8.98	5.08	85.716	9.388✓	sulfate	94
7	11.00	42.78	491.249	32.082		

This report has been created by IC Net
METROHM LTD

TV = 4 except SO₄ = 10

pu
5/26/05

8027

Report date: 5/23/2005 7:25:59 PM
Printed by: Cherry Dam

Ident: AE23-11 ICB
Analysis from: 5/23/2005 6:23:14 PM
File: p5231823.CHW

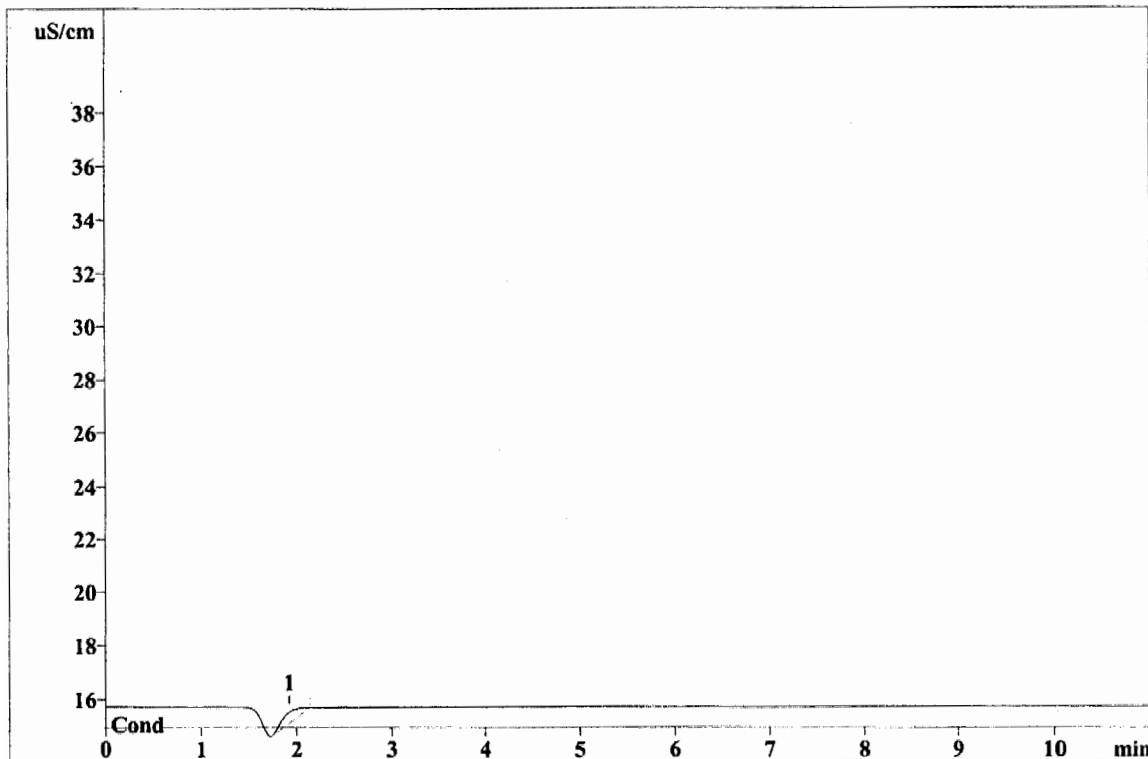
Last save: 5/23/2005 7:25:59 PM

Method: IC100-E23.mtw
Run operator: Cherry Dam
Analysis number: 1695

Last save: 5/23/2005 5:08:00 PM

SAMPLE:

Vial number: 11
Volume: 1.0 μ L
Dilution: 1.00
Amount: 1.0000



Quantitation method: Custom

No	Retention min	Height uS/cm	Area uS/cm*sec	Conc. mg/L	Name
1	1.92	0.41	5.585	0.000	

This report has been created by IC Net
METROHM LTD

Handwritten: 5/26/05

8028

DAILY CALIBRATION

IC Result Check FormVersion : QE2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AF03-01	CCV47	FCIBNPS	100.4%	100.8%	97.7%	102.6%	99.5%	98.3%	105.1%	p6031447	1
AF03-02	CCB47	FCIBNPS	0	0	0	0	0	0	0	p6031502	1
AF03-13	CCV48	FCIBNPS	101.6%	101.4%	97.9%	103.7%	99%	102.6%	104.1%	p6031737	1
AF03-14	CCB48	FCIBNPS	0	0	0	0	0	0	0	p6031751	1
AF03-25	CCV49	FCIBNPS	102.2%	103.4%	99%	104.4%	98.9%	101.9%	104.4%	p6032037	1
AF03-26	CCB49	FCIBNPS	0	0	0	0	0	0	0	p6032051	1
AF03-37	CCV50	FCIBNPS	101.6%	102.7%	98.2%	104.1%	99%	102.8%	104.3%	p6032327	1
AF03-38	CCB50	FCIBNPS	0	0	0	0	0	0	0	p6032341	1
AF03-49	CCV51	FCIBNPS	86.3%*	90.5%	85.1%*	91.1%	85%*	79.9%*	85.2%*	p6040216	1
AF03-50	CCB51	FCIBNPS	0	0	0	0	0	0	0	p6040230	1
AF03-61	CCV52	FCIBNPS	99.7%	101.8%	96.8%	103%	97.7%	99.6%	102.4%	p6040505	1
AF03-62	CCB52	FCIBNPS	0	0	0	0	0	0	0	p6040519	1
AF03-69	CCV53	FCIBNPS	99.3%	101.3%	97.2%	103.5%	98.1%	99.6%	102.6%	p6040658	1
AF03-70	CCB53	FCIBNPS	0	0	0	0	0	0	0	p6040712	1

IC Result Check FormVersion : QE2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AF02-01	CCV41	FCIBNPS	95.4%	96.6%	95%	99.5%	95.7%	90.7%	100.4%	p6021210	1
AF02-02	CCB41	FCIBNPS	0	0	0	0	0	0	0	p6021225	1
A 13	CCV42	FCIBNPS	95.3%	97.8%	95.3%	100.6%	96.8%	96.4%	101.8%	p6021505	1
A 14	CCB42	FCIBNPS	0	0	0	0	0	0	0	p6021519	1
AF02-26	CCV43	FCIBNPS	98.2%	101.1%	98%	103.6%	98.1%	100.3%	101.9%	p6021921	1
AF02-28	CCB43	FCIBNPS	0	0	0	0	0	0	0	p6021949	1
AF02-37	CCV44	FCIBNPS	100.2%	108.2%	98.7%	104.8%	98.4%	103.2%	103%	p6022157	1
AF02-38	CCB44	FCIBNPS	0	0	0	0	0	0	0	p6022211	1
AF02-49	CCV45	FCIBNPS	102.3%	102.9%	98.7%	104.7%	98.7%	101.4%	103.1%	p6030046	1
AF02-50	CCB45	FCIBNPS	0	0	0	0	0	0	0	p6030100	1
AF02-60	CCV46	FCIBNPS	102.4%	102.3%	98.7%	105.2%	99.1%	99%	103.3%	p6030320	1
AF02-61	CCB46	FCIBNPS	0	0	0	0	0	0	0	p6030334	1

8031

ANALYTICAL LOG

ANALYSIS RUN LOG FOR IC

SOP □ EMAX-300.0 Rev. No. 3 □ EMAX-9056 Rev. No. 2 □ EMAX-300.1 Rev. No. 0 □

Start Date: 05/23/05 Time: 15:43 Ending Date: 05/23/05 Time: 21:12 Book # A22-025

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Notes
* 1	AE23-01	TD	1	✓	
* 2	02	30			
* 3	03	1			
* 4	04	2			
* 5	05	3			
* 6	06	4			
* 7	07	5			
* 8	08	6			
* 9	09	7			
* 10	10	ICV			
* 11	11	TCB			
* 12	12				
* 13	13				
* 14	14				
* 15	15				
* 16	16				
* 17	17				
* 18	18				
* 19	19				
* 20	20				

ANALYTICAL BATCH * IC

Instrument Number		22 (10) 05/23/05						
INITIAL CALIBRATION REFERENCE								
Method File	IC 100 - E23.mhw	Date						
ICAL ID	SW5B-12-18B-194	05/23/05						
ICV ID	295 - 301							
Standards-A								
Name	ID	Conc. (mg/L)						
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄
ICAL S ₁	SW5B-12-292	0.1					→	0.3
S ₂	291	0.2					→	0.6
S ₃	290	0.5					→	1.5
S ₄	291	1					→	3
S ₅	292	2					→	6
ICV S ₆	293	5					→	15
CCV S ₇	294	10					→	30
LCS ICV	SW5B-12-295-301	8.1					→	10
MS								
Standards-B								
Name	ID	Conc. (mg/L)						
		BrO ₃	DCA	ClO ₃				
ICAL S ₁								
S ₂								
S ₃								
S ₄								
ICV	SW5B-12-295-301							
CCV								
LCS								

Comments:

Analyzed By: aq

This page is checked during the data review process.

Instrument Number		22100						
INITIAL CALIBRATION REFERENCE								
Method File	IC100-E23.mtw	Date						
ICAL ID	SW5B-12-298-294	05/23/05						
ICV ID	SW5B-12-295-301	05/23/05						
Standards-A								
Name	ID	Conc. (mg/L)						
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄
ICAL	S ₁							
	S ₂							
	S ₃							
	S ₄							
	S ₅							
ICV								
CCV	SW5B-12-301-304	5	5	5	5	5	5	5
LCS	SW5B-12-305-308	↓	↓	↓	↓	↓	↓	↓
MS × DF	LCS Source	↓	↓	↓	↓	↓	↓	↓
Standards-B								
Name	ID	Conc. (mg/L)						
		BrO ₃	DCA	ClO ₃				
ICAL	S ₁	N/A						
	S ₂							
	S ₃							
	S ₄							
ICV								
CCV								
LCS								
Comments:								
Analyzed By: cel								
This page is checked during the data review process.								

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix		Notes
				S	W	
* 1	AF02-01	CCV41	1		✓	
* 2	01	CCB41	1			
* 3	03	ICF03WB				
* 4	04	WL				
* 5	05	WL	↓			
* 6	06	F004-05	10			
* 7	07	06	↓			
* 8	08	07	↓			
* 9	09	F020-01	1			
* 10	10	02	1			
* 11	11	F004-07D	10			
* 12	12	14	10			
* 13	13	CCV42	1			
* 14	14	CCB42	1			
* 15	15	F004-07M	10			
* 16	16	07S	10			
* 17	17	ICF004WB	1			
* 18	18	WL	1			
* 19	19	WL				
* 20	20	F014-10				
* 1	21	11				
* 2	22	02				
* 3	23	PIN-E				
* 4	24	PIN-E				
* 5	25	CCV43				* Bad Injection; NDTIGE
* 6	26	CCB43				CCV43
* 7	27	CCV43				* Not use; wrong sample
* 8	28	CCB43				CCB43
* 29	29	F027-01				
* 30	30	02				

ANALYTICAL BATCH *

ICF003**ICF004W

ANALYSIS RUN LOG FOR IC

Page 2

SOP □ EMAX-300.0 Rev. No. 3 □ EMAX-9056 Rev. No. 2 □ EMAX-300.1 Rev. No. 0 □

Start Date: 06/07/05 Time: 12:10 Ending Date: 06/05/05 Time: 03:16 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Notes
** 31	AF02-31	F017-02	1		
*	32	F017-10	10		
*	33	11	10		
*	34	F017-02	10		
*	35	F017-01	20		
*	36	RINSE	1		
*	37	CCV415			
*	38	CCV415			
*	39	F017-02	20		
*	40	03			
*	41	04			
*	42	05			
*	43	RINSE	1		
*	44	ICF005W			
*	45	01			
*	46	06			* Not 11-2
*	47	F017-04	20		
*	48	RINSE	1		
*	49	CCV415			
*	50	CCV415			
*	51	F017-06D	20		
*	52	06M			
*	53	07			
*	54	RINSE	1		
*	55	F020-01	25		
*	56	02	25		
*	57	F017-01	10		
*	58	02			
*	59	03			
*	60	CCV415	1		

INITIAL CALIBRATION REFERENCE									
Instrument Number	22 00 00 00 00 00 00 00 00 00								
Method File	Date								
ICAL ID	Refer to Ppt								
ICV ID									

Name	ID	Conc. (mg/L)						
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄
ICAL S ₁								
S ₂								
S ₃								
S ₄								
S ₅								
ICV								
CCV								
LCS								
MS								

Standards-B				
Name	ID	Conc. (mg/L)		
		BrO ₃	DCA	ClO ₃
ICAL S ₁	N/A			
S ₂				
S ₃				
S ₄				
ICV				
CCV				
LCS				

Comments:

Analyzed By: 000

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ANALYSIS RUN LOG FOR IC

Page 3

SOP ☐ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 06/02/05 Time: 17:10 Ending Date: 06/03/05 Time: 03:40 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix	Notes
* 01	AF02-01	000406	1	S W	
* 02	AF02-02	000406	1	S W	
* 03					
* 04					
* 05					
* 06					
* 07					
* 08					
* 09					
* 10					
* 11					
* 12					
* 13					
* 14					
* 15					
* 16					
* 17					
* 18					
* 19					
* 20					

Instrument Number		2200 at calibration							
INITIAL CALIBRATION REFERENCE									
Method File		Date							
ICAL ID		Refer to pg 1							
ICV ID									
Standards-A									
Name	ID	Conc. (mg/L)							
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄	
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
	S ₅								
ICV									
CCV									
LCS									
MS									
Standards-B									
Name	ID	Conc. (mg/L)							
		BrO ₃	DCA	ClO ₃					
ICAL	N/A								
	S ₁								
	S ₂								
	S ₃								
	S ₄								
ICV									
CCV									
LCS									

Comments:

Analyzed By: ak

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ANALYTICAL BATCH * IC

ANALYSIS RUN LOG FOR IC

Page 4

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 06/03/05 Time: 14:47 Ending Date: 06/04/05 Time: 07:12 Book # A100-001

Instrument Number		2210						
INITIAL CALIBRATION REFERENCE								
Method File	IC100-E23.mtw	Date	05/23/05					
ICAL ID	SW5B-12-288-294		05/23/05					
ICV ID	SW5B-12-245-301		05/23/05					
Standards-A								
Name	ID	Conc. (mg/L)						
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄
ICAL	S ₁							
	S ₂							
	S ₃							
	S ₄							
	S ₅							
ICV								
CCV	(104-112)-404-404	5	5	5	5	5	5	5
LCS	(413-416)-405-405	↓	↓	↓	↓	↓	↓	↓
MS x DF	LCS Source	↓	↓	↓	↓	↓	↓	↓
Standards-B								
Name	ID	Conc. (mg/L)						
		BrO ₃	DCA	ClO ₃				
ICAL	S ₁ N/A							
	S ₂							
	S ₃							
	S ₄							
ICV								
CCV								
LCS								
Comments:								
Analyzed By: QJ								
This page is checked during the data review process.								

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix		Notes
				S	W	
* 1	AF03-01	00V47	1		✓	
* 2	02	00B47				
* 3	03	ICF006WB				
* 4	04	WL				
* 5	05	WL				
* 6	06	F023-01	10			
* 7	07	↓ 02	10			
* 8	08	F037-02	1			
* 9	09	06				
* 10	10	08				
* 11	11	09				
* 12	12	RINSE				
* 13	13	00V48				
* 14	14	00B48				
* 15	15	F037-10				
* 16	16	10P				
* 17	17	10M				
* 18	18	10S				
* 19	19	11				
* 20	20	12				
* 21	21	↓ 13				
* 22	22	F041-01				
* 23	23	↓ 02				
* 24	24	RINSE				
* 25	25	00V49				
* 26	26	00B49				
* 27	27	F041-01	10			
* 28	28	↓ 02	10			
** 29		ICF007WB	1			
** 30	✓	30	1			

ANALYTICAL BATCH * ICF006W**ICF007W



EMAX LABORATORIES, INC. 1835 W. 305th St. Torrance, CA 90501

8037

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 06/03/05

ANALYSIS RUN LOG FOR IC

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 06/03/05

Instrument Number		-221034345									
INITIAL CALIBRATION REFERENCE											
Method File		Date									
ICAL ID											
ICV ID											
Standards-A											
Name	ID	Conc. (mg/L)								P	SO ₄
		F	Cl	NO ₂	Br	NO ₃					
ICAL	S ₁										
	S ₂										
	S ₃										
	S ₄										
	S ₅										
ICV											
CCV											
LCS											
MS											
Standards-B											
Name	ID	Conc. (mg/L)						ClO ₃			
		BrO ₃	DCA								
ICAL	S ₁										
	S ₂										
	S ₃										
	S ₄										
ICV											
CCV											
LCS											
Comments:											
Analyzed By: J.L.											
This page is checked during the data review process.											

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix		Notes
				S	W	
*** 61	AF03-61	00V52	1		✓	
* 2	61	00B52				
* 3	63	F021-03				
* 4	64	080				
* 5	65	05M				
* 6	66	085				
* 7	67	10				
* 8	68	RINSE				
* 9	69	00X53				
* 70	70	00B53				
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						

ANALYTICAL BATCH *** JC F008W

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05F027

METHOD 310.1 TOTAL ALKALINITY

Five (5) water samples were received on 06/02/05 and 06/03/05 for Total Alkalinity analysis by Method 310.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 310.1
TOTAL ALKALINITY

Client : BATTILLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F027

Matrix : WATER
Instrument ID : 153

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
NBLK1W	ALF005WB	ND	1	NA	5	1	06/09/0512:40	NA	ALF005W-03	ALF005W-01	ALF005W	NA	NA
LCS1W	ALF005WL	55.9	1	NA	5	1	06/09/0512:45	NA	ALF005W-04	ALF005W-01	ALF005W	NA	NA
LCD1W	ALF005WC	55.9	1	NA	5	1	06/09/0512:50	NA	ALF005W-05	ALF005W-01	ALF005W	NA	NA
GARFIELD	F027-01	91.5	1	NA	5	1	06/09/0514:10	NA	ALF005W-21	ALF005W-13	ALF005W	06/02/05	06/02/05
SUNSET	F027-02	221	1	NA	5	1	06/09/0514:15	NA	ALF005W-22	ALF005W-13	ALF005W	06/02/05	06/02/05
BANGHAM	F027-03	170	1	NA	5	1	06/09/0514:20	NA	ALF005W-23	ALF005W-13	ALF005W	06/02/05	06/02/05
NBLK2W	ALF007WB	ND	1	NA	5	1	06/11/0512:40	NA	ALF007W-03	ALF007W-01	ALF007W	NA	NA
LCS2W	ALF007WL	55.6	1	NA	5	1	06/11/0512:45	NA	ALF007W-04	ALF007W-01	ALF007W	NA	NA
LCD2W	ALF007WC	55.6	1	NA	5	1	06/11/0512:50	NA	ALF007W-05	ALF007W-01	ALF007W	NA	NA
LFHC-2	F041-01	157	1	NA	5	1	06/11/0514:25	NA	ALF007W-24	ALF007W-13	ALF007W	06/03/05	06/03/05
LAWC-3	F041-02	169	1	NA	5	1	06/11/0514:40	NA	ALF007W-27	ALF007W-25	ALF007W	06/03/05	06/03/05

8041

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 310.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05F027
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: ALF005WL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 06/09/05 12:45/12:50

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Total Alkalinity	ND	58.90	55.90	95	58.90	55.90	95	0	80-120	20

8042

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 310.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05F027
SAMPLE ID: LCS2W/LCD2W
CONTROL NO.: ALF007WL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 06/11/05 12:45/12:50

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Total Alkalinity	ND	58.90	55.60	94	58.90	55.60	94	0	80-120	20

8043

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ANALYSIS LOG FOR ALKALINITY

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SOP ☒ EMAX-310.1 Rev. No. 2 ☐ SM2320B Rev. No. 0 ☐

Book # AAL-009

Start Date: 6/9/05 Time: 12:30 Ending Date: 6/9/05 Time: 14:30 Instrument No: E53 ☐ 97

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Initial pH	Acid Titrant			Final pH	ALKALINITY (mg/L)			Notes	Standard Reagent	ID	Conc. mg/L
					pH=8.3	pH=4.5	pH=4.2		Total	Pre-tit (eq)	Post-tit (mg/L)				
*01	100	12:30	20	9.98	NA	1.15	NA	4.50	58.4				LCS	SW7A-06-146	58.9
*02	100	12:35		5.10		0.015		4.41	ND				Spike	SW7A-06-120	112
*03	AL F005WB	12:40		5.08		0.015		4.40	ND	ND	ND		Na ₂ CO ₃ Soln	SW7A-06-120	2360
*04	WL	12:45		8.80		1.10		4.93	55.9	NA	NA		Acid Titrant	SW3B-02-711	0.03M
*05	WL	12:50		8.80		1.10		4.92	55.9	NA	NA				
*06	F017-01	12:55		6.20		2.75		4.50	140						
*07	-02	13:00		6.27		2.70		4.93	137				Na ₂ CO ₃ Soln (ml)	Acid Titrant (ml)	Normality, N
*08	-03	13:05		6.31		8.30		4.48	422				B1K	0.015	ND
*09	-04	13:10		6.40		7.75		4.53	394				5	11.60	0.02033
*10	-05	13:15		6.11		11.25		4.53	572				5	11.60	0.02033
*11	-05D	13:20	✓	6.15		11.30		4.92	574				5	11.60	0.02033
*12	F017-05M	13:25	10+0.5	6.40		6.95		4.47	673						Ave. N: 0.02033
*13	CCV1	13:30	20	9.98		1.15		4.48	58.4						
*14	CCV1	13:35		5.04		0.015		4.46	ND				pH Buffer	ID	Reading
*15	F017-06	13:40	✓	6.86		12+		overrange					pH 4	SW7A-06-097	3.99
*16	-06R	13:45	10	6.90		6.95		4.50	766				pH 7		7.00
*17	-07	13:50	20	6.83		14+		overrange					pH 10		10.00
*18	F017-07R	13:55	10	6.88		7.10		4.48	722				Slope		100.4
*19	F020-01	14:00	20	8.05		2.40		4.49	122	ND	122				
*20	-02	14:05		8.06		3.75		4.50	191	ND	191		Comments:		
*21	F027-01	14:10		8.01		1.80		4.52	91.5						
*22	-02	14:15		7.91		4.35		4.53	221						
*23	-03	14:20		7.96		3.35		4.49	170						
*24	CCV2	14:25		9.97		1.10		4.53	55.9						
*25	CCV2	14:30	✓	5.06	✓	0.015	✓	4.40	ND						Analyzed By: RM

ANALYTICAL BATCH * AL F005W

Time: 15:05

Ending Date:

Time: 12:30

501105

Start Date:

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Initial pH	Acid Titrant				Final pH	ALKALINITY (mg/L)				Notes	Standard Reagent	ID	Conc. mg/L
					pH=8.3	pH=4.5	pH=4.2	Total		Reagent (mg)	Carbonate (mg)	Bicarbonate (mg)					
*01	LCW	12:30	20	10.02	NA	1.15	NA	4.50	58.1	NA	NA	58.1		LCS	SW7A-06-146	58.4	
*02	ICB	12:35		5.08		0.015	0.015	4.42	ND	ND	ND	ND		Spike	SW7A-06-170	57.6	
*03	AL F007WB	12:40		5.10		0.015	0.015	4.42	ND	ND	ND	ND		Na ₂ CO ₃ Soln	SW7A-06-120	236.0	
*04	WL	12:45		8.85		1.10	1.10	4.50	55.6	NA	NA	55.6		Acid Titrant	SW7A-02-711	0.00N	
*05	WC	12:50		8.84		1.10	1.10	4.49	55.6	NA	NA	55.6					
*06	F033-01	12:55		7.02		3.70	3.70	4.53	187								
*07	-02	13:00		7.90		4.15	4.15	4.53	210								
*08	-03	13:05		6.98		4.75	4.75	4.49	240					NAK	0.015	ND	
*09	-03D	13:10		7.00		4.80	4.80	4.47	243					5	11.60	0.02033	
*10	-03M	13:15	20 to 50	7.25		6.00	6.00	4.48	296					5	11.70	0.02010	
*11	-04	13:20	20	7.05		4.55	NA	4.53	230					5	11.70	0.02010	
*12	F033-06	13:25		7.28		3.70		4.48	187								
*13	CCV ₁	13:30		10.08		1.15		4.52	58.1								
*14	CCB ₁	13:35		5.09		0.015		4.41	ND								
*15	F037-06	13:40		7.34		4.85		4.49	245						SW7A-06-097	4.00	
*16	-08	13:45	100	5.35		0.10	0.20	4.23	ND						-098	7.02	
*17	-10	13:50	20	6.72		3.45	NA	4.51	174							10.00	
*18	-11	13:55		7.26		5.30		4.51	268						100.4		
*19	F037-12	14:00		7.30		4.70		4.53	238								
*20	F039-01	14:05		7.76		2.75		4.49	139	ND	ND	139					
*21	-02	14:10		7.64		2.75		4.48	139	ND	ND	139					
*22	-03	14:15		7.88		2.85		4.50	144	ND	ND	144					
*23	-04	14:20		7.71		2.35		4.49	119	ND	ND	119					
*24	F041-01	14:25		7.54		3.10		4.51	157								
*25	CCW ₂	14:30		10.08		1.15		4.53	58.1	NA	NA	58.1					

Analyzed By: RNA
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ANALYTICAL BATCH * AL F007W

8045

Start Date:	6/1/05	Time:	12:30	Ending Date:	6/1/05	Time:	15:05	Instrument No:	53	97
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Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Initial pH	Acid Titrant				Final pH	ALKALINITY (mg/L)				Notes	Standard Reagent	ID	Conc.
					pH=8.3	pH=4.5	pH=4.2	Total		Equivalents (mg)	Calcium (mg)	Magnesium (mg)					
76-001	CCB 2	14:35	20	5.10	NA	0.015	NA	4.40	ND	ND	ND	ND	LCS	same as p. 19/10/11			
77-002	F041-02	14:40	↓	7.77		3.35	↓	4.91	169				Spike				
78-003	F037-02	14:45	100	5.25		0.10	0.20	4.23	ND				Na ₂ CO ₃ Soln				
79-004	↓ - 09	14:50	20	7.03		3.30	NA	4.49	167				Acid Titrant				
80-005	↓ - 13	14:55		7.06		4.95		4.48	250								
81-006	CCU 3	15:00	↓	9.98		1.15		4.52	58.1								
82-007	CCB 3	15:05	↓	9.06	↓	0.015	↓	4.42	ND								
08																	
09																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	
24																	
25																	

ANALYTICAL BATCH *

ALF037W

Comments:

Analyzed By: RM

RM

a/15/05

This name is checked during data review.

Analyzed By: RM

This page is checked during data review.

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05F027

METHOD 350.2 AMMONIA (NH₃-N)

Five (5) water samples were received on 06/02/05 and 06/03/05 for Ammonia analysis by Method 350.2 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Matrix Spike

MS sample was not designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

8047

METHOD 0.2
AMMONIA (NH3-N)

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F027

Matrix : WATER
Instrument ID : 170

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	NHF003WB	ND	1	NA	.1	.03	06/15/0509:11	06/14/0510:30	NHF003W-12	NHF003W-10	NHF003W	NA	06/14/05
LCST1W	NHF003WL	1.02	1	NA	.1	.03	06/15/0509:12	06/14/0510:30	NHF003W-13	NHF003W-10	NHF003W	NA	06/14/05
LCST1W	NHF003WC	1.02	1	NA	.1	.03	06/15/0509:13	06/14/0510:30	NHF003W-14	NHF003W-10	NHF003W	NA	06/14/05
GARFIELD	F027-01	ND	1	NA	.1	.03	06/15/0509:20	06/14/0510:30	NHF003W-21	NHF003W-10	NHF003W	06/02/05	06/02/05
SUNSET	F027-02	ND	1	NA	.1	.03	06/15/0509:23	06/14/0510:30	NHF003W-24	NHF003W-22	NHF003W	06/02/05	06/02/05
BANGHAM	F027-03	ND	1	NA	.1	.03	06/15/0509:24	06/14/0510:30	NHF003W-25	NHF003W-22	NHF003W	06/02/05	06/02/05
LFMC-2	F041-01	ND	1	NA	.1	.03	06/15/0509:25	06/14/0510:30	NHF003W-26	NHF003W-22	NHF003W	06/03/05	06/03/05
LANC-3	F041-02	ND	1	NA	.1	.03	06/15/0509:26	06/14/0510:30	NHF003W-27	NHF003W-22	NHF003W	06/03/05	06/03/05

8048

24

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 350.2
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05F027
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: MHF003WL/C

DATE RECEIVED: 06/14/05
DATE EXTRACTED: 06/14/05 10:30
DATE ANALYZED: 06/15/05 09:12/09:13

ACCESSION:

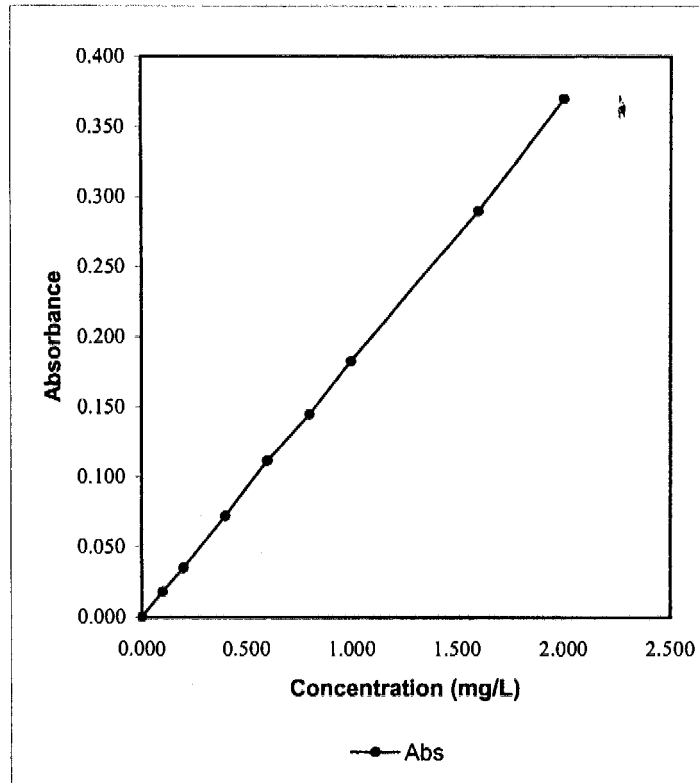
PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Ammonia (NH3-N)	ND	1.00	1.02	102	1.00	1.02	102	0	80-120	20

8049

Handwritten mark

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.018
0.200	0.035
0.400	0.072
0.600	0.112
0.800	0.145
1.000	0.183
1.600	0.290
2.000	0.370



R^2 0.999758

Y 0.1833

CF 5.4547

Comments: **PASSED**

Analyzed by: LA

8050

ANALYSIS LOG FOR AMMONIA-N

Book # A70-NH₃-005

SOP # EMAX-350.2 Rev. No. 2 □ EMAX-350.1 □ Rev. No. 0 □

Starting Date: 6-15-05 Time: 9:20 Ending Date: 6-15-05 Time: 9:20

Data File Name	Prep. Batch	Lab Sample ID	Matrix		Time	Vol. Colored (ml)	DF	Absorbance	Notes	Instrument No: 70		Wavelength: 425 nm
			S	W						Standard	ID	
* 1	NH ₃ 003W	S-0.0			19:00	20	1	0.000				
* 2		S-0.1			-01			0.018				
* 3		S-0.2			-02			0.025				
* 4		S-0.4			-03			0.072				
* 5		S-0.6			-04			0.112				
* 6		S-0.8			-05			0.145				
* 7		S-1.0			-06			0.183				
* 8		S-1.6			-07			0.240				
* 9		S-2.0			-08			0.370				
* 0		10V			-09			0.150	0.482			
* 1		10B			-10			0.000	ND			
* 2		NH ₃ 003W			-11			0.487	ND			
* 3		WC			-12			0.187	1020			
* 4		WC			-13			0.186	1.015			
* 5		F021-08			-14			0.001	ND			
* 6		-08D			-15			0.021	ND			
* 7		-08H			-16			0.195	1.009			
* 8		-06			-17			0.001	ND			
* 9		-09			-18			0.002	ND			
* 0		-10			-19			0.001	ND			
* 1		F027-01			-20			0.001	ND			
* 2		CCV1			-21			0.194	1.004			
* 3		CCB1			-22			0.000	ND			
* 4		F027-06			-23			0.011	ND			
* 5		V-03			-24			0.002	ND			
* 6		F041-01			-25			0.008	ND			
* 7		-02			-26			0.001	ND			
* 8		F045L-03			-27			0.006	ND			
* 9		F067-02			-28			0.042	ND			
* 0		CCV2			-29			0.185	1.009			
ANALYTICAL BATCH * NH ₃ 003W												
		CCM1			-30			0.000	ND			

Comments:

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By: M

This page is checked during data review.

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-005

SOP ☒ EMAX-350.2 Rev. No.: 2 ☐ EMAX-351.3 Rev. No.: 2 ☐

Start Date

Time 14:05

End Date

Time 16:40

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	S-0.0	9.5	0.1	10	5	100	100		ICV/MS	S-0.03-151	10.00
*02	S-0.1								LCS	S-0.151	10.00
*03	S-1.0								Reagent		
*04	S-2.0								NaOH	207A-02-112	
*05	10V								Borate Buffer	S-152	
*06	10B								H ₃ BO ₃	S-07B-02-315A	
*07	NH F003003								Digestion Mixture	NA	
*08	10C								Distilling Soln.		
*09	10D										
*10	F021-08		0.1						SDG #	NA	
*11	-05D		0.1						Extract Location		
*12	-08M		0.8								
*13	-09		0.9								
*14	-10		0.7								
*15	F027-01		0.4								
*16	-02		0.8								
*17	-03		0.7								
*18	F047-01		0.7								
*19	-02		0.8								
*20	F461-02		0.7								
*21	F452-03	9.5	0.6	10	5	100	100				
*22	F031-06	9.5	0.6	10	5	100	100				
*23											
*24											
*25											
*26											

PREPARATION BATCH * NH F00300

Prepared By: da

Standard Added By: da

Checked By: da

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05F027

METHOD 314.0 PERCHLORATE

Five (5) water samples were received on 06/02/05 and 06/03/05 for Perchlorate analysis by Method 314.0 in accordance with "Method for Determination of Perchlorate by Ion Chromatography", EPA 600/98-118.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at half the method reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control sample results were within QC limits.

4. Duplicate

Sample F041-02 was analyzed for Duplicate. % RPD was within QC limit.

5. Matrix Spike

Sample F041-02 was spiked. % Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

SAMPLE RESULTS

METHOD 3.4.0
PERCHLORATE

Matrix : WATER
Instrument ID : T1057

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F027

SAMPLE ID	EMAX SAMPLE ID	RESULTS (ug/L)	DLF	MOIST	RL (ug/L)	MDL (ug/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	PCF001WB	ND	1	NA	2	.5	06/03/0522:44	NA	JF03-2	JF03-1	PCF001W	NA	NA
LCS1W	PCF001WL	10	1	NA	2	.5	06/03/0523:24	NA	JF03-4	JF03-1	PCF001W	NA	NA
LCD1W	PCF001WC	10.1	1	NA	2	.5	06/03/0523:45	NA	JF03-5	JF03-1	PCF001W	NA	NA
GARFIELD	F027-01	3.63	1	NA	2	.5	06/04/0500:05	NA	JF03-6	JF03-1	PCF001W	06/02/05	06/02/05
SUNSET	F027-02	12.3	1	NA	2	.5	06/04/0500:25	NA	JF03-7	JF03-1	PCF001W	06/02/05	06/02/05
BANGHAM	F027-03	5.46	1	NA	2	.5	06/04/0500:45	NA	JF03-8	JF03-1	PCF001W	06/02/05	06/02/05
LFWC-2	F041-01	6.15	1	NA	2	.5	06/04/0501:06	NA	JF03-9	JF03-1	PCF001W	06/03/05	06/03/05
LAWC-3	F041-02	25.7	1	NA	2	.5	06/04/0501:26	NA	JF03-10	JF03-1	PCF001W	06/03/05	06/03/05
LAWC-3MS	F041-02M	35	1	NA	2	.5	06/04/0502:27	NA	JF03-13	JF03-11	PCF001W	06/03/05	06/03/05
LAWC-3DUP	F041-02D	25.5	1	NA	2	.5	06/04/0502:06	NA	JF03-12	JF03-11	PCF001W	06/03/05	06/03/05

8055

QC SUMMARY

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05F027

METHOD: METHOD 314.0

% MOISTURE: NA

MATRIX: WATER

DILUTION FACTOR: 1

SAMPLE ID: MBLK1W

LAB SAMP ID: PCF001WB

LAB FILE ID: JF03-2

DATE EXTRACTED: NA

DATE ANALYZED: 06/03/0522:44

PREP. BATCH: PCF001W

CALIB. REF: JF03-1

PCF001WL

JF03-4

NA

06/03/0523:24

PCF001W

JF03-1

PCF001WC

JF03-5

NA

06/03/0523:45

PCF001W

JF03-1

DATE COLLECTED: NA

DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Perchlorate	ND	10	10	100	10	10.1	101	0	80-120	20

8057

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05F027
METHOD: METHOD 314.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: LAMC-3
EMAX SAMP ID: F041-02
LAB FILE ID: JF03-10
DATE EXTRACTED: NA
DATE ANALYZED: 06/04/0501:26
PREP. BATCH: PCF001W
CALIB. REF: JF03-11

% MOISTURE: NA

DATE COLLECTED: 06/03/05
DATE RECEIVED: 06/03/05

ACCESSION:

PARAMETER	SMPL RSLT (ug/L)	DUPL RSLT (ug/L)	RPD RSLT %	QC LIMIT (%)
Perchlorate	25.7	25.5	1	20

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05F027
METHOD: METHOD 314.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: LAHC-3
LAB SAMP ID: F041-02M
LAB FILE ID: JF03-13
DATE EXTRACTED: NA
DATE ANALYZED: 06/04/0501:26
PREP. BATCH: PCF001W
CALIB. REF: JF03-11

% MOISTURE: NA
DATE COLLECTED: 06/03/05
DATE RECEIVED: 06/03/05

ACCESSION:

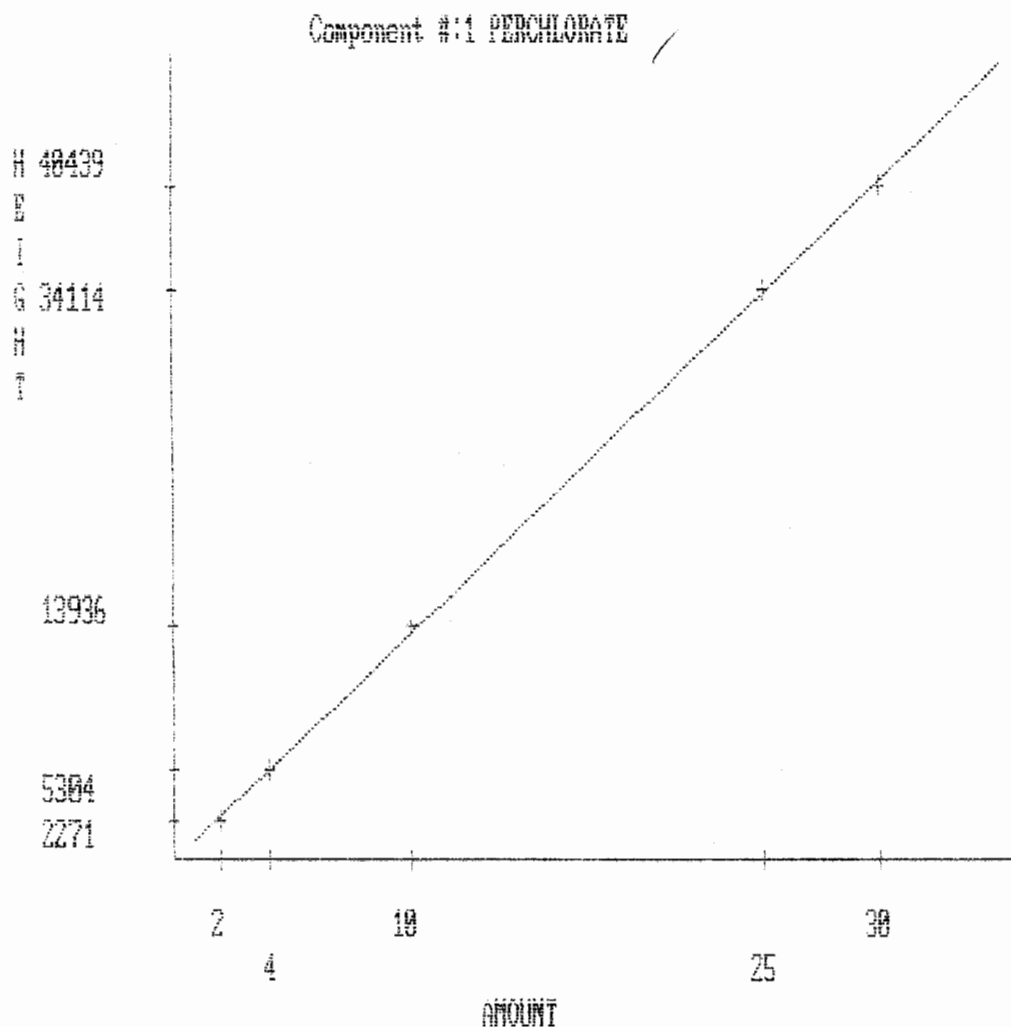
PARAMETER	SMPL RSLT (ug/L)	SPIKE AMT (ug/L)	MS RSLT (ug/L)	MS % REC	QC LIMIT (%)
perchlorate	25.7	10	35	93	75-125

8059

INITIAL CALIBRATION

INDEX	LSID	LFID	DF	METNAME	SELCOMP	DateTime
1	IB	JC22-1	1	IC57C22	ALL	03/22/0512:32
2	S-0.0	JC22-2	1	IC57C22	ALL	03/22/0512:52
3	S-2.0	JC22-3	1	IC57C22	ALL	02/22/0522:36
4	S-4.0	JC22-4	1	IC57C22	ALL	03/22/0513:33
5	S-10.0	JC22-5	1	IC57C22	ALL	03/22/0513:53
6	S-25.0	JC22-6	1	IC57C22	ALL	03/22/0514:13
7	S-30.0	JC22-7	1	IC57C22	ALL	03/22/0514:33
8	ICV	JC22-8	1	IC57C22	ALL	03/22/0515:52
9	ICB	JC22-9	1	IC57C22	ALL	03/22/0516:12
10	IPCS	JC22-10	1	IC57C22	ALL	03/22/0516:34
11	PC007WB	JC22-11	1	IC57C22	ALL	03/22/0516:55
12	MRL	JC22-12	1	IC57C22	ALL	03/22/0517:15
13	PCC007WL	JC22-13	1	IC57C22	ALL	03/22/0517:35
14	PCC007WC	JC22-14	1	IC57C22	ALL	03/22/0518:22
15	C135-01	JC22-15	1	IC57C22	ALL	03/22/0518:42
16	C135-02	JC22-16	1	IC57C22	ALL	03/22/0519:38
17	C135-02D	JC22-17	1	IC57C22	ALL	03/22/0519:59
18	C135-02M	JC22-18	1	IC57C22	ALL	03/22/0520:19
19	CCV1-15	JC22-19	1	IC57C22	ALL	03/22/0520:39
20	C141-11	JC22-20	1	IC57C22	ALL	03/22/0520:59
21	C141-12	JC22-21	1	IC57C22	ALL	03/22/0521:20
22	C141-13	JC22-22	1	IC57C22	ALL	03/22/0521:40
23	C141-14	JC22-23	1	IC57C22	ALL	03/22/0522:00
24	CCV2-30	JC22-24	1	IC57C22	ALL	03/22/0522:20
25	PCC008SB	JC22-25	1	IC57C22	ALL	03/22/0522:41
26	PCC008SL	JC22-26	1	IC57C22	ALL	03/22/0523:01
27	PCC008SC	JC22-27	1	IC57C22	ALL	03/22/0523:21
28	C041-01	JC22-28	10	IC57C22	ALL	03/22/0523:41
29	C041-02	JC22-29	10	IC57C22	ALL	03/23/0500:02
30	C041-03	JC22-30	10	IC57C22	ALL	03/23/0500:22
31	C041-04	JC22-31	10	IC57C22	ALL	03/23/0500:42
32	C041-05	JC22-32	10	IC57C22	ALL	03/23/0501:02
33	C041-06	JC22-33	10	IC57C22	ALL	03/23/0501:23
34	C041-07	JC22-34	10	IC57C22	ALL	03/23/0501:43
35	CCV3-15	JC22-35	1	IC57C22	ALL	03/23/0502:03
36	C041-08	JC22-36	10	IC57C22	ALL	03/23/0502:23
37	C041-09	JC22-37	10	IC57C22	ALL	03/23/0502:44
38	C041-10	JC22-38	10	IC57C22	ALL	03/23/0503:04
39	C041-11	JC22-39	10	IC57C22	ALL	03/23/0503:24
40	C041-11D	JC22-40	10	IC57C22	ALL	03/23/0503:44
41	C041-11M	JC22-41	10	IC57C22	ALL	03/23/0504:05
42	C041-12	JC22-42	10	IC57C22	ALL	03/23/0504:25
43	C041-13	JC22-43	10	IC57C22	ALL	03/23/0504:45
44	C041-14	JC22-44	10	IC57C22	ALL	03/23/0505:05
45	C041-15	JC22-45	10	IC57C22	ALL	03/23/0505:26
46	CCV4-30	JC22-46	1	IC57C22	ALL	03/23/0505:46
47	PCC009SB	JC22-47	1	IC57C22	ALL	03/23/0506:06
48	PCC009SL	JC22-48	1	IC57C22	ALL	03/23/0506:26
49	PCC009SC	JC22-49	1	IC57C22	ALL	03/23/0506:47
50	C041-16	JC22-50	10	IC57C22	ALL	03/23/0507:07
51	C041-17	JC22-51	10	IC57C22	ALL	03/23/0507:27
52	C041-18	JC22-52	10	IC57C22	ALL	03/23/0507:47
53	C041-19	JC22-53	10	IC57C22	ALL	03/23/0508:08
54	C041-20	JC22-54	10	IC57C22	ALL	03/23/0508:28
55	C041-21	JC22-55	10	IC57C22	ALL	03/23/0508:48
56	C041-22	JC22-56	10	IC57C22	ALL	03/23/0509:08
57	C041-23	JC22-57	10	IC57C22	ALL	03/23/0509:29
58	CCV5-15	JC22-58	1	IC57C22	ALL	03/23/0509:50

Method IC57022 ✓
 Sample CL04
 Operator JKN
 Run date 03-22-2005 14:53:31 Version: 142
 Printed on 03-22-2005 AT 14:53:44
 Straight Line fit



Component 1 = PERCHLORATE
 EXTERNAL STANDARD CALIBRATION

LEVEL	AMOUNT	HEIGHT
1	1.0000	2271 ✓
2	4.0000	5304 ✓
3	10.0000	13936 ✓
4	25.0000	34114 ✓
5	30.0000	40439 ✓

Handwritten signature 3/22/05

Y = SLOPE * X + INTERCEPT

Height = 1.3615E+03 * Amount + -1.2108E+02 ✓
 Amount = 7.3446E-04 * Height + 8.8928E-02 ✓
 R squared = 0.9996 ✓

8062

SECOND SOURCE

IC RESULT FORM

LFID\$	LSID\$	DF\$	PERCHLORATE
JC22-1	IB	1	ND
JC22-2	S-0.0	1	ND
JC22-3	S-2.0	1	111%
JC22-4	S-4.0	1	127%
JC22-5	S-10.0	1	133%
JC22-6	S-25.0	1	129%
JC22-7	S-30.0	1	128%
JC22-8	ICV	1	99.3%
JC22-9	ICB	1	ND
JC22-10	IPCS	1	87%
JC22-11	PC007WB	1	ND
JC22-12	MRL	1	118%
JC22-13	PCC007WL	1	9.93
JC22-14	PCC007WC	1	9.35
JC22-15	C135-01	1	ND
JC22-16	C135-02	1	ND
JC22-17	C135-02D	1	ND
JC22-18	C135-02M	1	7.5
JC22-19	CCV1-15	1	88.3%
JC22-20	C141-11	1	7.35
JC22-21	C141-12	1	ND
JC22-22	C141-13	1	ND
JC22-23	C141-14	1	ND
JC22-24	CCV2-30	1	101%
JC22-25	PCC008SB	1	ND
JC22-26	PCC008SL	1	10.4
JC22-27	PCC008SC	1	10.3
JC22-28	C041-01	10	ND
JC22-29	C041-02	10	ND
JC22-30	C041-03	10	ND
JC22-31	C041-04	10	ND
JC22-32	C041-05	10	ND
JC22-33	C041-06	10	ND
JC22-34	C041-07	10	ND
JC22-35	CCV3-15	1	100%
JC22-36	C041-08	10	ND
JC22-37	C041-09	10	ND
JC22-38	C041-10	10	ND
JC22-39	C041-11	10	ND
JC22-40	C041-11D	10	ND
JC22-41	C041-11M	10	97.2
JC22-42	C041-12	10	43.1
JC22-43	C041-13	10	ND
JC22-44	C041-14	10	ND
JC22-45	C041-15	10	ND
JC22-46	CCV4-30	1	99.7%
JC22-47	PCC009SB	1	ND
JC22-48	PCC009SL	1	10.3
JC22-49	PCC009SC	1	10.1
JC22-50	C041-16	10	ND
JC22-51	C041-17	10	ND
JC22-52	C041-18	10	ND
JC22-53	C041-19	10	ND
JC22-54	C041-20	10	ND
JC22-55	C041-21	10	ND
JC22-56	C041-22	10	ND
JC22-57	C041-23	10	ND
JC22-58	CCV5-15	1	99.9%

DAILY CALIBRATION

INDX	LSID	LFID	DF	METNAME	SELCOMP	DateTime
1	IPCS	JF03-1	1	IC57C22	ALL	06/03/0522:24
2	PCF001WB	JF03-2	1	IC57C22	ALL	06/03/0522:44
3	MRL	JF03-3	1	IC57C22	ALL	06/03/0523:04
	PCF001WL	JF03-4	1	IC57C22	ALL	06/03/0523:24
	PCF001WC	JF03-5	1	IC57C22	ALL	06/03/0523:45
6	F027-01	JF03-6	1	IC57C22	ALL	06/04/0500:05
7	F027-02	JF03-7	1	IC57C22	ALL	06/04/0500:25
8	F027-03	JF03-8	1	IC57C22	ALL	06/04/0500:45
9	F041-01	JF03-9	1	IC57C22	ALL	06/04/0501:06
10	F041-02	JF03-10	1	IC57C22	ALL	06/04/0501:26
11	CCV28-30	JF03-11	1	IC57C22	ALL	06/04/0501:46
12	F041-02D	JF03-12	1	IC57C22	ALL	06/04/0502:06
13	F041-02M	JF03-13	1	IC57C22	ALL	06/04/0502:27
14	E130-01	JF03-14	2	IC57C22	ALL	06/04/0502:47
15	E130-02	JF03-15	2	IC57C22	ALL	06/04/0503:07
16	E186-01	JF03-16	2	IC57C22	ALL	06/04/0503:27
17	E186-02	JF03-17	2	IC57C22	ALL	06/04/0503:48
18	E251-01	JF03-18	2	IC57C22	ALL	06/04/0504:08
19	F023-01	JF03-19	2	IC57C22	ALL	06/04/0504:28
20	F023-02	JF03-20	2	IC57C22	ALL	06/04/0504:48
21	CCV29-15	JF03-21	1	IC57C22	ALL	06/04/0505:09
22	E130-01	JF03-22	1	IC57C22	ALL	06/04/0505:29
23	E130-02	JF03-23	1	IC57C22	ALL	06/04/0510:23
24	E186-01	JF03-24	1	IC57C22	ALL	06/04/0510:43
25	E186-02	JF03-25	1	IC57C22	ALL	06/04/0511:04
26	E251-01	JF03-26	1	IC57C22	ALL	06/04/0511:24
27	F023-01	JF03-27	1	IC57C22	ALL	06/04/0511:44
28	F023-02	JF03-28	1	IC57C22	ALL	06/04/0512:04
29	RINSE	JF03-29	1	IC57C22	ALL	06/04/0512:25
30	RINSE	JF03-30	1	IC57C22	ALL	06/04/0512:45
31	CCV30-30	JF03-31	1	IC57C22	ALL	06/04/0513:05
32	PCF002WB	JF03-32	1	IC57C22	ALL	06/04/0513:25
33	PCF002WL	JF03-33	1	IC57C22	ALL	06/04/0513:46
34	PCF002WC	JF03-34	1	IC57C22	ALL	06/04/0514:06
35	E116-01	JF03-35	1	IC57C22	ALL	06/04/0514:26
	E116-02	JF03-36	1	IC57C22	ALL	06/04/0514:46
	E116-03	JF03-37	1	IC57C22	ALL	06/04/0515:07
38	E116-04	JF03-38	1	IC57C22	ALL	06/04/0515:27
39	E116-06	JF03-39	1	IC57C22	ALL	06/04/0515:47
40	E116-08	JF03-40	1	IC57C22	ALL	06/04/0516:07
41	RINSE	JF03-41	1	IC57C22	ALL	06/04/0516:28
42	CCV31-15	JF03-42	1	IC57C22	ALL	06/04/0516:48
43	E105-01	JF03-43	1	IC57C22	ALL	06/04/0517:08
44	E105-02	JF03-44	1	IC57C22	ALL	06/04/0517:28
45	E105-03	JF03-45	1	IC57C22	ALL	06/04/0517:49
46	E105-04	JF03-46	1	IC57C22	ALL	06/04/0518:09
47	E105-04D	JF03-47	1	IC57C22	ALL	06/04/0518:29
48	E105-04M	JF03-48	1	IC57C22	ALL	06/04/0518:49
49	E116-05	JF03-49	5	IC57C22	ALL	06/04/0519:10
50	E116-05	JF03-50	2	IC57C22	ALL	06/04/0519:30
51	E116-05	JF03-51	1	IC57C22	ALL	06/04/0519:50
52	RINSE	JF03-52	1	IC57C22	ALL	06/04/0520:10
53	CCV32-30	JF03-53	1	IC57C22	ALL	06/04/0520:31

IC RESULT FORM

LFID\$	LSID\$	DF\$	PERCHLORATE
JF03-1	IPCS	1	85%
JF03-2	PCF001WB	1	ND
JF03-3	MRL	1	111%
JF03-4	PCF001WL	1	10
JF03-5	PCF001WC	1	10.1
JF03-6	F027-01	1	3.63
JF03-7	F027-02	1	12.3
JF03-8	F027-03	1	5.46
JF03-9	F041-01	1	6.15
JF03-10	F041-02	1	25.7
JF03-11	CCV28-30	1	100%
JF03-12	F041-02D	1	25.5
JF03-13	F041-02M	1	35
JF03-14	E130-01	2	ND
JF03-15	E130-02	2	ND
JF03-16	E186-01	2	ND
JF03-17	E186-02	2	ND
JF03-18	E251-01	2	ND
JF03-19	F023-01	2	2.58
JF03-20	F023-02	2	ND
JF03-21	CCV29-15	1	101%
JF03-22	E130-01	1	ND
JF03-23	E130-02	1	ND
JF03-24	E186-01	1	ND
JF03-25	E186-02	1	ND
JF03-26	E251-01	1	ND
JF03-27	F023-01	1	ND
JF03-28	F023-02	1	ND
JF03-29	RINSE	1	ND
JF03-30	RINSE	1	ND
JF03-31	CCV30-30	1	100%
JF03-32	PCF002WB	1	ND
JF03-33	PCF002WL	1	10.2
JF03-34	PCF002WC	1	10.1
JF03-35	E116-01	1	3
JF03-36	E116-02	1	ND
JF03-37	E116-03	1	1.54
JF03-38	E116-04	1	ND
JF03-39	E116-06	1	ND
JF03-40	E116-08	1	ND
JF03-41	RINSE	1	ND
JF03-42	CCV31-15	1	102%
JF03-43	E105-01	1	ND
JF03-44	E105-02	1	1.23
JF03-45	E105-03	1	ND
JF03-46	E105-04	1	ND
JF03-47	E105-04D	1	ND
JF03-48	E105-04M	1	9.81
JF03-49	E116-05	5	ND
JF03-50	E116-05	2	ND
JF03-51	E116-05	1	ND
JF03-52	RINSE	1	ND
JF03-53	CCV32-30	1	99.9%

8067

ANALYTICAL LOGS

ANALYSIS RUN LOG FOR IC - PERCHLORATE

SOP

EMAX-3140 Revision No. 2 □

Book # A57-008

Start Date

3/22/01

Time

12:32

Ending Date

3/23/05

Time

09:50

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix		Conductivity, (us/cm)	Notes	Instrument Number	57
				S	W				
* 1	IC22-1	1B	1		X				
* 2	2	S-0.0							
* 3	3	S-0.0							
* 4	4	S-4.0							
* 5	5	S-10.0							
* 6	6	S-25.0							
* 7	7	S-30.0							
* 8	8	ICV							
* 9	9	ICP							
* 0	10	ICP							
* 1	11	ICP							
* 2	12	ICP							
* 3	13	ICP							
* 4	14	ICP							
* 5	15	ICP							
* 6	16	ICP							
* 7	17	ICP							
* 8	18	ICP							
* 9	19	ICP							
* 0	20	ICP							
* 1	21	ICP							
* 2	22	ICP							
* 3	23	ICP							
* 4	24	ICP							
* 5	25	ICP							
* 6	26	ICP							
* 7	27	ICP							
* 8	28	ICP							
* 9	29	ICP							
* 0	30	ICP							

INITIAL CALIBRATION REFERENCE	
Method File	IC57C22.MET
ICAL ID	SWAB-02-095
ICV ID	SWAB-02-096

Standards	
Name	ID
ICAL	SI
S2	S3
S4	S5
ICV	SWAB-02-096
OCV-15	691
OCV-30	692
LCS	693
MS	693
IPC	694
CMC	SWAB-02-095

Comments:	
CMC Reading, (us/cm)	QC Criteria (us/cm)
1404	±30
Electronic Data Archival	
Location	
Date	

Temp.	
Temp. (°C)	25°C

Analyzed By: 2	
This page is checked during the data review process.	

ANALYSIS RUN LOG FOR IC - PERCHLORATE

SOP EMAX-314.0 Revision No. 2 □

Book # A57-008

Ending Date 6/14/05

Time 22:24

Start Date 06/03/05

Time 20:31

Instrument Number 57

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix		Conductivity, (us/cm)	Notes
				S	W		
* 1	PCF03-1	PCF03-1	1		X		
* 2	PCF03-2	PCF03-2	1				* PAH
* 3	3	MR4					
* 4	4	PCF03-1					* PAH
* 5	5	↓ WC					
* 6	6	PCF03-1				495	
* 7	7	↓ 02				914	
* 8	8	↓ 03				657	
* 9	9	PCF03-1				698	
* 10	10	↓ 02				569	
* 11	11	CCV28-30					
* 12	12	PCF03-2					* PAH
* 13	13	↓ 02M					
* 14	14	E130-01	2				
* 15	15	↓ 02	2				
* 16	16	E186-01	2				
* 17	17	↓ 02	2				
* 18	18	E251-01	2				
* 19	19	PCF03-1	2				
* 20	20	↓ 02	2				
* 21	21	CCV28-15	1				
* 22	22	E130-01				3730	* PAH
* 23	23	↓ 02				3750	
* 24	24	E186-01				3640	
* 25	25	↓ 02				3670	
* 26	26	E251-01				3630	
* 27	27	PCF03-1				3440	
* 28	28	↓ 02				3440	
* 29	29	Rinse					
* 30	30	Rinse					

BATCH * PCF001W

** PCF002W

INITIAL CALIBRATION REFERENCE		
Method File	IC57C22	
ICAL ID	SWBB-02-695	
ICV ID	↓ 696	

Standards		
Name	ID	Conc. (ug/L)
ICAL	S1	
	S2	
	S3	
	S4	
	S5	
ICV		
CCV-15	SWBB-02-709	15
CCV-30	↓ 710	30
LCS	↓ 713	10
MS	SWBB-02-712	10
IPC	SWBB-02-708	600/25
CMC	SWBB-02-565	1413/15/20

Comments:

CMC Reading (us/cm)	QC Criteria (us/cm)	Temp. (°C)
1404	±30	25°C
Electronic Data Archival		
Location		Date

Analyzed By: W

This page is checked during the data review process.

ANALYSIS RUN LOG FOR IC - PERCHLORATE

SOP

☐ EMAX-314.0 Revision No. 2.0

Book # A57-008

Start Date 6/13/05

Time 22:24

Ending Date 6/14/05

Time 20:31

Sample Prep ID		Data File Name	Lab Sample ID	DF	Matrix		Conductivity, (us/cm)	Notes
S	W				S	W		
* 1		JF03-31	CCV30-30	1		X		
* 2		32	PCF002W8					X BAH
* 3		33	WL					X
* 4		34	WC					X
* 5		35	E116-01				1632	X
* 6		36	02				668	X
* 7		37	03				1095	X
* 8		38	04				1264	X
* 9		39	06				5233	X
* 0		40	08				1220	X
* 1		41	Rinse					
* 2		42	CCV31-15					
* 3		43	E105-01				420	X BAH
* 4		44	02				1500	X
* 5		45	03				1310	X
* 6		46	04				980	X
* 7		47	040					X
* 8		48	04M					X
* 9		49	E116-05	5			5233	X
* 0		50	05	2				X
* 1		51	05	1				X
* 2		52	Rinse					
* 3		53	CCV32-30					
* 4		54						
* 5								
* 6								
* 7								
* 8								
* 9								
* 0								

BATCH * PCF001W ** PCF002W

Instrument Number 57

INITIAL CALIBRATION REFERENCE

Method File 1C57C22

ICAL ID SW3B-02-695

ICV ID V 696

Standards

Name	ID	Conc. (ug/L)
ICAL	S1	
	S2	16
	S3	100
	S4	200
	S5	400
ICV		
CCV-15	SW3B-02-709	15
CCV-30	710	30
LCS	713	10
MS	712	10
IPC	708	600/25
CMC	SW3B-02-505	1413/4510

Comments:

CMC Reading, (us/cm)	QC Criteria (us/cm)	Temp. (°C)
1404	±30	25.2

Electronic Data Archival

Location Date

Analyzed By: r

This page is checked during the data review process.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05F027**

SM3500 FERROUS IRON

Five (5) water samples were received on 06/02/05 and 06/03/05 for Ferrous Iron analysis by Method SM3500 in accordance with "Standard Methods for the Examination of Water and Wastewater", 18th edition (1990).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample

Lab control results were within QC limit.

4. Duplicate

Samples F027-01 and F041-01 were analyzed for duplicate. %RPDs were within QC limit.

5. Matrix Spike/Matrix Spike Duplicate

Samples F027-01 and F041-01 were spiked. %Recoveries were within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

SML
FERROUS IRON

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F027
Matrix : WATER
Instrument ID : I70

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	FEF002WB	ND	1	NA	5	2.5	06/02/05 18:38	NA	FEF002W-09	FEF002W-07	FEF002W	NA	NA
LCSTW	FEF002WL	20.5	1	NA	5	2.5	06/02/05 18:39	NA	FEF002W-10	FEF002W-07	FEF002W	NA	NA
GARFIELD	F027-01	ND	1	NA	5	2.5	06/02/05 18:40	NA	FEF002W-11	FEF002W-07	FEF002W	06/02/05	06/02/05
GARFIELDUP	F027-01D	ND	1	NA	5	2.5	06/02/05 18:41	NA	FEF002W-12	FEF002W-07	FEF002W	06/02/05	06/02/05
GARFIELDMIS	F027-01M	21.4	1	NA	5	2.5	06/02/05 18:42	NA	FEF002W-13	FEF002W-07	FEF002W	06/02/05	06/02/05
SUNSET	F027-02	ND	1	NA	5	2.5	06/02/05 18:43	NA	FEF002W-14	FEF002W-07	FEF002W	06/02/05	06/02/05
BANGHAM	F027-03	ND	1	NA	5	2.5	06/02/05 18:44	NA	FEF002W-15	FEF002W-07	FEF002W	06/02/05	06/02/05
MBLK2W	FEF003WB	ND	1	NA	5	2.5	06/03/05 19:08	NA	FEF003W-09	FEF003W-07	FEF003W	NA	NA
LCSTW	FEF003WL	20.6	1	NA	5	2.5	06/03/05 19:09	NA	FEF003W-10	FEF003W-07	FEF003W	NA	NA
LFWC-2	F041-01	ND	1	NA	5	2.5	06/03/05 19:10	NA	FEF003W-11	FEF003W-07	FEF003W	06/03/05	06/03/05
LFWC-2DUP	F041-01D	ND	1	NA	5	2.5	06/03/05 19:11	NA	FEF003W-12	FEF003W-07	FEF003W	06/03/05	06/03/05
LFWC-2MS	F041-01M	21.5	1	NA	5	2.5	06/03/05 19:12	NA	FEF003W-13	FEF003W-07	FEF003W	06/03/05	06/03/05
LFWC-3	F041-02	ND	1	NA	5	2.5	06/03/05 19:13	NA	FEF003W-14	FEF003W-07	FEF003W	06/03/05	06/03/05

8073

EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: SM3500
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05F027 DATE RECEIVED: NA
SAMPLE ID: LCS1W DATE EXTRACTED: NA
CONTROL NO.: FEF002WL DATE ANALYZED: 06/02/05 18:39

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	LCS RSLT (mg/L)	LCS % REC	QC LIMIT (%)
Ferrous Iron	ND	20.00	20.50	102	80-120

8074

EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: SM3500

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05F027

SAMPLE ID: LCS2W

CONTROL NO.: FEF003WL

DATE RECEIVED: NA

DATE EXTRACTED: NA

DATE ANALYZED: 06/03/05 19:09

ACCESSION:

BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	LCS RSLT (mg/L)	LCS % REC	QC LIMIT (%)
ND	20.00	20.60	103	80-120

PARAMETER

Ferrous Iron

8075

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: SM3500
MATRIX: WATER
% MOISTURE: NA
=====

BATCH NO.: 05F027
SAMPLE ID: GARFIELDMS
CONTROL NO.: F027-01M
DATE RECEIVED: 06/02/05
DATE EXTRACTED: NA
DATE ANALYZED: 06/02/05 18:42

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Ferrous Iron	ND	20.00	21.40	107	75-125

8076

5/6

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: SM3500
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05F027
SAMPLE ID: LFWC-2MS
CONTROL NO.: F041-01M
DATE RECEIVED: 06/03/05
DATE EXTRACTED: NA
DATE ANALYZED: 06/03/05 19:12

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Ferrous Iron	ND	20.00	21.50	108	75-125

8077

4/1

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: SM3500

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05F027
DATE RECEIVED: 06/02/05
SAMPLE ID: GARFIELDUP
DATE EXTRACTED: NA
CONTROL NO.: F027-01D
DATE ANALYZED: 06/02/05 18:41

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Ferrous Iron	ND	ND	0	20

8078

Handwritten signature

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: SM3500
MATRIX: WATER
% MOISTURE: NA
=====

BATCH NO.: 05F027
SAMPLE ID: LFWC-2DUP
CONTROL NO.: F041-01D
DATE RECEIVED: 06/03/05
DATE EXTRACTED: NA
DATE ANALYZED: 06/03/05 19:11

ACCESSION:

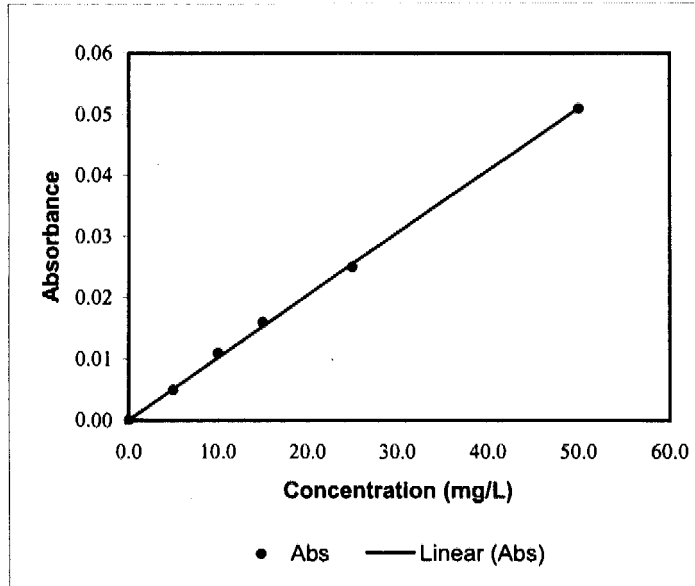
PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Ferrous Iron	ND	ND	0	20

8079

761

CALIBRATION CURVE FERROUS FE

Conc.	Abs
0.0	0.000
5.0	0.005
10.0	0.011
15.0	0.016
25.0	0.025
50.0	0.051



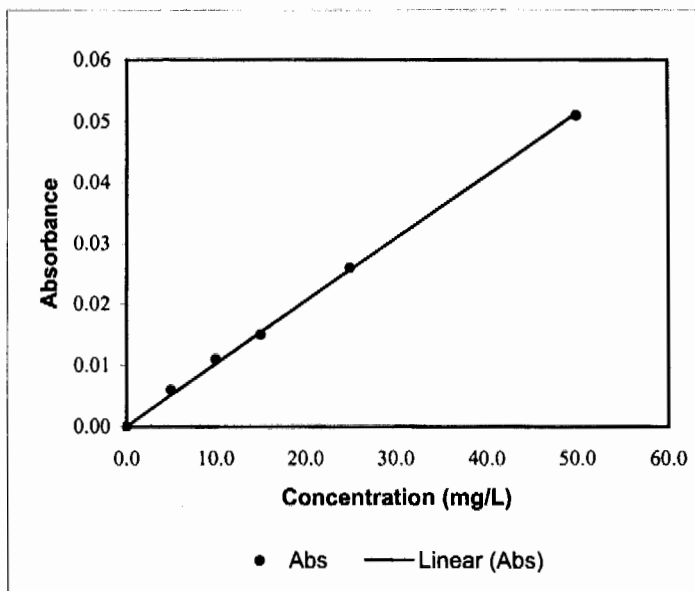
R ²	0.9993
Eq.Line	0.0010
CF	978.8732

Comments: **PASSED**

Analyzed by: LA

CALIBRATION CURVE **FERROUS FE**

Conc.	Abs
0.0	0.000
5.0	0.006
10.0	0.011
15.0	0.015
25.0	0.026
50.0	0.051



R ²	0.9994
Eq.Line	0.0010
CF	974.7546

Comments: **PASSED**

Analyzed by: LA

ANALYSIS LOG FOR FERROUS IRON

SOP ☒ EMAX-3500-Fe D/C Rev. No. 0 ☐

Starting Date 6/02/05 Time 18:30 Ending Date 6/02/05 Time

Book # A70-Fe D/C-001

Data File Name	Preparative Batch	Lab Sample ID	Matrix		Sample Amount (ml)	DF	Abs. (510 nm)	Time	Ferrous Iron (mg/L)	Notes	Instrument No.: 70		Wavelength: 510 nm														
			S	W							Standard	ID															
* 1	FEF0024	5-0.0			50	1	0.000	18:40																			
* 2		5-5					0.000	18:41																			
* 3		5-10					0.011	18:42																			
* 4		5-15					0.015	18:43																			
* 5		5-25					0.020	18:44																			
* 6		5-50					0.051	18:45																			
* 7		10V					0.020	18:46	19.50																		
* 8		10B					0.000	18:47	ND																		
* 9		FEF0024B					0.000	18:48	ND																		
* 0		↓ WC					0.021	18:49	20.4L																		
* 1		FOR7-01					0.002	18:50	ND																		
* 2		↓ 01D					0.002	18:51	ND																		
* 3		↓ 01M					0.022	18:52	21.44																		
* 4		↓ 02					0.001	18:53	ND																		
* 5		↓ 03					0.001	18:54	ND																		
* 6		CCV					0.020	18:55	19.50																		
* 7		CCP					0.000	18:56	ND																		
* 8																											
* 9																											
* 0																											
ANALYTICAL BATCH * FEF0024																											
<table border="1"> <thead> <tr> <th colspan="2">Standard Curve</th> </tr> </thead> <tbody> <tr> <td>R (≤0.995)</td> <td>0.9994</td> </tr> <tr> <td>Y</td> <td>0.0010</td> </tr> <tr> <td>CF</td> <td>974.7544</td> </tr> </tbody> </table>														Standard Curve		R (≤0.995)	0.9994	Y	0.0010	CF	974.7544						
Standard Curve																											
R (≤0.995)	0.9994																										
Y	0.0010																										
CF	974.7544																										
<table border="1"> <thead> <tr> <th colspan="2">Reagents</th> </tr> </thead> <tbody> <tr> <td>Name</td> <td>ID</td> </tr> <tr> <td>HCl</td> <td>SW1A-02-15-97</td> </tr> <tr> <td>NH₄C₂H₃O₂ Buffer</td> <td>SW1B-06-21-98</td> </tr> <tr> <td>Phenanthroline Sol'n</td> <td>L-218A</td> </tr> <tr> <td>Na₂H₂O₄ Sol'n</td> <td>NA</td> </tr> <tr> <td>Hydroxylamine Soln</td> <td>↓</td> </tr> </tbody> </table>														Reagents		Name	ID	HCl	SW1A-02-15-97	NH ₄ C ₂ H ₃ O ₂ Buffer	SW1B-06-21-98	Phenanthroline Sol'n	L-218A	Na ₂ H ₂ O ₄ Sol'n	NA	Hydroxylamine Soln	↓
Reagents																											
Name	ID																										
HCl	SW1A-02-15-97																										
NH ₄ C ₂ H ₃ O ₂ Buffer	SW1B-06-21-98																										
Phenanthroline Sol'n	L-218A																										
Na ₂ H ₂ O ₄ Sol'n	NA																										
Hydroxylamine Soln	↓																										
<table border="1"> <thead> <tr> <th colspan="2">Comments:</th> </tr> </thead> <tbody> <tr> <td>Standard Curve</td> <td></td> </tr> <tr> <td>R (≤0.995)</td> <td>0.9994</td> </tr> <tr> <td>Y</td> <td>0.0010</td> </tr> <tr> <td>CF</td> <td>974.7544</td> </tr> </tbody> </table>														Comments:		Standard Curve		R (≤0.995)	0.9994	Y	0.0010	CF	974.7544				
Comments:																											
Standard Curve																											
R (≤0.995)	0.9994																										
Y	0.0010																										
CF	974.7544																										
<table border="1"> <thead> <tr> <th colspan="2">Analyzed By:</th> </tr> </thead> <tbody> <tr> <td>ANALYST</td> <td>NA</td> </tr> </tbody> </table>														Analyzed By:		ANALYST	NA										
Analyzed By:																											
ANALYST	NA																										
<table border="1"> <thead> <tr> <th colspan="2">Disposal Date:</th> </tr> </thead> <tbody> <tr> <td>DISPOSAL DATE</td> <td>NA</td> </tr> </tbody> </table>														Disposal Date:		DISPOSAL DATE	NA										
Disposal Date:																											
DISPOSAL DATE	NA																										

This page is checked during data review.

ANALYSIS LOG FOR FERROUS IRON

SOP EMAX-3500-Fe D/C Rev. No. 0 □

Starting Date 6-09-05 Time 19:00

Ending Date 6-09-05 Time 19:15

Book # A70-Fe D/C-001

Data File Name	Preparative Batch	Lab Sample ID	Matrix		Sample Amount (ml)	DF	Abs. (510 nm)	Time	Ferrous Iron (mg/L)	Notes	Instrument No.: 70		Wavelength: 510 nm
			S	W							Standard	ID	
* 1	FEF003W	5-010	✓		50	1	0.000	19:00					Conc. (mg/L)
* 2		5-5					0.000	-01					0.0
* 3		5-10					0.011	-02					5
* 4		5-15					0.016	-03					10
* 5		5-25					0.025	-04					15
* 6		5-50					0.051	-05					25
* 7		101					0.020	-06	19.58				50
* 8		102					0.000	-07	ND				20
* 9		FEF003WB					0.000	-08	ND				20
* 0		↓ WC					0.021	-09	20.00				
* 1		F04-01					0.001	-10	ND				
* 2		↓ -01D					0.002	-11	ND				
* 3		↓ -01M					0.012	-12	21.04				
* 4		↓ -02					0.001	-13	ND				
* 5		CCV					0.020	-14	19.48				
* 6		CCB					0.000	-15	ND				
* 7													
* 8													
* 9													
* 0													
* 1													
* 2													
* 3													
* 4													
* 5													
* 6													
* 7													
* 8													
* 9													
* 0													

Standard Curves	
R (≤0.995)	0.9993
Y	0.0010
CF	778.9192

Comments:	
Analyzed By:	ND/LA
Disposal Date:	

ANALYTICAL BATCH * FEF003W

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05F027**

METHOD 351.3 TKN

Five (5) water samples were received on 06/02/05 and 06/03/05 for TKN analysis by Method 351.3 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample F027-01 was analyzed for duplicate. %RPD was within QC limit.

5. Matrix Spike

Sample F027-01 was spiked. %Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 1.3
TKN

Matrix : WATER
Instrument ID : 170

Client : BATTILLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F027

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE TIME	Extraction DATE TIME	LFID	CAL REF	PREP BATCH	Collection DATE TIME	Received DATE TIME
NBLK1W	KNF003WB	ND	1	.1	.035	06/15/0510:10	06/14/0511:30	KNF003W-11	KNF003W-09	KNF003W	NA	06/14/05
LCS1W	KNF003WL	1.07	1	.1	.035	06/15/0510:11	06/14/0511:30	KNF003W-12	KNF003W-09	KNF003W	NA	06/14/05
LCD1W	KNF003WC	1.04	1	.1	.035	06/15/0510:12	06/14/0511:30	KNF003W-13	KNF003W-09	KNF003W	NA	06/14/05
GARFIELD	F027-01	.595	1	.1	.035	06/15/0510:13	06/14/0511:30	KNF003W-14	KNF003W-09	KNF003W	06/02/05	06/02/05
GARFIELDDUP	F027-01D	.610	1	.1	.035	06/15/0510:14	06/14/0511:30	KNF003W-15	KNF003W-09	KNF003W	06/02/05	06/02/05
GARFIELDS	F027-01M	1.53	1	.1	.035	06/15/0510:15	06/14/0511:30	KNF003W-16	KNF003W-09	KNF003W	06/02/05	06/02/05
SUNSET	F027-02	.322	1	.1	.035	06/15/0510:16	06/14/0511:30	KNF003W-17	KNF003W-09	KNF003W	06/02/05	06/02/05
BANGHAM	F027-03	.397	1	.1	.035	06/15/0510:17	06/14/0511:30	KNF003W-18	KNF003W-09	KNF003W	06/02/05	06/02/05
LFMC-2	F041-01	.327	1	.1	.035	06/15/0510:18	06/14/0511:30	KNF003W-19	KNF003W-09	KNF003W	06/03/05	06/03/05
LAWC-3	F041-02	.526	1	.1	.035	06/15/0510:19	06/14/0511:30	KNF003W-20	KNF003W-09	KNF003W	06/03/05	06/03/05

8085

fr

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT:

JPL

METHOD:

METHOD 351.3

MATRIX:

WATER

% MOISTURE:

NA

BATCH NO.:

05F027

SAMPLE ID:

LCS1W/LCD1W

CONTROL NO.:

KNF003WL/C

DATE RECEIVED: 06/14/05

DATE EXTRACTED: 06/14/05 11:30

DATE ANALYZED: 06/15/05 10:11/10:12

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TKN	ND	1.00	1.07	107	1.00	1.04	104	3	80-120	20

8086

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 351.3
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05F027 DATE RECEIVED: 06/02/05
SAMPLE ID: GARFIELDMS DATE EXTRACTED: 06/14/05 11:30
CONTROL NO.: F027-01M DATE ANALYZED: 06/15/05 10:15

ACCESSION:

PARAMETER	SNPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
TKN	.595	1.00	1.53	93	75-125

8087

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EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: 351.3

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05F027

SAMPLE ID: GARFIELDUP

CONTROL NO.: F027-01D

DATE RECEIVED: 06/02/05

DATE EXTRACTED: 06/14/05 11:30

DATE ANALYZED: 06/15/05 10:14

ACCESSION:

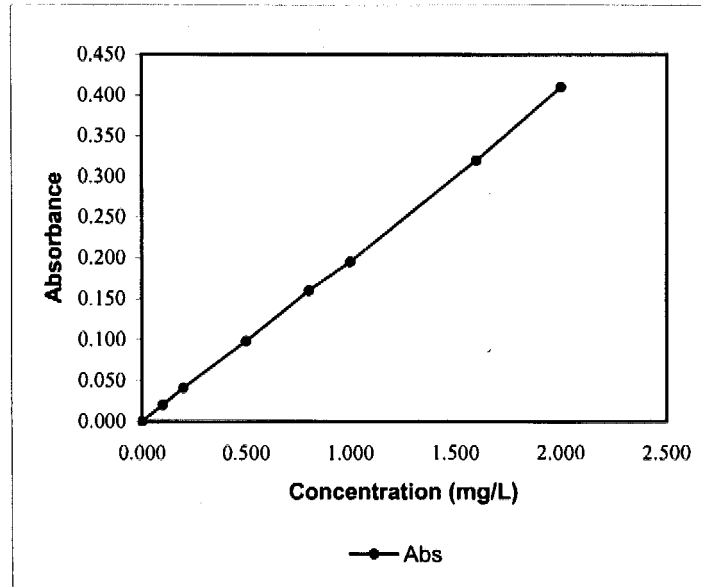
PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
TKN	.595	.61	2	20

8088

25

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.020
0.200	0.041
0.500	0.098
0.800	0.160
1.000	0.195
1.600	0.320
2.000	0.410



R² 0.999379

Comments: **PASSED**

Y 0.2017

CF 4.9586

Analyzed by: LA

8089

ANALYSIS LOG FOR TOTAL KJELDAHL NITROGEN (TKN)

Page 70

SOP ☒ EMAX-351.3 Rev. No. 1 ☐

Start Date: 6-15-05 Time: 10:00

End Date: 6-15-05 Time: 10:24

Book # A70-KN-004

Data File Name	Prep. Batch	Lab Sample ID	Matrix		Time	Vol. Colored (ml)	DF	Absorbance	Notes	Instrument No: 70		Wavelength: 425 nm
			S	W						Standard	ID	
* 1	KNF002W	5-0-0			10:00	20	1	0.000				
* 2		5-0-1			-01			0.000				
* 3		5-0-2			-02			0.001				
* 4		5-0-5			-03			0.098				
* 5		5-0-8			-04			0.160				
* 6		5-1-0			-05			0.195				
* 7		5-1-1			-06			0.320				
* 8		5-2-0			-07			0.410				
* 9		10-1			-08			0.198	0.982			
* 0		10-3			-09			0.000	ND			
* 1		KNF003W			-10			0.000	ND			
* 2		↓ 40L			-11			0.215	1.064			
* 3		↓ 40L			-12			0.210	1.041			
* 4		F027-01			-13			0.120	0.595			
* 5		↓ 01D			-14			0.123	0.610			
* 6		01M			-15			0.209	1.532			
* 7		02			-16			0.065	0.922			
* 8		↓ 03			-17			0.050	0.397			
* 9		F041-01			-18			0.064	0.327			
* 0		↓ 02			-19			0.104	0.524			
* 1		CCV1			-20			0.201	0.997			
* 2		CCV01			-21			0.000	ND			
* 3		F 476-03			-22			0.181	0.000			
* 4		CCV2			-23			0.200	0.992			
* 5		CCV2			-24			0.000	ND			
* 6												
* 7												
* 8												
* 9												
* 0												

ANALYTICAL BATCH * KNF003W

Reagent	ID
Color Reagent	RW7A-06-144

Standard	Conc. (mg/L)
S ₀	0.0
S ₁	0.1
S ₂	0.2
S ₃	0.5
S ₄	0.8
S ₅	1.0
S ₆	1.6
S ₇	2.0
ICVMS	1.0
CCV	1.0
LCS	1.0

Reagent	ID
Color Reagent	RW7A-06-144

Standard Curve	
R ²	0.9996
Y	0.2017
CF	4.9582

Comments:

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By: du

This page is checked during data review.

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-005

SOP □ EMAX-350.2 Rev. No.: 2 □ EMAX-351.3 Rev. No.: 2 □

Start Date 6-14-05 Time 11:30 End Date 6-14-05 Time 18:40

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	5-0.0	9.5	10	5	4	50	50		ICV/MS	5W7A-06-151	5 ml
*02	5-0.1								LCS	↓ -156	50 ml
*03	5-1.0								Reagent	NA	
*04	5-2.0								NaOH	5W7A-06-152	
*05	10V								Borate Buffer	5W7A-06-315A	
*06	10B								H ₃ BO ₃	5W7A-06-053	
*07	KNF-003WB								Digestion Mixture	5W7A-06-515B	
*08	↓ WL								Distilling Soln.		
*09	↓ WC										
*10	FOR 0.1								SDG #	NA	
*11	↓ -0.1D								Extract Location		
*12	↓ -0.1M										
*13	↓ -0.1										
*14	↓ -0.3										
*15	↓ 7001-01										
*16	↓ 7001-02										
*17	↓ 7001-03	9.5	10	5	4	50	50				
*18											
*19											
*20											
*21											
*22											
*23											
*24	↓										
*25	67808										
*26											

PREPARATION BATCH KNF-003WB

Prepared By: 2a
Standard Added By: 2a
Checked By: 2a

8091

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05F027

METHOD 376.1 SULFIDE

Five (5) water samples were received on 06/02/05 and 06/03/05 for Sulfide analysis by Method 376.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample F041-02 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 3.0.1
SULFIDE

Client : BATTILLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F027
Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATETIME	Extraction DATETIME	LFID	CAL REF	PREP BATCH	Collection DATETIME	Received DATETIME
MBLK1W	SDF002WB	ND	1	1	.4	06/06/0510:30	NA	SDF002W-01	NA	SDF002W	NA	NA
LCS1W	SDF002WL	5.20	1	1	.4	06/06/0510:33	NA	SDF002W-02	NA	SDF002W	NA	NA
LCD1W	SDF002WC	5.24	1	1	.4	06/06/0510:36	NA	SDF002W-03	NA	SDF002W	NA	NA
GARFIELD	F027-01	ND	1	1	.4	06/06/0510:39	NA	SDF002W-04	NA	SDF002W	06/02/05	06/02/05
SUNSET	F027-02	ND	1	1	.4	06/06/0510:42	NA	SDF002W-05	NA	SDF002W	06/02/05	06/02/05
BANGHAM	F027-03	ND	1	1	.4	06/06/0510:45	NA	SDF002W-06	NA	SDF002W	06/02/05	06/02/05
LFMC-2	F041-01	ND	1	1	.4	06/06/0510:48	NA	SDF002W-07	NA	SDF002W	06/03/05	06/03/05
LAWC-3	F041-02	ND	1	1	.4	06/06/0510:51	NA	SDF002W-08	NA	SDF002W	06/03/05	06/03/05
LAWC-3DUP	F041-02D	ND	1	1	.4	06/06/0510:54	NA	SDF002W-09	NA	SDF002W	06/03/05	06/03/05

8093

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 376.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05F027
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: SDF002WL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 06/06/05 10:33/10:36

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Sulfide	ND	5.62	5.20	93	5.62	5.24	93	1	80-120	20

8094

24

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: METHOD 376.1

MATRIX: WATER

% MOISTURE: NA

=====

BATCH NO.: 05F027

SAMPLE ID: LAWC-3DUP

CONTROL NO.: F041-020

DATE RECEIVED: 06/03/05

DATE EXTRACTED: NA

DATE ANALYZED: 06/06/05 10:54

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Sulfide	ND	ND	0	20

8095

Re

ANALYSIS LOG FOR SULFIDE

SOP ☒ EMAX-376.1 Rev. No. 1 ☐ EMAX-9034 Rev. No. 9 ☐ Ending Date: 6-26-05 Time: 10:54 Book # ASD-006

Starting Date: 6-26-05 Time: 10:30

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Volume of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Notes	Standard	ID	Conc. (mg/L)
* 1	SDF002W B	10:30	100	10	10.4	ND	LCS	207A-05-265	5.62
* 2	↓ WC	-33			4.65	5.20	Spike	NA	
* 3	↓ WC	-36			4.60	5.24	Na ₂ S ₂ O ₃	207B-02-697	000264
* 4	F027-01	-39			10.3	ND	PAO IL	↓ -696	000264
* 5	↓ -02	-02			10.2	ND	Indicator	207B-06-266	NA
* 6	↓ -03	-45			10.0	ND			
* 7	F041-01	-48			10.4	ND	STANDARDIZATION		
* 8	↓ -02	-51			10.3	ND			
* 9	↓ -02D	-54			10.3	ND			
* 0									
* 1							Vol. Of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Conc. Of Iodine (N)
* 2							10	10.4	0.00587
* 3							10	10.4	0.00587
* 4							10	10.4	0.00587
* 5									
* 6									
* 7									
* 8									
* 9									
* 0									
* 1									
* 2									
* 3									
* 4									
* 5									
* 6									
* 7									
* 8									
* 9									
* 0									
* 1									
* 2									
* 3									
* 4									
* 5									
* 6									
* 7									
* 8									
* 9									
* 0									
ANALYTICAL BATCH * SDF002W									
Average Iodine Conc. (N) 0.00587									

Comments:

Analyzed By: SL
This page is checked during data review.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05F027**

METHOD 160.1 TOTAL DISSOLVED SOLIDS

Five (5) water samples were received on 06/02/05 and 06/03/05 for Total Dissolved Solids analysis by Method 160.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 160.1
TOTAL DISSOLVED SOLIDS

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F027

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLKTW	TDF005WB	ND	1	NA	10	5	06/04/0512:00	NA	TDF005W-01	NA	TDF005W	NA	NA
LCSTW	TDF005WL	276	1	NA	10	5	06/04/0512:01	NA	TDF005W-02	NA	TDF005W	NA	NA
LCSTW	TDF005WC	270	1	NA	10	5	06/04/0512:02	NA	TDF005W-03	NA	TDF005W	NA	NA
GARFIELD	F027-01	274	1	NA	10	5	06/04/0512:03	NA	TDF005W-04	NA	TDF005W	06/02/05	06/02/05
SUNSET	F027-02	420	1	NA	10	5	06/04/0512:04	NA	TDF005W-05	NA	TDF005W	06/02/05	06/02/05
BANGHAM	F027-03	380	1	NA	10	5	06/04/0512:05	NA	TDF005W-06	NA	TDF005W	06/02/05	06/02/05
LFWC-2	F041-01	460	1	NA	10	5	06/04/0512:06	NA	TDF005W-07	NA	TDF005W	06/03/05	06/03/05
LAUC-3	F041-02	324	1	NA	10	5	06/04/0512:07	NA	TDF005W-08	NA	TDF005W	06/03/05	06/03/05

8098

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 160.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05F027
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: TDF005WL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 06/04/05 12:01/12:02

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TDS	ND	270.00	276.00	102	270.00	270.00	100	2	80-120	20

8099

24

GRAVIMETRIC ANALYSIS LOG

SOP □ EMAX-160.1 Rev. No. 3 □ EMAX-160.2 Rev. No. 2 □ EMAX-160.3 Rev. No. 1 □ EMAX-160.4 Rev. No. 0 □ EMAX-160.5 Rev. No. 0

Oven/Furnace Temp. 105 Starting Date 6/3/05 Time 1800 Ending Date 6/4/05 Time 1030

Comments: 180°C

LCS ID 907A-06-155

LCSTV 269.9 mg/L

Balance: 160-4070636

I -37030058

Analyzed By: MB/RM

This page is checked during the data review process.

Data File Name	Lab Sample ID	Sample Amt. (ml)	Dish Wt. (g)	Dry Wt. Dish + Solids (g)			Solids (mg)	Result (mg/L)	Settleable Solids	
				1st	2nd	3rd			Vol. of SS	Result (ml/L)
1	TD F005-013	100	66.2008	66.2010	66.2006	66.2008	0	N/D		
2	WC	50	66.6187	66.6330	66.6323	66.6325	13.8	276		
3	WC	50	60.0899	60.1039	60.1035	60.1034	13.5	270		
4	F027-01	50	62.9426	62.9577	62.9565	62.9563	13.7	274		
5	-02	50	55.8818	55.9036	55.9020	55.9028	21.0	420		
6	-03	50	62.9679	62.9864	62.9848	62.9849	19.0	380		
7	F041-01	50	62.9897	63.0136	63.0126	63.0127	23.0	460	✓	
8	-02	50	64.8770	64.8940	64.8930	64.8932	16.2	324	✓	
9	F021-02	50	66.9802	66.9810	66.9803	66.9802	0	N/B		
0	-03	50	73.0195	73.0612	73.0605	73.0602	40.7	814		
1	-04	50	62.9345	62.9708	62.9698	62.9700	35.5	710		
2	-06	50	65.9162	65.9571	65.9560	65.9568	10.2	N/B		
3	-08	50	63.9220	63.9577	63.9563	63.9562	34.2	684		
4	-08	50	60.0409	60.0764	60.0753	60.0749	34	680		
5	-09	50	70.9820	71.0133	71.0122	71.0125	30.5	610		
6	-10	50	66.0452	66.0956	66.0940	66.0942	49.0	980		
7	F020-01	50	58.9167	58.9370	58.9366	58.9364	25.7	514		
8	-02	50	62.8764	62.8825	62.8818	62.8816	22.2	504		
9	F417-01	50	59.9582	59.9811	59.9802	59.9804	22.2	444		
0	F418-01	50	64.9266	64.9796	64.9790	64.9788	36.2	724		

ANALYTICAL BATCH * SS TD F0054 S VS

BALANCE CALIBRATION VERIFICATION LOG (DOE)

Page 26

SOP □ EMAX-QC-REVISION NO.: 1

QC04-036

Balance ID 10601202

Date 6-3-05

Range	Min:	1	Max:	600	g
TV	200	100	30	5	1
1	199.999	99.998	29.999	5.000	1.000
2	199.999	99.997	29.999	5.000	1.000
3	199.999	99.998	29.999	5.000	1.000
Criteria (±0.1%)	0.2	0.1	0.03	0.005	0.001
LL	199.8	99.9	29.97	4.995	0.999
UL	200.2	100.1	30.03	5.005	1.001

Comment: passed

Balance ID J77299

Date 6-3-05

Range	Min:	1	Max:	300	g
TV	200	100	50	30	20
1	200.00	100.00	50.00	30.00	20.00
2	200.00	100.00	50.00	30.00	20.00
3	200.00	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment: passed

Balance ID 10203192

Date 6-3-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.00	100.00	50.00	30.00	20.00
2	200.00	100.00	50.00	30.00	20.00
3	200.00	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment: passed

Balance ID 10304418

Date 6-3-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.04	100.03	50.00	30.00	20.00
2	200.04	100.03	50.00	30.00	20.00
3	200.04	100.03	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment: passed

Balance ID 40706360

Date 6-3-05

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1	199.9983	99.9974	29.9993	1.0000	0.0200
2	199.9984	99.9975	29.9987	1.0000	0.0200
3	199.9982	99.9977	29.9986	1.0000	0.0200
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment: passed

Balance ID 40706360

Date

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:



LABORATORIES, INC. 1925 W. 205th St. Torrance, CA 90501

Verified by: h/c

Checked by: _____

BALANCE CALIBRATION VERIFICATION LOG (DOE)

Page 27

SOP □ EMAX-QC04 Revision No.: 1

QC04-036

Balance ID 10601202

Date 6-4-05

Range	Min:	1	Max:	600	g
TV	200	100	30	5	1
1	200.003	100.004	30.001	4.999	1.000
2	200.002	100.002	30.001	4.998	1.000
3	200.001	100.002	30.001	4.998	1.000
Criteria (±0.1%)	0.2	0.1	0.03	0.005	0.001
LL	199.8	99.9	29.97	4.995	0.999
UL	200.2	100.1	30.03	5.005	1.001

Comment:

passed

Balance ID J77299

Date

Range	Min:	1	Max:	300	g
TV	200	100	50	30	20
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

N/A

Balance ID 10203192

Date

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

N/A

Balance ID 10304418

Date

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

N/A

Balance ID 40706360

Date 6/4/05

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1	199.9995	99.9990	30.0000	1.0000	0.0020
2	199.9996	99.9987	29.9999	1.0000	0.0020
3	199.9998	99.9984	29.9998	0.9999	0.0020
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

passed

6/4/05

Balance ID 40706360

Date

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

EMAX LABORATORIES, INC. 1835 W. 20th St. Torrance, CA 90501

Verified by:

Checked by:

6/4/05

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05F027

METHOD 415.1 DISSOLVED ORGANIC CARBON

Five (5) water samples were received on 06/02/05 and 06/03/05 for Dissolved Organic Carbon analysis by Method 415.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample F041-02 was analyzed for Duplicate. % RPD was within QC limit.

5. Matrix Spike

Sample F041-02 was spiked. % Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F041

Matrix : WATER
Instrument ID : 62

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
NBLK1W	TCF005WB	ND	1.00	NA	1	.5	06/10/0518:13	NA	TCF005-5	TCF005-2	TCF005W	NA	NA
LCS1W	TCF005WL	24.5	1.00	NA	1	.5	06/10/0518:24	NA	TCF005-6	TCF005-2	TCF005W	NA	NA
LCD1W	TCF005WC	24	1.00	NA	1	.5	06/10/0518:34	NA	TCF005-7	TCF005-2	TCF005W	NA	NA
GARFIELD	F027-01	9.29	1.00	NA	1	.5	06/10/0520:54	NA	TCF005-22	TCF005-14	TCF005W	06/02/05	06/02/05
SUNSET	F027-02	17.1	1.00	NA	1	.5	06/10/0521:04	NA	TCF005-23	TCF005-14	TCF005W	06/02/05	06/02/05
BANGHAM	F027-03	6.66	1.00	NA	1	.5	06/10/0521:13	NA	TCF005-24	TCF005-14	TCF005W	06/02/05	06/02/05
LMC-2	F041-01	-923J	1.00	NA	1	.5	06/10/0521:22	NA	TCF005-25	TCF005-14	TCF005W	06/03/05	06/03/05
LMC-3	F041-02	12.8	1.00	NA	1	.5	06/10/0521:53	NA	TCF005-28	TCF005-26	TCF005W	06/03/05	06/03/05
LMC-3DUP	F041-02D	12.9	1.00	NA	1	.5	06/10/0522:02	NA	TCF005-29	TCF005-26	TCF005W	06/03/05	06/03/05
LMC-3MS	F041-02M	35.8	1.00	NA	1	.5	06/10/0522:12	NA	TCF005-30	TCF005-26	TCF005W	06/03/05	06/03/05

8105

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05F041

METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1.00
SAMPLE ID: MBLK1W
LAB SAMP ID: TCF005WB
LAB FILE ID: TCF005-5
DATE EXTRACTED: NA
DATE ANALYZED: 06/10/0518:13
PREP. BATCH: TCF005W
CALIB. REF: TCF005-2

1.00 1.00

TCF005WL TCF005WC
TCF005-6 TCF005-7

NA NA
06/10/0518:24 06/10/0518:34
TCF005W TCF005W
TCF005-2 TCF005-2

% MOISTURE: NA
DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
DOC	ND	25	24.5	98	25	24	96	2	80-120	20

8106

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05F041
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1.00
SAMPLE ID: LAMC-3
LAB SAMP ID: F041-02M
LAB FILE ID: TCF005-30
DATE EXTRACTED: NA
DATE ANALYZED: 06/10/0521:53
PREP. BATCH: TCF005W
CALIB. REF: TCF005-26

% MOISTURE: NA

DATE COLLECTED: 06/03/05
DATE RECEIVED: 06/03/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
DOC	12.8	25	35.8	92	75-125

8107

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05F041

METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1.00
SAMPLE ID: LWC-3DUP
EMAX SAMP ID: F041-020
LAB FILE ID: TCF005-28
DATE EXTRACTED: NA
DATE ANALYZED: 06/10/0521:53
PREP. BATCH: TCF005W
CALIB. REF: TCF005-26

% MOISTURE: NA
DATE COLLECTED: 06/03/05
DATE RECEIVED: 06/03/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
DOC	12.8	12.9	1	20

8108

	Type	Analysis	Sample Name	Sample ID	ObjectID	Origin	Dilution	Result	Notes
1	Standard	NPOC	ICAL	TCF005-1	0A-123456-0	C:\Pro	1.000		
2	Control	NPOC	ICV	TCF005-2	0A-123456-0	C:\Pro	1.000	NPOC:25.15 mg/L	Control value:
3	Unknown	NPOC	ICB	TCF005-3	0A-123456-0	C:\Pro	1.000	NPOC:0.06167 m	
4	Unknown	NPOC	HCO3/CO3	TCF005-4	0A-123456-0	C:\Pro	1.000	NPOC:0.1932 mg	
5	Unknown	NPOC	TCF005WB	TCF005-5	0A-123456-0	C:\Pro	1.000	NPOC:0.05997 m	
6	Unknown	NPOC	TCF005WL	TCF005-6	0A-123456-0	C:\Pro	1.000	NPOC:24.53 mg/L	
7	Unknown	NPOC	TCF005WC	TCF005-7	0A-123456-0	C:\Pro	1.000	NPOC:24.01 mg/L	
8	Unknown	NPOC	05E175-01	TCF005-8	0A-123456-0	C:\Pro	1.000	NPOC:1.663 mg/L	
9	Unknown	NPOC	05E175-02	TCF005-9	0A-123456-0	C:\Pro	1.000	NPOC:1.693 mg/L	
10	Unknown	NPOC	05E175-03	TCF005-10	0A-123456-0	C:\Pro	1.000	NPOC:0.4687 mg	
11	Unknown	NPOC	05E175-04	TCF005-11	0A-123456-0	C:\Pro	1.000	NPOC:1.003 mg/L	
12	Unknown	NPOC	05E175-05	TCF005-12	0A-123456-0	C:\Pro	1.000	NPOC:1.089 mg/L	
13	Unknown	NPOC	05E175-06	TCF005-13	0A-123456-0	C:\Pro	1.000	NPOC:1.302 mg/L	
14	Control	NPOC	CCV1	TCF005-14	0A-123456-0	C:\Pro	1.000	NPOC:24.79 mg/L	Control value:
15	Unknown	NPOC	CCB1	TCF005-15	0A-123456-0	C:\Pro	1.000	NPOC:0.000 mg/L	
16	Unknown	NPOC	05E175-07	TCF005-16	0A-123456-0	C:\Pro	1.000	NPOC:0.3987 mg	
17	Unknown	NPOC	05E189-01	TCF005-17	0A-123456-0	C:\Pro	1.000	NPOC:0.6302 mg	
18	Unknown	NPOC	05E189-02	TCF005-18	0A-123456-0	C:\Pro	1.000	NPOC:1.183 mg/L	
19	Unknown	NPOC	05E189-03	TCF005-19	0A-123456-0	C:\Pro	1.000	NPOC:1.710 mg/L	
20	Unknown	NPOC	05E189-04	TCF005-20	0A-123456-0	C:\Pro	1.000	NPOC:0.5658 mg	
21	Unknown	NPOC	05F064-01	TCF005-21	0A-123456-0	C:\Pro	1.000	NPOC:14.91 mg/L	
22	Unknown	NPOC	05F027-01	TCF005-22	0A-123456-0	C:\Pro	1.000	NPOC:9.288 mg/L	
23	Unknown	NPOC	05F027-02	TCF005-23	0A-123456-0	C:\Pro	1.000	NPOC:17.13 mg/L	
24	Unknown	NPOC	05F027-03	TCF005-24	0A-123456-0	C:\Pro	1.000	NPOC:6.665 mg/L	
25	Unknown	NPOC	05F041-01	TCF005-25	0A-123456-0	C:\Pro	1.000	NPOC:0.9232 mg	
26	Control	NPOC	CCV2	TCF005-26	0A-123456-0	C:\Pro	1.000	NPOC:24.49 mg/L	Control value:
27	Unknown	NPOC	CCB2	TCF005-27	0A-123456-0	C:\Pro	1.000	NPOC:0.000 mg/L	
28	Unknown	NPOC	05F041-02	TCF005-28	0A-123456-0	C:\Pro	1.000	NPOC:12.76 mg/L	
29	Unknown	NPOC	05F041-02D	TCF005-29	0A-123456-0	C:\Pro	1.000	NPOC:12.87 mg/L	
30	Unknown	NPOC	05F041-02M	TCF005-30	0A-123456-0	C:\Pro	1.000	NPOC:35.76 mg/L	
31	Unknown	NPOC	05F064-01	TCF005-31	0A-123456-0	C:\Pro	1.000	NPOC:0.8298 mg	
32	Unknown	NPOC	TCF006WB	TCF005-32	0A-123456-0	C:\Pro	1.000	NPOC:0.1326 mg	
33	Unknown	NPOC	TCF006WL	TCF005-33	0A-123456-0	C:\Pro	1.000	NPOC:24.77 mg/L	
34	Unknown	NPOC	TCF006WC	TCF005-34	0A-123456-0	C:\Pro	1.000	NPOC:24.73 mg/L	
35	Unknown	NPOC	05E175-01	TCF005-35	0A-123456-0	C:\Pro	1.000	NPOC:1.451 mg/L	
36	Unknown	NPOC	05E175-02	TCF005-36	0A-123456-0	C:\Pro	1.000	NPOC:0.6567 mg	
37	Unknown	NPOC	05E175-03	TCF005-37	0A-123456-0	C:\Pro	1.000	NPOC:0.4543 mg	
38	Control	NPOC	CCV3	TCF005-38	0A-123456-0	C:\Pro	1.000	NPOC:24.57 mg/L	Control value:
39	Unknown	NPOC	CCB3	TCF005-39	0A-123456-0	C:\Pro	1.000	NPOC:0.05422 m	
40	Unknown	NPOC	05E175-04	TCF005-40	0A-123456-0	C:\Pro	1.000	NPOC:0.4391 mg	
41	Unknown	NPOC	05E175-05	TCF005-41	0A-123456-0	C:\Pro	1.000	NPOC:1.097 mg/L	
42	Unknown	NPOC	05E175-06	TCF005-42	0A-123456-0	C:\Pro	1.000	NPOC:1.008 mg/L	
43	Unknown	NPOC	05E175-07	TCF005-43	0A-123456-0	C:\Pro	1.000	NPOC:0.3261 mg	
44	Unknown	NPOC	05E189-01	TCF005-44	0A-123456-0	C:\Pro	1.000	NPOC:0.5660 mg	
45	Unknown	NPOC	05E189-02	TCF005-45	0A-123456-0	C:\Pro	1.000	NPOC:1.110 mg/L	
46	Unknown	NPOC	05E189-03	TCF005-46	0A-123456-0	C:\Pro	1.000	NPOC:1.839 mg/L	
47	Unknown	NPOC	05E189-04	TCF005-47	0A-123456-0	C:\Pro	1.000	NPOC:0.4890 mg	
48	Unknown	NPOC	05F027-01	TCF005-48	0A-123456-0	C:\Pro	1.000	NPOC:0.3541 mg	
49	Unknown	NPOC	05F027-02	TCF005-49	0A-123456-0	C:\Pro	1.000	NPOC:0.9690 mg	
50	Control	NPOC	CCV4	TCF005-50	0A-123456-0	C:\Pro	1.000	NPOC:24.22 mg/L	Control value:
51	Unknown	NPOC	CCB4	TCF005-51	0A-123456-0	C:\Pro	1.000	NPOC:0.05882 m	
52	Unknown	NPOC	05F027-03	TCF005-52	0A-123456-0	C:\Pro	1.000	NPOC:0.7103 mg	
53	Unknown	NPOC	05F041-01	TCF005-53	0A-123456-0	C:\Pro	1.000	NPOC:0.5763 mg	
54	Unknown	NPOC	05F041-02	TCF005-54	0A-123456-0	C:\Pro	1.000	NPOC:0.5965 mg	
55	Unknown	NPOC	05F041-02D	TCF005-55	0A-123456-0	C:\Pro	1.000	NPOC:0.6222 mg	
56	Unknown	NPOC	05F041-02M	TCF005-56	0A-123456-0	C:\Pro	1.000	NPOC:24.42 mg/L	
57	Unknown	NPOC	05F048-02	TCF005-57	0A-123456-0	C:\Pro	1.000	NPOC:2.061 mg/L	
58	Unknown	NPOC	05F048-04	TCF005-58	0A-123456-0	C:\Pro	1.000	NPOC:18.25 mg/L	
59	Unknown	NPOC	05F048-06	TCF005-59	0A-123456-0	C:\Pro	1.000	NPOC:5.965 mg/L	
60	Unknown	NPOC	05E526-01	TCF005-60	0A-123456-0	C:\Pro	5.000	NPOC:118.0 mg/L	
61	Control	NPOC	CCV5	TCF005-61	0A-123456-0	C:\Pro	1.000	NPOC:24.76 mg/L	Control value:
62	Unknown	NPOC	CCB5	TCF005-62	0A-123456-0	C:\Pro	1.000	NPOC:0.000 mg/L	
63									
64									
65									
66									

8109

Instr. Information

System
Detector
Catalyst
Cell Length

toc
Combustion
Regular Sensitivity
long

Cal. Curve

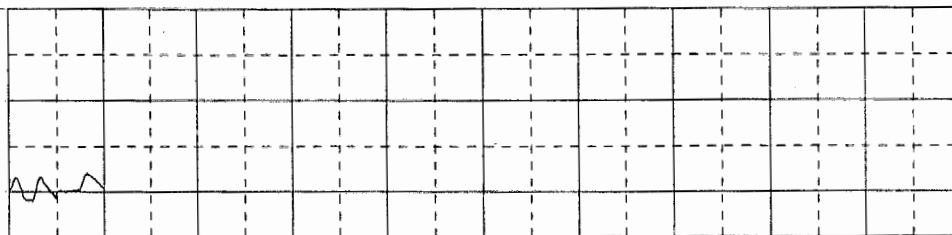
Sample Name: ICAL
Sample ID: TCF005-1
Cal. Curve: tcf005.2005_06_10_16_40_16.cal

Type	Anal.
Standard	NPOC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	0.3586	50uL	1	*****		06/10/05 04:47:30 PM
2	0.2707	50uL	1	*****		06/10/05 04:48:40 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 0.3146

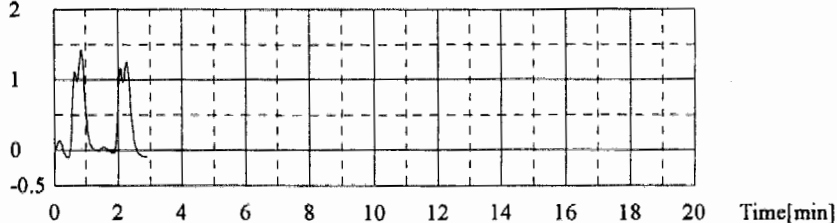


Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	3.482	50uL	10	*****		06/10/05 04:57:17 PM
2	3.214	50uL	10	*****		06/10/05 04:58:57 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 3.348

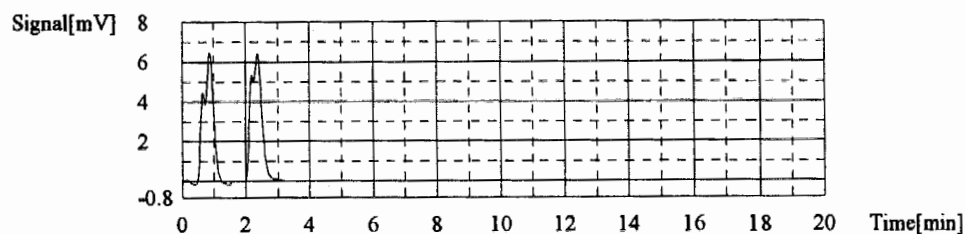
Signal[mV] 2



Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	15.04	50uL	2	*****		06/10/05 05:05:47 PM
2	15.17	50uL	2	*****		06/10/05 05:07:35 PM

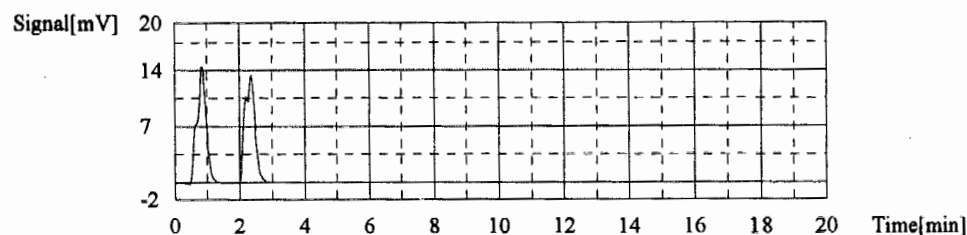
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 15.11



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	29.63	50uL	1	*****		06/10/05 05:13:42 PM
2	30.03	50uL	1	*****		06/10/05 05:15:22 PM

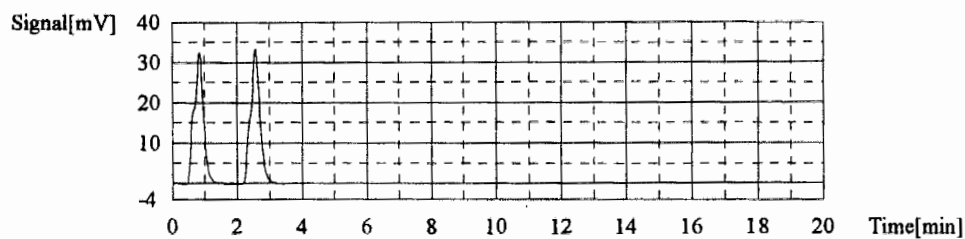
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 29.83



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	67.87	50uL	2	*****		06/10/05 05:24:19 PM
2	67.50	50uL	2	*****		06/10/05 05:26:13 PM

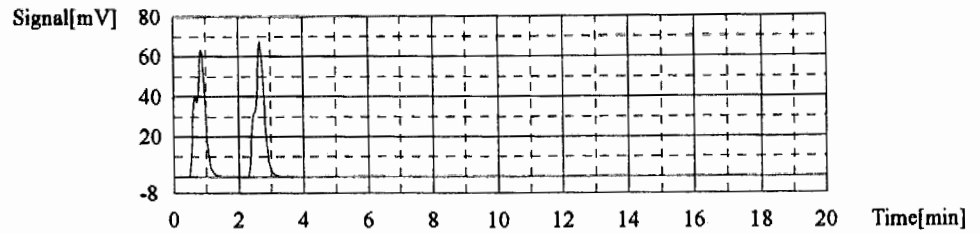
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 67.69



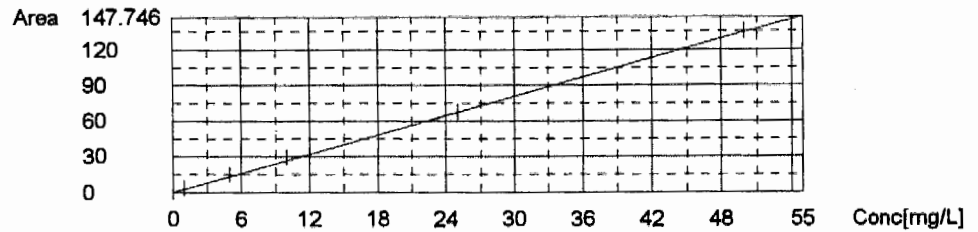
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	135.6	50uL	1	*****		06/10/05 05:32:37 PM
2	135.4	50uL	1	*****		06/10/05 05:34:36 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 135.5



Slope: 2.686
Intercept 0.000
 r^2 0.999639



Control Sample

Sample Name: ICV
Sample ID: TCF005-2
Method: tcf005.tpl
Chk. Result: Control value: 3.30% / Control within range!

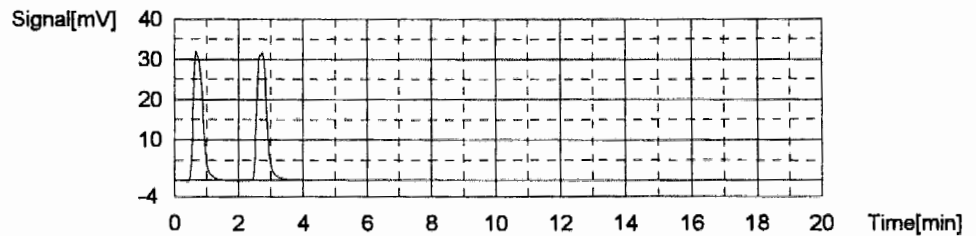
Type	Anal.	Dil.	Result
Control	NPOC	1.000	NPOC:25.15 mg/L

1. Det.

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut Dil.	Ex.	Cal. Curve	Date / Time
1	66.45	24.74mg/L	50uL	1		tcf005.2005_06_10_16_40_18.cal	06/10/05 05:43:20 PM
2	68.68	25.57mg/L	50uL	1		tcf005.2005_06_10_16_40_18.cal	06/10/05 05:45:30 PM

Mean Area 67.56
Mean Conc. 25.15mg/L



Sample

Sample Name: ICB
Sample ID: TCF005-3
Origin: tcf005.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.06167 mg/L

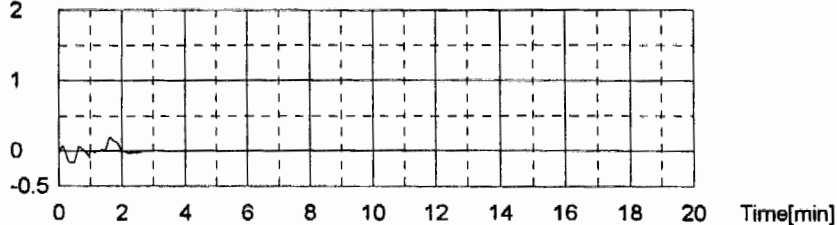
1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.3313	0.1233mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 05:53:00 PM
2	0.000	0.000mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 05:55:05 PM

Mean Area 0.1657
Mean Conc. 0.06167mg/L

Signal[mV] 2



Sample

Sample Name: HCO3/CO3
Sample ID: TCF005-4
Origin: tcf005.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.1932 mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.5246	0.1953mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 06:02:44 PM
2	0.5136	0.1912mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 06:04:02 PM

ANALYSIS RUN LOG FOR TOC

SOP: 0 EMAX-9060 Revision No. 1 ✓ EMAX-415.1 Revision No. 1 0

Book # A62-006

Start Date: 6/10/05 Time: 04:16:47 Ending Date: 6/11/05 Time: 03:13

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix S W	Run Time	Notes
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						

ANALYTICAL BATCH * TCF005 W ** TCF006 W

Instrument No.	62
Method File	TCF005
ICAL ID	SW10B-01-594
ICV ID	↓ 593

INITIAL CALIBRATION REFERENCE

ICAL Level	Conc. (mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	25
ICV/LCS	SW10B-01-593
CCV	↓ 595

STANDARDS

Comments:

See ATTACHED INSTRUMENT STD. 6/10/05

Analyzed By: *r jbr*

This page is checked during data review.

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05F027

METHOD 415.1 TOTAL ORGANIC CARBON

Five (5) water samples were received on 06/02/05 and 06/03/05 for Total Organic Carbon analysis by Method 415.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample F041-02 was analyzed for Duplicate. % RPD was within QC limit.

5. Matrix Spike

Sample F041-02 was spiked. % Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 1.1
TOC

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05F041

Matrix : WATER
Instrument ID : 62

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TCF006WB	ND	1.00	NA	1	.5	06/10/0522:30	NA	TCF005-32	TCF005-26	TCF006W	NA	NA
LCST1W	TCF006WL	24.8	1.00	NA	1	.5	06/10/0522:40	NA	TCF005-33	TCF005-26	TCF006W	NA	NA
LCST1W	TCF006WC	24.7	1.00	NA	1	.5	06/10/0522:50	NA	TCF005-34	TCF005-26	TCF006W	NA	NA
GARFIELD	F027-01	ND	1.00	NA	1	.5	06/11/0500:58	NA	TCF005-48	TCF005-38	TCF006W	06/02/05	06/02/05
SUNSET	F027-02	.969J	1.00	NA	1	.5	06/11/0501:07	NA	TCF005-49	TCF005-38	TCF006W	06/02/05	06/02/05
BANGHAM	F027-03	.71J	1.00	NA	1	.5	06/11/0501:36	NA	TCF005-52	TCF005-50	TCF006W	06/02/05	06/02/05
LFWC-2	F041-01	ND	1.00	NA	1	.5	06/11/0501:45	NA	TCF005-53	TCF005-50	TCF006W	06/03/05	06/03/05
LAWC-3	F041-02	ND	1.00	NA	1	.5	06/11/0501:54	NA	TCF005-54	TCF005-50	TCF006W	06/03/05	06/03/05
LAWC-3DUP	F041-02D	ND	1.00	NA	1	.5	06/11/0502:03	NA	TCF005-55	TCF005-50	TCF006W	06/03/05	06/03/05
LAWC-3MS	F041-02M	24.4	1.00	NA	1	.5	06/11/0502:13	NA	TCF005-56	TCF005-50	TCF006W	06/03/05	06/03/05

8116

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05F041

METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1.00
SAMPLE ID: MBLK1W
LAB SAMP ID: TCF006WB
LAB FILE ID: TCF005-32
DATE EXTRACTED: NA
DATE ANALYZED: 06/10/0522:30
PREP. BATCH: TCF006W
CALIB. REF: TCF005-26

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
TOC	ND	25	24.8	99	25	24.7	99	0	80-120	20

8117

22

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05F041
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1.00
SAMPLE ID: LAWC-3
LAB SAMP ID: F041-02
LAB FILE ID: TCF005-54
DATE EXTRACTED: NA
DATE ANALYZED: 06/11/0501:54
PREP. BATCH: TCF006W
CALIB. REF: TCF005-50

% MOISTURE: NA
DATE COLLECTED: 06/03/05
DATE RECEIVED: 06/03/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
TOC	.597	25	24.4	95	75-125

8118

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05F041
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1.00
SAMPLE ID: LANC-3DUP
EMAX SAMP ID: F041-02D
LAB FILE ID: TCF005-54
DATE EXTRACTED: NA
DATE ANALYZED: 06/11/0501:54
PREP. BATCH: TCF006W
CALIB. REF: TCF005-50

% MOISTURE: NA
DATE COLLECTED: 06/03/05
DATE RECEIVED: 06/03/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
TOC	.597J	.622J	NA	20

8119

	Type	Analysis	Sample Name	Sample ID	ObjectID	Origin	Dilution	Result	Notes
1	Standard	NPOC	ICAL	TCF005-1	0A-123456-0	C:\Pro	1.000		
2	Control	NPOC	ICV	TCF005-2	0A-123456-0	C:\Pro	1.000		
3	Unknown	NPOC	ICB	TCF005-3	0A-123456-0	C:\Pro	1.000		
4	Unknown	NPOC	HCO3/CO3	TCF005-4	0A-123456-0	C:\Pro	1.000		
5	Unknown	NPOC	TCF005WB	TCF005-5	0A-123456-0	C:\Pro	1.000		
6	Unknown	NPOC	TCF005WL	TCF005-6	0A-123456-0	C:\Pro	1.000		
7	Unknown	NPOC	TCF005WC	TCF005-7	0A-123456-0	C:\Pro	1.000		
8	Unknown	NPOC	05E175-01	TCF005-8	0A-123456-0	C:\Pro	1.000		DOC
9	Unknown	NPOC	05E175-02	TCF005-9	0A-123456-0	C:\Pro	1.000		↓
10	Unknown	NPOC	05E175-03	TCF005-10	0A-123456-0	C:\Pro	1.000		
11	Unknown	NPOC	05E175-04	TCF005-11	0A-123456-0	C:\Pro	1.000		
12	Unknown	NPOC	05E175-05	TCF005-12	0A-123456-0	C:\Pro	1.000		
13	Unknown	NPOC	05E175-06	TCF005-13	0A-123456-0	C:\Pro	1.000		↓
14	Control	NPOC	CCV1	TCF005-14	0A-123456-0	C:\Pro	1.000		
15	Unknown	NPOC	CCB1	TCF005-15	0A-123456-0	C:\Pro	1.000		
16	Unknown	NPOC	05E175-07	TCF005-16	0A-123456-0	C:\Pro	1.000		DOC
17	Unknown	NPOC	05E189-01	TCF005-17	0A-123456-0	C:\Pro	1.000		↓
18	Unknown	NPOC	05E189-02	TCF005-18	0A-123456-0	C:\Pro	1.000		
19	Unknown	NPOC	05E189-03	TCF005-19	0A-123456-0	C:\Pro	1.000		
20	Unknown	NPOC	05E189-04	TCF005-20	0A-123456-0	C:\Pro	1.000		
21	Unknown	NPOC	05F064-01	TCF005-21	0A-123456-0	C:\Pro	1.000		
22	Unknown	NPOC	05F027-01	TCF005-22	0A-123456-0	C:\Pro	1.000		
23	Unknown	NPOC	05F027-02	TCF005-23	0A-123456-0	C:\Pro	1.000		
24	Unknown	NPOC	05F027-03	TCF005-24	0A-123456-0	C:\Pro	1.000		↓
25	Unknown	NPOC	05F041-01	TCF005-25	0A-123456-0	C:\Pro	1.000		
26	Control	NPOC	CCV2	TCF005-26	0A-123456-0	C:\Pro	1.000		
27	Unknown	NPOC	CCB2	TCF005-27	0A-123456-0	C:\Pro	1.000		
28	Unknown	NPOC	05F041-02	TCF005-28	0A-123456-0	C:\Pro	1.000		DOC
29	Unknown	NPOC	05F041-02D	TCF005-29	0A-123456-0	C:\Pro	1.000		↓
30	Unknown	NPOC	05F041-02M	TCF005-30	0A-123456-0	C:\Pro	1.000		TOC
31	Unknown	NPOC	05F064-01	TCF005-31	0A-123456-0	C:\Pro	1.000		
32	Unknown	NPOC	TCF006WB	TCF005-32	0A-123456-0	C:\Pro	1.000	✓	
33	Unknown	NPOC	TCF006WL	TCF005-33	0A-123456-0	C:\Pro	1.000	✓	
34	Unknown	NPOC	TCF006WC	TCF005-34	0A-123456-0	C:\Pro	1.000	✓	
35	Unknown	NPOC	05E175-01	TCF005-35	0A-123456-0	C:\Pro	1.000		TOC
36	Unknown	NPOC	05E175-02	TCF005-36	0A-123456-0	C:\Pro	1.000		↓
37	Unknown	NPOC	05E175-03	TCF005-37	0A-123456-0	C:\Pro	1.000		
38	Control	NPOC	CCV3	TCF005-38	0A-123456-0	C:\Pro	1.000		
39	Unknown	NPOC	CCB3	TCF005-39	0A-123456-0	C:\Pro	1.000		
40	Unknown	NPOC	05E175-04	TCF005-40	0A-123456-0	C:\Pro	1.000		TOC
41	Unknown	NPOC	05E175-05	TCF005-41	0A-123456-0	C:\Pro	1.000		↓
42	Unknown	NPOC	05E175-06	TCF005-42	0A-123456-0	C:\Pro	1.000		
43	Unknown	NPOC	05E175-07	TCF005-43	0A-123456-0	C:\Pro	1.000		
44	Unknown	NPOC	05E189-01	TCF005-44	0A-123456-0	C:\Pro	1.000		
45	Unknown	NPOC	05E189-02	TCF005-45	0A-123456-0	C:\Pro	1.000		
46	Unknown	NPOC	05E189-03	TCF005-46	0A-123456-0	C:\Pro	1.000		
47	Unknown	NPOC	05E189-04	TCF005-47	0A-123456-0	C:\Pro	1.000		
48	Unknown	NPOC	05F027-01	TCF005-48	0A-123456-0	C:\Pro	1.000	✓	
49	Unknown	NPOC	05F027-02	TCF005-49	0A-123456-0	C:\Pro	1.000	✓	
50	Control	NPOC	CCV4	TCF005-50	0A-123456-0	C:\Pro	1.000		
51	Unknown	NPOC	CCB4	TCF005-51	0A-123456-0	C:\Pro	1.000		
52	Unknown	NPOC	05F027-03	TCF005-52	0A-123456-0	C:\Pro	1.000	✓	TOC
53	Unknown	NPOC	05F041-01	TCF005-53	0A-123456-0	C:\Pro	1.000	✓	
54	Unknown	NPOC	05F041-02	TCF005-54	0A-123456-0	C:\Pro	1.000	✓	
55	Unknown	NPOC	05F041-02D	TCF005-55	0A-123456-0	C:\Pro	1.000		
56	Unknown	NPOC	05F041-02M	TCF005-56	0A-123456-0	C:\Pro	1.000		
57	Unknown	NPOC	05F048-02	TCF005-57	0A-123456-0	C:\Pro	1.000		
58	Unknown	NPOC	05F048-04	TCF005-58	0A-123456-0	C:\Pro	1.000		
59	Unknown	NPOC	05F048-06	TCF005-59	0A-123456-0	C:\Pro	1.000		
60	Unknown	NPOC	05E526-01	TCF005-60	0A-123456-0	C:\Pro	1.000		
61	Control	NPOC	CCV5	TCF005-61	0A-123456-0	C:\Pro	1.000		
62	Unknown	NPOC	CCB5	TCF005-62	0A-123456-0	C:\Pro	1.000		
63									
64									
65									
66									

Handwritten notes:
 11/10/08
 8/19/08
 8120

	Type	Analysis	Sample Name	Sample ID	ObjectID	Origin	Dilution	Result	Notes
1	Standard	NPOC	ICAL	TCF005-1	0A-123456-0	C:\Pro	1.000		
2	Control	NPOC	ICV	TCF005-2	0A-123456-0	C:\Pro	1.000	NPOC:25.15 mg/L	Control value:
3	Unknown	NPOC	ICB	TCF005-3	0A-123456-0	C:\Pro	1.000	NPOC:0.06167 m	
4	Unknown	NPOC	HCO3/CO3	TCF005-4	0A-123456-0	C:\Pro	1.000	NPOC:0.1932 mg	
5	Unknown	NPOC	TCF005WB	TCF005-5	0A-123456-0	C:\Pro	1.000	NPOC:0.05997 m	
6	Unknown	NPOC	TCF005WL	TCF005-6	0A-123456-0	C:\Pro	1.000	NPOC:24.53 mg/L	
7	Unknown	NPOC	TCF005WC	TCF005-7	0A-123456-0	C:\Pro	1.000	NPOC:24.01 mg/L	
8	Unknown	NPOC	05E175-01	TCF005-8	0A-123456-0	C:\Pro	1.000	NPOC:1.663 mg/L	
9	Unknown	NPOC	05E175-02	TCF005-9	0A-123456-0	C:\Pro	1.000	NPOC:1.693 mg/L	
10	Unknown	NPOC	05E175-03	TCF005-10	0A-123456-0	C:\Pro	1.000	NPOC:0.4687 mg	
11	Unknown	NPOC	05E175-04	TCF005-11	0A-123456-0	C:\Pro	1.000	NPOC:1.003 mg/L	
12	Unknown	NPOC	05E175-05	TCF005-12	0A-123456-0	C:\Pro	1.000	NPOC:1.089 mg/L	
13	Unknown	NPOC	05E175-06	TCF005-13	0A-123456-0	C:\Pro	1.000	NPOC:1.302 mg/L	
14	Control	NPOC	CCV1	TCF005-14	0A-123456-0	C:\Pro	1.000	NPOC:24.79 mg/L	Control value:
15	Unknown	NPOC	CCB1	TCF005-15	0A-123456-0	C:\Pro	1.000	NPOC:0.000 mg/L	
16	Unknown	NPOC	05E175-07	TCF005-16	0A-123456-0	C:\Pro	1.000	NPOC:0.3987 mg	
17	Unknown	NPOC	05E189-01	TCF005-17	0A-123456-0	C:\Pro	1.000	NPOC:0.6302 mg	
18	Unknown	NPOC	05E189-02	TCF005-18	0A-123456-0	C:\Pro	1.000	NPOC:1.183 mg/L	
19	Unknown	NPOC	05E189-03	TCF005-19	0A-123456-0	C:\Pro	1.000	NPOC:1.710 mg/L	
20	Unknown	NPOC	05E189-04	TCF005-20	0A-123456-0	C:\Pro	1.000	NPOC:0.5658 mg	
21	Unknown	NPOC	05F064-01	TCF005-21	0A-123456-0	C:\Pro	1.000	NPOC:14.91 mg/L	
22	Unknown	NPOC	05F027-01	TCF005-22	0A-123456-0	C:\Pro	1.000	NPOC:9.288 mg/L	
23	Unknown	NPOC	05F027-02	TCF005-23	0A-123456-0	C:\Pro	1.000	NPOC:17.13 mg/L	
24	Unknown	NPOC	05F027-03	TCF005-24	0A-123456-0	C:\Pro	1.000	NPOC:6.665 mg/L	
25	Unknown	NPOC	05F041-01	TCF005-25	0A-123456-0	C:\Pro	1.000	NPOC:0.9232 mg	
26	Control	NPOC	CCV2	TCF005-26	0A-123456-0	C:\Pro	1.000	NPOC:24.49 mg/L	Control value:
27	Unknown	NPOC	CCB2	TCF005-27	0A-123456-0	C:\Pro	1.000	NPOC:0.000 mg/L	
28	Unknown	NPOC	05F041-02	TCF005-28	0A-123456-0	C:\Pro	1.000	NPOC:12.76 mg/L	
29	Unknown	NPOC	05F041-02D	TCF005-29	0A-123456-0	C:\Pro	1.000	NPOC:12.87 mg/L	
30	Unknown	NPOC	05F041-02M	TCF005-30	0A-123456-0	C:\Pro	1.000	NPOC:35.76 mg/L	
31	Unknown	NPOC	05F064-01	TCF005-31	0A-123456-0	C:\Pro	1.000	NPOC:0.8298 mg	
32	Unknown	NPOC	TCF006WB	TCF005-32	0A-123456-0	C:\Pro	1.000	NPOC:0.1326 mg	
33	Unknown	NPOC	TCF006WL	TCF005-33	0A-123456-0	C:\Pro	1.000	NPOC:24.77 mg/L	
34	Unknown	NPOC	TCF006WC	TCF005-34	0A-123456-0	C:\Pro	1.000	NPOC:24.73 mg/L	
35	Unknown	NPOC	05E175-01	TCF005-35	0A-123456-0	C:\Pro	1.000	NPOC:1.451 mg/L	
36	Unknown	NPOC	05E175-02	TCF005-36	0A-123456-0	C:\Pro	1.000	NPOC:0.6567 mg	
37	Unknown	NPOC	05E175-03	TCF005-37	0A-123456-0	C:\Pro	1.000	NPOC:0.4543 mg	
38	Control	NPOC	CCV3	TCF005-38	0A-123456-0	C:\Pro	1.000	NPOC:24.57 mg/L	Control value:
39	Unknown	NPOC	CCB3	TCF005-39	0A-123456-0	C:\Pro	1.000	NPOC:0.05422 m	
40	Unknown	NPOC	05E175-04	TCF005-40	0A-123456-0	C:\Pro	1.000	NPOC:0.4391 mg	
41	Unknown	NPOC	05E175-05	TCF005-41	0A-123456-0	C:\Pro	1.000	NPOC:1.097 mg/L	
42	Unknown	NPOC	05E175-06	TCF005-42	0A-123456-0	C:\Pro	1.000	NPOC:1.008 mg/L	
43	Unknown	NPOC	05E175-07	TCF005-43	0A-123456-0	C:\Pro	1.000	NPOC:0.3261 mg	
44	Unknown	NPOC	05E189-01	TCF005-44	0A-123456-0	C:\Pro	1.000	NPOC:0.5660 mg	
45	Unknown	NPOC	05E189-02	TCF005-45	0A-123456-0	C:\Pro	1.000	NPOC:1.110 mg/L	
46	Unknown	NPOC	05E189-03	TCF005-46	0A-123456-0	C:\Pro	1.000	NPOC:1.839 mg/L	
47	Unknown	NPOC	05E189-04	TCF005-47	0A-123456-0	C:\Pro	1.000	NPOC:0.4890 mg	
48	Unknown	NPOC	05F027-01	TCF005-48	0A-123456-0	C:\Pro	1.000	NPOC:0.3541 mg	
49	Unknown	NPOC	05F027-02	TCF005-49	0A-123456-0	C:\Pro	1.000	NPOC:0.9690 mg	
50	Control	NPOC	CCV4	TCF005-50	0A-123456-0	C:\Pro	1.000	NPOC:24.22 mg/L	Control value:
51	Unknown	NPOC	CCB4	TCF005-51	0A-123456-0	C:\Pro	1.000	NPOC:0.05882 m	
52	Unknown	NPOC	05F027-03	TCF005-52	0A-123456-0	C:\Pro	1.000	NPOC:0.7103 mg	
53	Unknown	NPOC	05F041-01	TCF005-53	0A-123456-0	C:\Pro	1.000	NPOC:0.5763 mg	
54	Unknown	NPOC	05F041-02	TCF005-54	0A-123456-0	C:\Pro	1.000	NPOC:0.5965 mg	
55	Unknown	NPOC	05F041-02D	TCF005-55	0A-123456-0	C:\Pro	1.000	NPOC:0.6222 mg	
56	Unknown	NPOC	05F041-02M	TCF005-56	0A-123456-0	C:\Pro	1.000	NPOC:24.42 mg/L	
57	Unknown	NPOC	05F048-02	TCF005-57	0A-123456-0	C:\Pro	1.000	NPOC:2.061 mg/L	
58	Unknown	NPOC	05F048-04	TCF005-58	0A-123456-0	C:\Pro	1.000	NPOC:18.25 mg/L	
59	Unknown	NPOC	05F048-06	TCF005-59	0A-123456-0	C:\Pro	1.000	NPOC:5.965 mg/L	
60	Unknown	NPOC	05E526-01	TCF005-60	0A-123456-0	C:\Pro	5.000	NPOC:118.0 mg/L	
61	Control	NPOC	CCV5	TCF005-61	0A-123456-0	C:\Pro	1.000	NPOC:24.76 mg/L	Control value:
62	Unknown	NPOC	CCB5	TCF005-62	0A-123456-0	C:\Pro	1.000	NPOC:0.000 mg/L	
63									
64									
65									
66									

8121

System	tac
Detector	Combustion
Catalyst	Regular Sensitivity
Cell Length	long

Sample Name: ICAL
Sample ID: TCF005-1
Cal. Curve: tcf005.2005_06_10_16_40_16.cal

Type	Anal.
Standard	NPOC

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	0.3586	50uL	1	*****		06/10/05 04:47:30 PM
2	0.2707	50uL	1	*****		06/10/05 04:48:40 PM

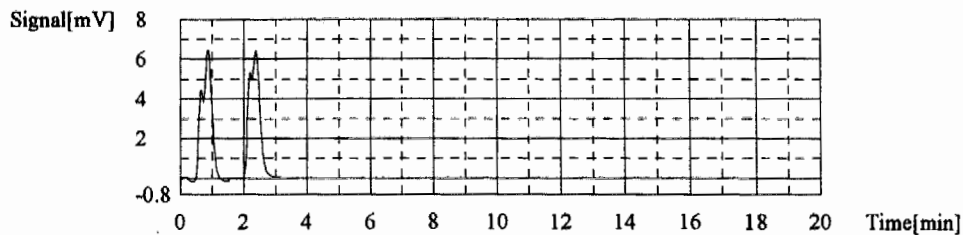
A blank sheet of graph paper with a grid of squares. The left edge has a wavy line drawn across it.

No.	Area	Inj. Vol.	Aut Dil.	Rem.	Ex	Date / Time
1	3.482	50uL	10	*****		06/10/05 04:57:17 PM
2	3.214	50uL	10	*****		06/10/05 04:58:57 PM

8122

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	15.04	50uL	2	*****		06/10/05 05:05:47 PM
2	15.17	50uL	2	*****		06/10/05 05:07:35 PM

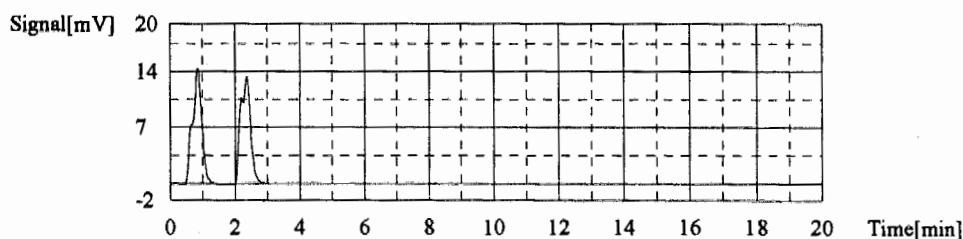
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 15.11



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	29.63	50uL	1	*****		06/10/05 05:13:42 PM
2	30.03	50uL	1	*****		06/10/05 05:15:22 PM

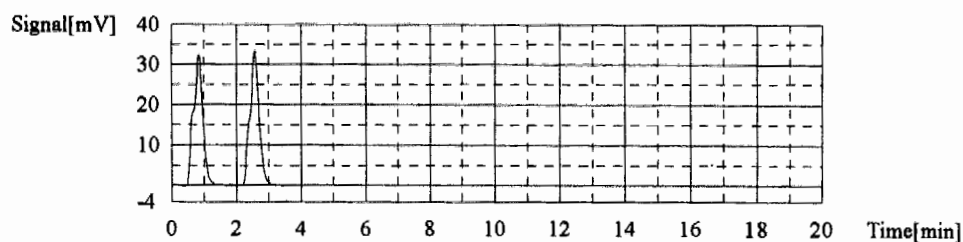
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 29.83



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	67.87	50uL	2	*****		06/10/05 05:24:19 PM
2	67.50	50uL	2	*****		06/10/05 05:26:13 PM

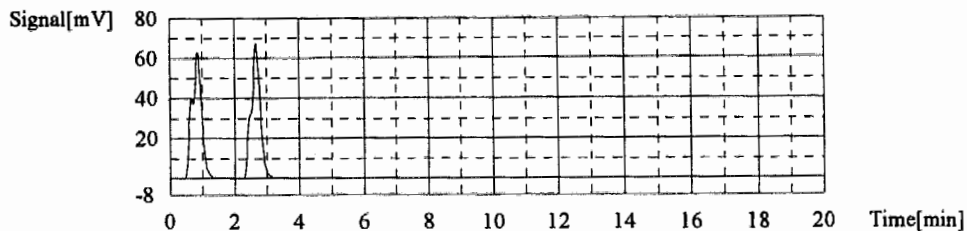
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 67.89



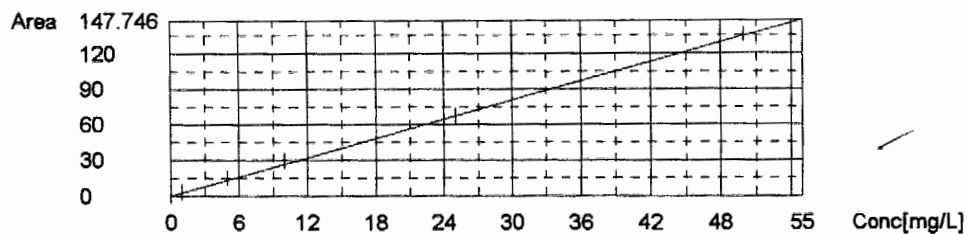
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	135.6	50uL	1	*****		06/10/05 05:32:37 PM
2	135.4	50uL	1	*****		06/10/05 05:34:36 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 135.5



Slope: 2.686
Intercept 0.000
 r^2 0.999639



Control Sample

Sample Name: ICV
Sample ID: TCF005-2
Method: tcf005.tpl
Chk. Result: Control value: 3.30% / Control within range!

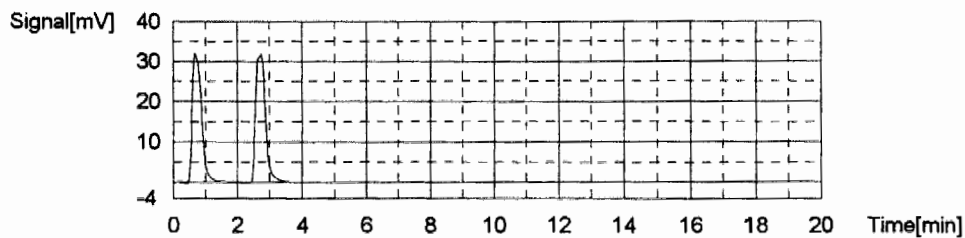
Type	Anal.	Dil.	Result
Control	NPOC	1.000	NPOC:25.15 mg/L

1. Dat.

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	68.45	24.74mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 05:43:20 PM
2	68.68	25.57mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 05:45:30 PM

Mean Area 67.56
Mean Conc. 25.15mg/L



Sample

Sample Name: ICB
Sample ID: TCF005-3
Origin: tcf005.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.06167 mg/L

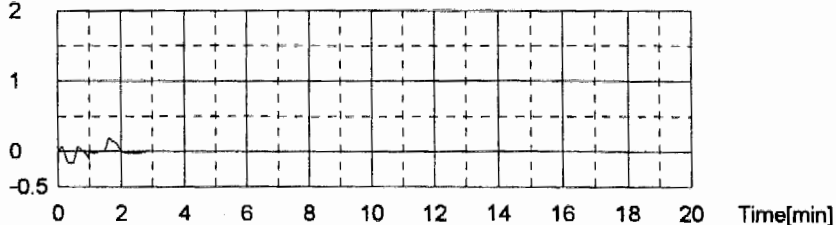
1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.3313	0.1233mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 05:53:00 PM
2	0.000	0.000mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 05:55:05 PM

Mean Area 0.1657
Mean Conc. 0.06167mg/L

Signal[mV] 2



Sample

Sample Name: HCO3/CO3
Sample ID: TCF005-4
Origin: tcf005.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.1932 mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.5246	0.1953mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 06:02:44 PM
2	0.5136	0.1912mg/L	50uL	1		tcf005.2005_06_10_16_40_16.cal	06/10/05 06:04:02 PM

ANALYSIS RUN LOG FOR TOC

SOP: 0 EMAX-9060 Revision No. 1 0 EMAX-415.1 Revision No. 1 0

Start Date: 6/11/05 Time: 04:10:47 Ending Date: 6/11/05 Time: 03:13

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix S W	Run Time	Notes
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						

ANALYTICAL BATCH * TCF005W ** TCF006W

Instrument No.	62
INITIAL CALIBRATION REFERENCE	
Method File	TCF005
ICAL ID	SW10B-01-594
ICV ID	↓ 593

STANDARDS	
ICAL Level	Conc. (mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	2-67/08
ICV/LCS	SW10B-01-593
CCV	↓ 595

Comments:

Analyzed By: r/

This page is checked during data review.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H132**

METHOD 310.1 TOTAL ALKALINITY

Five (5) water samples were received on 08/16/05 for Total Alkalinity analysis by Method 310.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample H132-05 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 310.1
TOTAL ALKALINITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H132

Matrix : WATER
Instrument ID : I53

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ALH010WB	ND	1	NA	5	1	08/17/0515:30	NA	ALH010W-01	NA	ALH010W	NA	NA
LCS1W	ALH010WL	47.2	1	NA	5	1	08/17/0515:35	NA	ALH010W-02	NA	ALH010W	NA	NA
LCD1W	ALH010WC	47.2	1	NA	5	1	08/17/0515:40	NA	ALH010W-03	NA	ALH010W	NA	NA
MW-17-5	H132-01	123	1	NA	5	1	08/17/0515:45	NA	ALH010W-04	NA	ALH010W	08/15/05	08/16/05
MW-17-4	H132-02	126	1	NA	5	1	08/17/0515:50	NA	ALH010W-05	NA	ALH010W	08/15/05	08/16/05
MW-17-3	H132-03	183	1	NA	5	1	08/17/0515:55	NA	ALH010W-06	NA	ALH010W	08/15/05	08/16/05
MW-17-2	H132-04	212	1	NA	5	1	08/17/0516:00	NA	ALH010W-07	NA	ALH010W	08/15/05	08/16/05
MW-17-1	H132-05	126	1	NA	5	1	08/17/0516:05	NA	ALH010W-08	NA	ALH010W	08/15/05	08/16/05
MW-17-1DUP	H132-05D	126	1	NA	5	1	08/17/0516:10	NA	ALH010W-09	NA	ALH010W	08/15/05	08/16/05

8002

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 310.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H132
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: ALH010WL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 08/17/05 15:35/15:40

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Total Alkalinity	ND	49.20	47.20	96	49.20	47.20	96	0	80-120	20

8003

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 310.1
MATRIX: WATER
% MOISTURE: NA
=====

BATCH NO.: 05H132
SAMPLE ID: MW-17-1DUP
CONTROL NO.: H132-05D
DATE RECEIVED: 08/16/05
DATE EXTRACTED: NA
DATE ANALYZED: 08/17/05 16:10

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Total Alkalinity	126.00	126.00	0	20

8004

ANALYSIS LOG FOR ALKALINITY

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Initial pH	Acid Titrant				Final pH	ALKALINITY (mg/L)				Notes	Standard Reagent	ID	Conc. mg/L
					pH=8.3	pH=4.5	pH=4.2	Total		Hydroxide (mg)	Carbonate (mg)	Bicarbonate (mg)					
*01	ALH010WB	15:30	20	5.26	NA	0.020	NA	4.44	ND				LCS	SW7A-06-174	49.2		
*02	↓ WC	35		8.92		0.90		4.49	47.2				Spike		NA		
*03	↓ WC	40		8.94		0.90		4.53	47.2				Na ₂ CO ₃ Soln	SW7A-06-170	236.0		
*04	H132-01	45		8.24		2.35		4.51	123				Acid Titrant	SW3B-02-745	0.02N		
*05	↓ -02	50		8.26		2.40		4.53	126								
*06	↓ -03	55		8.09		3.50		4.47	183								
*07	↓ -04	16:00		7.76		4.05		4.46	212								
*08	↓ -05	05		7.61		2.40		4.47	126				B1K	0.020	ND		
*09	↓ -05D	10		7.64		2.40		4.51	126				S	11.25	0.02096		
*10	H133-01	19		8.66		1.35		4.49	70.7				S	11.25	0.02096		
*11	↓ -03	20		8.70		1.40		4.47	73.4				S	11.25	0.02096		
*12	↓ -03D	16:25	✓	8.68	✓	1.35	✓	4.49	70.7						Ave N: 0.02096		
*13																	
*14																	
*15													pH Buffer	ID	Reading		
*16													pH 4	SW7A-06-201	4.00		
*17													pH 7		7.00		
*18													pH 10		10.00		
*19													Slope	100.1			
*20																	
*21																	
*22																	
*23																	
*24																	
*25																	

ANALYTICAL BATCH *ALH010WB

8005

Analyzed By:RLM

Run 8/10/15

This page is checked during data review.

Analyzed By: *P. LM*

This page is checked during data review.

ANALYTICAL BATCH #

Alitolo W

8005

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H132**

METHOD 350.2 AMMONIA (NH₃-N)

Five (5) water samples were received on 08/16/05 for Ammonia analysis by Method 350.2 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample H132-05 was analyzed for duplicate. %RPD was within QC limit.

5. Matrix Spike

Sample H132-05 was spiked. Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

All results were reported as Nitrogen concentration.

METHOD 350.2
AMMONIA (NH3-N)

Client : BATTIELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H132

Matrix : WATER
Instrument ID : 170

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1V	NHH008WB	ND	1	NA	.1	.03	08/24/0515:11	08/24/0510:00	NHH008W-12	NHH008W-10	NHH008W	NA	08/24/05
LCSTW	NHH008WL	1.01	1	NA	.1	.03	08/24/0515:12	08/24/0510:00	NHH008W-13	NHH008W-10	NHH008W	NA	08/24/05
LCSTW	NHH008WC	.998	1	NA	.1	.03	08/24/0515:13	08/24/0510:00	NHH008W-14	NHH008W-10	NHH008W	NA	08/24/05
WW-17-5	H132-01	ND	1	NA	.1	.03	08/24/0515:14	08/24/0510:00	NHH008W-15	NHH008W-10	NHH008W	08/15/05	08/16/05
WW-17-4	H132-02	ND	1	NA	.1	.03	08/24/0515:15	08/24/0510:00	NHH008W-16	NHH008W-10	NHH008W	08/15/05	08/16/05
WW-17-3	H132-03	ND	1	NA	.1	.03	08/24/0515:16	08/24/0510:00	NHH008W-17	NHH008W-10	NHH008W	08/15/05	08/16/05
WW-17-2	H132-04	ND	1	NA	.1	.03	08/24/0515:17	08/24/0510:00	NHH008W-18	NHH008W-10	NHH008W	08/15/05	08/16/05
WW-17-1	H132-05	ND	1	NA	.1	.03	08/24/0515:18	08/24/0510:00	NHH008W-19	NHH008W-10	NHH008W	08/15/05	08/16/05
WW-17-IDUP	H132-05D	ND	1	NA	.1	.03	08/24/0515:19	08/24/0510:00	NHH008W-20	NHH008W-10	NHH008W	08/15/05	08/16/05
WW-17-1MS	H132-05M	.903	1	NA	.1	.03	08/24/0515:20	08/24/0510:00	NHH008W-21	NHH008W-10	NHH008W	08/15/05	08/16/05

8007

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 350.2
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H132
SAMPLE ID: LCSTW/LCD1W
CONTROL NO.: NHH008WL/C

DATE RECEIVED: 08/24/05
DATE EXTRACTED: 08/24/05 10:00
DATE ANALYZED: 08/24/05 15:12/15:13

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Ammonia (NH3-N)	ND	1.00	1.01	101	1.00	.998	100	1	80-120	20

8008
9/9

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 350.2
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H132
SAMPLE ID: MW-17-1MS
CONTROL NO.: H132-05M
DATE RECEIVED: 08/16/05
DATE EXTRACTED: 08/24/05 10:00
DATE ANALYZED: 08/24/05 15:20

ACCESSION:

PARAMETER	SAMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Ammonia (NH3-N)	ND	1.00	.903	90	75-125

8009

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BAYTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 350.2
MATRIX: WATER
% MOISTURE: NA
=====

BATCH NO.: 05H132
SAMPLE ID: MW-17-1DUP
CONTROL NO.: H132-05D
DATE RECEIVED: 08/16/05
DATE EXTRACTED: 08/24/05 10:00
DATE ANALYZED: 08/24/05 15:19

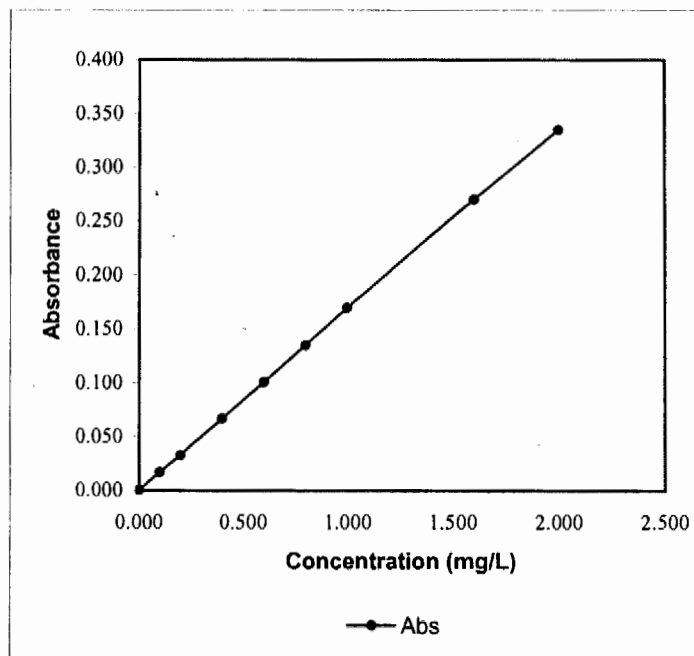
ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Ammonia (NH3-N)	ND	ND	0	20

8010
24

CALIBRATION CURVE AMMONIA _NH3 _TKN

Conc.	Abs
0.000	0.000
0.100	0.017
0.200	0.033
0.400	0.067
0.600	0.101
0.800	0.135
1.000	0.170
1.600	0.270
2.000	0.335



R^2 0.999939

Y 0.1683

CF 5.9429

Comments: **PASSED**

Analyzed by: NT/LA

ANALYSIS LOG FOR AMMONIA-N

SOP # EMAX-350.2 Rev. No. 2 □ EMAX-350.1 □ Rev. No. 0 □

Book # A70-NH₃-005

Starting Date: 8/24/05		Time: 15:00		Ending Date: 8/24/05		Time: 15:25		
Data File Name	Prep. Batch	Lab Sample ID	Matrix S w	Time	Vol. Colored (ml)	DF	Absorbance	Notes
* 1	NH4008W	S-0		15:00	2.0	1	0.000	
* 2		0.1		01			0.017	
* 3		0.2		02			0.033	
* 4		0.4		03			0.067	
* 5		0.6		04			0.101	
* 6		0.8		05			0.135	
* 7		1.0		06			0.170	
* 8		1.6		07			0.270	
* 9		2.0		08			0.335	
* 10		ICV		09			0.171	1.016
* 11		ICB		10			0.000	ND
* 12		NH4008WB	✓	11			0.000	ND
* 13		WL		12			0.170	1.010
* 14		WC		13			0.168	0.998
* 15		H132-01		14			0.002	ND
* 16		02		15			0.001	ND
* 17		03		16			0.014	ND
* 18		04		17			0.010	ND
* 19		05		18			0.004	ND
* 20		05D		19			0.009	ND
* 21		05M	✓	20			0.152	0.903
* 22		CCV1		21			0.168	0.998
* 23		CCB1		22			0.000	ND
* 24		H178-01	✓	23			0.005	ND
* 25		CCV2		24			0.168	0.998
* 26		CCB2		15:25			0.000	ND
* 7								
* 8								
* 9								
* 0								

Instrument No: 70	Wavelength: 425 nm
Standard	ID
S ₀	Nanopure
S ₁	SW2B-03-182
S ₂	
S ₃	
S ₄	
S ₅	
S ₆	
S ₇	
S ₈	
S ₉	
S ₁₀	
ICV/MS	SW2B-03-181
OCV	182
LCS	179
Reagent	ID
Color Reagent	SW7A-06-141
Standard Curve	
R	0.999939
Y	0.1683
CF	5.9429
Comments:	
Results are based on: <input type="checkbox"/> Dry Weight <input type="checkbox"/> Wet Weight	
Analyzed By: NT/LA	

This page is checked during data review.

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKNSOP ☒ EMAX-350.2 Rev. No.: 2 ☐ EMAX-351.3 Rev. No.: 2 ☐

Book # EKN-006

Start Date 8/24/05 Time 10:00 End Date 8/24/05 Time 14:30

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	S-0	9.5	0.1	10	5	100	100		ICV/MS	SW28-03-	181
*02	0.1								LCS	↓	179
*03	1.0										10ml, 100
*04	2.0										100
*05	ICV								Reagent	Lot# / ID	
*06	ICB								NaOH	SW7A-06-112	
*07	NHH008WB								Digestion Mixture	N/A	
*08	WL								Borate Buffer	SW7A-06-152	
*09	WC								H ₃ BO ₃	SW7B-06-322	
*10	H132-01		0.7						Distilling Soln.	N/A	
*11	02		0.9						Comments:		
*12	03		0.7								
*13	04		0.8								
*14	05		0.9								
*15	05D		0.9								
*16	05M		0.9								
*17	H178-01		0.8								
*18											
*19											
*20											
*21											
*22											
*23											
*24											
*25											
*26											

Prepared By: NT/LA
 Standard Added By: NT/LA
 Checked By:

PREPARATION BATCH • NHH008W

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H132**

METHOD 300.0 ANIONS

Five (5) water samples were received on 08/16/05 for Chloride, Nitrate-N, Nitrite-N and Sulfate analyses by method 300.0 in accordance with "Method for Determination of Inorganic Anions by Ion Chromatography", EPA 600/84-017.

1. Holding Time

Analyses met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limits.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

Nitrate-N and Nitrite-N results were reported as Nitrogen concentration.

SAMPLE RESULTS

METHOD 300.0
CHLORIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H132

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICH020WB	ND	1	NA	.2	.1	08/16/0515:11	NA	AH16-03	AH16-01	ICH020W	NA	NA
LCS1W	ICH020WL	4.8	1	NA	.2	.1	08/16/0515:25	NA	AH16-04	AH16-01	ICH020W	NA	NA
LCD1W	ICH020WC	4.8	1	NA	.2	.1	08/16/0515:39	NA	AH16-05	AH16-01	ICH020W	NA	NA
MW-17-5	H132-01	48.1	5	NA	1	.5	08/16/0518:00	NA	AH16-15	AH16-13	ICH020W	08/15/05	08/16/05
MW-17-1	H132-05	6.52	1	NA	.2	.1	08/16/0519:19	NA	AH16-19	AH16-13	ICH020W	08/15/05	08/16/05
MBLK2W	ICH021WB	ND	1	NA	.2	.1	08/16/0523:15	NA	AH16-34	AH16-25	ICH021W	NA	NA
LCS2W	ICH021WL	4.79	1	NA	.2	.1	08/16/0523:29	NA	AH16-35	AH16-25	ICH021W	NA	NA
LCD2W	ICH021WC	4.81	1	NA	.2	.1	08/16/0523:43	NA	AH16-36	AH16-25	ICH021W	08/15/05	08/16/05
MW-17-4	H132-02	10.1	2	NA	.4	.2	08/17/0501:35	NA	AH16-44	AH16-37	ICH021W	08/15/05	08/16/05
MW-17-2	H132-04	68.2	10	NA	2	1	08/17/0502:03	NA	AH16-46	AH16-37	ICH021W	NA	NA
MBLK3W	ICH029WB	ND	1	NA	.2	.1	08/23/0502:01	NA	AH22-34	AH22-25	ICH029W	NA	NA
LCS3W	ICH029WL	1.89	1	NA	.2	.1	08/23/0502:15	NA	AH22-35	AH22-25	ICH029W	NA	NA
LCD3W	ICH029WC	1.91	1	NA	.2	.1	08/23/0502:30	NA	AH22-36	AH22-25	ICH029W	NA	NA
MW-17-3	H132-03	51	10	NA	2	1	08/23/0503:26	NA	AH22-40	AH22-37	ICH029W	08/15/05	08/16/05

8016

4

METHOD 300.0
NITRATE-N

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H132

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
NBLK1W	ICH020WB	ND	1	NA	.1	.05	08/16/0515:11	NA	AH16-03	AH16-01	ICH020W	NA	NA
LCS1W	ICH020WL	2.36	1	NA	.1	.05	08/16/0515:25	NA	AH16-04	AH16-01	ICH020W	NA	NA
LCD1W	ICH020WC	2.39	1	NA	.1	.05	08/16/0515:39	NA	AH16-05	AH16-01	ICH020W	NA	NA
NW-17-4	H132-02	.211	1	NA	.1	.05	08/16/0518:14	NA	AH16-16	AH16-13	ICH020W	08/15/05	08/16/05
NW-17-3	H132-03	6.5	1	NA	.1	.05	08/16/0518:41	NA	AH16-17	AH16-13	ICH020W	08/15/05	08/16/05
NW-17-2	H132-04	7.79	1	NA	.1	.05	08/16/0518:55	NA	AH16-18	AH16-13	ICH020W	08/15/05	08/16/05
NW-17-1	H132-05	.634	1	NA	.1	.05	08/16/0519:19	NA	AH16-19	AH16-13	ICH020W	08/15/05	08/16/05
NBLK2W	ICH021WB	ND	1	NA	.1	.05	08/16/0523:15	NA	AH16-34	AH16-25	ICH021W	NA	NA
LCS2W	ICH021WL	2.44	1	NA	.1	.05	08/16/0523:29	NA	AH16-35	AH16-25	ICH021W	NA	NA
LCD2W	ICH021WC	2.47	1	NA	.1	.05	08/16/0523:43	NA	AH16-36	AH16-25	ICH021W	NA	NA
NW-17-5	H132-01	ND	1	NA	.1	.05	08/17/0501:21	NA	AH16-43	AH16-37	ICH021W	08/15/05	08/16/05

8017

METHOD 300.0
NITRITE-N

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H132

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICH020WB	ND	1	NA	.1	.05	08/16/0515:11	NA	AH16-03	AH16-01	ICH020W	NA	NA
LCS1W	ICH020WL	2.37	1	NA	.1	.05	08/16/0515:25	NA	AH16-04	AH16-01	ICH020W	NA	NA
LCD1W	ICH020WC	2.4	1	NA	.1	.05	08/16/0515:39	NA	AH16-05	AH16-01	ICH020W	NA	NA
MW-17-4	H132-02	ND	1	NA	.1	.05	08/16/0518:14	NA	AH16-16	AH16-13	ICH020W	08/15/05	08/16/05
MW-17-3	H132-03	ND	1	NA	.1	.05	08/16/0518:41	NA	AH16-17	AH16-13	ICH020W	08/15/05	08/16/05
MW-17-2	H132-04	ND	1	NA	.1	.05	08/16/0518:55	NA	AH16-18	AH16-13	ICH020W	08/15/05	08/16/05
MW-17-1	H132-05	ND	1	NA	.1	.05	08/16/0519:19	NA	AH16-19	AH16-13	ICH020W	08/15/05	08/16/05
MBLK2W	ICH021WB	ND	1	NA	.1	.05	08/16/0523:15	NA	AH16-34	AH16-25	ICH021W	NA	NA
LCS2W	ICH021WL	2.38	1	NA	.1	.05	08/16/0523:29	NA	AH16-35	AH16-25	ICH021W	NA	NA
LCD2W	ICH021WC	2.39	1	NA	.1	.05	08/16/0523:43	NA	AH16-36	AH16-25	ICH021W	NA	NA
MW-17-5	H132-01	ND	1	NA	.1	.05	08/17/0501:21	NA	AH16-43	AH16-37	ICH021W	08/15/05	08/16/05

METHOD 300.0
SULFATE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H132

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICH020WB	ND	1	NA	.5	.25	08/16/0515:11	NA	AH16-03	AH16-01	ICH020W	NA	NA
LC51W	ICH020WL	6.97	1	NA	.5	.25	08/16/0515:25	NA	AH16-04	AH16-01	ICH020W	NA	NA
LC01W	ICH020WC	6.98	1	NA	.5	.25	08/16/0515:39	NA	AH16-05	AH16-01	ICH020W	NA	NA
MW-17-5	H132-01	95.3	5	NA	2.5	1.25	08/16/0518:00	NA	AH16-15	AH16-13	ICH020W	08/15/05	08/16/05
MW-17-4	H132-02	19	1	NA	.5	.25	08/16/0518:14	NA	AH16-16	AH16-13	ICH020W	08/15/05	08/16/05
MBLK2W	ICH021WB	ND	1	NA	.5	.25	08/16/0523:15	NA	AH16-34	AH16-25	ICH021W	NA	NA
LC52W	ICH021WL	7.34	1	NA	.5	.25	08/16/0523:29	NA	AH16-35	AH16-25	ICH021W	NA	NA
LC02W	ICH021WC	7.3	1	NA	.5	.25	08/16/0523:43	NA	AH16-36	AH16-25	ICH021W	NA	NA
MW-17-3	H132-03	70	5	NA	2.5	1.25	08/17/0501:49	NA	AH16-45	AH16-37	ICH021W	08/15/05	08/16/05
MW-17-2	H132-04	98.7	10	NA	5	2.5	08/17/0502:03	NA	AH16-46	AH16-37	ICH021W	08/15/05	08/16/05
MW-17-1	H132-05	19.4	5	NA	2.5	1.25	08/17/0502:17	NA	AH16-47	AH16-37	ICH021W	08/15/05	08/16/05

8019

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QC SUMMARIES

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H132
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICH020WL ICH020WC
LAB FILE ID: AH16-04 AH16-05
DATE EXTRACTED: NA
DATE ANALYZED: 08/16/0515:11 08/16/0515:25 08/16/0515:39
PREP. BATCH: ICH020W ICH020W
CALIB. REF: AH16-01 AH16-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Chloride-Cl	ND	5	4.8	96	5	4.8	96	0	90-110	20

8021

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H132
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK2W
LAB SAMP ID: ICH021WL ICH021WC
LAB FILE ID: AH16-35 AH16-36
DATE EXTRACTED: NA
DATE ANALYZED: 08/16/0523:15 08/16/0523:29 08/16/0523:43
PREP. BATCH: ICH021W ICH021W
CALIB. REF: AH16-25 AH16-25

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Chloride-Cl	ND	5	4.79	96	5	4.81	96	1	90-110	20

8022

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H132
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK3W
LAB SAMP ID: ICH029WL ICH029WC
LAB FILE ID: AH22-35 AH22-36
DATE EXTRACTED: NA NA
DATE ANALYZED: 08/23/0502:01 08/23/0502:30
PREP. BATCH: ICH029W ICH029W
CALIB. REF: AH22-25 AH22-25
% MOISTURE: NA
DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Chloride-Cl	ND	2	1.89	95	2	1.91	96	1	90-110	20

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H132
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICH020WL ICH020WC
LAB FILE ID: AH16-04 AH16-05
DATE EXTRACTED: NA
DATE ANALYZED: 08/16/0515:25 08/16/0515:39
PREP. BATCH: ICH020W ICH020W
CALIB. REF: AH16-01 AH16-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	% REC	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	% REC	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	2.5	2.36	94	94	2.5	2.39	96	96	1	90-110	20

8024

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H132
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK2W
LAB SMP ID: ICH021WL ICH021WC
LAB FILE ID: AH16-34 AH16-35 AH16-36
DATE EXTRACTED: NA
DATE ANALYZED: 08/16/0523:15 08/16/0523:29 08/16/0523:43
PREP. BATCH: ICH021W ICH021W
CALIB. REF: AH16-25 AH16-25

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	2.5	2.44	98	2.5	2.47	99	1	90-110	20

8025

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H132
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB. SAMP ID: ICH020WL ICH020WC
LAB. FILE ID: AH16-04 AH16-05
DATE EXTRACTED: NA
DATE ANALYZED: 08/16/0515:25 08/16/0515:39
PREP. BATCH: ICH020W ICH020W
CALIB. REF: AH16-01 AH16-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrite-N	ND	2.5	2.37	95	2.5	2.4	96	1	90-110	20

8026

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H132
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK2W
LAB SAMP ID: ICH021WB
LAB FILE ID: AH16-34
DATE EXTRACTED: NA
DATE ANALYZED: 08/16/0523:15
PREP. BATCH: ICH021W
CALIB. REF: AH16-25

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrite-N	ND	2.5	2.38	95	2.5	2.39	96	0	90-110	20

8027

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05H132

METHOD: 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICH020WB
LAB FILE ID: AH16-03
DATE EXTRACTED: NA
DATE ANALYZED: 08/16/0515:11
PREP. BATCH: ICH020W
CALIB. REF: AH16-01

% MOISTURE: NA
DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Sulfate	ND	7.5	6.97	93	7.5	6.98	93	0	90-110	20

8028

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H132
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK2W
LAB SAMP ID: ICH021WB ICH021WL ICH021WC
LAB FILE ID: AH16-34 AH16-35 AH16-36
DATE EXTRACTED: NA NA
DATE ANALYZED: 08/16/0523:15 08/16/0523:29 08/16/0523:43
PREP. BATCH: ICH021W ICH021W ICH021W
CALIB. REF: AH16-25 AH16-25 AH16-25

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Sulfate	ND	7.5	7.34	98	7.5	7.3	97	1	90-110	20

8029

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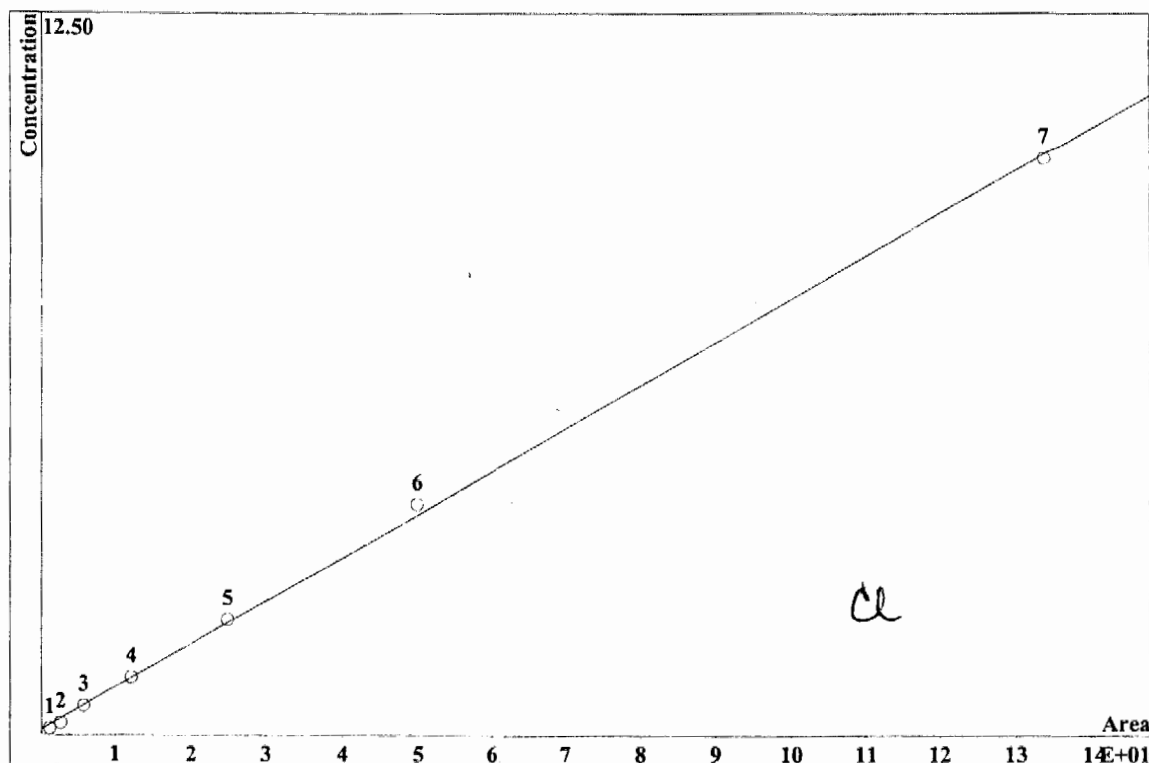
INITIAL CALIBRATIONS

IC Result Check FormVersion : QH2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH18-01	1B	FCIBNPS	0	0	0	0	0	0	0	p8181936	1
AH18-02	S0	FCIBNPS	0	0	0	0	0	0	0	p8181950	1
AH18-03	S1	FCIBNPS	0.166	0.17262	0.13231	0.12813	0.13644	0.22927	0.14104	p8182004	1
AH18-04	S2	FCIBNPS	0.28466	0.28623	0.22239	0.22088	0.22213	0.31227	0.24604	p8182018	1
AH18-05	S3	FCIBNPS	0.51393	0.51514	0.50265	0.50493	0.50026	0.56154	0.52244	p8182032	1
AH18-06	S4	FCIBNPS	0.96429	0.99164	0.95545	0.95771	0.95423	0.9672	0.9792	p8182047	1
AH18-07	S5	FCIBNPS	1.9297	1.9476	1.9596	2.0373	1.9583	1.8503	1.9613	p8182101	1
AH18-08	S6	FCIBNPS	3.8838	3.8076	4.0276	3.9271	4.0286	3.7744	3.9072	p8182115	1
AH18-09	S7	FCIBNPS	10.058	10.079	10.533	10.024	11.158	10.105	10.043	p8182129	1
AH18-10	ICV	FCIBNPS	94.6%	95.5%	98%	99.9%	98.2%	93%	97.2%	p8182143	1
AH18-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8182157	1
AH18-12	ICH025WB	FCIBNPS	0	0	0	0	0	0	0	p8182211	1
AH18-13	ICH025WL	FCIBNPS	1.9633	1.9339	1.884	2.1091	1.9384	1.8022	1.9892	p8182225	1
AH18-14	ICH025WC	FCIBNPS	1.9405	1.927	1.8843	2.0871	1.9384	1.8038	2.0248	p8182239	1
AH18-15	H023-01	F*IBNPS	0	11823E	0	-7.8039	0	0	1470.9	p8182253	200
AH18-16	H023-03	F*IBNPS	0	11711E	0	0	0	0	1420.9	p8182307	200
AH18-17	H023-01	*C*****	0	9274.5	0	0	0	0	1588.2	p8182321	2000
AH18-18	H023-02	FCIBNPS	0	8909.8	0	0	0	0	1504.6	p8182335	2000
AH18-19	H023-03	*C*****	0	9111	0	0	0	0	1525.4	p8182349	2000
AH18-20	H023-04	FCIBNPS	0	9589.9	0	0	0	0	1558.3	p8190004	2000
AH18-21	CCV1	FCIBNPS	95.3%	99%	97.2%	96.8%	97.9%	92.8%	99.3%	p8190018	1
AH18-22	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8190032	1
AH18-23	H169-01	F*IBNP*	0.58784	557.84E	0	3.9834	0.30268	0	222.2E	p8190046	1
AH18-24	H169-01D	F*IBNP*	0.54415	557.56E	0	3.8987	0.26518	0	222.08E	p8190100	1
AH18-25	H169-01M	F*IBNP*	2.3279	551.74E	2.2881	5.3508	2.2308	2.1545	221.61E	p8190114	1
AH18-26	H614-01	F*IBNP*	0.30333	24.22E	0	0.84928	3.8374	0.23597	25.147E	p8190128	1
AH18-27	H614-02	F*IB*P*	0.24861	17.85E	0	0.85627	5.8152E	0	15.634E	p8190142	1
AH18-28	H614-02D	F*IB*P*	0.42543	18.124E	0	1.1955	5.8532E	0.23178	15.667E	p8190156	1
AH18-29	H614-02M	F*IB*P*	2.2519	20.146E	2.0242	3.1702	8.3464E	2.4015	18.076E	p8190210	1
AH18-30	H614-01	*C*****S	0.7526	19.853	0	0.84668	3.6036	0	22.543	p8190224	5
AH18-31	H614-02	*C**N*S	0.57712	14.626	0	0.8431	5.0755	0	13.896	p8190238	5
AH18-32	H614-02D	*C**N*S	0.5948	14.546	0	0.80981	5.0759	0	13.937	p8190252	5
AH18-33	CCV2	FCIBNPS	95.5%	99.2%	97.8%	101.7%	98.2%	95.2%	98.8%	p8190306	1
AH18-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8190320	1
AH18-35	H614-02M	*C**N*S	9.666	24.294	9.0355	10.763	15.204	10.183	23.849	p8190335	5
AH18-36	H169-01	*****	1.2771	462.51E	0	3.1323	0	0	162.61E	p8190349	10
AH18-37	H169-01D	*****	1.1563	462.25E	0	2.6472	0	0	162.5E	p8190403	10
AH18-38	H169-10M	F*IBNP*	19.589	483.82E	19.02	22.753	19.898	20.393	183.19E	p8190417	10
AH18-39	RINSE	FCIBNPS	0	0.12789	0	0	0	0.23054	0	p8190431	1
AH18-40	RINSE	FCIBNPS	0	0	0	0.049699	0	0	0	p8190445	1
AH18-41	CCV3	FCIBNPS	97.4%	98.2%	96.2%	103.3%	96.9%	124.7%*	102%	p8190459	1
AH18-42	CCB3	FCIBNPS	0	0	0	0	0	0	0	p8190513	1

CALIBRATION OF COMPONENT chloride

Method: IC100-H18.mtw
 Equation: $Q = 0.0746236 \cdot A + 0.0865749$
 RSD: 4.273 %
 Correlation coefficient: 0.999612



K3 = 0 K2 = 0 K1 = 0.0746236 K0 = 0.0865749

Base: Area

Ref.channel: Cond

ISTD:

Formula: Linear

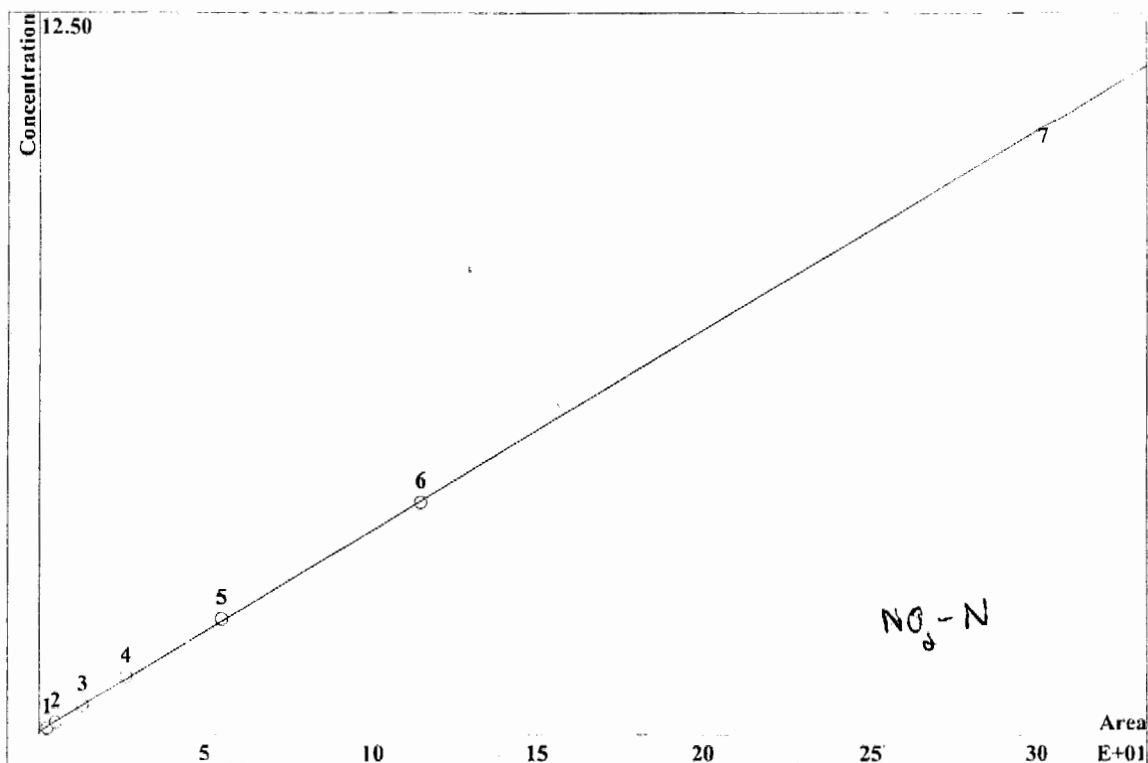
Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.1069	1.153	0.1	1	3.37	Yes	p8182004.chw
2	0.2322	2.675	0.2	1	3.37	Yes	p8182018.chw
3	0.5371	5.743	0.5	1	3.37	Yes	p8182032.chw
4	1.091	12.13	1	1	3.37	Yes	p8182047.chw
5	2.293	24.94	2	1	3.37	Yes	p8182101.chw
6	4.737	49.86	4	1	3.37	Yes	p8182115.chw
7	13.01	133.9	10	1	3.37	Yes	p8182129.chw

Handwritten: 8/18/05

CALIBRATION OF COMPONENT nitrite

Method: IC100-H18.mtw
 Equation: $Q = 0.0346959 \cdot A + 0.043272$
 RSD: 2.962 %
 Correlation coefficient: 0.999734



K3 = 0 K2 = 0 K1 = 0.0346959 K0 = 0.043272

Base: Area

Ref.channel: Cond

ISTD:

Formula: Linear

Weight: 1

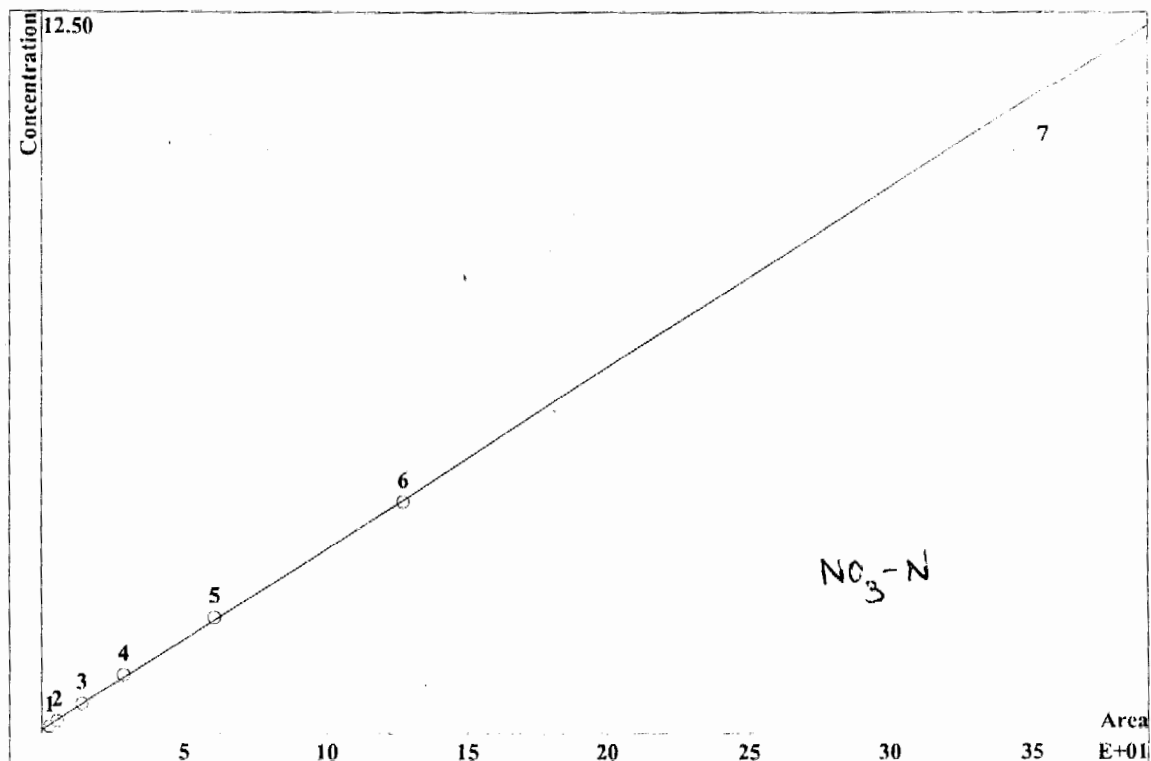
Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2049	2.566	0.1	1	3.98	Yes	p8182004.chw
2	0.4151	5.163	0.2	1	3.98	Yes	p8182018.chw
3	1.077	13.24	0.5	1	3.98	Yes	p8182032.chw
4	2.113	26.29	1	1	3.98	Yes	p8182047.chw
5	4.455	55.23	2	1	3.98	Yes	p8182101.chw
6	9.454	114.8	4	1	3.98	Yes	p8182115.chw
7	24.1	302.3	10	1	3.98	No	p8182129.chw

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CALIBRATION OF COMPONENT nitrate

Method: IC100-H18.mtw
 Equation: $Q = 0.0313474 \cdot A + 0.0465038$
 RSD: 3.094 %
 Correlation coefficient: 0.999710



K3 = 0 K2 = 0 K1 = 0.0313474 K0 = 0.0465038
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

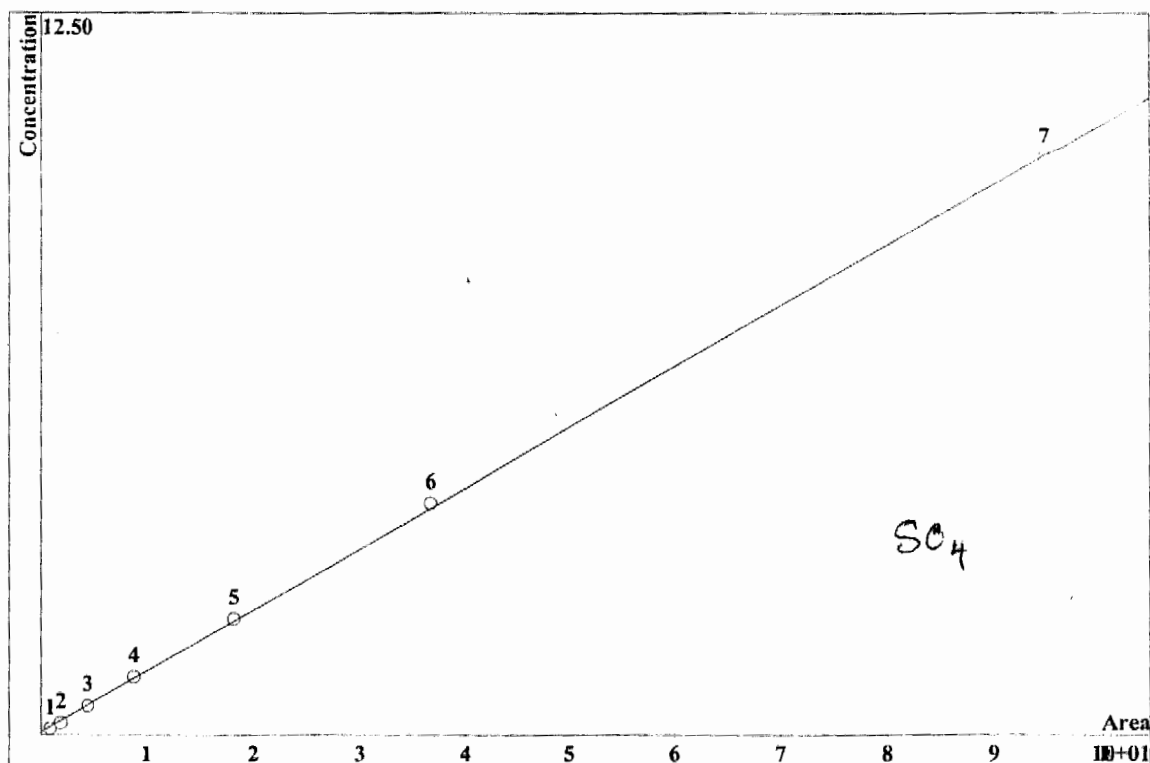
Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.1627	2.869	0.1	1	5.56	Yes	p8182004.chw
2	0.329	5.603	0.2	1	5.56	Yes	p8182018.chw
3	0.8519	14.48	0.5	1	5.56	Yes	p8182032.chw
4	1.718	28.96	1	1	5.56	Yes	p8182047.chw
5	3.662	60.99	2	1	5.56	Yes	p8182101.chw
6	7.807	127	4	1	5.56	Yes	p8182115.chw
7	22.1	354.5	10	1	5.56	No	p8182129.chw

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8034

CALIBRATION OF COMPONENT sulfate

Method: IC100-H18.mtw
 Equation: $Q = 0.105352 \cdot A + 0.0443227$
 RSD: 2.272 %
 Correlation coefficient: 0.999890



K3 = 0 K2 = 0 K1 = 0.105352 K0 = 0.0443227
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.04363	0.918	0.1	1	8.329	Yes	p8182004.chw
2	0.08724	1.915	0.2	1	8.329	Yes	p8182018.chw
3	0.2067	4.538	0.5	1	8.329	Yes	p8182032.chw
4	0.4025	8.874	1	1	8.329	Yes	p8182047.chw
5	0.8301	18.2	2	1	8.329	Yes	p8182101.chw
6	1.668	36.67	4	1	8.329	Yes	p8182115.chw
7	4.326	94.91	10	1	8.329	Yes	p8182129.chw

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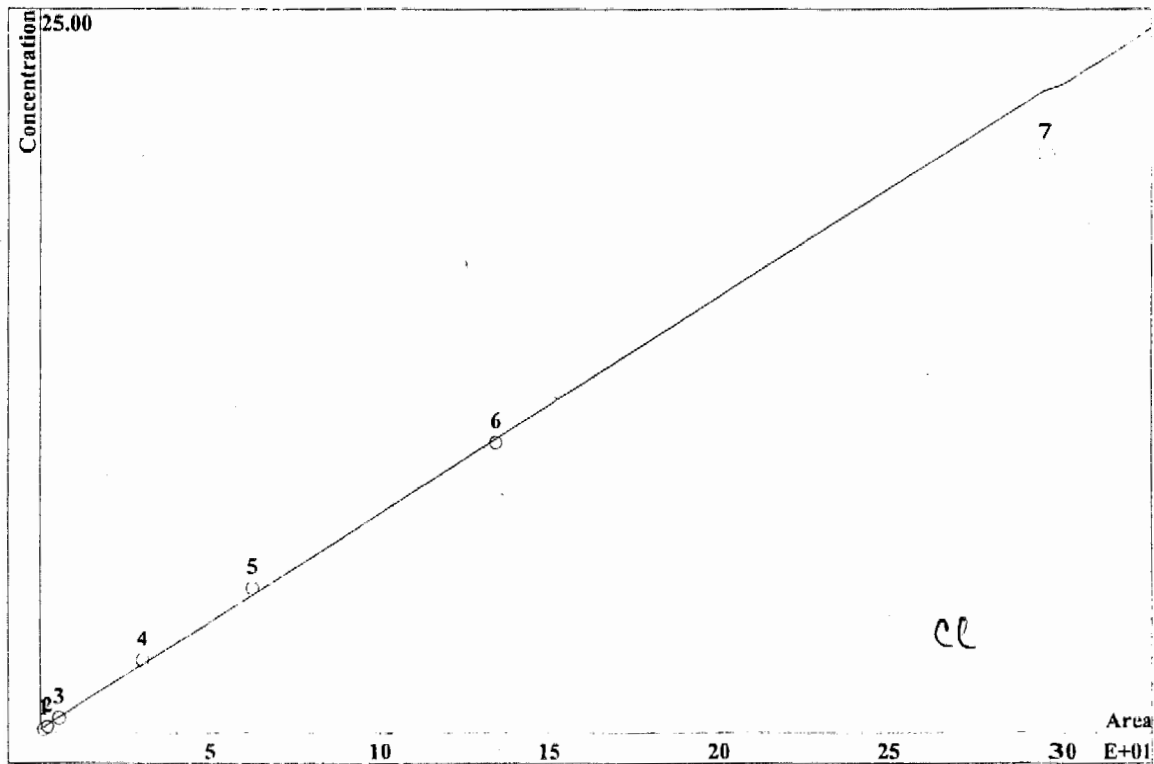
8035

IC Result Check FormVersion : QH1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH01-01	I8	FCIBNPS	0	0	0	0	0	0	0	p8011625	1
AH01-02	S0	FCIBNPS	0	0	0	0	0	0	0	p8011639	1
AH01-03	S1	FCIBNPS	0.18836	0.20113	0.17432	0.2216	0.23129	0.23666	0.21269	p8011653	1
AH01-04	S2	FCIBNPS	0.27278	0.28754	0.25434	0.31636	0.304	0.31331	0.2938	p8011707	1
AH01-05	S3	FCIBNPS	0.53025	0.54412	0.50474	0.57579	0.53797	0.52755	0.55595	p8011721	1
AH01-06	S4	FCIBNPS	2.3695	2.3621	2.3884	2.4564	2.3144	2.2205	2.46	p8011735	1
AH01-07	S5	FCIBNPS	4.8345	4.7729	4.9114	4.8164	4.7699	4.9004	4.8979	p8011749	1
AH01-08	S6	FCIBNPS	10.105	10.132	10.067	9.7475	10.142	10.102	9.8172	p8011803	1
AH01-09	S7	FCIBNPS	20.268	22.156	20.839	20.166	22.614	21.9	20.324	p8011818	1
AH01-10	ICV	FCIBNPS	95.6%	93.6%	92.2%	99.1%	93.3%	90.6%	98.5%	p8011832	1
AH01-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8011846	1
AH01-12	ICH001WB	FCIBNPS	0	0	0	0	0	0	0	p8011900	1
AH01-13	ICH001WL	FCIBNPS	4.8635	4.7236	4.6805	4.8835	4.6546	4.6229	4.7245	p8011914	1
AH01-14	ICH001WC	FCIBNPS	4.9057	4.722	4.6814	4.8697	4.6509	4.6182	4.7516	p8011928	1
AH01-15	G126-01T	FCIBNPS	1.1839	138.72	0	0	6.1591	0	65.298	p8012025	5
AH01-16	G126-02T	FCIBNPS	3.2244	215.94	0	1.2074	9.0006	0	192.41	p8012040	5
AH01-17	G126-03T	FCIBNPS	2.2603	137.59	0	0	5.4868	0	162.34	p8012054	5
AH01-18	G126-04T	FCIBNPS	4.9866	306.58	0	1.3846	14.847	0	244.28	p8012108	5
AH01-19	G126-06T	FCIBNPS	4.8433	139.79	0	0	7.0632	0	159.73	p8012122	5
AH01-20	G126-07T	FCIBNPS	1.8163	100.33	0	0	15.019	0	285.93	p8012136	10
AH01-21	G818-02	FCIBNPS	5.67	181.29	0	0	8.4455	0	86.102	p8012150	50
AH01-22	CCV1	FCIBNPS	97.7%	95.4%	98.2%	93.7%	94.5%	96.9%	90.9%	p8012204	1
AH01-23	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8012218	1
AH01-24	G818-02D	FCIBNPS	0	182.67	0	0	8.5372	0	85.987	p8012233	50
AH01-25	G818-02M	FCIBNPS	245.13	430.51	238.71	234.77	240.79	119.04	305.82	p8012247	50
AH01-26	G818-03	FCIBNPS	0	179.51	0	6.961	0	0	85.432	p8012301	50
AH01-27	G818-04	FCIBNPS	2.3845	69.544	0	0	3.6042	0	116.42	p8012315	20
AH01-28	G818-05	FCIBNPS	2.3472	74.139	0	0	3.8114	0	124.21	p8012329	20
AH01-29	G820-02	FCIBNPS	0	153.08	0	0	0	0	167.66	p8012343	200
AH01-30	G184-05	FCIBNPS	2.2847	11.049	0	0	4.0779	0	32.802	p8012357	20
AH01-31	G147-01	FCIBNPS	1.0454	13208	0	50.116	0	0	1977.7	p8020011	5
AH01-32	G147-02	FCIBNPS	0	13488	0	2.8757	0	0	2019.9	p8020025	5
AH01-33	CCV2	FCIBNPS	97.7%	108.6%	97.8%	93.6%	94.4%	93.3%	92.5%	p8020039	1
AH01-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8020053	1

CALIBRATION OF COMPONENT chloride

Method: IC100-H01.mtw
 Equation: $Q = 0.0743917 \cdot A + 0.117752$
 RSD: 5.386 %
 Correlation coefficient: 0.999287 ✓



K3 = 0 K2 = 0 K1 = 0.0743917 K0 = 0.117752
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

LR = 10

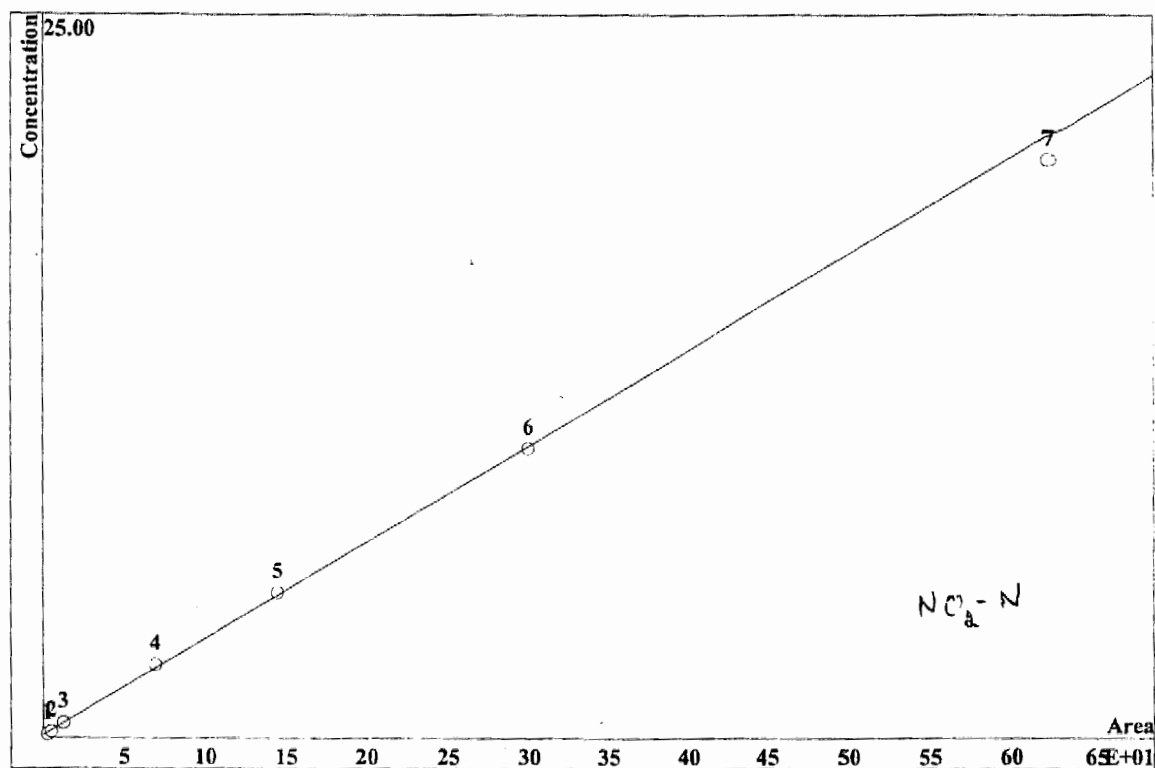
Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.1281	1.121 ✓	0.1	1	3.37	Yes	p8011653.chw
2	0.2568	2.282 ✓	0.2	1	3.37	Yes	p8011707.chw
3	0.6501	5.731 ✓	0.5	1	3.37	Yes	p8011721.chw
4	3.457	30.17 ✓	2.5	1	3.37	Yes	p8011735.chw
5	7.342	62.58 ✓	5	1	3.37	Yes	p8011749.chw
6	16.29	134.6 ✓	10	1	3.37	Yes	p8011803.chw
7	36.06	296.2 x	20	1	3.37	No	p8011818.chw

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8037

CALIBRATION OF COMPONENT nitrite

Method: IC100-H01.mtw
 Equation: $Q = 0.0333061 \cdot A + 0.0871128$
 RSD: 2.990 %
 Correlation coefficient: 0.999780 ✓



K3 = 0 K2 = 0 K1 = 0.0333061 K0 = 0.0871128
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

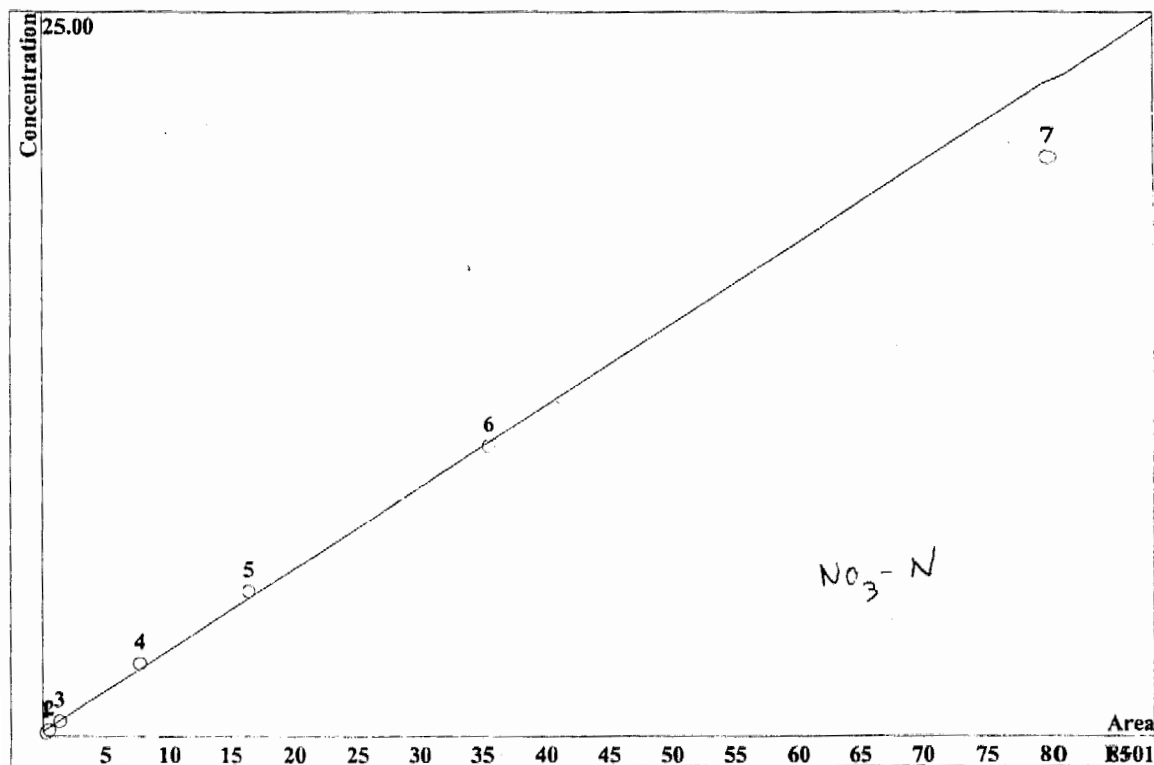
LR = 10

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2534	2.618 ✓	0.1	1	3.98	Yes	p8011653.chw
2	0.4871	5.021 ✓	0.2	1	3.98	Yes	p8011707.chw
3	1.231	12.54 ✓	0.5	1	3.98	Yes	p8011721.chw
4	6.737	69.09 ✓	2.5	1	3.98	Yes	p8011735.chw
5	14.03	144.8 ✓	5	1	3.98	Yes	p8011749.chw
6	28.16	299.6 ✓	10	1	3.98	Yes	p8011803.chw
7	54.14	623.1 ✗	20	1	3.98	No	p8011818.chw

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CALIBRATION OF COMPONENT nitrate

Method: IC100-H01.mtw
 Equation: $Q = 0.0281219 \cdot A + 0.154267$
 RSD: 6.071 %
 Correlation coefficient: 0.999094



K3 = 0 K2 = 0 K1 = 0.0281219 K0 = 0.154267
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

LR = 10

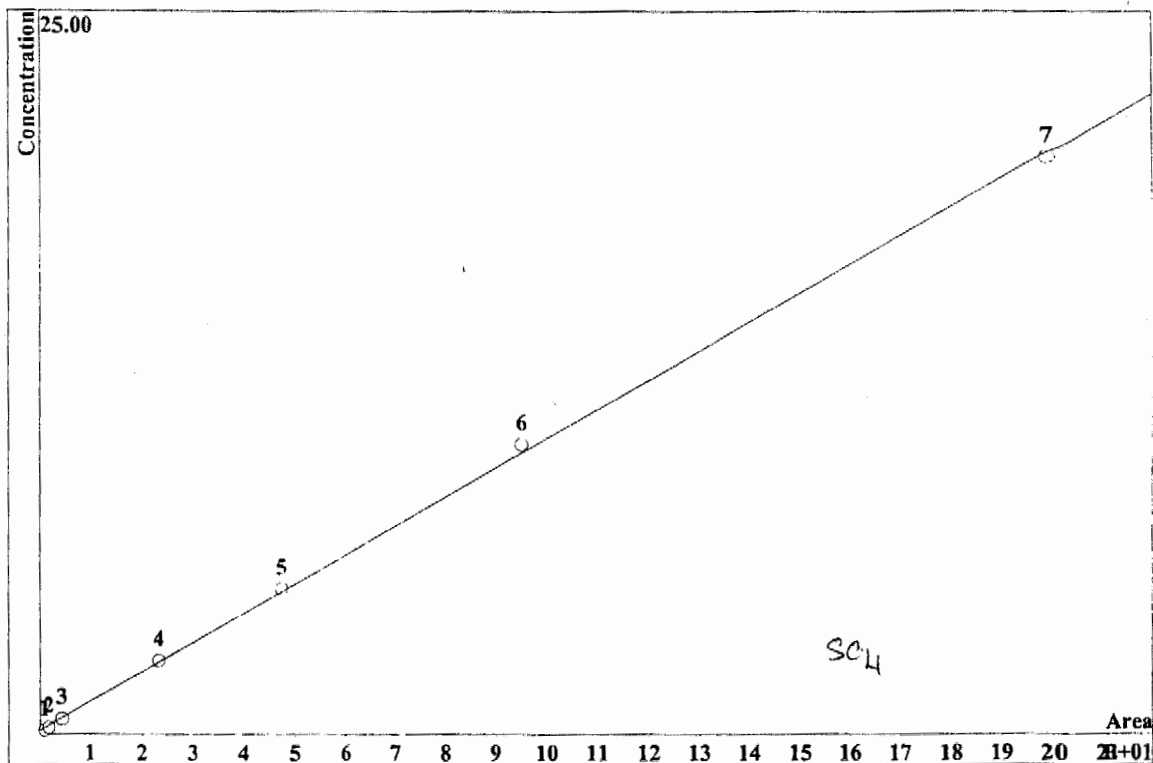
Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.203	2.739 ✓	0.1	1	5.56	Yes	p8011653.chw
2	0.3959	5.324 ✓	0.2	1	5.56	Yes	p8011707.chw
3	1.02	13.64 ✓	0.5	1	5.56	Yes	p8011721.chw
4	5.865	76.81 ✓	2.5	1	5.56	Yes	p8011735.chw
5	12.87	164.1 ✓	5	1	5.56	Yes	p8011749.chw
6	28.43	355.2 ✓	10	1	5.56	Yes	p8011803.chw
7	62.62	798.7 x	20	1	5.56	No	p8011818.chw

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8039

CALIBRATION OF COMPONENT sulfate

Method: IC100-H01.mtw
 Equation: $Q = 0.100694 \cdot A + 0.113285$
 RSD: 3.081 %
 Correlation coefficient: 0.999779



K3 = 0 K2 = 0 K1 = 0.100694 K0 = 0.113285
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

LR = 20

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.05823	0.9872	0.1	1	8.35	Yes	p8011653.chw
2	0.1026	1.793	0.2	1	8.35	Yes	p8011707.chw
3	0.2493	4.396	0.5	1	8.35	Yes	p8011721.chw
4	1.262	23.31	2.5	1	8.35	Yes	p8011735.chw
5	2.566	47.52	5	1	8.35	Yes	p8011749.chw
6	5.337	95.39	10	1	8.35	Yes	p8011803.chw
7	11.44	199.1	20	1	8.35	Yes	p8011818.chw

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8040

IC Result Check FormVersion : QH2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH18-10	ICV	FCIBNPS	94.6%	95.5%	98%	99.9%	98.2%	93%	97.2%	p8182143	1
AH18-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8182157	1
AH18-21	CCV1	FCIBNPS	95.3%	99%	97.2%	96.8%	97.9%	92.8%	99.3%	p8190018	1
AH18-22	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8190032	1
AH18-33	CCV2	FCIBNPS	95.5%	99.2%	97.8%	101.7%	98.2%	95.2%	98.8%	p8190306	1
AH18-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8190320	1
AH18-41	CCV3	FCIBNPS	97.4%	98.2%	96.2%	103.3%	96.9%	124.7%*	102%	p8190459	1
AH18-42	CCB3	FCIBNPS	0	0	0	0	0	0	0	p8190513	1

IC Result Check FormVersion : QH1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH01-01	IB	FCIBNPS	0	0	0	0	0	0	0	p8011625	1
AH01-10	ICV	FCIBNPS	95.6%	93.6%	92.2%	99.1%	93.3%	90.6%	98.5%	p8011832	1
AH01-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8011846	1
AH01-22	CCV1	FCIBNPS	97.7%	95.4%	98.2%	93.7%	94.5%	96.9%	90.9%	p8012204	1
AH01-23	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8012218	1
AH01-33	CCV2	FCIBNPS	97.7%	108.6%	97.8%	93.6%	94.4%	93.3%	92.5%	p8020039	1
AH01-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8020053	1

DAILY CALIBRATIONS

8044

IC Result Check FormVersion : QH1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH16-01 ✓	CCV52	FCIBNPS	95.7%	95.6%	96.2%	98.4%	92.4%	97.1%	93%	p8161438	1
AH16-02	CCB52	FCIBNPS	0	0	0	0	0	0	0	p8161457	1
AH16-13 ✓	CCV53	FCIBNPS	95.9%	96.7%	95.4%	99.8%	98.2%	101.8%	97.9%	p8161732	1
AH16-14	CCB53	FCIBNPS	0	0	0	0	0	0	0	p8161746	1
AH16-25 ✓	CCV54	FCIBNPS	96.4%	96.1%	95.4%	99.4%	98.6%	101.9%	97.6%	p8162108	1
AH16-26	CCB54	FCIBNPS	0	0	0	0	0	0	0	p8162122	1
AH16-37 ✓	CCV55	FCIBNPS	96.4%	95.9%	95.3%	98.7%	98%	104.2%	96.8%	p8162357	1
AH16-38	CCB55	FCIBNPS	0	0	0	0	0	0	0	p8170011	1
AH16-49 ✓	CCV56	FCIBNPS	95.7%	96.4%	96.1%	98.9%	98.6%	75.5%*	96.6%	p8170246	1
AH16-50	CCB56	FCIBNPS	0	0	0	0	0	0	0	p8170300	1
AH16-61	CCV57	FCIBNPS	93.8%	96.3%	92.4%	96.8%	96.1%	97.9%	99.4%	p8170534	1
AH16-63	CCB57	FCIBNPS	0.22401	0	0	0	0	0	0	p8170603	1
AH16-71	CCV58	FCIBNPS	95.1%	95.2%	95.4%	97.3%	97.2%	94.2%	96.4%	p8170756	1
AH16-72	CCB58	FCIBNPS	0	0	0	0	0	0	0	p8170810	1
AH16-75	CCV59	FCIBNPS	94.4%	95.4%	94.8%	97.7%	96.1%	98.1%	96.6%	p8170852	1
AH16-76	CCB59	FCIBNPS	0	0	0	0	0	0	0	p8170906	1

IC Result Check FormVersion : qh2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH22-01	CCV11	FCIBNPS	94.2%	96.1%	105.1%	100.3%	99.3%	92.6%	93.1%	p8221803	1
AH22-02	CCB11	FCIBNPS	0	0	0	0	0	0	0	p8221817	1
AH22-13	CCV12	FCIBNPS	93.2%	97.5%	104.6%	99%	99%	92.6%	99.4%	p8222106	1
AH22-14	CCB12	FCIBNPS	0	0	0	0	0	0	0	p8222120	1
AH22-25✓	CCV13	FCIBNPS	94.1%	96.9%	105%	99.9%	99.3%	81.8%*	99.8%	p8222355	1
AH22-26	CCB13	FCIBNPS	0	0	0	0	0	0	0	p8230009	1
AH22-37✓	CCV14	FCIBNPS	94.8%	96%	104.8%	99.3%	99.1%	75.4%*	97.1%	p8230244	1
AH22-38	CCB14	FCIBNPS	0	0	0	0	0	0	0	p8230258	1
AH22-49✓	CCV15	FCIBNPS	94.9%	96.2%	105.2%	103.2%	100.7%	75.8%*	98.5%	p8230532	1
AH22-50	CCB15	FCIBNPS	0	0	0	0	0	0	0	p8230547	1
AH22-61	CCV16	FCIBNPS	92.6%	95.3%	103.2%	99.3%	97.8%	88.5%*	96.1%	p8230821	1
AH22-62	CCB16	FCIBNPS	0	0	0	0	0	0	0	p8230835	1
AH22-67	CCV17	FCIBNPS	93%	95.6%	103.9%	101.6%	99%	85.2%*	96.3%	p8230948	1
AH22-68	CCB17	FCIBNPS	0	0	0	0	0	0	0	p8231002	1

ANALYTICAL LOGS

Book# A100 003

ANALYSIS RUN LOG FOR IC T CAL

SOP E EMAX-300.0-Rev. 3 EMAX-300.1 Rev. No.0 EMAX-9056 Rev. No. 2

Time: 00:53

End Date: 08/02/05

Time: 16:25

Start Date: 08/01/05

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes Conc = (mg/L)	Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Instrument No.	100
* 1	AH01-01	IE	1	W		* 26	AH01-20	6018-03	50	W		0001/05	STANDARD
* 2	02	00				* 27	04	04	20			IC100 - HCl, pHw	
* 3	03	01			0.1 ppm	* 28	05	05	20			IC100 - 01 - 2 - 01	2
* 4	04	02			0.2	* 29	06	06	20			ICV/LESAM8 ID	3 (5 ppm)
* 5	05	03			0.5	* 30	07	07	20			CCV ID	3 - 1 (5 ppm)
* 6	06	04			2.5	* 31	08	08	5			MS ID	5 ppm Acc Std.
* 7	07	05			5	* 32	09	09	5				
* 8	08	06			10	* 33	10	10	1				
* 9	09	07			20	* 34	11	11	1				
* 10	10	ICV				* 35							
* 11	11	ICP				* 36							
* 12	12	ICP/ICP/ICP				* 37							
* 13	13	ICP				* 38							
* 14	14	ICP				* 39							
* 15	15	ICP/ICP	5			* 40							
* 16	16	ICP				* 41							
* 17	17	ICP				* 42							
* 18	18	ICP				* 43							
* 19	19	ICP				* 44							
* 20	20	ICP	10			* 45							
* 21	21	ICP/ICP	50			* 46							
* 22	22	ICV/ICV	1			* 47							
* 23	23	ICP/ICP	1			* 48							
* 24	24	ICP/ICP	50			* 49							
* 25	25	ICP	50			* 50							

Comments:

Analyzed By: al

This page is checked during data review.

** Sample Prep ID Prefix:

* Sample Prep ID Prefix: ICH001W

ANALYSIS RUN LOG FOR IC

ICM

SOP of EMAX-300.0 Rev. 3 □ EMAX-300.1 Rev. No.0 □ EMAX-9056 Rev. No.2

Book# A100 003

004

Start Date: 08/16/05

Time: 11:36

End Date: 08/16/05

Time: 05:13

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes (CCIV = mg/L)
* 1	AIH6-C1	1B	1	W	
* 2	02	SD			
* 3	03	S1			0.1 ppm
* 4	04	S2			0.2
* 5	05	S3			0.5
* 6	06	S4			1
* 7	07	S5			2
* 8	08	S6			4
* 9	09	S7			10
* 10	10	TCV			
* 11	11	TCB			
* 12	12	TCB25WB			
* 13	13	WL			
* 14	14	WL			
* 15	15	H23-C1	800		
* 16	16	K3			
* 17	17	E1	2000		
* 18	18	02			
* 19	19	03			
* 20	20	04			
* 21	21	CCV1	4		
* 22	22	CCB1	1		
* 23	23	HL69-01			
* 24	24	01D			
* 25	25	01M			
* 26	AIH3-06	HL64-01	1	W	
* 27	27	02			
* 28	28	02D			
* 29	29	02M			
* 30	30	01	5		
* 31	31	02			
* 32	32	02D			
* 33	33	CCV2	1		
* 34	34	CCB2			
* 35	35	HL64-02M	5		
* 36	36	HL69-01	10		
* 37	37	01D			
* 38	38	01M			
* 39	39	RINSE	1		
* 40	40	RINSE			
* 41	41	CV23			
* 42	42	CCB3			
* 43					
* 44					
* 45					
* 46					
* 47					
* 48					
* 49					
* 50					

* Sample Prep ID Prefix: TC H025W

** Sample Prep ID Prefix:

Analyzed By:

AL

This page is checked during data review.

ANALYSIS RUN LOG FOR IC

Book# A100 003

SOP □ EMAX-300.0-Rev. 3 □ EMAX-300.1 Rev. No. 0 □ EMAX-9056 Rev. No. 2

Start Date: 08/10/05		Time: 14:38		End Date: 08/11/05		Time: 09:06			
Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Lab Sample ID	DF	Matrix	Notes
* 1	AH10-01	00V52	1	W		00V54	1	W	
* 2	02	00V52				00V54	20		
* 3	03	ICH020WB				H123-03			
* 4	04	WL				H150-01			
* 5	05	WL				02			
* 6	06	H124-01				03			
* 7	07	02				04			
* 8	08	03				05			
* 9	09	04				RINSE			
* 10	10	04D				ICH021WB			
* 11	11	04M				WL			
* 12	12	RINSE				00V55			
* 13	13	00V53				00V55			
* 14	14	00V53				H150-06			
* 15	15	H132-01	5			07			
* 16	16	02	1			08			
* 17	17	03				10			
* 18	18	04				H132-01			
* 19	19	05				02	2		
* 20	20	H451-01	5			03	5		
* 21	21	02				04	10		
* 22	22	03				H132-05	5		
* 23	23	H133-01	20			H129-01	20		
* 24	24	RINSE				00V56			
* 25	25	00V54	1			00V56	1		
* 26						00V56	1		
* 27									
* 28									
* 29									
* 30									
* 31									
* 32									
* 33									
* 34									
* 35									
* 36									
* 37									
* 38									
* 39									
* 40									
* 41									
* 42									
* 43									
* 44									
* 45									
* 46									
* 47									
* 48									
* 49									
* 50									

Notes: NO₂ + NO_x = spiked 0.25ppm
* SO₂ = spiked 0.75ppm All = 5ppm

Comments:

Instrument No. 100

STANDARD

Date 08/10/05

Method File I1000.mtw

ICAL ID S1B-11-2-1

ICV/ECMS ID 2

CCV ID 8-3

LES ID 9-1

MS ID Acc Std.

ELECTRONIC DATA ARCHIVAL

Location

IC METROHM

Analyzed By: dL

8050

Book# A100 003

Time: 10:02

[illegible]

*** Sample Prep ID Prefix: TCH 026W cal 06/13/15

This page is checked during data review.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H132**

METHOD 120.1 SPECIFIC CONDUCTIVITY

Five (5) water samples were received on 08/16/05 for Specific Conductivity analysis by Method 120.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

3. Duplicate

Duplicate sample was not designated in this SDG.

4. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 120.1
SPECIFIC CONDUCTIVITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H132

Matrix : WATER
Instrument ID : 129

SAMPLE ID	EMAX SAMPLE ID	RESULTS (umhos/cm)	DLF	MOIST	RL (umhos/cm)	MDL (umhos/cm)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MW-17-5	H132-01	317	1	NA	1	.5	08/22/05 16:16	NA	ECH007N-04	NA	ECH007N	08/15/05	08/16/05
MW-17-4	H132-02	323	1	NA	1	.5	08/22/05 16:18	NA	ECH007N-05	NA	ECH007N	08/15/05	08/16/05
MW-17-3	H132-03	719	1	NA	1	.5	08/22/05 16:20	NA	ECH007N-06	NA	ECH007N	08/15/05	08/16/05
MW-17-2	H132-04	875	1	NA	1	.5	08/22/05 16:22	NA	ECH007N-07	NA	ECH007N	08/15/05	08/16/05
MW-17-1	H132-05	311	1	NA	1	.5	08/22/05 16:24	NA	ECH007N-08	NA	ECH007N	08/15/05	08/16/05

8053

ANALYSIS LOG FOR SPECIFIC CONDUCTIVITY

Book # AEC-003

SOP EMAX-120.1 Revision No. 1

Start Date 2/22/05 Time 1600 End Date 2/22/05 Time 1634

Data File Name	Lab Sample ID	Time	Temp. °C	Temp. Correction Factor QT @ 25 °C	DF	Measured Resistance (ohms)	Notes
* 1	STDLOW141	1610	22.4	0.950	1	141.5	EC @ 25 °C
* 2	EC Hootw	12	22.2	0.947	1	401.1	umhos/cm
* 3	✓ WC	10	22.2	0.941	1	400.8	
* 4	H132-01*	16	22.4	0.950	1	316	
* 5	-02	18			1	322	
* 6	-03	20			1	716	
* 7	-04	22			1	871	
* 8	-05	24	22.4	0.950	1	310	
* 9	H483-11	26	22.3	0.948	1	1000	1006 ± 1010
* 10	✓ -12	28	22.4	0.950	1	1022	1026 ± 1030
* 1	H505-01	30			1	1076	1080
* 2	✓ -040	32			1	1076	1080
* 3	STD High 1413	1634	22.4	0.950	1	1408	1414
* 4							
* 5							
* 6							
* 7							
* 8							
* 19							
* 20							

ANALYTICAL BATCH * EC Hootw

8054

Instrument No:	29
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Trial	ID	Resistance ohms
KCl Standard	SW2A-02-55	ASSAY
1	803B 02-654	704.5
2	Qc = 0.958	704.5
3		704.5
LCS	SW7A-06-174	402 umhos/cm
Calibration Temperature	22.8 °C	
True Value	1413	umhos/cm
Cell Constant (C)	0.954	

KCl Standard	ID	umhos/cm
Low-point	SW3B-02-729	141
Mid-point	-	
High-point	SW3B-02-604	1413

Comments: * Turbid brown

sample

Analyzed By: KB / RM

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CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H132**

METHOD SM3500 FERROUS IRON

Five (5) water samples were received on 08/16/05 for Ferrous Iron analysis by Method SM3500 in accordance with "Standard Methods for the Examination of Water and Wastewater", 18th edition (1990).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample

Lab control result was within QC limit.

4. Duplicate

Sample H132-05 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

SM3500
FERROUS IRON

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H132

Matrix : WATER
Instrument ID : 170

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	FEH002WB	ND	1	NA	5	2.5	08/25/0519:38	NA	FEH002W-09	FEH002W-07	FEH002W	NA	NA
LCSTW	FEH002WL	19.1	1	NA	5	2.5	08/25/0519:39	NA	FEH002W-10	FEH002W-07	FEH002W	NA	NA
MW-17-5	H132-01	8.02	1	NA	5	2.5	08/25/0519:40	NA	FEH002W-11	FEH002W-07	FEH002W	08/15/05	08/16/05
MW-17-4	H132-02	ND	1	NA	5	2.5	08/25/0519:41	NA	FEH002W-12	FEH002W-07	FEH002W	08/15/05	08/16/05
MW-17-3	H132-03	8.02	1	NA	5	2.5	08/25/0519:42	NA	FEH002W-13	FEH002W-07	FEH002W	08/15/05	08/16/05
MW-17-2	H132-04	ND	1	NA	5	2.5	08/25/0519:43	NA	FEH002W-14	FEH002W-07	FEH002W	08/15/05	08/16/05
MW-17-1	H132-05	ND	1	NA	5	2.5	08/25/0519:44	NA	FEH002W-15	FEH002W-07	FEH002W	08/15/05	08/16/05
MW-17-1DUP	H132-05D	ND	1	NA	5	2.5	08/25/0519:45	NA	FEH002W-16	FEH002W-07	FEH002W	08/15/05	08/16/05

8056

2

EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT:	BATTELLE MEMORIAL INSTITUTE	DATE RECEIVED:	NA
PROJECT:	JPL	DATE EXTRACTED:	NA
METHOD:	SM3500	DATE ANALYZED:	08/25/05 19:39
MATRIX:	WATER		
% MOISTURE:	NA		

BATCH NO.:	05H732
SAMPLE ID:	LCS1W
CONTROL NO.:	FEH002WL

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	LCS RSLT (mg/L)	LCS % REC	QC LIMIT (%)
Ferrous Iron	ND	20.00	19.10	96	80-120

8057
X

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: SM3500
MATRIX: WATER
% MOISTURE: NA
=====

BATCH NO.: 05H132
SAMPLE ID: MW-17-1DUP
CONTROL NO.: H132-05D
DATE RECEIVED: 08/16/05
DATE EXTRACTED: NA
DATE ANALYZED: 08/25/05 19:45

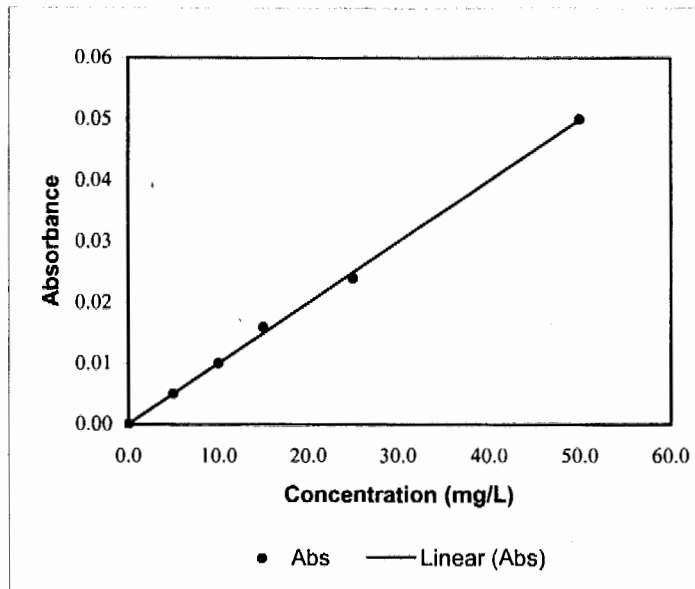
ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
-----	-----	-----	-----	-----
Ferrous Iron	ND	ND	0	20

8058
2

CALIBRATION CURVE FERROUS FE

Conc.	Abs
0.0	0.000
5.0	0.005
10.0	0.010
15.0	0.016
25.0	0.024
50.0	0.050



R ²	0.9988
Eq.Line	0.0010
CF	1002.8860

Comments: **PASSED**

Analyzed by: LA

ANALYSIS LOG FOR FERROUS IRON

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SOP \checkmark EMAX-3500-Fe D/C Rev. No. 0 ☐ Starting Date 08-25-05 Time 19:30 Ending Date 08-25-05 Time 19:47 Book # A70-Fe D/C-001

Data File Name	Preparative Batch	Lab Sample ID	Matrix		Sample Amount (ml)	DF	Abs. (510 nm)	Time	Ferrous Iron (mg/L)	Notes	Instrument No.: 70		Wavelength: 510 nm
			S	W							Standard	ID	
* 1	FEH002W	S-0.0			50	1	0.000	19:30					
* 2		S-5.0					0.005	19:31					
* 3		S-10					0.010	19:32					
* 4		S-15					0.016	19:33					
* 5		S-25					0.024	19:34					
* 6		S-50					0.050	19:35					
* 7		ICV					0.018	19:36	18.05				
* 8		ICB					0.000	19:37	0.0				
* 9		FEH002WB					0.000	19:38	0.0				
* 0		UL					0.019	19:39	19.05				
* 1		H132-01					0.008	19:40	8.003				
* 2		-02					0.002	19:41	0.0				
* 3		-03					0.002	19:42	8.003				
* 4		-04					0.002	19:43	0.0				
* 5		-05					0.002	19:44	0.0				
* 6		-05D					0.002	19:45	0.0				
* 7		CCV					0.019	19:46	19.05				
* 8		CCB					0.000	19:47	0.0				
* 9													
* 0													
* 1													
* 2													
* 3													
* 4													
* 5													
* 6													
* 7													
* 8													
* 9													
* 0													

Standard		ID	Conc. (mg/L)
S ₀	0.000		0.0
S ₁	0.010		5
S ₂	0.024		10
S ₃	0.050		15
S ₄	0.018		25
S ₅	0.000		50

ICV/LCS/MS		ID	Conc. (mg/L)
ICV	0.000		20
MS	0.019		20

Name		ID
HCl	301A-02-1539	
NH ₄ C ₂ H ₃ O ₂ Buffer	507B-06-228B	
Phenanthroline Sol'n	507B-06-228A	
Na ₂ C ₂ O ₄ Sol'n	17A	
Hydroxylamine Sol'n		

Standard Curve	
R (≤0.995)	0.9988
Y	0.0010
CF	1002.8860

Comments:

Analyzed By: mm

Disposal Date:

This page is checked during data review.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H132**

METHOD 160.1 TOTAL DISSOLVED SOLIDS

Five (5) water samples were received on 08/16/05 for Total Dissolved Solids analysis by Method 160.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 160.1
TOTAL DISSOLVED SOLIDS

Client : BATTILLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H132

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE TIME	Extraction DATE TIME	LFID	CAL REF	PREP BATCH	Collection DATE TIME	Received DATE TIME
MBLK1W	TDH012WB	ND	1	NA	10	5	08/17/0513:15	NA	TDH012W-01	NA	TDH012W	NA	NA
LCS1W	TDH012WL	335	1	NA	10	5	08/17/0513:16	NA	TDH012W-02	NA	TDH012W	NA	NA
LCD1W	TDH012WC	340	1	NA	10	5	08/17/0513:17	NA	TDH012W-03	NA	TDH012W	NA	NA
MW-17-4	H132-02	235	1	NA	10	5	08/17/0513:23	NA	TDH012W-09	NA	TDH012W	08/15/05	08/16/05
MW-17-3	H132-03	535	1	NA	10	5	08/17/0513:24	NA	TDH012W-10	NA	TDH012W	08/15/05	08/16/05
MW-17-2	H132-04	695	1	NA	10	5	08/17/0513:25	NA	TDH012W-11	NA	TDH012W	08/15/05	08/16/05
MW-17-1	H132-05	190	1	NA	10	5	08/17/0513:26	NA	TDH012W-12	NA	TDH012W	08/15/05	08/16/05
MBLK2W	TDH014WB	ND	1	NA	10	5	08/19/0513:00	NA	TDH014W-01	NA	TDH014W	NA	NA
LCS2W	TDH014WL	330	1	NA	10	5	08/19/0513:01	NA	TDH014W-02	NA	TDH014W	NA	NA
LCD2W	TDH014WC	335	1	NA	10	5	08/19/0513:02	NA	TDH014W-03	NA	TDH014W	NA	NA
MW-17-5	H132-01	185	1	NA	10	5	08/19/0513:19	NA	TDH014W-20	NA	TDH014W	08/15/05	08/16/05

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OK

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 160.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H132
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: TDH012WL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 08/17/05 13:16/13:17

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TDS	ND	336.00	335.00	100	336.00	340.00	101	1	80-120	20

8063

A

dt

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 160.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H132
SAMPLE ID: LCS2W/LCD2W
CONTROL NO.: TDH014HL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 08/19/05 13:01/13:02

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TDS	ND	336.00	330.00	98	336.00	335.00	100	2	80-120	20

8064

das

GRAVIMETRIC ANALYSIS LOG

SOP ☒ EMAX-160.1 Rev. No. 3 ☐ EMAX-160.2 Rev. No. 2 ☐ EMAX-160.3 Rev. No. 1 ☐ EMAX-160.4 Rev. No. 0 ☐ EMAX-160.5 Rev. No. 0

Starting Date: 8/18/05 Time: 20:30 Oven Temp: 105 °C Ending Date: 8/19/05 Time: 1430 Oven Temp: 120 °C

Data File Name	Lab Sample ID	Sample Amt. (ml)	Dish Wt. (g)	Dry Wt. Dish + Solids (g)				Solids (mg)	Result (mg/L)	Settleable Solids		Standard
				1st	2nd	Time	3rd			Vol. of SS	Result (ml/L/hr)	
1	TD 4014 WB	100	65.2113	65.2117	1100	65.2114	1300	0.1	1500	0.1	1500	LCS ID QW7A-06-146
2	1 WC	20	13.8435	13.8512	01	13.8505	01	6.6	330	98%		LCS TV (mg/L) 334
3	1 WC	20	13.5551	13.5627	02	13.5620	02	6.7	335	100%		
4	H150-01	20	13.3904	13.4024	03	13.4025	03	11.8	590			Balance ID:
5	-02	20	13.5303	13.5483	04	13.5477	04	17.0	850			40706360
6	-03	20	13.4556	13.4671	05	13.4663	05	10.4	520			37030058
7	-04	20	13.5513	13.5677	06	13.5670	06	15.4	770			
8	-05	20	13.4141	13.4242	07	13.4237	07	9.7	485			Comments:
9	-06	20	13.4593	13.4973	08	13.4966	08	34.1	1855	1860		* Sample H132-01
10	-07	20	13.3998	13.4369	09	13.4366	09	36.9	1845	1850		initially filtered
11	-08	20	13.4400	13.4945	10	13.4940	10	53.7	2685	2690		SP# A H Watson
12	-10	20	13.4870	13.5005	11	13.4993	11	11.4	570	RPD		has brown color,
13	-100	20	13.3985	13.4111	12	13.4105	12	11.7	585	3%		further filtered
14	H163-01	20	13.6897	13.7027	13	13.7020	13	11.9	595			with Acrodisk
15	-02	20	13.6938	13.7084	14	13.7070	14	13.1	655			0.45 g 0.2 um
16	-03	20	13.3313	13.3415	15	13.3407	15	9.2	460			
17	-04	20	13.5564	13.5707	16	13.5700	16	13.7	685			
18	H169-01	20	13.5098	13.5359	17	13.5354	17	25.7	1285	1290		
19	-06	20	13.9334	13.9817	18	13.9812	18	25.8	1290			
20	H132-01	20	13.5137	13.5182	119	13.5177	119	3.7	185	185		Analyzed By: PM / N/A

ANALYTICAL BATCH * SS

TD 4014 WB

R_{mg/L} = (DS - DW) x 1000

S

where: R_{mg/L} = concentration of solids; DS_(mg) = Dry weight of Dish + Solids; DW_(mg) = Dish weight; S_(mg) = sample amount

GRAVIMETRIC ANALYSIS LOG

☒ EMAX-160.1 Rev. No. 3 ☐ EMAX-160.2 Rev. No. 2 ☐ EMAX-160.3 Rev. No. 1 ☐ EMAX-160.4 Rev. No. 0 ☐ EMAX-160.5 Rev. No. 0
 S O P

Oven Temp. / 80°C

Time:

Ending Date:

Oven Temp. 105°C

Time:

5/6/05

Starting Date:

Data File Name	Lab Sample ID	Sample Amt. (ml)	Dish Wt. (g)	Dry Wt. Dish + Solids(g)						Solids (mg)	Result (mg/L)	Settleable Solids		Standard
				1st	Time	2nd	Time	3rd	Time			Vol. of SS	Result (ml/L/hr)	
1	704012 WPB	100	58.3759	58.3762	0925	58.3759	1115	58.3760	1315	0.1	N/D		LCS ID SUTA-06-146	
2	WL	20	13.3835	13.3610	26	13.3604	16	13.3602	16	6.7	335	100%	LCSTV(mg/L) 334	
3	WC	20	13.3851	13.3922	27	13.3920	17	13.3919	17	6.8	340	101		
4	H129-01	20	13.4001	13.4414	28	13.4405	18	13.4401	18	40.0	2000		Balance ID:	
5	-02	20	13.4200	13.4542	29	13.4536	19	13.4532	19	33.2	1660		40706360	
6	-03	20	13.3898	13.3884	30	13.3850	20	13.3847	20	30.9	1545	1550	37030058	
7	-04	20	13.3309	13.3611	31	13.3606	21	13.3605	21	29.6	1480			
8	H132-01	20	13.3781	13.3719	32	13.3970	22	13.3907	22	12.6	630 (nd und)		Comments:	
9	-02	20	13.4977	13.5033	33	13.5025	23	13.5004	23	4.7	235	✓	* Turned for further	
10	-03	20	13.3930	13.4215	34	13.4040	24	13.4037	24	10.7	535	✓	brown & black	
11	-04	20	13.4493	13.4641	35	13.4631	25	13.4632	25	13.9	695	✓	residue after	
12	H132-05	20	13.4880	13.4935	36	13.4925	26	13.4922	26	3.8	190	✓	drying	
13	H133-01	20	13.4460	13.4498	37	13.4491	27	13.4490	27	3.0	150			
14	-03	20	13.5124	13.5160	38	13.5157	28	13.5156	28	2.9	145	7 RPD 0%		
15	-030	20	13.4966	13.5003	39	13.4999	29	13.4997	29	2.9	145			
16														
17														
18														
19														
20													Analized By: Kib/A C	

ANALYTICAL BATCH # SS

to H012W

$$R_{(mg/L)} = \frac{(DS - DW) \times 1000}{S}$$

where: $R_{(mg/L)}$ = concentration of solids; $DS_{(mg)} = \text{Dry weight of Dish + Solids}$; $DW_{(mg)} = \text{Dish weight}$; $S_{(ml)}$ = sample amount

Analyzed By:

BALANCE CALIBRATION VERIFICATION LOG (DOE)

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SOP ☐ EMAX-QC04 Revision No.: 1

QC04-036

Balance ID 10601202

Date 8-16-05

Range	Min:	1	Max:	600	g
TV	200	100	30	5	1
1	200.003	100.001	29.999	5.000	1.000
2	200.004	100.002	29.998	5.000	1.000
3	200.004	100.002	29.998	5.000	1.000
Criteria (±0.1%)	0.2	0.1	0.03	0.005	0.001
LL	199.8	99.9	29.97	4.995	0.999
UL	200.2	100.1	30.03	5.005	1.001

Comment:

Balance ID J77299

Date 8-16-05

Range	Min:	1	Max:	300	g
TV	200	100	50	30	20
1	200.00	100.00	50.00	30.00	20.00
2	200.00	100.00	50.00	30.00	20.00
3	200.00	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 10203192

Date 8-16-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.01	100.01	50.00	30.00	20.00
2	200.01	100.01	50.00	30.00	20.00
3	200.01	100.01	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 10304418

Date 8-16-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.02	100.00	50.00	30.00	20.00
2	200.02	100.01	50.00	30.00	20.00
3	200.02	100.01	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 40706360

Date 8/16/05

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1	199.9985	100.0003	29.9998	1.0000	0.0200
2	199.9984	100.0004	29.9997	1.0000	0.0200
3	199.9985	100.0003	29.9994	1.0000	0.0200
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

Balance ID 40706360

Date 8/16/05

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

EMAX LABORATORIES, INC. 1835 W. 205th St. Tempe, AZ 85281

Verified by: MC

Checked by:

8067

BALANCE CALIBRATION VERIFICATION LOG (DOE)

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SOP ☐ EMAX-QC04 Revision No.: 1

Balance ID 10601202

Date 8-17-05

Balance ID J77299

QC04-036

Date 8-17-05

Range	Min:	1	Max:	600	g
TV	200	100	30	5	1
1	200.005	100.003	29.996	5.000	1.000
2	200.006	100.004	29.994	5.000	1.000
3	200.004	100.002	29.997	5.000	1.000
Criteria (±0.1%)	0.2	0.1	0.03	0.005	0.001
LL	199.8	99.9	29.97	4.995	0.999
UL	200.2	100.1	30.03	5.005	1.001

Comment:

Range	Min:	1	Max:	300	g
TV	200	100	50	30	20
1	200.01	100.01	50.00	30.00	20.00
2	200.01	100.01	50.00	30.00	20.00
3	200.01	100.01	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 10203192

Date 8-17-05

Balance ID 10304418

Date 8-17-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.00	100.00	50.00	30.00	20.00
2	200.00	100.00	50.00	30.00	20.00
3	200.00	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.03	100.00	50.00	30.00	20.00
2	200.03	100.02	50.00	30.00	20.00
3	200.03	100.01	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 40706360

Date 8/17/05

Balance ID 40706360

Date

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1	199.9996	100.0013	29.9991	1.0000	0.0200
2	199.9994	100.0014	29.9989	1.0000	0.0200
3	199.9997	100.0015	29.9983	1.0000	0.0200
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:



EMAX LABORATORIES, INC. 1835 W 205th St Torrance, CA 90501

Verified by *MC*

Checked by:

8068

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05H132

METHOD 351.3 TKN

Five (5) water samples were received on 08/16/05 for TKN analysis by Method 351.3 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample H132-05 was analyzed for duplicate. %RPD was within QC limit.

5. Matrix Spike

Sample H132-05 was spiked. Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

All results were reported as Nitrogen concentration.

METHOD 351.3

TKN

Client : BATTELLE MEMORIAL INSTITUTE

Project : JPL

Batch No. : 05H132

Matrix :

: WATER

Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	KNH008WB	ND	1	NA	.1	.035	08/24/0516:10	08/24/0511:00	KNH008W-11	KNH008W-09	KNH008W	NA	08/24/05
LCS1W	KNH008WL	.960	1	NA	.1	.035	08/24/0516:11	08/24/0511:00	KNH008W-12	KNH008W-09	KNH008W	NA	08/24/05
LCD1W	KNH008WC	.955	1	NA	.1	.035	08/24/0516:12	08/24/0511:00	KNH008W-13	KNH008W-09	KNH008W	NA	08/24/05
MW-17-5	H132-01	.181	1	NA	.1	.035	08/24/0516:13	08/24/0511:00	KNH008W-14	KNH008W-09	KNH008W	08/15/05	08/16/05
MW-17-4	H132-02	.549	1	NA	.1	.035	08/24/0516:14	08/24/0511:00	KNH008W-15	KNH008W-09	KNH008W	08/15/05	08/16/05
MW-17-3	H132-03	.315	1	NA	.1	.035	08/24/0516:15	08/24/0511:00	KNH008W-16	KNH008W-09	KNH008W	08/15/05	08/16/05
MW-17-2	H132-04	.304	1	NA	.1	.035	08/24/0516:16	08/24/0511:00	KNH008W-17	KNH008W-09	KNH008W	08/15/05	08/16/05
MW-17-1	H132-05	.277	1	NA	.1	.035	08/24/0516:17	08/24/0511:00	KNH008W-18	KNH008W-09	KNH008W	08/15/05	08/16/05
MW-17-1DUP	H132-05D	.320	1	NA	.1	.035	08/24/0516:18	08/24/0511:00	KNH008W-19	KNH008W-09	KNH008W	08/15/05	08/16/05
MW-17-1MS	H132-05M	1.25	1	NA	.1	.035	08/24/0516:19	08/24/0511:00	KNH008W-20	KNH008W-09	KNH008W	08/15/05	08/16/05

8070

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 351.3
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H132
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: KKH008WL/C

DATE RECEIVED: 08/24/05
DATE EXTRACTED: 08/24/05 11:00
DATE ANALYZED: 08/24/05 16:11/16:12

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TKN	ND	1.00	.96	96	1.00	.955	96	1	80-120	20

8071

EMAX QUALITY CONTROL DATA

MS ANALYSIS

CLIENT: BAYTELLE MEMORIAL INSTITUTE
 PROJECT: JPL
 METHOD: 351.3
 MATRIX: WATER
 % MOISTURE: NA
 =====
 BATCH NO.: 05H132
 SAMPLE ID: MW-17-1MS
 CONTROL NO.: H132-05M
 DATE RECEIVED: 08/16/05
 DATE EXTRACTED: 08/24/05 11:00
 DATE ANALYZED: 08/24/05 16:19

ACCESSION:

PARAMETER	SAMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
TKN	.277	1.00	1.25	97	75-125

8072

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: 351.3

MATRIX: WATER

% MOISTURE: NA

DATE RECEIVED: 08/16/05
DATE EXTRACTED: 08/24/05 11:00
DATE ANALYZED: 08/24/05 16:18

BATCH NO.: 05H132
SAMPLE ID: MW-17-1DUP
CONTROL NO.: H132-05D

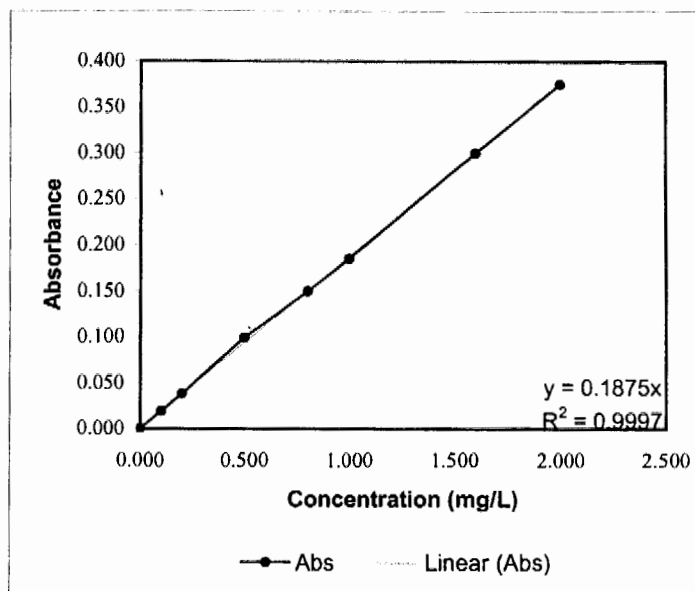
ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
TKN	.277	.32	14	20

8073

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.019
0.200	0.038
0.500	0.099
0.800	0.150
1.000	0.185
1.600	0.300
2.000	0.375



R^2	0.999760
y	0.1875
CF	5.3325

Comments: **PASSED**

Analyzed by: NT/LA

ANALYSIS LOG FOR TOTAL KJELDAHL NITROGEN (TKN)

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SOP ☒ EMAX-351.3 Rev. No. 1 ☐ Start Date: 8/24/05 Time: 16:00 End Date: 8/24/05 Time: 16:24 Book # A70-KN-004

Data File Name	Prep. Batch	Lab Sample ID	Matrix		Time	Vol. Colored (ml)	DF	Absorbance	Notes	Instrument No: 70		Wavelength: 425 nm
			S	W						Standard	ID		Conc. (mg/L)
* 1	KNH008W	S-0			16:00	20	1	0.000				
* 2		0.1			01			0.019			SW2B-03-182	0.0
* 3		0.2			02			0.038				0.1
* 4		0.5			03			0.099				0.2
* 5		0.8			04			0.150				0.5
* 6		1.0			05			0.185				0.8
* 7		1.6			06			0.300				1.0
* 8		2.0			07			0.375				1.6
* 9		ICV			08			0.176	0.939			2.0
* 10		ICB			09			0.000	ND			1.0
* 11		KNH008WB		✓	10			0.000	ND		SW2B-03-181	1.0
* 12		WC			11			0.180	0.960		182	1.0
* 13		WC			12			0.179	0.955		178	1.0
* 14		H132-01			13			0.034	0.181			
* 15		02			14			0.103	0.549			
* 16		03			15			0.059	0.315			
* 17		04			16			0.057	0.304			
* 18		05			17			0.052	0.277			
* 19		05D		✓	18			0.060	0.320			
* 20		DSM		✓	19			0.235	1.253			
* 21		CCV1			20			0.177	0.944			
* 22		CCB1			21			0.000	ND			
* 23		H178-01		✓	22			0.031	0.165			
* 24		CCV2			23			0.175	0.933			
* 25		CCB2			16:24			0.000	ND			
* 6												
* 7												
* 8												
* 9												
* 0												

Reagent	ID
Color Reagent	SW7A-06-141

Standard Curve	
R ²	0.999760
Y	0.1875
CF	5.3325

Comments:

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By: NT/LA

This page is checked during data review.

SOP ☐ EMAX-350.2 Rev. No.: 2 ☒ EMAX-351.3 Rev. No.: 2 ☐

Book # EKN-006

Start Date	Time	End Date	Time
8/24/05	11:00	8/25/05	15:00

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	S-0	9.5	10	5	4	50	50		ICV/MS	SW28-03-181	5ml
*02	0.1								LCS	↓ 178	50
*03	1.0								Reagent	Lot# / ID	
*04	2.0								NaOH	N/A	
*05	ICV								Digestion Mixture	SW7A-06-204	
*06	ICB								Borate Buffer	↓	152
*07	KNH008WB								H ₃ BO ₃	SW7B-06-322	
*08	WL								Distilling Soln.	↓	331
*09	WC								Comments:		
*10	H132-01										
*11	02										
*12	03										
*13	04										
*14	05										
*15	05D										
*16	05M										
*17	H178-01										
*18											
*19											
*20											
*21											
*22											
*23											
*24											
*25											
*26											

Preparation Batch * KNH008W

Prepared By: NT/LA

Standard Added By: NT/LA

Checked By:

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05H132

METHOD 376.1 SULFIDE

Five (5) water samples were received on 08/16/05 for Sulfide analysis by Method 376.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample H132-01 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 376.1
SULFIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H132

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
NBLK1W	SDH005WB	ND	1	NA	1	.4	08/16/0516:30	NA	SDH005W-01	NA	SDH005W	NA	NA
LCSTW	SDH005WL	4.69	1	NA	1	.4	08/16/0516:33	NA	SDH005W-02	NA	SDH005W	NA	NA
LCSTW	SDH005WC	4.65	1	NA	1	.4	08/16/0516:36	NA	SDH005W-03	NA	SDH005W	NA	NA
MW-17-5	H132-01	ND	1	NA	1	.4	08/16/0516:45	NA	SDH005W-06	NA	SDH005W	08/15/05	08/16/05
MW-17-5DUP	H132-01D	ND	1	NA	1	.4	08/16/0516:48	NA	SDH005W-07	NA	SDH005W	08/15/05	08/16/05
MW-17-4	H132-02	ND	1	NA	1	.4	08/16/0516:51	NA	SDH005W-08	NA	SDH005W	08/15/05	08/16/05
MW-17-3	H132-03	ND	1	NA	1	.4	08/16/0516:54	NA	SDH005W-09	NA	SDH005W	08/15/05	08/16/05
MW-17-2	H132-04	ND	1	NA	1	.4	08/16/0516:57	NA	SDH005W-10	NA	SDH005W	08/15/05	08/16/05
MW-17-1	H132-05	ND	1	NA	1	.4	08/16/0517:00	NA	SDH005W-11	NA	SDH005W	08/15/05	08/16/05

8078

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 376.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H132
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: SDH005HL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 08/16/05 16:33/16:36

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Sulfide	ND	5.00	4.69	94	5.00	4.65	93	1	80-120	20

8079

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
 PROJECT: JPL
 METHOD: METHOD 376.1
 MATRIX: WATER
 % MOISTURE: NA
 =====
 BATCH NO.: 05H132
 SAMPLE ID: MW-17-5DUP
 CONTROL NO.: H132-01D
 DATE RECEIVED: 08/16/05
 DATE EXTRACTED: NA
 DATE ANALYZED: 08/16/05 16:48

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Sulfide	ND	ND	0	20

8080

09

ANALYSIS LOG FOR SULFIDE

SOP ☒ EMAX-376.1 Rev. No. 1 ☐ EMAX-9034 Rev. No. 9

Start Date: 5-16-05

Time: 14:40

End Date: 8-16-05

Time: 17:40

Book # ASD-007

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Volume of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Notes	Standard	ID	Conc. (mg/L)
* 1	SDA005-03	11:40	100	10	9.6	mg/L	LCS	SW7A-06-178	5.0
* 2	WC	-33			4.4	4.09	Spike	NA	
* 3	WC	-46			4.4	4.05	Na ₂ S ₂ O ₃	SW7A-02-735	0.00224
* 4	H 123-01	-39			9.6	ND	PAO		
* 5	↓ -02	-48			9.5	ND	Iodine	SW7B-02-734	0.00224
* 6	H 132-01	-45			9.4	ND	HCL	SW7B-06-291C	111
* 7	↓ -01D	-48			9.5	ND	Indicator	SW7A-06-190	
* 8	-02	-57			9.6	ND	STANDARDIZATION		
* 9	-03	-64			9.6	ND	Vol. Of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Conc. Of Iodine (N)
* 0	-04	-57	✓	✓	9.5	ND	10	9.6	0.00224
* 1	✓ -05	17:00	100	10	9.6	ND	10	9.6	0.00224
* 2							10	9.6	0.00224
* 3									
* 4									
* 5									
* 6									
* 7									
* 8									
* 9									
* 0									
* 1									
* 2									
* 3									
* 4									
* 5									
* 6									
* 7									
* 0									

ANALYTICAL BATCH + SDA005N

8081

$$\text{Sulfide (mg/L)} = \frac{(V_{I_2} \times N_{I_2} - V_{PAO} \times N_{PAO}) \times 16,000}{V_{\text{sample}}}$$

Comments:

Analyzed By: *du*

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H132**

METHOD 415.1 DISSOLVED ORGANIC CARBON

Five (5) water samples were received on 08/16/05 for Dissolved Organic Carbon analysis by Method SW9060 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Method", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No Duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 415.1
DOC

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H132

Matrix : WATER
Instrument ID : 62

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TCH019WB	ND	1	NA	1	.5	08/25/0521:20	NA	TCH019-5	TCH019-2	TCH019W	NA	NA
LCS1W	TCH019WL	24.6	1	NA	1	.5	08/25/0521:31	NA	TCH019-6	TCH019-2	TCH019W	NA	NA
LCD1W	TCH019WC	24.2	1	NA	1	.5	08/25/0521:41	NA	TCH019-7	TCH019-2	TCH019W	NA	NA
MU-17-5	H132-01	1.87	1	NA	1	.5	08/25/0522:40	NA	TCH019-13	TCH019-2	TCH019W	08/15/05	08/16/05
MU-17-4	H132-02	2.79	1	NA	1	.5	08/25/0523:09	NA	TCH019-16	TCH019-14	TCH019W	08/15/05	08/16/05
MU-17-3	H132-03	3.49	1	NA	1	.5	08/25/0523:18	NA	TCH019-17	TCH019-14	TCH019W	08/15/05	08/16/05
MU-17-2	H132-04	3.39	1	NA	1	.5	08/25/0523:27	NA	TCH019-18	TCH019-14	TCH019W	08/15/05	08/16/05
MU-17-1	H132-05	4.32	1	NA	1	.5	08/25/0523:37	NA	TCH019-19	TCH019-14	TCH019W	08/15/05	08/16/05

8083

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H132
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: TCH019WB
LAB FILE ID: TCH019-5
DATE EXTRACTED: NA
DATE ANALYZED: 08/25/0521:20
PREP. BATCH: TCH019W
CALIB. REF: TCH019-2

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

TCH019WC
TCH019-7
TCH019WL
TCH019-6
TCH019W
TCH019-2

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
DOC	ND	25	24.6	98	25	24.2	97	2	80-120	20

8084

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**
PROJECT: **JPL**
SDG: **05H132**

METHOD 415.1 TOTAL ORGANIC CARBON

Five (5) water samples were received on 08/16/05 for Total Organic Carbon analysis by Method SW9060 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Method", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No Duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 415.1
TOC

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H132

Matrix : WATER
Instrument ID : 62

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TCH020WB	ND	1	NA	1	.5	08/26/0501:38	NA	TCH019-32	TCH019-26	TCH020W	NA	NA
LCS1W	TCH020WL	24.8	1	NA	1	.5	08/26/0501:48	NA	TCH019-33	TCH019-26	TCH020W	NA	NA
LCD1W	TCH020WC	25.1	1	NA	1	.5	08/26/0501:58	NA	TCH019-34	TCH019-26	TCH020W	NA	NA
MU-17-5	H132-01	1.85	1	NA	1	.5	08/26/0502:07	NA	TCH019-35	TCH019-26	TCH020W	08/15/05	08/16/05
MU-17-4	H132-02	2.31	1	NA	1	.5	08/26/0502:17	NA	TCH019-36	TCH019-26	TCH020W	08/15/05	08/16/05
MU-17-3	H132-03	2.29	1	NA	1	.5	08/26/0502:26	NA	TCH019-37	TCH019-26	TCH020W	08/15/05	08/16/05
MU-17-2	H132-04	2.64	1	NA	1	.5	08/26/0502:35	NA	TCH019-38	TCH019-26	TCH020W	08/15/05	08/16/05
MU-17-1	H132-05	2.39	1	NA	1	.5	08/26/0502:44	NA	TCH019-39	TCH019-26	TCH020W	08/15/05	08/16/05

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H132
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: TCH020WB TCH020WC
LAB FILE ID: TCH019-32 TCH019-33 TCH019-34
DATE EXTRACTED: NA
DATE ANALYZED: 08/26/0501:38 08/26/0501:48 08/26/0501:58
PREP. BATCH: TCH020W TCH020W
CALIB. REF: TCH019-26 TCH019-26

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
TOC	ND	25	24.8	99	25	25.1	100	1	80-120	20

8087

Total + DIS H13a

	Type	Analysis	Sample Name	Sample ID	ObjectID	Origin	Dilutio	Result	Notes
1	Standard	NPOC	ICAL	TCH019-1	0A-123456	C:\Program F	1.000		
2	Control	NPOC	ICV	TCH019-2	0A-123456	C:\Program F	1.000	NPOC:24.57	Control valu
3	Unknown	NPOC	ICB	TCH019-3	0A-123456	C:\Program F	1.000	NPOC:0.4446	
4	Unknown	NPOC	HCO3/CO3	TCH019-4	0A-123456	C:\Program F	1.000	NPOC:0.6484	
5	Unknown	NPOC	TCH019WB	TCH019-5	0A-123456	C:\Program F	1.000	NPOC:0.1429	
6	Unknown	NPOC	TCH019WL	TCH019-6	0A-123456	C:\Program F	1.000	NPOC:24.62	
7	Unknown	NPOC	TCH019WC	TCH019-7	0A-123456	C:\Program F	1.000	NPOC:24.25	
8	Unknown	NPOC	05H074-02	TCH019-8	0A-123456	C:\Program F	5.000	NPOC:117.3	
9	Unknown	NPOC	05H074-06	TCH019-9	0A-123456	C:\Program F	5.000	NPOC:96.20	
10	Unknown	NPOC	05H118-01	TCH019-10	0A-123456	C:\Program F	1.000	NPOC:19.09	
11	Unknown	NPOC	05H118-01D	TCH019-11	0A-123456	C:\Program F	1.000	NPOC:19.06	
12	Unknown	NPOC	05H118-01M	TCH019-12	0A-123456	C:\Program F	1.000	NPOC:42.66	
13	Unknown	NPOC	05H132-01	TCH019-13	0A-123456	C:\Program F	1.000	NPOC:1.869	
14	Control	NPOC	CCV1	TCH019-14	0A-123456	C:\Program F	1.000	NPOC:25.02	Control valu
15	Unknown	NPOC	CCB1	TCH019-15	0A-123456	C:\Program F	1.000	NPOC:0.4697	
16	Unknown	NPOC	05H132-02	TCH019-16	0A-123456	C:\Program F	1.000	NPOC:2.788	
17	Unknown	NPOC	05H132-03	TCH019-17	0A-123456	C:\Program F	1.000	NPOC:3.494	
18	Unknown	NPOC	05H132-04	TCH019-18	0A-123456	C:\Program F	1.000	NPOC:3.389	
19	Unknown	NPOC	05H132-05	TCH019-19	0A-123456	C:\Program F	1.000	NPOC:4.324	
20	Unknown	NPOC	05H150-01	TCH019-20	0A-123456	C:\Program F	1.000	NPOC:0.9213	
21	Unknown	NPOC	05H150-02	TCH019-21	0A-123456	C:\Program F	1.000	NPOC:2.474	
22	Unknown	NPOC	05H150-03	TCH019-22	0A-123456	C:\Program F	1.000	NPOC:1.119	
23	Unknown	NPOC	05H150-04	TCH019-23	0A-123456	C:\Program F	1.000	NPOC:1.690	
24	Unknown	NPOC	05H150-05	TCH019-24	0A-123456	C:\Program F	1.000	NPOC:1.335	
25	Unknown	NPOC	05H150-06	TCH019-25	0A-123456	C:\Program F	1.000	NPOC:16.45	
26	Control	NPOC	CCV2	TCH019-26	0A-123456	C:\Program F	1.000	NPOC:24.55	Control valu
27	Unknown	NPOC	CCB2	TCH019-27	0A-123456	C:\Program F	1.000	NPOC:0.4336	
28	Unknown	NPOC	05H150-07	TCH019-28	0A-123456	C:\Program F	1.000	NPOC:16.14	
29	Unknown	NPOC	05H150-08	TCH019-29	0A-123456	C:\Program F	1.000	NPOC:10.81	
30	Unknown	NPOC	05H150-10	TCH019-30	0A-123456	C:\Program F	1.000	NPOC:1.018	
31	Unknown	NPOC	RINSE	TCH019-31	0A-123456	C:\Program F	1.000	NPOC:0.4563	
32	Unknown	NPOC	TCH020WB	TCH019-32	0A-123456	C:\Program F	1.000	NPOC:0.4028	
33	Unknown	NPOC	TCH020WL	TCH019-33	0A-123456	C:\Program F	1.000	NPOC:24.77	
34	Unknown	NPOC	TCH020WC	TCH019-34	0A-123456	C:\Program F	1.000	NPOC:25.09	
35	Unknown	NPOC	05H132-01	TCH019-35	0A-123456	C:\Program F	1.000	NPOC:1.846	
36	Unknown	NPOC	05H132-02	TCH019-36	0A-123456	C:\Program F	1.000	NPOC:2.312	
37	Unknown	NPOC	05H132-03	TCH019-37	0A-123456	C:\Program F	1.000	NPOC:2.287	
38	Unknown	NPOC	05H132-04	TCH019-38	0A-123456	C:\Program F	1.000	NPOC:2.641	
39	Unknown	NPOC	05H132-05	TCH019-39	0A-123456	C:\Program F	1.000	NPOC:2.394	
40	Unknown	NPOC	05H163-01	TCH019-40	0A-123456	C:\Program F	1.000	NPOC:1.426	
41	Control	NPOC	CCV3	TCH019-41	0A-123456	C:\Program F	1.000	NPOC:25.26	Control valu
42	Unknown	NPOC	CCB3	TCH019-42	0A-123456	C:\Program F	1.000	NPOC:0.3947	
43	Unknown	NPOC	05H163-02	TCH019-43	0A-123456	C:\Program F	1.000	NPOC:2.111	
44	Unknown	NPOC	05H163-03	TCH019-44	0A-123456	C:\Program F	1.000	NPOC:1.043	
45	Unknown	NPOC	05H163-04	TCH019-45	0A-123456	C:\Program F	1.000	NPOC:2.142	
46	Unknown	NPOC	05H176-01	TCH019-46	0A-123456	C:\Program F	1.000	NPOC:1.754	
47	Unknown	NPOC	05H176-02	TCH019-47	0A-123456	C:\Program F	1.000	NPOC:2.471	
48	Unknown	NPOC	05H176-03	TCH019-48	0A-123456	C:\Program F	1.000	NPOC:1.493	
49	Unknown	NPOC	05H176-04	TCH019-49	0A-123456	C:\Program F	1.000	NPOC:1.635	
50	Unknown	NPOC	05H133-01	TCH019-50	0A-123456	C:\Program F	1.000	NPOC:1.122	
51	Unknown	NPOC	05H133-03	TCH019-51	0A-123456	C:\Program F	1.000	NPOC:0.7613	
52	Unknown	NPOC	05H133-03D	TCH019-52	0A-123456	C:\Program F	1.000	NPOC:0.7830	
53	Control	NPOC	CCV4	TCH019-53	0A-123456	C:\Program F	1.000	NPOC:25.06	Control valu
54	Unknown	NPOC	CCB4	TCH019-54	0A-123456	C:\Program F	1.000	NPOC:0.4882	
55	Unknown	NPOC	05H133-03M	TCH019-55	0A-123456	C:\Program F	1.000	NPOC:24.15	
56	Control	NPOC	CCV5	TCH019-56	0A-123456	C:\Program F	1.000	NPOC:25.32	Control valu
57	Unknown	NPOC	CCB5	TCH019-57	0A-123456	C:\Program F	1.000	NPOC:0.8666	
58									
59									
60									
61									
62									
63									
64									
65									
66									

System	toc
Detector	Combustion
Catalyst	Regular Sensitivity
Cell Length	long

Sample Name:	ICAL
Sample ID:	TCH019-1
Cal. Curve:	TCH019.2005_08_25_19_49_28.cal

Type	Anal.
Standard	NPOC

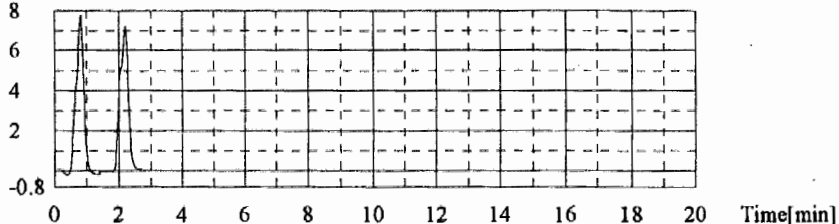
No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	0.8045	50uL	1	*****		08/25/05 07:58:51 PM
2	0.3271	50uL	1	*****		08/25/05 07:58:00 PM

No.	Area	Inj. Vol.	Aut Dil.	Rem.	Ex.	Date / Time
1	2.795	50uL	10	*****		08/25/05 08:06:26 PM
2	3.339	50uL	10	*****		08/25/05 08:08:00 PM

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	13.86	50uL	2	*****		08/25/05 08:14:41 PM
2	14.01	50uL	2	*****		08/25/05 08:16:16 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 13.94

Signal[mV] 8

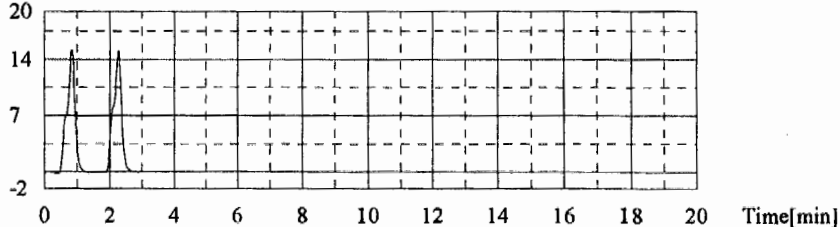


Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	27.28	50uL	1	*****		08/25/05 08:22:17 PM
2	27.41	50uL	1	*****		08/25/05 08:23:54 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 27.34

Signal[mV] 20

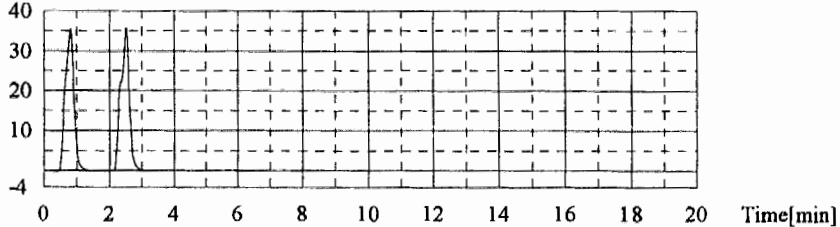


Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	67.99	50uL	2	*****		08/25/05 08:32:48 PM
2	69.63	50uL	2	*****		08/25/05 08:34:50 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 68.81

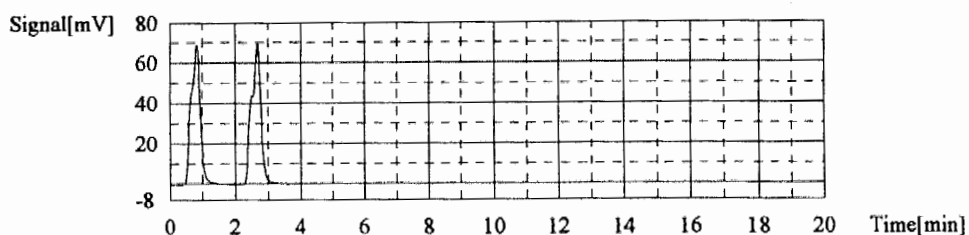
Signal[mV] 40



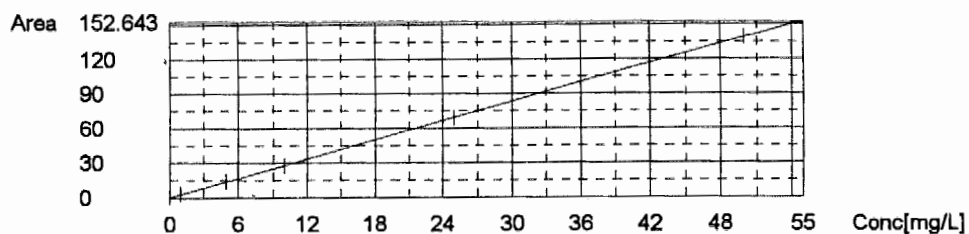
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	138.7	50uL	1	*****		08/25/05 08:41:15 PM
2	139.8	50uL	1	*****		08/25/05 08:43:15 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 139.3



Slope: 2.775
Intercept 0.000
 r^2 0.999923



Control Sample

Sample Name: ICV
Sample ID: TCH019-2
Method: TCH019.tpi
Chk. Result: Control value: 1.55% / Control within range

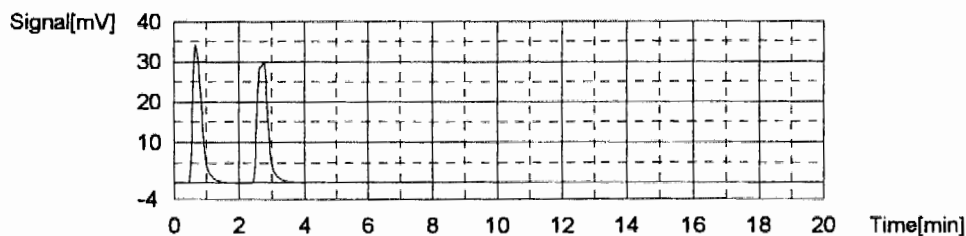
Type	Anal.	Dil.	Result
Control	NPOC	1.000	NPOC:24.57 mg/L

1. Det.

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	67.65	24.38mg/L	50uL	1		TCH019.2005_08_25_19_49_28.cal	08/25/05 08:51:59 PM
2	68.71	24.76mg/L	50uL	1		TCH019.2005_08_25_19_49_28.cal	08/25/05 08:54:12 PM

Mean Area 68.18
Mean Conc. 24.57mg/L



Sample

Sample Name: ICB
Sample ID: TCH019-3
Origin: TCH019.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.4446 mg/L

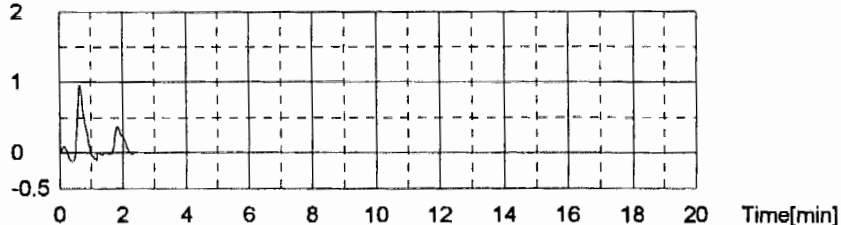
1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1.755	0.6324mg/L	50uL	1		TCH019.2005_08_25_19_49_28.cal	08/25/05 09:01:55 PM
2	0.7126	0.2568mg/L	50uL	1		TCH019.2005_08_25_19_49_28.cal	08/25/05 09:03:14 PM

Mean Area 1.234
Mean Conc. 0.4446mg/L

Signal[mV] 2



Sample

Sample Name: HCO3/CO3
Sample ID: TCH019-4
Origin: TCH019.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.6484 mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1.856	0.6687mg/L	50uL	1		TCH019.2005_08_25_19_49_28.cal	08/25/05 09:10:56 PM
2	1.743	0.6280mg/L	50uL	1		TCH019.2005_08_25_19_49_28.cal	08/25/05 09:12:17 PM

ANALYSIS RUN LOG FOR TOC

SOP: o EMAX-9060 Revision No. 1 o EMAX-415.1 Revision No. 1 o

Book # A62-006

Start Date: 8/25/2005

Time: (4:56)

Ending Date: 8/24/05

Time: (3:38)

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix	Run Time	Notes
* 1	TEH019 -			S		
* 2				W		
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						

ANALYTICAL BATCH * TEH019 ** TEH020W

Instrument No.	62
INITIAL CALIBRATION REFERENCE	
Method File	TEH009
ICAL ID	SW108-01-615
ICV ID	↓ 617
STANDARDS	
ICAL Level	Conc. (mg/L)
S ₀	Nonepure
S ₁	SW108-01-615
S ₂	↓
S ₃	↓
S ₄	↓
S ₅	↓
S ₆	↓
ICV/LCS	SW108-01-617
CCV	↓ 616

Comments:

NPEC Run pH < 2

Analyzed By: *W*

This page is checked during data review.

T + D H132

	Type	Analysis	Sample Name	Sample ID	ObjectID	Origin	Dilutio	Result	Notes
1	Standard	NPOC	ICAL	TCH019-1	OA-123456	C:\Program F	1.000		
2	Control	NPOC	ICV	TCH019-2	OA-123456	C:\Program F	1.000		
3	Unknown	NPOC	ICB	TCH019-3	OA-123456	C:\Program F	1.000		
4	Unknown	NPOC	HCO3/CO3	TCH019-4	OA-123456	C:\Program F	1.000		
5	Unknown	NPOC	TCH019WB	TCH019-5	OA-123456	C:\Program F	1.000		
6	Unknown	NPOC	TCH019WL	TCH019-6	OA-123456	C:\Program F	1.000		
7	Unknown	NPOC	TCH019WC	TCH019-7	OA-123456	C:\Program F	1.000		
8	Unknown	NPOC	05H074-02	TCH019-8	OA-123456	C:\Program F	5.000		
9	Unknown	NPOC	05H074-06	TCH019-9	OA-123456	C:\Program F	5.000		
10	Unknown	NPOC	05H118-01	TCH019-10	OA-123456	C:\Program F	1.000		
11	Unknown	NPOC	05H118-01D	TCH019-11	OA-123456	C:\Program F	1.000		
12	Unknown	NPOC	05H118-01M	TCH019-12	OA-123456	C:\Program F	1.000		
13	Unknown	NPOC	05H132-01	TCH019-13	OA-123456	C:\Program F	1.000		
14	Control	NPOC	CCV1	TCH019-14	OA-123456	C:\Program F	1.000		
15	Unknown	NPOC	CCB1	TCH019-15	OA-123456	C:\Program F	1.000		
16	Unknown	NPOC	05H132-02	TCH019-16	OA-123456	C:\Program F	1.000		
17	Unknown	NPOC	05H132-03	TCH019-17	OA-123456	C:\Program F	1.000		
18	Unknown	NPOC	05H132-04	TCH019-18	OA-123456	C:\Program F	1.000		
19	Unknown	NPOC	05H132-05	TCH019-19	OA-123456	C:\Program F	1.000		
20	Unknown	NPOC	05H150-01	TCH019-20	OA-123456	C:\Program F	1.000		
21	Unknown	NPOC	05H150-02	TCH019-21	OA-123456	C:\Program F	1.000		
22	Unknown	NPOC	05H150-03	TCH019-22	OA-123456	C:\Program F	1.000		
23	Unknown	NPOC	05H150-04	TCH019-23	OA-123456	C:\Program F	1.000		
24	Unknown	NPOC	05H150-05	TCH019-24	OA-123456	C:\Program F	1.000		
25	Unknown	NPOC	05H150-06	TCH019-25	OA-123456	C:\Program F	1.000		
26	Control	NPOC	CCV2	TCH019-26	OA-123456	C:\Program F	1.000		
27	Unknown	NPOC	CCB2	TCH019-27	OA-123456	C:\Program F	1.000		
28	Unknown	NPOC	05H150-07	TCH019-28	OA-123456	C:\Program F	1.000		
29	Unknown	NPOC	05H150-08	TCH019-29	OA-123456	C:\Program F	1.000		
30	Unknown	NPOC	05H150-10	TCH019-30	OA-123456	C:\Program F	1.000		
31	Unknown	NPOC	RINSE	TCH019-31	OA-123456	C:\Program F	1.000		
32	Unknown	NPOC	TCH020WB	TCH019-32	OA-123456	C:\Program F	1.000		
33	Unknown	NPOC	TCH020WL	TCH019-33	OA-123456	C:\Program F	1.000		
34	Unknown	NPOC	TCH020WC	TCH019-34	OA-123456	C:\Program F	1.000		
35	Unknown	NPOC	05H132-01	TCH019-35	OA-123456	C:\Program F	1.000		
36	Unknown	NPOC	05H132-02	TCH019-36	OA-123456	C:\Program F	1.000		
37	Unknown	NPOC	05H132-03	TCH019-37	OA-123456	C:\Program F	1.000		
38	Unknown	NPOC	05H132-04	TCH019-38	OA-123456	C:\Program F	1.000		
39	Unknown	NPOC	05H132-05	TCH019-39	OA-123456	C:\Program F	1.000		
40	Unknown	NPOC	05H163-01	TCH019-40	OA-123456	C:\Program F	1.000		
41	Control	NPOC	CCV3	TCH019-41	OA-123456	C:\Program F	1.000		
42	Unknown	NPOC	CCB3	TCH019-42	OA-123456	C:\Program F	1.000		
43	Unknown	NPOC	05H163-02	TCH019-43	OA-123456	C:\Program F	1.000		
44	Unknown	NPOC	05H163-03	TCH019-44	OA-123456	C:\Program F	1.000		
45	Unknown	NPOC	05H163-04	TCH019-45	OA-123456	C:\Program F	1.000		
46	Unknown	NPOC	05H176-01	TCH019-46	OA-123456	C:\Program F	1.000		
47	Unknown	NPOC	05H176-02	TCH019-47	OA-123456	C:\Program F	1.000		
48	Unknown	NPOC	05H176-03	TCH019-48	OA-123456	C:\Program F	1.000		
49	Unknown	NPOC	05H176-04	TCH019-49	OA-123456	C:\Program F	1.000		
50	Unknown	NPOC	05H133-01	TCH019-50	OA-123456	C:\Program F	1.000		
51	Unknown	NPOC	05H133-03	TCH019-51	OA-123456	C:\Program F	1.000		
52	Unknown	NPOC	05H133-03D	TCH019-52	OA-123456	C:\Program F	1.000		
53	Control	NPOC	CCV4	TCH019-53	OA-123456	C:\Program F	1.000		
54	Unknown	NPOC	CCB4	TCH019-54	OA-123456	C:\Program F	1.000		
55	Unknown	NPOC	05H133-03M	TCH019-55	OA-123456	C:\Program F	1.000		
56	Control	NPOC	CCV5	TCH019-56	OA-123456	C:\Program F	1.000		
57	Unknown	NPOC	CCB5	TCH019-57	OA-123456	C:\Program F	1.000		
58									
59									
60									
61									
62									
63									
64									
65									
66									

Handwritten signature and date:
 8/25/05

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PROJECT: JPL

SDG: 05H132

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** - Not Requested



1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889
Fax: (310) 618-0818

Date: 09-26-2005
EMAX Batch No.: 05H132

Attn: Tien Shiao

Battelle Memorial Institute
505 King Ave.
Columbus OH 43201

Subject: Laboratory Report
Project: JPL

Enclosed is the Laboratory report for samples received on 08/16/05.
The data reported include :

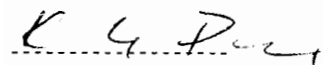
Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
MW-17-5	H132-01	08/15/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-17-4	H132-02	08/15/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N

Sample ID	Control #	Col Date	Matrix	Analysis
MW-17-3	H132-03	08/15/05	WATER	SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-17-2	H132-04	08/15/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-17-1	H132-05	08/15/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,



Kam Y. Pang, Ph.D.
Laboratory Director

1001

[illegible]
$$T_1 = 2.8^\circ\text{C}$$

Hanh Bui

From: Shiao, Tien [shiaoh@BATTELLE.ORG]
Sent: Tuesday, August 16, 2005 1:25 PM
To: Hanh Bui
Cc: Conner, David J
Subject: RE: COC for samples receive 8/16 SDG: 05H132 (Battelle/JPL)

Hanh,

You're right. Instead of two sulfides, there should be one sulfide and one sulfate on the COC. Please change the COC accordingly and thanks for checking.

Also, please let me know when we will be receiving the results for MW-21 (Screens 1 through 5 + duplicate) (samples were collected on 07/26) and MW-20 (Screens 1 through 5) (samples were collected on 08/01). With a 14 day TAT, we should receive the results any day now.

Thanks,
Tien

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Tuesday, August 16, 2005 4:07 PM
To: Shiao, Tien
Subject: COC for samples receive 8/16 SDG: 05H132 (Battelle/JPL)

Hi Tien,
Just confirm with you that COC indicated sulfide twice. I think Anions included sulfate/nitrate/nitrite/chloride.
Thanks
Hanh

1003

8/16/2005

Type of Delivery	Delivered By/Airbill	ECN	05H132
<input checked="" type="checkbox"/> EMAX Courier		Receipient	SITNIKOV
<input type="checkbox"/> Client Delivery		Date	8-16-05
<input type="checkbox"/> Third Party		Time	09:20

COC Inspection		
<input checked="" type="checkbox"/> Client Name	<input checked="" type="checkbox"/> Sampler Name	<input checked="" type="checkbox"/> Sampling Date/Time/Location
<input checked="" type="checkbox"/> Address	<input checked="" type="checkbox"/> Courier Signature/Date/Time	<input checked="" type="checkbox"/> Analysis Required
<input type="checkbox"/> Client PM/FC	<input checked="" type="checkbox"/> TAT	<input type="checkbox"/> Matrix
<input checked="" type="checkbox"/> Tel #/Fax #	<input checked="" type="checkbox"/> Sample ID	<input checked="" type="checkbox"/> Preservative (if any)
Safety Issues <input checked="" type="checkbox"/> None	<input type="checkbox"/> High Concentrations expected	<input type="checkbox"/> Superfund Site Samples
Comments: <input type="checkbox"/> Rad Screening Required		

[illegible]

PM 6:30 Pm
Date 8/11/15

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

METHOD 200.7
METALS BY ICP-AES

SDG#: 05H132

7000

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H132**

METHOD 200.7 METALS BY ICP-AES

Five (5) water samples were received on 08/16/05 for Metals analysis by Method 200.7 in accordance with "Methods for Chemical Analysis of Water and Wastes", EPA 600/R-94-111-May 1994.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample H132-01 was analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
METALS BY ICP-AES

SDG NO. : 05H132
Instrument ID : T-107

Client : BATTILLE MEMORIAL INSTITUTE
Project : JPL

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	WATER		Extraction Date/Time	Sample Data FN	Calibration Prep.		Notes
									Data FN	Batch	
MBLK1W	IPH044WB	1	NA	08/19/0517:10			08/17/0514:00	107H050012	107H050010	IPH044W	Method Blank
LCS1W	IPH044WL	1	NA	08/19/0517:14			08/17/0514:00	107H050013	107H050010	IPH044W	Lab Control Sample (LCS)
LCD1W	IPH044WC	1	NA	08/19/0517:18			08/17/0514:00	107H050014	107H050010	IPH044W	LCS Duplicate
MW-17-5AS	H132-01A	1	NA	08/19/0517:23			08/17/0514:00	107H050015	107H050010	IPH044W	Analytical Spike Sample
MW-17-5	H132-01	1	NA	08/19/0517:27			08/17/0514:00	107H050016	107H050010	IPH044W	Field Sample
MW-17-5DL	H132-01T	5	NA	08/19/0517:31			08/17/0514:00	107H050017	107H050010	IPH044W	Diluted Sample
MW-17-4	H132-02	1	NA	08/19/0517:35			08/17/0514:00	107H050018	107H050010	IPH044W	Field Sample
MW-17-3	H132-03	1	NA	08/19/0517:39			08/17/0514:00	107H050019	107H050010	IPH044W	Field Sample
MW-17-2	H132-04	1	NA	08/19/0517:43			08/17/0514:00	107H050020	107H050010	IPH044W	Field Sample
MW-17-1	H132-05	1	NA	08/19/0517:46			08/17/0514:00	107H050021	107H050010	IPH044W	Field Sample

FN - Filename
% Moist - Percent Moisture

7002

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 08/15/05
Project     : JPL                         Date Received: 08/16/05
SDG NO.     : 05H132                     Date Extracted: 08/17/05 14:00
Sample ID   : MW-17-5                    Date Analyzed: 08/19/05 17:27
Lab Samp ID : H132-01                    Dilution Factor: 1
Lab File ID : I07H050016                 Matrix          : WATER
Ext Btch ID : IPH044W                    % Moisture       : NA
Calib. Ref. : I07H050010                 Instrument ID    : EMAXTI07
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	65.7	1	.1
Iron	63	.2	.04
Magnesium	23.5	1	.1
Potassium	5.05	2	1.4
Sodium	59.8	1	.25

7002A

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 08/15/05
Project     : JPL                          Date Received: 08/16/05
SDG NO.     : 05H132                      Date Extracted: 08/17/05 14:00
Sample ID:  MW-17-4                       Date Analyzed: 08/19/05 17:35
Lab Samp ID: H132-02                     Dilution Factor: 1
Lab File ID: I07H050018                  Matrix       : WATER
Ext Btch ID: IPH044W                     % Moisture    : NA
Calib. Ref.: I07H050010                  Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	18.1	1	.1
Iron	ND	.2	.04
Magnesium	4.82	1	.1
Potassium	2.41	2	1.4
Sodium	46.9	1	.25

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 08/15/05
Project     : JPL                         Date Received: 08/16/05
SDG NO.     : 05H132                     Date Extracted: 08/17/05 14:00
Sample ID   : MW-17-3                     Date Analyzed: 08/19/05 17:39
Lab Samp ID : H132-03                     Dilution Factor: 1
Lab File ID : I07H050019                  Matrix          : WATER
Ext Btch ID : IPH044W                     % Moisture       : NA
Calib. Ref. : I07H050010                  Instrument ID    : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	73.6	1	.1
Iron	1.62	.2	.04
Magnesium	30	1	.1
Potassium	ND	2	1.4
Sodium	25.6	1	.25

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE      Date Collected: 08/15/05
Project     : JPL                             Date Received: 08/16/05
SDG NO.     : 05H132                         Date Extracted: 08/17/05 14:00
Sample ID   : MW-17-2                       Date Analyzed: 08/19/05 17:43
Lab Samp ID : H132-04                       Dilution Factor: 1
Lab File ID : I07H050020                    Matrix       : WATER
Ext Btch ID : IPH044W                       % Moisture    : NA
Calib. Ref. : I07H050010                    Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	106	1	.1
Iron	.292	.2	.04
Magnesium	36.6	1	.1
Potassium	3.82	2	1.4
Sodium	24.5	1	.25

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 08/15/05
Project     : JPL                         Date Received: 08/16/05
SDG NO.    : 05H132                     Date Extracted: 08/17/05 14:00
Sample ID: MW-17-1                     Date Analyzed: 08/19/05 17:46
Lab Samp ID: H132-05                   Dilution Factor: 1
Lab File ID: I07H050021                 Matrix      : WATER
Ext Btch ID: IPH044W                   % Moisture   : NA
Calib. Ref.: I07H050010                 Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	35.5	1	.1
Iron	ND	.2	.04
Magnesium	11.6	1	.1
Potassium	ND	2	1.4
Sodium	14.4	1	.25

METHOD 200.7
METALS BY ICP-AES

=====

Client	: BATTELLE MEMORIAL INSTITUTE	Date Collected:	NA
Project	: JPL	Date Received:	08/17/05
SDG NO.	: 05H132	Date Extracted:	08/17/05 14:00
Sample ID:	MBLK1W	Date Analyzed:	08/19/05 17:10
Lab Samp ID:	IPH044WB	Dilution Factor:	1
Lab File ID:	I07H050012	Matrix	: WATER
Ext Btch ID:	IPH044W	% Moisture	: NA
Calib. Ref.:	I07H050010	Instrument ID	: EMAXTI07

=====

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
-----	-----	-----	-----
Calcium	ND	1	.1
Iron	ND	.2	.04
Magnesium	ND	1	.1
Potassium	ND	2	1.4
Sodium	ND	1	.25

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05H132
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILT N FACTR: 1 1 1
SAMPLE ID: MBLK1W
CONTROL NO.: IPH044WB IPH044WL IPH044WC
LAB FILE ID: I07H050012 I07H050013 I07H050014
DATE TIME EXTRCTD: 08/17/0514:00 08/17/0514:00 08/17/0514:00 DATE COLLECTED: NA
DATE TIME ANALYZD: 08/19/0517:10 08/19/0517:14 08/19/0517:18 DATE RECEIVED: 08/17/05
PREP. BATCH: IPH044W IPH044W IPH044W
CALIB. REF: I07H050010 I07H050010 I07H050010

ACCESSION:

PARAMETER	BLNK RSLT mg/L	SPIKE AMT mg/L	BS RSLT mg/L	BS % REC	SPIKE AMT mg/L	BSD RSLT mg/L	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	ND	50	50.5	101	50	51.8	104	3	85-115	20
Iron	ND	10	10.6	106	10	10.8	108	2	85-115	20
Magnesium	ND	50	51.1	102	50	52.5	105	3	85-115	20
Potassium	ND	50	50	100	50	50.6	101	1	85-115	20
Sodium	ND	50	51	102	50	52.7	105	3	85-115	20

EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H132
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 5
SAMPLE ID: MW-17-5 MW-17-5DL
EMAX SAMP ID: H132-01 H132-01T
LAB FILE ID: I07H050016 I07H050017
DATE EXTRACTED: 08/17/0514:00 08/17/0514:00 DATE COLLECTED: 08/15/05
DATE ANALYZED: 08/19/0517:27 08/19/0517:31 DATE RECEIVED: 08/16/05
PREP. BATCH: IPH044W IPH044W
CALIB. REF: I07H050010 I07H050010

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SERIAL DIL RSLT (mg/L)	DIF RSLT %	QC LIMIT (%)
Calcium	65.7	62.6	5	10
Iron	63	60.9	3	10
Magnesium	23.5	22.3	5	10
Potassium	5.05	ND	NA	10
Sodium	59.8	57.9	3	10

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05H132
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILTN FACTR: 1 1
SAMPLE ID: MW-17-5
CONTROL NO.: H132-01 H132-01A
LAB FILE ID: I07H050016 I07H050015
DATIME EXTRACTD: 08/17/0514:00 08/17/0514:00 DATE COLLECTED: 08/15/05
DATIME ANALYZD: 08/19/0517:27 08/19/0517:23 DATE RECEIVED: 08/16/05
PREP. BATCH: IPH044W IPH044W
CALIB. REF: I07H050010 I07H050010

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	AS RSLT (mg/L)	AS % REC	QC LIMIT (%)
Calcium	65.7	50	113	94	85-115
Iron	63	10	70	70*	85-115
Magnesium	23.5	50	72.2	97	85-115
Potassium	5.05	50	53.3	97	85-115
Sodium	59.8	50	107	94	85-115

REGULAR ICP QC CHECK TABLE

QC Limit% Comp	ICV HIGH 95-105 mg/L	ICV 90-110 mg/L	CCV 90-110 mg/L	ICSAB 80-120 mg/L	ICSA 80-120 mg/L
Al	10	5	5	500	500
Sb	2	1	1	1	0
As	2	1	1	1	0
Ba	2	1	1	0.5	0
Be	2	1	1	0.5	0
B	2	1	1	0.5	0
Cd	2	1	1	1	0
Ca	100	50	50	500	500
Cr	2	1	1	0.5	0
Co	2	1	1	0.5	0
Cu	2	1	1	0.5	0
Fe	10	5	5	200	200
Pb	2	1	1	1	0
Mg	100	50	50	500	500
Mn	2	1	1	0.5	0
Mo	2	1	1	1	0
Ni	2	1	1	1	0
K	100	50	50	50	0
Se	2	1	1	3.6	0
Ag	2	1	1	1	0
Na	100	50	50	10	0
Sr	2	1	1	0.5	0
Tl	2	1	1	3.6	0
Sn	10	5	5	1	0
Ti	2	1	1	1	0
V	2	1	1	0.5	0
Zn	2	1	1	1	0

ANALYSIS RUN LOG FOR ICP

SOP ☐ EMAX-6010-Rev. 3 ☐ EMAX-CLP-TAL ☒ 800.7 Method File: 6010B2 Autosampler Table: 1CP
 Matrix: WATER Start Date: 8/19/05 Time: 16:22 End Date: 8/19/05 Time: 18:14 Book# A24 -038

Data File Name	Prep. Batch	Lab Sample ID	DF	Matrix	Notes	Data File Name	Prep. Batch	Lab Sample ID	DF	Matrix	Notes	Instrument No.	ID
01		SC				26		00V2	1	W		S0	SMIB.09.38.01
02		SB				27		00B2	1	W		S1	NA
03		SB				28						S2	NA
04		ICV				29						S3	SMIB.09.44.04
05		ICB				30						S4	NA
06		ICV				31						S5	NA
07		ICB				32						S6	SMIB.09.45.02
08		ICGAI				33						ICV	↓ 09.69.02
09		ICGAB				34						ICVH1	NA
10		ICV				35						ICVH2	NA
11		ICB				36						CCV	SMIB.09.60.02
12	PH04W	PH04WB	1	W		37						ICSA	↓ 09.63.03
13		W2	1			38						ICSAB	↓ 09.60.01
14		W2	1			39						MRL	NA
15		W2	1			40							
16		W2	1			41							
17		W2	1			42							
18		W2	1			43							
19		W2	1			44							
20		W2	1			45							
21		W2	1			46							
22		W2	1			47							
23		W2	1			48							
24		W2	1			49							
25		W2	1			50							

ANALYTICAL BATCH * 1074050

ANALYTICAL BATCH * 7012

Comments: OK

Analyzed By: 12

Date Disposed:

This page is checked during data review.

SEQUENCE FILE : I07H050

4-18	19-33	34-43	44-53	54-63
LFID	LSID	TIME	DATE	DF
I07H050001	S0	16:22	08/19/05	1
I07H050002	S3	16:26	08/19/05	1
I07H050003	S6	16:30	08/19/05	1
I07H050004	ICV	16:34	08/19/05	1
I07H050005	ICB	16:39	08/19/05	1
I07H050006	CCV	16:43	08/19/05	1
I07H050007	CCB	16:48	08/19/05	1
I07H050008	ICSAI	16:52	08/19/05	1
I07H050009	ICSAB1	16:56	08/19/05	1
I07H050010	CCV1	17:01	08/19/05	1
I07H050011	CCB1	17:06	08/19/05	1
I07H050012	IPH044MB	17:10	08/19/05	1
I07H050013	IPH044WL	17:14	08/19/05	1
I07H050014	IPH044WC	17:18	08/19/05	1
I07H050015	H132-01A	17:23	08/19/05	1
I07H050016	H132-01	17:27	08/19/05	1
I07H050017	H132-01T	17:31	08/19/05	5
I07H050018	H132-02	17:35	08/19/05	1
I07H050019	H132-03	17:39	08/19/05	1
I07H050020	H132-04	17:43	08/19/05	1
I07H050021	H132-05	17:46	08/19/05	1
I07H050022	CCV2	17:52	08/19/05	1
I07H050023	CCB2	17:57	08/19/05	1
I07H050024	ICSAF	18:01	08/19/05	1
I07H050025	ICSABF	18:05	08/19/05	1
I07H050026	CCV3	18:10	08/19/05	1
I07H050027	CCB3	18:14	08/19/05	1

SDG : 05H132

UNIT : %

ICP CHECK : 107H050

DATE : 08/19/05

INST : EMAXT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
SQ	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICV	100	101	104	96	100	102	96	101	97	97	97	103	96	102	97	97	96	99	99	96	101	96	98	97	100	98	98
ICB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV	99	102	102	97	98	99	99	103	99	98	97	103	99	100	98	99	97	99	102	98	101	97	98	98	98	98	100
CCB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA1	96	...	...	...	...	...	...	93	...	...	...	91	...	98	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA81	94	86	104	91	91	92	88	89	84	83	94	88	91	95	87	86	83	97	104	93	103	88	90	80	89	94	91
CCV1	99	99	98	96	96	97	97	99	96	97	96	101	97	98	96	97	95	99	102	97	101	96	94	95	97	96	98
CCB1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH044WB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH044WL	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH044WC	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
HL32-01A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
HL32-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
HL32-01T	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
HL32-02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
HL32-03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
HL32-04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
HL32-05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV2	96	97	103	92	95	95	98	101	97	98	93	101	97	97	96	99	95	94	107	95	95	93	92	98	95	96	100
CCB2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAF	93	...	...	...	...	...	...	93	...	...	...	90	...	96	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA8F	93	90	108	88	91	92	91	93	88	87	91	90	95	95	89	89	84	93	106	93	101	86	95	88	88	95	96
CCV3	97	100	101	93	95	94	99	101	98	98	94	101	100	98	96	98	96	96	103	96	97	93	98	99	95	96	100
CCB3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

QC limit of each parameter are listed in a table attached next to all the ICP check forms
 * : Out of QC Limit

7014

DIGESTION LOG FOR ICP METALS

SOP ☐ EMAX-3005 Rev. No. 3 ☐ EMAX-3010 Rev. No. 2 ☐ EMAX-3050 Rev. No. 2 ☐ EMAX-CLP-TAL ☒ 200.7

Book # EIP-047

Matrix: WATER Start Date: 8-17-05 Time: 14:00 Temp: 85 °C Ending Date: 8-17-05 Time: 16:00 Temp: 85 °C

Sample Prep ID	Lab Sample ID	Matrix Description		Turbidity <1 NTU	Sample Amount (g/ml)	pH	Extract Volume (ml)	Digestate Description	Standards	ID	Amount Added (ml)	
		Color	Artifacts									
01	IPH044-WB				50	-	50		LCS-1	SMIA-09-42	0.5	
02	-WL				50	-	50		LCS-2	SMIA-09-43	0.5	
03	-WL				50	-	50		LCS-3	SMIA-09-44	0.5	
04	H132-01				50	4.2	50		MS			
05	-02				50		50		Reagent			
06	-03				50		50		HNO ₃	SWIA-03-120	0.5	
07	-04				50		50		HCl	SWIA-03-115	0.25	
08	-05				50		50		H ₂ O ₂	NIA		
09									HNO ₃ (1:1)	NIA		
10									Digestate Location	ICP LAB		
11									Extract Location			
12									Legend:			
13									Texture	Cs = Coarse	Md = Medium	Fn = Fine
14									Clarity	Cr = Clear	Cy = Cloudy	Td = Turbid
15									Artifacts	Rk = rocks	Sl = Shale	Vg = Vegetation
16									Color	Bu = blue	Bk = Black	Bn = Brown
17										Gn = Green	Og = Orange	Rd = Red
18										Yw = Yellow	Cl = Colorless	

Comments: Samples for Methods 200.7 or 200.8 Analyses

If turbidity ≤ 1 NTU no digestion is required unless otherwise required by the project

Prepared By: mcStandard Added By: mcWitnessed By: A2Extracts Recd. By: A2 8-17-05Checked By: A2

Date Disposed:

Disposed by:

TABLE OF CONTENTS

CLIENT: **BATTELLE MEMORIAL INSTITUTE**
PROJECT: **JPL**
SDG: **05H213**

SECTION		PAGE
Cover Letter, COC/Sample Receipt Form		1000 – 1005
GC/MS-VOA	**	2000 –
GC/MS-SVOA	**	3000 –
GC-VOA	**	4000 –
GC-SVOA	**	5000 –
HPLC	**	6000 –
METALS	METHOD 200.7	7000 – 7013
WET	METHOD 300.0	8000 – 8022
	METHOD 160.1	8023 – 8028
	METHOD 376.1	8029 – 8033
OTHERS	**	9000 –

** - Not Requested



1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889
Fax: (310) 618-0818

Date: 09-06-2005
EMAX Batch No.: 05H213

Attn: Tien Shiao

Battelle Memorial Institute
505 King Ave.
Columbus OH 43201

Subject: Laboratory Report
Project: JPL

Enclosed is the Laboratory report for samples received on 08/23/05.
The data reported include :

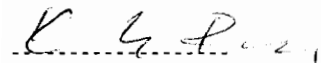
Sample ID	Control #	Col Date	Matrix	Analysis
MW-20-1	H213-01	08/22/05	WATER	METALS IN WATER & WASTE
MW-25-5	H213-02	08/22/05	WATER	NITRATE-N BY IC
MW-25-4	H213-03	08/22/05	WATER	NITRATE-N BY IC
MW-25-3	H213-04	08/22/05	WATER	NITRATE-N BY IC
MW-25-2	H213-05	08/22/05	WATER	NITRATE-N BY IC
MW-25-1	H213-06	08/22/05	WATER	NITRATE-N BY IC
MW-21-5	H213-07	08/22/05	WATER	SULFIDE SOLIDS TOTAL DISSOLVED NITRATE-N BY IC NITRITE-N BY IC
MW-21-4	H213-08	08/22/05	WATER	SULFIDE SOLIDS TOTAL DISSOLVED NITRATE-N BY IC NITRITE-N BY IC
MW-21-3	H213-09	08/22/05	WATER	SULFIDE SOLIDS TOTAL DISSOLVED NITRATE-N BY IC NITRITE-N BY IC
DUPE-1-8/22/05	H213-10	08/22/05	WATER	SULFIDE

Sample ID -----	Control # -----	Col Date -----	Matrix -----	Analysis -----
				SOLIDS TOTAL DISSOLVED NITRATE-N BY IC NITRITE-N BY IC
MW-21-2	H213-11	08/22/05	WATER	SULFIDE SOLIDS TOTAL DISSOLVED NITRATE-N BY IC NITRITE-N BY IC
MW-21-1	H213-12	08/22/05	WATER	SULFIDE SOLIDS TOTAL DISSOLVED NITRATE-N BY IC NITRITE-N BY IC

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,



Kam Y. Pang, Ph.D.
Laboratory Director

A5

05 H213

Proj. No.	Project Title	SAMPLE I.D.		SAMPLE TYPE (✓)		Container No.	Number of Containers	Remarks
DATE	TIME							
648611-73	Source Determination Study							PO# 191943
SAMPLERS: (Signature) <i>D. Gerner</i>								
1. 8/22/05	0745	MW-20-1						
2. 8/22/05	0850	MW-25-5						
3. 8/22/05	0918	MW-25-4						
4. 8/22/05	0936	MW-25-3						
5. 8/22/05	0952	MW-25-2						
6. 8/22/05	1015	MW-25-1						
7. 8/22/05	1113	MW-21-5						
8. 8/22/05	1130	MW-21-4						
9. 8/22/05	1154	MW-21-3						
10. 8/22/05	1154	DVPE-1-8/22/05						
11. 8/22/05	1207	MW-21-2						
12. 8/22/05	1221	MW-21-1						
Relinquished by: (Signature) <i>[Signature]</i> Date/Time 8-23-05 0800 Received by: (Signature) <i>Phil Hatten</i>								
Relinquished by: (Signature) <i>[Signature]</i> Date/Time 8-23-05 915 Received by: (Signature)								
Relinquished by: (Signature) <i>[Signature]</i> Date/Time Received for Laboratory by: (Signature)								
Remarks TO: EMAX T=2.8°C								

Hanh Bui

From: Shiao, Tien [shiaoh@BATTELLE.ORG]
Sent: Wednesday, August 24, 2005 11:33 AM
To: Hanh Bui
Cc: Ohart, Carolyn J
Subject: FW: COC SDG: 05H213 (Battelle/JPL)

Hi Hanh,

I reviewed the COCs and they look correct. And yes, nitrate will be the only parameter re-sampled for MW-25.

Sorry for the late reply.

Thanks,
Tien

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Tuesday, August 23, 2005 4:57 PM
To: Shiao, Tien
Subject: COC SDG: 05H213 (Battelle/JPL)

Hi Tien,
Here is the COC for samples receive today, Nitrate only for MW-25 samples? thanks.
Hanh

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

METHOD 200.7
METALS BY ICP-AES

SDG#: 05H213

7000

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H213**

METHOD 200.7 METALS BY ICP-AES

One (1) water sample was received on 08/23/05 for Metals analysis by Method 200.7 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample H213-01 was analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

6. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
METALS BY ICP-AES

Client : BAITELLE MEMORIAL INSTITUTE
Project : JPL
SDG NO. : 05H213
Instrument ID : T-107

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	WATER		Extraction DateTime	Sample Data FN	Calibration Prep.		Notes
									Data FN	Batch	
MALK1W	IPH056MB	1	NA	09/01/0519:55			08/24/0513:35	1071003023	1071003021	IPH056W	Method Blank
LCS1W	IPH056WL	1	NA	09/01/0519:59			08/24/0513:35	1071003024	1071003021	IPH056W	Lab Control Sample (LCS)
LCD1W	IPH056WC	1	NA	09/01/0520:03			08/24/0513:35	1071003025	1071003021	IPH056W	LCS Duplicate
MW-20-1AS	H213-01A	1	NA	09/01/0520:07			08/24/0513:35	1071003026	1071003021	IPH056W	Analytical Spike Sample
MW-20-1	H213-01	1	NA	09/01/0520:13			08/24/0513:35	1071003027	1071003021	IPH056W	Field Sample
MW-20-1DL	H213-01T	5	NA	09/01/0520:17			08/24/0513:35	1071003028	1071003021	IPH056W	Diluted Sample

FN - Filename
% Moist - Percent Moisture

7002

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 08/22/05
Project     : JPL                         Date Received: 08/23/05
SDG NO.     : 05H213                     Date Extracted: 08/24/05 13:35
Sample ID   : MW-20-1                    Date Analyzed: 09/01/05 20:13
Lab Samp ID : H213-01                     Dilution Factor: 1
Lab File ID : I07I003027                  Matrix       : WATER
Ext Btch ID : IPH056W                     % Moisture    : NA
Calib. Ref. : I07I003021                  Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	82.3	1	.1
Iron	ND	.2	.04
Magnesium	26.3	1	.1
Potassium	2.72	2	1.4
Sodium	20	1	.25

7003

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE      Date Collected: NA
Project     : JPL                             Date Received: 08/24/05
SDG NO.     : 05H213                         Date Extracted: 08/24/05 13:35
Sample ID   : MBLK1W                         Date Analyzed: 09/01/05 19:55
Lab Samp ID : IPH056WB                       Dilution Factor: 1
Lab File ID : I07I003023                     Matrix       : WATER
Ext Btch ID : IPH056W                       % Moisture    : NA
Calib. Ref.: I07I003021                     Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
-----	-----	-----	-----
Calcium	ND	1	.1
Iron	ND	.2	.04
Magnesium	ND	1	.1
Potassium	ND	2	1.4
Sodium	ND	1	.25

7004

21

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05H213
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILTN FACTR: 1 1 1
SAMPLE ID: MBLK1W
CONTROL NO.: IPH056WB IPH056WL IPH056WC
LAB FILE ID: I071003023 I071003024 I071003025
DATIME EXTRACTD: 08/24/0513:35 08/24/0513:35 08/24/0513:35 DATE COLLECTED: NA
DATIME ANALYZD: 09/01/0519:55 09/01/0519:59 09/01/0520:03 DATE RECEIVED: 08/24/05
PREP. BATCH: IPH056W IPH056W IPH056W
CALIB. REF: I071003021 I071003021 I071003021

ACCESSION:

PARAMETER	BLNK RSLT mg/L	SPIKE AMT mg/L	BS RSLT mg/L	BS % REC	SPIKE AMT mg/L	BSD RSLT mg/L	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	ND	50	49.5	99	50	49.9	100	1	85-115	20
Iron	ND	10	10.1	101	10	9.99	100	1	85-115	20
Magnesium	ND	50	48.8	98	50	49.5	99	1	85-115	20
Potassium	ND	50	49.8	100	50	51.2	102	3	85-115	20
Sodium	ND	50	48.6	97	50	49.6	99	2	85-115	20

7005

EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H213
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 5
SAMPLE ID: MW-20-1 MW-20-1DL
EMAX SAMP ID: H213-01 H213-01T
LAB FILE ID: I071003027 I071003028
DATE EXTRACTED: 08/24/0513:35 08/24/0513:35 DATE COLLECTED: 08/22/05
DATE ANALYZED: 09/01/0520:13 09/01/0520:17 DATE RECEIVED: 08/23/05
PREP. BATCH: IPH056W IPH056W
CALIB. REF: I071003021 I071003021

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SERIAL DIL RSLT (mg/L)	DIF RSLT %	QC LIMIT (%)
Calcium	82.3	78.9	4	10
Iron	ND	ND	0	10
Magnesium	26.3	25.1	5	10
Potassium	2.72	ND	NA	10
Sodium	20	20.3	1	10

7006

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05H213
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILTN FACTR: 1 1
SAMPLE ID: MW-20-1
CONTROL NO.: H213-01 H213-01A
LAB FILE ID: I071003027 I071003026
DATIME EXTRCTD: 08/24/0513:35 08/24/0513:35 DATE COLLECTED: 08/22/05
DATIME ANALYZD: 09/01/0520:13 09/01/0520:07 DATE RECEIVED: 08/23/05
PREP. BATCH: IPH056W IPH056W
CALIB. REF: I071003021 I071003021

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	AS RSLT (mg/L)	AS % REC	QC LIMIT (%)
Calcium	82.3	50	127	89	85-115
Iron	ND	10	9.78	98	85-115
Magnesium	26.3	50	73.2	94	85-115
Potassium	2.72	50	52.8	100	85-115
Sodium	20	50	67.4	95	85-115

7007

REGULAR ICP QC CHECK TABLE

QC Limit%	ICV HIGH 95-105 mg/L	ICV 90-110 mg/L	CCV 90-110 mg/L	ICSAB 80-120 mg/L	ICSA 80-120 mg/L
Comp					
Al	10	5	5	500	500
Sb	2	1	1	1	0
As	2	1	1	1	0
Ba	2	1	1	0.5	0
Be	2	1	1	0.5	0
B	2	1	1	0.5	0
Cd	2	1	1	1	0
Ca	100	50	50	500	500
Cr	2	1	1	0.5	0
Co	2	1	1	0.5	0
Cu	2	1	1	0.5	0
Fe	10	5	5	200	200
Pb	2	1	1	1	0
Mg	100	50	50	500	500
Mn	2	1	1	0.5	0
Mo	2	1	1	1	0
Ni	2	1	1	1	0
K	100	50	50	50	0
Se	2	1	1	3.6	0
Ag	2	1	1	1	0
Na	100	50	50	10	0
Sr	2	1	1	0.5	0
Tl	2	1	1	3.6	0
Sn	10	5	5	1	0
Ti	2	1	1	1	0
V	2	1	1	0.5	0
Zn	2	1	1	1	0

ANALYSIS RUN LOG FOR ICP

SOP ☒ EMAX-6010-Rev. 3 ☐ EMAX-CLP-TAL ☐

Method File:

Autosampler Table:

Book# A24 -038

Matrix: WATER Start Date: 9/1/05 Time: 18:21 End Date: 9/1/05 Time: 20:26

Data File Name	Prep. Batch	Lab Sample ID	DF	Matrix	Notes	Data File Name	Prep. Batch	Lab Sample ID	DF	Matrix	Notes	Instrument No.	ID
01		50				26	1PH050W	4273-01A	1	W		S ₀	SIM14209.77.05
02		51				27		01	1			S ₁	NA
03		52				28		01T	5			S ₂	NA
04		10V (GCS)				29	105AT		1			S ₃	SIM14109.44.04
05		10D				30	105AT		1			S ₄	NA
06		CCV (17C)				31	CCV (17C)		1			S ₅	NA
07		CCV				32	CCV		1			S ₆	SIM14109.45.02
08		105A1				33						ICV(GCS)	↓ 09.09-02
09		105A11				34						ICVH1	NA
10		CCV (17C)				35						ICVH2	NA
11		CCV				36						CCV(17C)	SIM14109.00.02
12	1P11076W	1P11076WB	1	W	LRD	37						ICSA	↓ 09.09-09
13		WV	1		LFB	38						ICSAB	↓ 09.00-01
14		WC	1		LFB	39						MRL	NA
15		H870-01A	1	*		40							
16		01	1			41							
17		01T	5			42							
18		02	1			43							
19		03	1			44							
20		04	1			45							
21		CCV2 (17C)	1			46							
22		CCV2	1			47							
23	1P11050W	1P11050WB	1		LRD	48							
24		WV	1		LFB	49							
25		WC	1		LFB	50							

ANALYTICAL BATCH* 1071003

7009

Comments:

* NOT SPIKED ; FOR
CERTIFICATION

OK

Analyzed By:

AUL

Date Disposed:

This page is checked during data review.

SEQUENCE FILE : 1071003

4-18	19-33	34-43	44-53	54-63
LFID	LSID	TIME	DATE	DF
1071003001	S0	18:21	09/01/05	1
1071003002	S3	18:25	09/01/05	1
1071003003	S6	18:29	09/01/05	1
1071003004	ICV	18:33	09/01/05	1
1071003005	ICB	18:39	09/01/05	1
1071003006	CCV	18:43	09/01/05	1
1071003007	CCB	18:47	09/01/05	1
1071003008	ICSAI	18:51	09/01/05	1
1071003009	ICSAB1	18:55	09/01/05	1
1071003010	CCV1	19:01	09/01/05	1
1071003011	CCB1	19:05	09/01/05	1
1071003012	IPH076WB	19:09	09/01/05	1
1071003013	IPH076WL	19:13	09/01/05	1
1071003014	IPH076WC	19:17	09/01/05	1
1071003015	H870-01A	19:21	09/01/05	1
1071003016	H870-01	19:27	09/01/05	1
1071003017	H870-01T	19:31	09/01/05	5
1071003018	H870-02	19:35	09/01/05	1
1071003019	H870-03	19:39	09/01/05	1
1071003020	H870-04	19:43	09/01/05	1
1071003021	CCV2	19:47	09/01/05	1
1071003022	CCB2	19:51	09/01/05	1
1071003023	IPH056WB	19:55	09/01/05	1
1071003024	IPH056WL	19:59	09/01/05	1
1071003025	IPH056WC	20:03	09/01/05	1
1071003026	H213-01A	20:07	09/01/05	1
1071003027	H213-01	20:13	09/01/05	1
1071003028	H213-01T	20:17	09/01/05	5
1071003029	ICSAF	20:22	09/01/05	1
1071003030	ICSABF	20:26	09/01/05	1
1071003031	CCV3	20:32	09/01/05	1
1071003032	CCB3	20:36	09/01/05	1

SDG : 05H213

UNIT : %

ICP CHECK : 1071003

DATE : 09/01/05

INST : ENAXT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
S0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICV	98	100	101	97	100	101	96	99	98	97	97	102	100	99	99	97	96	98	97	96	98	96	101	97	100	97	99
ICB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV	99	102	99	99	99	99	99	101	98	98	98	101	100	99	98	100	97	101	101	99	100	99	100	99	99	98	99
CCB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAI	91	...	...	...	...	...	...	89	...	...	...	87	...	93	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAB1	91	85	98	90	91	91	91	89	88	84	93	87	97	93	89	85	84	96	94	99	88	96	84	88	93	92	
CCV1	96	98	102	95	96	97	98	99	96	95	95	99	96	96	95	96	96	97	100	97	97	95	95	96	96	97	
CCB1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH076B	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH076L	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH076C	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H870-01A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H870-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H870-01T	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H870-02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H870-03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H870-04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV2	93	100	100	90	93	95	97	97	93	92	91	96	98	94	93	93	94	94	97	95	94	91	94	94	93	93	95
CCB2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH056B	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH056L	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH056C	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H213-01A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H213-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H213-01T	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAF	91	...	...	...	...	...	...	88	...	...	...	85	...	93	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSABF	93	92	113	91	92	95	92	89	88	83	93	87	100	94	89	86	84	99	98	96	104	88	97	87	89	93	91
CCV3	99	102	104	97	98	101	99	99	96	94	96	99	97	98	95	95	97	102	105	98	101	97	95	95	97	96	96
CCB3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

QC Limit of each parameter are listed in a table attached next to all the ICP check forms
 * : Out of QC Limit

7011

SDG : 054213

UNIT : UG/L

SUMMARY of CALIBRATION BLANKS : 1071003 (WATER)

DATE : 09/01/05 INST : EMAXT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
SO																											
S3																											
S6																											
ICV																											
ICB	-3.52	7.58	6.19	.300	.000	.830	-.330	1.64	1.20	1.59	.000	1.64	-16.8	-1.34	.000	-6.63	-3.23	246	10.1	.510	-7.06	.000	34.9	-15.1	-.330	-500	-580
CCV																											
CCB	-5.11	27.1	-16.5	.100	.050	1.68	-.410	-6.95	-.900	-.530	1.15	.820	-22.6	-.120	-.260	-5.30	-2.09	346	37.8	.510	.000	.000	39.3	-1.29	-.010	.980	-1.16
ICSAI		16.1	102	.000	-.050	5.39	1.17		.150	3.54	.990		18.5		2.56	-12.5	9.51	140	72.4	12.9	-14.1	-.720	555	-23.2	-12.3	9.56	-3.53
ICSABF																											
CCV1																											
CCB1	-19.2	14.6	20.6	.100	.060	2.53	.110	-.450	1.51	.000	1.15	-.270	17.1	-4.83	-.530	-1.32	-3.04	261	33.6	-2.22	-14.1	.700	41.0	-6.85	.150	-.090	-1.46
IPH076WB																											
IPH076WL																											
IPH076WC																											
H870-01A																											
H870-01																											
H870-01T																											
H870-02																											
H870-03																											
H870-04																											
CCV2																											
CCB2	-16.6	13.5	10.3	.100	-.060	3.37	.520	-6.43	-1.21	-1.32	-.380	.820	-7.43	-6.02	.260	-1.32	-1.71	406	23.5	-.680	-35.3	.860	22.7	-5.47	.300	-.100	-.800
IPH056WB																											
IPH056WL																											
IPH056WC																											
H213-01A																											
H213-01																											
H213-01T																											
ICSABF																											
CCV3																											
CCB3	-7.67	21.4	17.5	.300	-.110	2.52	-.760	-6.47	.300	-1.85	-1.15	.270	7.41	-13.3	-.530	-6.63	3.99	160	31.9	-3.42	.000	.000	55.8	-6.82	.290	-2.35	-1.80

QC Limit of each parameter are listed in a table attached next to all the ICP check forms

* : Out of QC Limit

7012

DIGESTION LOG FOR ICP METALS

Book # EIP-047

SOP □ EMAX-3005 Rev. No. 2 □ EMAX-3010 Rev. No. 2 □ EMAX-3050 Rev. No. 2 □ EMAX-CLP-TAL □ 200.7

Matrix: WATER Start Date: 8-24-05 Time: 13:35 Temp: 85°C Ending Date: 8-24-05 Time: 15:35 Temp: 85°C

Sample Prep ID	Lab Sample ID	Matrix Description		Turbidity <1 NTU	Sample Amount (g/ml)	pH	Extract Volume (ml)	Digestate Description		Standards	ID	Amount Added (ml)	
		Color	Texture / Clarity					Artifacts	Color				Clarity
01	IPH056-WB				50	-	50			LCS -1	SMIA -09 -42	0.5	
02	-WL				50	-	50			LCS -2	SMIA -09 -43	0.5	
03	-WL				50	-	50			LCS -3	SMIA -09 -44	0.5	
04	H147-01				50	12	50			MS	N/A		
05	-02				50		50			Reagent	Lot# / ID	Amount Added (ml)	
06	-04				50		50			HNO ₃	SWIA -03 -120	0.5	
07	-05				50		50			HCl	SWIA -03 -115	0.25	
08	H162-01				50		50			H ₂ O ₂	N/A		
09	-02				50		50			HNO ₃ (1:1)	N/A		
10	-03				50		50			Digestate Location	ICP LAB		
11	-04				50		50			Extract Location			
12	H213-01				50	↓	50			Legend:			
13	H521-04				50	↓	50			Texture	Cs = Coarse	Md = Medium	Fb = Fine
14										Clarity	Cr = Clear	Cy = Cloudy	Td = Turbid
15										Artifacts	Rk = rocks	Sl = Shale	Vg = Vegetation
16										Color	Bu = blue	Bk = Black	Bn = Brown
17											Gn = Green	Og = Orange	Rd = Red
											Yw = Yellow	Cl = Colorless	

BATCH: IPH056-W

BATCH: IPH056-W

7013

Prepared By: MC

Standard Added By: MC

Witnessed By: A2

Extracts Recd. By: A28/24/05

Checked By: A2

Date Disposed:

Disposed by:

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

WET CHEMICAL ANALYSES

SDG#: 05H213

8600

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05H213

METHOD 300.0 NITRATE-N AND NITRITE-N

Eleven (11) water for Nitrate-N and six (6) water samples for Nitrite-N were received on 08/23/05 to be analyzed by method 300.0 in accordance with "Method for Determination of Inorganic Anions by Ion Chromatography", EPA 600/84-017.

1. Holding Time

Analyses met holding time criteria except dilution runs of H213-06 and -07 for Nitrate-N analysis.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limits.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met with the aforementioned exception.

Nitrate-N analysis in the initial runs of samples H213-06 and -07 were within 48-hours holding time criteria. The samples were reanalyzed at DF 5 due to exceeded calibration range in the initial runs, however, the dilution runs were approximately analyzed two-hour out of 48-hour holding time criteria. Both initial and dilution results were reported.

All results were reported as Nitrogen concentration.

SAMPLE RESULTS

METHOD 300.0
NITRATE-N

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H213

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICH030WB	ND	1	NA	.1	.05	08/23/0515:31	NA	AH23-03	AH23-01	ICH030W	NA	NA
LCS1W	ICH030WL	2.08	1	NA	.1	.05	08/23/0515:45	NA	AH23-04	AH23-01	ICH030W	NA	NA
LCD1W	ICH030WC	2.08	1	NA	.1	.05	08/23/0515:59	NA	AH23-05	AH23-01	ICH030W	NA	NA
MW-25-5	H213-02	ND	1	NA	.1	.05	08/23/0519:41	NA	AH23-15	AH23-13	ICH030W	08/22/05	08/23/05
MW-25-1	H213-06	12.8E	1	NA	.1	.05	08/23/0520:38	NA	AH23-19	AH23-13	ICH030W	08/22/05	08/23/05
MW-21-5	H213-07	7.13E	1	NA	.1	.05	08/23/0520:52	NA	AH23-20	AH23-13	ICH030W	08/22/05	08/23/05
MW-25-4	H213-03	4.5	2	NA	.2	.1	08/23/0522:45	NA	AH23-28	AH23-25	ICH030W	08/22/05	08/23/05
MW-25-3	H213-04	8.59	5	NA	.5	.25	08/23/0522:59	NA	AH23-29	AH23-25	ICH030W	08/22/05	08/23/05
MBLK2W	ICH031WB	ND	1	NA	.1	.05	08/23/0523:27	NA	AH23-31	AH23-25	ICH031W	NA	NA
LCS2W	ICH031WL	2.05	1	NA	.1	.05	08/23/0523:41	NA	AH23-32	AH23-25	ICH031W	NA	NA
LCD2W	ICH031WC	2.03	1	NA	.1	.05	08/23/0523:55	NA	AH23-33	AH23-25	ICH031W	NA	NA
MW-25-2	H213-05	6.31	5	NA	.5	.25	08/24/0500:37	NA	AH23-36	AH23-25	ICH031W	08/22/05	08/23/05
MBLK3W	ICH033WB	ND	1	NA	.1	.05	08/24/0513:02	NA	AH24-09	AH24-01	ICH033W	NA	NA
LCS3W	ICH033WL	2.09	1	NA	.1	.05	08/24/0513:16	NA	AH24-10	AH24-01	ICH033W	NA	NA
LCD3W	ICH033WC	2.09	1	NA	.1	.05	08/24/0513:30	NA	AH24-11	AH24-01	ICH033W	NA	NA
MW-21-4	H213-08	6.53	5	NA	.5	.25	08/24/0511:24	NA	AH24-02	AH24-01	ICH033W	08/22/05	08/23/05
MW-21-3	H213-09	9.53	5	NA	.5	.25	08/24/0511:38	NA	AH24-03	AH24-01	ICH033W	08/22/05	08/23/05
DUPE-1-8/22/05	H213-10	9.69	5	NA	.5	.25	08/24/0511:52	NA	AH24-04	AH24-01	ICH033W	08/22/05	08/23/05
MW-21-2	H213-11	10.7	5	NA	.5	.25	08/24/0512:06	NA	AH24-05	AH24-01	ICH033W	08/22/05	08/23/05
MW-21-1	H213-12	14.2	5	NA	.5	.25	08/24/0512:20	NA	AH24-06	AH24-01	ICH033W	08/22/05	08/23/05
MW-25-1DL	H213-06T	10.5	5	NA	.5	.25	08/24/0512:34	NA	AH24-07	AH24-01	ICH033W	08/22/05	08/23/05
MW-21-5DL	H213-07T	6.35	5	NA	.5	.25	08/24/0512:48	NA	AH24-08	AH24-01	ICH033W	08/22/05	08/23/05

METHOD 300.0
NITRITE-N

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H213

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICH030W/B	ND	1	NA	.1	.05	08/23/0515:31	NA	AH23-03	AH23-01	ICH030W	NA	NA
LCST1W	ICH030WL	1.98	1	NA	.1	.05	08/23/0515:45	NA	AH23-04	AH23-01	ICH030W	NA	NA
LCST1W	ICH030WC	2	1	NA	.1	.05	08/23/0515:59	NA	AH23-05	AH23-01	ICH030W	NA	NA
MW-21-5	H213-07	ND	1	NA	.1	.05	08/23/0520:52	NA	AH23-20	AH23-13	ICH030W	08/22/05	08/23/05
MW-21-4	H213-08	ND	1	NA	.1	.05	08/23/0521:06	NA	AH23-21	AH23-13	ICH030W	08/22/05	08/23/05
MW-21-3	H213-09	ND	1	NA	.1	.05	08/23/0521:20	NA	AH23-22	AH23-13	ICH030W	08/22/05	08/23/05
DUPE-1-8/22/05	H213-10	ND	1	NA	.1	.05	08/23/0521:34	NA	AH23-23	AH23-13	ICH030W	08/22/05	08/23/05
MW-21-2	H213-11	ND	1	NA	.1	.05	08/23/0521:48	NA	AH23-24	AH23-13	ICH030W	08/22/05	08/23/05
MW-21-1	H213-12	ND	1	NA	.1	.05	08/23/0522:30	NA	AH23-27	AH23-25	ICH030W	08/22/05	08/23/05

8004

24

QC SUMMARIES

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H213
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICH030WL ICH030WC
LAB FILE ID: AH23-04 AH23-05
DATE EXTRACTED: NA
DATE ANALYZED: 08/23/0515:31 08/23/0515:45 08/23/0515:59
PREP. BATCH: ICH030W ICH030W
CALIB. REF: AH23-01 AH23-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	2	2.08	104	2	2.08	104	0	90-110	20

8006

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H213
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK2W
LAB SAMP ID: ICH031WB ICH031WC
LAB FILE ID: AH23-31 AH23-32 AH23-33
DATE EXTRACTED: NA
DATE ANALYZED: 08/23/0523:27 08/23/0523:41 08/23/0523:55
PREP. BATCH: ICH031W ICH031W
CALIB. REF: AH23-25 AH23-25

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	2	2.05	103	2	2.03	102	1	90-110	20

8007

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H213
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK3W
LAB SAMP ID: ICH033WB ICH033WC
LAB FILE ID: AH24-09 AH24-10 AH24-11
DATE EXTRACTED: NA DATE COLLECTED: NA
DATE ANALYZED: 08/24/0513:02 08/24/0513:16 08/24/0513:30
PREP. BATCH: ICH033W ICH033W ICH033W
CALIB. REF: AH24-01 AH24-01 AH24-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	2	2.09	105	2	2.09	105	0	90-110	20

8008

947

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05H213

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICH030WB
LAB FILE ID: AH23-03
DATE EXTRACTED: NA
DATE ANALYZED: 08/23/0515:31
PREP. BATCH: ICH030W
CALIB. REF: AH23-01

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrite-N	ND	2	1.98	99	2	2	100	1	90-110	20

8009

34

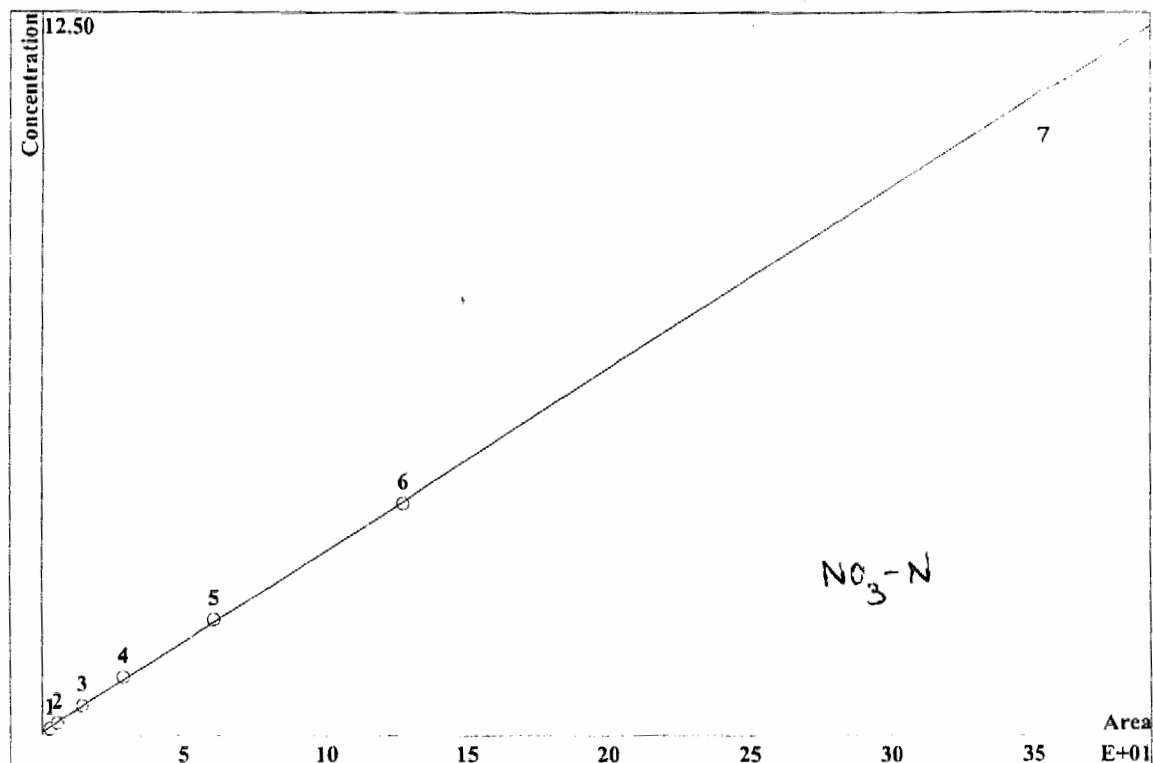
INITIAL CALIBRATIONS

IC Result Check FormVersion : QH2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH18-01	1B	FCIBNPS	0	0	0	0	0	0	0	p8181936	1
AH18-02	S0	FCIBNPS	0	0	0	0	0	0	0	p8181950	1
AH18-03	S1	FCIBNPS	0.166	0.17262	0.13231	0.12813	0.13644	0.22927	0.14104	p8182004	1
AH18-04	S2	FCIBNPS	0.28466	0.28623	0.22239	0.22088	0.22213	0.31227	0.24604	p8182018	1
AH18-05	S3	FCIBNPS	0.51393	0.51514	0.50265	0.50493	0.50026	0.56154	0.52244	p8182032	1
AH18-06	S4	FCIBNPS	0.96429	0.99164	0.95545	0.95771	0.95423	0.9672	0.9792	p8182047	1
AH18-07	S5	FCIBNPS	1.9297	1.9476	1.9596	2.0373	1.9583	1.8503	1.9613	p8182101	1
AH18-08	S6	FCIBNPS	3.8838	3.8076	4.0276	3.9271	4.0286	3.7744	3.9072	p8182115	1
AH18-09	S7	FCIBNPS	10.058	10.079	10.533	10.024	11.158	10.105	10.043	p8182129	1
AH18-10	ICV	FCIBNPS	94.6%	95.5%	98%	99.9%	98.2%	93%	97.2%	p8182143	1
AH18-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8182157	1
AH18-12	ICH025WB	FCIBNPS	0	0	0	0	0	0	0	p8182211	1
AH18-13	ICH025WL	FCIBNPS	1.9633	1.9339	1.884	2.1091	1.9384	1.8022	1.9892	p8182225	1
AH18-14	ICH025WC	FCIBNPS	1.9405	1.927	1.8843	2.0871	1.9384	1.8038	2.0248	p8182239	1
AH18-15	H023-01	F*IBNPS	0	11823E	0	-7.8039	0	0	1470.9	p8182253	200
AH18-16	H023-03	F*IBNPS	0	11711E	0	0	0	0	1420.9	p8182307	200
AH18-17	H023-01	*C*****	0	9274.5	0	0	0	0	1588.2	p8182321	2000
AH18-18	H023-02	FCIBNPS	0	8909.8	0	0	0	0	1504.6	p8182335	2000
AH18-19	H023-03	*C*****	0	9111	0	0	0	0	1525.4	p8182349	2000
AH18-20	H023-04	FCIBNPS	0	9589.9	0	0	0	0	1558.3	p8190004	2000
AH18-21	CCV1	FCIBNPS	95.3%	99%	97.2%	96.8%	97.9%	92.8%	99.3%	p8190018	1
AH18-22	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8190032	1
AH18-23	H169-01	F*IBNP*	0.58784	557.84E	0	3.9834	0.30268	0	222.2E	p8190046	1
AH18-24	H169-01D	F*IBNP*	0.54415	557.56E	0	3.8987	0.26518	0	222.08E	p8190100	1
AH18-25	H169-01M	F*IBNP*	2.3279	551.74E	2.2881	5.3508	2.2308	2.1545	221.61E	p8190114	1
AH18-26	H614-01	F*IBNP*	0.30333	24.22E	0	0.84928	3.8374	0.23597	25.147E	p8190128	1
AH18-27	H614-02	F*IB*P*	0.24861	17.85E	0	0.85627	5.8152E	0	15.634E	p8190142	1
AH18-28	H614-02D	F*IB*P*	0.42543	18.124E	0	1.1955	5.8532E	0.23178	15.667E	p8190156	1
AH18-29	H614-02M	F*IB*P*	2.2519	20.146E	2.0242	3.1702	8.3464E	2.4015	18.076E	p8190210	1
AH18-30	H614-01	*C*****S	0.7526	19.853	0	0.84668	3.6036	0	22.543	p8190224	5
AH18-31	H614-02	*C**N*S	0.57712	14.626	0	0.8431	5.0755	0	13.896	p8190238	5
AH18-32	H614-02D	*C**N*S	0.5948	14.546	0	0.80981	5.0759	0	13.937	p8190252	5
AH18-33	CCV2	FCIBNPS	95.5%	99.2%	97.8%	101.7%	98.2%	95.2%	98.8%	p8190306	1
AH18-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8190320	1
AH18-35	H614-02M	*C**N*S	9.666	24.294	9.0355	10.763	15.204	10.183	23.849	p8190335	5
AH18-36	H169-01	*****	1.2771	462.51E	0	3.1323	0	0	162.61E	p8190349	10
AH18-37	H169-01D	*****	1.1563	462.25E	0	2.6472	0	0	162.5E	p8190403	10
AH18-38	H169-10M	F*IBNP*	19.589	483.82E	19.02	22.753	19.898	20.393	183.19E	p8190417	10
AH18-39	RINSE	FCIBNPS	0	0.12789	0	0	0	0.23054	0	p8190431	1
AH18-40	RINSE	FCIBNPS	0	0	0	0.049699	0	0	0	p8190445	1
AH18-41	CCV3	FCIBNPS	97.4%	98.2%	96.2%	103.3%	96.9%	124.7%*	102%	p8190459	1
AH18-42	CCB3	FCIBNPS	0	0	0	0	0	0	0	p8190513	1

CALIBRATION OF COMPONENT nitrate

Method: IC100-H18.mtw
 Equation: $Q = 0.0313474 \cdot A + 0.0465038$
 RSD: 3.094 %
 Correlation coefficient: 0.999710



K3 = 0 K2 = 0 K1 = 0.0313474 K0 = 0.0465038

Base: Area

Ref.channel: Cond

ISTD:

Formula: Linear

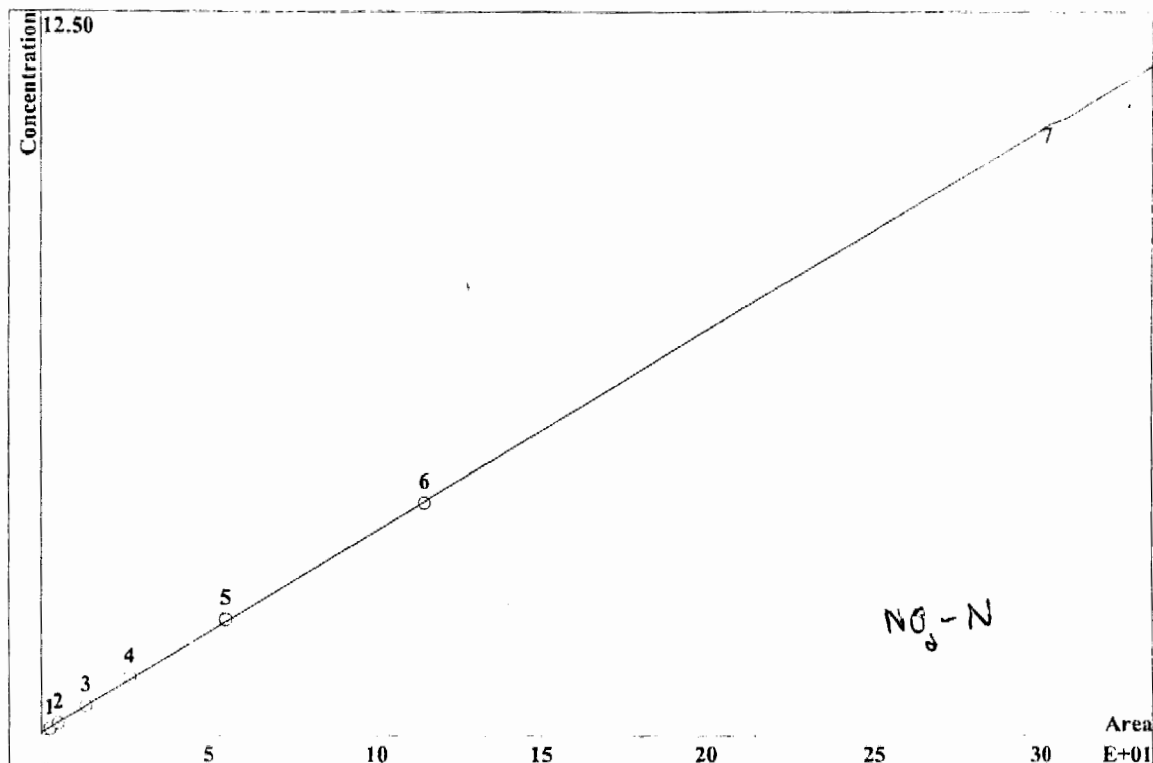
Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.1627	2.869	0.1	1	5.56	Yes	p8182004.chw
2	0.329	5.603	0.2	1	5.56	Yes	p8182018.chw
3	0.8519	14.48	0.5	1	5.56	Yes	p8182032.chw
4	1.718	28.96	1	1	5.56	Yes	p8182047.chw
5	3.662	60.99	2	1	5.56	Yes	p8182101.chw
6	7.807	127	4	1	5.56	Yes	p8182115.chw
7	22.1	354.5	10	1	5.56	No	p8182129.chw

10/8/05

CALIBRATION OF COMPONENT nitrite

Method: IC100-H18.mtw
 Equation: $Q = 0.0346959 \cdot A + 0.043272$
 RSD: 2.962 %
 Correlation coefficient: 0.999734



K3 = 0 K2 = 0 K1 = 0.0346959 K0 = 0.043272
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2049	2.566	0.1	1	3.98	Yes	p8182004.chw
2	0.4151	5.163	0.2	1	3.98	Yes	p8182018.chw
3	1.077	13.24	0.5	1	3.98	Yes	p8182032.chw
4	2.113	26.29	1	1	3.98	Yes	p8182047.chw
5	4.455	55.23	2	1	3.98	Yes	p8182101.chw
6	9.454	114.8	4	1	3.98	Yes	p8182115.chw
7	24.1	302.3	10	1	3.98	No	p8182129.chw

8/18/05

8013

***SECOND SOURCE
VERIFICATION***

IC Result Check FormVersion : QH2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH18-10	ICV	FCIBNPS	94.6%	95.5%	98%	99.9%	98.2%	93%	97.2%	p8182143	1
AH18-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8182157	1
AH18-21	CCV1	FCIBNPS	95.3%	99%	97.2%	96.8%	97.9%	92.8%	99.3%	p8190018	1
AH18-22	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8190032	1
AH18-33	CCV2	FCIBNPS	95.5%	99.2%	97.8%	101.7%	98.2%	95.2%	98.8%	p8190306	1
AH18-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8190320	1
AH18-41	CCV3	FCIBNPS	97.4%	98.2%	96.2%	103.3%	96.9%	124.7%*	102%	p8190459	1
AH18-42	CCB3	FCIBNPS	0	0	0	0	0	0	0	p8190513	1

DAILY CALIBRATIONS

IC Result Check FormVersion : QH2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH23-01 ✓	CCV18	FCIBNPS	94.1%	93.9%	105.1%	97.4%	101.1%	93%	99.5%	p8231503	1
AH23-02	CCB18	FCIBNPS	0	0	0	0	0	0	0	p8231517	1
AH23-13 ✓	CCV19	FCIBNPS	92.1%	94.8%	97.1%	98.8%	101.8%	90%	94.6%	p8231856	1
AH23-14	CCB19	FCIBNPS	0	0	0	0	0	0	0	p8231910	1
AH23-25 ✓	CCV20	FCIBNPS	93.2%	95.5%	96.8%	97.9%	101.2%	91.5%	97.1%	p8232202	1
AH23-26	CCB20	FCIBNPS	0	0	0	0	0	0	0	p8232216	1
AH23-37 ✓	CCV21	FCIBNPS	94.1%	94.5%	95.1%	98.9%	103.1%	84.3%*	90.8%	p8240051	1
AH23-38	CCB21	FCIBNPS	0	0	0	0	0	0	0	p8240105	1
AH23-50	CCV22	FCIBNPS	96.1%	97.9%	93.8%	102.9%	103.7%	113.9%*	99.7%	p8240354	1
AH23-51	CCB22	FCIBNPS	0	0	0	0	0	0.58609	0	p8240408	1

IC Result Check FormVersion : QH2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH24-01 ✓	CCV25	FCIBNPS	90.5%	95.8%	99.1%	99.7%	104.3%	80.4%*	97.6%	p8241109	1
AH24-12 ✓	CCV26	FCIBNPS	96.1%	95.1%	98%	98%	104.2%	86.7%*	92.2%	p8241344	1
AH24-13 ✓	CCB26	FCIBNPS	0	0	0	0	0	0	0	p8241358	1
AH24-24	CCV27	FCIBNPS	94.9%	92.4%	96.6%	97.5%	98.6%	87.8%*	93.7%	p8241633	1
AH24-25	CCB27	FCIBNPS	0	0	0	0	0	0	0	p8241647	1
AH24-36	CCV28	FCIBNPS	93.3%	94.6%	95.6%	98.2%	98.6%	91.3%	94.7%	p8241952	1
AH24-37	CCB28	FCIBNPS	0	0	0	0	0	0	0	p8242015	1
AH24-48	CCV29	FCIBNPS	93.9%	94.4%	96%	98.8%	98.7%	88.6%*	91.9%	p8242256	1
AH24-49	CCB29	FCIBNPS	0	0	0	0	0	0	0	p8242310	1
AH24-60	CCV30	FCIBNPS	93.7%	91.1%	97%	95%	98.6%	89.3%*	94.4%	p8250957	1
AH24-61	CCB30	FCIBNPS	0	0	0	0	0	0	0	p8251011	1
AH24-72	CCV31	FCIBNPS	95.4%	100.1%	97.9%	100.3%	99.2%	91.6%	98.5%	p8251250	1
AH24-83	CCV32	FCIBNPS	94.6%	95.9%	96%	99.2%	99.2%	91.5%	97.8%	p8251533	1
AH24-84	CCB32	FCIBNPS	0	0	0	0	0	0	0	p8251547	1
AH24-95	CCV33	FCIBNPS	91.9%	92.8%	94.1%	94%	97.5%	86.9%*	93.4%	p8251923	1
AH24-96	CCB33	FCIBNPS	0	0	0	0	0	0	0	p8251937	1
AH24-107	CCV34	FCIBNPS	94.8%	95%	97%	102.3%	101.2%	92.4%	95.5%	p8252334	1
AH24-108	CCB34	FCIBNPS	0	0	0	0	0	0	0	p8252348	1
AH24-119	CCV35	FCIBNPS	93.5%	96%	96.6%	99.2%	99.4%	86.8%*	90.8%	p8260222	1
AH24-120	CCB35	FCIBNPS	0	0	0	0	0	0	0	p8260236	1
AH24-131	CCV36	FCIBNPS	94.5%	94.7%	96.4%	99.8%	99.7%	90.2%	95.5%	p8260511	1
AH24-132	CCB36	FCIBNPS	0	0	0	0	0	0	0	p8260525	1
AH24-137	CCV37	FCIBNPS	94.4%	94.4%	96.7%	99.4%	99.5%	87.4%*	90.8%	p8260636	1
AH24-138	CCB37	FCIBNPS	0	0	0	0	0	0	0	p8260650	1
AH24-145	CCV38	FCIBNPS	92.4%	93.5%	95.2%	94.6%	98%	86.5%*	92.2%	p8260848	1
AH24-146	CCB38	FCIBNPS	0	0	0	0	0	0	0	p8260902	1

ANALYTICAL LOGS

ANALYSIS RUN LOG FOR IC

SOP # EMAX-300.0-Rev. 3 □ EMAX-300.1 Rev. No. 0 □ EMAX-9056 Rev. No. 2

Book# A100 003

Start Date: 05/15/13		Time: 19:26		End Date: 05/15/13		Time: 05:13					
Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes (cc/mL = mg/L)	Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes
* 1	AL18-01	IB	1	W		* 26	AL18-26	H1614-01	1	W	
* 2	02	SD				* 7	27	02			
* 3	03	SI			0.1 ppm	* 8	28	02P			
* 4	04	S2			0.2	* 9	29	02M	✓		
* 5	05	S3			0.5	* 30	30	01	5		
* 6	06	S4			1	* 1	31	02			
* 7	07	S5			2	* 2	32	02P	✓		
* 8	08	S6			4	* 3	33	00V2	1		
* 9	09	S7			10	* 4	34	00P2	1		
* 10	10	ICV				* 5	35	H1614-02M	5		
* 11	11	ICB				* 6	36	H1614-01	10		
* 12	12	IC110251W6				* 7	37	01D			
* 13	13	W1				* 8	38	01M	✓		
* 14	14	W2				* 9	39	RINSE	1		
* 15	15	H073-01	EQ			* 40	40	RINSE			
* 16	16	R3	✓			* 1	41	CV3	✓		
* 17	17	01	EQD			* 2	42	00B3			
* 18	18	02				* 3					
* 19	19	03				* 4					
* 20	20	04				* 5					
* 21	21	00V1	✓			* 6					
* 22	22	00P1	✓			* 7					
* 23	23	H1614-01				* 8					
* 24	24	01D				* 9					
* 25	25	01M				* 50					

Instrument No. 100		STANDARD	
Date	05/15/13	Method File	IC1102-1118.mhw
ICAL ID	518-01-11-1	ICV/ICSV/MS ID	2
CCV ID			
LCS ID	12-1 (2P)		
NIS ID	27 min Acc Std.		
ELECTRONIC DATA ARCHIVAL			
Location		Date	
<input type="checkbox"/> IC METROHM			
<input type="checkbox"/>			
Comments:			

Analyzed By: al	
This page is checked during data review.	

* Sample Prep ID Prefix: IC110251W ** Sample Prep ID Prefix:

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes
* 1	AH24 - 01	QC V25	1	W		* 26	AH24 - 26	H233 - 07	5	W	
* 2	02	H213 - 08	5			* 7	27	H230 - 01	1		
* 3	03					* 8	28				
* 4	04	10				* 9	29				
* 5	05	11				* 30	30	RINSE			
* 6	06	12				** 1	31	ICH034WB			
* 7	07	16				* 2	32	WL			
* 8	08	17				* 3	33	WL			
* 9	09	ICH034WB	1			* 4	34	H230 - 02			
* 10	10	WL				* 5	35	03			
* 11	11	WL				* 6	36	QC V25			
* 12	12	QC V26				* 7	37	QC B28			
* 13	13	QC B26				* 8	38	H230 - 04			
* 14	14	G212 - 04	2			* 9	39	15			
* 15	15	04D				* 40	40	06			
* 16	16	04R				* 1	41	07			
* 17	17	04Z				* 2	42	08			
* 18	18	H223 - 02	5			* 3	43	09			
* 19	19	03				* 4	44	10			
* 20	20	04				* 5	45	11			
* 1	21	05				* 6	46	12			
* 2	22	06				* 7	47	H210 - 01	5		
* 3	23	RINSE	1			* 8	48	QC V29	1		
* 4	24	QC V267			QC B27	* 9	49	0929			
* 5	25	QC B267			QC B27	* 50	50	H210 - 02	5		

IC#034W

* Sample Prep ID Prefix: JCH033W

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ANALYSIS RUN LOG FOR IC

SOP □ EMAX-300.0-Rev. 3 □ EMAX-300.1 Rev. No. 0 □ EMAX-9056 Rev. No. 2

Book# A100 003

Start Date: 08/23/05		Time: 15:03		End Date: 08/24/05		Time: 14:18	
Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Instrument No.	100
* 1	AH23-01	CCV18	1	W		DATE	08/18/05
* 2		CCV18				Method File	IC100-H10.mty
* 3		ICH030WB				ICAL ID	S1B-C1-11-1
* 4		WL				ICV/ECAMS ID	2
* 5		WL				CCV ID	as vials 195-1 (2 pr)
* 6		Q111-00	10			LCS ID	2 (2 pr)
* 7		00	50			NIS ID	2 ppm Acc Std
* 8		Q212-04	2				
* 9		04P					
* 10		04R					
* 11		04Z					
* 12		RINSE					
* 13		CCV19					
* 14		CCV19					
* 15	AH23-15	H-213-02	1	W			
* 16		H-213-03					
* 17		04					
* 18		15					
* 19		00					
* 20		07					
* 21		08					
* 22		09					
* 23		10					
* 24		11					
* 25		CCV20					
* 26	AH23-26	CCV20	1	W			
* 27		H213-12	1				
* 28		03	2				
* 29		04	5				
* 30		RINSE	1				
* 31		ICH031WB					
* 32		WL					
* 33		WL					
* 34		H210-02					
* 35		03					
* 36		H213-05	5				
* 37		CCV21	1				
* 38		CCV21					
* 39		H216-03P					
* 40		03M					
* 41		02	20				
* 42		03					
* 43		03P					
* 44		03M					
* 45		H451-02	100				
* 46		H110-01	50				
* 47		H094-01	20				
* 48		03	50				
* 49		sample CCV22	1				
* 50		CCV22-08-02	1				

Comments:

Electron Data Archival

Location: ☐ IC METROHM ☐ Date:

Analyzed By: CE/JL

* Sample Prep ID Prefix: ICH031W

** Sample Prep ID Prefix: ICH03CW

* picked up sample before (again) This page is checked during data review.

+ missed 1 sample over.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H213**

METHOD 160.1 TOTAL DISSOLVED SOLIDS

Six (6) water samples were received on 08/23/05 for Total Dissolved Solids analysis by Method 160.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 160.1
TOTAL DISSOLVED SOLIDS

Client : BATTLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H213

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TDH017MB	ND	1	10	5	08/24/0514:15	NA	TDH017W-1	NA	TDH017W	NA	NA
LCS1W	TDH017WL	335	1	10	5	08/24/0514:16	NA	TDH017W-2	NA	TDH017W	NA	NA
LCD1W	TDH017WC	330	1	10	5	08/24/0516:17	NA	TDH017W-3	NA	TDH017W	NA	NA
MW-21-5	H213-07	590	1	10	5	08/24/0514:18	NA	TDH017W-4	NA	TDH017W	08/22/05	08/23/05
MW-21-4	H213-08	545	1	10	5	08/24/0514:19	NA	TDH017W-5	NA	TDH017W	08/22/05	08/23/05
MW-21-3	H213-09	900	1	10	5	08/24/0514:20	NA	TDH017W-6	NA	TDH017W	08/22/05	08/23/05
DUPPE-1-8/22/05	H213-10	825	1	10	5	08/24/0514:21	NA	TDH017W-7	NA	TDH017W	08/22/05	08/23/05
MW-21-2	H213-11	925	1	10	5	08/24/0514:22	NA	TDH017W-8	NA	TDH017W	08/22/05	08/23/05
MW-21-1	H213-12	760	1	10	5	08/24/0514:23	NA	TDH017W-9	NA	TDH017W	08/22/05	08/23/05

8024

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: 160.1

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05H213

SAMPLE ID: LCS1W

CONTROL NO.: TDH017WL

DATE RECEIVED: NA

DATE EXTRACTED: NA

DATE ANALYZED: 08/24/05 14:16

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
IDS	ND	336.00	335.00	100	336.00	330.00	98	2	80-120	20

8025

[Handwritten mark]

GRAVIMETRIC ANALYSIS LOG

SOP ☒ EM-X-160.1 Rev. No. 3 ☐ EMAX-160.2 Rev. No. 2 ☐ EMAX-160.3 Rev. No. 1 ☐ EMAX-160.4 Rev. No. 0 ☐ EMAX-160.5 Rev. No. 0 Book # AGV-019

Data File Name	Lab Sample ID	Sample Amt. (ml)	Dish Wt. (g)	Dry Wt. Dish + Solids (g)				Solids (mg)	Result (mg/L)	Settleable Solids		Standard 8/23/05
				1st	2nd	Time	3rd			Time	Vol. of SS		Result (ml/L/hr)
1	T04017WB	100	59.3299	59.3553	1015	12.15	59.3550	1415	0.10	ND		LCS ID 50774 06-133
2	WL	20	13.4175	13.4248	16	13.4244	16	4242	6.7	335	100%	LCS TV (mg/L) 336
3	WL	20	13.4773	13.4867	17	13.4860	17	4859	6.6	330	98%	Balance ID: 40706360
4	H213-07	20	13.4202	13.4331	18	13.4322	18	4320	11.8	590		37030058
5	08	20	13.4078	13.4196	19	13.4189	19	4187	10.9	545		
6	09	20	13.3527	13.3715	20	13.3708	20	3707	18.0	900		
7	10	20	13.4531	13.4708	21	13.4700	21	4696	16.5	825		
8	11	20	13.3671	13.3866	22	13.3857	22	3856	18.5	925		
9	H213-12	20	13.4144	13.4302	23	13.4299	23	4296	15.2	760		
0	H223-02	20	13.4333	13.4584	24	13.4575	24	4573	24	1200		
1	-03	20	13.4838	13.5143	25	13.5141	25	5141	30.3	1515	1520	
2	-04	20	13.4056	13.4388	26	13.4385	26	4383	32.7	1635	1640	
3	-05	20	13.5073	13.5500	27	13.5497	27	5497	41.9	2095	2100	
4	-06	20	13.4112	13.4425	28	13.4420	28	4419	30.7	1535	1540	
5	-07	20	13.4305	13.4459	29	13.4454	29	4455	15.0	750	750	
6	-08	20	13.5340	13.5498	30	13.5490	30	5491	15.1	755	755	
7												
8												
9												
0												

ANALYTICAL BATCH # 55 ID H017W

Comments:

Standard 8/23/05

LCS ID 50774 06-133

LCS TV (mg/L) 336

Balance ID: 40706360

37030058

Analyzed By: 64/162

where: $R_{(mg/L)}$ = concentration of solids; $DS_{(mg)}$ = Dry weight of Dish + Solids; $DW_{(mg)}$ = Dish weight; $S_{(ml)}$ = sample amount

$R_{(mg/L)} = (DS - DW) \times 1000$

BALANCE CALIBRATION VERIFICATION LOG (DOE)

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SOP □ EMAX-QC04 Revision No.: 1

QC04-036

Balance ID 10601202

Date 8-23-05

Range	Min:	1	Max:	600	g
TV	200	100	30	5	1
1	200.004	100.002	29.999	5.000	1.000
2	200.005	100.003	30.000	5.000	1.000
3	200.005	100.003	30.001	5.000	1.000
Criteria (±0.1%)	0.2	0.1	0.03	0.005	0.001
LL	199.8	99.9	29.97	4.995	0.999
UL	200.2	100.1	30.03	5.005	1.001

Comment:

Balance ID J77299

Date 8-23-05

Range	Min:	1	Max:	300	g
TV	200	100	50	30	20
1	199.99	100.00	50.00	30.00	20.00
2	199.99	100.00	50.00	30.00	20.00
3	199.99	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 10203192

Date 8-23-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.00	100.00	50.00	30.00	20.00
2	200.00	100.00	50.00	30.00	20.00
3	200.00	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 10304418

Date 8-23-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.03	100.02	50.00	30.00	20.00
2	200.03	100.02	50.00	30.00	20.00
3	200.03	100.02	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 40706360

Date 8-23-05

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1	199.9996	100.0005	29.9999	1.0000	0.0200
2	199.9988	100.0004	30.0001	1.0002	0.0200
3	199.9989	100.0003	30.0002	1.0000	0.0200
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

Balance ID 40706360

Date

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:



EMAX LABORATORIES, INC., 1835 W. 205th St. Torrance, CA 90501

Verified by: *lnc*

Checked by:

Calibration Report No.: 3950-05

3949-05

8027

BALANCE CALIBRATION VERIFICATION LOG (DOE)

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OP □ EMAX-QC04 Revision No.: 1

QC04-036

Balance ID 10601202

Date 8-24-05

Balance ID J77299

Date 8-24-05

Range	Min:	1	Max:	600	g
TV	200	100	30	5	1
1	200.008	100.006	30.000	5.000	1.000
2	200.009	100.005	30.000	5.000	1.000
3	200.007	100.006	30.000	5.000	1.000
Criteria (±0.1%)	0.2	0.1	0.03	0.005	0.001
LL	199.8	99.9	29.97	4.995	0.999
UL	200.2	100.1	30.03	5.005	1.001

Comment:

Range	Min:	1	Max:	300	g
TV	200	100	50	30	20
1	199.99	100.00	50.00	30.00	20.00
2	199.99	100.00	50.00	30.00	20.00
3	199.99	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 10203192

Date 8-24-05

Balance ID 10304418

Date 8-24-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.00	100.00	50.00	30.00	20.00
2	200.00	100.00	50.00	30.00	20.00
3	200.00	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.04	100.03	50.00	30.00	20.00
2	200.04	100.03	50.00	30.00	20.00
3	200.04	100.03	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 40706360

Date 8-24-05

Balance ID 40706360

Date 8

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1	199.9985	99.9999	29.9984	1.0000	0.0200
2	199.9987	99.9998	29.9978	1.0000	0.0200
3	199.9986	99.9998	29.9982	1.0000	0.0200
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:



LABORATORIES, INC. 1835 W. 205th St. Torrance, CA 90501

Verified by: mc

Checked by: _____

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H213**

METHOD 376.1 SULFIDE

Six (6) water samples were received on 08/23/05 for Sulfide analysis by Method 376.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample

Lab control result was within QC limit.

4. Duplicate

Sample H213-12 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 376.1
SULFIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H213

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
M8LK1W	SDH009WB	ND	1	NA	1	.4	08/23/0512:00	NA	SDH009W-01	NA	SDH009W	NA	NA
LCS1W	SDH009WL	4.65	1	NA	1	.4	08/23/0512:03	NA	SDH009W-02	NA	SDH009W	NA	NA
MW-21-5	H213-07	ND	1	NA	1	.4	08/23/0512:06	NA	SDH009W-03	NA	SDH009W	08/22/05	08/23/05
MW-21-4	H213-08	ND	1	NA	1	.4	08/23/0512:09	NA	SDH009W-04	NA	SDH009W	08/22/05	08/23/05
MW-21-3	H213-09	ND	1	NA	1	.4	08/23/0512:12	NA	SDH009W-05	NA	SDH009W	08/22/05	08/23/05
DUPE-1-8/22/05	H213-10	ND	1	NA	1	.4	08/23/0512:15	NA	SDH009W-06	NA	SDH009W	08/22/05	08/23/05
MW-21-2	H213-11	ND	1	NA	1	.4	08/23/0512:18	NA	SDH009W-07	NA	SDH009W	08/22/05	08/23/05
MW-21-1	H213-12	ND	1	NA	1	.4	08/23/0512:21	NA	SDH009W-08	NA	SDH009W	08/22/05	08/23/05
MW-21-1DUP	H213-12D	ND	1	NA	1	.4	08/23/0512:24	NA	SDH009W-09	NA	SDH009W	08/22/05	08/23/05

8030

8

EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 376.1
MATRIX: WATER
% MOISTURE: NA
=====

BATCH NO.: 05H213
SAMPLE ID: LCS1W
CONTROL NO.: SDH009WL
DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 08/23/05 12:03

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	LCS RSLT (mg/L)	LCS % REC	QC LIMIT (%)
Sulfide	ND	5.00	4.65	93	80-120

8031

8

ENAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: METHOD 376.1

MATRIX: WATER

% MOISTURE: NA

=====

BATCH NO.: 05H213

SAMPLE ID: MW-21-1DUP

CONTROL NO.: H213-12D

DATE RECEIVED: 08/23/05

DATE EXTRACTED: NA

DATE ANALYZED: 08/23/05 12:24

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Sulfide	ND	ND	0	20

8032

gpc

ANALYSIS LOG FOR SULFIDE

Book # ASD-007

Start Date: 08-23-05 Time: 12:00 End Date: 08-23-05 Time: 12:24

SOP ☒ EMAX-376.1 Rev. No. 1 ☐ EMAX-9034 Rev. No. 0

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Volume of Iodine (ml)	Volume of PAO/ $\text{Na}_2\text{S}_2\text{O}_3$ (ml)	Notes	Standard	ID	Conc. (mg/L)
* 1	SDH009-013	12:00	100	10	9.7	00	LOS	SD7A-06-178	5.0
* 2	10L	12:03			4.45	465	Spike	n/a	
* 3	H2133-07	12:06			9.8	00	$\text{Na}_2\text{S}_2\text{O}_3$	SD3B-02-735	0.0564
* 4	-08	12:09			9.7	00	PAO		
* 5	-09	12:12			9.9	00	Iodine	SD3B-02-734	0.0564
* 6	-10	12:15			9.6	00	HCL	SD7B-06-281C	1:1
* 7	-11	12:18			9.7	00	Indicator	SD7A-06-190	
* 8	-12	12:21			9.4	00	STANDARDIZATION		
* 9	-120	12:24			9.4	00	Vol. Of Iodine (ml)	Volume of PAO/ $\text{Na}_2\text{S}_2\text{O}_3$ (ml)	Conc. Of Iodine (N)
* 0							10	9.6	0.05414
* 1							10	9.6	0.05414
* 2							10	9.4	0.05414
* 3									
* 4									
* 5									
* 6									
* 7									
* 8									
* 9									
* 0									
* 1									
* 2									
* 3									
* 4									
* 5									
* 6									
* 7									
* 0									
ANALYTICAL BATCH * SDH009-013									

$$\text{Sulfide (mg/L)} = \frac{(V_1 \times N_{I_2} - V_{PAO} \times N_{PAO}) \times 16,000}{V_{\text{sample}}}$$

Comments:

Analyzed By: A112

TABLE OF CONTENTS

CLIENT: **BATTELLE MEMORIAL INSTITUTE**
PROJECT: **JPL**
SDG: **05H213**

SECTION		PAGE
Cover Letter, COC/Sample Receipt Form		1000 – 1005
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GC/MS-SVOA	**	3000 –
GC-VOA	**	4000 –
GC-SVOA	**	5000 –
HPLC	**	6000 –
METALS	METHOD 200.7	7000 – 7013
WET	METHOD 300.0	8000 – 8022
	METHOD 160.1	8023 – 8028
	METHOD 376.1	8029 – 8033
OTHERS	**	9000 –

** - Not Requested



1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889
Fax: (310) 618-0818

Date: 09-06-2005
EMAX Batch No.: 05H213

Attn: Tien Shiao

Battelle Memorial Institute
505 King Ave.
Columbus OH 43201

Subject: Laboratory Report
Project: JPL

Enclosed is the Laboratory report for samples received on 08/23/05.
The data reported include :

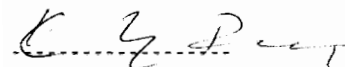
Sample ID	Control #	Col Date	Matrix	Analysis
MW-20-1	H213-01	08/22/05	WATER	METALS IN WATER & WASTE
MW-25-5	H213-02	08/22/05	WATER	NITRATE-N BY IC
MW-25-4	H213-03	08/22/05	WATER	NITRATE-N BY IC
MW-25-3	H213-04	08/22/05	WATER	NITRATE-N BY IC
MW-25-2	H213-05	08/22/05	WATER	NITRATE-N BY IC
MW-25-1	H213-06	08/22/05	WATER	NITRATE-N BY IC
MW-21-5	H213-07	08/22/05	WATER	SULFIDE SOLIDS TOTAL DISSOLVED NITRATE-N BY IC NITRITE-N BY IC
MW-21-4	H213-08	08/22/05	WATER	SULFIDE SOLIDS TOTAL DISSOLVED NITRATE-N BY IC NITRITE-N BY IC
MW-21-3	H213-09	08/22/05	WATER	SULFIDE SOLIDS TOTAL DISSOLVED NITRATE-N BY IC NITRITE-N BY IC
DUPE-1-8/22/05	H213-10	08/22/05	WATER	SULFIDE

Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
				SOLIDS TOTAL DISSOLVED
				NITRATE-N BY IC
				NITRITE-N BY IC
MW-21-2	H213-11	08/22/05	WATER	SULFIDE
				SOLIDS TOTAL DISSOLVED
				NITRATE-N BY IC
				NITRITE-N BY IC
MW-21-1	H213-12	08/22/05	WATER	SULFIDE
				SOLIDS TOTAL DISSOLVED
				NITRATE-N BY IC
				NITRITE-N BY IC

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,



Kam Y. Pang, Ph.D.
Laboratory Director

Proj. No.	Project Title	
G-486111 -73	Source Determination Study	
SAMPLERS:(Signature)	D. Garver	
DATE	TIME	SAMPLE I.D.
1. 8/22/05	0745	MW-20-1
2. 8/22/05	0850	MW-25-5
3. 8/22/05	0918	MW-25-4
4. 8/22/05	0936	MW-25-3
5. 8/22/05	0952	MW-25-2
6. 8/22/05	1015	MW-25-1
7. 8/22/05	1113	MW-21-5
8. 8/22/05	1130	MW-21-4
9. 8/22/05	1154	MW-21-3
10. 8/22/05	1154	DVPE-1-8/22/05
11. 8/22/05	1207	MW-21-2
12. 8/22/05	1221	MW-21-1
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[Signature]	8-23-05 0800	Phil Hatan
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[Signature]	8-23-05 915	
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
[Signature]		

Hanh Bui

From: Shiao, Tien [shiaoh@BATTELLE.ORG]
Sent: Wednesday, August 24, 2005 11:33 AM
To: Hanh Bui
Cc: Ohart, Carolyn J
Subject: FW: COC SDG: 05H213 (Battelle/JPL)

Hi Hanh,

I reviewed the COCs and they look correct. And yes, nitrate will be the only parameter re-sampled for MW-25.

Sorry for the late reply.

Thanks,
Tien

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Tuesday, August 23, 2005 4:57 PM
To: Shiao, Tien
Subject: COC SDG: 05H213 (Battelle/JPL)

Hi Tien,
Here is the COC for samples receive today, Nitrate only for MW-25 samples? thanks.
Hanh

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

METHOD 200.7
METALS BY ICP-AES

SDG#: 05H213

7000

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H213**

METHOD 200.7 METALS BY ICP-AES

One (1) water sample was received on 08/23/05 for Metals analysis by Method 200.7 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample H213-01 was analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

6. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

7001

LAB CHRONICLE
METALS BY ICP-AES

SDG NO. : 05H213
Instrument ID : T-107

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample		Calibration Prep.		Notes
						Data FN		Data FN	Batch	
WATER										
MBLK1W LCS1W LCD1W MM-20-1AS MM-20-1 MM-20-1DL	IPH056WB	1	NA	09/01/0519:55	08/24/0513:35	1071003023		1071003021	IPH056W	Method Blank
	IPH056WL	1	NA	09/01/0519:59	08/24/0513:35	1071003024		1071003021	IPH056W	Lab Control Sample (LCS)
	IPH056WC	1	NA	09/01/0520:03	08/24/0513:35	1071003025		1071003021	IPH056W	LCS Duplicate
	H213-01A	1	NA	09/01/0520:07	08/24/0513:35	1071003026		1071003021	IPH056W	Analytical Spike Sample
	H213-01	1	NA	09/01/0520:13	08/24/0513:35	1071003027		1071003021	IPH056W	Field Sample
	H213-01T	5	NA	09/01/0520:17	08/24/0513:35	1071003028		1071003021	IPH056W	Diluted Sample

FN - Filename
% Moist - Percent Moisture

7002

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 08/22/05
Project     : JPL                          Date Received: 08/23/05
SDG NO.     : 05H213                       Date Extracted: 08/24/05 13:35
Sample ID:  MW-20-1                        Date Analyzed: 09/01/05 20:13
Lab Samp ID: H213-01                       Dilution Factor: 1
Lab File ID: I07I003027                    Matrix       : WATER
Ext Btch ID: IPH056W                       % Moisture    : NA
Calib. Ref.: I07I003021                    Instrument ID : EMAXT107
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	82.3	1	.1
Iron	ND	.2	.04
Magnesium	26.3	1	.1
Potassium	2.72	2	1.4
Sodium	20	1	.25

7003

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE      Date Collected: NA
Project     : JPL                             Date Received: 08/24/05
SDG NO.    : 05H213                          Date Extracted: 08/24/05 13:35
Sample ID   : MBLK1W                          Date Analyzed: 09/01/05 19:55
Lab Samp ID : IPH056WB                        Dilution Factor: 1
Lab File ID : I07I003023                      Matrix       : WATER
Ext Btch ID : IPH056W                         % Moisture    : NA
Calib. Ref.: I07I003021                       Instrument ID : EMAXT107
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	ND	1	.1
Iron	ND	.2	.04
Magnesium	ND	1	.1
Potassium	ND	2	1.4
Sodium	ND	1	.25

7004

al

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05H213
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILT N FACTR: 1 1 1
SAMPLE ID: MBLK1W
CONTROL NO.: IPH056WB IPH056WL IPH056WC
LAB FILE ID: I07I003023 I07I003024 I07I003025
DATIME EXTRCTD: 08/24/0513:35 08/24/0513:35 08/24/0513:35 DATE COLLECTED: NA
DATIME ANALYZD: 09/01/0519:55 09/01/0519:59 09/01/0520:03 DATE RECEIVED: 08/24/05
PREP. BATCH: IPH056W IPH056W IPH056W
CALIB. REF: I07I003021 I07I003021 I07I003021

ACCESSION:

PARAMETER	BLNK RSLT mg/L	SPIKE AMT mg/L	BS RSLT mg/L	BS % REC	SPIKE AMT mg/L	BSD RSLT mg/L	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	ND	50	49.5	99	50	49.9	100	1	85-115	20
Iron	ND	10	10.1	101	10	9.99	100	1	85-115	20
Magnesium	ND	50	48.8	98	50	49.5	99	1	85-115	20
Potassium	ND	50	49.8	100	50	51.2	102	3	85-115	20
Sodium	ND	50	48.6	97	50	49.6	99	2	85-115	20

7005

EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H213
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 5
SAMPLE ID: MW-20-1 MW-20-1DL
EMAX SAMP ID: H213-01 H213-01T
LAB FILE ID: I071003027 I071003028
DATE EXTRACTED: 08/24/0513:35 08/24/0513:35 DATE COLLECTED: 08/22/05
DATE ANALYZED: 09/01/0520:13 09/01/0520:17 DATE RECEIVED: 08/23/05
PREP. BATCH: IPH056W IPH056W
CALIB. REF: I071003021 I071003021

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SERIAL DIL RSLT (mg/L)	DIF RSLT %	QC LIMIT (%)
Calcium	82.3	78.9	4	10
Iron	ND	ND	0	10
Magnesium	26.3	25.1	5	10
Potassium	2.72	ND	NA	10
Sodium	20	20.3	1	10

7006

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05H213
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILT N FACTR: 1 1
SAMPLE ID: MW-20-1
CONTROL NO.: H213-01 H213-01A
LAB FILE ID: I071003027 I071003026
DATIME EXTRCTD: 08/24/0513:35 08/24/0513:35 DATE COLLECTED: 08/22/05
DATIME ANALYZD: 09/01/0520:13 09/01/0520:07 DATE RECEIVED: 08/23/05
PREP. BATCH: IPH056W IPH056W
CALIB. REF: I071003021 I071003021

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	AS RSLT (mg/L)	AS % REC	QC LIMIT (%)
Calcium	82.3	50	127	89	85-115
Iron	ND	10	9.78	98	85-115
Magnesium	26.3	50	73.2	94	85-115
Potassium	2.72	50	52.8	100	85-115
Sodium	20	50	67.4	95	85-115

7007

REGULAR ICP QC CHECK TABLE

QC	ICV HIGH	ICV	CCV	ICSAB	ICSA
Limit%	95-105	90-110	90-110	80-120	80-120
Comp	mg/L	mg/L	mg/L	mg/L	mg/L
Al	10	5	5	500	500
Sb	2	1	1	1	0
As	2	1	1	1	0
Ba	2	1	1	0.5	0
Be	2	1	1	0.5	0
B	2	1	1	0.5	0
Cd	2	1	1	1	0
Ca	100	50	50	500	500
Cr	2	1	1	0.5	0
Co	2	1	1	0.5	0
Cu	2	1	1	0.5	0
Fe	10	5	5	200	200
Pb	2	1	1	1	0
Mg	100	50	50	500	500
Mn	2	1	1	0.5	0
Mo	2	1	1	1	0
Ni	2	1	1	1	0
K	100	50	50	50	0
Se	2	1	1	3.6	0
Ag	2	1	1	1	0
Na	100	50	50	10	0
Sr	2	1	1	0.5	0
Tl	2	1	1	3.6	0
Sn	10	5	5	1	0
Ti	2	1	1	1	0
V	2	1	1	0.5	0
Zn	2	1	1	1	0

ANALYSIS RUN LOG FOR ICP

SOP ☒ EMAX-6010-Rev. 3 ☐ EMAX-CLP-TAL ☐ Method File: 6010031 Autosampler Table: 108 Time: 18:21 End Date: 09/11/05 Time: 20:36 Book# A24 -038

Matrix: <u>WATER</u>		Start Date: <u>09/11/05</u>		End Date: <u>09/11/05</u>		Time: <u>20:36</u>		Book# <u>A24 -038</u>	
Data File Name	Prep. Batch	Lab Sample ID	DF	Matrix	Notes	Std.	Instrument No.	ID	
01		SC				S ₀	51117007.77.05		24
02		SC				S ₁	NA		
03		SC				S ₂	NA		
04		ICV (GES)				S ₃	51117007.44.08		
05		ICP				S ₄	NA		
06		CCV (IPC)				S ₅	NA		
07		CCP				S ₆	51117007.45.02		
08		ICGAI				ICV (GES)	↓ 09.09.02		
09		ICGAPI				ICVH1	NA		
10		CCV1 (IPC)				ICVH2	NA		
11		CCP1				CCV (IPC)	51117007.00.02		
12	1P11076W	1P11076WB				ICSA	↓ 09.07.09		
13		WV				ICSAB	↓ 09.00.01		
14		WC				MRL	NA		
15		H870-01A							
16		01							
17		01T							
18		02							
19		03							
20		04							
21		CCV2 (IPC)							
22		CCP2							
23	1P11076W	1P11076WB							
24		WV							
25		WC							

ANALYTICAL BATCH * 1071003

ANALYTICAL BATCH * 7009

Comments: NOT STIKED; FOR
CERTIFICATION

Analyzed By: ALC
Date Disposed: ALC

This page is checked during data review.

SEQUENCE FILE : I071003

4-18	19-33	34-43	44-53	54-63
LFID	LSID	TIME	DATE	DF
I071003001	S0	18:21	09/01/05	1
I071003002	S3	18:25	09/01/05	1
I071003003	S6	18:29	09/01/05	1
I071003004	ICV	18:33	09/01/05	1
I071003005	ICB	18:39	09/01/05	1
I071003006	CCV	18:43	09/01/05	1
I071003007	CCB	18:47	09/01/05	1
I071003008	ICSAI	18:51	09/01/05	1
I071003009	ICSAB1	18:55	09/01/05	1
I071003010	CCV1	19:01	09/01/05	1
I071003011	CCB1	19:05	09/01/05	1
I071003012	IPH076MB	19:09	09/01/05	1
I071003013	IPH076WL	19:13	09/01/05	1
I071003014	IPH076WC	19:17	09/01/05	1
I071003015	H870-01A	19:21	09/01/05	1
I071003016	H870-01	19:27	09/01/05	1
I071003017	H870-01T	19:31	09/01/05	5
I071003018	H870-02	19:35	09/01/05	1
I071003019	H870-03	19:39	09/01/05	1
I071003020	H870-04	19:43	09/01/05	1
I071003021	CCV2	19:47	09/01/05	1
I071003022	CCB2	19:51	09/01/05	1
I071003023	IPH056MB	19:55	09/01/05	1
I071003024	IPH056WL	19:59	09/01/05	1
I071003025	IPH056WC	20:03	09/01/05	1
I071003026	H213-01A	20:07	09/01/05	1
I071003027	H213-01	20:13	09/01/05	1
I071003028	H213-01T	20:17	09/01/05	5
I071003029	ICSAF	20:22	09/01/05	1
I071003030	ICSABF	20:26	09/01/05	1
I071003031	CCV3	20:32	09/01/05	1
I071003032	CCB3	20:36	09/01/05	1

SDG : 05H213

UNIT : %

ICP CHECK : I07I003

DATE : 09/01/05

INST : EMAXT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
S0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICV	98	100	101	97	100	101	96	99	98	97	97	102	100	99	99	97	96	98	97	96	98	96	101	97	100	97	99
ICB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV	99	102	99	99	99	99	99	101	98	98	98	101	100	99	98	100	97	101	101	99	100	99	100	99	99	98	99
CCB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA1	91	...	...	...	...	...	...	89	...	...	...	87	...	93	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA81	91	85	98	90	91	91	91	89	88	84	93	87	97	93	89	85	84	96	96	94	99	88	96	84	88	93	92
CCV1	96	98	102	95	96	97	98	99	96	95	95	99	96	96	95	96	96	97	100	97	97	95	95	96	96	96	97
CCB1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH076WB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH076WL	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH076WC	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H870-01A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H870-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H870-01T	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H870-02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H870-03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H870-04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV2	93	100	100	90	93	95	97	97	93	92	91	96	98	94	93	93	94	94	97	95	94	91	94	94	93	93	95
CCB2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH056WB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH056WL	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH056WC	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H213-01A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H213-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H213-01T	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAF	91	...	...	...	...	...	...	88	...	...	...	85	...	93	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA8F	93	92	113	91	92	95	92	89	88	83	93	87	100	94	89	86	84	99	98	96	104	88	97	87	89	93	91
CCV3	99	102	104	97	98	101	99	99	96	94	96	99	97	98	95	95	97	102	105	98	101	97	95	95	97	96	96
CCB3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

QC limit of each parameter are listed in a table attached next to all the ICP check forms
* : Out of QC Limit

7011

SDG : 054213

UNIT : UG/L

SUMMARY of CALIBRATION BLANKS : I071003 (WATER)

DATE : 09/01/05 INST : EMAXT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
S0
S3
S6
ICV
ICB	-3.52	7.58	6.19	300	.000	.830	-330	1.64	1.20	1.59	.000	1.64	-16.8	-1.34	.000	-6.63	-3.23	246	10.1	.510	-7.06	.000	34.9	-15.1	-.330	-.500	-.580
CCV
CCB	-5.11	27.1	-16.5	100	.050	1.68	-410	-6.95	.900	.530	1.15	.820	-22.6	-.120	-.260	-5.30	-2.09	346	37.8	.510	.000	.000	39.3	-1.29	-.010	.980	-1.16
ICSAI	...	16.1	102	.000	-.050	5.39	-1.17	...	.150	-3.54	.990	...	18.5	...	...	...	...	140	72.4	12.9	-14.1	-.720	555	23.2	12.3	9.56	3.53
ICSAB1
CCV1
CCB1	-19.2	14.6	20.6	100	.060	2.53	-110	-.450	1.51	.000	1.15	-.270	17.1	-4.83	-.530	-1.32	-3.04	261	33.6	-2.22	-14.1	.700	41.0	-6.85	150	-.090	-1.46
IPH076WB
IPH076WL
IPH076WC
H870-01A
H870-01
H870-01T
H870-02
H870-03
H870-04
CCV2
CCB2	-16.6	13.5	10.3	100	-.060	3.37	-520	-6.43	-1.21	-1.32	-.380	.820	-7.43	-6.02	.260	-1.32	-1.71	-406	-23.5	-.680	-35.3	.860	22.7	-5.47	.300	-.100	-.800
IPH056WB
IPH056WL
IPH056WC
H213-01A
H213-01
H213-01T
ICSAF	...	-11.8	56.5	.070	.110	1.49	.030	...	-.220	-4.34	-1.04	...	28.5	...	1.54	-5.81	.190	-256	39.6	10.8	-21.2	-.590	414	39.8	-12.7	9.11	-5.83
ICSABF
CCV3
CCB3	-7.67	21.4	17.5	300	-.110	2.52	-.760	-6.47	.300	-1.85	-1.15	.270	7.41	-13.3	-.530	-6.63	3.99	160	31.9	-3.42	.000	.000	55.8	-6.82	.290	-2.35	-1.80

QC limit of each parameter are listed in a table attached next to all the ICP check forms
* : Out of QC Limit

7012

DIGESTION LOG FOR ICP METALS

Book # EIP-047

SOP □ EMAX-3005 Rev. No. 3 □ EMAX-3010 Rev. No. 2 □ EMAX-CLP-TAL □ 200.7

Matrix: WATER		Start Date: 8-24-05	Time: 13:35	Temp: 85°C	Ending Date: 8-24-05	Time: 15:35	Temp: 85°C
Sample Prep ID	Lab Sample ID	Matrix Description	Turbidity <1 NTU	Sample Amount (g)	pH	Extract Volume (ml)	Digestate Description
01	IPH056-WB			50	-	50	
02	-WL			50	-	50	
03	-WL			50	-	50	
04	H147-01			50	4.2	50	
05	-02			50		50	
06	-04			50		50	
07	-05			50		50	
08	H162-01			50		50	
09	-02			50		50	
10	-03			50		50	
11	-04			50		50	
12	H213-01			50		50	
13	H521-04			50		50	
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

Standards	ID	Amount Added (ml)
LCS -1	SMIA -09 - 42	0.5
LCS -2	SMIA -09 - 43	0.5
LCS -3	SMIA -09 - 44	0.5
MS	NIA	
Reagent	Lot# / ID	Amount Added (ml)
HNO ₃	SWIA -03 - 120	0.5
HCl	SWIA -03 - 115	0.25
H ₂ O ₂	NIA	
HNO ₃ (1:1)	NIA	
Digestate Location	TOP LAB	
Extract Location		

Texture	Cs = Coarse	Ms = Medium	Fs = Fine
Clarity	Cr = Clear	Cy = Cloudy	Td = Turbid
Artifacts	Rk = rocks	Sl = Shale	Vg = Vegetation
Color	Bu = blue	Bk = Black	Bn = Brown
	Gn = Green	Og = Orange	Rd = Red
	Yw = Yellow	Cl = Colorless	

Comments: Samples for Methods 200.7 or 200.8 Analyses

If turbidity ≤ 1 NTU no digestion is required unless otherwise required by the project

Prepared By: MC Standard Added By: MC

Witnessed By: A2 Extracts Rcvd. By: A2812405

Checked By: A2

Date Disposed: Disposed by:

BATCH: IPH056-W

7013

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

WET CHEMICAL ANALYSES

SDG#: 05H213

8000

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05H213

METHOD 300.0 NITRATE-N AND NITRITE-N

Eleven (11) water for Nitrate-N and six (6) water samples for Nitrite-N were received on 08/23/05 to be analyzed by method 300.0 in accordance with "Method for Determination of Inorganic Anions by Ion Chromatography", EPA 600/84-017.

1. Holding Time

Analyses met holding time criteria except dilution runs of H213-06 and -07 for Nitrate-N analysis.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limits.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met with the aforementioned exception.

Nitrate-N analysis in the initial runs of samples H213-06 and -07 were within 48-hours holding time criteria. The samples were reanalyzed at DF 5 due to exceeded calibration range in the initial runs, however, the dilution runs were approximately analyzed two-hour out of 48-hour holding time criteria. Both initial and dilution results were reported.

All results were reported as Nitrogen concentration.

SAMPLE RESULTS

METHOD 300.0
NITRATE-N

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H213

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICH030WB	ND	1	NA	.1	.05	08/23/0515:31	NA	AH23-03	AH23-01	ICH030W	NA	NA
LCS1W	ICH030WL	2.08	1	NA	.1	.05	08/23/0515:45	NA	AH23-04	AH23-01	ICH030W	NA	NA
LCD1W	ICH030WC	2.08	1	NA	.1	.05	08/23/0515:59	NA	AH23-05	AH23-01	ICH030W	NA	NA
MW-25-5	H213-02	ND	1	NA	.1	.05	08/23/0519:41	NA	AH23-15	AH23-13	ICH030W	08/22/05	08/23/05
MW-25-1	H213-06	12.8E	1	NA	.1	.05	08/23/0520:38	NA	AH23-19	AH23-13	ICH030W	08/22/05	08/23/05
MW-21-5	H213-07	7.13E	1	NA	.1	.05	08/23/0520:52	NA	AH23-20	AH23-13	ICH030W	08/22/05	08/23/05
MW-25-4	H213-03	4.5	2	NA	.2	.1	08/23/0522:45	NA	AH23-28	AH23-25	ICH030W	08/22/05	08/23/05
MW-25-3	H213-04	8.59	5	NA	.5	.25	08/23/0522:59	NA	AH23-29	AH23-25	ICH030W	08/22/05	08/23/05
MBLK2W	ICH031WB	ND	1	NA	.1	.05	08/23/0523:27	NA	AH23-31	AH23-25	ICH031W	NA	NA
LCS2W	ICH031WL	2.05	1	NA	.1	.05	08/23/0523:41	NA	AH23-32	AH23-25	ICH031W	NA	NA
LCD2W	ICH031WC	2.03	1	NA	.1	.05	08/23/0523:55	NA	AH23-33	AH23-25	ICH031W	NA	NA
MW-25-2	H213-05	6.31	5	NA	.5	.25	08/24/0500:37	NA	AH23-36	AH23-25	ICH031W	08/22/05	08/23/05
MBLK3W	ICH033WB	ND	1	NA	.1	.05	08/24/0513:02	NA	AH24-09	AH24-01	ICH033W	NA	NA
LCS3W	ICH033WL	2.09	1	NA	.1	.05	08/24/0513:16	NA	AH24-10	AH24-01	ICH033W	NA	NA
LCD3W	ICH033WC	2.09	1	NA	.1	.05	08/24/0513:30	NA	AH24-11	AH24-01	ICH033W	NA	NA
MW-21-4	H213-08	6.53	5	NA	.5	.25	08/24/0511:24	NA	AH24-02	AH24-01	ICH033W	08/22/05	08/23/05
MW-21-3	H213-09	9.53	5	NA	.5	.25	08/24/0511:38	NA	AH24-03	AH24-01	ICH033W	08/22/05	08/23/05
DUPE-1-8/22/05	H213-10	9.69	5	NA	.5	.25	08/24/0511:52	NA	AH24-04	AH24-01	ICH033W	08/22/05	08/23/05
MW-21-2	H213-11	10.7	5	NA	.5	.25	08/24/0512:06	NA	AH24-05	AH24-01	ICH033W	08/22/05	08/23/05
MW-21-1	H213-12	14.2	5	NA	.5	.25	08/24/0512:20	NA	AH24-06	AH24-01	ICH033W	08/22/05	08/23/05
MW-25-1DL	H213-06T	10.5	5	NA	.5	.25	08/24/0512:34	NA	AH24-07	AH24-01	ICH033W	08/22/05	08/23/05
MW-21-5DL	H213-07T	6.35	5	NA	.5	.25	08/24/0512:48	NA	AH24-08	AH24-01	ICH033W	08/22/05	08/23/05

METHOD 300.0
NITRITE-N

Client : BATTILLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H213

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLKTW	ICH030WB	ND	1	NA	.1	.05	08/23/0515:31	NA	AH23-03	AH23-01	ICH030W	NA	NA
LCS1W	ICH030WL	1.98	1	NA	.1	.05	08/23/0515:45	NA	AH23-04	AH23-01	ICH030W	NA	NA
LCD1W	ICH030WC	2	1	NA	.1	.05	08/23/0515:59	NA	AH23-05	AH23-01	ICH030W	NA	NA
MW-21-5	H213-07	ND	1	NA	.1	.05	08/23/0520:52	NA	AH23-20	AH23-13	ICH030W	08/22/05	08/23/05
MW-21-4	H213-08	ND	1	NA	.1	.05	08/23/0521:06	NA	AH23-21	AH23-13	ICH030W	08/22/05	08/23/05
MW-21-3	H213-09	ND	1	NA	.1	.05	08/23/0521:20	NA	AH23-22	AH23-13	ICH030W	08/22/05	08/23/05
DUPE-1-8/22/05	H213-10	ND	1	NA	.1	.05	08/23/0521:34	NA	AH23-23	AH23-13	ICH030W	08/22/05	08/23/05
MW-21-2	H213-11	ND	1	NA	.1	.05	08/23/0521:48	NA	AH23-24	AH23-13	ICH030W	08/22/05	08/23/05
MW-21-1	H213-12	ND	1	NA	.1	.05	08/23/0522:30	NA	AH23-27	AH23-25	ICH030W	08/22/05	08/23/05

8004

21

QC SUMMARIES

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05K213

METHOD: METHOD 300.0

MATRIX: WATER

DILUTION FACTOR: 1

SAMPLE ID: MBLK1W

LAB SAMP ID: ICH030WB

LAB FILE ID: AH23-03

DATE EXTRACTED: NA

DATE ANALYZED: 08/23/0515:31

PREP. BATCH: ICH030W

CALIB. REF: AH23-01

% MOISTURE: NA

DATE COLLECTED: NA

DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	2	2.08	104	2	2.08	104	0	90-110	20

8006

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H213
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK2W
LAB SAMP ID: ICH031WB
LAB FILE ID: AH23-31
DATE EXTRACTED: NA
DATE ANALYZED: 08/23/0523:27
PREP. BATCH: ICH031W
CALIB. REF: AH23-25

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	2	2.05	103	2	2.03	102	1	90-110	20

8007

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H213
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK3W
LAB. SAMP ID: ICH033WL ICH033WC
LAB. FILE ID: AH24-10 AH24-11
DATE EXTRACTED: NA
DATE ANALYZED: 08/24/0513:02 08/24/0513:30
PREP. BATCH: ICH033W ICH033W
CALIB. REF: AH24-01 AH24-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	2	2.09	105	2	2.09	105	0	90-110	20

8008

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H213
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1 % MOISTURE: NA
SAMPLE ID: MBLK1W
LAB SAMP ID: ICH030WB ICH030WC
LAB FILE ID: AH23-03 AH23-05
DATE EXTRACTED: NA
DATE ANALYZED: 08/23/0515:31 08/23/0515:45 08/23/0515:59
PREP. BATCH: ICH030W ICH030W ICH030W
CALIB. REF: AH23-01 AH23-01 AH23-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrite-N	ND	2	1.98	99	2	2	100	1	90-110	20

8009

24

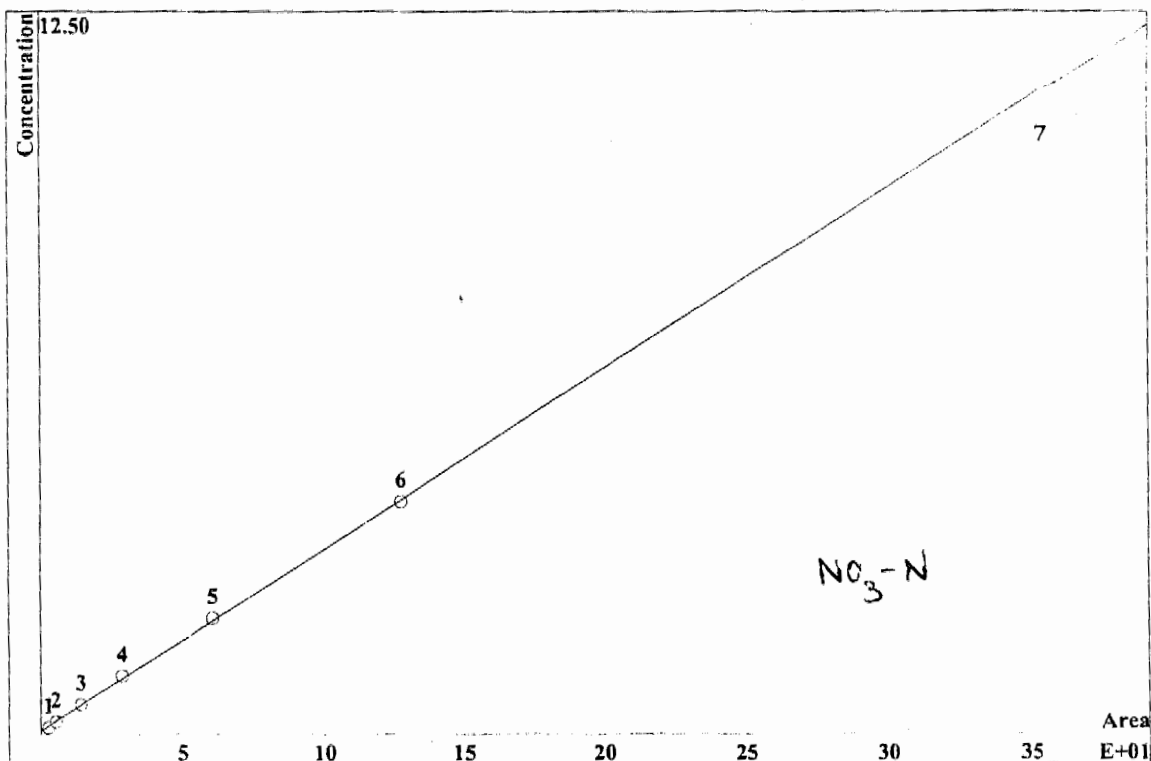
INITIAL CALIBRATIONS

IC Result Check FormVersion : QH2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH18-01	1B	FCIBNPS	0	0	0	0	0	0	0	p8181936	1
AH18-02	S0	FCIBNPS	0	0	0	0	0	0	0	p8181950	1
AH18-03	S1	FCIBNPS	0.166	0.17262	0.13231	0.12813	0.13644	0.22927	0.14104	p8182004	1
AH18-04	S2	FCIBNPS	0.28466	0.28623	0.22239	0.22088	0.22213	0.31227	0.24604	p8182018	1
AH18-05	S3	FCIBNPS	0.51393	0.51514	0.50265	0.50493	0.50026	0.56154	0.52244	p8182032	1
AH18-06	S4	FCIBNPS	0.96429	0.99164	0.95545	0.95771	0.95423	0.9672	0.9792	p8182047	1
AH18-07	S5	FCIBNPS	1.9297	1.9476	1.9596	2.0373	1.9583	1.8503	1.9613	p8182101	1
AH18-08	S6	FCIBNPS	3.8838	3.8076	4.0276	3.9271	4.0286	3.7744	3.9072	p8182115	1
AH18-09	S7	FCIBNPS	10.058	10.079	10.533	10.024	11.158	10.105	10.043	p8182129	1
AH18-10	ICV	FCIBNPS	94.6%	95.5%	98%	99.9%	98.2%	93%	97.2%	p8182143	1
AH18-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8182157	1
AH18-12	ICH025WB	FCIBNPS	0	0	0	0	0	0	0	p8182211	1
AH18-13	ICH025WL	FCIBNPS	1.9633	1.9339	1.884	2.1091	1.9384	1.8022	1.9892	p8182225	1
AH18-14	ICH025WC	FCIBNPS	1.9405	1.927	1.8843	2.0871	1.9384	1.8038	2.0248	p8182239	1
AH18-15	H023-01	F*IBNPS	0	11823E	0	-7.8039	0	0	1470.9	p8182253	200
AH18-16	H023-03	F*IBNPS	0	11711E	0	0	0	0	1420.9	p8182307	200
AH18-17	H023-01	*C*****	0	9274.5	0	0	0	0	1588.2	p8182321	2000
AH18-18	H023-02	FCIBNPS	0	8909.8	0	0	0	0	1504.6	p8182335	2000
AH18-19	H023-03	*C*****	0	9111	0	0	0	0	1525.4	p8182349	2000
AH18-20	H023-04	FCIBNPS	0	9589.9	0	0	0	0	1558.3	p8190004	2000
AH18-21	CCV1	FCIBNPS	95.3%	99%	97.2%	96.8%	97.9%	92.8%	99.3%	p8190018	1
AH18-22	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8190032	1
AH18-23	H169-01	F*IBNP*	0.58784	557.84E	0	3.9834	0.30268	0	222.2E	p8190046	1
AH18-24	H169-01D	F*IBNP*	0.54415	557.56E	0	3.8987	0.26518	0	222.08E	p8190100	1
AH18-25	H169-01M	F*IBNP*	2.3279	551.74E	2.2881	5.3508	2.2308	2.1545	221.61E	p8190114	1
AH18-26	H614-01	F*IBNP*	0.30333	24.22E	0	0.84928	3.8374	0.23597	25.147E	p8190128	1
AH18-27	H614-02	F*IB*P*	0.24861	17.85E	0	0.85627	5.8152E	0	15.634E	p8190142	1
AH18-28	H614-02D	F*IB*P*	0.42543	18.124E	0	1.1955	5.8532E	0.23178	15.667E	p8190156	1
AH18-29	H614-02M	F*IB*P*	2.2519	20.146E	2.0242	3.1702	8.3464E	2.4015	18.076E	p8190210	1
AH18-30	H614-01	*C*****S	0.7526	19.853	0	0.84668	3.6036	0	22.543	p8190224	5
AH18-31	H614-02	*C**N*S	0.57712	14.626	0	0.8431	5.0755	0	13.896	p8190238	5
AH18-32	H614-02D	*C**N*S	0.5948	14.546	0	0.80981	5.0759	0	13.937	p8190252	5
AH18-33	CCV2	FCIBNPS	95.5%	99.2%	97.8%	101.7%	98.2%	95.2%	98.8%	p8190306	1
AH18-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8190320	1
AH18-35	H614-02M	*C**N*S	9.666	24.294	9.0355	10.763	15.204	10.183	23.849	p8190335	5
AH18-36	H169-01	*****	1.2771	462.51E	0	3.1323	0	0	162.61E	p8190349	10
AH18-37	H169-01D	*****	1.1563	462.25E	0	2.6472	0	0	162.5E	p8190403	10
AH18-38	H169-10M	F*IBNP*	19.589	483.82E	19.02	22.753	19.898	20.393	183.19E	p8190417	10
AH18-39	RINSE	FCIBNPS	0	0.12789	0	0	0	0.23054	0	p8190431	1
AH18-40	RINSE	FCIBNPS	0	0	0	0.049699	0	0	0	p8190445	1
AH18-41	CCV3	FCIBNPS	97.4%	98.2%	96.2%	103.3%	96.9%	124.7%*	102%	p8190459	1
AH18-42	CCB3	FCIBNPS	0	0	0	0	0	0	0	p8190513	1

CALIBRATION OF COMPONENT nitrate

Method: IC100-H18.mtw
 Equation: $Q = 0.0313474 \cdot A + 0.0465038$
 RSD: 3.094 %
 Correlation coefficient: 0.999710



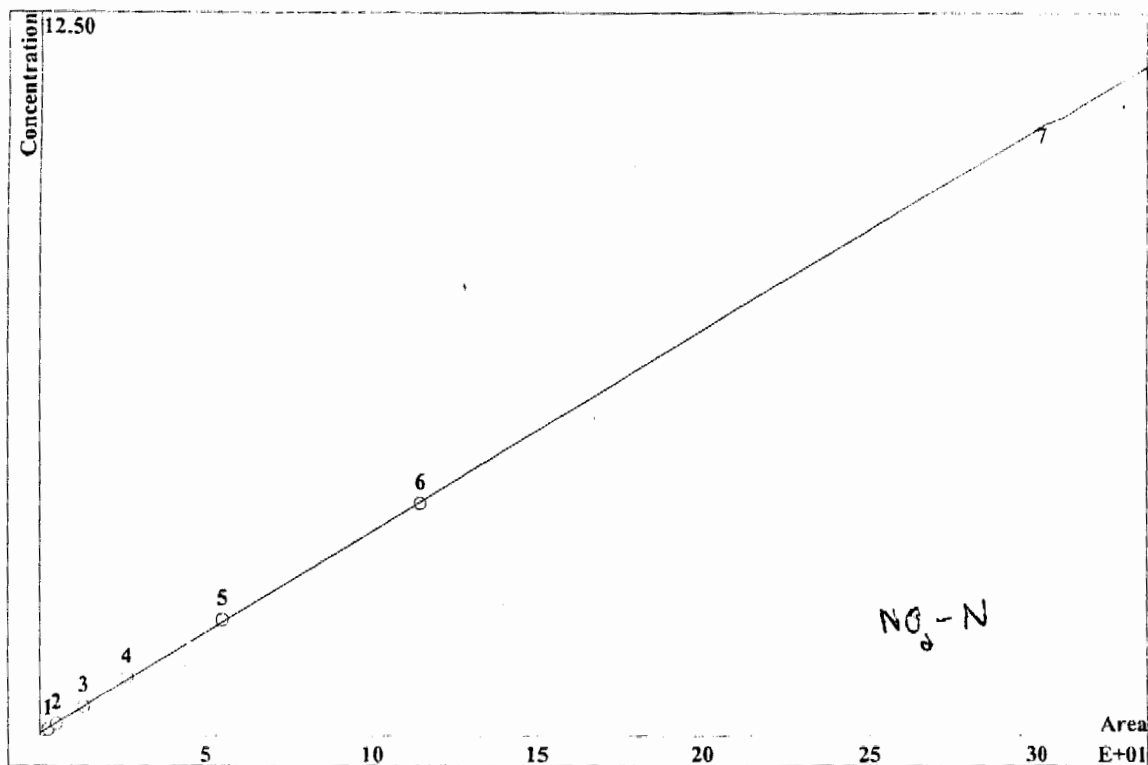
K3 = 0 K2 = 0 K1 = 0.0313474 K0 = 0.0465038
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.1627	2.869	0.1	1	5.56	Yes	p8182004.chw
2	0.329	5.603	0.2	1	5.56	Yes	p8182018.chw
3	0.8519	14.48	0.5	1	5.56	Yes	p8182032.chw
4	1.718	28.96	1	1	5.56	Yes	p8182047.chw
5	3.662	60.99	2	1	5.56	Yes	p8182101.chw
6	7.807	127	4	1	5.56	Yes	p8182115.chw
7	22.1	354.5	10	1	5.56	No	p8182129.chw

7/28/05

CALIBRATION OF COMPONENT nitrite

Method: IC100-H18.mtw
 Equation: $Q = 0.0346959 \cdot A + 0.043272$
 RSD: 2.962 %
 Correlation coefficient: 0.999734



K3 = 0 K2 = 0 K1 = 0.0346959 K0 = 0.043272
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2049	2.566	0.1	1	3.98	Yes	p8182004.chw
2	0.4151	5.163	0.2	1	3.98	Yes	p8182018.chw
3	1.077	13.24	0.5	1	3.98	Yes	p8182032.chw
4	2.113	26.29	1	1	3.98	Yes	p8182047.chw
5	4.455	55.23	2	1	3.98	Yes	p8182101.chw
6	9.454	114.8	4	1	3.98	Yes	p8182115.chw
7	24.1	302.3	10	1	3.98	No	p8182129.chw

10/8/05

***SECOND SOURCE
VERIFICATION***

IC Result Check FormVersion : QH2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH18-10	ICV	FCIBNPS	94.6%	95.5%	98%	99.9%	98.2%	93%	97.2%	p8182143	1
AH18-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8182157	1
AH18-21	CCV1	FCIBNPS	95.3%	99%	97.2%	96.8%	97.9%	92.8%	99.3%	p8190018	1
AH18-22	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8190032	1
AH18-33	CCV2	FCIBNPS	95.5%	99.2%	97.8%	101.7%	98.2%	95.2%	98.8%	p8190306	1
AH18-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8190320	1
AH18-41	CCV3	FCIBNPS	97.4%	98.2%	96.2%	103.3%	96.9%	124.7%*	102%	p8190459	1
AH18-42	CCB3	FCIBNPS	0	0	0	0	0	0	0	p8190513	1

DAILY CALIBRATIONS

IC Result Check FormVersion : QH2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH23-01 ✓	CCV18	FCIBNPS	94.1%	93.9%	105.1%	97.4%	101.1%	93%	99.5%	p8231503	1
AH23-02	CCB18	FCIBNPS	0	0	0	0	0	0	0	p8231517	1
AH23-13 ✓	CCV19	FCIBNPS	92.1%	94.8%	97.1%	98.8%	101.8%	90%	94.6%	p8231856	1
AH23-14	CCB19	FCIBNPS	0	0	0	0	0	0	0	p8231910	1
AH23-25 ✓	CCV20	FCIBNPS	93.2%	95.5%	96.8%	97.9%	101.2%	91.5%	97.1%	p8232202	1
AH23-26	CCB20	FCIBNPS	0	0	0	0	0	0	0	p8232216	1
AH23-37 ✓	CCV21	FCIBNPS	94.1%	94.5%	95.1%	98.9%	103.1%	84.3%*	90.8%	p8240051	1
AH23-38	CCB21	FCIBNPS	0	0	0	0	0	0	0	p8240105	1
AH23-50	CCV22	FCIBNPS	96.1%	97.9%	93.8%	102.9%	103.7%	113.9%*	99.7%	p8240354	1
AH23-51	CCB22	FCIBNPS	0	0	0	0	0	0.58609	0	p8240408	1

IC Result Check FormVersion : QH2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH24-01 ✓	CCV25	FCIBNPS	90.5%	95.8%	99.1%	99.7%	104.3%	80.4%*	97.6%	p8241109	1
AH24-12 ✓	CCV26	FCIBNPS	96.1%	95.1%	98%	98%	104.2%	86.7%*	92.2%	p8241344	1
AH24-13 ✓	CCB26	FCIBNPS	0	0	0	0	0	0	0	p8241358	1
AH24-24	CCV27	FCIBNPS	94.9%	92.4%	96.6%	97.5%	98.6%	87.8%*	93.7%	p8241633	1
AH24-25	CCB27	FCIBNPS	0	0	0	0	0	0	0	p8241647	1
AH24-36	CCV28	FCIBNPS	93.3%	94.6%	95.6%	98.2%	98.6%	91.3%	94.7%	p8241952	1
AH24-37	CCB28	FCIBNPS	0	0	0	0	0	0	0	p8242015	1
AH24-48	CCV29	FCIBNPS	93.9%	94.4%	96%	98.8%	98.7%	88.6%*	91.9%	p8242256	1
AH24-49	CCB29	FCIBNPS	0	0	0	0	0	0	0	p8242310	1
AH24-60	CCV30	FCIBNPS	93.7%	91.1%	97%	95%	98.6%	89.3%*	94.4%	p8250957	1
AH24-61	CCB30	FCIBNPS	0	0	0	0	0	0	0	p8251011	1
AH24-72	CCV31	FCIBNPS	95.4%	100.1%	97.9%	100.3%	99.2%	91.6%	98.5%	p8251250	1
AH24-83	CCV32	FCIBNPS	94.6%	95.9%	96%	99.2%	99.2%	91.5%	97.8%	p8251533	1
AH24-84	CCB32	FCIBNPS	0	0	0	0	0	0	0	p8251547	1
AH24-95	CCV33	FCIBNPS	91.9%	92.8%	94.1%	94%	97.5%	86.9%*	93.4%	p8251923	1
AH24-96	CCB33	FCIBNPS	0	0	0	0	0	0	0	p8251937	1
AH24-107	CCV34	FCIBNPS	94.8%	95%	97%	102.3%	101.2%	92.4%	95.5%	p8252334	1
AH24-108	CCB34	FCIBNPS	0	0	0	0	0	0	0	p8252348	1
AH24-119	CCV35	FCIBNPS	93.5%	96%	96.6%	99.2%	99.4%	86.8%*	90.8%	p8260222	1
AH24-120	CCB35	FCIBNPS	0	0	0	0	0	0	0	p8260236	1
AH24-131	CCV36	FCIBNPS	94.5%	94.7%	96.4%	99.8%	99.7%	90.2%	95.5%	p8260511	1
AH24-132	CCB36	FCIBNPS	0	0	0	0	0	0	0	p8260525	1
AH24-137	CCV37	FCIBNPS	94.4%	94.4%	96.7%	99.4%	99.5%	87.4%*	90.8%	p8260636	1
AH24-138	CCB37	FCIBNPS	0	0	0	0	0	0	0	p8260650	1
AH24-145	CCV38	FCIBNPS	92.4%	93.5%	95.2%	94.6%	98%	86.5%*	92.2%	p8260848	1
AH24-146	CCB38	FCIBNPS	0	0	0	0	0	0	0	p8260902	1

ANALYTICAL LOGS

Book# A100 003

Time: 05:13

End Date: 03/19/65

Time: 14:36

Analyzed By: 10

This page is checked during data review.

Sample Prep ID Prefix:

* Sample Prep ID Prefix: ICN025W

ANALYSIS RUN LOG FOR IC

SOP ☒ EMAX-300.0-Rev. 3 ☐ EMAX-300.1 Rev. No.0 ☐ EMAX-9056 Rev. No. 2

Book# A100 003

Start Date:	6/24/15	Time:	11:09
End Date:	6/26/15	Time:	09:02

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes
* 1	AH24-01	00V25	1	W	
* 2	02	H213-00	5		
* 3	03	04			
* 4	04	10			
* 5	05	11			
* 6	06	12			
* 7	07	16			
* 8	08	07			
* 9	09	ICH033WB	1		
* 10	10	WL			
* 11	11	WL			
* 12	12	00V26			
* 13	13	00B26			
* 14	14	Q212-04	2		
* 15	15	04D			
* 16	16	04R			
* 17	17	04T			
* 18	18	H223-02	5		
* 19	19	03			
* 20	20	04			
* 21	21	05			
* 22	22	06			
* 23	23	RINSE	1		
* 24	24	00V27			
* 25	25	00B27			

Analyzed By:

This page is checked during data review.

*** Sample Prep ID Prefix: TCH034W

* Sample Prep ID Prefix: JCH033W

1

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H213**

METHOD 160.1 TOTAL DISSOLVED SOLIDS

Six (6) water samples were received on 08/23/05 for Total Dissolved Solids analysis by Method 160.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 160.1
TOTAL DISSOLVED SOLIDS

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H213

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TDH017WB	ND	1	NA	10	5	08/24/0514:15	NA	TDH017W-1	NA	TDH017W	NA	NA
LCS1W	TDH017WL	335	1	NA	10	5	08/24/0514:16	NA	TDH017W-2	NA	TDH017W	NA	NA
LCD1W	TDH017WC	330	1	NA	10	5	08/24/0516:17	NA	TDH017W-3	NA	TDH017W	NA	NA
MW-21-5	H213-07	590	1	NA	10	5	08/24/0514:18	NA	TDH017W-4	NA	TDH017W	08/22/05	08/23/05
MW-21-4	H213-08	545	1	NA	10	5	08/24/0514:19	NA	TDH017W-5	NA	TDH017W	08/22/05	08/23/05
MW-21-3	H213-09	900	1	NA	10	5	08/24/0514:20	NA	TDH017W-6	NA	TDH017W	08/22/05	08/23/05
DUPE-1-8/22/05	H213-10	825	1	NA	10	5	08/24/0514:21	NA	TDH017W-7	NA	TDH017W	08/22/05	08/23/05
MW-21-2	H213-11	925	1	NA	10	5	08/24/0514:22	NA	TDH017W-8	NA	TDH017W	08/22/05	08/23/05
MW-21-1	H213-12	760	1	NA	10	5	08/24/0514:23	NA	TDH017W-9	NA	TDH017W	08/22/05	08/23/05

8024

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 160.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H213
SAMPLE ID: LCS1W
CONTROL NO.: TDH017ML

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 08/24/05 14:16

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TDS	ND	336.00	335.00	100	336.00	330.00	98	2	80-120	20

3025

OK

GRAVIMETRIC ANALYSIS LOG

SOP ☒ EMAX-160.1 Rev. No. 3 ☐ EMAX-160.2 Rev. No. 2 ☐ EMAX-160.3 Rev. No. 1 ☐ EMAX-160.4 Rev. No. 0 ☐ EMAX-160.5 Rev. No. 0

Starting Date: 8/23/05 Time: 20:00 Oven Temp. 105 °C Ending Date: 8/24/05 Time: 13:45 Oven Temp. 180 °C

Data File Name	Lab Sample ID	Sample Amt. (ml)	Dish Wt. (g)	Dry Wt. Dish + Solids (g)				Solids (mg)	Result (mg/L)	Settleable Solids		Standard
				1st	2nd	Time	3rd			Vol. of SS	Result (ml/L/hr)	
1	T104017WB	100	59.3249	59.3553	1015	1215	59.3550	1415	0.10	N/D		8/23/05
2		20	13.4175	13.4248	16	13.4244	16	6.7	335	100%		8/23/05
3		20	13.4793	13.4863	17	13.4860	17	6.6	330	98%		8/23/05
4	H213-07	20	13.4202	13.4331	18	13.4322	18	11.8	590			33
5		20	13.4078	13.4196	19	13.4189	19	10.9	545			33
6		20	13.3527	13.3715	20	13.3708	20	18.0	900			33
7		20	13.4531	13.4708	21	13.4700	21	16.5	825			33
8		20	13.3671	13.3866	22	13.3857	22	18.5	925			33
9	H213-12	20	13.4144	13.4302	23	13.4299	23	15.2	760			33
0	H223-02	20	13.4333	13.4584	24	13.4575	24	2.4	1200			33
1		20	13.4838	13.5143	25	13.5141	25	30.3	1515	1520		33
2		20	13.4056	13.4388	26	13.4385	26	32.7	1635	1640		33
3		20	13.5093	13.5500	27	13.5497	27	41.9	2095	2100		33
4		20	13.4112	13.4405	28	13.4420	28	38.7	1535	1540		33
5		20	13.4305	13.4459	29	13.4454	29	15.0	750	750		33
6		20	13.5340	13.5498	30	13.5490	30	15.1	755	755		33
7												33
8												33
9												33
0												33

ANALYTICAL BATCH # SS

ID H217W

Comments:

Balance ID:

40706360

37030058

Analyzed By: LA/NL

 $R_{(mg/L)} = (DS - DW) \times 1000$

S

where: $R_{(mg/L)}$ = concentration of solids; $DS_{(mg)}$ = Dry weight of Dish + Solids; $DW_{(mg)}$ = Dish weight; $S_{(mg)}$ = sample amount

BALANCE CALIBRATION VERIFICATION LOG (DOE)

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SOP □ EMAX-QC04 Revision No.: 1

QC04-036

Balance ID 10601202

Date 8-23-05

Range	Min:	1	Max:	600	g
TV	200	100	30	5	1
1	200.004	100.002	29.995	5.000	1.000
2	200.005	100.003	30.000	5.000	1.000
3	200.005	100.003	30.001	5.000	1.000
Criteria (±0.1%)	0.2	0.1	0.03	0.005	0.001
LL	199.8	99.9	29.97	4.995	0.999
UL	200.2	100.1	30.03	5.005	1.001

Comment:

Balance ID J77299

Date 8-23-05

Range	Min:	1	Max:	300	g
TV	200	100	50	30	20
1	199.99	100.00	50.00	30.00	20.00
2	199.99	100.00	50.00	30.00	20.00
3	199.99	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 10203192

Date 8-23-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.00	100.00	50.00	30.00	20.00
2	200.00	100.00	50.00	30.00	20.00
3	200.00	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 10304418

Date 8-23-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.03	100.02	50.00	30.00	20.00
2	200.03	100.02	50.00	30.00	20.00
3	200.03	100.02	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 40706360

Date 8-23-05

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1	199.9956	100.0005	29.9999	1.0000	0.0200
2	199.9989	100.0004	30.0001	1.0000	0.0200
3	199.9989	100.0003	30.0002	1.0000	0.0200
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

Balance ID 40706360

Date

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:



EMAX LABORATORIES, INC. 1835 W. 205th St. Torrance, CA 90501

Verified by: *lnc*

Checked by:

BALANCE CALIBRATION VERIFICATION LOG (DOE)

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OP □ EMAX-QC04 Revision No.: 1

QC04-036

Balance ID 10601202

Date 8-24-05

Balance ID J77299

Date 8-24-05

Range	Min:	1	Max:	600	g
TV	200	100	30	5	1
1	200.008	100.006	30.000	5.000	1.000
2	200.009	100.005	30.000	5.000	1.000
3	200.007	100.006	30.000	5.000	1.000
Criteria (±0.1%)	0.2	0.1	0.03	0.005	0.001
LL	199.8	99.9	29.97	4.995	0.999
UL	200.2	100.1	30.03	5.005	1.001

Comment:

Range	Min:	1	Max:	300	g
TV	200	100	50	30	20
1	199.99	100.00	50.00	30.00	20.00
2	199.99	100.00	50.00	30.00	20.00
3	199.99	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 10203192

Date 8-24-05

Balance ID 10304418

Date 8-24-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.00	100.00	50.00	30.00	20.00
2	200.00	100.00	50.00	30.00	20.00
3	200.00	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.04	100.03	50.00	30.00	20.00
2	200.04	100.03	50.00	30.00	20.00
3	200.04	100.03	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 40706360

Date 8-29-05

Balance ID 40706360

Date 8

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1	199.9985	99.9999	29.9984	1.0000	0.0200
2	199.9987	99.9998	29.9978	1.0000	0.0200
3	199.9986	99.9998	29.9982	1.0000	0.0200
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

EMAX LABORATORIES, INC. 1835 W. 205th St. Torrance, CA 90501

Verified by: JMC
Checked by: _____

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H213**

METHOD 376.1 SULFIDE

Six (6) water samples were received on 08/23/05 for Sulfide analysis by Method 376.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample

Lab control result was within QC limit.

4. Duplicate

Sample H213-12 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 376.1
SULFIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H213

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	SDH009W8	ND	1	NA	1	.4	08/23/0512:00	NA	SDH009W-01	NA	SDH009W	NA	NA
LCS1W	SDH009W1	4.65	1	NA	1	.4	08/23/0512:03	NA	SDH009W-02	NA	SDH009W	NA	NA
MW-21-5	H213-07	ND	1	NA	1	.4	08/23/0512:06	NA	SDH009W-03	NA	SDH009W	08/22/05	08/23/05
MW-21-4	H213-08	ND	1	NA	1	.4	08/23/0512:09	NA	SDH009W-04	NA	SDH009W	08/22/05	08/23/05
MW-21-3	H213-09	ND	1	NA	1	.4	08/23/0512:12	NA	SDH009W-05	NA	SDH009W	08/22/05	08/23/05
DUPE-1-8/22/05	H213-10	ND	1	NA	1	.4	08/23/0512:15	NA	SDH009W-06	NA	SDH009W	08/22/05	08/23/05
MW-21-2	H213-11	ND	1	NA	1	.4	08/23/0512:18	NA	SDH009W-07	NA	SDH009W	08/22/05	08/23/05
MW-21-1	H213-12	ND	1	NA	1	.4	08/23/0512:21	NA	SDH009W-08	NA	SDH009W	08/22/05	08/23/05
MW-21-1DUP	H213-12D	ND	1	NA	1	.4	08/23/0512:24	NA	SDH009W-09	NA	SDH009W	08/22/05	08/23/05

8030

8

EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 376.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H213
SAMPLE ID: LCS1W
CONTROL NO.: SDH009WL
DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 08/23/05 12:03

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	LCS RSLT (mg/L)	LCS % REC	QC LIMIT (%)
Sulfide	ND	5.00	4.65	93	80-120

8031

8

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 376.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H213
SAMPLE ID: MW-21-1DUP
CONTROL NO.: H213-120
DATE RECEIVED: 08/23/05
DATE EXTRACTED: NA
DATE ANALYZED: 08/23/05 12:24

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Sulfide	ND	ND	0	20

8032

9/2

ANALYSIS LOG FOR SULFIDE

SOP ☒ EMAX-376.1 Rev. No. 1 ☐ EMAX-9034 Rev. No. 0

Start Date: 08-23-05 Time: 12:00 End Date: 08-23-05 Time: 12:24

Book # ASD-007

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Volume of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Notes	Standard	ID	Conc. (mg/L)
* 1	SDH009-03	12:00	100	10	9.7	00	LCS	SD7A-06-178	5.0
* 2	02L	12:03			4.45	465	Spike	n/a	
* 3	HQ138-07	12:06			9.8	00	Na ₂ S ₂ O ₃	SD3B-02-735	0.00504
* 4	-08	12:09			9.7	00	PAO		
* 5	-09	12:12			9.9	00	Iodine	SD3B-02-734	0.00504
* 6	-10	12:15			9.6	00	HCL	SD7B-06-281C	1:1
* 7	-11	12:18			9.7	00	Indicator	SD7A-06-190	
* 8	-12	12:21			9.4	00	STANDARDIZATION		
* 9	-120	12:24			9.4	00	Vol. Of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Conc. Of Iodine (N)
* 0							10	9.4	0.005414
* 1							10	9.4	0.005414
* 2							10	9.4	0.005414
* 3									
* 4									
* 5									
* 6									
* 7									
* 8									
* 9									
* 0									
* 1									
* 2									
* 3									
* 4									
* 5									
* 6									
* 7									
* 0									

ANALYTICAL BATCH # SDH009-03

$$\text{Sulfide (mg/L)} = \frac{(V_{I_2} \times N_{I_2} - V_{PAO} \times N_{PAO}) \times 16,000}{V_{\text{sample}}}$$

Comments:

Analyzed By: A.D.

TABLE OF CONTENTS

CLIENT: **BATTELLE MEMORIAL INSTITUTE**
PROJECT: **JPL**
SDG: **05H231**

SECTION		PAGE
Cover Letter, COC/Sample Receipt Form		1000 – 1003
GC/MS-VOA	**	2000 –
GC/MS-SVOA	**	3000 –
GC-VOA	**	4000 –
GC-SVOA	**	5000 –
HPLC	**	6000 –
METALS	**	7000 –
WET	METHOD 300.0	8000 – 8016
OTHERS	**	9000 –

** - Not Requested



LABORATORIES, INC.

1835 205th Street
Torrance, CA 90501
(310) 618-8889
(310) 618-0818

Date: 09-08-2005
EMAX Batch No.: 05H231

Attn: Tien Shiao

Battelle Memorial Institute
505 King Ave.
Columbus OH 43201

Subject: Laboratory Report
Project: JPL

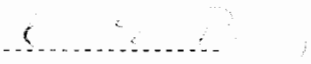
Enclosed is the Laboratory report for samples received on 08/24/05.
The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
MW-19-5	H231-01	08/23/05	WATER	NITRATE-N BY IC
MW-19-4	H231-02	08/23/05	WATER	NITRATE-N BY IC
DUPE-2-8/23/05	H231-03	08/23/05	WATER	NITRATE-N BY IC
MW-19-3	H231-04	08/23/05	WATER	NITRATE-N BY IC
MW-19-2	H231-05	08/23/05	WATER	NITRATE-N BY IC

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,



Kam Y. Pang, Ph.D.
Laboratory Director

Page ____ of ____

Type of Delivery	Delivered By/Airbill	ECN	05H231
<input checked="" type="checkbox"/> EMAX Courier		Recipient	Luna
<input type="checkbox"/> Client Delivery		Date	8/24/05
<input type="checkbox"/> Third Party		Time	10:30

COC Inspection		
<input checked="" type="checkbox"/> Client Name	<input type="checkbox"/> Sampler Name	<input checked="" type="checkbox"/> Sampling Date/Time/Location
<input type="checkbox"/> Address	<input type="checkbox"/> Courier Signature/Date/Time	<input checked="" type="checkbox"/> Analysis Required
<input type="checkbox"/> Client PM/FC	<input type="checkbox"/> TAT	<input type="checkbox"/> Matrix
<input type="checkbox"/> Tel #/Fax #	<input checked="" type="checkbox"/> Sample ID	<input type="checkbox"/> Preservative (if any)
Safety Issues	<input type="checkbox"/> None	<input type="checkbox"/> Superfund Site Samples
Comments:	<input type="checkbox"/> High Concentrations expected	
	<input type="checkbox"/> Rad Screening Required	

Packaging Inspection			
Container	<input checked="" type="checkbox"/> Cooler	<input type="checkbox"/> Box	<input type="checkbox"/>
Condition	<input type="checkbox"/> Custody Seal	<input checked="" type="checkbox"/> Intact	<input type="checkbox"/> Damaged
Packaging	<input type="checkbox"/> Bubble Pack	<input type="checkbox"/> Styrofoam	<input checked="" type="checkbox"/> Sufficient
Temperatures	<input checked="" type="checkbox"/> Cooler 1 <u>32</u>	<input checked="" type="checkbox"/> Cooler 2 _____	<input type="checkbox"/> Cooler 3 _____
	<input type="checkbox"/> Cooler 5 _____	<input type="checkbox"/> Cooler 6 _____	<input type="checkbox"/> Cooler 4 _____
	<input type="checkbox"/> Cooler 9 _____	<input type="checkbox"/> Cooler 10 _____	<input type="checkbox"/> Cooler 7 _____
			<input type="checkbox"/> Cooler 8 _____
			<input type="checkbox"/> Cooler 11 _____
			<input type="checkbox"/> Cooler 12 _____
Comments:			

[illegible]

Date _____

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

METHOD 300.0
NITRATE-N

SDG#: 05H231

8000

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H231**

METHOD 300.0 NITRATE-N

Five (5) water samples were received on 08/24/05 for Nitrate-N analysis by method 300.0 in accordance with "Method for Determination of Inorganic Anions by Ion Chromatography", EPA 600/84-017.

1. Holding Time

Analysis met holding time criteria except samples H231-03 and 04 were analyzed at 13 minutes and 12 minutes out of 48-hour holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limits.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met except as aforementioned.

Results were reported as nitrogen concentration.

SAMPLE RESULTS

METHOD 300.0
NITRATE-N

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H231

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICH034WB	ND	1	NA	.1	.05	08/24/05 18:36	NA	AH24-31	AH24-24	ICH034W	NA	NA
LCSTW	ICH034WL	1.97	1	NA	.1	.05	08/24/05 18:50	NA	AH24-32	AH24-24	ICH034W	NA	NA
LCSTW	ICH034WC	1.99	1	NA	.1	.05	08/24/05 19:05	NA	AH24-33	AH24-24	ICH034W	NA	NA
MM-19-5	H231-01	2.93	5	NA	.5	.25	08/25/05 00:31	NA	AH24-54	AH24-48	ICH034W	08/23/05	08/24/05
MM-19-4	H231-02	7.35	5	NA	.5	.25	08/25/05 08:46	NA	AH24-55	AH24-48	ICH034W	08/23/05	08/24/05
DUPE-2-8/23/05	H231-03	7.28	5	NA	.5	.25	08/25/05 09:00	NA	AH24-56	AH24-48	ICH034W	08/23/05	08/24/05
MM-19-3	H231-04	8.46	5	NA	.5	.25	08/25/05 09:15	NA	AH24-57	AH24-48	ICH034W	08/23/05	08/24/05
MM-19-2	H231-05	12	5	NA	.5	.25	08/25/05 09:29	NA	AH24-58	AH24-48	ICH034W	08/23/05	08/24/05

8003

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QC SUMMARIES

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H231
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICH034WL ICH034WC
LAB FILE ID: AH24-32 AH24-33
DATE EXTRACTED: NA NA
DATE ANALYZED: 08/24/0518:36 08/24/0519:05
PREP. BATCH: ICH034W ICH034W
CALIB. REF: AH24-24 AH24-24

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	2	1.97	98	2	1.99	100	1	90-110	20

8005

22

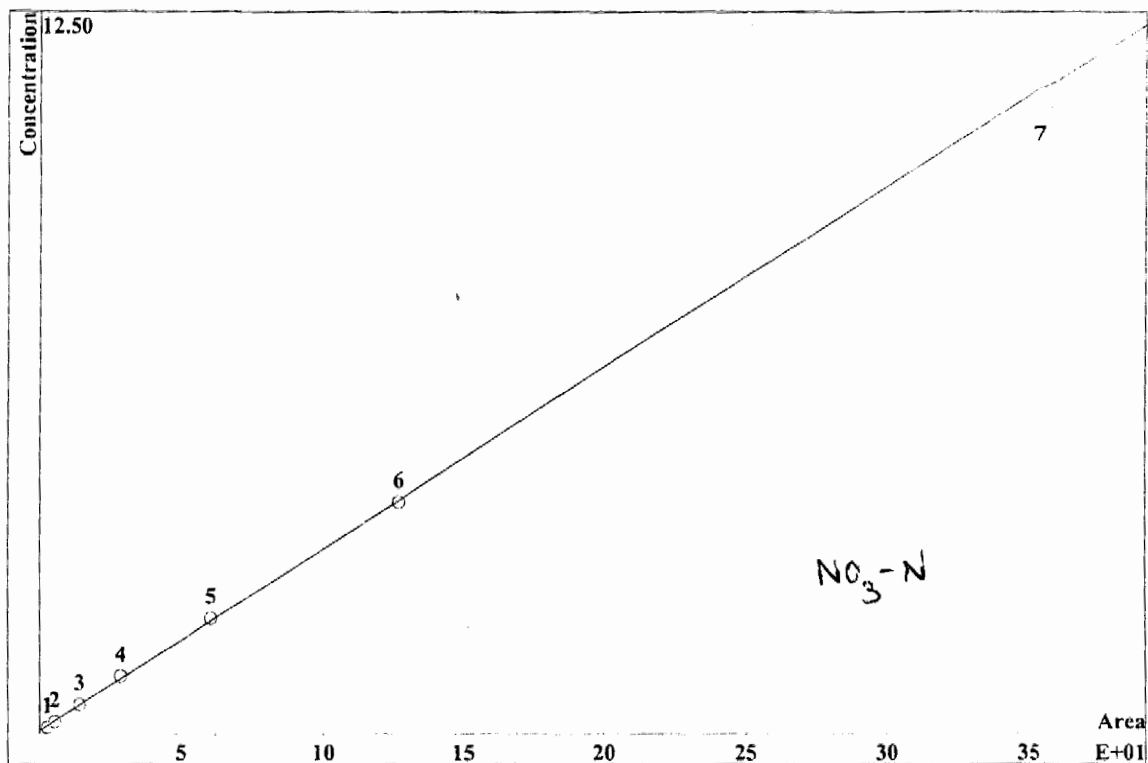
INITIAL CALIBRATIONS

IC Result Check FormVersion : QH2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH18-01	1B	FCIBNPS	0	0	0	0	0	0	0	p8181936	1
AH18-02	S0	FCIBNPS	0	0	0	0	0	0	0	p8181950	1
AH18-03	S1	FCIBNPS	0.166	0.17262	0.13231	0.12813	0.13644	0.22927	0.14104	p8182004	1
AH18-04	S2	FCIBNPS	0.28466	0.28623	0.22239	0.22088	0.22213	0.31227	0.24604	p8182018	1
AH18-05	S3	FCIBNPS	0.51393	0.51514	0.50265	0.50493	0.50026	0.56154	0.52244	p8182032	1
AH18-06	S4	FCIBNPS	0.96429	0.99164	0.95545	0.95771	0.95423	0.9672	0.9792	p8182047	1
AH18-07	S5	FCIBNPS	1.9297	1.9476	1.9596	2.0373	1.9583	1.8503	1.9613	p8182101	1
AH18-08	S6	FCIBNPS	3.8838	3.8076	4.0276	3.9271	4.0286	3.7744	3.9072	p8182115	1
AH18-09	S7	FCIBNPS	10.058	10.079	10.533	10.024	11.158	10.105	10.043	p8182129	1
AH18-10	ICV	FCIBNPS	94.6%	95.5%	98%	99.9%	98.2%	93%	97.2%	p8182143	1
AH18-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8182157	1
AH18-12	ICH025WB	FCIBNPS	0	0	0	0	0	0	0	p8182211	1
AH18-13	ICH025WL	FCIBNPS	1.9633	1.9339	1.884	2.1091	1.9384	1.8022	1.9892	p8182225	1
AH18-14	ICH025WC	FCIBNPS	1.9405	1.927	1.8843	2.0871	1.9384	1.8038	2.0248	p8182239	1
AH18-15	H023-01	F*IBNPS	0	11823E	0	-7.8039	0	0	1470.9	p8182253	200
AH18-16	H023-03	F*IBNPS	0	11711E	0	0	0	0	1420.9	p8182307	200
AH18-17	H023-01	*C*****	0	9274.5	0	0	0	0	1588.2	p8182321	2000
AH18-18	H023-02	FCIBNPS	0	8909.8	0	0	0	0	1504.6	p8182335	2000
AH18-19	H023-03	*C*****	0	9111	0	0	0	0	1525.4	p8182349	2000
AH18-20	H023-04	FCIBNPS	0	9589.9	0	0	0	0	1558.3	p8190004	2000
AH18-21	CCV1	FCIBNPS	95.3%	99%	97.2%	96.8%	97.9%	92.8%	99.3%	p8190018	1
AH18-22	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8190032	1
AH18-23	H169-01	F*IBNP*	0.58784	557.84E	0	3.9834	0.30268	0	222.2E	p8190046	1
AH18-24	H169-01D	F*IBNP*	0.54415	557.56E	0	3.8987	0.26518	0	222.08E	p8190100	1
AH18-25	H169-01M	F*IBNP*	2.3279	551.74E	2.2881	5.3508	2.2308	2.1545	221.61E	p8190114	1
AH18-26	H614-01	F*IBNP*	0.30333	24.22E	0	0.84928	3.8374	0.23597	25.147E	p8190128	1
AH18-27	H614-02	F*IB*P*	0.24861	17.85E	0	0.85627	5.8152E	0	15.634E	p8190142	1
AH18-28	H614-02D	F*IB*P*	0.42543	18.124E	0	1.1955	5.8532E	0.23178	15.667E	p8190156	1
AH18-29	H614-02M	F*IB*P*	2.2519	20.146E	2.0242	3.1702	8.3464E	2.4015	18.076E	p8190210	1
AH18-30	H614-01	*C*****S	0.7526	19.853	0	0.84668	3.6036	0	22.543	p8190224	5
AH18-31	H614-02	*C**N*S	0.57712	14.626	0	0.8431	5.0755	0	13.896	p8190238	5
AH18-32	H614-02D	*C**N*S	0.5948	14.546	0	0.80981	5.0759	0	13.937	p8190252	5
AH18-33	CCV2	FCIBNPS	95.5%	99.2%	97.8%	101.7%	98.2%	95.2%	98.8%	p8190306	1
AH18-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8190320	1
AH18-35	H614-02M	*C**N*S	9.666	24.294	9.0355	10.763	15.204	10.183	23.849	p8190335	5
AH18-36	H169-01	*****	1.2771	462.51E	0	3.1323	0	0	162.61E	p8190349	10
AH18-37	H169-01D	*****	1.1563	462.25E	0	2.6472	0	0	162.5E	p8190403	10
AH18-38	H169-10M	F*IBNP*	19.589	483.82E	19.02	22.753	19.898	20.393	183.19E	p8190417	10
AH18-39	RINSE	FCIBNPS	0	0.12789	0	0	0	0.23054	0	p8190431	1
AH18-40	RINSE	FCIBNPS	0	0	0	0.049699	0	0	0	p8190445	1
AH18-41	CCV3	FCIBNPS	97.4%	98.2%	96.2%	103.3%	96.9%	124.7%*	102%	p8190459	1
AH18-42	CCB3	FCIBNPS	0	0	0	0	0	0	0	p8190513	1

CALIBRATION OF COMPONENT nitrate

Method: IC100-H18.mtw
 Equation: $Q = 0.0313474 \cdot A + 0.0465038$
 RSD: 3.094 %
 Correlation coefficient: 0.999710



K3 = 0 K2 = 0 K1 = 0.0313474 K0 = 0.0465038
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.1627	2.869	0.1	1	5.56	Yes	p8182004.chw
2	0.329	5.603	0.2	1	5.56	Yes	p8182018.chw
3	0.8519	14.48	0.5	1	5.56	Yes	p8182032.chw
4	1.718	28.96	1	1	5.56	Yes	p8182047.chw
5	3.662	60.99	2	1	5.56	Yes	p8182101.chw
6	7.807	127	4	1	5.56	Yes	p8182115.chw
7	22.1	354.5	10	1	5.56	No	p8182129.chw

8/18/05

8008

***SECOND SOURCE
VERIFICATION***

IC Result Check FormVersion : QH2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH18-10	ICV	FCIBNPS	94.6%	95.5%	98%	99.9%	98.2%	93%	97.2%	p8182143	1
AH18-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8182157	1
AH18-21	CCV1	FCIBNPS	95.3%	99%	97.2%	96.8%	97.9%	92.8%	99.3%	p8190018	1
AH18-22	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8190032	1
AH18-33	CCV2	FCIBNPS	95.5%	99.2%	97.8%	101.7%	98.2%	95.2%	98.8%	p8190306	1
AH18-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8190320	1
AH18-41	CCV3	FCIBNPS	97.4%	98.2%	96.2%	103.3%	96.9%	124.7%*	102%	p8190459	1
AH18-42	CCB3	FCIBNPS	0	0	0	0	0	0	0	p8190513	1

8010

DAILY CALIBRATIONS

8011

IC Result Check FormVersion : QH2

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH24-01	CCV25	FCIBNPS	90.5%	95.8%	99.1%	99.7%	104.3%	80.4%*	97.6%	p8241109	1
AH24-12	CCV26	FCIBNPS	96.1%	95.1%	98%	98%	104.2%	86.7%*	92.2%	p8241344	1
AH24-13	CCB26	FCIBNPS	0	0	0	0	0	0	0	p8241358	1
AH24-24✓	CCV27	FCIBNPS	94.9%	92.4%	96.6%	97.5%	98.6%	87.8%*	93.7%	p8241633	1
AH24-25	CCB27	FCIBNPS	0	0	0	0	0	0	0	p8241647	1
AH24-36✓	CCV28	FCIBNPS	93.3%	94.6%	95.6%	98.2%	98.6%	91.3%	94.7%	p8241952	1
AH24-37	CCB28	FCIBNPS	0	0	0	0	0	0	0	p8242015	1
AH24-48✓	CCV29	FCIBNPS	93.9%	94.4%	96%	98.8%	98.7%	88.6%*	91.9%	p8242256	1
AH24-49	CCB29	FCIBNPS	0	0	0	0	0	0	0	p8242310	1
AH24-60✓	CCV30	FCIBNPS	93.7%	91.1%	97%	95%	98.6%	89.3%*	94.4%	p8250957	1
AH24-61	CCB30	FCIBNPS	0	0	0	0	0	0	0	p8251011	1
AH24-72	CCV31	FCIBNPS	95.4%	100.1%	97.9%	100.3%	99.2%	91.6%	98.5%	p8251250	1
AH24-83	CCV32	FCIBNPS	94.6%	95.9%	96%	99.2%	99.2%	91.5%	97.8%	p8251533	1
AH24-84	CCB32	FCIBNPS	0	0	0	0	0	0	0	p8251547	1
AH24-95	CCV33	FCIBNPS	91.9%	92.8%	94.1%	94%	97.5%	86.9%*	93.4%	p8251923	1
AH24-96	CCB33	FCIBNPS	0	0	0	0	0	0	0	p8251937	1
AH24-107	CCV34	FCIBNPS	94.8%	95%	97%	102.3%	101.2%	92.4%	95.5%	p8252334	1
AH24-108	CCB34	FCIBNPS	0	0	0	0	0	0	0	p8252348	1
AH24-119	CCV35	FCIBNPS	93.5%	96%	96.6%	99.2%	99.4%	86.8%*	90.8%	p8260222	1
AH24-120	CCB35	FCIBNPS	0	0	0	0	0	0	0	p8260236	1
AH24-131	CCV36	FCIBNPS	94.5%	94.7%	96.4%	99.8%	99.7%	90.2%	95.5%	p8260511	1
AH24-132	CCB36	FCIBNPS	0	0	0	0	0	0	0	p8260525	1
AH24-137	CCV37	FCIBNPS	94.4%	94.4%	96.7%	99.4%	99.5%	87.4%*	90.8%	p8260636	1
AH24-138	CCB37	FCIBNPS	0	0	0	0	0	0	0	p8260650	1
AH24-145	CCV38	FCIBNPS	92.4%	93.5%	95.2%	94.6%	98%	86.5%*	92.2%	p8260848	1
AH24-146	CCB38	FCIBNPS	0	0	0	0	0	0	0	p8260902	1

ANALYTICAL LOGS

ANALYSIS RUN LOG FOR IC

SOP □ EMAX-300.0-Rev. 3 □ EMAX-300.1 Rev. No. 0 □ EMAX-9056 Rev. No. 2

Book# A100 003

Start Date: 06/10/15		Time: 10:36		End Date: 06/10/15		Time: 05:13					
Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes (cc/L = mg/L)	Sample ID	Data Filename	Lab Sample ID	DF	Matrix	Notes
* 1	AM18-01	IB	1	W		* 26	AM18-06	H1614-01	1	W	
* 2	02	SD				* 7	21	02			
* 3	03	01				* 8	28	02B			
* 4	04	02			0.1 ppm	* 9	29	02M			
* 5	05	03			0.2	* 30	30	01	5		
* 6	06	04			0.5	* 1	31	02			
* 7	07	05			1	* 2	32	02B			
* 8	08	06			2	* 3	33	00V2	1		
* 9	09	07			4	* 4	34	00B2	1		
* 10	10	ICV			10	* 5	35	H1614-02M	5		
* 11	11	ICB				* 6	36	H1614-01	10		
* 12	12	IC102510B				* 7	37	01D			
* 13	13	W1				* 8	38	01M			
* 14	14	W2				* 9	39	RINSE	1		
* 15	15	H1023-01	200			* 40	40	RINSE			
* 16	16	03				* 1	41	00V3			
* 17	17	04				* 2	42	00B3			
* 18	18	01				* 3					
* 19	19	02				* 4					
* 20	20	04				* 5					
* 21	21	00V1	4			* 6					
* 22	22	00P1	1			* 7					
* 23	23	H1614-01				* 8					
* 24	24	01D				* 9					
* 25	25	01M				* 50					

Analyzed By: al

This page is checked during data review.

** Sample Prep ID Prefix:

* Sample Prep ID Prefix: IC102510

ANALYSIS RUN LOG FOR IC

SOP EMAX-300.0-Rev. 3 EMAX-300.1 Rev. No.0 EMAX-9056 Rev. No. 2

Book# A100 003

Start Date: 08/24/05		Time: 11:04		End Date: 08/24/05		Time: 09:02	
Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	AH24-01	0025	1	W		* 26	AH24-26
* 2		H213-06	5			* 7	
* 3						* 8	
* 4						* 9	
* 5						* 30	
* 6						** 1	
* 7						* 2	
* 8						* 3	
* 9						* 4	
* 10						* 5	
* 11						* 6	
* 12						* 7	
* 13						* 8	
* 14						* 9	
* 15						* 40	
* 16						* 1	
* 17						* 2	
* 18						* 3	
* 19						* 4	
* 20						* 5	
* 21						* 6	
* 22						* 7	
* 23						* 8	
* 24						* 9	
* 25						* 50	

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	AH24-01	0025	1	W		* 26	AH24-26
* 2		H213-06	5			* 7	
* 3						* 8	
* 4						* 9	
* 5						* 30	
* 6						** 1	
* 7						* 2	
* 8						* 3	
* 9						* 4	
* 10						* 5	
* 11						* 6	
* 12						* 7	
* 13						* 8	
* 14						* 9	
* 15						* 40	
* 16						* 1	
* 17						* 2	
* 18						* 3	
* 19						* 4	
* 20						* 5	
* 21						* 6	
* 22						* 7	
* 23						* 8	
* 24						* 9	
* 25						* 50	

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	AH24-01	0025	1	W		* 26	AH24-26
* 2		H213-06	5			* 7	
* 3						* 8	
* 4						* 9	
* 5						* 30	
* 6						** 1	
* 7						* 2	
* 8						* 3	
* 9						* 4	
* 10						* 5	
* 11						* 6	
* 12						* 7	
* 13						* 8	
* 14						* 9	
* 15						* 40	
* 16						* 1	
* 17						* 2	
* 18						* 3	
* 19						* 4	
* 20						* 5	
* 21						* 6	
* 22						* 7	
* 23						* 8	
* 24						* 9	
* 25						* 50	

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	AH24-01	0025	1	W		* 26	AH24-26
* 2		H213-06	5			* 7	
* 3						* 8	
* 4						* 9	
* 5						* 30	
* 6						** 1	
* 7						* 2	
* 8						* 3	
* 9						* 4	
* 10						* 5	
* 11						* 6	
* 12						* 7	
* 13						* 8	
* 14						* 9	
* 15						* 40	
* 16						* 1	
* 17						* 2	
* 18						* 3	
* 19						* 4	
* 20						* 5	
* 21						* 6	
* 22						* 7	
* 23						* 8	
* 24						* 9	
* 25						* 50	

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	AH24-01	0025	1	W		* 26	AH24-26
* 2		H213-06	5			* 7	
* 3						* 8	
* 4						* 9	
* 5						* 30	
* 6						** 1	
* 7						* 2	
* 8						* 3	
* 9						* 4	
* 10						* 5	
* 11						* 6	
* 12						* 7	
* 13						* 8	
* 14						* 9	
* 15						* 40	
* 16						* 1	
* 17						* 2	
* 18						* 3	
* 19						* 4	
* 20						* 5	
* 21						* 6	
* 22						* 7	
* 23						* 8	
* 24						* 9	
* 25						* 50	

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	AH24-01	0025	1	W		* 26	AH24-26
* 2		H213-06	5			* 7	
* 3						* 8	
* 4						* 9	
* 5						* 30	
* 6						** 1	
* 7						* 2	
* 8						* 3	
* 9						* 4	
* 10						* 5	
* 11						* 6	
* 12						* 7	
* 13						* 8	
* 14						* 9	
* 15						* 40	
* 16						* 1	
* 17						* 2	
* 18						* 3	
* 19						* 4	
* 20						* 5	
* 21						* 6	
* 22						* 7	
* 23						* 8	
* 24						* 9	
* 25						* 50	

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	AH24-01	0025	1	W		* 26	AH24-26
* 2		H213-06	5			* 7	
* 3						* 8	
* 4						* 9	
* 5						* 30	
* 6						** 1	
* 7						* 2	
* 8						* 3	
* 9						* 4	
* 10						* 5	
* 11						* 6	
* 12						* 7	
* 13						* 8	
* 14						* 9	
* 15						* 40	
* 16						* 1	
* 17						* 2	
* 18						* 3	
* 19						* 4	
* 20						* 5	
* 21						* 6	
* 22						* 7	
* 23						* 8	
* 24						* 9	
* 25						* 50	

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	AH24-01	0025	1	W		* 26	AH24-26
* 2		H213-06	5			* 7	
* 3						* 8	
* 4						* 9	
* 5						* 30	
* 6						** 1	
* 7						* 2	
* 8						* 3	
* 9						* 4	
* 10						* 5	
* 11						* 6	
* 12						* 7	
* 13						* 8	
* 14						* 9	
* 15						* 40	
* 16						* 1	
* 17						* 2	
* 18						* 3	
* 19						* 4	
* 20						* 5	
* 21						* 6	
* 22						* 7	
* 23						* 8	
* 24						* 9	
* 25						* 50	

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	AH24-01	0025	1	W		* 26	AH24-26
* 2		H213-06	5			* 7	
* 3						* 8	
* 4					</		

SOP ☒ EMAX-300.0-Rev. 3 ☐ EMAX-300.1 Rev. No.0 ☐ EMAX-9056 Rev. No. 2

Book# A100 003

Start Date: 08/24/05 Time: 11:09

End Date: 08/26/15

Time: 09:02

[illegible]

Analyzed By:

This page is checked during data review.

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PROJECT: **JPL**

SDG: **05G218**

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GC-VOA **	4000 –
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WET METHOD 300.0	8000 – 8042
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OTHERS **	9000 –

** - Not Requested



LABORATORIES, INC.

183 205th Street
Torrance, CA 90501
Tel: (310) 618-8889
Fax: (310) 618-0818

Date: 08-15-2005
EMAX Batch No.: 05G218

Attn: Tien Shiao

Battelle Memorial Institute
505 King Ave.
Columbus OH 43201

Subject: Laboratory Report
Project: JPL

Enclosed is the Laboratory report for samples received on 07/26/05.
The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
MW-24-4	G218-01	07/25/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-24-3	G218-02	07/25/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N

Sample ID	Control #	Col Date	Matrix	Analysis
				SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-24-2	G218-03	07/25/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-24-1	G218-04	07/25/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
DUPE-3-7/25/05	G218-05	07/25/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-24-5	G218-06	07/25/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON

Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
				ALKALINITY
				SULFIDE
				AMMONIA-N
				SPECIFIC CONDUCTANCE
				SOLIDS TOTAL DISSOLVED
				TKN

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,

K. Y. Pang

Kam Y. Pang, Ph.D.
Laboratory Director

Hanh Bui

From: Shiao, Tien [shiaoh@BATTELLE.ORG]
Sent: Wednesday, July 27, 2005 3:30 PM
To: Hanh Bui
Cc: Conner, David J
Subject: RE: COC for samples received on 7/26 SDG: 05G218 (Battelle/JPL)

Hi Hanh,

The COC for MW-24 looks good. You're correct that we're not analyzing any perchlorate at EMAX.

I see a note on the "sample receipt form" that says perchlorate was requested on label but not on COC. Please go with the COC and not the sample labels. Sorry about the confusion.

Thanks,
Tien

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Wednesday, July 27, 2005 5:11 PM
To: Shiao, Tien
Subject: COC for samples received on 7/26 SDG: 05G218 (Battelle/JPL)

Hi Tien,
Enclosed the COC for sample received on 7/26. I think all samples for Perchlorate you sent to APC labs. Thanks
Hanh

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

METHOD 200.7
METALS BY ICP-AES

SDG#: 05G218

7000

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G218**

METHOD 200.7 METALS BY ICP-AES

Six (6) water samples were received on 07/26/05 for Metals analysis by Method 200.7 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample G183-07 from another SDG was analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
METALS BY ICP-AES

SDG NO. : 05G218
Instrument ID : 1-107

Client : BATTILLE MEMORIAL INSTITUTE
Project : JPL

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	WATER		Sample Data FN	Calibration Data FN	Prep. Batch	Notes
					Extraction Date/Time	Date/Time				
WBLK1W	IPG052WB	1	NA	08/03/0519:11	07/29/0511:30	07/29/0511:30	107H007012	107H007010	IPG052W	Method Blank
LCS1W	IPG052WL	1	NA	08/03/0519:15	07/29/0511:30	07/29/0511:30	107H007013	107H007010	IPG052W	Lab Control Sample (LCS)
LCS1W	IPG052WC	1	NA	08/03/0519:20	07/29/0511:30	07/29/0511:30	107H007014	107H007010	IPG052W	LCS Duplicate
MU-24-4	G218-01	1	NA	08/03/0520:23	07/29/0511:30	07/29/0511:30	107H007028	107H007022	IPG052W	Field Sample
MU-24-3	G218-02	1	NA	08/03/0520:27	07/29/0511:30	07/29/0511:30	107H007029	107H007022	IPG052W	Field Sample
MU-24-2	G218-03	1	NA	08/03/0520:31	07/29/0511:30	07/29/0511:30	107H007030	107H007022	IPG052W	Field Sample
MU-24-1	G218-04	1	NA	08/03/0520:35	07/29/0511:30	07/29/0511:30	107H007031	107H007022	IPG052W	Field Sample
DUPE-3-7/25/05	G218-05	1	NA	08/03/0520:39	07/29/0511:30	07/29/0511:30	107H007032	107H007022	IPG052W	Field Sample
MU-24-5	G218-06	1	NA	08/03/0520:43	07/29/0511:30	07/29/0511:30	107H007033	107H007022	IPG052W	Field Sample
DUPE-2-7/21/05	G183-07	1	NA	08/03/0519:49	07/29/0511:30	07/29/0511:30	107H007021	107H007010	IPG052W	Field Sample
DUPE-2-7/21/05DL	G183-07T	5	NA	08/03/0520:05	07/29/0511:30	07/29/0511:30	107H007024	107H007022	IPG052W	Diluted Sample
DUPE-2-7/21/05AS	G183-07A	1	NA	08/03/0520:09	07/29/0511:30	07/29/0511:30	107H007025	107H007022	IPG052W	Analytical Spike Sample

FN - Filename
% Moist - Percent Moisture

7002

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/25/05
Project     : JPL                         Date Received: 07/26/05
SDG NO.     : 05G218                     Date Extracted: 07/29/05 11:30
Sample ID   : MW-24-4                     Date Analyzed: 08/03/05 20:23
Lab Samp ID : G218-01                     Dilution Factor: 1
Lab File ID : I07H007028                  Matrix       : WATER
Ext Btch ID : IPG052W                     % Moisture    : NA
Calib. Ref.: I07H007022                  Instrument ID : EMAXT107
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	9.76	1	.1
Iron	ND	.2	.04
Magnesium	9.46	1	.1
Potassium	2.48	2	1.4
Sodium	43.3	1	.25

7003

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/25/05
Project     : JPL                          Date Received: 07/26/05
SDG NO.     : 05G218                       Date Extracted: 07/29/05 11:30
Sample ID   : MW-24-3                      Date Analyzed: 08/03/05 20:27
Lab Samp ID : G218-02                      Dilution Factor: 1
Lab File ID : I07H007029                   Matrix       : WATER
Ext Btch ID : IPG052W                      % Moisture    : NA
Calib. Ref. : I07H007022                   Instrument ID : EMAXTI07
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	18.9	1	.1
Iron	ND	.2	.04
Magnesium	13.3	1	.1
Potassium	ND	2	1.4
Sodium	44.8	1	.25

7004

dx

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/25/05
Project     : JPL                         Date Received: 07/26/05
SDG NO.     : 05G218                     Date Extracted: 07/29/05 11:30
Sample ID   : MW-24-2                    Date Analyzed: 08/03/05 20:31
Lab Samp ID : G218-03                     Dilution Factor: 1
Lab File ID : I07H007030                  Matrix       : WATER
Ext Btch ID : IPG052W                     % Moisture    : NA
Calib. Ref.: I07H007022                  Instrument ID : EMAXT107
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	32.9	1	.1
Iron	ND	.2	.04
Magnesium	13.6	1	.1
Potassium	3.07	2	1.4
Sodium	43.6	1	.25

7005

8

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/25/05
Project     : JPL                          Date Received: 07/26/05
SDG NO.     : 05G218                       Date Extracted: 07/29/05 11:30
Sample ID   : MW-24-1                      Date Analyzed: 08/03/05 20:35
Lab Samp ID : G218-04                      Dilution Factor: 1
Lab File ID : I07H007031                   Matrix       : WATER
Ext Btch ID : IPG052W                      % Moisture    : NA
Calib. Ref. : I07H007022                   Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	55.6	1	.1
Iron	ND	.2	.04
Magnesium	18.2	1	.1
Potassium	ND	2	1.4
Sodium	19.4	1	.25

7006

dm

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date  Collected: 07/25/05
Project     : JPL                          Date   Received: 07/26/05
SDG NO.     : 05G218                       Date  Extracted: 07/29/05 11:30
Sample ID:  DUPE-3-7/25/05                 Date   Analyzed: 08/03/05 20:39
Lab Samp ID: G218-05                       Dilution Factor: 1
Lab File ID: I07H007032                   Matrix      : WATER
Ext Btch ID: IPG052W                      % Moisture   : NA
Calib. Ref.: I07H007022                   Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	55.1	1	.1
Iron	ND	.2	.04
Magnesium	18.2	1	.1
Potassium	ND	2	1.4
Sodium	19.4	1	.25

7007
X

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/25/05
Project     : JPL                          Date Received: 07/26/05
SDG NO.     : 05G218                       Date Extracted: 07/29/05 11:30
Sample ID   : MW-24-5                      Date Analyzed: 08/03/05 20:43
Lab Samp ID : G218-06                      Dilution Factor: 1
Lab File ID : 107H007033                   Matrix          : WATER
Ext Btch ID : IPG052W                      % Moisture       : NA
Calib. Ref. : 107H007022                   Instrument ID    : EMAXTI07
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	34.3	1	.1
Iron	ND	.2	.04
Magnesium	9.28	1	.1
Potassium	2.24	2	1.4
Sodium	39.9	1	.25

7008
du

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: NA
Project     : JPL                          Date Received: 07/29/05
SDG NO.     : 05G218                       Date Extracted: 07/29/05 11:30
Sample ID   : MBLK1W                       Date Analyzed: 08/03/05 19:11
Lab Samp ID : IPG052WB                     Dilution Factor: 1
Lab File ID : I07H007012                   Matrix          : WATER
Ext Btch ID : IPG052W                      % Moisture       : NA
Calib. Ref. : I07H007010                   Instrument ID    : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	ND	1	.1
Iron	ND	.2	.04
Magnesium	ND	1	.1
Potassium	ND	2	1.4
Sodium	ND	1	.25

7009

dm

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05G218
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILTN FACTR: 1 1 1
SAMPLE ID: MBLK1W
CONTROL NO.: IPG052WB IPG052WL IPG052WC
LAB FILE ID: 107H007012 107H007013 107H007014
DATIME EXTRCTD: 07/29/0511:30 07/29/0511:30 07/29/0511:30 DATE COLLECTED: NA
DATIME ANALYZD: 08/03/0519:11 08/03/0519:15 08/03/0519:20 DATE RECEIVED: 07/29/05
PREP. BATCH: IPG052W IPG052W IPG052W
CALIB. REF: 107H007010 107H007010 107H007010

ACCESSION:

PARAMETER	BLNK RSLT mg/L	SPIKE AMT mg/L	BS RSLT mg/L	BS % REC	SPIKE AMT mg/L	BSD RSLT mg/L	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	ND	50	50.9	102	50	50.4	101	1	85-115	20
Iron	ND	10	10.6	106	10	10.4	104	2	85-115	20
Magnesium	ND	50	51.6	103	50	50.8	102	2	85-115	20
Potassium	ND	50	51.1	102	50	50.6	101	1	85-115	20
Sodium	ND	50	50.9	102	50	50.5	101	1	85-115	20

7010

for

EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G218
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 5
SAMPLE ID: DUPE-2-7/21/05 DUPE-2-7/21/05DL
EMAX SAMP ID: G183-07 G183-07T
LAB FILE ID: I07H007021 I07H007024
DATE EXTRACTED: 07/29/0511:30 07/29/0511:30 DATE COLLECTED: 07/21/05
DATE ANALYZED: 08/03/0519:49 08/03/0520:05 DATE RECEIVED: 07/22/05
PREP. BATCH: IPG052W IPG052W
CALIB. REF: I07H007010 I07H007022

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SERIAL DIL RSLT (mg/L)	DIF RSLT %	QC LIMIT (%)
Calcium	56.5	56.6	0	10
Iron	ND	ND	0	10
Magnesium	18.7	18.8	0	10
Potassium	2.51	ND	NA	10
Sodium	19.8	21.1	7	10

7011

da

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05G218
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILT N FACTR: 1 1
SAMPLE ID: DUPE-2-7/21/05
CONTROL NO.: G183-07 G183-07A
LAB FILE ID: 107H007021 107H007025
DATIME EXTRACTD: 07/29/0511:30 07/29/0511:30 DATE COLLECTED: 07/21/05
DATIME ANALYZD: 08/03/0519:49 08/03/0520:09 DATE RECEIVED: 07/22/05
PREP. BATCH: IPG052W IPG052W
CALIB. REF: 107H007010 107H007022

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	AS RSLT (mg/L)	AS % REC	QC LIMIT (%)
Calcium	56.5	50	104	95	75-125
Iron	ND	10	10.2	102	75-125
Magnesium	18.7	50	68.9	100	75-125
Potassium	2.51	50	53.6	102	75-125
Sodium	19.8	50	69	98	75-125

7012

REGULAR ICP QC CHECK TABLE

QC Limit%	ICV HIGH 95-105	ICV 90-110	CCV 90-110	ICSAB 80-120	ICSA 80-120
Comp	mg/L	mg/L	mg/L	mg/L	mg/L
Al	10	5	5	500	500
Sb	2	1	1	1	0
As	2	1	1	1	0
Ba	2	1	1	0.5	0
Be	2	1	1	0.5	0
B	2	1	1	0.5	0
Cd	2	1	1	1	0
Ca	100	50	50	500	500
Cr	2	1	1	0.5	0
Co	2	1	1	0.5	0
Cu	2	1	1	0.5	0
Fe	10	5	5	200	200
Pb	2	1	1	1	0
Mg	100	50	50	500	500
Mn	2	1	1	0.5	0
Mo	2	1	1	1	0
Ni	2	1	1	1	0
K	100	50	50	50	0
Se	2	1	1	3.6	0
Ag	2	1	1	1	0
Na	100	50	50	10	0
Sr	2	1	1	0.5	0
Tl	2	1	1	3.6	0
Sn	10	5	5	1	0
Ti	2	1	1	1	0
V	2	1	1	0.5	0
Zn	2	1	1	1	0

SEQUENCE FILE : 107H007

4-18	19-33	34-43	44-53	54-63
LFID	LSID	TIME	DATE	DF
107H007001	S0	18:22	08/03/05	1
107H007002	S3	18:26	08/03/05	1
107H007003	S6	18:31	08/03/05	1
107H007004	ICV	18:34	08/03/05	1
107H007005	ICB	18:40	08/03/05	1
107H007006	CCV	18:44	08/03/05	1
107H007007	CCB	18:48	08/03/05	1
107H007008	ICSAI	18:54	08/03/05	1
107H007009	ICSA81	18:58	08/03/05	1
107H007010	CCV1	19:02	08/03/05	1
107H007011	CCB1	19:07	08/03/05	1
107H007012	IPG052WB	19:11	08/03/05	1
107H007013	IPG052WL	19:15	08/03/05	1
107H007014	IPG052WC	19:20	08/03/05	1
107H007015	G183-01	19:25	08/03/05	1
107H007016	G183-02	19:29	08/03/05	1
107H007017	G183-03	19:33	08/03/05	1
107H007018	G183-04	19:37	08/03/05	1
107H007019	G183-05	19:41	08/03/05	1
107H007020	G183-06	19:45	08/03/05	1
107H007021	G183-07	19:49	08/03/05	1
107H007022	CCV2	19:55	08/03/05	1
107H007023	CCB2	20:01	08/03/05	1
107H007024	G183-07T	20:05	08/03/05	5
107H007025	G183-07A	20:09	08/03/05	1
107H007026	G183-07M	20:13	08/03/05	1
107H007027	G183-07S	20:17	08/03/05	1
107H007028	G218-01	20:23	08/03/05	1
107H007029	G218-02	20:27	08/03/05	1
107H007030	G218-03	20:31	08/03/05	1
107H007031	G218-04	20:35	08/03/05	1
107H007032	G218-05	20:39	08/03/05	1
107H007033	G218-06	20:43	08/03/05	1
107H007034	CCV2	20:49	08/03/05	1
107H007035	CCB2	20:54	08/03/05	1
107H007036	ICSAF	20:58	08/03/05	1
107H007037	ICSA8F	21:02	08/03/05	1
107H007038	CCV3	21:06	08/03/05	1
107H007039	CCB3	21:10	08/03/05	1

SDS : 030218

UNIT : %

ICP CHECK : I07H007

DATE : 08/03/05

INST : EMAXT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
S0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICV	99	98	99	97	100	102	97	99	97	97	98	101	97	101	98	98	96	98	105	97	100	97	98	98	100	98	97
ICB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV	100	96	101	98	98	98	99	100	98	97	98	101	98	100	98	99	97	100	104	99	99	98	96	98	98	98	98
CCB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAI	97	...	...	...	...	...	...	93	...	...	...	91	...	99	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAB1	96	88	106	94	94	95	92	92	88	86	98	90	96	98	90	89	86	100	106	97	104	92	102	86	92	97	93
CCV1	100	96	98	99	98	98	99	100	97	96	98	101	97	99	97	98	96	98	99	99	100	98	102	98	98	97	97
CCB1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPG0524B	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPG0524L	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPG0524C	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-06	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-07	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV2	101	98	97	99	99	99	100	101	97	96	98	101	99	100	97	99	98	102	100	100	99	98	100	99	98	98	97
CCB2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-07T	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-07A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-07H	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-07S	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G218-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G218-02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G218-03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G218-04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G218-05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G218-06	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV2	100	97	95	98	97	99	98	99	95	93	96	99	97	99	95	96	96	101	98	99	99	97	101	96	97	96	94
CCB2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAF	95	...	...	...	...	...	...	91	...	...	...	88	...	97	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSABF	95	88	99	93	91	95	92	91	85	83	96	87	90	96	88	85	86	105	102	97	104	90	99	84	90	93	90
CCV3	99	99	97	98	97	98	99	99	95	93	96	99	99	98	95	95	97	102	98	99	98	97	98	96	97	96	94
CCB3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

QC limit of each parameter are listed in a table attached next to all the ICP check forms

* : Out of QC Limit

7016

SDG : 056218

UNIT : UG/L

SUMMARY of CALIBRATION BLANKS : I07H007 (WATER)

DATE : 08/03/05

INST : EMAXT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Hg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
S0
S3
S6
ICV
ICB	4.74	19.9	11.5	.090	-.060	3.65	.260	.600	.000	.660	1.16	1.11	14.7	7.82	1.49	9.24	-3.46	619	-54.5	-.170	7.41	.120	-19.0	27.2	-.120	2.10	.940
CCV
CCB	4.75	5.03	3.13	-.090	-.060	1.83	-.520	4.70	-2.11	2.12	.000	3.05	-1.60	7.81	.000	9.24	-.380	277	-4.71	-2.25	.000	.090	13.8	-9.52	.020	1.62	.470
ICSAI	...	34.0	145	-.210	-.120	7.23	1.13	...	-8.79	.280	8.11	...	78.8	...	-1.37	3.41	1.92	-659	219	14.7	7.41	-1.84	297	-6.46	-11.3	-3.64	2.05
ICSAB1
CCV1
CCB1	-4.59	16.2	2.09	.000	.050	.920	.030	3.38	1.81	2.26	1.16	1.66	5.74	28.2	.670	11.9	-4.04	906	-47.0	-1.03	7.41	.090	37.9	21.8	-.110	4.63	.350
IPG0524B
IPG0524L
IPG0524C
G183-01
G183-02
G183-03
G183-04
G183-05
G183-06
G183-07
CCV2
CCB2	2.08	7.32	2.09	.090	-.130	1.37	-.260	-3.04	.300	.520	.390	1.11	2.18	12.8	1.49	5.28	2.88	431	-36.7	-1.55	7.41	-.120	20.7	-12.2	320	1.80	.380
G183-07T
G183-07A
G183-07H
G183-07S
G218-01
G218-02
G218-03
G218-04
G218-05
G218-06
CCV2
CCB2	-15.9	6.32	-13.6	-.090	-.260	1.37	1.16	-1.27	1.21	3.45	1.17	.830	.290	-6.22	.810	5.28	4.81	4.95	-41.4	.510	7.41	.220	-7.76	-4.05	-.760	2.73	-1.14
ICSAB	...	45.3	23.9	-.270	-.250	14.2	.880	...	-9.77	1.34	8.96	...	5.97	...	-2.92	14.0	-.570	1179	259	15.1	7.41	-1.57	190	-5.06	-12.1	-7.11	1.67
ICSABF
CCV3
CCB3	-1.32	16.4	3.14	.090	-.260	2.29	-.280	-5.08	-2.10	1.59	.000	2.22	-10.3	-8.57	.810	13.2	2.11	-267	-31.9	-.510	.000	.250	18.1	13.6	-.660	2.86	1.39

QC Limit of each parameter are listed in a table attached next to all the ICP check forms

* : Out of QC Limit

7017

DIGESTION LOG FOR ICP METALS

Book # EIP-046

SOP ☐ EMAX-3005 Rev. No. 3 ☐ EMAX-3010 Rev. No. 2 ☐ EMAX-3050 Rev. No. 2 ☐ EMAX-CIP-TAL ☐ 200-7

Matrix: WATER Start Date: 7-29-05 Time: 11:30 Temp: 85°C Ending Date: 7-29-05 Time: 13:30 Temp: 85°C

Sample Prep ID	Lab Sample ID	Matrix Description		Turbidity <1 NTU	Sample Amount (g/ml)	pH	Extract Volume (ml)	Digestate Description		Standards	ID	Amount Added (ml)	
		Color	Texture / Clarity					Color	Clarity				
01	IPG 052-WB				50	-	50			LCS -1	SMIA -09-42	0.5	
02	-WL				50	-	50			LCS -2	SMIA -09-43	0.5	
03	-WC				50	-	50			LCS -3	SMIA -09-44	0.5	
04	G183-01				50	12	50			MS			
05	-02				50		50			Reagent	Lot# / ID	Amount Added (ml)	
06	-03				50		50			HNO ₃	SWIA -03-120	0.5	
07	-04				50		50			HCl	SWIA -03-115	0.25	
08	-05				50		50			H ₂ O ₂	N/A		
09	-06				50		50			HNO ₃ (1:1)	N/A		
10	-07				50		50			Digestate Location	ICP LAB		
11	-07M				50		50			Extract Location			
12	-07S				50		50			Legend:			
13	G158-01				50		50			Texture	Cs = Coarse	Md = Medium	Fn = Fine
14	-02				50		50			Clarity	Cr = Clear	Cy = Cloudy	Td = Turbid
15	G539-01				50		50			Artifacts	Rk = rocks	Sl = Shale	Vg = Vegetation
16	G218-01				50		50			Color	Bu = blue	Bk = Black	Bn = Brown
17	-02				50		50				Gn = Green	Og = Orange	Rd = Red
											Yw = Yellow	Cl = Colorless	

BATCH: IPG 052-W

BATCH: IPG 052-W

Comments: Samples for Methods 200.7 or 200.8 Analyses

If turbidity < 1 NTU no digestion is required unless otherwise required by the project

Prepared By: lmcStandard Added By: lmcWitnessed By: A2Extracts Recd. By: A2Checked By: A2Date Disposed: 7-29-05 lmc

Date Disposed:

Disposed by:

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

WET CHEMICAL ANALYSES

SDG#: 05G218

8000

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G218

METHOD 300.0 ANIONS

Six (6) water samples were received on 07/26/05 for Chloride, Nitrate-N, Nitrite-N and Sulfate analyses by method 300.0 in accordance with "Method for Determination of Inorganic Anions by Ion Chromatography", EPA 600/84-017.

1. Holding Time

Analyses met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limits.

4. Duplicate

Sample G218-02 was analyzed for duplicate. %RPDs were within QC limit.

5. Matrix Spike

Sample G218-02 was spiked. Recoveries were within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

Nitrate-N and Nitrite-N results were reported as Nitrogen concentration.

SAMPLE RESULTS

METHOD 300.0
CHLORIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G218

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICG033MB	ND	1	NA	.2	.1	07/27/0500:38	NA	AG26-34	AG26-25	ICG033W	NA	NA
LCS1W	ICG033WL	4.87	1	NA	.2	.1	07/27/0500:52	NA	AG26-35	AG26-25	ICG033W	NA	NA
LCD1W	ICG033WC	4.84	1	NA	.2	.1	07/27/0501:06	NA	AG26-36	AG26-25	ICG033W	NA	NA
MW-24-5	G218-06	9.48	1	NA	.2	.1	07/27/0502:30	NA	AG26-42	AG26-37	ICG033W	07/25/05	07/26/05
MBLK2W	ICG044WB	ND	1	NA	.2	.1	07/30/0523:12	NA	AG29-142	AG29-133	ICG044W	NA	NA
LCS2W	ICG044WL	4.76	1	NA	.2	.1	07/30/0523:26	NA	AG29-143	AG29-133	ICG044W	NA	NA
LCD2W	ICG044WC	4.77	1	NA	.2	.1	07/30/0523:40	NA	AG29-144	AG29-133	ICG044W	NA	NA
MW-24-4	G218-01	13.5	5	NA	1	.5	07/31/0504:21	NA	AG29-164	AG29-158	ICG044W	07/25/05	07/26/05
MW-24-3	G218-02	18.3	5	NA	1	.5	07/31/0504:35	NA	AG29-165	AG29-158	ICG044W	07/25/05	07/26/05
MW-24-3DUP	G218-02D	18.3	5	NA	1	.5	07/31/0504:49	NA	AG29-166	AG29-158	ICG044W	07/25/05	07/26/05
MW-24-3MS	G218-02M	41	5	NA	1	.5	07/31/0505:03	NA	AG29-167	AG29-158	ICG044W	07/25/05	07/26/05
MW-24-2	G218-03	36.1	10	NA	2	1	07/31/0505:17	NA	AG29-168	AG29-158	ICG044W	07/25/05	07/26/05
MW-24-1	G218-04	28.2	5	NA	1	.5	07/31/0507:10	NA	AG29-176	AG29-170	ICG044W	07/25/05	07/26/05
DUPE-3-7/25/05	G218-05	28.4	5	NA	1	.5	07/31/0507:24	NA	AG29-177	AG29-170	ICG044W	07/25/05	07/26/05

8003

AL

METHOD 300.0
NITRATE-N

Client : BATTILLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G218

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
NBLK1W	ICG032WB	ND	1	NA	.1	.05	07/26/0514:50	NA	AG26-04	AG26-01	ICG032W	NA	NA
LCS2W	ICG032WL	2.48	1	NA	.1	.05	07/26/0515:04	NA	AG26-05	AG26-01	ICG032W	NA	NA
LCD2W	ICG032WC	2.47	1	NA	.1	.05	07/26/0515:18	NA	AG26-06	AG26-01	ICG032W	NA	NA
MW-24-4	G218-01	.264	1	NA	.1	.05	07/26/0523:27	NA	AG26-29	AG26-25	ICG032W	07/25/05	07/26/05
MW-24-3	G218-02	.424	1	NA	.1	.05	07/26/0523:41	NA	AG26-30	AG26-25	ICG032W	07/25/05	07/26/05
MW-24-3NS	G218-02M	2.84	1	NA	.1	.05	07/26/0523:56	NA	AG26-31	AG26-25	ICG032W	07/25/05	07/26/05
MW-24-3DUP	G218-02D	.422	1	NA	.1	.05	07/27/0500:10	NA	AG26-32	AG26-25	ICG032W	07/25/05	07/26/05
NBLK2W	ICG033WB	ND	1	NA	.1	.05	07/27/0500:38	NA	AG26-34	AG26-25	ICG033W	NA	NA
LCS3W	ICG033WL	2.43	1	NA	.1	.05	07/27/0500:52	NA	AG26-35	AG26-25	ICG033W	NA	NA
LCD3W	ICG033WC	2.41	1	NA	.1	.05	07/27/0501:06	NA	AG26-36	AG26-25	ICG033W	NA	NA
MW-24-2	G218-03	1.77	1	NA	.1	.05	07/27/0501:48	NA	AG26-39	AG26-37	ICG033W	07/25/05	07/26/05
MW-24-1	G218-04	1.54	1	NA	.1	.05	07/27/0502:02	NA	AG26-40	AG26-37	ICG033W	07/25/05	07/26/05
DUPE-3-7/25/05	G218-05	1.5	1	NA	.1	.05	07/27/0502:16	NA	AG26-41	AG26-37	ICG033W	07/25/05	07/26/05
MW-24-5	G218-06	1.26	1	NA	.1	.05	07/27/0502:30	NA	AG26-42	AG26-37	ICG033W	07/25/05	07/26/05

8004

4

METHOD 300.0
NITRITE-N

Client : BATTLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G218

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICG032WB	ND	1	NA	.1	.05	07/26/0514:50	NA	AG26-04	AG26-01	ICG032W	NA	NA
LCS1W	ICG032WL	2.45	1	NA	.1	.05	07/26/0515:04	NA	AG26-05	AG26-01	ICG032W	NA	NA
LCD1W	ICG032WC	2.49	1	NA	.1	.05	07/26/0515:18	NA	AG26-06	AG26-01	ICG032W	NA	NA
NW-24-4	G218-01	ND	1	NA	.1	.05	07/26/0523:27	NA	AG26-29	AG26-25	ICG032W	07/25/05	07/26/05
NW-24-3	G218-02	ND	1	NA	.1	.05	07/26/0523:41	NA	AG26-30	AG26-25	ICG032W	07/25/05	07/26/05
NW-24-3MS	G218-02M	2.31	1	NA	.1	.05	07/26/0523:56	NA	AG26-31	AG26-25	ICG032W	07/25/05	07/26/05
NW-24-3DUP	G218-02D	ND	1	NA	.1	.05	07/27/0500:10	NA	AG26-32	AG26-25	ICG032W	07/25/05	07/26/05
MBLK2W	ICG033WB	ND	1	NA	.1	.05	07/27/0500:38	NA	AG26-34	AG26-25	ICG033W	NA	NA
LCS2W	ICG033WL	2.38	1	NA	.1	.05	07/27/0500:52	NA	AG26-35	AG26-25	ICG033W	NA	NA
LCD2W	ICG033WC	2.38	1	NA	.1	.05	07/27/0501:06	NA	AG26-36	AG26-25	ICG033W	NA	NA
NW-24-2	G218-03	ND	1	NA	.1	.05	07/27/0501:48	NA	AG26-39	AG26-37	ICG033W	07/25/05	07/26/05
NW-24-1	G218-04	ND	1	NA	.1	.05	07/27/0502:02	NA	AG26-40	AG26-37	ICG033W	07/25/05	07/26/05
DUPE-3-7/25/05	G218-05	ND	1	NA	.1	.05	07/27/0502:16	NA	AG26-41	AG26-37	ICG033W	07/25/05	07/26/05
NW-24-5	G218-06	ND	1	NA	.1	.05	07/27/0502:30	NA	AG26-42	AG26-37	ICG033W	07/25/05	07/26/05

8005

du

METHOD 300.0
SULFATE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G218

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICG032WB	ND	1	NA	.5	.25	07/26/0514:50	NA	AG26-04	AG26-01	ICG032W	NA	NA
LCS1W	ICG032WL	7.35	1	NA	.5	.25	07/26/0515:04	NA	AG26-05	AG26-01	ICG032W	NA	NA
LCD1W	ICG032WC	7.33	1	NA	.5	.25	07/26/0515:18	NA	AG26-06	AG26-01	ICG032W	NA	NA
MW-24-4	G218-01	7.79	1	NA	.5	.25	07/26/0523:27	NA	AG26-29	AG26-25	ICG032W	07/25/05	07/26/05
MW-24-3	G218-02	14.9	1	NA	.5	.25	07/26/0523:41	NA	AG26-30	AG26-25	ICG032W	07/25/05	07/26/05
MW-24-3MS	G218-02M	22.4	1	NA	.5	.25	07/26/0523:56	NA	AG26-31	AG26-25	ICG032W	07/25/05	07/26/05
MW-24-3DUP	G218-02D	14.8	1	NA	.5	.25	07/27/0500:10	NA	AG26-32	AG26-25	ICG032W	07/25/05	07/26/05
MBLK2W	ICG044WB	ND	1	NA	.5	.25	07/30/0523:12	NA	AG29-142	AG29-133	ICG044W	NA	NA
LCS2W	ICG044WL	7.16	1	NA	.5	.25	07/30/0523:26	NA	AG29-143	AG29-133	ICG044W	NA	NA
LCD2W	ICG044WC	7.22	1	NA	.5	.25	07/30/0523:40	NA	AG29-144	AG29-133	ICG044W	NA	NA
MW-24-2	G218-03	18.9	10	NA	5	2.5	07/31/0505:17	NA	AG29-168	AG29-158	ICG044W	07/25/05	07/26/05
MW-24-1	G218-04	40	5	NA	2.5	1.25	07/31/0507:10	NA	AG29-176	AG29-170	ICG044W	07/25/05	07/26/05
DUPE-3-7/25/05	G218-05	40.5	5	NA	2.5	1.25	07/31/0507:24	NA	AG29-177	AG29-170	ICG044W	07/25/05	07/26/05
MW-24-5	G218-06	19	5	NA	2.5	1.25	07/31/0507:38	NA	AG29-178	AG29-170	ICG044W	07/25/05	07/26/05

8006

dy

QC SUMMARIES

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 056218

METHOD: METHOD 300.0

% MOISTURE: NA

MATRIX: WATER

DILUTION FACTOR: 1

SAMPLE ID: MBLK1W

LAB SAMP ID: ICG033WB

LAB FILE ID: AG26-34

DATE EXTRACTED: NA

DATE ANALYZED: 07/27/0500:38

PREP. BATCH: ICG033W

CALIB. REF: AG26-25

ICG033WC

AG26-36

NA

07/27/0501:06

ICG033W

AG26-25

DATE COLLECTED: NA

DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Chloride-Cl	ND	5	4.87	97	5	4.84	97	1	90-110	20

8008

d

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G218
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK2W
LAB SAMPLE ID: ICG044WL
LAB FILE ID: AG29-143
DATE EXTRACTED: NA
DATE ANALYZED: 07/30/0523:12
PREP. BATCH: ICG044W
CALIB. REF: AG29-133

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Chloride-Cl	ND	5	4.76	95	5	4.77	95	0	90-110	20

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G218
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 5
SAMPLE ID: MW-24-3
LAB SAMP ID: G218-02
LAB FILE ID: AG29-167
DATE EXTRACTED: NA
DATE ANALYZED: 07/31/0504:35
PREP. BATCH: ICG044W
CALIB. REF: AG29-158

% MOISTURE: NA
DATE COLLECTED: 07/25/05
DATE RECEIVED: 07/26/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Chloride-Cl	18.3	25	41	91	80-120

8010

da

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G218

METHOD: METHOD 300.0

MATRIX: WATER % MOISTURE: NA

DILUTION FACTOR: 5

SAMPLE ID: MW-24-3

EMAX SAMP ID: G218-02

LAB FILE ID: AG29-165

DATE EXTRACTED: NA

DATE ANALYZED: 07/31/0504:35

PREP. BATCH: ICG044W

CALIB. REF: AG29-158

DATE COLLECTED: 07/25/05

DATE RECEIVED: 07/26/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
Chloride-Cl	18.3	18.3	0	20

8011

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G218

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICG032WL ICG032WC
LAB FILE ID: AG26-05 AG26-06
DATE EXTRACTED: NA
DATE ANALYZED: 07/26/0514:50 07/26/0515:04 07/26/0515:18
PREP. BATCH: ICG032W ICG032W
CALIB. REF: AG26-01 AG26-01

% MOISTURE: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	2.5	2.48	99	2.5	2.47	99	0	90-110	20

8012

dr

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

BATTELLE MEMORIAL INSTITUTE

CLIENT:

JPL

PROJECT:

05G218

BATCH NO.:

METHOD 300.0

METHOD:

% MOISTURE: NA

MATRIX: WATER

DILUTION FACTOR: 1

MBLK2W

SAMPLE ID:

ICG033WB

LAB SAMP ID:

AG26-34

LAB FILE ID:

NA

DATE EXTRACTED:

07/27/0500:38

DATE ANALYZED:

ICG033W

PREP. BATCH:

AG26-25

CALIB. REF:

1

ICG033WL

AG26-35

NA

07/27/0500:52

ICG033W

AG26-25

ICG033WC

AG26-36

NA

07/27/0501:06

ICG033W

AG26-25

DATE COLLECTED: NA

DATE RECEIVED: NA

ACCESSION:

PARAMETER

Nitrate-N

BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
ND	2.5	2.43	97	2.5	2.41	97	1	90-110	20

8013

dp

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G218
METHOD: METHOD 300.0
=====

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-24-3
LAB SAMP ID: G218-02
LAB FILE ID: AG26-30
DATE EXTRACTED: NA
DATE ANALYZED: 07/26/0523:41
PREP. BATCH: ICG032W
CALIB. REF: AG26-25
DATE COLLECTED: 07/25/05
DATE RECEIVED: 07/26/05
% MOISTURE: NA

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Nitrate-N	.424	2.5	2.84	97	80-120

8014

df

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G218

METHOD: METHOD 300.0

MATRIX: WATER % MOISTURE: NA

DILUTION FACTOR: 1

SAMPLE ID: MW-24-3

EMAX SAMP ID: G218-02D

LAB FILE ID: AG26-30

DATE EXTRACTED: NA

DATE ANALYZED: 07/26/0523:41

PREP. BATCH: ICG032W

CALIB. REF: AG26-25

DATE COLLECTED: 07/25/05

DATE RECEIVED: 07/26/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
Nitrate-N	.424	.422	1	20

8015

JA

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G218

METHOD: METHOD 300.0

MATRIX: WATER % MOISTURE: NA

DILUTION FACTOR: 1

SAMPLE ID: MBLK1W

LAB SAMP ID: ICG032WB

LAB FILE ID: AG26-04

DATE EXTRACTED: NA

DATE ANALYZED: 07/26/0514:50

PREP. BATCH: ICG032W

CALIB. REF: AG26-01

ICG032WL

AG26-05

NA

07/26/0515:04

ICG032W

AG26-01

ICG032WC

AG26-06

NA

07/26/0515:18

ICG032W

AG26-01

DATE COLLECTED: NA

DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrite-N	ND	2.5	2.45	98	2.5	2.49	99	1	90-110	20

8016

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G218

METHOD: METHOD 300.0

% MOISTURE: NA

MATRIX: WATER

DILUTION FACTOR: 1

SAMPLE ID: MBLK2W

LAB SAMP ID: ICG033WB

LAB FILE ID: AG26-34

DATE EXTRACTED: NA

DATE ANALYZED: 07/27/0500:38

PREP. BATCH: ICG033W

CALIB. REF: AG26-25

1

1

ICG033WL

AG26-35

NA

07/27/0500:52

ICG033W

AG26-25

ICG033WC

AG26-36

NA

07/27/0501:06

ICG033W

AG26-25

DATE COLLECTED: NA

DATE RECEIVED: NA

ACCESSION:

BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
ND	2.5	2.38	95	2.5	2.38	95	0	90-110	20

PARAMETER

Nitrite-N

8017

6A

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G218
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-24-3
LAB SAMP ID: G218-02
LAB FILE ID: AG26-30
DATE EXTRACTED: NA
DATE ANALYZED: 07/26/0523:41
PREP. BATCH: ICG032W
CALIB. REF: AG26-25

% MOISTURE: NA
DATE COLLECTED: 07/25/05
DATE RECEIVED: 07/26/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Nitrite-N	ND	2.5	2.31	93	80-120

8018

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G218

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-24-3
EMAX SAMP ID: G218-02
LAB FILE ID: AG26-30
DATE EXTRACTED: NA
DATE ANALYZED: 07/26/0523:41
PREP. BATCH: ICG032W
CALIB. REF: AG26-25

% MOISTURE: NA
DATE COLLECTED: 07/25/05
DATE RECEIVED: 07/26/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
Nitrite-N	ND	ND	0	20

for

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G218

METHOD: METHOD 300.0

% MOISTURE: NA

MATRIX: WATER

DILUTION FACTOR: 1

SAMPLE ID: MBLK1W

LAB SAMP ID: ICG032WB

LAB FILE ID: AG26-04

DATE EXTRACTED: NA

DATE ANALYZED: 07/26/0514:50

PREP. BATCH: ICG032W

CALIB. REF: AG26-01

ICG032WL

AG26-05

NA

07/26/0515:04

ICG032W

AG26-01

ICG032WC

AG26-06

NA

07/26/0515:18

ICG032W

AG26-01

DATE COLLECTED: NA

DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Sulfate	ND	7.5	7.35	98	7.5	7.33	98	0	90-110	20

8020

da

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G218

METHOD: METHOD 300.0

% MOISTURE: NA

MATRIX: WATER

DILUTION FACTOR: 1 1

SAMPLE ID: MBLK2W

LAB SAMP ID: ICG044WB

LAB FILE ID: AG29-142

DATE EXTRACTED: NA

DATE ANALYZED: 07/30/0523:12

PREP. BATCH: ICG044W

CALIB. REF: AG29-133

ICG044WL

AG29-143

NA

07/30/0523:26

ICG044W

AG29-133

ICG044WC

AG29-144

NA

07/30/0523:40

ICG044W

AG29-133

DATE COLLECTED: NA

DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Sulfate	ND	7.5	7.16	95	7.5	7.22	96	1	90-110	20

8021

dk

ENMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G218
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-24-3
LAB SAMP ID: G218-02M
LAB FILE ID: AG26-31
DATE EXTRACTED: NA
DATE ANALYZED: 07/26/0523:41
PREP. BATCH: ICG032W
CALIB. REF: AG26-25

DATE COLLECTED: 07/25/05
DATE RECEIVED: 07/26/05

% MOISTURE: NA

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Sulfate	14.9	7.5	22.4	100	80-120

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 056218
METHOD: METHOD 300.0
=====

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-24-3
EMAX SAMP ID: G218-02D
LAB FILE ID: AG26-32
DATE EXTRACTED: NA
DATE ANALYZED: 07/26/0523:41
PREP. BATCH: ICG032W
CALIB. REF: AG26-25
% MOISTURE: NA
DATE COLLECTED: 07/25/05
DATE RECEIVED: 07/26/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
Sulfate	14.9	14.8	0	20

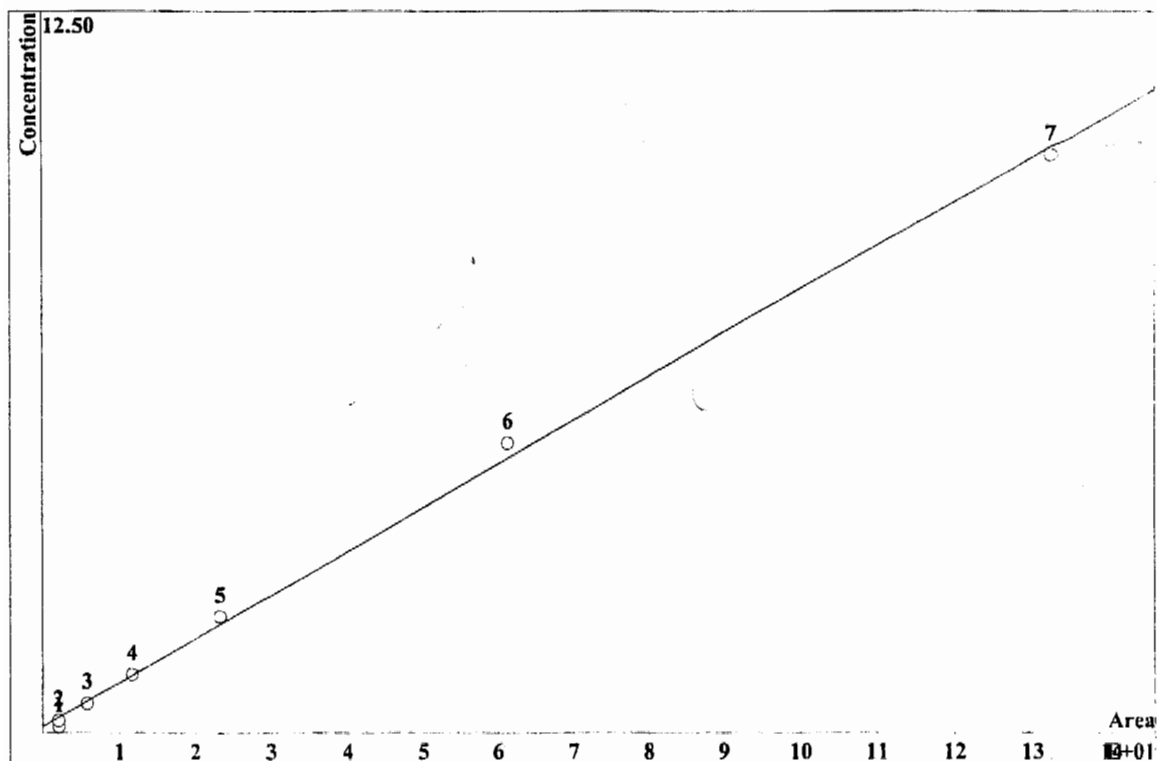
INITIAL CALIBRATIONS

IC Result Check FormVersion : qG1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AG12-01	IB	FCIBNPS	0	0	0	0	0	0	0	p7121933	1
AG12-02	S0	FCIBNPS	0	0	0	0	0	0	0	p7121947	1
AG12-03	S1	FCIBNPS	0.20922	0.26528	0.13263	0.17713	0.15064	0.23059	0.62598	p7122001	1
AG12-04	S2	FCIBNPS	0.27777	0.26131	0.22143	0.24989	0.23142	0.30903	0.72351	p7122016	1
AG12-05	S3	FCIBNPS	0.58991	0.54378	0.49016	0.55127	0.49616	0.56439	1.454	p7122030	1
AG12-06	S4	FCIBNPS	1.0109	0.98258	0.97309	1.0085	0.95747	1.027	2.868	p7122044	1
AG12-07	S5	FCIBNPS	1.9049	1.8679	1.9644	1.9839	1.9331	2.0024	5.7811	p7122058	1
AG12-08	S6	FCIBNPS	4.9656	4.7397	5.0183	4.9153	5.0312	4.8329	15.101	p7122112	1
AG12-09	S7	FCIBNPS	10.029	10.139	10.729	10.041	11.159	10.073	32.87	p7122126	1
AG12-10	ICV	FCIBNPS	97.2%	92.9%	97.1%	99.8%	97%	97.6%	97.4%	p7122140	1
AG12-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p7122154	1
AG12-12	CCV1	FCIBNPS	93.8%	90%	94.6%	96.4%	93.3%	97%	94.4%	p7122208	1
AG12-13	CCB1	FCIBNPS	0	0	0	0	0	0	0	p7122222	1
AG12-14	ICG011WB	FCIBNPS	0	0	0	0	0	0	0	p7122236	1
AG12-15	ICG011WL	FCIBNPS	4.9443	2.4394	2.4005	5.0644	2.3517	4.8648	7.0588	p7122250	1
AG12-16	ICG011WC	FCIBNPS	4.9971	2.4088	2.3901	5.0721	2.3585	5.016	7.2809	p7122305	1
AG12-17	MRL	FCIBNPS	0	0.25633	0	0	0.14022	0	0.49989	p7122319	1
AG12-18	G608-01	FCIBNPS	0	17.852	0	0	4.4945	0	15.463	p7122333	5
AG12-19	G608-02	FCIBNPS	0	19.873	0	0	2.0438	0	15.346	p7122347	5
AG12-20	G608-02D	FCIBNPS	0	19.907	0	0	2.0568	0	15.409	p7130001	5
AG12-21	G608-02M	FCIBNPS	25.496	32.238	12.127	24.026	14.648	25.773	51.746	p7130015	5
AG12-22	G058-17	FCIBNPS	0	0.86159	0	0	0.13449	0	5.2827	p7130029	1
AG12-23	RINSE	FCIBNPS	0	0	0	0	0	0	0	p7130043	1
AG12-24	CCV2	FCIBNPS	100.4%	95.6%	95.5%	101.3%	94.3%	100.6%	97.8%	p7130057	1
AG12-25	CCB2	FCIBNPS	0	0	0	0	0	0	0	p7130111	1
AG12-26	G058-18	F*IBNP*	0.42065	23.035E	0	2.6521	0	0	69.943E	p7130125	1
AG12-27	G058-19	FCIBNP*	0.52238	8.3145	0	0	0	0	63.422E	p7130139	1
AG12-28	G058-20	FCIBNP*	0.52701	8.2627	0	0	0	0	63.425E	p7130153	1
AG12-29	G058-21	FCIBNP*	0.49273	6.0643	0	0	0.091894	0	61.446E	p7130208	1
AG12-30	G058-22	F*IBNP*	0	995.75E	0	0.23033	0	0	15.385E	p7130222	1
AG12-31	G058-23	FCIBNPS	0.61192	6.4321	0	0.2531	0	0	7.0539	p7130236	1
AG12-32	G058-24	FCIBNPS	0.32896	2.8076	0	3.1748	0	0	10.156	p7130250	1
AG12-33	G058-25	F*IBNP*	0.34649	11.301E	0	2.5751	0	0	89.86E	p7130304	1
AG12-34	RINSE	FCIBNPS	0	0	0	0	0	0	0	p7130318	1
AG12-35	RINSE	FCIBNPS	0	0	0	0	0	0	0	p7130332	1
AG12-36	CCV3	FCIBNPS	100.2%	95.6%	95.6%	101.8%	94.8%	96.8%	97.9%	p7130346	1
AG12-37	CCB3	FCIBNPS	0	0	0	0	0	0.1887	0	p7130400	1
AG12-38	MRL	FCIBNPS	0	0.25923	0	0	0.13842	0	0.49672	p7130414	1
AG12-39	MDL	FCIBNPS	0	0.25447	0	0	0.13519	0	0.48865	p7130428	1
AG12-40	CCV4	FCIBNPS	96.9%	93.9%	92.9%	99.9%	92.5%	98%	95.5%	p7130442	1
AG12-41	CCB4	FCIBNPS	0.21534	0	0.090606	0	0	0.92427	0	p7130456	1

CALIBRATION OF COMPONENT chloride

Method: IC100-G12.mtw
 Equation: $Q = 0.0757087 \cdot A + 0.100061$
 RSD: 6.184 %
 Correlation coefficient: 0.999136



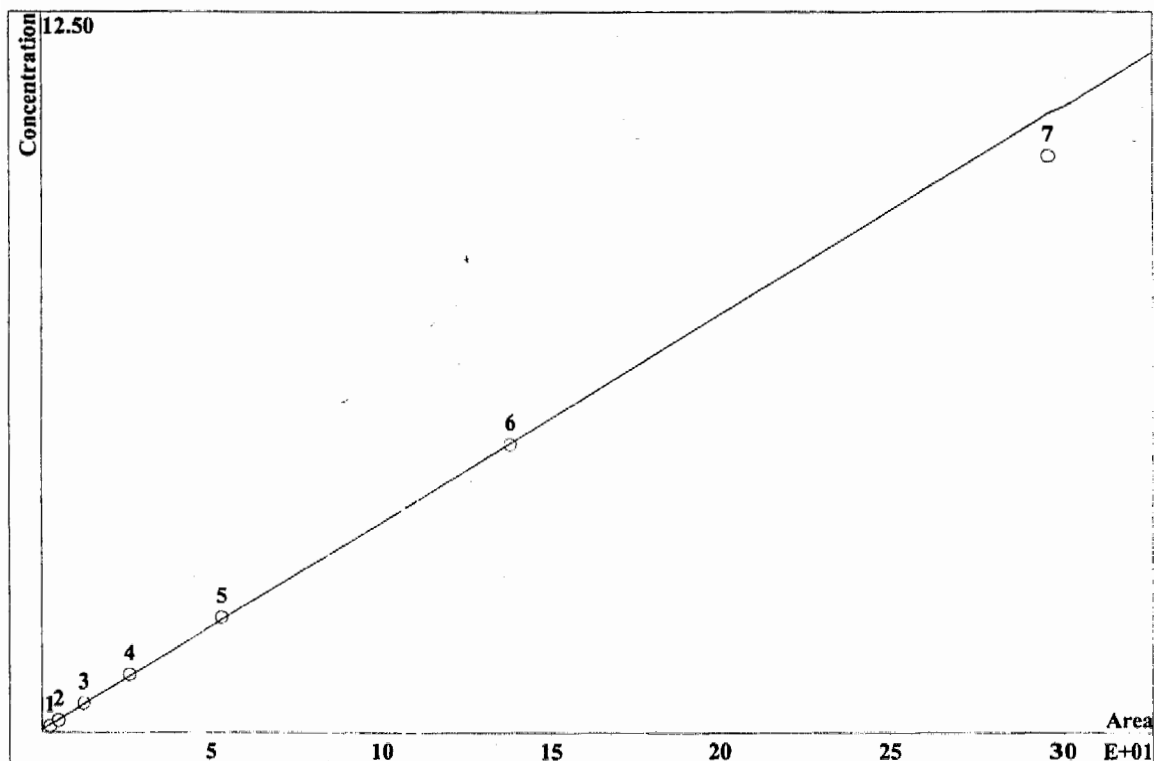
K3 = 0 K2 = 0 K1 = 0.0757087 K0 = 0.100061
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2455	2.182 ✓	0.1	1	3.4	Yes	p7122001.chw
2	0.2371	2.13 ✓	0.2	1	3.4	Yes	p7122016.chw
3	0.6644	5.861 ✓	0.5	1	3.4	Yes	p7122030.chw
4	1.319	11.66 ✓	1	1	3.4	Yes	p7122044.chw
5	2.661	23.35 ✓	2	1	3.4	Yes	p7122058.chw
6	7.225	61.28 ✓	5	1	3.4	Yes	p7122112.chw
7	15.92	132.6 ✓	10	1	3.4	Yes	p7122126.chw

7-15-05 8026

CALIBRATION OF COMPONENT nitrite

Method: IC100-G12.mtw
 Equation: $Q = 0.0360261 \cdot A + 0.0453635$
 RSD: 2.142 %
 Correlation coefficient: 0.999886



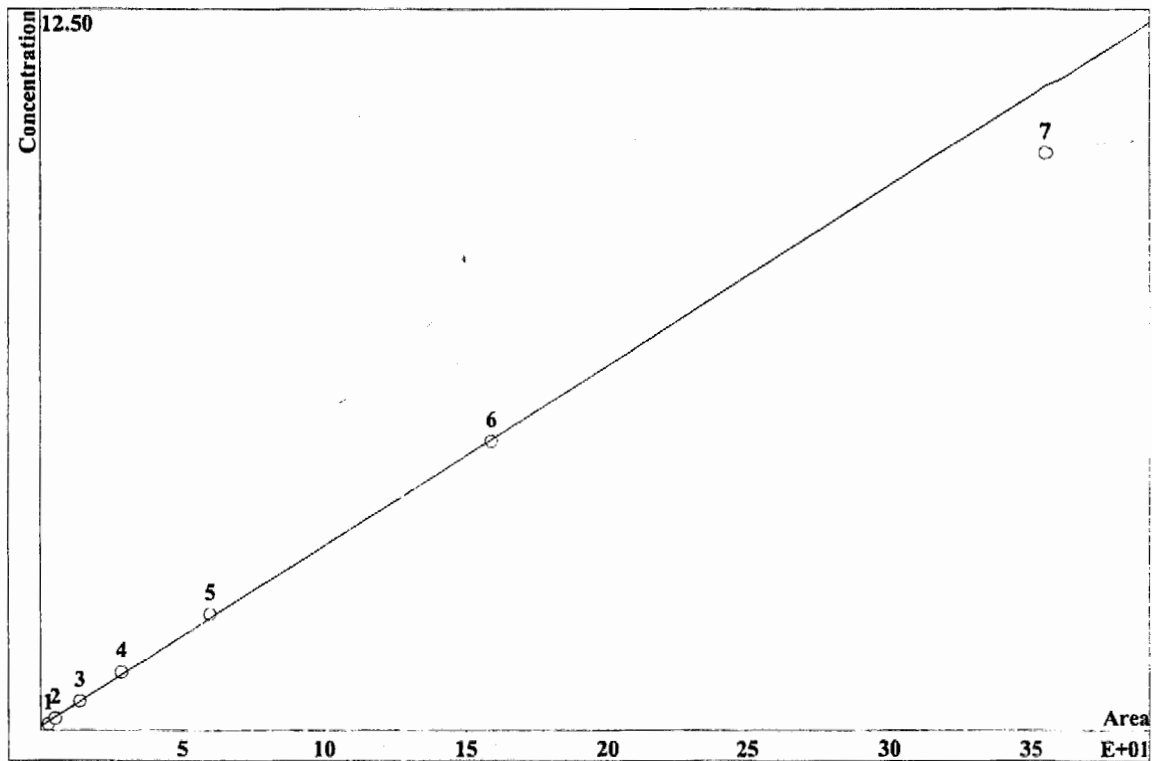
K3 = 0 K2 = 0 K1 = 0.0360261 K0 = 0.0453635
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2338	2.422 ✓	0.1	1	4.04	Yes	p7122001.chw
2	0.4699	4.887 ✓	0.2	1	4.04	Yes	p7122016.chw
3	1.199	12.35 ✓	0.5	1	4.04	Yes	p7122030.chw
4	2.505	25.75 ✓	1	1	4.04	Yes	p7122044.chw
5	5.149	53.27 ✓	2	1	4.04	Yes	p7122058.chw
6	13.25	138 ✓	5	1	4.04	Yes	p7122112.chw
7	27.46	296.6	10	1	4.04	No	p7122126.chw

1-15-05
 8027
 4

CALIBRATION OF COMPONENT nitrate

Method: IC100-G12.mtw
 Equation: $Q = 0.0311912 \cdot A + 0.0620763$
 RSD: 3.547 %
 Correlation coefficient: 0.999689



K3 = 0 K2 = 0 K1 = 0.0311912 K0 = 0.0620763

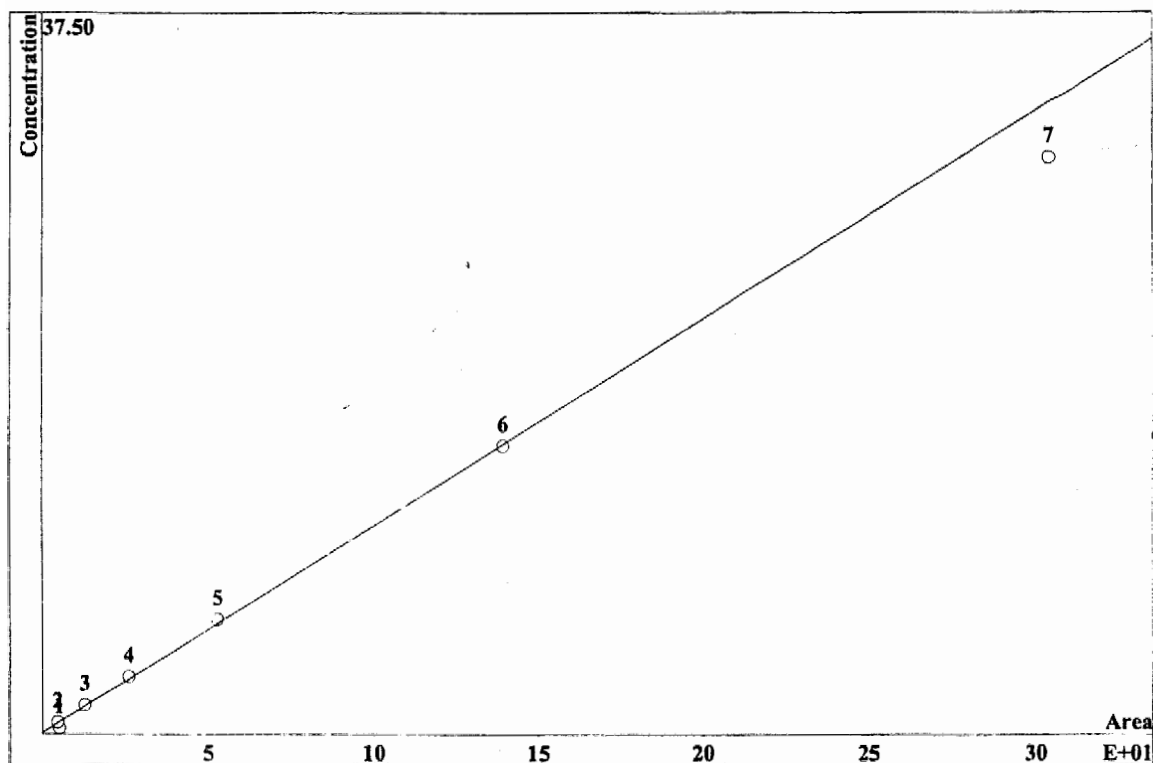
Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2165	2.84 ✓	0.1	1	5.72	Yes	p7122001.chw
2	0.415	5.429 ✓	0.2	1	5.72	Yes	p7122016.chw
3	1.072	13.92 ✓	0.5	1	5.72	Yes	p7122030.chw
4	2.23	28.71 ✓	1	1	5.72	Yes	p7122044.chw
5	4.699	59.99 ✓	2	1	5.72	Yes	p7122058.chw
6	12.88	159.3 ✓	5	1	5.72	Yes	p7122112.chw
7	29.17	355.8 ✗	10	1	5.72	No	p7122126.chw

For 5-03
 1-8028

CALIBRATION OF COMPONENT sulfate

Method: IC100-G12.mtw
 Equation: $Q = 0.10777 \cdot A + 0.0673535$
 RSD: 4.885 %
 Correlation coefficient: 0.999410



K3 = 0 K2 = 0 K1 = 0.10777 K0 = 0.0673535

Base: Area

Ref.channel: Cond

ISTD:

Formula: Linear

Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.3229	5.184 ✓	0.3	1	8.36	Yes	p7122001.chw
2	0.2916	4.664 ✓	0.6	1	8.36	Yes	p7122016.chw
3	0.8086	12.87 ✓	1.5	1	8.36	Yes	p7122030.chw
4	1.631	25.99 ✓	3	1	8.36	Yes	p7122044.chw
5	3.365	53.02 ✓	6	1	8.36	Yes	p7122058.chw
6	9.065	139.5 ✓	15	1	8.36	Yes	p7122112.chw
7	20.13	304.4	30	1	8.36	No	p7122126.chw

12-15-05
 8029

***SECOND SOURCE
VERIFICATION***

IC Result Check FormVersion : QG1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AG12-10	ICV	FCIBNPS	97.2%	92.9%	97.1%	99.8%	97%	97.6%	97.4%	p7122140	1
AG12-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p7122154	1
AG12-12	CCV1	FCIBNPS	93.8%	90%	94.6%	96.4%	93.3%	97%	94.4%	p7122208	1
AG12-13	CCB1	FCIBNPS	0	0	0	0	0	0	0	p7122222	1
AG12-24	CCV2	FCIBNPS	100.4%	95.6%	95.5%	101.3%	94.3%	100.6%	97.8%	p7130057	1
AG12-25	CCB2	FCIBNPS	0	0	0	0	0	0	0	p7130111	1
AG12-36	CCV3	FCIBNPS	100.2%	95.6%	95.6%	101.8%	94.8%	96.8%	97.9%	p7130346	1
AG12-37	CCB3	FCIBNPS	0	0	0	0	0	0.1887	0	p7130400	1
AG12-40	CCV4	FCIBNPS	96.9%	93.9%	92.9%	99.9%	92.5%	98%	95.5%	p7130442	1
AG12-41	CCB4	FCIBNPS	0.21534	0	0.090606	0	0	0.92427	0	p7130456	1

DAILY CALIBRATIONS

8032

IC Result Check FormVersion : QG1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AG26-01 ✓	CCV64	FCIBNPS	91.3%	91%	98.9%	96.6%	96.1%	93.8%	92.2%	p7261407	1
AG26-02	CCB64	FCIBNPS	0	0	0	0	0	0	0	p7261421	1
AG26-13 ✓	CCV65	FCIBNPS	93%	92.1%	99.3%	97.8%	95.6%	97.2%	92.8%	p7261656	1
AG26-14	CCB65	FCIBNPS	0	0	0	0	0	0	0	p7261710	1
AG26-25 ✓	CCV66	FCIBNPS	93.6%	99.1%	102.7%	104.1%	97.1%	92.2%	93.8%	p7262231	1
AG26-26	CCB66	FCIBNPS	0	0	0	0	0	0	0	p7262245	1
AG26-37 ✓	CCV67	FCIBNPS	92%	91.2%	98%	96.9%	94.4%	91.2%	91.5%	p7270120	1
AG26-38	CCB67	FCIBNPS	0	0	0	0	0	0	0	p7270134	1
AG26-49 ✓	CCV68	FCIBNPS	92.2%	91.1%	98.1%	96.7%	94.2%	90.3%	91.4%	p7270409	1
AG26-50	CCB68	FCIBNPS	0	0	0	0	0	0	0	p7270423	1
AG26-59	CCV69	FCIBNPS	93.4%	91.2%	97.7%	96.6%	93.8%	84%*	91%	p7270629	1
AG26-60	CCB69	FCIBNPS	0	0	0	0	0	0.20794	0	p7270644	1
AG26-61	CCV69	FCIBNPS	91.6%	91.2%	98.2%	96.4%	94.1%	82.2%*	91.3%	p7270658	1
AG26-62	CCB69	FCIBNPS	0	0	0	0	0	0.19777	0	p7270712	1

✓

✓

✓

IC Result Check FormVersion : qg1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AG29-01	CCV86	FCIBNPS	91.1%	94.2%	99.6%	99.6%	96.5%	93.4%	98.8%	p7291246	1
AG29-02	CCB86	FCIBNPS	0	0	0	0	0	0	0	p7291301	1
AG29-13	CCV87	FCIBNPS	95.3%	94.9%	99.1%	100.4%	97%	99%	99.8%	p7291549	1
AG29-14	CCB87	FCIBNPS	0	0	0	0	0	0	0	p7291603	1
AG29-25	CCV88	FCIBNPS	95.3%	94.7%	99.2%	100.4%	97.1%	99.6%	99.4%	p7291838	1
AG29-26	CCB88	FCIBNPS	0	0	0	0	0	0	0	p7291852	1
AG29-37	CCV89	FCIBNPS	93%	93.8%	98.8%	98.8%	102.5%	94.4%	98.5%	p7292153	1
AG29-38	CCB89	FCIBNPS	0	0	0	0	0	0	0	p7292208	1
AG29-49	CCV90	FCIBNPS	95.6%	95.3%	99.4%	100.8%	104.1%	100.8%	99.6%	p7300043	1
AG29-50	CCB90	FCIBNPS	0	0	0	0	0	0	0	p7300057	1
AG29-61	CCV91	FCIBNPS	95.4%	94.7%	99.1%	100.5%	103.7%	101.7%	99.4%	p7300332	1
AG29-62	CCB91	FCIBNPS	0	0	0	0	0	0	0	p7300346	1
AG29-73	CCV92	FCIBNPS	95.1%	96.4%	99.6%	100.7%	104.1%	99.8%	99.9%	p7300620	1
AG29-74	CCB92	FCIBNPS	0	0	0	0	0	0	0	p7300635	1
AG29-85	CCV93	FCIBNPS	93%	94.4%	99.4%	99.5%	102.7%	93.2%	97.8%	p7300909	1
AG29-86	CCB93	FCIBNPS	0	0	0	0	0	0	0	p7300923	1
AG29-97	CCV94	FCIBNPS	93.2%	94.6%	99.1%	99.6%	102.8%	87.6%*	98%	p7301158	1
AG29-98	CCB94	FCIBNPS	0	0	0	0	0	0	0	p7301212	1
AG29-109	CCV95	FCIBNPS	95%	95.1%	99.5%	100.4%	104.3%	99.9%	99.7%	p7301514	1
AG29-110	CCB95	FCIBNPS	0	0	0	0	0	0	0	p7301528	1
AG29-121	CCV96	FCIBNPS	97.6%	95%	99.3%	100.2%	103.5%	92.3%	99.9%	p7301816	1
AG29-122	CCB96	FCIBNPS	0	0	0	0	0	0	0	p7301830	1
AG29-133	CCV97	FCIBNPS	104.8%	97%	99.9%	100.6%	104.2%	89%*	99.7%	p7302105	1
AG29-134	CCB97	FCIBNPS	0	0	0	0	0	0	0	p7302119	1
AG29-145	CCV98	FCIBNPS	107%	96.8%	100.1%	101.1%	104.7%	89.3%*	100%	p7302354	1
AG29-146	CCB98	FCIBNPS	0	0	0	0	0	0	0	p7310008	1
AG29-147	CCB98	FCIBNPS	0	0	0	0	0	0	0	p7310022	1
AG29-158	CCV99	FCIBNPS	108.4%	96.7%	99.7%	100.9%	104.2%	89.4%*	100%	p7310257	1
AG29-159	CCB99	FCIBNPS	0	0	0	0	0	0	0	p7310311	1
AG29-170	CCV100	FCIBNPS	107%	95.5%	99.2%	99.8%	103%	86.9%*	98.2%	p7310546	1
AG29-171	CCB100	FCIBNPS	0	0	0	0	0	0	0	p7310600	1
AG29-179	CCV101	FCIBNPS	108.5%	95.7%	92.8%	100.5%	98.4%	94%	96.3%	p7310752	1
AG29-180	CCB101	FCIBNPS	0	0	0	0	0	0	0	p7310806	1
AG29-181	CCV102	FCIBNPS	108.8%	95.6%	98.4%	100.8%	100.7%	96.8%	96.2%	p7310820	1

ANALYTICAL LOG

ANALYSIS RUN LOG FOR IC

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 07/12/05 Time: 19:33 Ending Date: 07/13/05 Time: 04:56 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix		Notes
				S	W	
* 1	AG12-01	1B	1		✓	
* 2	02	SG				
* 3	03	SI				
* 4	04	S2				
* 5	05	S3				
* 6	06	S4				
* 7	07	S5				
* 8	08	SG				
* 9	09	S7				
* 10	10	ICV				
* 1	11	ICB				
* 2	12	CCV				
* 3	13	CCB				
* 4	14	ICQ11WB				
* 5	16	ICQ11WB				
* 6	18	ICQ11WB				
* 7	17	MRL				
* 8	18	GLC1-01				
* 9	19	GLC1-02				
* 20	20	GLC1-02b				
* 1	21	GLC1-01M				
* 2	22	GLC1-12				
* 3	23	RINSE				
* 4	24	CCV2				
* 5	25	CCB2				
* 6	26	GLC1-18				
* 7	27	GLC1-15				
* 8	28	GLC1-20				
* 9	29	GLC1-21				
* 30	30	GLC1-22				

ANALYTICAL BATCH * IC 601W

Instrument Number		22/02/2005						
INITIAL CALIBRATION REFERENCE								
Method File	IC100-012.mhw	Date						
ICAL ID	SW5B-12-628-634	07/12/05						
ICV ID	SW5B-12-635-641	07/12/05						
Standards-A								
Name	ID	Conc. (mg/L)						
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄
ICAL	S1	SW5B-12-628	0.1					0.3
	S2	629	0.2					0.6
	S3	630	0.5					1.5
	S4	631	1					3
	S5	632	2					6
	S6	633	5					15
	S7	634	10					30
LCS ICV		SW5B-12-635-641	3					10
MS (1)		LCS SMPLC	5	5	2.5	5	2.5	7.5
Standards-B								
Name	ID	Conc. (mg/L)						
		BrO ₃	DCA	ClO ₃				
ICAL	S1							
	S2							
	S3							
	S4							
ICV								
CCV								
LCS								
		Standards-A (Conc. mg/L)						
		F	Cl	NO ₂	Pr	NO ₃	P	SO ₄
		5	5	2.5	5	2.5	5	7.5
		5	5	2.5	5	2.5	5	7.5

Comments:

Analyzed By: AL

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ANALYSIS RUN LOG FOR IC

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SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 07/12/05

Time: 14:33

Ending Date: 07/13/05

Time: 04:56

Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Notes
* 1	AG12-31	6058-23	1		
* 2	32	6058-24			
* 3	33	6058-25			
* 4	34	RINSE			
* 5	35	RINSE			
* 6	36	CCV3			
* 7	37	CCB3			
* 8	38	HRL			
* 9	39	HPL			
* 40	40	CCV4			
* 41	41	CCB4			
* 2					
* 3					
* 4					
* 5					
* 6					
* 7					
* 8					
* 9					
* 0					
* 1					
* 2					
* 3					
* 4					
* 5					
* 6					
* 7					
* 8					
* 9					
* 0					

ANALYTICAL BATCH * IC 6011W

Instrument Number		22100 01 12/15	
INITIAL CALIBRATION REFERENCE			
Method File		Date	
ICAL ID			
ICV ID			
Standards-A			
Name	ID	Conc. (mg/L)	
		F	Cl
		NO ₂	Br
		NO ₃	P
		SO ₄	
ICAL	S ₁		
	S ₂		
	S ₃		
	S ₄		
	S ₅		
ICV			
CCV			
LCS			
MS			
Standards-B			
Name	ID	Conc. (mg/L)	
		BrO ₃	DCA
		ClO ₃	
ICAL	S ₁		
	S ₂		
	S ₃		
	S ₄		
ICV			
CCV			
LCS			
Comments:			

Analyzed By: ckl

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ANALYSIS RUN LOG FOR IC

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SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 07/26/05 Time: 1407 Ending Date: 07/27/05 Time: 07154 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Notes
* 1	AG40-11	CCV64	1	✓	
* 2	01	CCV64			
* 3	02	MRL			
* 4	04	ICG032112			
* 5	05	01			
* 6	06	02			
* 7	07	G136-02	10		
* 8	08	03	20		
* 9	09	04	10		
* 10	10	05	5		
* 1	11	06	10		
* 2	12	07	10		
* 3	13	CCV65	1		
* 4	14	CCV65			
* 5	15	G1842-02			
* 6	16	02	50		* Re-run due to possible air bubble in
* 7	17	02A	50		instrument.
* 8	18	G222-01	20		
* 9	19	02			
* 20	20	03			
* 1	21	04			
* 2	22	03			
* 3	23	05			
* 4	24	RINSE	1		
* 5	25	CCV66			
* 6	26	CCV66			
* 7	27	MRL			
* 8	28	G222-02	20		
* 9	29	G219-01	1		
* 30	30	02	1		

ANALYTICAL BATCH * IC A032W

Instrument Number		22102 03/26/05						
INITIAL CALIBRATION REFERENCE								
Method File	IC101-1212 mFW	Date						
ICAL ID	SW50-12-628-634	07/12/05						
ICV ID	SW50-12-635-641	07/12/05						
Standards-A								
Name	ID	Conc. (mg/L)						
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄
ICAL	S ₁							
	S ₂							
	S ₃							
	S ₄							
	S ₅							
ICV								
CCV	SW50-12-757-760	5	5	2.5	5	2.5	5	7.5
LCS	SW50-12-761-764							
MS	LCS SOURCE							
Standards-B								
Name	ID	Conc. (mg/L)						
		BrO ₃	DCA	ClO ₃				
ICAL	S ₁							
	S ₂							
	S ₃							
	S ₄							
ICV								
CCV								
LCS								

Comments:

Analyzed By: 08

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ANALYSIS RUN LOG FOR IC

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SOP ☐ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 07/26/05 Time: 14:07 Ending Date: 07/27/05 Time: 07:54 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Notes
* 3 1	AG06-0131	0218-02M	1		
* 2	0232	↓ 0218		✓	
* 3	0233	RINSE			
* 4	0234	ICV03WP			
* 5	0235	WL			
* 6	0236	WL			
* 7	0237	CCV07			
* 8	0238	CCV07			
* 9	0239	0218-03			
* 40	40	04			
* 1	41	05			
* 2	42	↓ 06			
* 3	43	0219-02	5		
* 4	44	03			
* 5	45	04			
* 6	46	↓ 05			
* 7	47	RINSE	1		
* 8	48	RINSE			
* 9	49	CCV08			
* 50	50	CCV08			
* 1	51	0221-02			
* 2	52	02			
* 3	53	02-1			
* 4	54	03			
* 5	55	04			
* 6	56	05	5		
* 7	57	↓ 06			
* 8	58	RINSE			
* 9	59	CCV09			
* 60	60	CCV09			

INITIAL CALIBRATION REFERENCE									
Method File	Conc. (mg/L)				Date				
ICAL ID	F	Cl	NO ₂	Br	NO ₃	P	SO ₄		
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
	S ₅								
ICV									
CCV									
LCS									
MS									

Standards-A									
Name	ID	Conc. (mg/L)							
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄	
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
	S ₅								
ICV									
CCV									
LCS									
MS									

Standards-B									
Name	ID	Conc. (mg/L)							
		BrO ₃	DCA	ClO ₃					
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
ICV									
CCV									
LCS									

Comments:

Analyzed By: al

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ANALYTICAL BATCH * ICG0321V ** ICG033W

ANALYSIS RUN LOG FOR IC

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SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 07/29/05

Time: 12:10p

Ending Date: 07/29/05

Time: 08:20

Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix		Notes
				S	W	
* 1	A628-01	CCV-EE	1		✓	
* 2	02	CCV-EE				
* 3	03	IC6038WB				
* 4	04	IC6038UL				
* 5	05	IC6038UL				
* 6	06	IC62-c1				
* 7	07	IC62-c2				
* 8	08	IC62-c3				
* 9	09	IC62-c4				
* 10	10	IC62-c5				
* 1	11	IC62-c6				
* 2	12	BL				
* 3	13	CCV-EE				
* 4	14	CCV-EE				
* 5	15	IC62-c7	✓			
* 6	16	IC62-c1	50			
* 7	17	RINSE	1			
* 8	18	IC62-c1	1			
* 9	19	IC62-c1	5			
* 20	20	IC62-c2	5			
* 1	21	IC60-c1	1			
* 2	22	IC60-c10				
* 3	23	IC60-c11				
* 4	24	RINSE				
* 5	25	CCV-EE				
* 6	26	CCV-EE				
* 7	27	IC60-c2				
* 8	28	IC60-c3				
* 9	29	RINSE				
* 30	30	IC60-cWB	✓		✓	

ANALYTICAL BATCH * IC 6038WB ** IC 6040WB

Instrument Number		22-180						
INITIAL CALIBRATION REFERENCE								
Method File	IC100-G12.mtw	Date						
ICAL ID	SW5B-12-626-634	07/12/05						
ICV ID	SW5B-12-635-641	07/12/05						
Standards-A								
Name	ID	Conc. (mg/L)						
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄
ICAL	S ₁							
	S ₂							
	S ₃							
	S ₄							
	S ₅							
ICV								
CCV	SW5B-12-733-746	5	5	2.5	5	2.5	5	7.5
LCS	SW5B-12-747-800							
MS * DF	LCS Source							
Standards-B								
Name	ID	Conc. (mg/L)						
		BrO ₃	DCA	ClO ₃				
ICAL	S ₁	N/A						
	S ₂							
	S ₃							
	S ₄							
ICV								
CCV								
LCS								
Comments:						1		

Comments:

Analyzed By: oal

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ANALYSIS RUN LOG FOR IC

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 07/29/05 Time: 12:46 Ending Date: 07/31/05 Time: 08:20 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix	Notes
				S W	
***121	6629-121	6629	1		
2	122	6630	1		
3	123	6631-03	1		
4	124	6632-01	200		
5	125	6633-03	25		
6	126	6633-04	25		
7	127	6633-05	100		
8	128	6633-06	100		
9	129	6633-07	50		
10	130	6644-01	50		
11	131	6644-02	250		
12	132	RINSE	1		
13	133	6657	1		
14	134	6657	1		
15	135	6664-01	500		
16	136	6664-02	200		
17	137	6664-03	50		
18	138	6664-04	50		
19	139	RINSE	1		
140	140	RINSE	1		
141	141	RINSE	1		
142	142	IC6043WL			IC6044WL
143	143	IC6043WL			IC6044WL
144	144	IC6043WL			IC6044WL
145	145	6658			
146	146	6658			
147	147	6658			
148	148	RINSE	1		
149	149	6629-02	20		
150	150	6629-0217	20		

ANALYTICAL BATCH *****IC6043W***** JCG044W

Instrument Number		2210002151/15	
INITIAL CALIBRATION REFERENCE			
Method File	ID	Date	
ICAL ID			
ICV ID			
Standards-A			
Name	ID	Conc. (mg/L)	
		F	Cl
		NO ₂	Br
		NO ₃	P
		SO ₄	
ICAL	S ₁		
	S ₂		
	S ₃		
	S ₄		
	S ₅		
ICV			
CCV			
LCS			
MS			
Standards-B			
Name	ID	Conc. (mg/L)	
		BrO ₃	DCA
		ClO ₃	
ICAL	S ₁		
	S ₂		
	S ₃		
	S ₄		
ICV			
CCV			
LCS			

Comments:

Analyzed By: adk

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ANALYSIS RUN LOG FOR IC

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SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 07/29/05 Time: 12:46 Ending Date: 07/30/05 Time: 08:20 Instrument Number: 1002208 173105 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix		Notes
				S	W	
1	A625-151	G1823-02H	20		✓	
2	152	G266-02	20			
3	153	G266-03	50			
4	154	G266-04	100			
5	155	G266-05	200			
6	156	G266-05D	200			
7	157	G266-05H	200			
8	158	(C)59	1			
9	159	(C)59	1			
10	160	G218-02	10			
11	161	G218-03	1000			
12	162	G218-04	500			
13	163	G218-05	10			
14	164	G218-01	5			
15	165	G218-02	5			
16	166	G218-02D	5			
17	167	G218-02H	5			
18	168	G218-03	10			
19	169	RINSE	1			
170	170	(C)100				
171	171	(C)100				
172	172	(C)4045WB				ICG045WB
173	173	(C)4045WB				ICG045WB
174	174	(C)4045WB				ICG045WB
175	175	RINSE	✓			
176	176	G218-04	5			
177	177	G218-05	5			
178	178	G218-06	5			
179	179	(C)100	1			
180	180	(C)100	1			

ANALYTICAL BATCH *****ICG044W*****ICG046W

Instrument Number		1002208 173105						
INITIAL CALIBRATION REFERENCE								
Method File		Date						
ICAL ID								
ICV ID								
Standards-A								
Name	ID	Conc. (mg/L)						
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄
ICAL	S ₁							
	S ₂							
	S ₃							
	S ₄							
	S ₅							
ICV								
CCV								
LCS								
MS								
Standards-B								
Name	ID	Conc. (mg/L)						
		BrO ₃	DCA	ClO ₃				
ICAL	S ₁							
	S ₂							
	S ₃							
	S ₄							
ICV								
CCV								
LCS								

Comments:

Analyzed By: cL

This page is checked during the data review process.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G218**

METHOD 310.1 TOTAL ALKALINITY

Six (6) water samples were received on 07/26/05 for Total Alkalinity analysis by Method 310.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 310.1
TOTAL ALKALINITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G218

Matrix : WATER
Instrument ID : I53

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATETIME	Extraction DATETIME	LFID	CAL REF	PREP BATCH	Collection DATETIME	Received DATETIME
MBLK1W	ALG020WB	ND	1	NA	5	1	07/29/0511:30	NA	ALG020W-01	NA	ALG020W	NA	NA
LCS1W	ALG020WL	48.1	1	NA	5	1	07/29/0511:35	NA	ALG020W-02	NA	ALG020W	NA	NA
LCD1W	ALG020WC	48.1	1	NA	5	1	07/29/0511:40	NA	ALG020W-03	NA	ALG020W	NA	NA
MW-24-4	G218-01	127	1	NA	5	1	07/29/0512:20	NA	ALG020W-11	NA	ALG020W	07/25/05	07/26/05
MW-24-3	G218-02	142	1	NA	5	1	07/29/0512:25	NA	ALG020W-12	NA	ALG020W	07/25/05	07/26/05
MW-24-2	G218-03	144	1	NA	5	1	07/29/0512:30	NA	ALG020W-13	NA	ALG020W	07/25/05	07/26/05
MW-24-1	G218-04	154	1	NA	5	1	07/29/0512:35	NA	ALG020W-14	NA	ALG020W	07/25/05	07/26/05
DUPE-3-7/25/05	G218-05	159	1	NA	5	1	07/29/0512:40	NA	ALG020W-15	NA	ALG020W	07/25/05	07/26/05
MW-24-5	G218-06	164	1	NA	5	1	07/29/0512:45	NA	ALG020W-16	NA	ALG020W	07/25/05	07/26/05

8044

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 310.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G218
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: ALG020ML/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 07/29/05 11:35/11:40

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Total Alkalinity	ND	49.20	48.10	98	49.20	48.10	98	0	80-120	20

8045

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G218**

METHOD 350.2 AMMONIA (NH₃-N)

Six (6) water samples were received on 07/26/05 for Ammonia analysis by Method 350.2 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G218-06 was analyzed for duplicate. %RPD was within QC limit.

5. Matrix Spike

Sample G218-06 was spiked. %Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 350.2
AMMONIA (NH3-N)

Client : BATTLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G218

Matrix : WATER
Instrument ID : 170

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL	REF	PREP	BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	NHH002WB	ND	1	NA	.1	.03	08/05/0515:11	08/05/0514:00	NHH002W-12	NHH002W-10	NHH002W	NHH002W		NA	08/05/05
LCS1W	NHH002WL	.927	1	NA	.1	.03	08/05/0515:12	08/05/0514:00	NHH002W-13	NHH002W-10	NHH002W	NHH002W		NA	08/05/05
LCD1W	NHH002WC	.940	1	NA	.1	.03	08/05/0515:13	08/05/0514:00	NHH002W-14	NHH002W-10	NHH002W	NHH002W		NA	08/05/05
MW-24-4	G218-01	.254	1	NA	.1	.03	08/05/0515:14	08/05/0514:00	NHH002W-15	NHH002W-10	NHH002W	NHH002W		07/25/05	07/26/05
MW-24-3	G218-02	.117	1	NA	.1	.03	08/05/0515:15	08/05/0514:00	NHH002W-16	NHH002W-10	NHH002W	NHH002W		07/25/05	07/26/05
MW-24-2	G218-03	.111	1	NA	.1	.03	08/05/0515:16	08/05/0514:00	NHH002W-17	NHH002W-10	NHH002W	NHH002W		07/25/05	07/26/05
MW-24-1	G218-04	ND	1	NA	.1	.03	08/05/0515:17	08/05/0514:00	NHH002W-18	NHH002W-10	NHH002W	NHH002W		07/25/05	07/26/05
DUPE-3-7/25/05	G218-05	ND	1	NA	.1	.03	08/05/0515:18	08/05/0514:00	NHH002W-19	NHH002W-10	NHH002W	NHH002W		07/25/05	07/26/05
MW-24-5	G218-06	ND	1	NA	.1	.03	08/05/0515:19	08/05/0514:00	NHH002W-20	NHH002W-10	NHH002W	NHH002W		07/25/05	07/26/05
MW-24-5DUP	G218-060	ND	1	NA	.1	.03	08/05/0515:20	08/05/0514:00	NHH002W-21	NHH002W-10	NHH002W	NHH002W		07/25/05	07/26/05
MW-24-5MS	G218-06M	.952	1	NA	.1	.03	08/05/0515:23	08/05/0514:00	NHH002W-24	NHH002W-22	NHH002W	NHH002W		07/25/05	07/26/05

8048

OK

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 350.2
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G218
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: MHH002WL/C

ACCESSION:

DATE RECEIVED: 08/05/05
DATE EXTRACTED: 08/05/05 14:00
DATE ANALYZED: 08/05/05 15:12/15:13

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Ammonia (NH3-N)	ND	1.00	.927	93	1.00	.94	94	1	80-120	20

8049

8

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 350.2
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G218
SAMPLE ID: MW-24-5MS
CONTROL NO.: G218-06M
DATE RECEIVED: 07/26/05
DATE EXTRACTED: 08/05/05 14:00
DATE ANALYZED: 08/05/05 15:23

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Ammonia (NH3-N)	ND	1.00	.952	95	75-125

8050

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 350.2
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G218
SAMPLE ID: MW-24-50UP
CONTROL NO.: G218-060
DATE RECEIVED: 07/26/05
DATE EXTRACTED: 08/05/05 14:00
DATE ANALYZED: 08/05/05 15:20

ACCESSION:

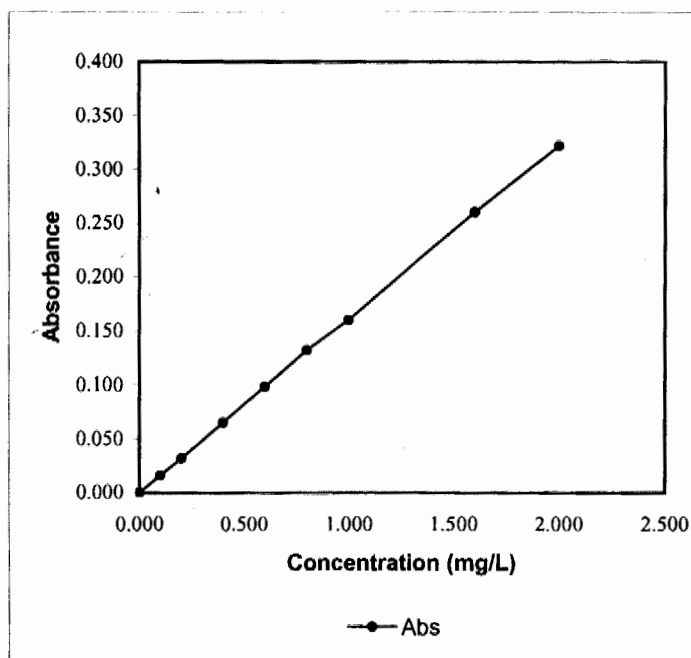
PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Ammonia (NH3-N)	ND	ND	0	20

8651

α

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.016
0.200	0.032
0.400	0.065
0.600	0.098
0.800	0.132
1.000	0.160
1.600	0.260
2.000	0.322



R² 0.999856

Y 0.1617

CF 6.1830

Comments: **PASSED**

Analyzed by: NT/LA

ANALYSIS LOG FOR AMMONIA-N

Book # A70-NH₃-005

SOP # EMAX-350.2 Rev. No. 2 □ EMAX-350.1 □ Rev. No. 0 □

Starting Date: 8/5/05 Time: 15:00 Ending Date: 8/5/05 Time: 15:37

Data File Name	Prep. Batch	Lab Sample ID	Matrix S W	Time	Vol. Colored (ml)	DF	Absorbance	Notes mg/L
* 1	NH002W	S-0		15:00	20	1	0.000	
* 2		0.1		01			0.016	
* 3		0.2		02			0.032	
* 4		0.4		03			0.065	
* 5		0.6		04			0.098	
* 6		0.8		05			0.132	
* 7		1.0		06			0.160	
* 8		1.6		07			0.260	
* 9		2.0		08			0.322	
* 10		ICV		09			0.158	0.977
* 11		ICB		10			0.000	ND
* 12		NH002W	✓	11			0.000	ND
* 13		WL		12			0.150	0.927
* 14		WC		13			0.152	0.940
* 15		G218-01		14			0.041	0.254
* 16		02		15			0.019	0.117
* 17		03		16			0.018	0.111
* 18		04		17			0.002	ND
* 19		05		18			0.000	ND
* 20		NT 06		19			0.000	ND
* 21		8/5/05 06D		20			0.000	ND
* 22		CCV1 06A		21			0.160	0.989
* 23		CCB1		22			0.000	ND
* 24		G218-06M		23			0.154	0.952
* 25		G244-01		24			0.034	0.210
* 26		02		25			0.000	ND
* 27		G265-01		26			0.002	ND
* 28		02		27			0.000	ND
* 29		03		28			0.000	ND
* 30		04		29			0.000	ND

ANALYTICAL BATCH * NH002W

Analyzed By: NT/LA

This page is checked during data review.

ANALYSIS LOG FOR AMMONIA-N

Book # A70-NH₃-005SOP ☒ EMAX-350.2 Rev. No. 2 ☐ EMAX-350.1 ☐ Rev. No. 0 ☐

Starting Date: 8/5/05

Time: 15:00

Ending Date: 8/5/05

Time: 15:37

Data File Name	Prep. Batch	Lab Sample ID	Matrix S W	Time	Vol. Colored (ml)	DF	Absorbance	Notes mg/L
* 31	NAH002W	G265-05	✓	15:30	20	1	0.000	ND
* 32		06	✓	31			0.000	ND
* 33		07	✓	32			0.000	ND
* 34		CCV2		33			0.158	0.977
* 35		CCB2		34			0.000	ND
* 36		G265-08	✓	35			0.000	ND
* 37		CCV3		36			0.160	0.989
* 38		CCB3		15:37			0.000	ND
* 9								
* 0								
* 1								
* 2								
* 3								
* 4								
* 5								
* 6								
* 7								
* 8								
* 9								
* 0								
* 1								
* 2								
* 3								
* 4								
* 5								
* 6								
* 7								
* 8								
* 9								
* 0								

ANALYTICAL BATCH * NAH002W

Standard Curve

Reagent

Color Reagent

ICV/MS

CCV

LCS

Standard

Conc. (mg/L)

Wavelength: 425 nm

Instrument No: 70

ID

Comments:

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By: NT/LA

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-006

SOP ☒ EMAX-350.2 Rev. No.: 2 ☐ EMAX-351.3 Rev. No.: 2 ☐

Start Date	Time	End Date	Time
8/5/05	9:00	8/5/05	14:00

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	S-0	9.5	0.1	10	5	100	100		ICV/MS	SW2B-03-180	10ml + 100ml
*02	0.1								LCS	↓ 179	100 mL
*03	1.0								Reagent	Lot# / ID	
*04	2.0								NaOH	SW7A-06-112	
*05	ICV								Digestion Mixture	NA	
*06	ICB								Borate Buffer	SW7A-06-152	
*07	NHH002WB								H ₃ BO ₃	SW7B-06-322	
*08	WL								Distilling Soln.	N/A	
*09	WC								Comments:		
*10	G218-01		0.8								
*11	02		0.7								
*12	03		0.8								
*13	04		0.9								
*14	05		0.9								
*15	06		0.8								
*16	06D		0.8								
*17	06M		0.8								
*18	G244-01		0.9								
*19	02		0.7								
*20	G265-01		0.7								
*21	02		0.8								
*22	03		0.7								
*23	04		0.7								
*24	05		0.7								
*25	06		0.7								
*26	07		0.7								
*27	08		0.6								

Prepared By: NT/LA

Standard Added By: NT/LA

Checked By:

PREPARATION BATCH * NHH002W

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G218**

METHOD 120.1 SPECIFIC CONDUCTIVITY

Six (6) water samples were received on 07/26/05 for Specific Conductivity analysis by Method 120.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G218-05 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 120.1
SPECIFIC CONDUCTIVITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G218

Matrix : WATER
Instrument ID : 129

SAMPLE ID	EMAX SAMPLE ID	RESULTS (umhos/cm)	DLF	MOIST	RL (umhos/cm)	MDL (umhos/cm)	Analysis DATETIME	Extraction DATETIME	LFID	CAL REF	PREP BATCH	Collection DATETIME	Received DATETIME
LCSW	ECG008WL	403	1	NA	1	.5	07/28/0515:02	NA	ECG008W-02	NA	ECG008W	NA	NA
LCDW	ECG008WC	403	1	NA	1	.5	07/28/0515:04	NA	ECG008W-03	NA	ECG008W	NA	NA
MU-24-4	G218-01	297	1	NA	1	.5	07/28/0515:32	NA	ECG008W-17	NA	ECG008W	07/25/05	07/26/05
MU-24-3	G218-02	365	1	NA	1	.5	07/28/0515:34	NA	ECG008W-18	NA	ECG008W	07/25/05	07/26/05
MU-24-2	G218-03	451	1	NA	1	.5	07/28/0515:36	NA	ECG008W-19	NA	ECG008W	07/25/05	07/26/05
MU-24-1	G218-04	487	1	NA	1	.5	07/28/0515:38	NA	ECG008W-20	NA	ECG008W	07/25/05	07/26/05
DUPE-3-7/25/05	G218-05	488	1	NA	1	.5	07/28/0515:40	NA	ECG008W-21	NA	ECG008W	07/25/05	07/26/05
DUPE-3-7/25/05DUP	G218-05D	488	1	NA	1	.5	07/28/0515:42	NA	ECG008W-22	NA	ECG008W	07/25/05	07/26/05
MU-24-5	G218-06	394	1	NA	1	.5	07/28/0515:44	NA	ECG008W-23	NA	ECG008W	07/25/05	07/26/05

8057

28

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: 120.1

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 056218

SAMPLE ID: LCSW/LCD1W

CONTROL NO.: ECG008WL/C

DATE RECEIVED: NA

DATE EXTRACTED: NA

DATE ANALYZED: 07/28/05 15:02/15:04

ACCESSION:

PARAMETER	BLNK RSLT (umhos/cm)	SPIKE AMT (umhos/cm)	BS RSLT (umhos/cm)	BS % REC	SPIKE AMT (umhos/cm)	BSD RSLT (umhos/cm)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Specific Conductivity	ND	402.00	403.00	100	402.00	403.00	100	0	80-120	20

8058

ENMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: METHOD 120.1

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05G218 DATE RECEIVED: 07/26/05
SAMPLE ID: DUPE-3-7/25/05DUP DATE EXTRACTED: NA
CONTROL NO.: G218-050 DATE ANALYZED: 07/28/05 15:42

ACCESSION:

PARAMETER	SAMPLE (umhos/cm)	DUP. SAMPLE (umhos/cm)	RPD (%)	RPD LIMIT (%)
Specific Conductivity	488.00	488.00	0	5

8059

ANALYSIS LOG FOR SPECIFIC CONDUCTIVITY

Book # AEC-003

SOP EMAX-120.1 Revision No. 1 □

Start Date 7/28/05 Time 15:00 End Date 7/28/05 Time 15:46

Data File Name	Lab Sample ID	Time	Temp. °C	Temp. Correction Factor QT @ 25 °C	DF	Measured Resistance (ohms)	Notes
* 1	STD high	15:00	21.8	0.939	1	133.8	1412
* 2	EC 9008006	-02	21.8	↓		381.5	403
* 3	↓ WC	04	21.8	0.939		381.5	403
* 4	G145-01	-01	21.7	0.937		412	435.72 436
* 5	↓ -02	-08	21.7	↓		642	678.92 679
* 6	↓ -03	-10	21.7	0.937		613	648
* 7	04	-12	21.7	0.937		748	579.62 580
* 8	↓ -05	-14	21.8	0.939		818	863
* 9	G103-1	-16	21.8	↓		388	409
* 10	↓ -2	-18	21.8	0.939		273	288
* 1	↓ -3	-20	21.7	0.937		383	405
* 2	↓ -4	-22	21.7	↓		517	546.82 547
* 3	↓ -5	-20	21.8	0.939		345	364
* 4	↓ -6	-26	21.8	↓		463	488.52 489
* 5	↓ -7	-28	21.8			462	488
* 6	↓ -76	-20	21.8			462	488
* 7	G218-1	-32	21.8			281	297
* 8	↓ 2	-34	21.8			346	365
* 19	↓ 3	-36	21.8			427	451
* 20	↓ 4	-48	21.8	↓	1	461	487

ANALYTICAL BATCH * EC9008006 **8060**

Instrument No: 29

Trial	ID	Resistance ohms
KCI Standard	SWFA 02-55	Assay
1	SWFA 02-654	747
2	QC = 939	747
3		747
LCS	SWFA-06-174	462 umhos/cm
Calibration Temperature	21.8 °C	
True Value	1413	umhos/cm
Cell Constant (C)	0.991	

KCI Standard	ID	umhos/cm
Low-point	SWFA 02-654	141.3
Mid-point	21.8	
High-point	SWFA 02-654	1413

Comments:

Analyzed By: pk/ka

This page is checked during the data review process.

ANALYSIS LOG FOR SPECIFIC CONDUCTIVITY

Book # AEC-003

SOP ☐ EMAX-120.1 Revision No. 1 ☐

Start Date 7-28-05 Time 1520 End Date 7-28-05 Time 15:48

Data File Name	Lab Sample ID	Time	Temp. °C	Temp. Correction Factor QT @ 25 °C	DF	Measured Resistance (ohms)	Notes
* 21	218-05	15:40	21.8	0.939	1	462	EC @ 25°C
* 2	-05D	-42	21.8			462	μmhos/cm
* 3	-06	-44	21.8			343	
* 4	STD CON 141	-46	21.8	0.939	1	134.1	
* 5							
* 6							
* 7							
* 8							
* 9							
* 0							
* 1							
* 2							
* 3							
* 4							
* 5							
* 6							
* 7							
* 8							
* 9							
* 0							

ANALYTICAL BATCH * EC6008W

8061

Instrument No:	29
----------------	----

Trial	ID	Resistance ohms
KCl Standard	same as pg. 11	
1		
2		
3		
LCS		
Calibration Temperature	°C	
True Value		μmhos/cm
Cell Constant (C)		

KCl Standard	ID	μmhos/cm
Low-point	same as pg. 11	
Mid-point		
High-point		

Comments:

Analyzed By: 1/15/11

This page is checked during the data review process.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G218**

METHOD SM3500 FERROUS IRON

Six (6) water samples were received on 07/26/05 for Ferrous Iron analysis by Method SM3500 in accordance with "Standard Methods for the Examination of Water and Wastewater", 18th edition (1990).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample

Lab control result was within QC limit.

4. Duplicate

Sample G218-06 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

SM3500
FERROUS IRON

Matrix : WATER
Instrument ID : 170

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G218

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	FEG004WB	ND	1	NA	5	2.5	07/26/0519:08	NA	FEG004W-09	FEG004W-07	FEG004W	NA	NA
LCS1W	FEG004WL	21.6	1	NA	5	2.5	07/26/0519:09	NA	FEG004W-10	FEG004W-07	FEG004W	NA	NA
MW-24-4	G218-01	ND	1	NA	5	2.5	07/26/0519:10	NA	FEG004W-11	FEG004W-07	FEG004W	07/25/05	07/26/05
MW-24-3	G218-02	ND	1	NA	5	2.5	07/26/0519:11	NA	FEG004W-12	FEG004W-07	FEG004W	07/25/05	07/26/05
MW-24-2	G218-03	ND	1	NA	5	2.5	07/26/0519:12	NA	FEG004W-13	FEG004W-07	FEG004W	07/25/05	07/26/05
MW-24-1	G218-04	ND	1	NA	5	2.5	07/26/0519:13	NA	FEG004W-14	FEG004W-07	FEG004W	07/25/05	07/26/05
DUPE-3-7/25/05	G218-05	ND	1	NA	5	2.5	07/26/0519:14	NA	FEG004W-15	FEG004W-07	FEG004W	07/25/05	07/26/05
MW-24-5	G218-06	ND	1	NA	5	2.5	07/26/0519:15	NA	FEG004W-16	FEG004W-07	FEG004W	07/25/05	07/26/05
MW-24-5DUP	G218-06D	ND	1	NA	5	2.5	07/26/0519:16	NA	FEG004W-17	FEG004W-07	FEG004W	07/25/05	07/26/05

8063

24

EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: SM3500
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G218
SAMPLE ID: LCS1W
CONTROL NO.: FEG004WL
DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 07/26/05 19:09

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	LCS RSLT (mg/L)	LCS % REC	QC LIMIT (%)
Ferrous Iron	ND	20.00	21.60	108	80-120

8064

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: SM3500

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05G218 DATE RECEIVED: 07/26/05
SAMPLE ID: MW-24-5DUP DATE EXTRACTED: NA
CONTROL NO.: G218-06D DATE ANALYZED: 07/26/05 19:16

ACCESSION:

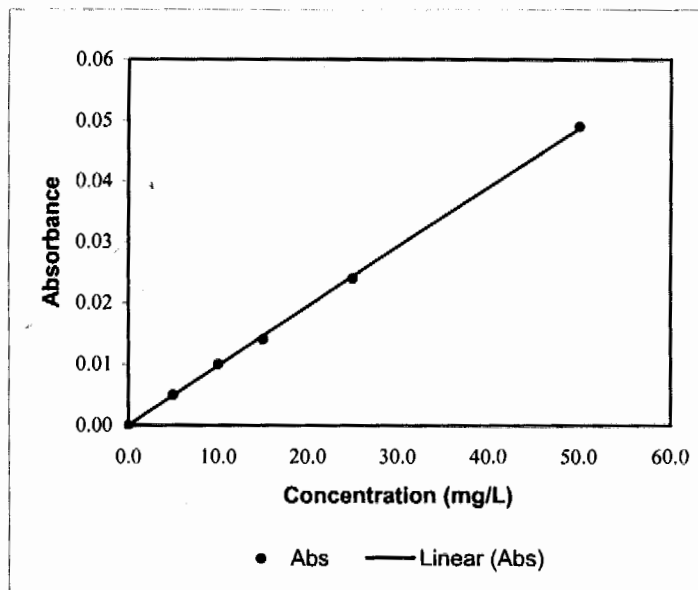
PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Ferrous Iron	ND	ND	0	20

8065

21

CALIBRATION CURVE FERROUS FE

Conc.	Abs
0.0	0.000
5.0	0.005
10.0	0.010
15.0	0.014
25.0	0.024
50.0	0.049



R ²	0.9996
Eq.Line	0.0010
CF	1026.5879

Comments: **PASSED**

Analyzed by: LA

ANALYSIS LOG FOR FERROUS IRON

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Book # A70-Fe D/C-001

Time 19:19

Ending Date 7-26-05

Starting Date 7-26-05

SOP # EMAX-3500-Fe D/C Rev. No. 0

Data File Name	Preparative Batch	Lab Sample ID	Matrix		Sample Amount (ml)	DF	Abs. (510 nm)	Time	Ferrous Iron (mg/L)	Notes	Instrument No.: 70		Wavelength: 510 nm
			S	W							Standard	ID		Conc. (mg/L)
* 1	FE6004W	5-0-0			40	1	0.000	19:00					
* 2		5-0-0					0.000	01					
* 3		5-10					0.000	02					
* 4		5-15					0.014	03					
* 5		5-20					0.020	04					
* 6		5-30					0.049	05					
* 7		5-1CV					0.000	06					
* 8		1CV					0.000	07					
* 9		FE6004W					0.000	08					
* 10		5-1CV					0.000	09					
* 1		5-1CV					0.000	10					
* 2		5-1CV					0.000	11					
* 3		5-1CV					0.000	12					
* 4		5-1CV					0.000	13					
* 5		5-1CV					0.000	14					
* 6		5-1CV					0.000	15					
* 7		5-1CV					0.000	16					
* 8		5-1CV					0.000	17					
* 9		5-1CV					0.000	18					
* 10		5-1CV					0.000	19					
* 1		5-1CV					0.000	20					
* 2		5-1CV					0.000	21					
* 3		5-1CV					0.000	22					
* 4		5-1CV					0.000	23					
* 5		5-1CV					0.000	24					
* 6		5-1CV					0.000	25					
* 7		5-1CV					0.000	26					
* 8		5-1CV					0.000	27					
* 9		5-1CV					0.000	28					
* 10		5-1CV					0.000	29					
ANALYTICAL BATCH # FE6004W													

Standard Curve	
R (≤0.995)	0.9994
Y	0.0010
CF	10.00.5879

Comments:	
Standard	
Reagents	
Name	OR ID
HCl	501A-06-1539
NH ₄ C ₂ H ₃ O ₂ Buffer	501B-06-1539
Phenanthroline Sol'n	↓ - 158A
Na ₂ H ₂ O ₄ Sol'n	NA
Hydroxylamine Sol'n	↓

Analyzed By:	
Standard	da / w
Disposal Date:	
Standard	

This page is checked during data review.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G218**

METHOD 160.1 TOTAL DISSOLVED SOLIDS

Six (6) water samples were received on 07/26/05 for Total Dissolved Solids analysis by Method 160.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G218-06 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 160.1
TOTAL DISSOLVED SOLIDS

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G218

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
NBLK1W	TDG025WB	ND	1	NA	10	5	07/29/0514:31	NA	TDG025W-01	NA	TDG025W	NA	NA
LCS1W	TDG025WL	165	1	NA	10	5	07/29/0514:32	NA	TDG025W-02	NA	TDG025W	NA	NA
LCD1W	TDG025WC	165	1	NA	10	5	07/29/0514:33	NA	TDG025W-03	NA	TDG025W	NA	NA
MW-24-4	G218-01	175	1	NA	10	5	07/29/0514:39	NA	TDG025W-09	NA	TDG025W	07/25/05	07/26/05
MW-24-3	G218-02	235	1	NA	10	5	07/29/0514:40	NA	TDG025W-10	NA	TDG025W	07/25/05	07/26/05
MW-24-2	G218-03	270	1	NA	10	5	07/29/0514:41	NA	TDG025W-11	NA	TDG025W	07/25/05	07/26/05
MW-24-1	G218-04	300	1	NA	10	5	07/29/0514:42	NA	TDG025W-12	NA	TDG025W	07/25/05	07/26/05
DUPE-3-7/25/05	G218-05	310	1	NA	10	5	07/29/0514:43	NA	TDG025W-13	NA	TDG025W	07/25/05	07/26/05
MW-24-5	G218-06	235	1	NA	10	5	07/29/0514:44	NA	TDG025W-14	NA	TDG025W	07/25/05	07/26/05
MW-24-5DUP	G218-06D	235	1	NA	10	5	07/29/0514:45	NA	TDG025W-15	NA	TDG025W	07/25/05	07/26/05

8069

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BAITELLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: METHOD 160.1

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05G218

SAMPLE ID: LCS1W/LCD1W

CONTROL NO.: TDG025WL/C

DATE RECEIVED: NA

DATE EXTRACTED: NA

DATE ANALYZED: 07/29/05 14:32/14:33

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TDS	ND	162.00	165.00	102	162.00	165.00	102	0	80-120	20

8070

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 160.1
MATRIX: WATER
% MOISTURE: NA
=====

BATCH NO.: 05G218
SAMPLE ID: MW-24-5DUP
CONTROL NO.: G218-060

DATE RECEIVED: 07/26/05
DATE EXTRACTED: NA
DATE ANALYZED: 07/29/05 14:45

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
TDS	235.00	235.00	0	20

8071

GRAVIMETRIC ANALYSIS LOG

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Book # AGY-017

SOP EMAX-160.1 Rev. No. 3 EMAX-160.2 Rev. No. 2 EMAX-160.3 Rev. No. 1 EMAX-160.4 Rev. No. 0 EMAX-160.5 Rev. No. 0

Oven/Furnace Temp. 105°C Starting Date 07-28-05 Time 20:30 Ending Date 07-29-05 Time 14:00

Data File Name	Lab Sample ID	Sample Amt. (ml)	Dish Wt. (g)	Dry Wt. Dish + Solids (g)				Solids (mg)	Result (mg/L)	Settleable Solids		Comments
				1st	2nd	Time	3rd			Vol. of SS	Result (ml/L)	
1	TDG025W03	20	13.8750	13.8750	13.8750	12:45	13.8750	0.0	100			LCS ID S07A-06-133
2		20	13.9597	13.9655	13.9685	12:46	13.9630	3.3	165			LCS TV 162
3		20	13.4548	13.4606	13.4584	12:47	13.4581	3.3	165			Balance: ✓
4	G842-02	20	12.9202	12.9485	12.9458	12:48	12.9455	25.3	1260			160-4070636
5	G839-02	20	12.8762	12.8885	12.8870	12:49	12.8865	10.3	515			I - 37030058
6		20	12.9998	13.0123	13.0098	12:50	13.0103	10.5	525			
7	G113-01	20	12.9903	13.0500	13.0400	12:51	13.0470	56.7	2840			
8		20	12.8654	12.9241	12.9224	12:52	12.9221	56.7	2840			
9	G218-01	20	12.9661	12.9716	12.9696	12:53	12.9696	3.5	175			
0		20	12.9294	12.9371	12.9344	12:54	12.9341	4.7	235			
1		20	13.0422	13.0501	13.0480	12:55	13.0476	5.4	270			
2		20	12.9840	12.9921	12.9899	12:56	12.9900	6.0	300			
3		20	12.8815	12.8906	12.8889	12:57	12.8877	6.2	310			
4		20	12.9860	12.9934	12.9889	12:58	12.9887	4.7	235			
5		20	13.0102	13.0172	13.0145	12:59	13.0149	4.7	235			
6												
7												
8												
9												
0												

ANALYTICAL BATCH * SS TDG025W S VS

Analyzed By: WJH/10/10/10
This page is checked during the data review process.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G218**

METHOD 351.3 TKN

Six (6) water samples were received on 07/26/05 for TKN analysis by Method 351.3 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Matrix Spike

MS sample was not designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 351.3
TKN

Client : BATTILLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G218

Matrix : WATER
Instrument ID : 170

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	KNH002WB	ND	1	NA	.1	.035	08/05/0516:10	08/05/0509:30	KNH002W-11	KNH002W-09	KNH002W	NA	08/05/05
LC51W	KNH002WL	1.04	1	NA	.1	.035	08/05/0516:11	08/05/0509:30	KNH002W-12	KNH002W-09	KNH002W	NA	08/05/05
LC91W	KNH002WC	1.01	1	NA	.1	.035	08/05/0516:12	08/05/0509:30	KNH002W-13	KNH002W-09	KNH002W	NA	08/05/05
NU-24-4	G218-01	.681	1	NA	.1	.035	08/05/0516:23	08/05/0509:30	KNH002W-24	KNH002W-21	KNH002W	07/25/05	07/26/05
NU-24-3	G218-02	.393	1	NA	.1	.035	08/05/0516:24	08/05/0509:30	KNH002W-25	KNH002W-21	KNH002W	07/25/05	07/26/05
NU-24-2	G218-03	.308	1	NA	.1	.035	08/05/0516:25	08/05/0509:30	KNH002W-26	KNH002W-21	KNH002W	07/25/05	07/26/05
NU-24-1	G218-04	.595	1	NA	.1	.035	08/05/0516:26	08/05/0509:30	KNH002W-27	KNH002W-21	KNH002W	07/25/05	07/26/05
DUPE-3-7/25/05	G218-05	.766	1	NA	.1	.035	08/05/0516:27	08/05/0509:30	KNH002W-28	KNH002W-21	KNH002W	07/25/05	07/26/05
NU-24-5	G218-06	.340	1	NA	.1	.035	08/05/0516:28	08/05/0509:30	KNH002W-29	KNH002W-21	KNH002W	07/25/05	07/26/05

8074

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 351.3
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G218
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: KNH0024L/C

DATE RECEIVED: 08/05/05
DATE EXTRACTED: 08/05/05 09:30
DATE ANALYZED: 08/05/05 16:11/16:12

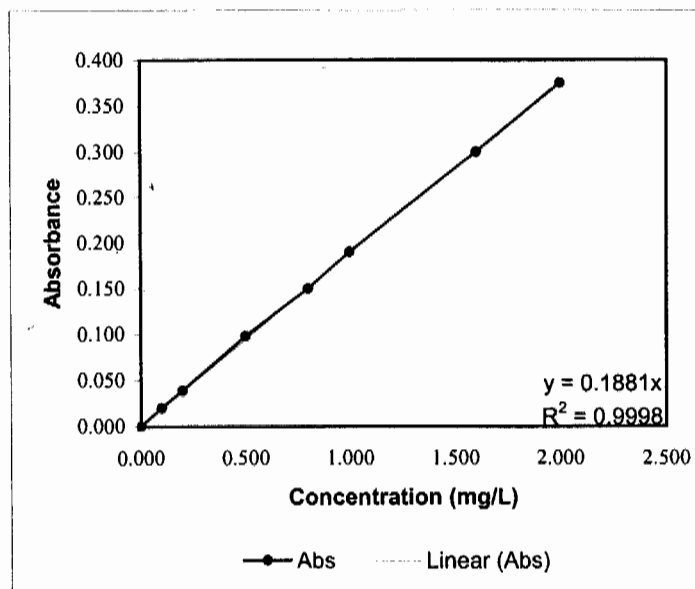
ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TKN	ND	1.00	1.04	104	1.00	1.01	101	3	80-120	20

8075
24

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.020
0.200	0.039
0.500	0.098
0.800	0.150
1.000	0.190
1.600	0.300
2.000	0.375



R^2	0.999881
y	0.1881
CF	5.3165

Comments: **PASSED**

K191

Analyzed by: NT/LA

ANALYSIS LOG FOR TOTAL KJELDAHL NITROGEN (TKN)

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Book # A70-KN-004

SOP ☒ EMAX-351.3 Rev. No. 1 ☐

Start Date:

8/5/05

Time: 16:00

End Date: 8/5/05

Time: 16:38

Data File Name		Prep. Batch	Lab Sample ID	Matrix	Time	Vol. Colored (ml)	DF	Absorbance	Notes mg/L	Standard	Instrument No: 70	ID	Wavelength: 425 nm	Conc. (mg/L)																						
* 1	* 2	* 3	* 4	* 5	* 6	* 7	* 8	* 9	* 10	* 11	* 12	* 13	* 14	* 15	* 16	* 17	* 18	* 19	* 20	* 21	* 22	* 23	* 24	* 25	* 26	* 27	* 28	* 29	* 30							
KNH002W			S-0		16:00	20	1	0.000																												
			0.1		01			0.020																												
			0.2		02			0.039																												
			0.5		03			0.098																												
			0.8		04			0.150																												
			1.0		05			0.190																												
			1.6		06			0.300																												
			2.0		07			0.375																												
			ICV		08			0.190	1.010																											
			ICB		09			0.000	ND																											
			KNH002WB		10			0.000	ND																											
			WL		11			0.195	1.037																											
			WC		12			0.190	1.010																											
			G152-02		13			0.118	0.627																											
			02D		14			0.100	0.532																											
			02M		15			0.312	1.659																											
			03		16			0.046	0.245																											
			04		17			0.076	0.404																											
			05		18			0.052	0.276																											
			06		19			0.586	3.115																											
			CCV1		20			0.190	1.010																											
			CCB1		21			0.000	ND																											
			G152-07		22			0.064	0.340																											
			G218-01		23			0.128	0.681																											
			02		24			0.074	0.393																											
			03		25			0.058	0.308																											
			04		26			0.112	0.595																											
			05		27			0.144	0.766																											
			06		28			0.064	0.340																											
			G136-02		29			0.050	0.266																											
					30																															

ANALYTICAL BATCH * KNH002W

Comments:

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By:

NT/LA

This page is checked during data review.

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKN

SOP □ EMAX-350.2 Rev. No.: 2 □ EMAX-351.3 Rev. No.: 2 □

Book # EKN-006

Start Date	Time	End Date	Time	Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
8/5/05	9:30	8/5/05	15:00	*01	S-0	9.5	10	5	4	50	50		ICV/MS	SWZF-03-180	5ml of 10% m
				*02	0.1								LCS	↓	178
				*03	1.0								Reagent		
				*04	2.0								NaOH	NA	
				*05	ICV								Digestion Mixture	SW7A-06-204	
				*06	ICB								Borate Buffer	↓	152
				*07	KNH002WB								H ₃ BO ₃	SW7B-06-322	
				*08	WL								Distilling Soln.	↓	315B
				*09	WL								Comments:		
				*10	G152-02										
				*11	02D										
				*12	02M										
				*13	03										
				*14	04										
				*15	05										
				*16	06										
				*17	07										
				*18	G218-01										
				*19	02										
				*20	03										
				*21	04										
				*22	05										
				*23	06										
				*24	G136-02										
				*25	03										
				*26	04										

Prepared By: NT/LA

Standard Added By: NT/LA

Checked By:

ANALYSIS LOG FOR TOTAL KJELDAHL NITROGEN (TKN)

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SOP ☒ EMAX351.3 Rev. No. 1 ☐

Start Date:

8/5/05

Time:

16:00

End Date:

8/5/05

Time:

16:38

Book # A70-KN-004

Data File Name	Prep. Batch	Lab Sample ID	Matrix		Time	Vol. Colored (ml)	DF	Absorbance	Notes	Instrument No: 70		Wavelength: 425 nm
			S	W						Standard	ID	
* 31	KNH002W	G136-03	✓		16:30	20	1	0.114	0.606	S ₀		Conc. (mg/L)
* 32		↓ 04	✓		31			0.084	0.447	S ₁		0.0
* 33		CCV2 05			32			0.195	1.037	S ₂		0.1
* 34		CCB2 06			33			0.000	ND	S ₃		0.2
* 35		G136-05 07	✓		34			0.088	0.468	S ₄		0.5
* 36		G136-06	✓		35			0.110	0.585	S ₅		0.8
* 37		↓ 07	✓		36			0.086	0.457	S ₆		1.0
* 38		CCV3			37			0.190	1.01	S ₇		1.6
* 39		CCB3			16:38			0.000	ND	ICVMS		2.0
* 0										CCV		1.0
* 1										LCS		1.0
* 2												
* 3												
* 4												
* 5												
* 6												
* 7												
* 8												
* 9												
* 0												
* 1												
* 2												
* 3												
* 4												
* 5												
* 6												
* 7												
* 8												
* 9												
* 0												

ANALYTICAL BATCH * KNH002W

8079

Comments: _____

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By: NT/LA

This page is checked during data review.

DISTILLATION LOG FOR NH_3 / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-006

SOP □ EMAX-350.2 Rev. No.: 2 □ EMAX-351.3 Rev. No.: 2 □

Start Date	Time	End Date	Time
8/5/05	9:30	8/5/05	15:00

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	G136-05	9.5	10	5	4	50	50		ICV/MS		
*02	↓ 06	↓	↓	↓	↓	↓	↓		LCS		
*03	↓ 07	↓	↓	↓	↓	↓	↓				
*04	↓	↓	↓	↓	↓	↓	↓				
*05	↓	↓	↓	↓	↓	↓	↓				
*06	↓	↓	↓	↓	↓	↓	↓				
*07	↓	↓	↓	↓	↓	↓	↓				
*08	↓	↓	↓	↓	↓	↓	↓				
*09	↓	↓	↓	↓	↓	↓	↓				
*10	↓	↓	↓	↓	↓	↓	↓				
*11	↓	↓	↓	↓	↓	↓	↓				
*12	↓	↓	↓	↓	↓	↓	↓				
*13	↓	↓	↓	↓	↓	↓	↓				
*14	↓	↓	↓	↓	↓	↓	↓				
*15	↓	↓	↓	↓	↓	↓	↓				
*16	↓	↓	↓	↓	↓	↓	↓				
*17	↓	↓	↓	↓	↓	↓	↓				
*18	↓	↓	↓	↓	↓	↓	↓				
*19	↓	↓	↓	↓	↓	↓	↓				
*20	↓	↓	↓	↓	↓	↓	↓				
*21	↓	↓	↓	↓	↓	↓	↓				
*22	↓	↓	↓	↓	↓	↓	↓				
*23	↓	↓	↓	↓	↓	↓	↓				
*24	↓	↓	↓	↓	↓	↓	↓				
*25	↓	↓	↓	↓	↓	↓	↓				
*26	↓	↓	↓	↓	↓	↓	↓				

Reagent	Lot# / ID	Amount Added (ml)
NaOH		
Digestion Mixture		
Borate Buffer		
H_3BO_3		
Distilling Soln.		

Comments:
NT 8/5/05

Prepared By:	Standard Added By:	Checked By:
NT/LA	NT/LA	

PREPARATION BATCH *

KNH002W

8080

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G218**

METHOD 376.1 SULFIDE

Six (6) water samples were received on 07/26/05 for Sulfide analysis by Method 376.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 376.1
SULFIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G218

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	SDG011WB	ND	1	NA	1	.4	07/28/0508:05	NA	SDG011W-01	NA	SDG011W	NA	NA
LCS1W	SDG011WL	4.87	1	NA	1	.4	07/28/0508:08	NA	SDG011W-02	NA	SDG011W	NA	NA
LCD1W	SDG011WC	4.92	1	NA	1	.4	07/28/0508:11	NA	SDG011W-03	NA	SDG011W	NA	NA
MW-24-4	G218-01	ND	1	NA	1	.4	07/28/0508:14	NA	SDG011W-04	NA	SDG011W	07/25/05	07/26/05
MW-24-3	G218-02	ND	1	NA	1	.4	07/28/0508:17	NA	SDG011W-05	NA	SDG011W	07/25/05	07/26/05
MW-24-2	G218-03	ND	1	NA	1	.4	07/28/0508:20	NA	SDG011W-06	NA	SDG011W	07/25/05	07/26/05
MW-24-1	G218-04	ND	1	NA	1	.4	07/28/0508:23	NA	SDG011W-07	NA	SDG011W	07/25/05	07/26/05
DUPE-3-7/25/05	G218-05	ND	1	NA	1	.4	07/28/0508:26	NA	SDG011W-08	NA	SDG011W	07/25/05	07/26/05
MW-24-5	G218-06	ND	1	NA	1	.4	07/28/0508:29	NA	SDG011W-09	NA	SDG011W	07/25/05	07/26/05

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 376.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G218
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: SDG011WL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 07/28/05 08:08/08:11

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Sulfide	ND	5.00	4.87	97	5.00	4.92	98	1	80-120	20

8083

ANALYSIS LOG FOR SULFIDE

SOP # EMAX-3761 Rev. No. 1 □ EMAX-9034 Rev. No. 0

Start Date: 07/28/05

Time: 8:05

End Date: 07/28/05

Time: 8:33

Book # ASD-007

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Volume of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Notes mg/mL	Standard	ID	Conc. (mg/L)
* 1	30G01000	8:05	100	10	10.0	ND	LCS	SW7A-06-178	5.0
* 2	WL	8:08			4.6	4.87	Spike		
* 3	WC	8:11			4.55	4.92	Na ₂ S ₂ O ₃	SW3B-02-735	0.00564
* 4	G218-01	8:14			4.7	ND	PAO		
* 5	-02	8:17			4.9	ND	Iodine	SW3B-02-734	0.00564
* 6	-03	8:20			4.6	ND	HCL	SW7B-06-281C	1:1(600)
* 7	-04	8:23			4.8	ND	Indicator	SW7A-06-190	
* 8	-05	8:26			4.7	ND	STANDARDIZATION		
* 9	-06	8:29			4.9	ND	Vol. Of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Conc. Of Iodine (N)
* 10	G222-01	8:32			4.9	ND	10	10.0	0.00564
* 1	-02	8:35			4.6	ND	10	10.0	0.00564
* 2	-03	8:38			4.7	ND	10	10.0	0.00564
* 3	-04	8:41			4.8	ND	10	10.0	0.00564
* 4	-05	8:44			4.8	ND			
* 5	-06	8:47			4.7	ND			
* 6	-07	8:50			4.9	ND			
* 7	-07D	8:53			4.9	ND			
* 8									
* 9									
* 10									
* 1									
* 2									
* 3									
* 4									
* 5									
* 6									
* 7									
* 8									
* 9									
* 10									

$$\text{Sulfide (mg/L)} = \frac{(V_{I_2} \times N_{I_2} - V_{PAO} \times N_{PAO}) \times 16,000}{V_{\text{sample}}}$$

Comments:

Analyzed By:

ANALYTICAL BATCH # 30G01000

8084

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G218

METHOD 415.1 DISSOLVED ORGANIC CARBON

Six (6) water samples were received on 07/26/05 for Dissolved Organic Carbon analysis by Method 415.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G218-06 was analyzed for Duplicate. % RPD was slightly bias high.

5. Matrix Spike

Sample G218-06 was spiked. % Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G218

Matrix : WATER
Instrument ID : 62

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TCH006WB	ND	1	NA	1	.5	08/08/0514:11	NA	TCH006-5	TCH006-2	TCH006W	NA	NA
LCS1W	TCH006WL	24.4	1	NA	1	.5	08/08/0514:21	NA	TCH006-6	TCH006-2	TCH006W	NA	NA
LCD1W	TCH006WC	24.4	1	NA	1	.5	08/08/0514:32	NA	TCH006-7	TCH006-2	TCH006W	NA	NA
MW-24-4	G218-01	1.83	1	NA	1	.5	08/08/0514:41	NA	TCH006-8	TCH006-2	TCH006W	07/25/05	07/26/05
MW-24-3	G218-02	5.38	1	NA	1	.5	08/08/0514:50	NA	TCH006-9	TCH006-2	TCH006W	07/25/05	07/26/05
MW-24-2	G218-03	2.08	1	NA	1	.5	08/08/0515:00	NA	TCH006-10	TCH006-2	TCH006W	07/25/05	07/26/05
MW-24-1	G218-04	3.35	1	NA	1	.5	08/08/0515:09	NA	TCH006-11	TCH006-2	TCH006W	07/25/05	07/26/05
DUPE-3-7/25/05	G218-05	1.74	1	NA	1	.5	08/08/0515:18	NA	TCH006-12	TCH006-2	TCH006W	NA	NA
MBLK2W	TCH009WB	ND	1	NA	1	.5	08/11/0500:37	NA	TCH009-5	TCH009-2	TCH009W	NA	NA
LCS2W	TCH009WL	24.1	1	NA	1	.5	08/11/0500:47	NA	TCH009-6	TCH009-2	TCH009W	NA	NA
LCD2W	TCH009WC	24.6	1	NA	1	.5	08/11/0500:57	NA	TCH009-7	TCH009-2	TCH009W	07/25/05	07/26/05
MW-24-5	G218-06	4.22	1	NA	1	.5	08/11/0501:06	NA	TCH009-8	TCH009-2	TCH009W	07/25/05	07/26/05
MW-24-5DUP	G218-06D	3.43	1	NA	1	.5	08/11/0501:16	NA	TCH009-9	TCH009-2	TCH009W	07/25/05	07/26/05
MW-24-5MS	G218-06M	26.6	1	NA	1	.5	08/11/0501:25	NA	TCH009-10	TCH009-2	TCH009W	07/25/05	07/26/05

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G218

METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: TCH006WL TCH006WC
LAB FILE ID: TCH006-5 TCH006-7
DATE EXTRACTED: NA
DATE ANALYZED: 08/08/0514:11 08/08/0514:32
PREP. BATCH: TCH006W TCH006W
CALIB. REF: TCH006-2 TCH006-2

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
DOC	ND	25	24.4	97	25	24.4	98	0	80-120	20

8087

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G218

METHOD: METHOD 415.1

MATRIX: WATER % MOISTURE: NA

DILUTION FACTOR: 1 1

SAMPLE ID: MBLK2W

LAB SAMP ID: TCH009WB TCH009WL TCH009WC

LAB FILE ID: TCH009-5 TCH009-6 TCH009-7

DATE EXTRACTED: NA NA NA DATE COLLECTED: NA

DATE ANALYZED: 08/11/0500:37 08/11/0500:47 08/11/0500:57

PREP. BATCH: TCH009W TCH009W TCH009W

CALIB. REF: TCH009-2 TCH009-2 TCH009-2

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
DOC	ND	25	24.1	96	25	24.6	99	2	80-120	20

8088

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G218
METHOD: METHOD 415.1
=====

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-24-5
LAB SAMP ID: G218-06
LAB FILE ID: TCH009-8
DATE EXTRACTED: NA
DATE ANALYZED: 08/11/0501:06
PREP. BATCH: TCH009W
CALIB. REF: TCH009-2
% MOISTURE: NA
DATE COLLECTED: 07/25/05
DATE RECEIVED: 07/26/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
DOC	4.22	25	26.6	89	75-125

8089
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EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G218
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-24-5
EMAX SAMP ID: G218-06
LAB FILE ID: TCH009-8
DATE EXTRACTED: NA
DATE ANALYZED: 08/11/0501:06
PREP. BATCH: TCH009W
CALIB. REF: TCH009-2

% MOISTURE: NA
DATE COLLECTED: 07/25/05
DATE RECEIVED: 07/26/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
DOC	4.22	3.43	21*	20

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G218**

METHOD 415.1 TOTAL ORGANIC CARBON

Six (6) water samples were received on 07/26/05 for Total Organic Carbon analysis by Method 415.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G218-06 was analyzed for Duplicate. % RPD was within QC limit.

5. Matrix Spike

Sample G218-06 was spiked. % Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 415.1
TOC

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G218

Matrix : WATER
Instrument ID : 62

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
NBLK1W	TCH007MB	ND	1	NA	1	.5	08/08/0519:25	NA	TCH006-36	TCH006-26	TCH007W	NA	NA
LCSTW	TCH007ML	24.8	1	NA	1	.5	08/08/0519:36	NA	TCH006-37	TCH006-26	TCH007W	NA	NA
LCSTW	TCH007WC	24.8	1	NA	1	.5	08/08/0520:06	NA	TCH006-40	TCH006-38	TCH007W	NA	NA
MW-24-4	G218-01	1.67	1	NA	1	.5	08/08/0520:15	NA	TCH006-41	TCH006-38	TCH007W	07/25/05	07/26/05
MW-24-3	G218-02	1.5	1	NA	1	.5	08/08/0520:24	NA	TCH006-42	TCH006-38	TCH007W	07/25/05	07/26/05
MW-24-2	G218-03	1.6	1	NA	1	.5	08/08/0520:33	NA	TCH006-43	TCH006-38	TCH007W	07/25/05	07/26/05
MW-24-1	G218-04	1.65	1	NA	1	.5	08/08/0520:42	NA	TCH006-44	TCH006-38	TCH007W	07/25/05	07/26/05
DUPE-3-7/25/05	G218-05	1.59	1	NA	1	.5	08/08/0520:51	NA	TCH006-45	TCH006-38	TCH007W	07/25/05	07/26/05
MW-24-5	G218-06	1.52	1	NA	1	.5	08/08/0521:01	NA	TCH006-46	TCH006-38	TCH007W	07/25/05	07/26/05
MW-24-5DUP	G218-06D	1.47	1	NA	1	.5	08/08/0521:10	NA	TCH006-47	TCH006-38	TCH007W	07/25/05	07/26/05
MW-24-5MS	G218-06M	24.6	1	NA	1	.5	08/08/0521:20	NA	TCH006-48	TCH006-38	TCH007W	07/25/05	07/26/05

8092

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G218

METHOD: 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: TCH007WJ
LAB FILE ID: TCH006-37
DATE EXTRACTED: NA
DATE ANALYZED: 08/08/0519:25
PREP. BATCH: TCH007W
CALIB. REF: TCH006-26

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
TOC	ND	25	24.8	99	25	24.8	99	0	80-120	20

8093

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G218
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-24-5
LAB SAMP ID: G218-06
LAB FILE ID: TCH006-46
DATE EXTRACTED: NA
DATE ANALYZED: 08/08/0521:01
PREP. BATCH: TCH007W
CALIB. REF: TCH006-38

% MOISTURE: NA
DATE COLLECTED: 07/25/05
DATE RECEIVED: 07/26/05

ACCESSION:

PARAMETER	SNPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
TOC	1.52	25	24.6	92	75-125

8094

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G218

METHOD: 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-24-5
EMAX SAMP ID: G218-06
LAB FILE ID: TCH006-46
DATE EXTRACTED: NA
DATE ANALYZED: 08/08/0521:01
PREP. BATCH: TCH007W
CAL IB. REF: TCH006-38

% MOISTURE: NA
DATE COLLECTED: 07/25/05
DATE RECEIVED: 07/26/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
TOC	1.52	1.47	3	20

	Type	Analysis	Sample Name	Sample ID	Object	Origin	Dilution	Result	Notes	Comment
1	Standard	NPOC	ICAL	TCH006-1	0A-12	C:\Progra	1.000			
2	Control	NPOC	ICV	TCH006-2	0A-12	C:\Progra	1.000	NPOC:24.34 m	Control valu	
3	Unknown	NPOC	ICB	TCH006-3	0A-12	C:\Progra	1.000	NPOC:0.3346		
4	Unknown	NPOC	HCO3/CO3	TCH006-4	0A-12	C:\Progra	1.000	NPOC:0.6327		
5	Unknown	NPOC	TCH006WB	TCH006-5	0A-12	C:\Progra	1.000	NPOC:0.05212	/	
6	Unknown	NPOC	TCH006WL	TCH006-6	0A-12	C:\Progra	1.000	NPOC:24.37 m	/	
7	Unknown	NPOC	TCH006WC	TCH006-7	0A-12	C:\Progra	1.000	NPOC:24.43 m	/	
8	Unknown	NPOC	05G218-01	TCH006-8	0A-12	C:\Progra	1.000	NPOC:1.828 m	/	DOC
9	Unknown	NPOC	05G218-02	TCH006-9	0A-12	C:\Progra	1.000	NPOC:5.383 m	/	DOC
10	Unknown	NPOC	05G218-03	TCH006-10	0A-12	C:\Progra	1.000	NPOC:2.081 m	/	DOC
11	Unknown	NPOC	05G218-04	TCH006-11	0A-12	C:\Progra	1.000	NPOC:3.346 m	/	DOC
12	Unknown	NPOC	05G218-05	TCH006-12	0A-12	C:\Progra	1.000	NPOC:1.735 m	/	DOC
13	Unknown	NPOC	05G218-06	TCH006-13	0A-12	C:\Progra	1.000	NPOC:5.865 m	/ Re-run	DOC
14	Control	NPOC	CCV1	TCH006-14	0A-12	C:\Progra	1.000	NPOC:24.49 m	Control valu	
15	Unknown	NPOC	CCB1	TCH006-15	0A-12	C:\Progra	1.000	NPOC:0.05638		
16	Unknown	NPOC	05G218-06D	TCH006-16	0A-12	C:\Progra	1.000	NPOC:3.477 m	} Not used	DOC
17	Unknown	NPOC	05G218-06M	TCH006-17	0A-12	C:\Progra	1.000	NPOC:26.86 m		DOC
18	Unknown	NPOC	05G219-02	TCH006-18	0A-12	C:\Progra	1.000	NPOC:8.670 m		
19	Unknown	NPOC	05G219-03	TCH006-19	0A-12	C:\Progra	1.000	NPOC:33.09 m		
20	Unknown	NPOC	05G219-04	TCH006-20	0A-12	C:\Progra	1.000	NPOC:25.47 m		
21	Unknown	NPOC	05G219-05	TCH006-21	0A-12	C:\Progra	1.000	NPOC:17.95 m		
22	Unknown	NPOC	05G231-02	TCH006-22	0A-12	C:\Progra	1.000	NPOC:9.674 m		
23	Unknown	NPOC	05G231-02D	TCH006-23	0A-12	C:\Progra	1.000	NPOC:9.472 m		
24	Unknown	NPOC	05G231-02M	TCH006-24	0A-12	C:\Progra	1.000	NPOC:32.75 m		
25	Unknown	NPOC	05G231-03	TCH006-25	0A-12	C:\Progra	1.000	NPOC:333.6 m		
26	Control	NPOC	CCV2	TCH006-26	0A-12	C:\Progra	1.000	NPOC:25.70 m	Control valu	
27	Unknown	NPOC	CCB2	TCH006-27	0A-12	C:\Progra	1.000	NPOC:0.2423	✓	
28	Unknown	NPOC	05G231-04	TCH006-28	0A-12	C:\Progra	1.000	NPOC:25.80 m		
29	Unknown	NPOC	05G231-05	TCH006-29	0A-12	C:\Progra	1.000	NPOC:18.82 m		
30	Unknown	NPOC	05G231-06	TCH006-30	0A-12	C:\Progra	1.000	NPOC:30.00 m		
31	Unknown	NPOC	05G231-07	TCH006-31	0A-12	C:\Progra	1.000	NPOC:30.21 m		
32	Unknown	NPOC	05G231-08	TCH006-32	0A-12	C:\Progra	1.000	NPOC:8.969 m		
33	Unknown	NPOC	05G839-02	TCH006-33	0A-12	C:\Progra	1.000	NPOC:1.293 m		
34	Unknown	NPOC	05G839-03	TCH006-34	0A-12	C:\Progra	1.000	NPOC:2.031 m		
35	Unknown	NPOC	05G842-02	TCH006-35	0A-12	C:\Progra	1.000	NPOC:2.845 m		
36	Unknown	NPOC	TCH007WB	TCH006-36	0A-12	C:\Progra	1.000	NPOC:0.3662		
37	Unknown	NPOC	TCH007WL	TCH006-37	0A-12	C:\Progra	1.000	NPOC:24.84 m		
38	Control	NPOC	CCV3	TCH006-38	0A-12	C:\Progra	1.000	NPOC:24.92 m	Control valu	
39	Unknown	NPOC	CCB3	TCH006-39	0A-12	C:\Progra	1.000	NPOC:0.3039		
40	Unknown	NPOC	TCH007WC	TCH006-40	0A-12	C:\Progra	1.000	NPOC:24.85 m		
41	Unknown	NPOC	05G218-01	TCH006-41	0A-12	C:\Progra	1.000	NPOC:1.670 m	} 70C	
42	Unknown	NPOC	05G218-02	TCH006-42	0A-12	C:\Progra	1.000	NPOC:1.497 m		
43	Unknown	NPOC	05G218-03	TCH006-43	0A-12	C:\Progra	1.000	NPOC:1.595 m		
44	Unknown	NPOC	05G218-04	TCH006-44	0A-12	C:\Progra	1.000	NPOC:1.650 m		
45	Unknown	NPOC	05G218-05	TCH006-45	0A-12	C:\Progra	1.000	NPOC:1.586 m		
46	Unknown	NPOC	05G218-06	TCH006-46	0A-12	C:\Progra	1.000	NPOC:1.521 m		
47	Unknown	NPOC	05G218-06D	TCH006-47	0A-12	C:\Progra	1.000	NPOC:1.474 m		
48	Unknown	NPOC	05G218-06M	TCH006-48	0A-12	C:\Progra	1.000	NPOC:24.63 m		
49	Control	NPOC	CCV4	TCH006-49	0A-12	C:\Progra	1.000	NPOC:24.65 m	Control valu	
50	Unknown	NPOC	CCB4	TCH006-50	0A-12	C:\Progra	1.000	NPOC:0.2706		
51	Unknown	NPOC	05G247-02	TCH006-51	0A-12	C:\Progra	1.000	NPOC:48.61 m		
52	Unknown	NPOC	05G247-03	TCH006-52	0A-12	C:\Progra	1.000	NPOC:104.8 m		
53	Unknown	NPOC	05G247-04	TCH006-53	0A-12	C:\Progra	1.000	NPOC:29.68 m		
54	Unknown	NPOC	05G247-05	TCH006-54	0A-12	C:\Progra	1.000	NPOC:28.31 m		
55	Unknown	NPOC	05G247-06	TCH006-55	0A-12	C:\Progra	1.000	NPOC:29.81 m		
56	Unknown	NPOC	05G247-07	TCH006-56	0A-12	C:\Progra	1.000	NPOC:9.548 m		
57	Unknown	NPOC	05G247-08	TCH006-57	0A-12	C:\Progra	1.000	NPOC:0.8519		
58	Unknown	NPOC	05G247-08D	TCH006-58	0A-12	C:\Progra	1.000	NPOC:0.8026		
59	Unknown	NPOC	05G247-08M	TCH006-59	0A-12	C:\Progra	1.000	NPOC:23.98 m		
60	Unknown	NPOC	05G260-01	TCH006-60	0A-12	C:\Progra	1.000	NPOC:2.384 m		DOC
61	Control	NPOC	CCV5	TCH006-61	0A-12	C:\Progra	1.000	NPOC:24.75 m	Control valu	
62	Unknown	NPOC	CCB5	TCH006-62	0A-12	C:\Progra	1.000	NPOC:0.3611		
63	Unknown	NPOC	05G260-02	TCH006-63	0A-12	C:\Progra	1.000	NPOC:2.484 m		DOC
64	Unknown	NPOC	05G260-03	TCH006-64	0A-12	C:\Progra	1.000	NPOC:3.286 m		DOC
65	Unknown	NPOC	05G260-04	TCH006-65	0A-12	C:\Progra	1.000	NPOC:8.444 m		DOC
66	Unknown	NPOC	05G260-05	TCH006-66	0A-12	C:\Progra	1.000	NPOC:4.181 m		DOC

8796

Instr. Information

System
Detector
Catalyst
Cell Length

toc
Combustion
Regular Sensitivity
long

Cal. Curve

Sample Name: ICAL
Sample ID: TCH006-1
Cal. Curve: TCH006.2005_08_08_12_38_44.cal

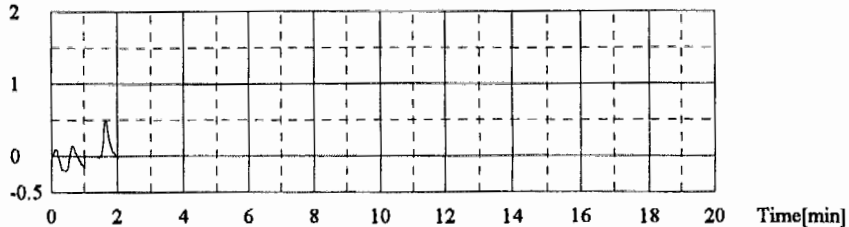
Type	Anal.
Standard	NPOC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	0.4887	50uL	1	*****		08/08/05 12:46:00 PM
2	0.5994	50uL	1	*****		08/08/05 12:47:11 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 0.5441

Signal[mV] 2

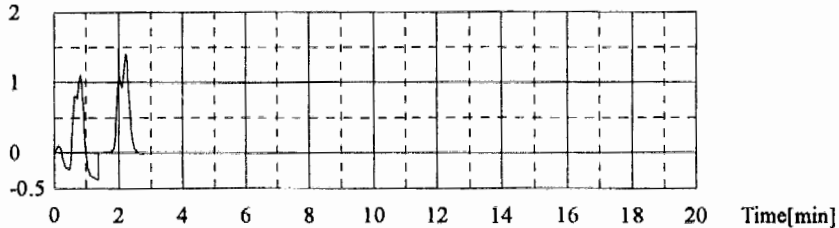


Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	2.825	50uL	10	*****		08/08/05 12:55:45 PM
2	3.085	50uL	10	*****		08/08/05 12:57:20 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 2.955

Signal[mV] 2

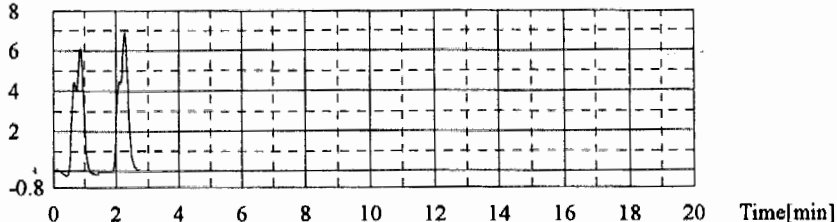


Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	13.66	50uL	2	*****		08/08/05 01:04:04 PM
2	13.91	50uL	2	*****		08/08/05 01:05:43 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 13.79

Signal[mV] 8

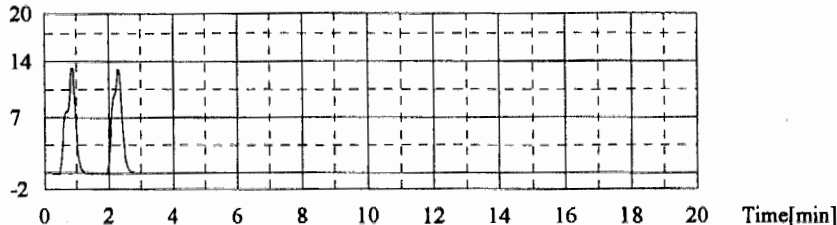


Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	27.40	50uL	1	*****		08/08/05 01:11:47 PM
2	27.39	50uL	1	*****		08/08/05 01:13:24 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 27.40

Signal[mV] 20

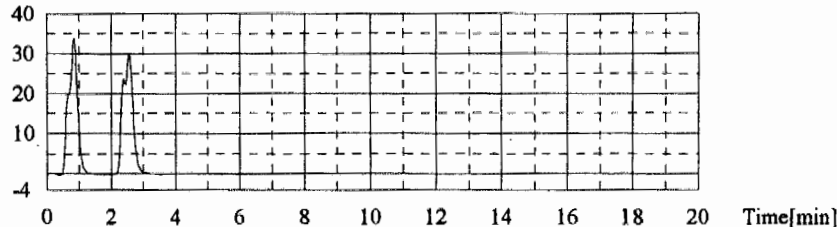


Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	67.41	50uL	2	*****		08/08/05 01:22:20 PM
2	68.59	50uL	2	*****		08/08/05 01:24:21 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 68.00

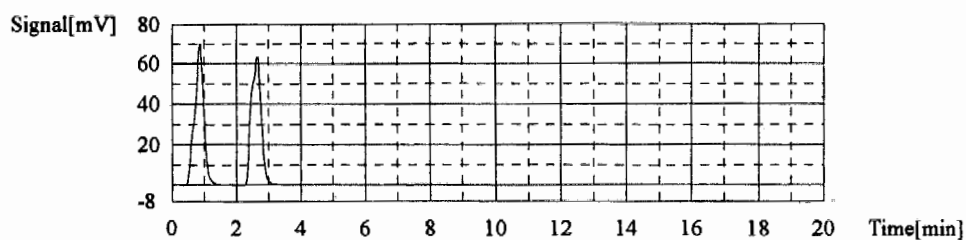
Signal[mV] 40



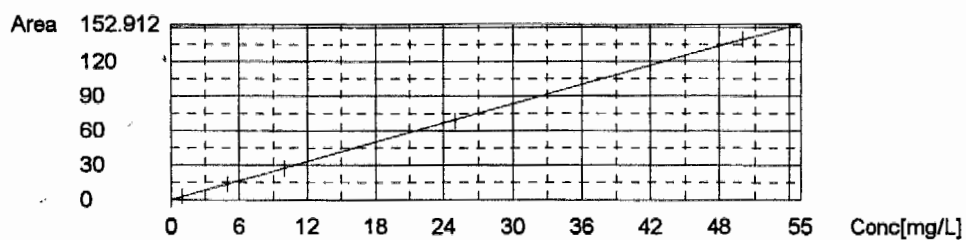
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	139.4	50uL	1	*****		08/08/05 01:30:45 PM
2	139.9	50uL	1	*****		08/08/05 01:32:42 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 139.7



Slope: 2.780
Intercept 0.000
 r^2 0.999785



Control Sample

Sample Name: ICV
Sample ID: TCH006-2
Method: TCH006.tpl
Chk. Result: Control value: 1.14% / Control within range!

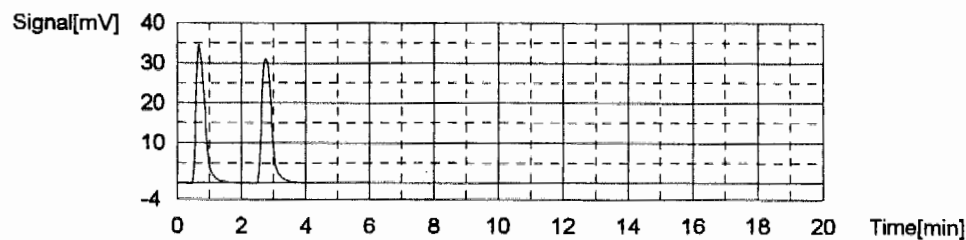
Type	Anal.	Dil.	Result
Control	NPOC	1.000	NPOC:24.34 mg/L

1. Det.

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	67.28	24.20mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 01:41:30 PM
2	68.05	24.48mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 01:43:48 PM

Mean Area 67.66
Mean Conc. 24.34mg/L



Sample

	Type	Analysis	Sample Name	Sample ID	Object	Origin	Dilution	Result	Notes	Comment
1	Standard	NPOC	ICAL	TCH009-1	0A-12	C:\Progra	1.000			
2	Control	NPOC	ICV	TCH009-2	0A-12	C:\Progra	1.000	NPOC:24.67 m	Control valu	
3	Unknown	NPOC	ICB	TCH009-3	0A-12	C:\Progra	1.000	NPOC:0.1949		
4	Unknown	NPOC	HCO3/CO3	TCH009-4	0A-12	C:\Progra	1.000	NPOC:0.7640		
5	Unknown	NPOC	TCH009WB	TCH009-5	0A-12	C:\Progra	1.000	NPOC:0.1857		
6	Unknown	NPOC	TCH009WL	TCH009-6	0A-12	C:\Progra	1.000	NPOC:24.07 m		
7	Unknown	NPOC	TCH009WC	TCH009-7	0A-12	C:\Progra	1.000	NPOC:24.63 m		
8	Unknown	NPOC	05G218-06	TCH009-8	0A-12	C:\Progra	1.000	NPOC:4.221 m	✓	
9	Unknown	NPOC	05G218-06D	TCH009-9	0A-12	C:\Progra	1.000	NPOC:3.431 m	✓	
10	Unknown	NPOC	05G218-06M	TCH009-10	0A-12	C:\Progra	1.000	NPOC:26.59 m	✓	
11	Unknown	NPOC	05G231-03	TCH009-11	0A-12	C:\Progra	20.00	NPOC:289.2 m		
12	Unknown	NPOC	05G247-03	TCH009-12	0A-12	C:\Progra	10.00	NPOC:98.57 m		
13	Unknown	NPOC	05H421-01	TCH009-13	0A-12	C:\Progra	1.000	NPOC:0.8802		
14	Control	NPOC	CCV1	TCH009-14	0A-12	C:\Progra	1.000	NPOC:24.26 m	Control valu	
15	Unknown	NPOC	CCB1	TCH009-15	0A-12	C:\Progra	1.000	NPOC:0.2533		
16	Unknown	NPOC	05H421-02	TCH009-16	0A-12	C:\Progra	1.000	NPOC:0.3291		
17	Unknown	NPOC	05H421-03	TCH009-17	0A-12	C:\Progra	1.000	NPOC:0.3251		
18	Unknown	NPOC	05H006-01	TCH009-18	0A-12	C:\Progra	1.000	NPOC:2.616 m		
19	Unknown	NPOC	05H006-02	TCH009-19	0A-12	C:\Progra	1.000	NPOC:2.101 m		
20	Unknown	NPOC	05H006-03	TCH009-20	0A-12	C:\Progra	1.000	NPOC:2.468 m		
21	Unknown	NPOC	05H006-04	TCH009-21	0A-12	C:\Progra	1.000	NPOC:2.623 m		
22	Unknown	NPOC	05H006-05	TCH009-22	0A-12	C:\Progra	1.000	NPOC:3.621 m		
23	Unknown	NPOC	05H056-01	TCH009-23	0A-12	C:\Progra	1.000	NPOC:0.9740		
24	Unknown	NPOC	05H056-03	TCH009-24	0A-12	C:\Progra	1.000	NPOC:1.799 m		
25	Unknown	NPOC	05H056-03D	TCH009-25	0A-12	C:\Progra	1.000	NPOC:1.574 m		
26	Control	NPOC	CCV2	TCH009-26	0A-12	C:\Progra	1.000	NPOC:24.67 m	Control valu	
27	Unknown	NPOC	CCB2	TCH009-27	0A-12	C:\Progra	1.000	NPOC:0.3041		
28	Unknown	NPOC	05H056-03M	TCH009-28	0A-12	C:\Progra	1.000	NPOC:24.83 m		
29	Unknown	NPOC	TCH010WB	TCH009-29	0A-12	C:\Progra	1.000	NPOC:0.4161		
30	Unknown	NPOC	TCH010WL	TCH009-30	0A-12	C:\Progra	1.000	NPOC:24.82 m		
31	Unknown	NPOC	TCH010WC	TCH009-31	0A-12	C:\Progra	1.000	NPOC:24.87 m		
32	Unknown	NPOC	05H020-05	TCH009-32	0A-12	C:\Progra	1.000	NPOC:12.19 m		
33	Unknown	NPOC	05H020-11	TCH009-33	0A-12	C:\Progra	1.000	NPOC:0.3111		
34	Unknown	NPOC	05H020-15	TCH009-34	0A-12	C:\Progra	1.000	NPOC:6.952 m		
35	Unknown	NPOC	05H033-04	TCH009-35	0A-12	C:\Progra	1.000	NPOC:23.26 m		
36	Unknown	NPOC	05H033-06	TCH009-36	0A-12	C:\Progra	1.000	NPOC:4.615 m		
37	Unknown	NPOC	05H033-08	TCH009-37	0A-12	C:\Progra	1.000	NPOC:4.757 m		
38	Control	NPOC	CCV3	TCH009-38	0A-12	C:\Progra	1.000	NPOC:24.91 m	Control valu	
39	Unknown	NPOC	CCB3	TCH009-39	0A-12	C:\Progra	1.000	NPOC:0.3356		
40	Unknown	NPOC	05H033-10	TCH009-40	0A-12	C:\Progra	1.000	NPOC:26.52 m		
41	Unknown	NPOC	05H033-12	TCH009-41	0A-12	C:\Progra	1.000	NPOC:28.61 m		
42	Unknown	NPOC	05H033-18	TCH009-40	0A-12	C:\Progra	1.000	NPOC:0.3647		
43	Unknown	NPOC	05H032-03	TCH009-40	0A-12	C:\Progra	1.000	NPOC:29.17 m		
44	Unknown	NPOC	05H048-02	TCH009-41	0A-12	C:\Progra	1.000	NPOC:12.30 m		
45	Unknown	NPOC	05H048-04	TCH009-42	0A-12	C:\Progra	1.000	NPOC:9.733 m		
46	Unknown	NPOC	05H048-06	TCH009-43	0A-12	C:\Progra	1.000	NPOC:21.25 m		
47	Unknown	NPOC	05H048-10	TCH009-44	0A-12	C:\Progra	1.000	NPOC:0.3925		
48	Unknown	NPOC	05H048-13	TCH009-45	0A-12	C:\Progra	1.000	NPOC:7.608 m		
49	Unknown	NPOC	05H048-13D	TCH009-46	0A-12	C:\Progra	1.000	NPOC:7.837 m		
50	Unknown	NPOC	05H048-13M	TCH009-47	0A-12	C:\Progra	1.000	NPOC:31.31 m		
51	Control	NPOC	CCV4	TCH009-48	0A-12	C:\Progra	1.000	NPOC:24.97 m	Control valu	
52	Unknown	NPOC	CCB4	TCH009-49	0A-12	C:\Progra	1.000	NPOC:0.3625		
53	Unknown	NPOC	05H006-01	TCH009-50	0A-12	C:\Progra	1.000	NPOC:1.776 m		
54	Unknown	NPOC	05H006-02	TCH009-51	0A-12	C:\Progra	1.000	NPOC:1.579 m		
55	Unknown	NPOC	05H006-03	TCH009-52	0A-12	C:\Progra	1.000	NPOC:2.270 m		
56	Unknown	NPOC	05H006-04	TCH009-56	0A-12	C:\Progra	1.000	NPOC:1.949 m		
57	Unknown	NPOC	05H006-05	TCH009-54	0A-12	C:\Progra	1.000	NPOC:1.941 m		
58	Unknown	NPOC	05H006-05D	TCH009-55	0A-12	C:\Progra	1.000	NPOC:1.876 m		
59	Unknown	NPOC	05H006-05M	TCH009-59	0A-12	C:\Progra	1.000	NPOC:25.05 m		
60	Control	NPOC	CCV5	TCH009-60	0A-12	C:\Progra	1.000	NPOC:24.82 m	Control valu	
61	Unknown	NPOC	CCB5	TCH009-61	0A-12	C:\Progra	1.000	NPOC:0.4095		
62										
63										
64										
65										
66										

Instr. Information

System
Detector
Catalyst
Cell Length

tac
Combustion
Regular Sensitivity
long

Cal. Curve

Sample Name: ICAL
Sample ID: TCH009-1
Cal. Curve: TCH009.2005_08_10_23_05_40.cal

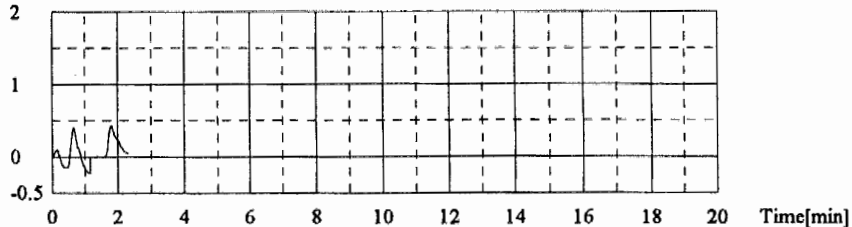
Type	Anal.
Standard	NPOC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	0.8982	50uL	1	*****		08/10/05 11:13:04 PM
2	0.6816	50uL	1	*****		08/10/05 11:14:24 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 0.7899

Signal[mV] 2

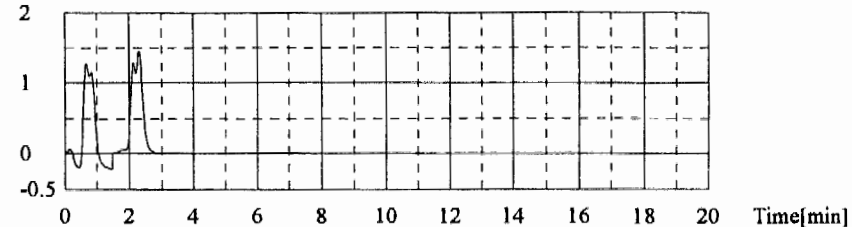


Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	3.392	50uL	10	*****		08/10/05 11:23:04 PM
2	3.273	50uL	10	*****		08/10/05 11:24:41 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 3.333

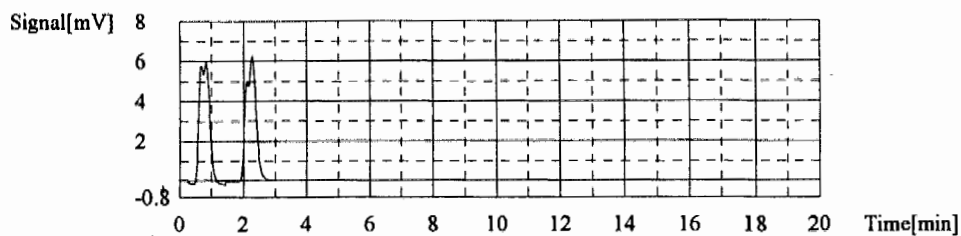
Signal[mV] 2



Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	14.40	50uL	2	*****		08/10/05 11:31:24 PM
2	14.51	50uL	2	*****		08/10/05 11:33:05 PM

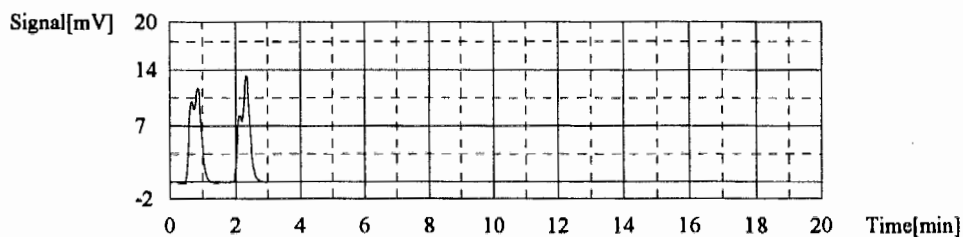
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 14.46



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	28.03	50uL	1	*****		08/10/05 11:39:08 PM
2	28.16	50uL	1	*****		08/10/05 11:40:49 PM

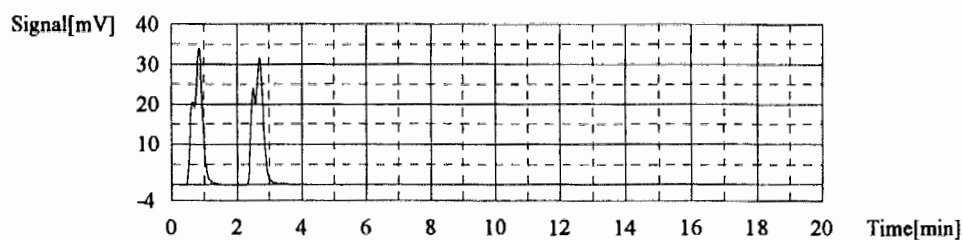
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 28.09



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	68.77	50uL	2	*****		08/10/05 11:49:53 PM
2	69.52	50uL	2	*****		08/10/05 11:52:08 PM

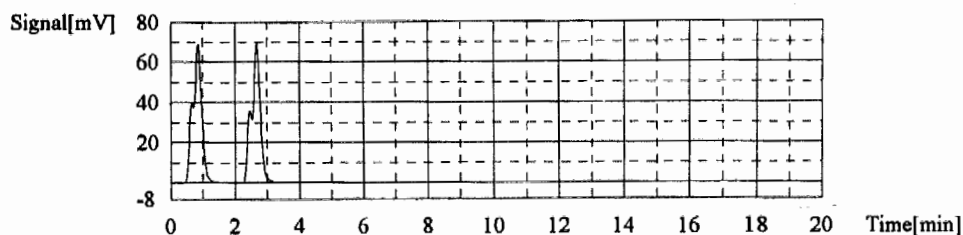
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 69.15



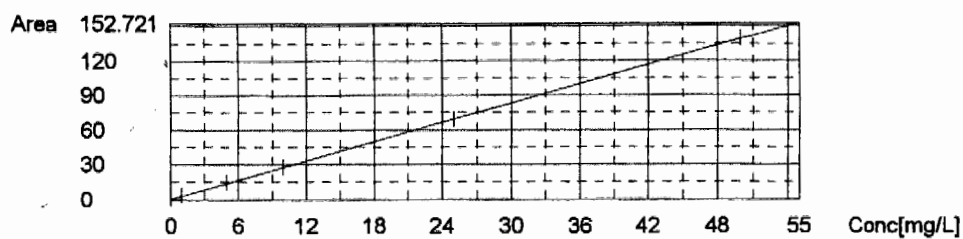
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	139.5	50uL	1	*****		08/10/05 11:58:31 PM
2	139.9	50uL	1	*****		08/11/05 12:00:31 AM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 139.7



Slope: 2.777
Intercept 0.000
r² 0.999941



Control Sample

Sample Name: ICV
Sample ID: TCH009-2
Method: TCH009.tpl
Chk. Result: Control value: 0.73% / Control within range!

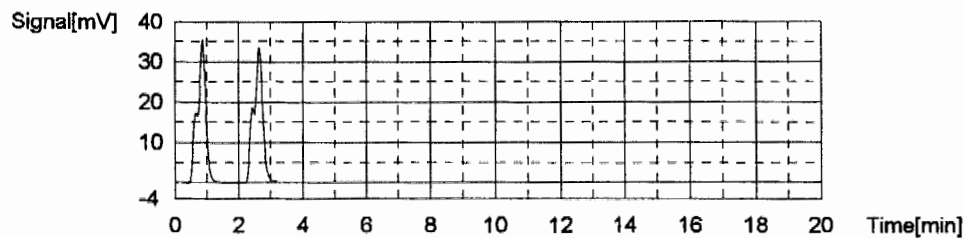
Type	Anal.	Dil.	Result
Control	NPOC	1.000	NPOC:24.67 mg/L

1. Det.

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	68.25	24.58mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:09:03 AM
2	68.75	24.76mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:11:02 AM

Mean Area 68.50
Mean Conc. 24.67mg/L



Sample

Sample Name: ICB
Sample ID: TCH009-3
Origin: TCH009.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.1949 mg/L

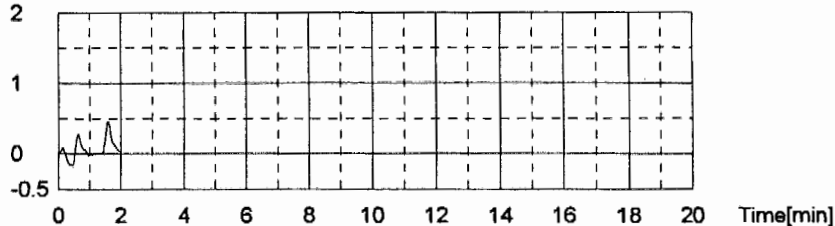
1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.5402	0.1945mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:18:30 AM
2	0.5419	0.1952mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:19:43 AM

Mean Area 0.5411
Mean Conc. 0.1949mg/L

Signal[mV] 2



Sample

Sample Name: HCO3/CO3
Sample ID: TCH009-4
Origin: TCH009.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.7640 mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2.098	0.7556mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:27:26 AM
2	2.145	0.7726mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:28:50 AM

ANALYSIS RUN LOG FOR TOC

SOP: 0 EMAX-9060 Revision No. 1 ✓ EMAX-415.1 Revision No. 1 0

Book # A62-006

Start Date: 8/8/05

Time: 12:46

Ending Date: 8/9/05

Time: 03:38

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix	Run Time	Notes
				S	W	
* 1	TEH006-1	ICAV	1		X	13:32 NPOC Rm
* 2	2	ICV				13:40 13:43 pH < 2
* 3	3	ICB				13:52
* 4	4	HC03/CO3				14:01
* 5	5	TEH006UB				14:11
* 6	6	ICV				14:21
* 7	7	ICV				14:32
* 8	8	OSG218-01				14:41
* 9	9	02				14:50
* 0	10	03				15:00
* 1	11	04				15:09
* 2	12	05				15:18
* 3	13	06				15:27
* 4	14	ICV1				15:38
* 5	15	ICV1				16:01
* 6	16	OSG218-06D				16:10
* 7	17	06M				16:20
* 8	18	OSG219-02				16:29
* 9	19	03				16:39
* 0	20	04				16:49
* 1	21	05				16:59
* 2	22	OSG231-02				17:09
* 3	23	02D				17:18
* 4	24	02M				17:28
* 5	25	03				17:40
* 6	26	ICV2				17:50
* 7	27	ICB2				17:59
* 8	28	OSG231-04				18:10
* 9	29	05				18:19
* 0	30	06				18:29

Instrument No.	62
Method File	TEH006
ICAL ID	SN10B-01-611
ICV ID	↓ 612

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	8/8/05

ICAL Level	Conc.(mg
------------	----------

ANALYSIS RUN LOG FOR TOC

Book # A62-006

SOP: 0 EMAX-9060 Revision No. 1 0 EMAX-415.1 Revision No. 1 0

Time: 03:38

Ending Date: 8/9/05

Time: 12:46

Start Date: 8/8/05

[illegible]

ANALYSIS RUN LOG FOR TOC

Book # A62-006

SOP: 0 EMAX-9060 Revision No. 1 0 EMAX-415.1 Revision No. 1 0

Start Date: 8/8/2005 Time: 12:46
Ending Date: 8/9/05 Time: 03:38

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix S W	Run Time	Notes
* 1	TEH006-61	CEV5	1	X	23:28	NPOE Run
* 2	62	CEP5	1		23:37	pH < 2
* 3	63	055260-02			23:46	
* 4	64	03			23:56	
* 5	65	04			00:05	
* 6	66	05			00:14	
* 7	67	06			00:24	
* 8	68	CEV4			00:34	
* 9	69	CEB6			00:44	
* 0	70	TEH008B08			00:53	
* 1	71	06			01:03	
* 2	72	07			01:14	
* 3	73	055260-01			01:24	
* 4	74	02			01:33	
* 5	75	03			01:42	
* 6	76	04			01:51	
* 7	77	05			02:01	
* 8	78	06			02:10	
* 9	79	CEV7			02:20	
* 0	80	CEP7			02:29	
* 1	81	055260-06D			02:39	
* 2	82	06NA			02:49	
* 3	83	055183-01			02:58	DOC
* 4	84	01			03:08	TOC
* 5	85	055159-03	2		03:18	
* 6	86	CEV8	1		03:29	
* 7	87	CEB8	1		03:38	
* 8						
* 9						
* 0						

ANALYTICAL BATCH * TEH008W

Instrument No. **62**

INITIAL CALIBRATION REFERENCE

Method File **TEH006**

ICAL ID **(see later on page 82)**

ICV ID

STANDARDS

ICAL Level	Conc. (mg/L)
S ₀	
S ₁	
S ₂	
S ₃	
S ₄	
S ₅	
S ₆	
ICV/LCS	
CCV	

Comments:

Analyzed By: **✓**

7-8/8/05

This page is checked during data review.

SOP: 0 EMAX-9060 Revision No. 1 ✓ EMAX-415.1 Revision No. 1 0

Book # A62-006

Start Date: 8/10/05

Time: 23:13

EndingDate:

Time: 09:28

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix	Run Time	Notes
				S	W	
* 1	TCH009-1	ICAL	1	X		NPROC Run
* 2	2	ICV				PH<2
* 3	3	ICP				
* 4	4	H2O3/CO3				
* 5	5	TCH009W3				
* 6	6	WL				
* 7	7	WC				
* 8	8	05624E-06				
* 9	9	06D				
* 10	10	06M				
* 11	11	056231-03	20			
* 12	12	056247-03	10			
* 13	13	056247-01	1			
* 14	14	04V1				
* 15	15	04B1				
* 16	16	05H421-02				
* 17	17	03				
* 18	18	05H000-01				
* 19	19	02				
* 20	20	05				
* 21	21	04				
* 22	22	05				
* 23	23	05H056-01				
* 24	24	03				
* 25	25	02D				
* 26	26	02V2				
* 27	27	02B2				
* 28	28	05H056-03M				
* 29	29	TCH010WB				
* 30	30	WL				

ANALYTICAL BATCH *TCH009W **TCH010W

Instrument No. 62
INITIAL CALIBRATION REFERENCE

Method File TCH009W
ICAL ID SW08-01-611
ICV ID 612

STANDARDS

ICAL Level		Conc. (mg/L)
S ₀	None pure	0
S ₁	SW08-01-611	1
S ₂		5
S ₃		10
S ₄		25
S ₅		50
S ₆	SW08-01-612	310/55
ICV/LCS	SW08-01-612	25
OCV	613	25

Comments:

Analyzed By:

This page is checked during data review.

This page is checked during data review.

8108

ANALYSIS RUN LOG FOR TOC

Book # A62-006

SOP: 0 EMAX-9060 Revision No. 1 0 EMAX-415.1 Revision No. 1 0

Time:	25:13	EndingDate:	5/10/25	Time:	07:25
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[illegible]

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CLIENT: **BATTELLE MEMORIAL INSTITUTE**
PROJECT: **JPL**
SDG: **05G260**

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GC/MS-SVOA **	3000 –
GC-VOA **	4000 –
GC-SVOA **	5000 –
HPLC **	6000 –
METALS METHOD 200.7	7000 – 7019
WET	METHOD 310.1 8000 – 8005
	METHOD 300.0 8006 – 8023
	METHOD 350.2 8024 – 8030
	METHOD 120.1 8031 – 8035
	METHOD SM3500 8036 – 8041
	METHOD 351.3 8042 – 8049
	METHOD 415.1 (DOC) 8050 – 8061
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OTHERS **	9000 –

** - Not Requested



LABORATORIES, INC.

1835 W. 205th Street

Torrance, CA 90501

Tel: (310) 618-8889

Fax: (310) 618-0818

Date: 08-22-2005

EMAX Batch No.: 05G260

Attn: Tien Shiao

Battelle Memorial Institute

505 King Ave.

Columbus OH 43201

Subject: Laboratory Report

Project: JPL

Enclosed is the Laboratory report for samples received on 07/29/05.
The data reported include :

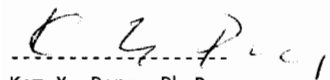
Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
MW-21-5	G260-01	07/26/05	WATER	FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY AMMONIA-N SPECIFIC CONDUCTANCE TKN SULFATE BY IC CHLORIDE BY IC
MW-21-4	G260-02	07/26/05	WATER	FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY AMMONIA-N SPECIFIC CONDUCTANCE TKN SULFATE BY IC

Sample ID	Control #	Col Date	Matrix	Analysis
MW-21-3	G260-03	07/26/05	WATER	CHLORIDE BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY AMMONIA-N SPECIFIC CONDUCTANCE TKN SULFATE BY IC CHLORIDE BY IC
MW-21-2	G260-04	07/26/05	WATER	FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY AMMONIA-N SPECIFIC CONDUCTANCE TKN SULFATE BY IC CHLORIDE BY IC
MW-21-1	G260-05	07/26/05	WATER	FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY AMMONIA-N SPECIFIC CONDUCTANCE TKN SULFATE BY IC CHLORIDE BY IC
DUPE-4-7/26/2005	G260-06	07/26/05	WATER	FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY AMMONIA-N SPECIFIC CONDUCTANCE TKN SULFATE BY IC CHLORIDE BY IC

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,



Kam Y. Pang, Ph.D.
Laboratory Director

Hanh Bui

From: Shiao, Tien [shiaoh@BATTELLE.ORG]
Sent: Wednesday, August 03, 2005 6:56 AM
To: Hanh Bui
Cc: Ohart, Carolyn J; Conner, David J
Subject: RE: COC for samples received on 8/2 SDG: 05H006 (Battelle/JPL)

Hanh,

For the MW-25 samples (MW-25-1, MW-25-2, MW-25-3, MW-25-4, MW-25-5, Dupe-4-7/26/05) please analyze the rest of the parameters on the COCs. But FIRST be sure to check whether the rest of the analytes are out of hold time, if they are let me know before you analyze, so we can figure out what to do.

As for the metals sample for MW-20-1, please confirm that MW-20-1 is the only location where the metal sample was collected in the wrong bottle. If this is the case, than please don't analyze the metals (Method 200.7 for Ca, Fe, Mg, K, Na) for MW-20-1. We will re-sample the metals for MW-20-1. But do analyze all other parameters on the COC for MW-20-1.

Please give me a call if you have any questions.

Thanks and hope to hear from you soon.

Tien

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Tuesday, August 02, 2005 8:29 PM
To: Shiao, Tien
Subject: RE: COC for samples received on 8/2 SDG: 05H006 (Battelle/JPL)

Tien,

Yes, it will affect the metals result. It should be preserved with HNO3 instead of H2SO4 as we received. Thus, we will get some sample from bottle with no preservation to analyze Metal (only sample MW-20-1).

We received your email on 8/1, and chemist already analyzed on 7/29 for Nitrate and Nitrite.
All analysis of this SDG 05G260 were on hold now. Please let me know about that.
Best regards,

Hanh

-----Original Message-----

From: Shiao, Tien [mailto:shiaoh@BATTELLE.ORG]
Sent: Tuesday, August 02, 2005 4:37 PM
To: Hanh Bui
Subject: RE: COC for samples received on 8/2 SDG: 05H006 (Battelle/JPL)

Hahn,

In the email 08/01/05 I thought I said to hold off on the analysis for MW-21 Screens 1 through 5 and the duplicate analysis:

Hanh,

The sampling collection date on the COC is correct and the samples are out of hold time for nitrate and nitrite.

Please hold off the analysis until I get back to you tomorrow.

1003

8/3/2005

Thanks for your patience,
Tien

Also, for the COC that you just attached, what does the discrepancy for MW-20-1 mean and will it affect the sample result?

Other than the discrepancy, the COC looks good.

Thanks,
Tien

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Tuesday, August 02, 2005 7:16 PM
To: Shiao, Tien
Subject: COC for samples received on 8/2 SDG: 05H006 (Battelle/JPL)

Hi Tien,
Here is the COC for samples we received today. Do you want to change something, please let me know.

However, chemist already analyzed Nitrate/Nitrite for these samples MW-21- (out of holding time, SDG 05G260, sampled on 7/29). We will charge for that. If you have any question, please feel free to contact with Kam, thanks.
Hanh

-----Original Message-----

From: Shiao, Tien [mailto:shiaoh@BATTELLE.ORG]
Sent: Tuesday, August 02, 2005 2:48 PM
To: Hanh Bui
Cc: Conner, David J
Subject: RE: COC for samples received on 7/29 SDG: 05G260 (Battelle/JPL)

Hahn,

I really hate to do this to you but can you hold of discarding the samples? I need to confirm whether we will be re-sampling all the anions or re-sampling all the geochemical parameters on the COCs.

Sorry for the trouble,
Tien

From: Shiao, Tien
Sent: Tuesday, August 02, 2005 4:30 PM
To: 'Hanh Bui'
Subject: RE: COC for samples received on 7/29 SDG: 05G260 (Battelle/JPL)

Thanks for the confirmation.

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Tuesday, August 02, 2005 4:28 PM
To: Shiao, Tien
Subject: RE: COC for samples received on 7/29 SDG: 05G260 (Battelle/JPL)

Hi Tien,
All analysis will be cancelled for samples received on 7/29. Thanks for your information.

Hanh

-----Original Message-----

From: Shiao, Tien [mailto:shiaoh@BATTELLE.ORG]

Sent: Tuesday, August 02, 2005 1:21 PM

To: Hanh Bui

Cc: Ohart, Carolyn J; Conner, David J

Subject: RE: COC for samples received on 7/29 SDG: 05G260 (Battelle/JPL)

Hahn,

We're going to re-sample MW-21.

MW-21-5

MW-21-4

MW-21-3

MW-21-2

MW-21-1

Dupe-4-7/26/2005

Therefore, please don't analyze any of the samples you received 07/29.

Let me know if you have any questions. Thank you for your patience.

Tien

From: Hanh Bui [mailto:HDBui@emaxlabs.com]

Sent: Friday, July 29, 2005 7:53 PM

To: Shiao, Tien

Subject: COC for samples received on 7/29 SDG: 05G260 (Battelle/JPL)

Hi Tien,

Please give me advise for discrepancy the samples we received today. Anions samples are out of holding time, thanks.

Hanh

Hanh Bui

From: Hanh Bui
Sent: Wednesday, August 03, 2005 11:06 AM
To: 'Shiao, Tien'
Subject: RE: COC for samples received on 7/29 SDG: 05G260 (Battelle/JPL)

Tien,
Sulfide is out of holding time too. Could you please re-samples next time. Thus, we will cancel Nitrate/Nitrite, TDS, and sulfide for samples MW-21-.....on 7/26. I send the login review sheet later, thanks.
Hanh

-----Original Message-----

From: Hanh Bui
Sent: Wednesday, August 03, 2005 10:41 AM
To: 'Shiao, Tien'
Subject: COC for samples received on 7/29 SDG: 05G260 (Battelle/JPL)

Hi Tien,
For samples MW-21-5, -4, -3, -2, -1, and Dupe-4-7/26/05 sampled on 7/26, all TDS samples are out of holding time now (7 days HT for TDS). Thus, can you re-sample those next time with Nitrate/nitrite? Please let me know. Sorry about that. Thanks
Hanh

1006

8/3/2005

SAMPLE RECEIPT FORM 1

Type of Delivery	Delivered By/Airbill	ECN	056260
<input checked="" type="checkbox"/> EMAX Courier	SEE C.O.C.	Receptient	I. PATEL
<input type="checkbox"/> Client Delivery		Date	07.29.05.
<input type="checkbox"/> Third Party		Time	11:30

COC Inspection		
<input checked="" type="checkbox"/> Client Name	<input checked="" type="checkbox"/> Sampler Name	<input checked="" type="checkbox"/> Sampling Date/Time/Location
<input type="checkbox"/> Address	<input checked="" type="checkbox"/> Courier Signature/Date/Time	<input checked="" type="checkbox"/> Analysis Required
<input checked="" type="checkbox"/> Client PM/FC	<input type="checkbox"/> TAT	<input type="checkbox"/> Matrix
<input type="checkbox"/> Tel #/Fax #	<input checked="" type="checkbox"/> Sample ID	<input type="checkbox"/> Preservative (if any)
Safety Issues <input checked="" type="checkbox"/> None	<input type="checkbox"/> High Concentrations expected	<input type="checkbox"/> Superfund Site Samples
Comments: <input type="checkbox"/> Rad Screening Required		

Packaging Inspection			
Container	<input checked="" type="checkbox"/> Cooler <i>STWO</i>	<input type="checkbox"/> Box	<input type="checkbox"/>
Condition	<input type="checkbox"/> Custody Seal	<input checked="" type="checkbox"/> Intact	<input type="checkbox"/> Damaged
Packaging	<input type="checkbox"/> Bubble Pack	<input type="checkbox"/> Styrofoam	<input checked="" type="checkbox"/> Sufficient
Temperatures	<input checked="" type="checkbox"/> Cooler 1 <i>3.8°C</i>	<input checked="" type="checkbox"/> Cooler 2 <i>4.2°C</i>	<input checked="" type="checkbox"/> <i>PLASTIC BAGS</i>
	<input type="checkbox"/> Cooler 5	<input type="checkbox"/> Cooler 6	<input type="checkbox"/> Cooler 3
	<input type="checkbox"/> Cooler 9	<input type="checkbox"/> Cooler 10	<input type="checkbox"/> Cooler 4
			<input type="checkbox"/> Cooler 7
			<input type="checkbox"/> Cooler 8
			<input type="checkbox"/> Cooler 11
			<input type="checkbox"/> Cooler 12
Comments:			

LSCID	Client ID	Discrepancy	Corrective Action
		ALL SAMPLES FOR 300.0 ANALYSIS REQ'D OUT OF HOLDING TIME.	Cancel Nitrate/Nitrite
			Cancel TGS/ Sulfide (out of HT), re-sample per Tier 1/2 tank conversation 8/3/05

LSCID : Lab Sample Container ID

REVIEWS

Sample Labeling

Date *07.29.05.*

SRF

Date

Opinion
7/29/05

PM

Date

E D - 1
8/3/05

1007

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

METHOD 200.7
METALS BY ICP

SDG#: 05G260

7000

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G260**

METHOD 200.7 METALS BY ICP

Six (6) water samples were received on 07/29/05 for Metals analysis by Method 200.7 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample G260-06 was analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

Sample G260-06 was spiked. All recoveries were within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
METALS BY ICP-AES

SDG NO. : 05G260
Instrument ID : T-107

Client : BATTIELLE MEMORIAL INSTITUTE
Project : JPL

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	WATER		Extraction Date/Time	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
NBLK1W	IPH009WB	1	NA	08/11/0515:06			08/03/0511:30	107H024012	107H024010	IPH009W	Method Blank
LCSTW	IPH009WL	1	NA	08/11/0515:10			08/03/0511:30	107H024013	107H024010	IPH009W	Lab Control Sample (LCS)
LCSTW	IPH009WC	1	NA	08/11/0515:15			08/03/0511:30	107H024014	107H024010	IPH009W	LCS Duplicate
MW-21-5	G260-01	1	NA	08/11/0515:41			08/03/0511:30	107H024020	107H024010	IPH009W	Field Sample
MW-21-4	G260-02	1	NA	08/11/0515:56			08/03/0511:30	107H024023	107H024021	IPH009W	Field Sample
MW-21-3	G260-03	1	NA	08/11/0516:00			08/03/0511:30	107H024024	107H024021	IPH009W	Field Sample
MW-21-2	G260-04	1	NA	08/11/0516:04			08/03/0511:30	107H024026	107H024021	IPH009W	Field Sample
MW-21-1	G260-05	1	NA	08/11/0516:09			08/03/0511:30	107H024027	107H024021	IPH009W	Field Sample
DUPE-4-7/26/2005	G260-06	1	NA	08/11/0516:13			08/03/0511:30	107H024028	107H024021	IPH009W	Diluted Sample
DUPE-4-7/26/2005DL	G260-06T	5	NA	08/11/0516:17			08/03/0511:30	107H024029	107H024021	IPH009W	Analytical Spike Sample
DUPE-4-7/26/2005AS	G260-06A	1	NA	08/11/0516:21			08/03/0511:30	107H024030	107H024021	IPH009W	Matrix Spike Sample (MS)
DUPE-4-7/26/2005MS	G260-06M	1	NA	08/11/0516:25			08/03/0511:30	107H024031	107H024021	IPH009W	MS Duplicate (MSD)
DUPE-4-7/26/2005MSD	G260-06S	1	NA	08/11/0516:29			08/03/0511:30				

FN - Filename
% Moist - Percent Moisture

7002

du

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/26/05
Project     : JPL                           Date Received: 07/29/05
SDG NO.     : 05G260                       Date Extracted: 08/03/05 11:30
Sample ID   : MW-21-5                      Date Analyzed: 08/11/05 15:41
Lab Samp ID : G260-01                      Dilution Factor: 1
Lab File ID : I07H024020                   Matrix          : WATER
Ext Btch ID : IPH009W                      % Moisture       : NA
Calib. Ref. : I07H024010                   Instrument ID    : EMAXT107
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
-----	-----	-----	-----
Calcium	99.6	1	.1
Iron	ND	.2	.04
Magnesium	32.9	1	.1
Potassium	2.3	2	1.4
Sodium	35.3	1	.25

7003

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/26/05
Project     : JPL                         Date Received: 07/29/05
SDG NO.     : 05G260                     Date Extracted: 08/03/05 11:30
Sample ID   : MW-21-4                    Date Analyzed: 08/11/05 15:56
Lab Samp ID : G260-02                     Dilution Factor: 1
Lab File ID : I07H024023                  Matrix          : WATER
Ext Btch ID : IPH009W                     % Moisture       : NA
Calib. Ref. : I07H024021                  Instrument ID    : EMAXTI07
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	96.8	1	.1
Iron	ND	.2	.04
Magnesium	29.9	1	.1
Potassium	2.42	2	1.4
Sodium	30.5	1	.25

7004

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/26/05
Project     : JPL                         Date Received: 07/29/05
SDG NO.     : 05G260                     Date Extracted: 08/03/05 11:30
Sample ID   : MW-21-3                    Date Analyzed: 08/11/05 16:00
Lab Samp ID : G260-03                     Dilution Factor: 1
Lab File ID : I07H024024                 Matrix          : WATER
Ext Btch ID : IPH009W                     % Moisture       : NA
Calib. Ref. : I07H024021                 Instrument ID    : EMAXTI07
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	150	1	.1
Iron	ND	.2	.04
Magnesium	47	1	.1
Potassium	3.38	2	1.4
Sodium	44.4	1	.25

7005

du

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/26/05
Project     : JPL                         Date Received: 07/29/05
SDG NO.    : 05G260                     Date Extracted: 08/03/05 11:30
Sample ID   : MW-21-2                   Date Analyzed: 08/11/05 16:04
Lab Samp ID : G260-04                   Dilution Factor: 1
Lab File ID : 107H024025                Matrix          : WATER
Ext Btch ID : IPH009W                   % Moisture       : NA
Calib. Ref. : 107H024021                Instrument ID    : EMAXTI07
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	152	1	.1
Iron	ND	.2	.04
Magnesium	50.3	1	.1
Potassium	2.82	2	1.4
Sodium	70.5	1	.25

7006

W

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/26/05
Project     : JPL                         Date Received: 07/29/05
SDG NO.    : 05G260                     Date Extracted: 08/03/05 11:30
Sample ID: MW-21-1                     Date Analyzed: 08/11/05 16:09
Lab Samp ID: G260-05                   Dilution Factor: 1
Lab File ID: I07H024026               Matrix       : WATER
Ext Btch ID: IPH009W                  % Moisture    : NA
Calib. Ref.: I07H024021               Instrument ID : EMAXTI07
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	126	1	.1
Iron	ND	.2	.04
Magnesium	40.9	1	.1
Potassium	2.72	2	1.4
Sodium	34.2	1	.25

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/26/05
Project     : JPL                          Date Received: 07/29/05
SDG NO.     : 05G260                       Date Extracted: 08/03/05 11:30
Sample ID   : DUPE-4-7/26/2005             Date Analyzed: 08/11/05 16:13
Lab Samp ID : G260-06                      Dilution Factor: 1
Lab File ID : I07H024027                   Matrix          : WATER
Ext Btch ID : IPH009W                      % Moisture       : NA
Calib. Ref. : I07H024021                   Instrument ID    : EMAXT107
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	156	1	.1
Iron	.253	.2	.04
Magnesium	49.3	1	.1
Potassium	2.96	2	1.4
Sodium	46.3	1	.25

7008

QW

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE      Date Collected: NA
Project     : JPL                             Date Received: 08/03/05
SDG NO.     : 05G260                         Date Extracted: 08/03/05 11:30
Sample ID   : MBLK1W                         Date Analyzed: 08/11/05 15:06
Lab Samp ID: IPH009WB                       Dilution Factor: 1
Lab File ID: I07H024012                     Matrix          : WATER
Ext Btch ID: IPH009W                         % Moisture      : NA
Calib. Ref.: I07H024010                     Instrument ID   : EMAXTI07
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	ND	1	.1
Iron	ND	.2	.04
Magnesium	ND	1	.1
Potassium	ND	2	1.4
Sodium	ND	1	.25

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05G260
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILTN FACTR: 1 1 1
SAMPLE ID: MBLK1W
CONTROL NO.: IPH009WB IPH009WL IPH009WC
LAB FILE ID: 107H024012 107H024013 107H024014
DATIME EXTRCTD: 08/03/0511:30 08/03/0511:30 08/03/0511:30 DATE COLLECTED: NA
DATIME ANALYZD: 08/11/0515:06 08/11/0515:10 08/11/0515:15 DATE RECEIVED: 08/03/05
PREP. BATCH: IPH009W IPH009W IPH009W
CALIB. REF: 107H024010 107H024010 107H024010

ACCESSION:

PARAMETER	BLNK RSLT mg/L	SPIKE AMT mg/L	BS RSLT mg/L	BS % REC	SPIKE AMT mg/L	BSD RSLT mg/L	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	ND	50	51	102	50	51.6	103	1	85-115	20
Iron	ND	10	10.5	105	10	10.8	108	3	85-115	20
Magnesium	ND	50	50.7	101	50	50.9	102	0	85-115	20
Potassium	ND	50	48.5	97	50	48.9	98	1	85-115	20
Sodium	ND	50	49.9	100	50	50.5	101	1	85-115	20

7010 *af*

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05G260
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILT N FACTR: 1 1 1
SAMPLE ID: DUPE-4-7/26/2005
CONTROL NO.: G260-06 G260-06M G260-06S
LAB FILE ID: I07H024027 I07H024030 I07H024031
DATIME EXTRACTD: 08/03/0511:30 08/03/0511:30 08/03/0511:30 DATE COLLECTED: 07/26/05
DATIME ANALYZD: 08/11/0516:13 08/11/0516:25 08/11/0516:29 DATE RECEIVED: 07/29/05
PREP. BATCH: IPH009W IPH009W IPH009W
CALIB. REF: I07H024021 I07H024021 I07H024021

ACCESSION:

PARAMETER	SMPL RSLT mg/L	SPIKE AMT mg/L	MS RSLT mg/L	MS % REC	SPIKE AMT mg/L	MSD RSLT mg/L	MSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	156	50	201	90	50	202	91	0	70-130	20
Iron	.253	10	10.5	103	10	10.6	104	1	70-130	20
Magnesium	49.3	50	98.7	99	50	98.5	98	0	70-130	20
Potassium	2.96	50	50.9	96	50	51.4	97	1	70-130	20
Sodium	46.3	50	95.8	99	50	95.4	98	0	70-130	20

7011 *dt*

EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G260
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 5
SAMPLE ID: DUPE-4-7/26/2005 DUPE-4-7/26/2005DL
EMAX SAMP ID: G260-06 G260-06T
LAB FILE ID: I07H024027 I07H024028
DATE EXTRACTED: 08/03/0511:30 08/03/0511:30 DATE COLLECTED: 07/26/05
DATE ANALYZED: 08/11/0516:13 08/11/0516:17 DATE RECEIVED: 07/29/05
PREP. BATCH: IPH009W IPH009W
CALIB. REF: I07H024021 I07H024021

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SERIAL DIL RSLT (mg/L)	DIF RSLT (%)	QC LIMIT (%)
Calcium	156	150	4	10
Iron	.253	ND	NA	10
Magnesium	49.3	46.7	5	10
Potassium	2.96	ND	NA	10
Sodium	46.3	44.4	4	10

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05G260
METHOD: METHOD 200.7

=====

MATRIX: WATER % MOISTURE: NA
DILTN FACTR: 1 1
SAMPLE ID: DUPE-4-7/26/2005
CONTROL NO.: G260-06 G260-06A
LAB FILE ID: I07H024027 I07H024029
DATIME EXTRACTD: 08/03/0511:30 08/03/0511:30 DATE COLLECTED: 07/26/05
DATIME ANALYZD: 08/11/0516:13 08/11/0516:21 DATE RECEIVED: 07/29/05
PREP. BATCH: IPH009W IPH009W
CALIB. REF: I07H024021 I07H024021

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	AS RSLT (mg/L)	AS % REC	QC LIMIT (%)
Calcium	156	50	200	87	85-115
Iron	.253	10	10.5	103	85-115
Magnesium	49.3	50	97.8	97	85-115
Potassium	2.96	50	51.3	97	85-115
Sodium	46.3	50	94.9	97	85-115

REGULAR ICP QC CHECK TABLE

QC Limit%	ICV HIGH 95-105	ICV 90-110	CCV 90-110	ICSAB 80-120	ICSA 80-120
Comp	mg/L	mg/L	mg/L	mg/L	mg/L
Al	10	5	5	500	500
Sb	2	1	1	1	0
As	2	1	1	1	0
Ba	2	1	1	0.5	0
Be	2	1	1	0.5	0
B	2	1	1	0.5	0
Cd	2	1	1	1	0
Ca	100	50	50	500	500
Cr	2	1	1	0.5	0
Co	2	1	1	0.5	0
Cu	2	1	1	0.5	0
Fe	10	5	5	200	200
Pb	2	1	1	1	0
Mg	100	50	50	500	500
Mn	2	1	1	0.5	0
Mo	2	1	1	1	0
Ni	2	1	1	1	0
K	100	50	50	50	0
Se	2	1	1	3.6	0
Ag	2	1	1	1	0
Na	100	50	50	10	0
Sr	2	1	1	0.5	0
Tl	2	1	1	3.6	0
Sn	10	5	5	1	0
Ti	2	1	1	1	0
V	2	1	1	0.5	0
Zn	2	1	1	1	0

SEQUENCE FILE : I07H024

4-13	19-33	34-43	44-53	54-63
LFID	LSID	TIME	DATE	DF
I07H024001	S0	14:18	08/11/05	1
I07H024002	S3	14:22	08/11/05	1
I07H024003	S6	14:26	08/11/05	1
I07H024004	ICV	14:30	08/11/05	1
I07H024005	ICB	14:36	08/11/05	1
I07H024006	CCV	14:40	08/11/05	1
I07H024007	CCB	14:44	08/11/05	1
I07H024008	ICSAI	14:48	08/11/05	1
I07H024009	ICSABI	14:52	08/11/05	1
I07H024010	CCV1	14:58	08/11/05	1
I07H024011	CCB1	15:02	08/11/05	1
I07H024012	IPH009WB	15:06	08/11/05	1
I07H024013	IPH009WL	15:10	08/11/05	1
I07H024014	IPH009WC	15:15	08/11/05	1
I07H024015	G242-01	15:20	08/11/05	1
I07H024016	G242-02	15:25	08/11/05	1
I07H024017	G242-04	15:29	08/11/05	1
I07H024018	G242-05	15:33	08/11/05	1
I07H024019	G242-07	15:37	08/11/05	1
I07H024020	G260-01	15:41	08/11/05	1
I07H024021	CCV2	15:47	08/11/05	1
I07H024022	CCB2	15:52	08/11/05	1
I07H024023	G260-02	15:56	08/11/05	1
I07H024024	G260-03	16:00	08/11/05	1
I07H024025	G260-04	16:04	08/11/05	1
I07H024026	G260-05	16:09	08/11/05	1
I07H024027	G260-06	16:13	08/11/05	1
I07H024028	G260-06T	16:17	08/11/05	5
I07H024029	G260-06A	16:21	08/11/05	1
I07H024030	G260-06M	16:25	08/11/05	1
I07H024031	G260-06S	16:29	08/11/05	1
I07H024032	H001-01	16:34	08/11/05	1
I07H024033	CCV3	16:40	08/11/05	1
I07H024034	CCB3	16:46	08/11/05	1
I07H024035	H001-02	16:50	08/11/05	1
I07H024036	G242-08	17:01	08/11/05	1
I07H024037	ICSAF	17:07	08/11/05	1
I07H024038	ICSAB	17:11	08/11/05	1
I07H024039	CCV4	17:17	08/11/05	1
I07H024040	CCB4	17:21	08/11/05	1

SDG : 056260

UNIT : *

ICP CHECK : I07H024

DATE : 08/11/05

INST : EMAXT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
S0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICV	99	100	97	96	100	102	97	101	97	97	97	104	96	102	98	97	97	98	105	96	100	97	100	98	100	97	98
ICB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICV	100	96	96	98	98	98	99	101	97	97	97	103	96	100	97	99	97	98	99	98	100	97	101	97	97	97	97
CCB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA1	95	...	...	...	...	...	...	93	...	...	...	91	...	97	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA81	95	90	82	92	91	93	91	93	89	86	95	90	93	96	89	86	85	98	95	94	103	89	97	87	90	95	93
CCV1	100	98	96	97	97	96	99	101	97	97	96	102	97	100	97	98	94	97	91	97	100	97	98	98	97	97	98
CCB1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH009WB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH009WL	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH009WC	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G242-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G242-02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G242-04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G242-05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G242-07	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G260-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV2	98	95	92	95	96	95	98	101	97	97	95	102	97	98	96	98	93	94	91	96	97	95	100	99	95	96	99
CCB2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G260-02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G260-03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G260-04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G260-05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G260-06	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G260-06T	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G260-06A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G260-06M	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G260-06S	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H001-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV3	100	98	95	96	97	95	98	102	99	99	96	103	96	99	98	100	96	93	97	97	98	96	102	101	96	97	100
CCB3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H001-02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G242-08	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAF	92	...	...	...	...	...	...	91	...	...	...	89	...	94	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA8	93	88	93	90	90	89	92	93	89	86	94	91	94	95	90	89	84	93	92	92	98	88	94	88	89	96	95
CCV4	99	97	92	95	97	94	98	102	99	99	95	103	96	98	98	101	95	91	93	96	97	95	100	99	96	97	101
CCB4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

QC limit of each parameter are listed in a table attached next to all the ICP check forms
* : Out of QC Limit

DATE : 08/11/05 INST : EMAXTI07

QC Limit of each parameter are listed in a table attached next to all the ICP check forms
 * : Out of QC Limit

7018

DIGESTION LOG FOR ICP METALS

Book # EIP-046

SOP □ EMAX-3005 Rev. No. 2 □ EMAX-3010 Rev. No. 2 □ EMAX-CLP-TAL □ 200.7

Matrix: WATER Start Date: 8-3-05 Time: 11:30 Ending Date: 8-3-05 Temp: 85 °C Temp.: 98 °C

Sample Prep ID	Lab Sample ID	Matrix Description Color / Texture / Clarity	Turbidity <1 NTU	Sample Amount (g)	pH	Extract Volume (ml)	Digestate Description Color / Clarity	Standards	ID	Amount Added (ml)
01	IPH 009-WB			50	-	50		LCS -1	SMIA - 09 - 42	0.5
02	-WL			50	-	50		LCS -2	SMIA - 09 - 43	0.5
03	-WC			50	-	50		LCS -3	SMIA - 09 - 44	0.5
04	G242-01			50	4.2	50		MS		
05	-02			50		50		Reagent	Lot# / ID	Amount Added (ml)
06	-04			50		50		HNO ₃	SWIA - 03 - 120	1.5
07	-05			50		50		HCl	SWIA - 03 - 115	2.5
08	-07			50		50		H ₂ O ₂	NIA	
09	-08			50		50		HNO ₃ (1:1)	NIA	
10	G260-01			50		50		Digestate Location	ICP LAB	
11	-02			50		50		Extract Location		
12	-03			50		50		Legend:		
13	-04			50		50		Texture	Cs = Coarse Md = Medium Fn = Fine	
14	-05			50		50		Clarity	Cr = Clear Cy = Cloudy Td = Turbid	
15	-06			50		50		Artifacts	Rk = rocks Sl = Shale Vg = Vegetation	
16	-06M			50		50		Color	Bk = Black Bn = Brown	
17	-06S			50		50			Gn = Green Og = Orange Rd = Red	
18	H001-01			50		50			Yw = Yellow Cl = Colorless	
19	-02			50		50				
20										
21										
22										
23										
24										
25										

BATCH: IPH 009-W

Comments: Samples for Methods 200.7 or 200.8 Analyses

If turbidity < 1 NTU no digestion is required unless otherwise required by the project

Prepared By: MCStandard Added By: MCWitnessed By: NTExtracts Rcvd. By: NT 8/3/05Checked By: NT

Date Disposed:

Disposed by:

7019



EMAX LABORATORIES, INC., 1835 W. 21st St. Torrance, CA 90501

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

WET CHEMICAL ANALYSES

SDG#: 05G260

8000

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G260

METHOD 310.1 TOTAL ALKALINITY

Six (6) water samples were received on 07/29/05 for Total Alkalinity analysis by Method 310.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G260-01 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 310.1
TOTAL ALKALINITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G260

Matrix : WATER
Instrument ID : 153

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL	REF	PREP	BATCH	Collection DATE/TIME	Received DATE/TIME
MBL1W	ALH001WB	ND	1	NA	5	1	08/03/0514:30	NA	ALH001W-01	NA		ALH001W		NA	NA
LCS1W	ALH001WL	45.8	1	NA	5	1	08/03/0514:35	NA	ALH001W-02	NA		ALH001W		NA	NA
LCD1W	ALH001WC	45.8	1	NA	5	1	08/03/0514:40	NA	ALH001W-03	NA		ALH001W		NA	NA
MW-21-5	G260-01	181	1	NA	5	1	08/03/0514:45	NA	ALH001W-04	NA		ALH001W		07/26/05	07/29/05
MW-21-5DUP	G260-01D	181	1	NA	5	1	08/03/0514:50	NA	ALH001W-05	NA		ALH001W		07/26/05	07/29/05
MW-21-4	G260-02	178	1	NA	5	1	08/03/0514:55	NA	ALH001W-06	NA		ALH001W		07/26/05	07/29/05
MW-21-3	G260-03	275	1	NA	5	1	08/03/0515:00	NA	ALH001W-07	NA		ALH001W		07/26/05	07/29/05
MW-21-2	G260-04	275	1	NA	5	1	08/03/0515:05	NA	ALH001W-08	NA		ALH001W		07/26/05	07/29/05
MW-21-1	G260-05	147	1	NA	5	1	08/03/0515:10	NA	ALH001W-09	NA		ALH001W		07/26/05	07/29/05
DUPE-4-7/26/2005	G260-06	277	1	NA	5	1	08/03/0515:15	NA	ALH001W-10	NA		ALH001W		07/26/05	07/29/05

8002

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 310.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G260
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: ALH001WL/C
DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 08/03/05 14:35/14:40

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Total Alkalinity	ND	49.20	45.80	93	49.20	45.80	93	0	80-120	20

8003

08

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 310.1
MATRIX: WATER
% MOISTURE: NA
=====

BATCH NO.: 05G260
SAMPLE ID: MW-21-5DUP
CONTROL NO.: G260-01D
DATE RECEIVED: 07/29/05
DATE EXTRACTED: NA
DATE ANALYZED: 08/03/05 14:50

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Total Alkalinity	181.00	181.00	0	20

8004

20

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G260**

METHOD 300.0 ANIONS

Six (6) water samples were received on 07/29/05 for Chloride and Sulfate analyses by method 300.0 in accordance with "Method for Determination of Inorganic Anions by Ion Chromatography", EPA 600/84-017.

1. Holding Time

Analyses met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limits.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

SAMPLE RESULTS

METHOD 300.0
CHLORIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G260

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICH008WB	ND	1	NA	.2	.1	08/05/0512:15	NA	AH05-03	AH05-01	ICH008W	NA	NA
LCS1W	ICH008WL	4.77	1	NA	.2	.1	08/05/0512:30	NA	AH05-04	AH05-01	ICH008W	NA	NA
LCD1W	ICH008WC	4.77	1	NA	.2	.1	08/05/0512:44	NA	AH05-05	AH05-01	ICH008W	NA	NA
MW-21-5	G260-01	66.5	10	NA	2	1	08/05/0516:02	NA	AH05-19	AH05-13	ICH008W	07/26/05	07/29/05
MW-21-4	G260-02	64.3	10	NA	2	1	08/05/0516:16	NA	AH05-20	AH05-13	ICH008W	07/26/05	07/29/05
MW-21-3	G260-03	108	20	NA	4	2	08/05/0516:30	NA	AH05-21	AH05-13	ICH008W	07/26/05	07/29/05
MW-21-2	G260-04	133	20	NA	4	2	08/05/0516:45	NA	AH05-22	AH05-13	ICH008W	07/26/05	07/29/05
MW-21-1	G260-05	103	20	NA	4	2	08/05/0516:59	NA	AH05-23	AH05-13	ICH008W	07/26/05	07/29/05
DUPE-4-7/26/2005	G260-06	112	20	NA	4	2	08/05/0517:13	NA	AH05-24	AH05-13	ICH008W	07/26/05	07/29/05

8008

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METHOD 300.0
SULFATE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G260

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
WBLK1W	ICH008VB	ND	1	NA	.5	.25	08/05/0512:15	NA	AH05-03	AH05-01	ICH008W	NA	NA
LCS1W	ICH008WL	5.12	1	NA	.5	.25	08/05/0512:30	NA	AH05-04	AH05-01	ICH008W	NA	NA
LCD1W	ICH008WC	5.02	1	NA	.5	.25	08/05/0512:44	NA	AH05-05	AH05-01	ICH008W	NA	NA
MM-21-5	G260-01	117	10	NA	5	2.5	08/05/0516:02	NA	AH05-19	AH05-13	ICH008W	07/26/05	07/29/05
MM-21-4	G260-02	96.5	10	NA	5	2.5	08/05/0516:16	NA	AH05-20	AH05-13	ICH008W	07/26/05	07/29/05
MM-21-3	G260-03	140	20	NA	10	5	08/05/0516:30	NA	AH05-21	AH05-13	ICH008W	07/26/05	07/29/05
MM-21-2	G260-04	178	20	NA	10	5	08/05/0516:45	NA	AH05-22	AH05-13	ICH008W	07/26/05	07/29/05
MM-21-1	G260-05	152	20	NA	10	5	08/05/0516:59	NA	AH05-23	AH05-13	ICH008W	07/26/05	07/29/05
DUPE-4-7/26/2005	G260-06	144	20	NA	10	5	08/05/0517:13	NA	AH05-24	AH05-13	ICH008W	07/26/05	07/29/05

8009

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QC SUMMARIES

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G260
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICH008WL ICH008WC
LAB FILE ID: AH05-04 AH05-05
DATE EXTRACTED: NA
DATE ANALYZED: 08/05/0512:30 08/05/0512:44
PREP. BATCH: ICH008W ICH008W
CALIB. REF: AH05-01 AH05-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Chloride-Cl	ND	5	4.77	95	5	4.77	95	0	90-110	20

8011

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G260

METHOD: METHOD 300.0

=====

MATRIX: WATER % MOISTURE: NA

DILUTION FACTOR: 1 1

SAMPLE ID: MBLK1W

LAB SAMP ID: ICH008WL ICH008WC

LAB FILE ID: AH05-03 AH05-04 AH05-05

DATE EXTRACTED: NA DATE COLLECTED: NA

DATE ANALYZED: 08/05/0512:15 08/05/0512:30 08/05/0512:44

PREP. BATCH: ICH008W ICH008W ICH008W

CALIB. REF: AH05-01 AH05-01 AH05-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Sulfate	ND	5	5.12	102	5	5.02	100	2	90-110	20

8012

0

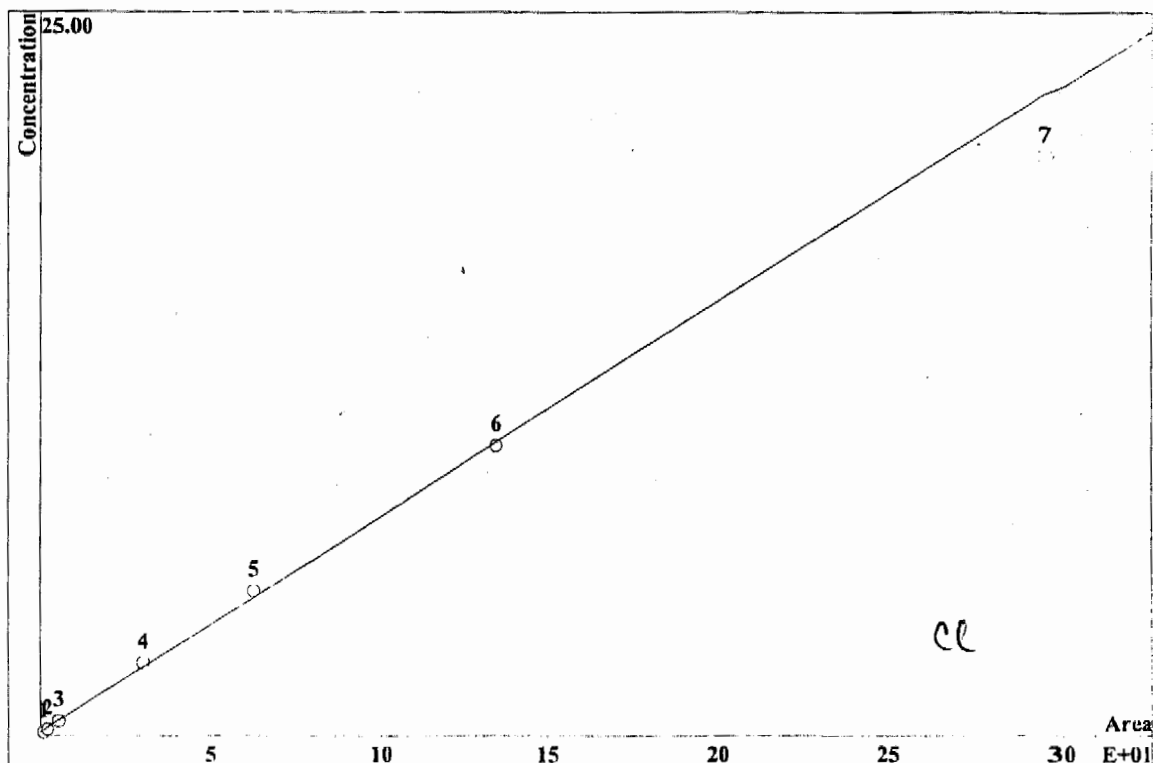
INITIAL CALIBRATIONS

IC Result Check FormVersion : QH1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH01-01	IB	FCIBNPS	0	0	0	0	0	0	0	p8011625	1
AH01-02	S0	FCIBNPS	0	0	0	0	0	0	0	p8011639	1
AH01-03	S1	FCIBNPS	0.18836	0.20113	0.17432	0.2216	0.23129	0.23666	0.21269	p8011653	1
AH01-04	S2	FCIBNPS	0.27278	0.28754	0.25434	0.31636	0.304	0.31331	0.2938	p8011707	1
AH01-05	S3	FCIBNPS	0.53025	0.54412	0.50474	0.57579	0.53797	0.52755	0.55595	p8011721	1
AH01-06	S4	FCIBNPS	2.3695	2.3621	2.3884	2.4564	2.3144	2.2205	2.46	p8011735	1
AH01-07	S5	FCIBNPS	4.8345	4.7729	4.9114	4.8164	4.7699	4.9004	4.8979	p8011749	1
AH01-08	S6	FCIBNPS	10.105	10.132	10.067	9.7475	10.142	10.102	9.8172	p8011803	1
AH01-09	S7	FCIBNPS	20.268	22.156	20.839	20.166	22.614	21.9	20.324	p8011818	1
AH01-10	ICV	FCIBNPS	95.6%	93.6%	92.2%	99.1%	93.3%	90.6%	98.5%	p8011832	1
AH01-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8011846	1
AH01-12	ICH001WB	FCIBNPS	0	0	0	0	0	0	0	p8011900	1
AH01-13	ICH001WL	FCIBNPS	4.8635	4.7236	4.6805	4.8835	4.6546	4.6229	4.7245	p8011914	1
AH01-14	ICH001WC	FCIBNPS	4.9057	4.722	4.6814	4.8697	4.6509	4.6182	4.7516	p8011928	1
AH01-15	G126-01T	FCIBNPS	1.1839	138.72	0	0	6.1591	0	65.298	p8012025	5
AH01-16	G126-02T	FCIBNPS	3.2244	215.94	0	1.2074	9.0006	0	192.41	p8012040	5
AH01-17	G126-03T	FCIBNPS	2.2603	137.59	0	0	5.4868	0	162.34	p8012054	5
AH01-18	G126-04T	FCIBNPS	4.9866	306.58	0	1.3846	14.847	0	244.28	p8012108	5
AH01-19	G126-06T	FCIBNPS	4.8433	139.79	0	0	7.0632	0	159.73	p8012122	5
AH01-20	G126-07T	FCIBNPS	1.8163	100.33	0	0	15.019	0	285.93	p8012136	10
AH01-21	G818-02	FCIBNPS	5.67	181.29	0	0	8.4455	0	86.102	p8012150	50
AH01-22	CCV1	FCIBNPS	97.7%	95.4%	98.2%	93.7%	94.5%	96.9%	90.9%	p8012204	1
AH01-23	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8012218	1
AH01-24	G818-02D	FCIBNPS	0	182.67	0	0	8.5372	0	85.987	p8012233	50
AH01-25	G818-02M	FCIBNPS	245.13	430.51	238.71	234.77	240.79	119.04	305.82	p8012247	50
AH01-26	G818-03	FCIBNPS	0	179.51	0	6.961	0	0	85.432	p8012301	50
AH01-27	G818-04	FCIBNPS	2.3845	69.544	0	0	3.6042	0	116.42	p8012315	20
AH01-28	G818-05	FCIBNPS	2.3472	74.139	0	0	3.8114	0	124.21	p8012329	20
AH01-29	G820-02	FCIBNPS	0	153.08	0	0	0	0	167.66	p8012343	200
AH01-30	G184-05	FCIBNPS	2.2847	11.049	0	0	4.0779	0	32.802	p8012357	20
AH01-31	G147-01	FCIBNPS	1.0454	13208	0	50.116	0	0	1977.7	p8020011	5
AH01-32	G147-02	FCIBNPS	0	13488	0	2.8757	0	0	2019.9	p8020025	5
AH01-33	CCV2	FCIBNPS	97.7%	108.6%	97.8%	93.6%	94.4%	93.3%	92.5%	p8020039	1
AH01-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8020053	1

CALIBRATION OF COMPONENT chloride

Method: IC100-H01.mtw
 Equation: $Q = 0.0743917 \cdot A + 0.117752$
 RSD: 5.386 %
 Correlation coefficient: 0.999287 ✓



K3 = 0 K2 = 0 K1 = 0.0743917 K0 = 0.117752
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

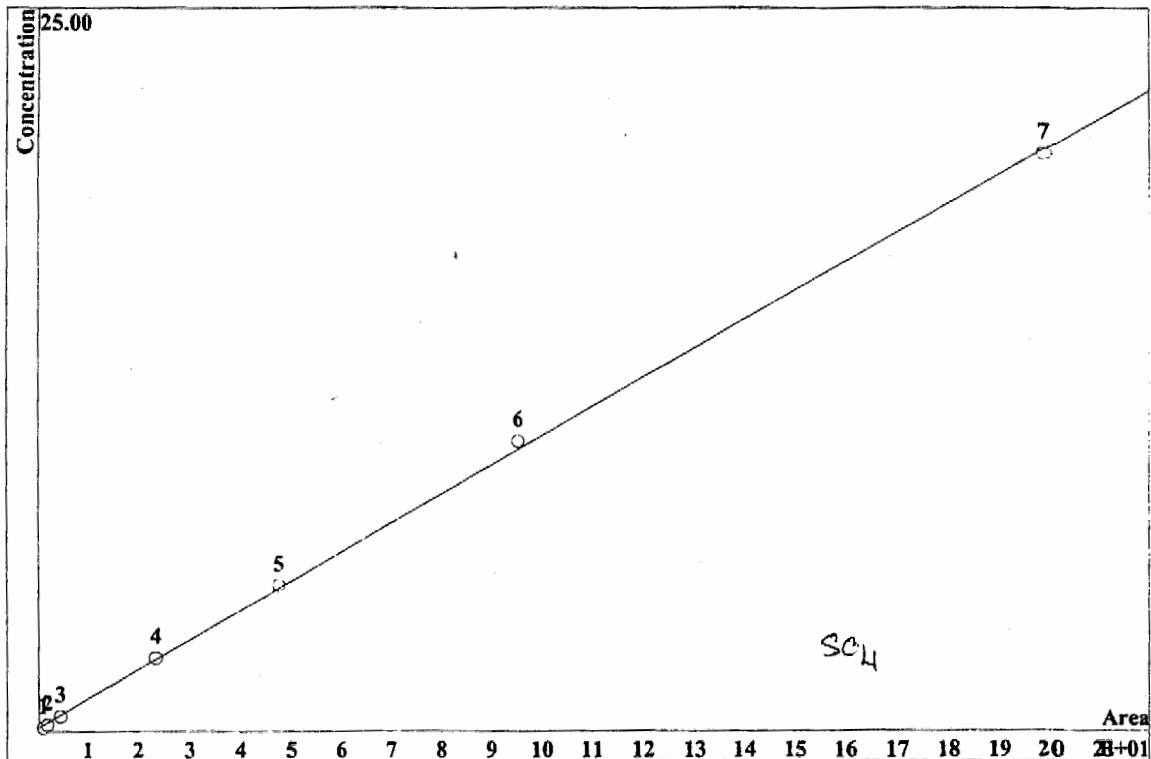
LR = 10

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.1281	1.121 ✓	0.1	1	3.37	Yes	p8011653.chw
2	0.2568	2.282 ✓	0.2	1	3.37	Yes	p8011707.chw
3	0.6501	5.731 ✓	0.5	1	3.37	Yes	p8011721.chw
4	3.457	30.17 ✓	2.5	1	3.37	Yes	p8011735.chw
5	7.342	62.58 ✓	5	1	3.37	Yes	p8011749.chw
6	16.29	134.6 ✓	10	1	3.37	Yes	p8011803.chw
7	36.06	296.2 x	20	1	3.37	No	p8011818.chw

4th 8/2/05
 8015

CALIBRATION OF COMPONENT sulfate

Method: IC100-H01.mtw
 Equation: $Q = 0.100694 \cdot A + 0.113285$
 RSD: 3.081 %
 Correlation coefficient: 0.999779



K3 = 0 K2 = 0 K1 = 0.100694 K0 = 0.113285
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

LP = 2.0

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.05823	0.9672	0.1	1	8.35	Yes	p8011653.chw
2	0.1026	1.793	0.2	1	8.35	Yes	p8011707.chw
3	0.2493	4.396	0.5	1	8.35	Yes	p8011721.chw
4	1.262	23.31	2.5	1	8.35	Yes	p8011735.chw
5	2.566	47.52	5	1	8.35	Yes	p8011749.chw
6	5.337	95.39	10	1	8.35	Yes	p8011803.chw
7	11.44	199.1	20	1	8.35	Yes	p8011818.chw

qu 8/2/05

***SECOND SOURCE
VERIFICATION***

IC Result Check FormVersion : QH1											
LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH01-01	IB	FCIBNPS	0	0	0	0	0	0	0	p8011625	1
AH01-10	ICV	FCIBNPS	95.6%	93.6%	92.2%	99.1%	93.3%	90.6%	98.5%	p8011832	1
AH01-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8011846	1
AH01-22	CCV1	FCIBNPS	97.7%	95.4%	98.2%	93.7%	94.5%	96.9%	90.9%	p8012204	1
AH01-23	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8012218	1
AH01-33	CCV2	FCIBNPS	97.7%	108.6%	97.8%	93.6%	94.4%	93.3%	92.5%	p8020039	1
AH01-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8020053	1

DAILY CALIBRATIONS

IC Result Check FormVersion : QH1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH05-01	CCV19	FCIBNPS	98%	98.3%	96.3%	100.1%	92.5%	102.2%	98.3%	p8051147	1
AH05-02	CCB19	FCIBNPS	0	0	0	0	0	0	0	p8051201	1
AH05-13	CCV20	FCIBNPS	98.7%	98.7%	96.1%	100.8%	93.8%	103.2%	97.8%	p8051437	1
AH05-14	CCB20	FCIBNPS	0	0	0	0	0	0	0	p8051451	1
AH05-25	CCV21	FCIBNPS	97.3%	95.8%	94.3%	97.2%	92.2%	101.8%	95.2%	p8051727	1
AH05-26	CCB21	FCIBNPS	0	0	0	0	0	0	0	p8051741	1
AH05-37	CCV22	FCIBNPS	98.8%	98.1%	95.8%	99.5%	93.3%	101.6%	96.1%	p8052018	1
AH05-38	CCB22	FCIBNPS	0	0	0	0	0	0	0	p8052032	1
AH05-43	CCV23	FCIBNPS	98.5%	97.4%	95%	96.2%	92.6%	102.8%	98.7%	p8052143	1
AH05-44	CCB23	FCIBNPS	0	0	0	0	0	0	0	p8052157	1

EXTRACTION LOG

ANALYSIS RUN LOG FOR IC

Book# A100 003

SOP # EMAX-300.0-Rev. 3 □ EMAX-300.1 Rev. No. 0 □ EMAX-9056 Rev. No. 2

Start Date: 02/01/05		Time: 16:25		End Date: 08/02/05		Time: 00:53							
Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes Conc = (mg/L)	Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Instrument No.	100
* 1	AH01-01	IB	1	W		* 26	AH01-26	G018-03	50	W		Date	02/01/05
* 2	02	00				* 27	27	04	20			Method File	IC100-1161.mhv
* 3	03	01			0.1 ppm	* 28	28	05	20			ICAL ID	010-01-2-01
* 4	04	02			0.2	* 29	29	G016-02	200			ICAL ID	010-01-2-01
* 5	05	03			0.5	* 30	30	G184-05	20			ICAL ID	010-01-2-01
* 6	06	04			2.5	* 31	31	G147-01	5			ICAL ID	010-01-2-01
* 7	07	05			5	* 32	32	02	5			ICAL ID	010-01-2-01
* 8	08	06			10	* 33	33	CCV1	1			ICAL ID	010-01-2-01
* 9	09	07			20	* 34	34	CCV2	1			ICAL ID	010-01-2-01
* 10	10	ICV				* 35						ICAL ID	010-01-2-01
* 11	11	ICB				* 36						ICAL ID	010-01-2-01
* 12	12	ICH01WP				* 37						ICAL ID	010-01-2-01
* 13	13	WL				* 38						ICAL ID	010-01-2-01
* 14	14	WL				* 39						ICAL ID	010-01-2-01
* 15	15	G126-01	5			* 40						ICAL ID	010-01-2-01
* 16	16	12				* 41						ICAL ID	010-01-2-01
* 17	17	13				* 42						ICAL ID	010-01-2-01
* 18	18	14				* 43						ICAL ID	010-01-2-01
* 19	19	15				* 44						ICAL ID	010-01-2-01
* 20	20	16				* 45						ICAL ID	010-01-2-01
* 21	21	G116-12	50			* 46						ICAL ID	010-01-2-01
* 22	22	CCV1	1			* 47						ICAL ID	010-01-2-01
* 23	23	CCB1	1			* 48						ICAL ID	010-01-2-01
* 24	24	G116-02D	50			* 49						ICAL ID	010-01-2-01
* 25	25	02M	50			* 50						ICAL ID	010-01-2-01

Analyzed By: al

This page is checked during data review.

** Sample Prep ID Prefix: JCH001W

* Sample Prep ID Prefix: JCH001W

ANALYSIS RUN LOG FOR IC

SOP ☒ EMAX-300.0-Rev. 3 ☐ EMAX-300.1 Rev. No.0 ☐ EMAX-9056 Rev. No. 2

Book# A100 003

Start Date: 08/05/05		Time: 11:47		End Date: 08/05/05		Time: 22:11	
Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	AH05-01	CCV19	1	W		* 26	AH05-16
* 2		CCB19				* 27	
* 3		ICH000WB				* 28	
* 4		WL				* 29	
* 5		WL				* 30	
* 6		G247-02	200			* 31	
* 7		03	50			* 32	
* 8		04	100			* 33	
* 9		05	100			* 34	
* 10		06	200			* 35	
* 11		07	50			* 36	
* 12		07	1000			* 37	
* 13		CCV20	1			* 38	
* 14		CCB20	1			* 39	
* 15		G039-07	20			* 40	
* 16		03				* 41	
* 17		03b				* 42	
* 18		03b1				* 43	
* 19		G200-01	10			* 44	
* 20		02	10			* 45	
* 21		03	20			* 46	
* 22		04				* 47	
* 23		05				* 48	
* 24		06				* 49	
* 25		CCV21	1			* 50	

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	CCV21	ICH000WB	1	W		* 26	CCV26
* 2		WL				* 27	
* 3		WL				* 28	
* 4		04				* 29	
* 5		05				* 30	
* 6		06				* 31	
* 7		07				* 32	
* 8		08				* 33	
* 9		09				* 34	
* 10		10				* 35	
* 11		11				* 36	
* 12		12				* 37	
* 13		13				* 38	
* 14		14				* 39	
* 15		15				* 40	
* 16		16				* 41	
* 17		17				* 42	
* 18		18				* 43	
* 19		19				* 44	
* 20		20				* 45	
* 21		21				* 46	
* 22		22				* 47	
* 23		23				* 48	
* 24		24				* 49	
* 25		25				* 50	

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	CCV21	ICH000WB	1	W		* 26	CCV26
* 2		WL				* 27	
* 3		WL				* 28	
* 4		04				* 29	
* 5		05				* 30	
* 6		06				* 31	
* 7		07				* 32	
* 8		08				* 33	
* 9		09				* 34	
* 10		10				* 35	
* 11		11				* 36	
* 12		12				* 37	
* 13		13				* 38	

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G260**

METHOD 350.2 AMMONIA (NH₃-N)

Six (6) water samples were received on 07/29/05 for Ammonia analysis by Method 350.2 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Matrix Spike

MS sample was not designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 350.2
AMMONIA (NH3-N)

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G260

Matrix : WATER
Instrument ID : 170

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	NHH003WB	ND	1	NA	.1	.03	08/11/0515:11	08/11/0509:30	NHH003W-12	NHH003W-10	NHH003W	NA	08/11/05
LCS1W	NHH003WL	1.01	1	NA	.1	.03	08/11/0515:12	08/11/0509:30	NHH003W-13	NHH003W-10	NHH003W	NA	08/11/05
LCD1W	NHH003WC	1.03	1	NA	.1	.03	08/11/0515:13	08/11/0509:30	NHH003W-14	NHH003W-10	NHH003W	NA	08/11/05
MW-21-5	G260-01	ND	1	NA	.1	.03	08/11/0515:24	08/11/0509:30	NHH003W-25	NHH003W-22	NHH003W	07/26/05	07/29/05
MW-21-4	G260-02	ND	1	NA	.1	.03	08/11/0515:25	08/11/0509:30	NHH003W-26	NHH003W-22	NHH003W	07/26/05	07/29/05
MW-21-3	G260-03	ND	1	NA	.1	.03	08/11/0515:26	08/11/0509:30	NHH003W-27	NHH003W-22	NHH003W	07/26/05	07/29/05
MW-21-2	G260-04	ND	1	NA	.1	.03	08/11/0515:27	08/11/0509:30	NHH003W-28	NHH003W-22	NHH003W	07/26/05	07/29/05
MW-21-1	G260-05	.159	1	NA	.1	.03	08/11/0515:28	08/11/0509:30	NHH003W-29	NHH003W-22	NHH003W	07/26/05	07/29/05
DUPE-4-7/26/2005	G260-06	ND	1	NA	.1	.03	08/11/0515:29	08/11/0509:30	NHH003W-30	NHH003W-22	NHH003W	07/26/05	07/29/05

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 350.2
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G260
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: NHH003WL/C

DATE RECEIVED: 08/11/05
DATE EXTRACTED: 08/11/05 09:30
DATE ANALYZED: 08/11/05 15:12/15:13

ACCESSION:

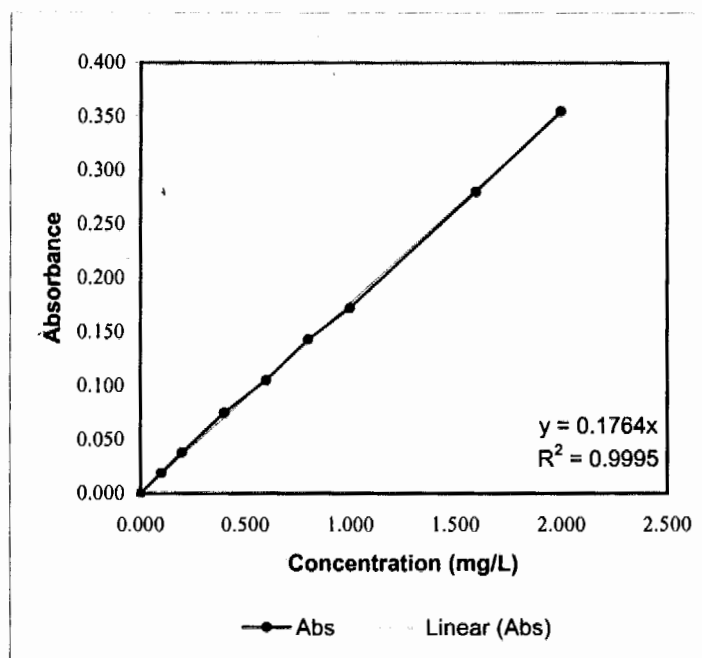
PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Ammonia (NH3-N)	ND	1.00	1.01	101	1.00	1.03	103	2	80-120	20

8026

8026

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.019
0.200	0.038
0.400	0.075
0.600	0.105
0.800	0.143
1.000	0.172
1.600	0.280
2.000	0.355



R^2 0.999524

y 0.1764

CF 5.6694

Comments: **PASSED**

Analyzed by: NT/LA

8027

ANALYSIS LOG FOR AMMONIA-N

Book # A70-NH₃-005SOP ☒ EMAX-350.2 Rev.No.2 ☐ EMAX-350.1 ☐ Rev.No.0 ☐

Starting Date: 8-11-08 Time: 15:40 Ending Date: 8-11-08 Time: 15:32

Data File Name	Prep. Batch	Lab Sample ID	Matrix S W	Time	Vol. Colored (ml)	DF	Absorbance	Notes	Instrument No: 70	ID	Wavelength: 425 nm
* 1	NH4003W	5-0.0		15:08	20	1	0.000				
* 2		5-0.1		-01			0.019				
* 3		5-0.2		-02			0.048				
* 4		5-0.4		-03			0.075				
* 5		5-0.6		-04			0.105				
* 6		5-0.8		-05			0.143				
* 7		5-1.0		-06			0.172				
* 8		5-1.6		-07			0.240				
* 9		5-2.0		-08			0.355				
* 10		10.1		-09			0.140	1.02			
* 1		10.13		-10			0.000	ND			
* 2		NH4003WB		-11			0.000	NP			
* 3		WL		-12			0.178	1.009			
* 4		WL		-13			0.182	1.032			
* 5		NH400-01		-14			0.012	NP			
* 6		-02		-15			0.011	NP			
* 7		-03		-16			0.027	0.153			
* 8		-04		-17			0.021	0.119			
* 9		-06		-18			0.008	ND			
* 10		NH400-01		-19			0.016	NP			
* 1		↓ -01D		-20			0.016	NP			
* 2		0001		-21			0.178	0.964			
* 3		00131		-22			0.000	NP			
* 4		NH400-01M		-23			0.190	1.077			
* 5		6200-01		-24			0.005	NP			
* 6		-02		-25			0.009	ND			
* 7		-03		-26			0.006	ND			
* 8		-00		-27			0.016	NP			
* 9		-05		-28			0.028	0.199			
* 10		-04		-29			0.016	NP			

ANALYTICAL BATCH * NH4003W

Standard Curve

R	0.9996
Y	0.1764
CF	50694

Comments:

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By:

NT/LA

This page is checked during data review.

ANALYSIS LOG FOR AMMONIA-N

Book # A70-NH₃-005

SOP # EMAX-350.2 Rev. No. 2 □ EMAX-350.1 □ Rev. No. 0 □

Starting Date: 8-11-05 Time: 15:00 Ending Date: 8-11-05 Time: 19:32

Data File Name	Prep. Batch	Lab Sample ID	Matrix S	W	Time	Vol. Colored (ml)	DF	Absorbance	Notes
* 1	11110034	11110034			15:34	20	1	0.020	mg/L
* 2		CCV2			15:31	1	1	0.182	0.181
* 3		CCV2			15:32	1	1	0.000	1.092
* 4									AD
* 5									
* 6									
* 7									
* 8									
* 9									
* 0									
* 1									
* 2									
* 3									
* 4									
* 5									
* 6									
* 7									
* 8									
* 9									
* 0									
* 1									
* 2									
* 3									
* 4									
* 5									
* 6									
* 7									
* 8									
* 9									
* 0									

Instrument No: 70	ID	Wavelength: 425 nm
S ₀	Sumid 00 19.73	0.0
S ₁		0.1
S ₂		0.2
S ₃		0.4
S ₄		0.6
S ₅		0.8
S ₆		1.0
S ₇		1.6
S ₈		2.0
ICV/MS		1.0
CCV		1.0
LCS		1.0
Reagent	ID	
Color Reagent		

Standard Curve
R 0.9995
Y 0.1762
CF 5.6694

Comments:

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By: NT/LA

ANALYTICAL BATCH * 11110034

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-006

SOP □ EMAX-350.2 Rev. No.: 2 □ EMAX-351.3 Rev. No.: 2 □

Start Date 8-11-05 Time 9:30 End Date 8-11-05 Time 14:00

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	5-0.0	9.6	0.1	10	5	100	100		ICV/MS	5W08-03-181	10ml/0.1
*02	5-0.1								LCS	5-179	10ml/0.1
*03	5-1.0								Reagent	Lot# / ID	
*04	5-2.0								NaOH	5W08-06-211	
*05	100								Digestion Mixture	NA	
*06	100								Borate Buffer		
*07	1111003003								H ₃ BO ₃	5W08-06-222	
*08	1111003003								Distilling Soln.	NA	
*09	1111003003		0.1						Comments:		
*10	1111003003		0.7								
*11	1111003003		0.8								
*12	1111003003		0.8								
*13	1111003003		0.9								
*14	1111003003		0.7								
*15	1111003003		0.8								
*16	1111003003		0.9								
*17	1111003003		0.8								
*18	1111003003		0.9								
*19	1111003003		0.8								
*20	1111003003		0.7								
*21	1111003003		0.8								
*22	1111003003		0.9								
*23	1111003003		0.7								
*24	1111003003	9.5	0.8								
*25	1111003003	NT									
*26	1111003003										

Prepared By: NT/LA

Standard Added By: NT

Checked By:

PREPARATION BATCH *

1111003003

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G260**

METHOD 120.1 SPECIFIC CONDUCTIVITY

Six (6) water samples were received on 07/29/05 for Specific Conductivity analysis by Method 120.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

3. Duplicate

Sample G260-05 was analyzed for duplicate. %RPD was within QC limit.

4. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 120.1
SPECIFIC CONDUCTIVITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G260

Matrix : WATER
Instrument ID : 129

SAMPLE ID	EMAX SAMPLE ID	RESULTS (umhos/cm)	DLF	MOIST	RL (umhos/cm)	MDL (umhos/cm)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
LCS1W	ECH002WL	518	1	NA	1	.5	08/09/0515:12	NA	ECH002W-02	NA	ECH002W	NA	NA
LCD1W	ECH002WC	516	1	NA	1	.5	08/09/0515:14	NA	ECH002W-03	NA	ECH002W	NA	NA
MW-21-5	G260-01	808	1	NA	1	.5	08/09/0515:16	NA	ECH002W-04	NA	ECH002W	07/26/05	07/29/05
MW-21-4	G260-02	761	1	NA	1	.5	08/09/0515:18	NA	ECH002W-05	NA	ECH002W	07/26/05	07/29/05
MW-21-3	G260-03	1160	1	NA	1	.5	08/09/0515:20	NA	ECH002W-06	NA	ECH002W	07/26/05	07/29/05
MW-21-2	G260-04	1290	1	NA	1	.5	08/09/0515:22	NA	ECH002W-07	NA	ECH002W	07/26/05	07/29/05
MW-21-1	G260-05	988	1	NA	1	.5	08/09/0515:24	NA	ECH002W-08	NA	ECH002W	07/26/05	07/29/05
MW-21-1DUP	G260-05D	988	1	NA	1	.5	08/09/0515:26	NA	ECH002W-09	NA	ECH002W	07/26/05	07/29/05
DUPE-4-7/26/2005	G260-06	1160	1	NA	1	.5	08/09/0515:28	NA	ECH002W-10	NA	ECH002W	07/26/05	07/29/05

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: 120.1

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05G260

SAMPLE ID: LCS1W/LCD1W

CONTROL NO.: ECH002WL/C

DATE RECEIVED: NA

DATE EXTRACTED: NA

DATE ANALYZED: 08/09/05 15:12/15:14

ACCESSION:

PARAMETER	BLNK RSLT (umhos/cm)	SPIKE AMT (umhos/cm)	BS RSLT (umhos/cm)	BS % REC	SPIKE AMT (umhos/cm)	BSD RSLT (umhos/cm)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Specific Conductivity	ND	510.00	518.00	102	510.00	516.00	101	0	80-120	20

8033

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 120.1
MATRIX: WATER
% MOISTURE: NA
=====

BATCH NO.: 05G260
SAMPLE ID: MW-21-1DUP
CONTROL NO.: G260-05D
DATE RECEIVED: 07/29/05
DATE EXTRACTED: NA
DATE ANALYZED: 08/09/05 15:26

ACCESSION:

PARAMETER	SAMPLE (Umhos/cm)	DUP. SAMPLE (Umhos/cm)	RPD (%)	RPD LIMIT (%)
Specific Conductivity	988.00	988.00	0	5

8034

ANALYSIS LOG FOR SPECIFIC CONDUCTIVITY

SOP ☒ EMAX-120.1 Revision No. 1 ☐ Start Date 8/9/05 Time 1500 End Date 8/9/05 Time 1624 Book # AEC-003

Data File Name	Lab Sample ID	Time	Temp. °C	Temp. Correction Factor QT @ 25 °C	DF	Measured Resistance (ohms)	Notes
* 1	STDLOW 141	1510	22.9	0.960	1	446.8	EC @ 25°C
* 2	EC #002 W/L	17	22.8	0.956	1	538	umhos/cm
* 3	WC	14	↓	↓	1	536	518
* 4	G260-01	16	23.3	0.968	1	849	808
* 5	-02	18	23.6	0.973	1	864	761
* 6	-03	20	↓	↓	1	1222	1157 ± 1160
* 7	-04	22	↓	↓	1	1359	1286 ± 1290
* 8	-05	24	23.5	0.971	1	1042	988
* 9	-050	26	↓	↓	1	1042	988
* 10	G260-06	28	↓	↓	1	1223	1160
* 1	G265-01	30	22.2	0.947	1	2168	2110
* 2	-02	32	↓	↓	1	2160	2100
* 3	-03	34	22.0	0.943	1	1940	1895 ± 1900
* 4	-04	36	↓	↓	1	7240	7070
* 5	-05	38	23.0	0.962	1	14360	13,691 ± 13700
* 6	-06	40	22.8	0.956	1	1811	1745 ± 1750
* 7	-07	42	↓	↓	1	9454	9108 ± 9110
* 8	-07b	44	↓	↓	1	9455	9110
* 9	-08	46	22.2	0.947	1	12700	12351 ± 12300
* 20	STD HIGH 14130	75 48	22.7	0.959	1	14690	14110

ANALYTICAL BATCH * ECH 002 W

Trial	ID	Resistance ohms
KCl Standard	SW1A-02-55	Assay
1	SW3B-02-652	700.3
2	QT = 0.931	
3		
LCS	SW7A-06-146	510 umhos/cm

Calibration Temperature	21.4 °C
True Value	1413
Cell Constant (C)	0.921

KCl Standard	ID	umhos/cm
Low-point	SW3B-02-127	141.3
Mid-point	SW3B-06-13160	3530
High-point	SW3B-02-115	14130

Comments:

Analyzed By: NB/JK

7200 →

This page is checked during the data review process.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G260**

METHOD SM3500 FERROUS IRON

Six (6) water samples were received on 07/29/05 for Ferrous Iron analysis by Method SM3500 in accordance with "Standard Methods for the Examination of Water and Wastewater", 18th edition (1990).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample

Lab control result was within QC limit.

4. Duplicate

Sample G260-06 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

SM3500
FERROUS IRON

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G260

Matrix : WATER
Instrument ID : 170

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	FEG005WB	ND	1	NA	5	2.5	07/29/0515:38	NA	FEG005W-09	FEG005W-07	FEG005W	NA	NA
LCS1W	FEG005WL	19.9	1	NA	5	2.5	07/29/0515:39	NA	FEG005W-10	FEG005W-07	FEG005W	NA	NA
NW-21-5	G260-01	ND	1	NA	5	2.5	07/29/0515:40	NA	FEG005W-11	FEG005W-07	FEG005W	07/26/05	07/29/05
NW-21-4	G260-02	ND	1	NA	5	2.5	07/29/0515:41	NA	FEG005W-12	FEG005W-07	FEG005W	07/26/05	07/29/05
NW-21-3	G260-03	ND	1	NA	5	2.5	07/29/0515:42	NA	FEG005W-13	FEG005W-07	FEG005W	07/26/05	07/29/05
NW-21-2	G260-04	ND	1	NA	5	2.5	07/29/0515:43	NA	FEG005W-14	FEG005W-07	FEG005W	07/26/05	07/29/05
NW-21-1	G260-05	ND	1	NA	5	2.5	07/29/0515:44	NA	FEG005W-15	FEG005W-07	FEG005W	07/26/05	07/29/05
DUPE-4-7/26/2005	G260-06	ND	1	NA	5	2.5	07/29/0515:45	NA	FEG005W-16	FEG005W-07	FEG005W	07/26/05	07/29/05
DUPE-4-7/26/2005	G260-06D	ND	1	NA	5	2.5	07/29/0515:46	NA	FEG005W-17	FEG005W-07	FEG005W	07/26/05	07/29/05

EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: SM3500

MATRIX: WATER

% MOISTURE: NA

DATE RECEIVED: NA

DATE EXTRACTED: NA

DATE ANALYZED: 07/29/05 15:39

BATCH NO.: 05G260

SAMPLE ID: LCS1W

CONTROL NO.: FEG005WL

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	LCS RSLT (mg/L)	LCS % REC	QC LIMIT (%)
Ferrous Iron	ND	20.00	19.90	99	80-120

8038

OK

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: SM3500

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05G260
 SAMPLE ID: DUPE-4-7/26/2005
 CONTROL NO.: G260-060

DATE RECEIVED: 07/29/05

DATE EXTRACTED: NA

DATE ANALYZED: 07/29/05 15:46

ACCESSION:

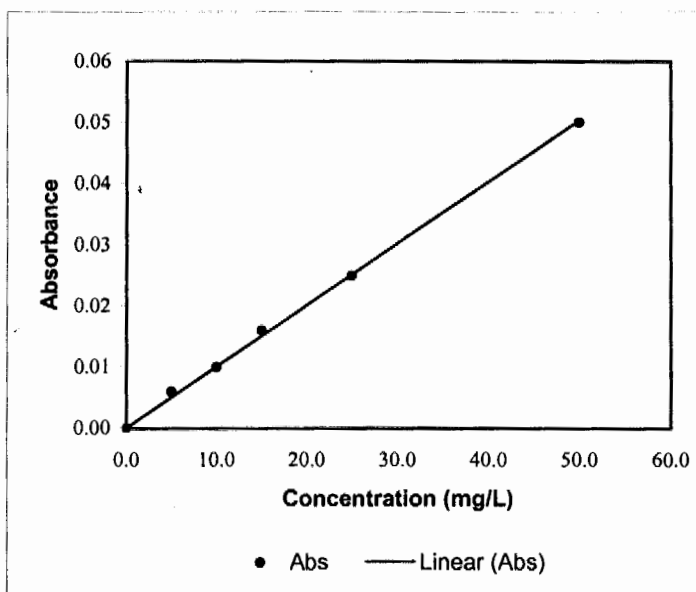
PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Ferrous Iron	ND	ND	0	20

8039

21

CALIBRATION CURVE FERROUS FE

Conc.	Abs
0.0	0.000
5.0	0.006
10.0	0.010
15.0	0.016
25.0	0.025
50.0	0.050



R ²	0.9993
Eq.Line	0.0010
CF	994.2775

Comments: **PASSED**

Analyzed by: LA

ANALYSIS LOG FOR FERROUS IRON

Page 40

SOP ☒ EMAX-3500-Fe D/C Rev. No. 0 ☐ Starting Date 07-29-05 Time 15:30 Ending Date 07-29-05 Time 15:48 Book # A70-Fe D/C-001

Data File Name	Preparative Batch	Lab Sample ID	Matrix		Sample Amount (ml)	DF	Abs. (510 nm)	Time	Ferrous Iron (mg/L)	Notes	Instrument No.: 70		Wavelength: 510 nm
			S	W							Standard	ID	
* 1	FEQ00540	S-010			50	1	0.000	15:30					Conc. (mg/L)
* 2		S-5					0.006	15:31					0.0
* 3		S-10					0.010	15:32					5
* 4		S-15					0.016	15:33					10
* 5		S-25					0.025	15:34					15
* 6		S-50					0.050	15:35					25
* 7		ICV					0.019	15:36	18.89				50
* 8		ICB					0.000	15:37	ND				20
* 9		FEQ00540B					0.000	15:38	ND				20
* 0		↓ WL					0.020	15:39	19.89				
* 1		G260-01					0.003	15:40	ND				
* 2		-02					0.004	15:41	ND				
* 3		-03					0.001	15:42	ND				
* 4		-04					0.003	15:43	ND				
* 5		-05					0.002	15:44	ND				
* 6		-06					0.002	15:45	ND				
* 7		-060					0.002	15:46	ND				
* 8		CCV					0.020	15:47	19.89				
* 9		CCB					0.000	15:48	ND				
* 0													
* 1													
* 2													
* 3													
* 4													
* 5													
* 6													
* 7													
* 8													
* 9													
* 0													

Standard Curve	
R (≤0.995)	0.9993
Y	0.0010
CF	994.2175

Comments:	
Analyzed By: <u>AK</u>	
Disposal Date:	

ANALYTICAL BATCH * FEQ00540

This page is checked during data review.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G260**

METHOD 351.3 TKN

Six (6) water samples were received on 07/29/05 for TKN analysis by Method 351.3 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G260-05 was analyzed for duplicate. %RPD was within QC limit.

5. Matrix Spike

Sample G260-05 was spiked. %Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 351.3

TKN

Client : BATTELLE MEMORIAL INSTITUTE
 Project : JPL
 Batch No. : 05G260

Matrix : WATER
 Instrument ID : I70

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MELK1W	KNH004WB	ND	1	NA	.1	.035	08/11/0516:10	08/11/0510:30	KNH004W-11	KNH004W-09	KNH004W	NA	08/11/05
LCS1W	KNH004WL	1.02	1	NA	.1	.035	08/11/0516:11	08/11/0510:30	KNH004W-12	KNH004W-09	KNH004W	NA	08/11/05
LCD1W	KNH004WC	1.01	1	NA	.1	.035	08/11/0516:12	08/11/0510:30	KNH004W-13	KNH004W-09	KNH004W	NA	08/11/05
MW-21-5	G260-01	.420	1	NA	.1	.035	08/11/0516:13	08/11/0510:30	KNH004W-14	KNH004W-09	KNH004W	07/26/05	07/29/05
MW-21-4	G260-02	.514	1	NA	.1	.035	08/11/0516:14	08/11/0510:30	KNH004W-15	KNH004W-09	KNH004W	07/26/05	07/29/05
MW-21-3	G260-03	.567	1	NA	.1	.035	08/11/0516:15	08/11/0510:30	KNH004W-16	KNH004W-09	KNH004W	07/26/05	07/29/05
MW-21-2	G260-04	.577	1	NA	.1	.035	08/11/0516:16	08/11/0510:30	KNH004W-17	KNH004W-09	KNH004W	07/26/05	07/29/05
MW-21-1	G260-05	.430	1	NA	.1	.035	08/11/0516:17	08/11/0510:30	KNH004W-18	KNH004W-09	KNH004W	07/26/05	07/29/05
MW-21-1DUP	G260-05D	.483	1	NA	.1	.035	08/11/0516:18	08/11/0510:30	KNH004W-19	KNH004W-09	KNH004W	07/26/05	07/29/05
MW-21-1MS	G260-05M	1.43	1	NA	.1	.035	08/11/0516:19	08/11/0510:30	KNH004W-20	KNH004W-09	KNH004W	07/26/05	07/29/05
DUPE-4-7/26/2005	G260-06	.745	1	NA	.1	.035	08/11/0516:22	08/11/0510:30	KNH004W-23	KNH004W-21	KNH004W	07/26/05	07/29/05

8043

ENAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 351.3
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G260
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: KNH004W/C

DATE RECEIVED: 08/11/05
DATE EXTRACTED: 08/11/05 10:30
DATE ANALYZED: 08/11/05 16:11/16:12

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TKN	ND	1.00	1.02	102	1.00	1.01	101	1	80-120	20

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 351.3
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G260
SAMPLE ID: MW-21-1MS
CONTROL NO.: G260-05M

DATE RECEIVED: 07/29/05
DATE EXTRACTED: 08/11/05 10:30
DATE ANALYZED: 08/11/05 16:19

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
TKN	.43	1.00	1.43	100	75-125

8045

5

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 351.3
MATRIX: WATER
% MOISTURE: NA
=====

BATCH NO.: 05G260
SAMPLE ID: MW-21-1DUP
CONTROL NO.: G260-05D
DATE RECEIVED: 07/29/05
DATE EXTRACTED: 08/11/05 10:30
DATE ANALYZED: 08/11/05 16:18

ACCESSION:

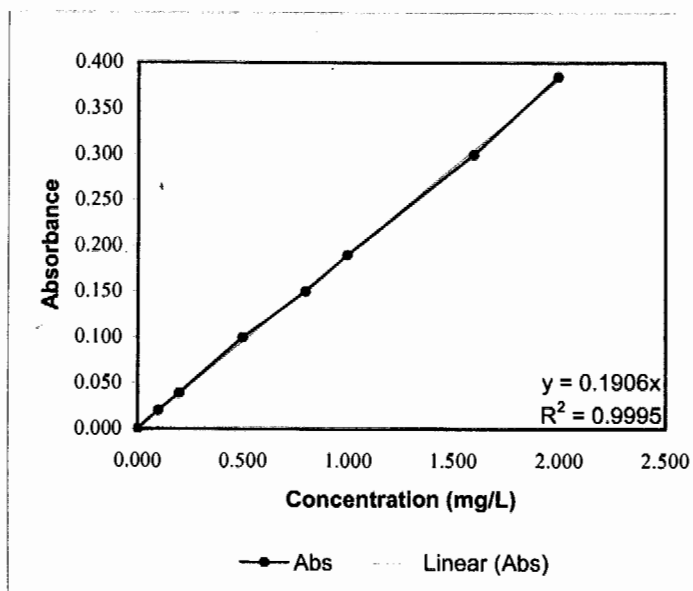
PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
TKN	.43	.483	12	20

8046

OK

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.020
0.200	0.039
0.500	0.100
0.800	0.150
1.000	0.190
1.600	0.300
2.000	0.385



R^2	0.999494
y	0.1906
CF	5.2476

Comments: **PASSED**

K191

Analyzed by: NT/LA

ANALYSIS LOG FOR TOTAL KJELDAHL NITROGEN (TKN)

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Book # A70-KN-004

SOP # EMAX-351.3 Rev. No. 1

Start Date: 8/11/05

Time: 16:00

End Date: 8/11/05

Time: 16:30

Data File Name	Prep. Batch	Lab Sample ID	Matrix		Time	Vol. Colored (ml)	DF	Absorbance	Notes mg/L	Instrument No: 70		Wavelength: 425 nm
			S	W						Standard	ID	
* 1	KNH004W	S-0			16:00	2.0	1	0.000		S ₀	SW2B-03-182	0.0
* 2		0.1			01			0.020		S ₁		0.1
* 3		0.2			02			0.039		S ₂		0.2
* 4		0.5			03			0.100		S ₃		0.5
* 5		0.8			04			0.150		S ₄		0.8
* 6		1.0			05			0.190		S ₅		1.0
* 7		1.6			06			0.300		S ₆		1.6
* 8		2.0			07			0.385		S ₇		2.0
* 9		ICV			08			0.197	1034			
* 10		ICB			09	NT		0.0800	ND			
* 11		KNH004WB	✓		10	8mls		0.09800	ND		SW2B-03-181	1.0
* 12		WL			11			0.194	1.018			1.0
* 13		WC			12			0.192	1.008			1.0
* 14		G260-01			13			0.080	0.420			
* 15		02			14			0.098	0.514			
* 16		03			15			0.108	0.567		SW7A-06-141	
* 17		04			16			0.110	0.577			
* 18		05			17			0.082	0.430			
* 19		05D			18			0.092	0.483			
* 20		05H	✓		19			0.273	0.908			
* 21		CCV1			20			0.194	1.018			
* 22		CCB1			21			0.000	ND			
* 23		G260-06	✓		22			0.142	0.745			
* 24		H006-01			23			0.074	0.388			
* 25		02			24			0.080	0.440			
* 26		03			25			0.100	0.525			
* 27		04			26			0.068	0.357			
* 28		05			27			0.112	0.588			
* 29		H418-02	✓		28			0.164	0.861			
* 30		CCV2			29			0.192	1.008			
* 31		CCB2			30			0.000	ND			

ANALYTICAL BATCH * KNH004W

NT 8/11/05

Analyzed By: NT/LA

This page is checked during data review.

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-006

SOP □ EMAX-350.2 Rev. No.: 2 □ EMAX-351.3 Rev. No.: 2 □

Start Date 8/11/05 Time 10:30 End Date 8/11/05 Time 15:30

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	S-0	9.5	10	5	4	50	50		ICV/MS	SW2B-03-181	5mL of 10ppm
*02	↓ 0.1								LCS	↓	178 50mL
*03	↓ 1.0								Reagent	Lot# / ID	
*04	↓ 2.0								NaOH	N/A	
*05	ICV								Digestion Mixture	SW7A-06-204	
*06	ICB								Borate Buffer	↓	152
*07	KNH004WB								H ₃ BO ₃	SW7B-06-322	
*08	↓ WL								Distilling Soln.	↓	331
*09	↓ WC								Comments:		
*10	G260-01										
*11	02										
*12	03										
*13	04										
*14	05										
*15	05D										
*16	05M										
*17	06										
*18	4006-01										
*19	02										
*20	03										
*21	04										
*22	05										
*23	418-02										
*24											
*25											
*26											

Preparation Batch * KNH004W

Prepared By: NT/LA
Standard Added By: NT/LA
Checked By: _____

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G260**

METHOD 415.1 DISSOLVED ORGANIC CARBON

Six (6) water samples were received on 07/29/05 for Dissolved Organic Carbon analysis by Method 415.1 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Method", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No Duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G260

Matrix : WATER
Instrument ID : 62

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE TIME	Extraction DATE TIME	LFID	CAL REF	PREP BATCH	Collection DATE TIME	Received DATE TIME
MBLK1W	TCH007WB	ND	1	NA	1	.5	08/08/0519:25	NA	TCH006-36	TCH006-26	TCH007W	NA	NA
LCS1W	TCH007WL	24.8	1	NA	1	.5	08/08/0519:36	NA	TCH006-37	TCH006-26	TCH007W	NA	NA
LCD1W	TCH007WC	24.8	1	NA	1	.5	08/08/0520:06	NA	TCH006-40	TCH006-38	TCH007W	NA	NA
MM-21-5	G260-01	2.38	1	NA	1	.5	08/08/0523:18	NA	TCH006-60	TCH006-49	TCH007W	07/26/05	07/29/05
MM-21-4	G260-02	2.48	1	NA	1	.5	08/08/0523:46	NA	TCH006-63	TCH006-61	TCH007W	07/26/05	07/29/05
MM-21-3	G260-03	3.29	1	NA	1	.5	08/08/0523:56	NA	TCH006-64	TCH006-61	TCH007W	07/26/05	07/29/05
MM-21-2	G260-04	8.44	1	NA	1	.5	08/09/0500:05	NA	TCH006-65	TCH006-61	TCH007W	07/26/05	07/29/05
MM-21-1	G260-05	4.18	1	NA	1	.5	08/09/0500:14	NA	TCH006-66	TCH006-61	TCH007W	07/26/05	07/29/05
DUPE-4-7/26/2005	G260-06	3.04	1	NA	1	.5	08/09/0500:24	NA	TCH006-67	TCH006-61	TCH007W	07/26/05	07/29/05

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G260

METHOD: 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: TCH007WL
LAB FILE ID: TCH006-37
DATE EXTRACTED: NA
DATE ANALYZED: 08/08/0519:25
PREP. BATCH: TCH007W
CALIB. REF: TCH006-26

% MOISTURE: NA
DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

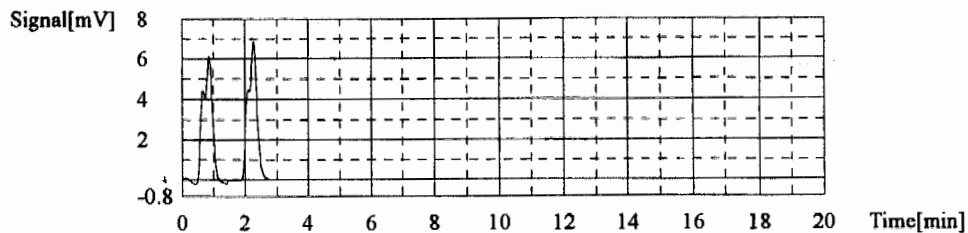
PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
DOC	ND	25	24.8	99	25	24.8	99	0	80-120	20

	Type	Analysis	Sample Name	Sample ID	Object	Origin	Dilution	Result	Notes	Comment
1	Standard	NPOC	ICAL	TCH006-1	0A-12	C:\Progra	1.000			
2	Control	NPOC	ICV	TCH006-2	0A-12	C:\Progra	1.000	NPOC:24.34 m	Control valu	
3	Unknown	NPOC	ICB	TCH006-3	0A-12	C:\Progra	1.000	NPOC:0.3346		
4	Unknown	NPOC	HCO3/CO3	TCH006-4	0A-12	C:\Progra	1.000	NPOC:0.6327		
5	Unknown	NPOC	TCH006WB	TCH006-5	0A-12	C:\Progra	1.000	NPOC:0.05212		
6	Unknown	NPOC	TCH006WL	TCH006-6	0A-12	C:\Progra	1.000	NPOC:24.37 m		
7	Unknown	NPOC	TCH006WC	TCH006-7	0A-12	C:\Progra	1.000	NPOC:24.43 m		
8	Unknown	NPOC	05G218-01	TCH006-8	0A-12	C:\Progra	1.000	NPOC:1.828 m		DOC
9	Unknown	NPOC	05G218-02	TCH006-9	0A-12	C:\Progra	1.000	NPOC:5.383 m		DOC
10	Unknown	NPOC	05G218-03	TCH006-10	0A-12	C:\Progra	1.000	NPOC:2.081 m		DOC
11	Unknown	NPOC	05G218-04	TCH006-11	0A-12	C:\Progra	1.000	NPOC:3.346 m		DOC
12	Unknown	NPOC	05G218-05	TCH006-12	0A-12	C:\Progra	1.000	NPOC:1.735 m		DOC
13	Unknown	NPOC	05G218-06	TCH006-13	0A-12	C:\Progra	1.000	NPOC:5.865 m		DOC
14	Control	NPOC	CCV1	TCH006-14	0A-12	C:\Progra	1.000	NPOC:24.49 m	Control valu	
15	Unknown	NPOC	CCB1	TCH006-15	0A-12	C:\Progra	1.000	NPOC:0.05638		
16	Unknown	NPOC	05G218-06D	TCH006-16	0A-12	C:\Progra	1.000	NPOC:3.477 m		DOC
17	Unknown	NPOC	05G218-06M	TCH006-17	0A-12	C:\Progra	1.000	NPOC:26.86 m		DOC
18	Unknown	NPOC	05G219-02	TCH006-18	0A-12	C:\Progra	1.000	NPOC:8.670 m		
19	Unknown	NPOC	05G219-03	TCH006-19	0A-12	C:\Progra	1.000	NPOC:33.09 m		
20	Unknown	NPOC	05G219-04	TCH006-20	0A-12	C:\Progra	1.000	NPOC:25.47 m		
21	Unknown	NPOC	05G219-05	TCH006-21	0A-12	C:\Progra	1.000	NPOC:17.95 m		
22	Unknown	NPOC	05G231-02	TCH006-22	0A-12	C:\Progra	1.000	NPOC:9.674 m		
23	Unknown	NPOC	05G231-02D	TCH006-23	0A-12	C:\Progra	1.000	NPOC:9.472 m		
24	Unknown	NPOC	05G231-02M	TCH006-24	0A-12	C:\Progra	1.000	NPOC:32.75 m		
25	Unknown	NPOC	05G231-03	TCH006-25	0A-12	C:\Progra	1.000	NPOC:333.6 m		
26	Control	NPOC	CCV2	TCH006-26	0A-12	C:\Progra	1.000	NPOC:25.70 m	Control valu	
27	Unknown	NPOC	CCB2	TCH006-27	0A-12	C:\Progra	1.000	NPOC:0.2423		
28	Unknown	NPOC	05G231-04	TCH006-28	0A-12	C:\Progra	1.000	NPOC:25.80 m		
29	Unknown	NPOC	05G231-05	TCH006-29	0A-12	C:\Progra	1.000	NPOC:18.82 m		
30	Unknown	NPOC	05G231-06	TCH006-30	0A-12	C:\Progra	1.000	NPOC:30.00 m		
31	Unknown	NPOC	05G231-07	TCH006-31	0A-12	C:\Progra	1.000	NPOC:30.21 m		
32	Unknown	NPOC	05G231-08	TCH006-32	0A-12	C:\Progra	1.000	NPOC:8.969 m		
33	Unknown	NPOC	05G839-02	TCH006-33	0A-12	C:\Progra	1.000	NPOC:1.293 m		
34	Unknown	NPOC	05G839-03	TCH006-34	0A-12	C:\Progra	1.000	NPOC:2.031 m		
35	Unknown	NPOC	05G842-02	TCH006-35	0A-12	C:\Progra	1.000	NPOC:2.845 m		
36	Unknown	NPOC	TCH007WB	TCH006-36	0A-12	C:\Progra	1.000	NPOC:0.3662		
37	Unknown	NPOC	TCH007WL	TCH006-37	0A-12	C:\Progra	1.000	NPOC:24.84 m		
38	Control	NPOC	CCV3	TCH006-38	0A-12	C:\Progra	1.000	NPOC:24.92 m	Control valu	
39	Unknown	NPOC	CCB3	TCH006-39	0A-12	C:\Progra	1.000	NPOC:0.3039		
40	Unknown	NPOC	TCH007WC	TCH006-40	0A-12	C:\Progra	1.000	NPOC:24.85 m		
41	Unknown	NPOC	05G218-01	TCH006-41	0A-12	C:\Progra	1.000	NPOC:1.670 m		
42	Unknown	NPOC	05G218-02	TCH006-42	0A-12	C:\Progra	1.000	NPOC:1.497 m		
43	Unknown	NPOC	05G218-03	TCH006-43	0A-12	C:\Progra	1.000	NPOC:1.595 m		
44	Unknown	NPOC	05G218-04	TCH006-44	0A-12	C:\Progra	1.000	NPOC:1.650 m		
45	Unknown	NPOC	05G218-05	TCH006-45	0A-12	C:\Progra	1.000	NPOC:1.586 m		
46	Unknown	NPOC	05G218-06	TCH006-46	0A-12	C:\Progra	1.000	NPOC:1.521 m		
47	Unknown	NPOC	05G218-06D	TCH006-47	0A-12	C:\Progra	1.000	NPOC:1.474 m		
48	Unknown	NPOC	05G218-06M	TCH006-48	0A-12	C:\Progra	1.000	NPOC:24.63 m		
49	Control	NPOC	CCV4	TCH006-49	0A-12	C:\Progra	1.000	NPOC:24.65 m	Control valu	
50	Unknown	NPOC	CCB4	TCH006-50	0A-12	C:\Progra	1.000	NPOC:0.2706		
51	Unknown	NPOC	05G247-02	TCH006-51	0A-12	C:\Progra	1.000	NPOC:48.61 m		
52	Unknown	NPOC	05G247-03	TCH006-52	0A-12	C:\Progra	1.000	NPOC:104.8 m		
53	Unknown	NPOC	05G247-04	TCH006-53	0A-12	C:\Progra	1.000	NPOC:29.68 m		
54	Unknown	NPOC	05G247-05	TCH006-54	0A-12	C:\Progra	1.000	NPOC:28.31 m		
55	Unknown	NPOC	05G247-06	TCH006-55	0A-12	C:\Progra	1.000	NPOC:29.81 m		
56	Unknown	NPOC	05G247-07	TCH006-56	0A-12	C:\Progra	1.000	NPOC:9.548 m		
57	Unknown	NPOC	05G247-08	TCH006-57	0A-12	C:\Progra	1.000	NPOC:0.8519		
58	Unknown	NPOC	05G247-08D	TCH006-58	0A-12	C:\Progra	1.000	NPOC:0.8026		
59	Unknown	NPOC	05G247-08M	TCH006-59	0A-12	C:\Progra	1.000	NPOC:23.98 m		
60	Unknown	NPOC	05G260-01	TCH006-60	0A-12	C:\Progra	1.000	NPOC:2.384 m		DOC
61	Control	NPOC	CCV5	TCH006-61	0A-12	C:\Progra	1.000	NPOC:24.75 m	Control valu	
62	Unknown	NPOC	CCB5	TCH006-62	0A-12	C:\Progra	1.000	NPOC:0.3611		
63	Unknown	NPOC	05G260-02	TCH006-63	0A-12	C:\Progra	1.000	NPOC:2.484 m		DOC
64	Unknown	NPOC	05G260-03	TCH006-64	0A-12	C:\Progra	1.000	NPOC:3.286 m		DOC
65	Unknown	NPOC	05G260-04	TCH006-65	0A-12	C:\Progra	1.000	NPOC:8.444 m		DOC
66	Unknown	NPOC	05G260-05	TCH006-66	0A-12	C:\Progra	1.000	NPOC:4.181 m		DOC

	Type	Analysis	Sample Nam	Sample ID	ObjectID	Origin	Dil	Result	Notes	Comment
67	Unknown	NPOC	05G260-06	TCH006-67	0A-123456-	C:\Program File	1.	NPOC:3.03		DOC
68	Control	NPOC	CCV6	TCH006-68	0A-123456-	C:\Program File	1.	NPOC:24.2	Control valu	
69	Unknown	NPOC	CCB6	TCH006-69	0A-123456-	C:\Program File	1.	NPOC:1.61		
70	Unknown	NPOC	TCH008WB	TCH006-70	0A-123456-	C:\Program File	1.	NPOC:0.50		
71	Unknown	NPOC	TCH008WL	TCH006-71	0A-123456-	C:\Program File	1.	NPOC:23.9		
72	Unknown	NPOC	TCH008WC	TCH006-72	0A-123456-	C:\Program File	1.	NPOC:24.3		
73	Unknown	NPOC	05G260-01	TCH006-73	0A-123456-	C:\Program File	1.	NPOC:1.96		
74	Unknown	NPOC	05G260-02	TCH006-74	0A-123456-	C:\Program File	1.	NPOC:2.06		
75	Unknown	NPOC	05G260-03	TCH006-75	0A-123456-	C:\Program File	1.	NPOC:2.37		
76	Unknown	NPOC	05G260-04	TCH006-76	0A-123456-	C:\Program File	1.	NPOC:2.70		
77	Unknown	NPOC	05G260-05	TCH006-77	0A-123456-	C:\Program File	1.	NPOC:2.58		
78	Unknown	NPOC	05G260-06	TCH006-78	0A-123456-	C:\Program File	1.	NPOC:2.39		
79	Control	NPOC	CCV7	TCH006-79	0A-123456-	C:\Program File	1.	NPOC:24.8	Control valu	
80	Unknown	NPOC	CCB7	TCH006-80	0A-123456-	C:\Program File	1.	NPOC:0.49		
81	Unknown	NPOC	05G260-06	TCH006-81	0A-123456-	C:\Program File	1.	NPOC:2.41		
82	Unknown	NPOC	05G260-06	TCH006-82	0A-123456-	C:\Program File	1.	NPOC:25.1		
83	Unknown	NPOC	05G183-01	TCH006-83	0A-123456-	C:\Program File	1.	NPOC:36.7		DOC
84	Unknown	NPOC	05G183-01	TCH006-84	0A-123456-	C:\Program File	1.	NPOC:35.4		TOC
85	Unknown	NPOC	05G159-03	TCH006-85	0A-123456-	C:\Program File	2.	NPOC:51.2		
86	Control	NPOC	CCV8	TCH006-86	0A-123456-	C:\Program File	1.	NPOC:24.8	Control valu	
87	Unknown	NPOC	CCB8	TCH006-87	0A-123456-	C:\Program File	1.	NPOC:0.48		
88										
89										
90										
91										
92										
93										
94										
95										
96										
97										
98										
99										
100										

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	13.66	50uL	2	*****		08/08/05 01:04:04 PM
2	13.91	50uL	2	*****		08/08/05 01:05:43 PM

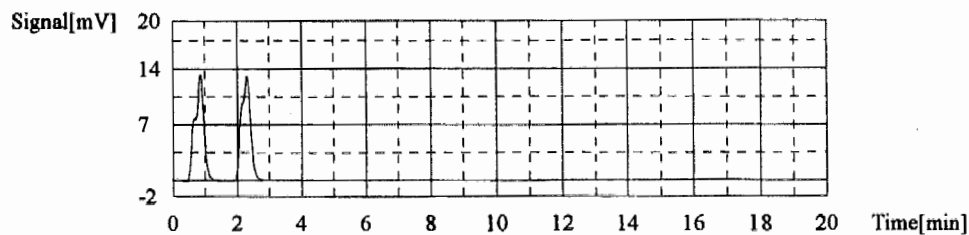
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 13.79



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	27.40	50uL	1	*****		08/08/05 01:11:47 PM
2	27.39	50uL	1	*****		08/08/05 01:13:24 PM

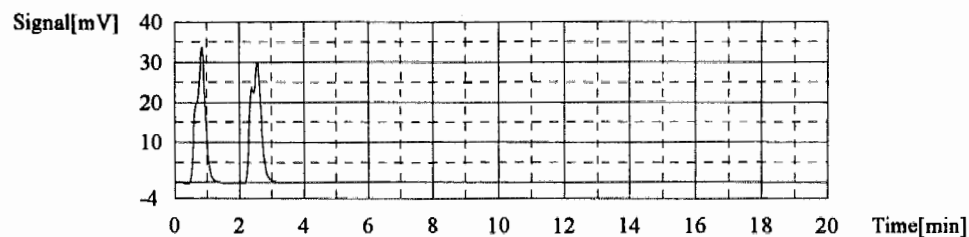
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 27.40



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	67.41	50uL	2	*****		08/08/05 01:22:20 PM
2	68.59	50uL	2	*****		08/08/05 01:24:21 PM

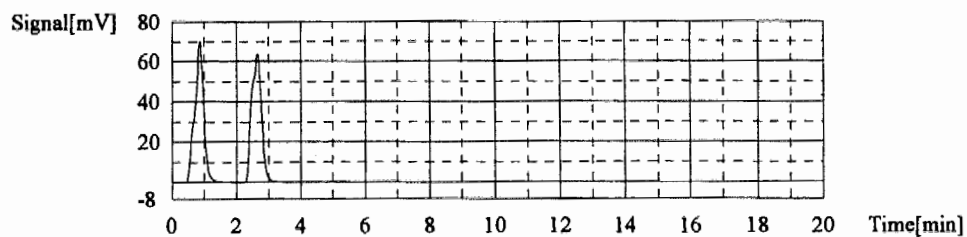
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 68.00



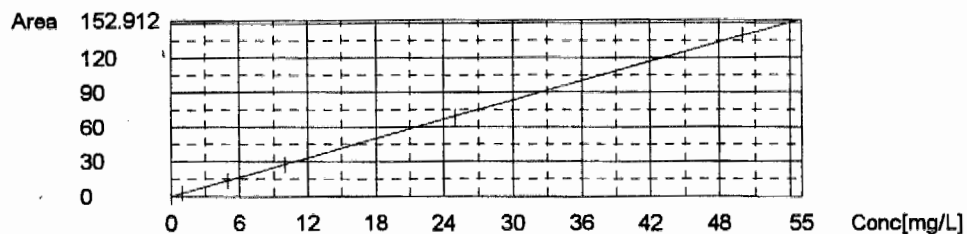
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	139.4	50uL	1	*****		08/08/05 01:30:45 PM
2	139.9	50uL	1	*****		08/08/05 01:32:42 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 139.7



Slope: 2.780
Intercept 0.000
 r^2 0.999785



Control Sample

Sample Name: ICV
Sample ID: TCH006-2
Method: TCH006.tpi
Chk. Result: Control value: 1.14% / Control within range!

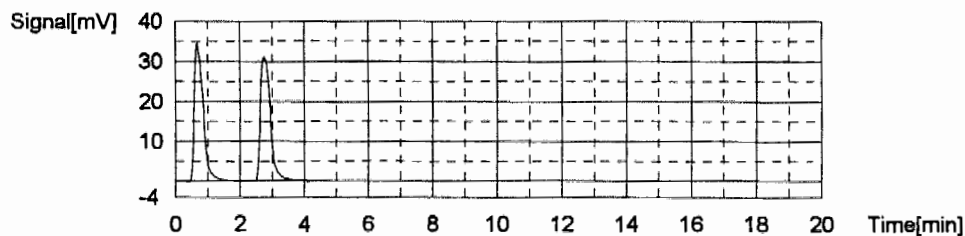
Type	Anal.	Dil.	Result
Control	NPOC	1.000	NPOC:24.34 mg/L

1. Det.

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	67.28	24.20mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 01:41:30 PM
2	68.05	24.48mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 01:43:48 PM

Mean Area 67.66
Mean Conc. 24.34mg/L



Sample

Sample Name: ICB
Sample ID: TCH006-3
Origin: TCH006.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.3346 mg/L

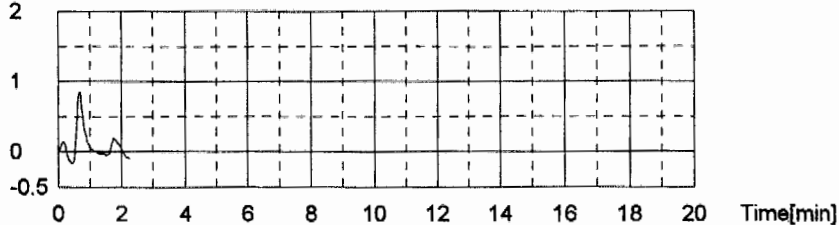
1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1.461	0.5255mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 01:51:26 PM
2	0.3993	0.1436mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 01:52:45 PM

Mean Area 0.9302
Mean Conc. 0.3346mg/L

Signal[mV] 2



Sample

Sample Name: HCO3/CO3
Sample ID: TCH006-4
Origin: TCH006.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.6327 mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1.717	0.6176mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 02:00:26 PM
2	1.801	0.6478mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 02:01:51 PM

SOP: 0 EMAX-9060 Revision No. 1 ☒ EMAX-415.1 Revision No. 1 0

Time:	12:44	EndingDate:	8/9/05	Time:	02:38
Start Date:	8/8/05				

Instrument No.	62	
INITIAL CALIBRATION REFERENCE		
Method File	TCH006	
ICAL ID	SW10B-01-611	
ICV ID	↓ 612	
STANDARDS		
ICAL Level		Conc.(mg/L)
S ₀		0
S ₁	Naopure	1
S ₂	SW10B-01-611	5
S ₃		10
S ₄		25
S ₅		50
S ₆	8/8/05	25
ICV/LCS	SW10B-01-612	25
CCV	↓ 613	25
Comments:		
Analyzed By: ~		
This page is checked during data review.		

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix		Run Time	Notes
				S	W		
* 1	TCH006-1	ICAL	1		X	13:32	NPOC Rm
* 2		ICV				13:43	PH < 2
* 3		ICB				13:52	
* 4		HC03/003				14:01	
* 5		TCH006WB				14:11	
* 6		↓ WCV				14:21	
* 7		↓ WCV				14:32	
* 8		05G21B-01				14:41	
* 9		02				14:50	
* 0		03				15:00	
* 1		04				15:09	
* 2		05				15:18	
* 3		06				15:27	
* 4		06M				15:38	
* 5		06M				16:01	
* 6		05G21B-06D				16:10	
* 7		06M				16:20	
* 8		05G21B-02				16:29	
* 9		03				16:39	
* 0		04				16:49	
* 1		05				16:59	
* 2		05G21B-02				17:09	
* 3		02D				17:18	
* 4		02M				17:28	
* 5		03				17:40	
* 6		06M				17:50	
* 7		06M				17:59	
* 8		06G21B-04				18:10	
* 9		05				18:19	
* 0		06M				18:29	

ANALYTICAL BATCH *TCH006W

This page is checked during data review.

ANALYSIS RUN LOG FOR TOC

SOP: o EMAX-9060 Revision No. 1 o EMAX-415.1 Revision No. 1 o

Book # A62-006

Start Date: 8/8/05

Time: 12:46

Ending Date: 8/9/05

Time: 03:38

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix	Run Time	Notes
				S W		
* 1	TEH006-31	056231-07		X	18:39	NPOC Rm
* 2	32	↓ 08			18:49	pH<2
* 3	33	056839-02			19:50	
* 4	34	↓ 03			19:07	
* 5	35	056842-02			19:16	
* 6	36	TEH007WB			19:25	
* 7	37	↓ WL			19:36	
* 8	38	056843			19:46	
* 9	39	056843			19:55	
* 0	40	TEH007WC			20:04	
* 1	41	056218-01			20:15	
* 2	42	02			20:24	
* 3	43	03			20:33	
* 4	44	04			20:42	
* 5	45	05			20:51	
* 6	46	06			21:01	
* 7	47	06D			21:10	
* 8	48	06M			21:20	
* 9	49	06V4			21:30	
* 0	50	06A			21:39	
* 1	51	056247-02			21:50	
* 2	52	03			22:01	
* 3	53	04			22:11	
* 4	54	05			22:21	
* 5	55	06			22:31	
* 6	56	07			22:41	
* 7	57	08			22:50	
* 8	58	09			22:59	
* 9	59	06M			23:09	
* 0	60	050260-01			23:18	

ANALYTICAL BATCH * TEH007W

Instrument No.	62
Method File	TEH006
ICAL ID	(see last page 82)
ICV ID	

INITIAL CALIBRATION REFERENCE

ICAL Level	Conc. (mg/L)
S ₀	
S ₁	
S ₂	
S ₃	
S ₄	
S ₅	
S ₆	
ICV/LCS	
CCV	

Comments:

Analyzed By: *W*

This page is checked during data review.

ANALYSIS RUN LOG FOR TOC

SOP: o EMAX-9060 Revision No. 1 o EMAX-415.1 Revision No. 1 o

Book # A62-006

Start Date: 8/8/05

Time: 12:44

Ending Date: 8/9/05

Time: 03:38

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix	Run Time	Notes
				S	W	
* 1	TEH006-61	CEV5	1	X		NPOE Run
* 2	62	CEP5				PH < 2
* 3	63	055260-02				
* 4	64	03				
* 5	65	04				
* 6	66	05				
* 7	67	06				
* 8	68	CEV4				
* 9	69	CEB6				
* 0	70	TEH008048				
* 1	71	02				
* 2	72	02				
* 3	73	055260-01				
* 4	74	02				
* 5	75	03				
* 6	76	04				
* 7	77	05				
* 8	78	06				
* 9	79	CEV7				
* 0	80	CEP7				
* 1	81	055260-06D				
* 2	82	06A				
* 3	83	055183-01				
* 4	84	01				
* 5	85	055159-03	2			
* 6	86	CEV8	1			
* 7	87	CEB8	1			
* 8						
* 9						
* 0						

Instrument No.	62
Method File	TEH006
ICAL ID	(see 1000 on page 82)
ICV ID	

ICAL Level	Conc. (mg/L)
S ₀	
S ₁	
S ₂	
S ₃	
S ₄	
S ₅	
S ₆	
ICV/LCS	
CCV	

Comments:

Analyzed By: ✓

7-8/8/05

This page is checked during data review.

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G260

METHOD 415.1 TOTAL ORGANIC CARBON

Six (6) water samples were received on 07/29/05 for Total Organic Carbon analysis by Method 415.1 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Method", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G260-06 was analyzed for Duplicate. % RPD was within QC limit.

5. Matrix Spike

Sample G260-06 was spiked. % Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 415.1
TOC

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G260
Matrix : WATER
Instrument ID : 62

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
NBLK1W	TCH008WB	ND	1	NA	1	.5	08/09/0500:53	NA	TCH006-70	TCH006-68	TCH008W	NA	NA
LCS1W	TCH008WL	24	1	NA	1	.5	08/09/0501:03	NA	TCH006-71	TCH006-68	TCH008W	NA	NA
LCD1W	TCH008WC	24.4	1	NA	1	.5	08/09/0501:14	NA	TCH006-72	TCH006-68	TCH008W	NA	NA
NW-21-5	G260-01	1.97	1	NA	1	.5	08/09/0501:24	NA	TCH006-73	TCH006-68	TCH008W	07/26/05	07/29/05
NW-21-4	G260-02	2.07	1	NA	1	.5	08/09/0501:33	NA	TCH006-74	TCH006-68	TCH008W	07/26/05	07/29/05
NW-21-3	G260-03	2.37	1	NA	1	.5	08/09/0501:42	NA	TCH006-75	TCH006-68	TCH008W	07/26/05	07/29/05
NW-21-2	G260-04	2.7	1	NA	1	.5	08/09/0501:51	NA	TCH006-76	TCH006-68	TCH008W	07/26/05	07/29/05
NW-21-1	G260-05	2.58	1	NA	1	.5	08/09/0502:01	NA	TCH006-77	TCH006-68	TCH008W	07/26/05	07/29/05
DUPE-4-7/26/2005	G260-06	2.39	1	NA	1	.5	08/09/0502:10	NA	TCH006-78	TCH006-68	TCH008W	07/26/05	07/29/05
DUPE-4-7/26/2005DUP	G260-06D	2.41	1	NA	1	.5	08/09/0502:39	NA	TCH006-81	TCH006-79	TCH008W	07/26/05	07/29/05
DUPE-4-7/26/2005WS	G260-06M	25.1	1	NA	1	.5	08/09/0502:49	NA	TCH006-82	TCH006-79	TCH008W	07/26/05	07/29/05

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G260
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: TCH008WL
LAB FILE ID: TCH006-71
DATE EXTRACTED: NA
DATE ANALYZED: 08/09/0500:53
PREP. BATCH: TCH008W
CALIB. REF: TCH006-68

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
TOC	ND	25	24	96	25	24.4	97	2	80-120	20

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EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G260
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: DUPE-4-7/26/2005
LAB SAMP ID: G260-06
LAB FILE ID: TCH006-78
DATE EXTRACTED: NA
DATE ANALYZED: 08/09/0502:10
PREP. BATCH: TCH008W
CALIB. REF: TCH006-68

% MOISTURE: NA
DATE COLLECTED: 07/26/05
DATE RECEIVED: 07/29/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
TOC	2.39	25	25.1	91	75-125

8065

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G260
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: DUPE-4-7/26/2005 DUPE-4-7/26/2005DUP
EMAX SAMP ID: G260-06
LAB FILE ID: TCH006-78
DATE EXTRACTED: NA
DATE ANALYZED: 08/09/0502:10
PREP. BATCH: TCH008W
CALIB. REF: TCH006-68

% MOISTURE: NA
DATE COLLECTED: 07/26/05
DATE RECEIVED: 07/29/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
TOC	2.39	2.41	1	20

	Type	Analysis	Sample Name	Sample ID	Object	Origin	Dilution	Result	Notes	Comment
1	Standard	NPOC	ICAL	TCH006-1	0A-12	C:\Progra	1.000			
2	Control	NPOC	ICV	TCH006-2	0A-12	C:\Progra	1.000	NPOC:24.34 m	Control valu	
3	Unknown	NPOC	ICB	TCH006-3	0A-12	C:\Progra	1.000	NPOC:0.3346		
4	Unknown	NPOC	HCO3/CO3	TCH006-4	0A-12	C:\Progra	1.000	NPOC:0.6327		
5	Unknown	NPOC	TCH006WB	TCH006-5	0A-12	C:\Progra	1.000	NPOC:0.05212		
6	Unknown	NPOC	TCH006WL	TCH006-6	0A-12	C:\Progra	1.000	NPOC:24.37 m		
7	Unknown	NPOC	TCH006WC	TCH006-7	0A-12	C:\Progra	1.000	NPOC:24.43 m		
8	Unknown	NPOC	05G218-01	TCH006-8	0A-12	C:\Progra	1.000	NPOC:1.828 m		DOC
9	Unknown	NPOC	05G218-02	TCH006-9	0A-12	C:\Progra	1.000	NPOC:5.383 m		DOC
10	Unknown	NPOC	05G218-03	TCH006-10	0A-12	C:\Progra	1.000	NPOC:2.081 m		DOC
11	Unknown	NPOC	05G218-04	TCH006-11	0A-12	C:\Progra	1.000	NPOC:3.346 m		DOC
12	Unknown	NPOC	05G218-05	TCH006-12	0A-12	C:\Progra	1.000	NPOC:1.735 m		DOC
13	Unknown	NPOC	05G218-06	TCH006-13	0A-12	C:\Progra	1.000	NPOC:5.865 m		DOC
14	Control	NPOC	CCV1	TCH006-14	0A-12	C:\Progra	1.000	NPOC:24.49 m	Control valu	
15	Unknown	NPOC	CCB1	TCH006-15	0A-12	C:\Progra	1.000	NPOC:0.05638		
16	Unknown	NPOC	05G218-06D	TCH006-16	0A-12	C:\Progra	1.000	NPOC:3.477 m		DOC
17	Unknown	NPOC	05G218-06M	TCH006-17	0A-12	C:\Progra	1.000	NPOC:26.86 m		DOC
18	Unknown	NPOC	05G219-02	TCH006-18	0A-12	C:\Progra	1.000	NPOC:8.670 m		
19	Unknown	NPOC	05G219-03	TCH006-19	0A-12	C:\Progra	1.000	NPOC:33.09 m		
20	Unknown	NPOC	05G219-04	TCH006-20	0A-12	C:\Progra	1.000	NPOC:25.47 m		
21	Unknown	NPOC	05G219-05	TCH006-21	0A-12	C:\Progra	1.000	NPOC:17.95 m		
22	Unknown	NPOC	05G231-02	TCH006-22	0A-12	C:\Progra	1.000	NPOC:9.674 m		
23	Unknown	NPOC	05G231-02D	TCH006-23	0A-12	C:\Progra	1.000	NPOC:9.472 m		
24	Unknown	NPOC	05G231-02M	TCH006-24	0A-12	C:\Progra	1.000	NPOC:32.75 m		
25	Unknown	NPOC	05G231-03	TCH006-25	0A-12	C:\Progra	1.000	NPOC:333.6 m		
26	Control	NPOC	CCV2	TCH006-26	0A-12	C:\Progra	1.000	NPOC:25.70 m	Control valu	
27	Unknown	NPOC	CCB2	TCH006-27	0A-12	C:\Progra	1.000	NPOC:0.2423		
28	Unknown	NPOC	05G231-04	TCH006-28	0A-12	C:\Progra	1.000	NPOC:25.80 m		
29	Unknown	NPOC	05G231-05	TCH006-29	0A-12	C:\Progra	1.000	NPOC:18.82 m		
30	Unknown	NPOC	05G231-06	TCH006-30	0A-12	C:\Progra	1.000	NPOC:30.00 m		
31	Unknown	NPOC	05G231-07	TCH006-31	0A-12	C:\Progra	1.000	NPOC:30.21 m		
32	Unknown	NPOC	05G231-08	TCH006-32	0A-12	C:\Progra	1.000	NPOC:8.969 m		
33	Unknown	NPOC	05G839-02	TCH006-33	0A-12	C:\Progra	1.000	NPOC:1.293 m		
34	Unknown	NPOC	05G839-03	TCH006-34	0A-12	C:\Progra	1.000	NPOC:2.031 m		
35	Unknown	NPOC	05G842-02	TCH006-35	0A-12	C:\Progra	1.000	NPOC:2.845 m		
36	Unknown	NPOC	TCH007WB	TCH006-36	0A-12	C:\Progra	1.000	NPOC:0.3662		
37	Unknown	NPOC	TCH007WL	TCH006-37	0A-12	C:\Progra	1.000	NPOC:24.84 m		
38	Control	NPOC	CCV3	TCH006-38	0A-12	C:\Progra	1.000	NPOC:24.92 m	Control valu	
39	Unknown	NPOC	CCB3	TCH006-39	0A-12	C:\Progra	1.000	NPOC:0.3039		
40	Unknown	NPOC	TCH007WC	TCH006-40	0A-12	C:\Progra	1.000	NPOC:24.85 m		
41	Unknown	NPOC	05G218-01	TCH006-41	0A-12	C:\Progra	1.000	NPOC:1.670 m		
42	Unknown	NPOC	05G218-02	TCH006-42	0A-12	C:\Progra	1.000	NPOC:1.497 m		
43	Unknown	NPOC	05G218-03	TCH006-43	0A-12	C:\Progra	1.000	NPOC:1.595 m		
44	Unknown	NPOC	05G218-04	TCH006-44	0A-12	C:\Progra	1.000	NPOC:1.650 m		
45	Unknown	NPOC	05G218-05	TCH006-45	0A-12	C:\Progra	1.000	NPOC:1.586 m		
46	Unknown	NPOC	05G218-06	TCH006-46	0A-12	C:\Progra	1.000	NPOC:1.521 m		
47	Unknown	NPOC	05G218-06D	TCH006-47	0A-12	C:\Progra	1.000	NPOC:1.474 m		
48	Unknown	NPOC	05G218-06M	TCH006-48	0A-12	C:\Progra	1.000	NPOC:24.63 m		
49	Control	NPOC	CCV4	TCH006-49	0A-12	C:\Progra	1.000	NPOC:24.65 m	Control valu	
50	Unknown	NPOC	CCB4	TCH006-50	0A-12	C:\Progra	1.000	NPOC:0.2706		
51	Unknown	NPOC	05G247-02	TCH006-51	0A-12	C:\Progra	1.000	NPOC:48.61 m		
52	Unknown	NPOC	05G247-03	TCH006-52	0A-12	C:\Progra	1.000	NPOC:104.8 m		
53	Unknown	NPOC	05G247-04	TCH006-53	0A-12	C:\Progra	1.000	NPOC:29.68 m		
54	Unknown	NPOC	05G247-05	TCH006-54	0A-12	C:\Progra	1.000	NPOC:28.31 m		
55	Unknown	NPOC	05G247-06	TCH006-55	0A-12	C:\Progra	1.000	NPOC:29.81 m		
56	Unknown	NPOC	05G247-07	TCH006-56	0A-12	C:\Progra	1.000	NPOC:9.548 m		
57	Unknown	NPOC	05G247-08	TCH006-57	0A-12	C:\Progra	1.000	NPOC:0.8519		
58	Unknown	NPOC	05G247-08D	TCH006-58	0A-12	C:\Progra	1.000	NPOC:0.8026		
59	Unknown	NPOC	05G247-08M	TCH006-59	0A-12	C:\Progra	1.000	NPOC:23.98 m		
60	Unknown	NPOC	05G260-01	TCH006-60	0A-12	C:\Progra	1.000	NPOC:2.384 m		DOC
61	Control	NPOC	CCV5	TCH006-61	0A-12	C:\Progra	1.000	NPOC:24.75 m	Control valu	
62	Unknown	NPOC	CCB5	TCH006-62	0A-12	C:\Progra	1.000	NPOC:0.3611		
63	Unknown	NPOC	05G260-02	TCH006-63	0A-12	C:\Progra	1.000	NPOC:2.484 m		DOC
64	Unknown	NPOC	05G260-03	TCH006-64	0A-12	C:\Progra	1.000	NPOC:3.286 m		DOC
65	Unknown	NPOC	05G260-04	TCH006-65	0A-12	C:\Progra	1.000	NPOC:8.444 m		DOC
66	Unknown	NPOC	05G260-05	TCH006-66	0A-12	C:\Progra	1.000	NPOC:4.181 m		DOC

	Type	Analysis	Sample Nam	Sample ID	ObjectID	Origin	Dil	Result	Notes	Comment
67	Unknown	NPOC	05G280-06	TCH006-67	0A-123456	C:\Program File	1.	NPOC:3.03		DOC
68	Control	NPOC	CCV6	TCH006-68	0A-123456	C:\Program File	1.	NPOC:24.2	Control valu	
69	Unknown	NPOC	CCB6	TCH006-69	0A-123456	C:\Program File	1.	NPOC:1.61		
70	Unknown	NPOC	TCH008WB	TCH006-70	0A-123456	C:\Program File	1.	NPOC:0.50		
71	Unknown	NPOC	TCH008WL	TCH006-71	0A-123456	C:\Program File	1.	NPOC:23.9		
72	Unknown	NPOC	TCH008WC	TCH006-72	0A-123456	C:\Program File	1.	NPOC:24.3		
73	Unknown	NPOC	05G260-01	TCH006-73	0A-123456	C:\Program File	1.	NPOC:1.96		
74	Unknown	NPOC	05G260-02	TCH006-74	0A-123456	C:\Program File	1.	NPOC:2.06		
75	Unknown	NPOC	05G260-03	TCH006-75	0A-123456	C:\Program File	1.	NPOC:2.37		
76	Unknown	NPOC	05G260-04	TCH006-76	0A-123456	C:\Program File	1.	NPOC:2.70		
77	Unknown	NPOC	05G260-05	TCH006-77	0A-123456	C:\Program File	1.	NPOC:2.58		
78	Unknown	NPOC	05G260-06	TCH006-78	0A-123456	C:\Program File	1.	NPOC:2.39		
79	Control	NPOC	CCV7	TCH006-79	0A-123456	C:\Program File	1.	NPOC:24.8	Control valu	
80	Unknown	NPOC	CCB7	TCH006-80	0A-123456	C:\Program File	1.	NPOC:0.49		
81	Unknown	NPOC	05G260-06	TCH006-81	0A-123456	C:\Program File	1.	NPOC:2.41		
82	Unknown	NPOC	05G260-06	TCH006-82	0A-123456	C:\Program File	1.	NPOC:25.1		
83	Unknown	NPOC	05G183-01	TCH006-83	0A-123456	C:\Program File	1.	NPOC:36.7		DOC
84	Unknown	NPOC	05G183-01	TCH006-84	0A-123456	C:\Program File	1.	NPOC:35.4		TOC
85	Unknown	NPOC	05G159-03	TCH006-85	0A-123456	C:\Program File	2.	NPOC:51.2		
86	Control	NPOC	CCV8	TCH006-86	0A-123456	C:\Program File	1.	NPOC:24.8	Control valu	
87	Unknown	NPOC	CCB8	TCH006-87	0A-123456	C:\Program File	1.	NPOC:0.48		
88										
89										
90										
91										
92										
93										
94										
95										
96										
97										
98										
99										
100										

Instr. Information

System
Detector
Catalyst
Cell Length

toc
Combustion
Regular Sensitivity
long

Cal. Curve

Sample Name: ICAL
Sample ID: TCH006-1
Cal. Curve: TCH006.2005_08_08_12_38_44.cal

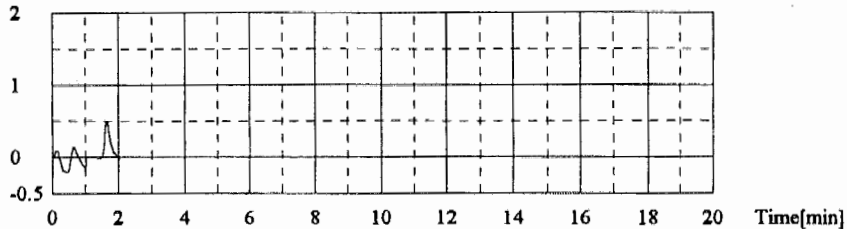
Type	Anal.
Standard	NPOC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	0.4887	50uL	1	*****		08/08/05 12:46:00 PM
2	0.5894	50uL	1	*****		08/08/05 12:47:11 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 0.5441

Signal[mV] 2

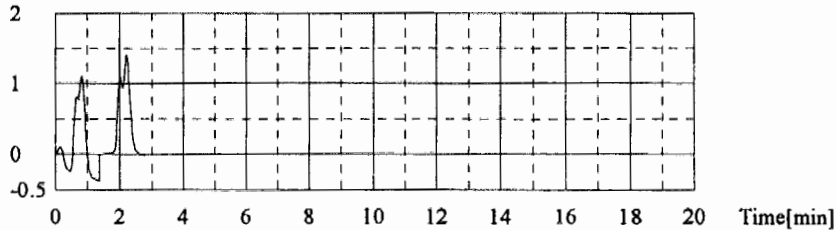


Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	2.825	50uL	10	*****		08/08/05 12:55:45 PM
2	3.085	50uL	10	*****		08/08/05 12:57:20 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 2.955

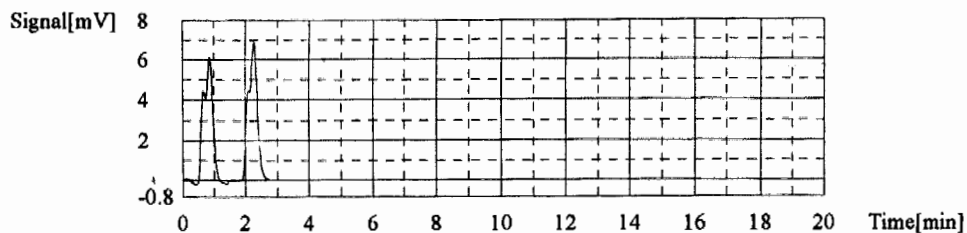
Signal[mV] 2



Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	13.66	50uL	2	*****		08/08/05 01:04:04 PM
2	13.91	50uL	2	*****		08/08/05 01:05:43 PM

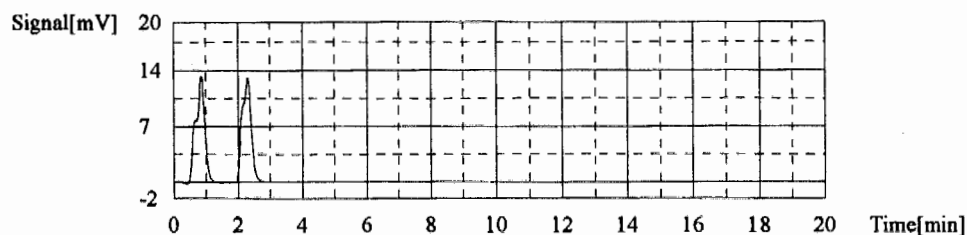
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 13.79



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	27.40	50uL	1	*****		08/08/05 01:11:47 PM
2	27.39	50uL	1	*****		08/08/05 01:13:24 PM

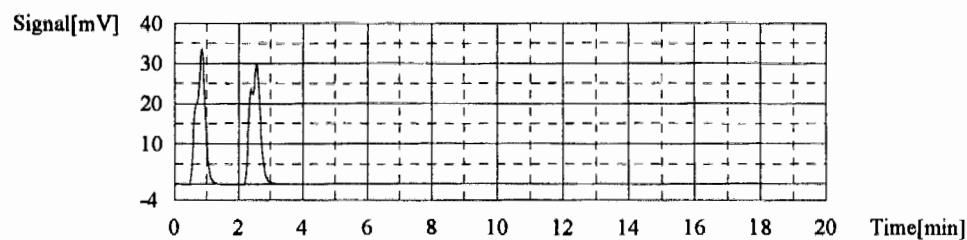
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 27.40



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	67.41	50uL	2	*****		08/08/05 01:22:20 PM
2	68.59	50uL	2	*****		08/08/05 01:24:21 PM

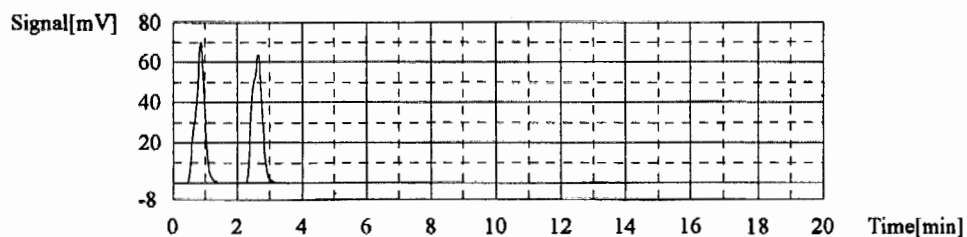
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 68.00



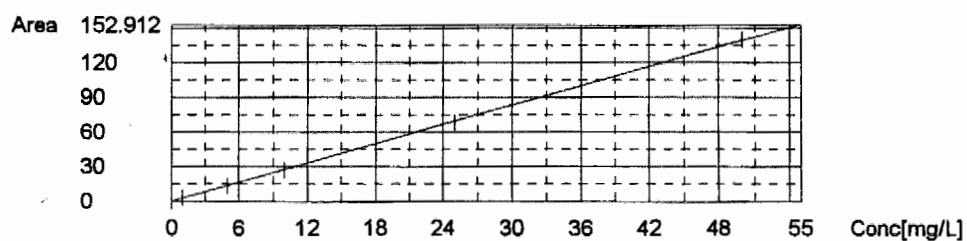
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	139.4	50uL	1	*****		08/08/05 01:30:45 PM
2	139.9	50uL	1	*****		08/08/05 01:32:42 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 139.7



Slope: 2.780
Intercept 0.000
 r^2 0.999785



Control Sample

Sample Name: ICV
Sample ID: TCH006-2
Method: TCH006.tpl
Chk. Result: Control value: 1.14% / Control within range

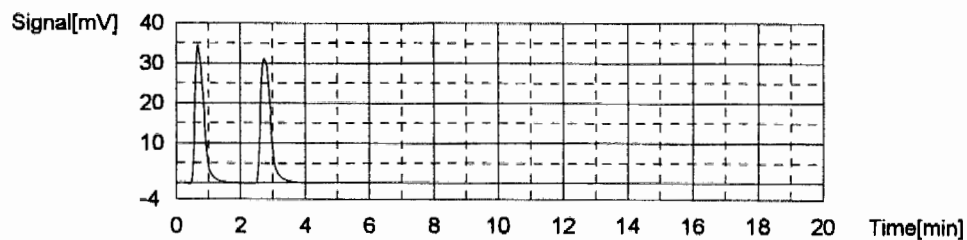
Type	Anal.	Dil.	Result
Control	NPOC	1.000	NPOC:24.34 mg/L

1. Det.

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	67.28	24.20mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 01:41:30 PM
2	68.05	24.48mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 01:43:48 PM

Mean Area 67.66
Mean Conc. 24.34mg/L



Sample

Sample Name: ICB
Sample ID: TCH006-3
Origin: TCH006.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.3346 mg/L

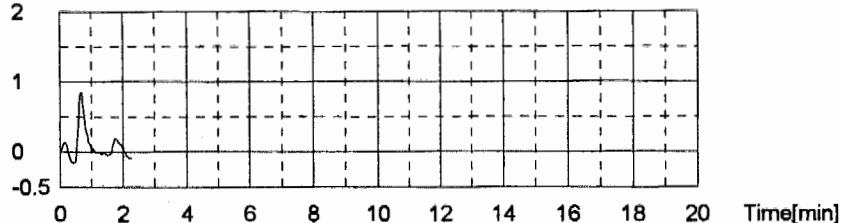
1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1.461	0.5255mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 01:51:26 PM
2	0.3993	0.1436mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 01:52:45 PM

Mean Area 0.9302
Mean Conc. 0.3346mg/L

Signal[mV] 2



Sample

Sample Name: HCO3/CO3
Sample ID: TCH006-4
Origin: TCH006.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.6327 mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1.717	0.6176mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 02:00:26 PM
2	1.801	0.6478mg/L	50uL	1		TCH006.2005_08_08_12_38_44.cal	08/08/05 02:01:51 PM

ANALYSIS RUN LOG FOR TOC

SOP: 0 EMAX-9060 Revision No. 1 0 EMAX-415.1 Revision No. 1 0

Book # A62-006

Start Date: 8/8/05

Time: 12:44

Ending Date: 8/9/05

Time: 03:38

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix		Run Time	Notes
				S	W		
* 1	TCH006-1	ICAL	1		X	13:32	NPOC RUN
* 2	2	ICV				13:40	PH < 2
* 3	3	ICB				13:52	
* 4	4	HC03/003				14:01	
* 5	5	TCH006-08				14:11	
* 6	6	↓ WCL				14:21	
* 7	7	↓ WCL				14:32	
* 8	8	056218-01				14:41	
* 9	9	02				14:50	
* 0	10	03				15:00	
* 1	11	04				15:09	
* 2	12	05				15:18	
* 3	13	06				15:27	
* 4	14	06V1				15:38	
* 5	15	06B1				16:01	
* 6	16	056218-06D				16:10	
* 7	17	↓ 06M				16:20	
* 8	18	056219-02				16:29	
* 9	19	03				16:39	
* 0	20	04				16:49	
* 1	21	05				16:59	
* 2	22	056231-02				17:09	
* 3	23	02D				17:18	
* 4	24	02M				17:28	
* 5	25	03				17:40	
* 6	26	06V2				17:50	
* 7	27	06B2				17:59	
* 8	28	056231-04				18:10	
* 9	29	05				18:19	
* 0	30	06				18:29	

ANALYTICAL BATCH *TCH006W

Instrument No. 62	
INITIAL CALIBRATION REFERENCE	
Method File	TCH006
ICAL ID	SW10B-01-611
ICV ID	↓ 612
STANDARDS	
ICAL Level	Conc.(mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	818105
ICV/LCS	SW10B-01-612
CCV	↓ 613

Comments:

Analyzed By: ~

This page is checked during data review.

ANALYSIS RUN LOG FOR TOC

SOP: o EMAX-9060 Revision No. 1 o EMAX-415.1 Revision No. 1 o

Start Date: 8/8/05

Time: 12:44

Ending Date: 8/9/05

Time: 03:38

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix S W	Run Time	Notes
* 1	TEH006-31	056231-07	1	X	18:39	HPLC Run
* 2	32	↓ 08			18:49	PHC2
* 3	33	056839-02			18:58	
* 4	34	↓ 03			19:07	
* 5	35	056842-02			19:16	
* 6	36	TEH007WB			19:25	
* 7	37	↓ WL			19:34	
* 8	38	CEV3			19:44	
* 9	39	CEB3			19:55	
* 0	40	TEH007WC			20:04	
* 1	41	056218-01			20:15	
* 2	42	02			20:24	
* 3	43	03			20:33	
* 4	44	04			20:42	
* 5	45	05			20:51	
* 6	46	06			21:01	
* 7	47	06D			21:10	
* 8	48	06M			21:20	
* 9	49	CEV4			21:30	
* 0	50	CEB4			21:39	
* 1	51	056217-02			21:50	
* 2	52	03			22:01	
* 3	53	04			22:11	
* 4	54	05			22:21	
* 5	55	06			22:31	
* 6	56	07			22:41	
* 7	57	08			22:50	
* 8	58	08D			22:59	
* 9	59	08M			23:09	
* 0	60	056260-01			23:18	

Instrument No.		62
INITIAL CALIBRATION REFERENCE		
Method File	TEH006	
ICAL ID	(see last page 82)	
ICV ID		
STANDARDS		
ICAL Level		Conc (mg/L)
S ₀		
S ₁		
S ₂		82
S ₃		
S ₄		
S ₅		
S ₆		
ICV/LCS		
CCV		
Comments:		
Analyzed By: <i>Y</i>		

This page is checked during data review.

ANALYSIS RUN LOG FOR TOC

Book # A62-006

SOP: o EMAX-9060 Revision No. 1 o EMAX-415.1 Revision No. 1 o

Start Date: 8/8/05 Time: 12:46 Ending Date: 8/9/05 Time: 03:38

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix	Run Time	Notes
				S	W	
* 1	TE4006-61	CEV5	1	X		NPOE Run
* 2	62	CEP5	1		23:32	PH < 2
* 3	63	055260-02			23:34	
* 4	64	03			23:56	
* 5	65	04			00:05	
* 6	66	05			00:14	
* 7	67	06			00:24	
* 8	68	CEV4			00:34	
* 9	69	CEB6			00:44	
* 0	70	TE4008WB			00:53	
* 1	71	WB			01:03	
* 2	72	WB			01:14	
* 3	73	055260-01			01:24	
* 4	74	02			01:33	
* 5	75	03			01:42	
* 6	76	04			01:51	
* 7	77	05			02:01	
* 8	78	06			02:10	
* 9	79	CEV7			02:20	
* 0	80	CEP7			02:29	
* 1	81	055260-06D			02:33	
* 2	82	06A			02:49	
* 3	83	055183-01			02:58	DOC
* 4	84	01			03:08	TDC
* 5	85	055159-03	2		03:18	
* 6	86	CEV8	1		03:29	
* 7	87	CEB8	1		03:38	
* 8						
* 9						
* 0						

Instrument No.	62
INITIAL CALIBRATION REFERENCE	
Method File	TE4006
ICAL ID	(see ical on page 82)
ICV ID	

ICAL Level	Conc. (mg/L)
S ₀	
S ₁	
S ₂	
S ₃	
S ₄	
S ₅	
S ₆	
ICV/LCS	
OCV	

Comments:

Analyzed By: ✓

This page is checked during data review.

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PROJECT: **JPL**

SDG: **05H006**

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** - Not Requested



LABORATORIES, INC.

1835 W. 205th Street

Torrance, CA 90501

Tel: (310) 618-8889

Fax: (310) 618-0818

Date: 08-19-2005

EMAX Batch No.: 05H006

Attn: Tien Shiao

Battelle Memorial Institute

505 King Ave.

Columbus OH 43201

Subject: Laboratory Report

Project: JPL

Enclosed is the Laboratory report for samples received on 08/02/05.
The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
MW-20-5	H006-01	08/01/05	WATER	ANIONS BY IC FERROUS IRON TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-20-4	H006-02	08/01/05	WATER	METALS IN WATER & WASTE ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N

Sample ID	Control #	Col Date	Matrix	Analysis
				----- SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-20-3	H006-03	08/01/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-20-2	H006-04	08/01/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-20-1	H006-05	08/01/05	WATER	ANIONS BY IC FERROUS IRON TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,

K. Y. Pang

Kam Y. Pang, Ph.D.
Laboratory Director

Hanh Bui

From: Shiao, Tien [shiaoh@BATTELLE.ORG]
Sent: Wednesday, August 03, 2005 6:56 AM
To: Hanh Bui
Cc: Ohart, Carolyn J; Conner, David J
Subject: RE: COC for samples received on 8/2 SDG: 05H006 (Battelle/JPL)

Hanh,

For the MW-25 samples (MW-25-1, MW-25-2, MW-25-3, MW-25-4, MW-25-5, Dupe-4-7/26/05) please analyze the rest of the parameters on the COCs. But FIRST be sure to check whether the rest of the analytes are out of hold time, if they are let me know before you analyze, so we can figure out what to do.

As for the metals sample for MW-20-1, please confirm that MW-20-1 is the only location where the metal sample was collected in the wrong bottle. If this is the case, than please don't analyze the metals (Method 200.7 for Ca, Fe, Mg, K, Na) for MW-20-1. We will re-sample the metals for MW-20-1. But do analyze all other parameters on the COC for MW-20-1.

Please give me a call if you have any questions.

Thanks and hope to hear from you soon.

Tien

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Tuesday, August 02, 2005 8:29 PM
To: Shiao, Tien
Subject: RE: COC for samples received on 8/2 SDG: 05H006 (Battelle/JPL)

Tien,

Yes, it will affect the metals result. It should be preserved with HNO3 instead of H2SO4 as we received. Thus, we will get some sample from bottle with no preservation to analyze Metal (only sample MW-20-1).

We received your email on 8/1, and chemist already analyzed on 7/29 for Nitrate and Nitrite.

All analysis of this SDG 05G260 were on hold now. Please let me know about that.

Best regards,

Hanh

-----Original Message-----

From: Shiao, Tien [mailto:shiaoh@BATTELLE.ORG]
Sent: Tuesday, August 02, 2005 4:37 PM
To: Hanh Bui
Subject: RE: COC for samples received on 8/2 SDG: 05H006 (Battelle/JPL)

Hahn,

In the email 08/01/05 I thought I said to hold off on the analysis for MW-21 Screens 1 through 5 and the duplicate analysis:

Hanh,

The sampling collection date on the COC is correct and the samples are out of hold time for nitrate and nitrite.

Please hold off the analysis until I get back to you tomorrow.

1003

8/3/2005

Type of Delivery	Delivered By/Airbill	ECN	05H006
<input checked="" type="checkbox"/> EMAX Courier	PHIL HATCHER	Receipient	T. FAREL
<input type="checkbox"/> Client Delivery		Date	8-2-05
<input type="checkbox"/> Third Party		Time	13:30

COC Inspection		
<input checked="" type="checkbox"/> Client Name	<input checked="" type="checkbox"/> Sampler Name	<input checked="" type="checkbox"/> Sampling Date/Time/Location
<input checked="" type="checkbox"/> Address	<input checked="" type="checkbox"/> Courier Signature/Date/Time	<input checked="" type="checkbox"/> Analysis Required
<input type="checkbox"/> Client PM/FC	<input type="checkbox"/> TAT	<input checked="" type="checkbox"/> Matrix
<input checked="" type="checkbox"/> Tel #/Fax #	<input checked="" type="checkbox"/> Sample ID	<input checked="" type="checkbox"/> Preservative (if any)
Safety Issues	<input type="checkbox"/> None	<input type="checkbox"/> Superfund Site Samples
Comments:	<input type="checkbox"/> High Concentrations expected	
	<input type="checkbox"/> Rad Screening Required	

Packaging Inspection					
Container	<input checked="" type="checkbox"/> Cooler	<input type="checkbox"/> Box	<input type="checkbox"/>	<input type="checkbox"/>	
Condition	<input type="checkbox"/> Custody Seal	<input checked="" type="checkbox"/> Intact	<input type="checkbox"/> Damaged	<input type="checkbox"/>	
Packaging	<input checked="" type="checkbox"/> Bubble Pack	<input type="checkbox"/> Styrofoam	<input checked="" type="checkbox"/> Sufficient	<input checked="" type="checkbox"/> PLASTIC BAG	
Temperatures	<input checked="" type="checkbox"/> Cooler 1 <u>T-39°C</u>	<input checked="" type="checkbox"/> Cooler 2 _____	<input type="checkbox"/> Cooler 3 _____	<input type="checkbox"/> Cooler 4 _____	
	<input type="checkbox"/> Cooler 5 _____	<input type="checkbox"/> Cooler 6 _____	<input type="checkbox"/> Cooler 7 _____	<input type="checkbox"/> Cooler 8 _____	
	<input type="checkbox"/> Cooler 9 _____	<input type="checkbox"/> Cooler 10 _____	<input type="checkbox"/> Cooler 11 _____	<input type="checkbox"/> Cooler 12 _____	
Comments:					

[illegible]

Date _____

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

METALS BY ICP-AES

SDG#: 05H006

7000

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05H006

METHOD 200.7 METALS BY ICP-AES

Four (4) water samples were received on 08/02/05 for Metals analysis by Method 200.7 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample H006-01 was analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
METALS BY ICP-AES

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL

SDG NO. : 05H006
Instrument ID : T-107

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	WATER		Extraction Date/Time	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	IPH017MB	1	NA	08/12/0510:02			08/08/0511:35	107H027012	107H027010	IPH017W	Method Blank
LCS1W	IPH017ML	1	NA	08/12/0510:06			08/08/0511:35	107H027013	107H027010	IPH017W	Lab Control Sample (LCS)
LCD1W	IPH017MC	1	NA	08/12/0510:11			08/08/0511:35	107H027014	107H027010	IPH017W	LCS Duplicate
MW-20-5AS	H006-01A	1	NA	08/12/0510:15			08/08/0511:35	107H027015	107H027010	IPH017W	Analytical Spike Sample
MW-20-5	H006-01T	1	NA	08/12/0510:20			08/08/0511:35	107H027016	107H027010	IPH017W	Field Sample
MW-20-5DL	H006-01T	5	NA	08/12/0510:24			08/08/0511:35	107H027017	107H027010	IPH017W	Diluted Sample
MW-20-4	H006-02	1	NA	08/12/0510:28			08/08/0511:35	107H027018	107H027010	IPH017W	Field Sample
MW-20-3	H006-03	1	NA	08/12/0510:33			08/08/0511:35	107H027019	107H027010	IPH017W	Field Sample
MW-20-2	H006-04	1	NA	08/12/0510:37			08/08/0511:35	107H027020	107H027010	IPH017W	Field Sample

FN - Filename
% Moist - Percent Moisture

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 08/01/05
Project     : JPL                         Date Received: 08/02/05
SDG NO.     : 05H006                     Date Extracted: 08/08/05 11:35
Sample ID   : MW-20-5                    Date Analyzed: 08/12/05 10:20
Lab Samp ID : H006-01                    Dilution Factor: 1
Lab File ID : I07H027016                 Matrix          : WATER
Ext Btch ID : IPH017W                    % Moisture       : NA
Calib. Ref. : I07H027010                 Instrument ID    : EMAXTI07
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	5.28	1	.1
Iron	ND	.2	.04
Magnesium	1.27	1	.1
Potassium	ND	2	1.4
Sodium	64	1	.25

7003

dk

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 08/01/05
Project     : JPL                         Date Received: 08/02/05
SDG NO.     : 05H006                     Date Extracted: 08/08/05 11:35
Sample ID   : MW-20-4                    Date Analyzed: 08/12/05 10:28
Lab Samp ID : H006-02                     Dilution Factor: 1
Lab File ID : I07H027018                  Matrix       : WATER
Ext Btch ID : IPH017W                     % Moisture    : NA
Calib. Ref. : I07H027010                  Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	12.8	1	.1
Iron	.502	.2	.04
Magnesium	3.45	1	.1
Potassium	ND	2	1.4
Sodium	59.1	1	.25

7004

df

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE      Date Collected: 08/01/05
Project     : JPL                             Date Received: 08/02/05
SDG NO.     : 05H006                         Date Extracted: 08/08/05 11:35
Sample ID   : MW-20-3                       Date Analyzed: 08/12/05 10:33
Lab Samp ID : H006-03                       Dilution Factor: 1
Lab File ID : 107H027019                   Matrix          : WATER
Ext Btch ID : IPH017W                      % Moisture       : NA
Calib. Ref. : 107H027010                   Instrument ID    : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	50.6	1	.1
Iron	ND	.2	.04
Magnesium	15.6	1	.1
Potassium	ND	2	1.4
Sodium	58.1	1	.25

7005

A

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE      Date Collected: 08/01/05
Project     : JPL                             Date Received: 08/02/05
SDG NO.    : 05H006                           Date Extracted: 08/08/05 11:35
Sample ID   : MW-20-2                         Date Analyzed: 08/12/05 10:37
Lab Samp ID : H006-04                         Dilution Factor: 1
Lab File ID : I07H027020                     Matrix          : WATER
Ext Btch ID : IPH017W                         % Moisture      : NA
Calib. Ref. : I07H027010                     Instrument ID   : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	51.2	1	.1
Iron	ND	.2	.04
Magnesium	16.9	1	.1
Potassium	2.5	2	1.4
Sodium	13.8	1	.25

7006

for

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: NA
Project     : JPL                          Date Received: 08/08/05
SDG NO.     : 05H006                       Date Extracted: 08/08/05 11:35
Sample ID   : MBLK1W                       Date Analyzed: 08/12/05 10:02
Lab Samp ID : IPH017WB                     Dilution Factor: 1
Lab File ID : I07H027012                   Matrix          : WATER
Ext Btch ID : IPH017W                      % Moisture       : NA
Calib. Ref. : I07H027010                   Instrument ID    : EMAXTI07
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	ND	1	.1
Iron	ND	.2	.04
Magnesium	ND	1	.1
Potassium	ND	2	1.4
Sodium	ND	1	.25

7007

1

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05H006
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILT N FACTR: 1 1 1
SAMPLE ID: MBLK1W
CONTROL NO.: IPH017WB IPH017WL IPH017WC
LAB FILE ID: 107H027012 107H027013 107H027014
DATIME EXTRCTD: 08/08/0511:35 08/08/0511:35 08/08/0511:35 DATE COLLECTED: NA
DATIME ANALYZD: 08/12/0510:02 08/12/0510:06 08/12/0510:11 DATE RECEIVED: 08/08/05
PREP. BATCH: IPH017W IPH017W IPH017W
CALIB. REF: 107H027010 107H027010 107H027010

ACCESSION:

PARAMETER	BLNK RSLT mg/L	SPIKE AMT mg/L	BS RSLT mg/L	BS % REC	SPIKE AMT mg/L	BSD RSLT mg/L	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	ND	50	51.6	103	50	52.7	105	2	85-115	20
Iron	ND	10	10.5	105	10	10.8	108	3	85-115	20
Magnesium	ND	50	51	102	50	52.3	105	2	85-115	20
Potassium	ND	50	50.1	100	50	51.1	102	2	85-115	20
Sodium	ND	50	49.6	99	50	51	102	3	85-115	20

7003

AP

EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H006
METHOD: METHOD 200.7

=====

MATRIX:	WATER		% MOISTURE:	NA
DILUTION FACTOR:	1	5		
SAMPLE ID:	MW-20-5	MW-20-5DL		
EMAX SAMP ID:	H006-01	H006-01T		
LAB FILE ID:	107H027016	107H027017		
DATE EXTRACTED:	08/08/0511:35	08/08/0511:35	DATE COLLECTED:	08/01/05
DATE ANALYZED:	08/12/0510:20	08/12/0510:24	DATE RECEIVED:	08/02/05
PREP. BATCH:	IPH017W	IPH017W		
CALIB. REF:	107H027010	107H027010		

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SERIAL DIL RSLT (mg/L)	DIF RSLT %	QC LIMIT (%)
Calcium	5.28	ND	NA	10
Iron	ND	ND	0	10
Magnesium	1.27	ND	NA	10
Potassium	ND	ND	0	10
Sodium	64	58.5	9	10

7009

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05H006
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILT N FACTR: 1 1
SAMPLE ID: MW-20-5
CONTROL NO.: H006-01 H006-01A
LAB FILE ID: I07H027016 I07H027015
DATIME EXTRCTD: 08/08/0511:35 08/08/0511:35 DATE COLLECTED: 08/01/05
DATIME ANALYZD: 08/12/0510:20 08/12/0510:15 DATE RECEIVED: 08/02/05
PREP. BATCH: IPH017W IPH017W
CALIB. REF: I07H027010 I07H027010

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	AS RSLT (mg/L)	AS % REC	QC LIMIT (%)
Calcium	5.28	50	57.2	104	70-130
Iron	ND	10	11	110	70-130
Magnesium	1.27	50	53.1	104	70-130
Potassium	ND	50	51.7	103	70-130
Sodium	64	50	113	98	70-130

7010

for

REGULAR ICP QC CHECK TABLE

QC	ICV HIGH	ICV	CCV	ICSAB	ICSA
Limit%	95-105	90-110	90-110	80-120	80-120
Comp	mg/L	mg/L	mg/L	mg/L	mg/L
Al	10	5	5	500	500
Sb	2	1	1	1	0
As	2	1	1	1	0
Ba	2	1	1	0.5	0
Be	2	1	1	0.5	0
B	2	1	1	0.5	0
Cd	2	1	1	1	0
Ca	100	50	50	500	500
Cr	2	1	1	0.5	0
Co	2	1	1	0.5	0
Cu	2	1	1	0.5	0
Fe	10	5	5	200	200
Pb	2	1	1	1	0
Mg	100	50	50	500	500
Mn	2	1	1	0.5	0
Mo	2	1	1	1	0
Ni	2	1	1	1	0
K	100	50	50	50	0
Se	2	1	1	3.6	0
Ag	2	1	1	1	0
Na	100	50	50	10	0
Sr	2	1	1	0.5	0
Tl	2	1	1	3.6	0
Sn	10	5	5	1	0
Ti	2	1	1	1	0
V	2	1	1	0.5	0
Zn	2	1	1	1	0

ANALYSIS RUN LOG FOR ICP

SOP ☒ EMAX-6010-Rev. 3 ☐ EMAX-CLP-TAL ☐ 210.7 Method File: 601031 Autosampler Table: 10

Matrix: WATER Start Date: 8/12/05 Time: 09:19 End Date: 8/12/05 Time: 11:02 Book# A24 -038

Data File Name	Prep. Batch	Lab Sample ID	Matrix	Notes	Data File Name	Prep. Batch	Lab Sample ID	Matrix	Notes
01		50			26		26		
02		53			27		27		
03		56			28		28		
04		ICV (GS)			29		29		
05		ICB			30		30		
06		CCV (IC)			31		31		
07		CCB			32		32		
08		ICCA1			33		33		
09		ICCA1H			34		34		
10		CCV1 (IC)			35		35		
11		CCB1			36		36		
12	PHO17W	PHO17W	W	(LRP)	37		37		
13		W		(LFB)	38		38		
14		W		(LFB)	39		39		
15		PHO17W			40		40		
16		01			41		41		
17		05			42		42		
18		02			43		43		
19		09			44		44		
20		04			45		45		
21		CCV2 (IC)			46		46		
22		CCB2			47		47		
23		ICCA1F			48		48		
24		ICCA1F			49		49		
25		CCV3 (IC)			50		50		

Std.	Instrument No.	ID
S ₀	SM1709.38-01	
S ₁	NA	
S ₂	NA	
S ₃	SM1709.44-01	
S ₄	NA	
S ₅	NA	
S ₆	SM1709.45-02	
ICV (GS)	09-09-02	
ICVH1	NA	
ICVH2	NA	
CCV (IC)	SM1709.60-02	
ICSA	09-09-09	
ICSAB	09-09-01	
MRL		

Comments: OK

Analyzed By: Quib
 Date Disposed: _____
 This page is checked during data review.

SEQUENCE FILE : I07H027

4-18	19-33	34-43	44-53	54-63
LFID	LSID	TIME	DATE	DF
I07H027001	S0	09:13	08/12/05	1
I07H027002	S3	09:18	08/12/05	1
I07H027003	S6	09:22	08/12/05	1
I07H027004	ICV	09:25	08/12/05	1
I07H027005	ICB	09:31	08/12/05	1
I07H027006	CCV	09:35	08/12/05	1
I07H027007	CCB	09:40	08/12/05	1
I07H027008	ICSAI	09:44	08/12/05	1
I07H027009	ICSAB1	09:48	08/12/05	1
I07H027010	CCV1	09:54	08/12/05	1
I07H027011	CCB1	09:58	08/12/05	1
I07H027012	IPH017WB	10:02	08/12/05	1
I07H027013	IPH017WL	10:06	08/12/05	1
I07H027014	IPH017WC	10:11	08/12/05	1
I07H027015	H006-01A	10:15	08/12/05	1
I07H027016	H006-01	10:20	08/12/05	1
I07H027017	H006-01T	10:24	08/12/05	5
I07H027018	H006-02	10:28	08/12/05	1
I07H027019	H006-03	10:33	08/12/05	1
I07H027020	H006-04	10:37	08/12/05	1
I07H027021	CCV2	10:41	08/12/05	1
I07H027022	CCB2	10:45	08/12/05	1
I07H027023	ICSAF	10:49	08/12/05	1
I07H027024	ICSABF	10:53	08/12/05	1
I07H027025	CCV3	10:58	08/12/05	1
I07H027026	CCB3	11:02	08/12/05	1

SDG : 05 H006

UNIT : %

ICP CHECK : 107H027

DATE : 08/12/05

INST : EMAXT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
S0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICV	100	101	101	97	100	102	97	100	98	98	98	103	99	102	99	97	97	99	98	97	101	98	89*	99	101	98	98
ICB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV	100	100	101	99	97	97	98	99	97	96	98	101	99	100	97	96	96	98	100	98	99	98	92	96	97	97	98
CCB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAI	96	...	...	...	...	...	...	94	...	...	...	91	...	98	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAI1	97	93	102	95	95	95	93	94	92	88	98	91	99	98	93	91	87	99	103	96	104	93	99	87	93	100	97
CCV1	100	97	98	98	97	96	98	100	97	97	98	101	101	99	97	98	95	99	104	98	99	98	96	99	97	97	98
CCB1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH017NB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH017WL	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPH017WC	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H006-01A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H006-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H006-01T	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H006-02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H006-03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H006-04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV2	100	101	101	99	99	97	100	103	101	101	98	103	100	99	100	101	99	98	105	99	98	99	94	103	98	100	102
CCB2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAF	96	...	...	...	...	...	...	96	...	...	...	92	...	98	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAF1	96	94	101	94	95	93	93	96	94	92	97	92	100	97	93	93	88	99	101	96	103	92	96	92	92	101	98
CCV3	101	101	105	99	100	98	100	104	102	103	99	103	103	100	101	102	97	97	106	100	98	99	101	104	99	100	103
CCB3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

QC limit of each parameter are listed in a table attached next to all the ICP check forms
* : Out of QC Limit

7014

SDG : 05 H206

UNIT : UG/L

SUMMARY OF CALIBRATION BLANKS : I07H027 (WATER)

DATE : 08/12/05

INST : EMAXT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
S0
S3
S6
ICV	7.15	-6.50	20.4	390	-060	-1.68	-1.56	3.34	.000	4.56	-1.22	-3.63	32.2	-7.62	150	5.00	.610	186	17.9	-3.93	.000	.220	11.5	-14.0	.180	-130	.940
ICB
CCV
CCB	-18.3	-5.91	35.2	-580	-060	-1.69	-.840	2.87	.710	-.640	.400	-1.51	34.3	3.75	.150	-5.00	-1.83	-909	-21.0	-.350	-13.6	.220	-1.90	-24.5	-.340	-.380	-.370
ICSAI
ICSABI
CCV1
CCB1	4.45	-3.47	12.5	190	-060	-.420	-.210	-.450	-.710	2.61	-.400	-2.72	14.1	15.5	-.460	.000	-1.22	-477	20.9	-.530	-13.6	.260	10.6	-15.8	.330	.510	-.360
IPH017MB
IPH017AL
IPH017WC
H006-01A
H006-01
H006-01T
H006-02
H006-03
H006-04
CCV2
CCB2	5.02	5.42	32.9	.090	-.130	.840	-2.02	5.96	.000	4.57	.400	-.910	44.5	18.0	-.460	-1.66	-2.04	212	-.010	3.03	-13.6	.260	12.4	-10.5	.320	1.95	.020
ICSAF
ICSABF
CCV3
CCB3	13.7	13.1	10.2	.000	.000	-2.10	-.300	4.28	-.700	3.26	-.410	1.51	28.2	6.75	-.300	13.3	-9.59	78.3	55.9	1.07	-13.6	.260	-25.9	15.8	.530	1.53	-.420

QC Limit of each parameter are listed in a table attached next to all the ICP check forms

★ : Out of QC Limit

7015

DIGESTION LOG FOR ICP METALS

Book # EIP-046

SOP □ EMAX-3005 Rev. No. 3 □ EMAX-3010 Rev. No. 2 □ EMAX-CIP-TAL 200.7

Matrix: WATER Start Date: 8-8-05 Time: 11:35 Temp: 85 °C Ending Date: 8-8-05 Time: 13:35 Temp.: 85 °C

Sample Prep ID	Lab Sample ID	Matrix Description		Turbidity <1 NTU	Sample Amount (g/ml)	pH	Extract Volume (ml)	Digestate Description		Standards	ID	Amount Added (ml)	
		Color	Texture/ Clarity					Artifacts	Color				Clarity
01	IPH017-WB				50	-	50			LCS -1	SMIA - 09 - 42	0.5	
02	-WL				50	-	50			LCS -2	SMIA - 09 - 43	0.5	
03	-WC				50	-	50			LCS -3	SMIA - 09 - 44	0.5	
04	H006-01				50	42	50			MS			
05	-02				50		50			Reagent			
06	-03				50		50			HNO ₃	SWIA - 03 - 120	0.5	
07	-04				50		50			HCl	SWIA - 03 - 115	0.25	
08	H010-01				50		50			H ₂ O ₂	N/A		
09	-02				50		50			HNO3 (1:1)	N/A		
10	-04				50		50			Digestate Location	ICP LAB		
11	-05				50		50			Extract Location			
12	-07				50		50			Legend:			
13	-08				50		50			Texture	Cs = Coarse	Md = Medium	Fn = Fine
14	H036-01				50		50			Clarity	Cr = Clear	Cy = Cloudy	Td = Turbid
15	-02				50		50			Artifacts	Rk = rocks	Sl = Shale	Vg = Vegetation
16	-03				50		50			Color	Bu = blue	Bk = Black	Bn = Brown
17	-04				50		50				Gn = Green	Og = Orange	Red = Red
					50		50				Yw = Yellow	Cl = Colorless	

BATCH: IPH017-W

BATCH: IPH017-W

7016

Prepared By:

MC

Standard Added By:

MC

Witnessed By:

AZ

Extracts Recd. By:

AZ

Checked By:

AZ

Date Disposed:

Disposed by:

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

WET CHEMICAL ANALYSES

SDG#: 05H006

8000

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05H006

METHOD 310.1 TOTAL ALKALINITY

Five (5) water samples were received on 08/02/05 for Total Alkalinity analysis by Method 310.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 310.1
TOTAL ALKALINITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H006

Matrix : WATER
Instrument ID : 153

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ALH003WB	ND	1	NA	5	1	08/05/0513:30	NA	ALH003W-01	NA	ALH003W	NA	NA
LCS1W	ALH003WL	45.7	1	NA	5	1	08/05/0513:35	NA	ALH003W-02	NA	ALH003W	NA	NA
LCD1W	ALH003WC	45.7	1	NA	5	1	08/05/0513:40	NA	ALH003W-03	NA	ALH003W	NA	NA
MW-20-5	H006-01	125	1	NA	5	1	08/05/0513:45	NA	ALH003W-04	NA	ALH003W	08/01/05	08/02/05
MW-20-4	H006-02	128	1	NA	5	1	08/05/0513:50	NA	ALH003W-05	NA	ALH003W	08/01/05	08/02/05
MW-20-3	H006-03	195	1	NA	5	1	08/05/0513:55	NA	ALH003W-06	NA	ALH003W	08/01/05	08/02/05
MW-20-2	H006-04	144	1	NA	5	1	08/05/0514:00	NA	ALH003W-07	NA	ALH003W	08/01/05	08/02/05
MW-20-1	H006-05	274	1	NA	5	1	08/05/0514:05	NA	ALH003W-08	NA	ALH003W	08/01/05	08/02/05

8002
24

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

BATTELLE MEMORIAL INSTITUTE

CLIENT:
PROJECT:
METHOD:
MATRIX:
% MOISTURE:

JPL
METHOD 310.1
WATER
NA

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 08/05/05 13:35/13:40

BATCH NO.: 05H006
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: ALH003WL/C

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Total Alkalinity	ND	49.20	45.70	93	49.20	45.70	93	0	80-120	20

8003

961

ANALYSIS LOG FOR ALKALINITY

Page 67

Book # AAL-009

SOP EMAX-310.1 Rev. No. 2 □ SM2320B Rev. No. 0 □

Instrument No: 853 □ 97

Ending Date: 8/5/05 Time: 4:50

Time: 13:30

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Initial pH	Acid Titrant			Final pH	ALKALINITY (mg/L)			Notes	Standard Reagent	ID	Conc. mg/L
					pH=8.3	pH=4.5	pH=4.2		Total	Endpoint (eq)	Calculation (mg/L)				
*01	ALH03	13:30	20	5.18	NA	0.025	NA	4.46	ND			LCS	SN7A-06-174	49.2	
*02	↓	35		8.95		0.95		4.53	45.7			Spike	NA		
*03	↓	40		8.93		0.95		4.48	45.7			Na ₂ CO ₃ Soln	SN7A-06-170	2360	
*04	H006-01	45		9.02		2.60		4.52	125			Acid Titrant HCl	SN3B-02-732	0.02N	
*05	↓	50		8.79		2.65		4.47	128						
*06	↓	55		8.05		4.05		4.47	195						
*07	↓	1:00		7.79		3.00		4.53	144			Na ₂ CO ₃ Soln (ml)		Normality, N	
*08	↓	15		6.85		5.70		4.52	274			BIK	0.025	ND	
*09	H007-09	10	100	5.94		0.15	0.25	4.70	ND			5	12.25	0.01925	
*10	H008-05	15	20	6.79		2.65	NA	4.53	128			5	12.25	0.01925	
*11	↓	20		6.49		2.55		4.49	123			5	12.25	0.01925	
*12	↓	25		7.14		5.10		4.52	245			Ave. N: 0.01925			
*13	↓	30		6.71		2.45		4.50	118						
*14	H020-05	35		7.80		3.10		4.50	149			pH Buffer		Reading	
*15	↓	40	100	5.88		0.20	0.30	4.22	ND			pH 4	SN7A-06-201	3.98	
*16	↓	45	20	6.09		3.20		4.50	154			pH 7		6.98	
*17	H020-15D	4:50		6.52		3.20		4.51	154			pH 10		9.98	
*18												Slope		98.9	
*19															
*20												Comments:			
*21															
*22															
*23															
*24															
*25															

ANALYTICAL BATCH * ALH03W 8004

Comments: Analyzed By: MGP/EM

This page is checked during data review.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H006**

METHOD 350.2 AMMONIA (NH₃-N)

Five (5) water samples were received on 08/02/05 for Ammonia analysis by Method 350.2 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Matrix Spike

MS sample was not designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

All results were reported as Nitrogen concentration.

METHOD 350.2
AMMONIA (NH3-N)

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H006

Matrix : WATER
Instrument ID : 170

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	NHH003WB	ND	1	NA	.1	.03	08/11/0515:11	08/11/0509:30	NHH003W-12	NHH003W-10	NHH003W	NA	08/11/05
LCS1W	NHH003WL	1.01	1	NA	.1	.03	08/11/0515:12	08/11/0509:30	NHH003W-13	NHH003W-10	NHH003W	NA	08/11/05
LCD1W	NHH003WC	1.03	1	NA	.1	.03	08/11/0515:13	08/11/0509:30	NHH003W-14	NHH003W-10	NHH003W	NA	08/11/05
MW-20-5	H006-01	ND	1	NA	.1	.03	08/11/0515:14	08/11/0509:30	NHH003W-15	NHH003W-10	NHH003W	08/01/05	08/02/05
MW-20-4	H006-02	ND	1	NA	.1	.03	08/11/0515:15	08/11/0509:30	NHH003W-16	NHH003W-10	NHH003W	08/01/05	08/02/05
MW-20-3	H006-03	.153	1	NA	.1	.03	08/11/0515:16	08/11/0509:30	NHH003W-17	NHH003W-10	NHH003W	08/01/05	08/02/05
MW-20-2	H006-04	.119	1	NA	.1	.03	08/11/0515:17	08/11/0509:30	NHH003W-18	NHH003W-10	NHH003W	08/01/05	08/02/05
MW-20-1	H006-05	ND	1	NA	.1	.03	08/11/0515:18	08/11/0509:30	NHH003W-19	NHH003W-10	NHH003W	08/01/05	08/02/05

8006
K

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 350.2
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H006
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: NHH003WL/C
DATE RECEIVED: 08/11/05
DATE EXTRACTED: 08/11/05 09:30
DATE ANALYZED: 08/11/05 15:12/15:13

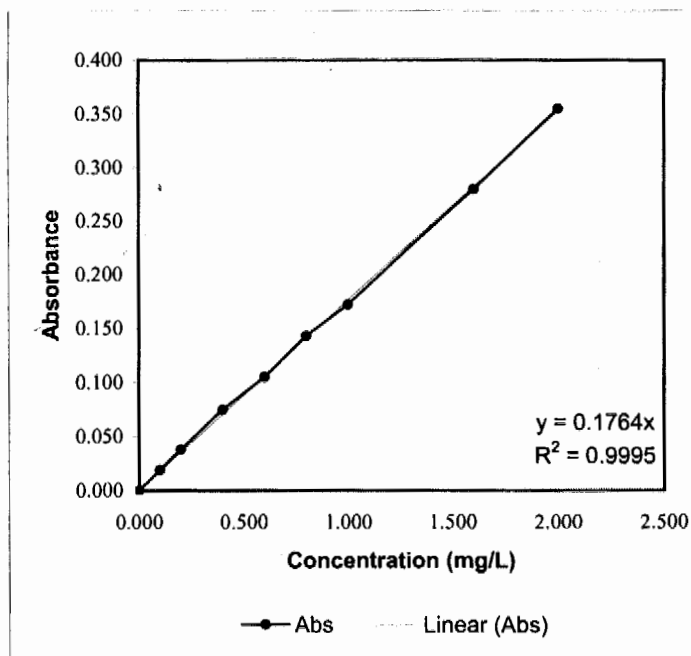
ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Ammonia (NH3-N)	ND	1.00	1.01	101	1.00	1.03	103	2	80-120	20

8007

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.019
0.200	0.038
0.400	0.075
0.600	0.105
0.800	0.143
1.000	0.172
1.600	0.280
2.000	0.355



R^2 0.999524

y 0.1764

CF 5.6694

Comments: **PASSED**

Analyzed by: NT/LA

ANALYSIS LOG FOR AMMONIA-N

Book # A70-NH₃-005

SOP EMAX-350.2 Rev. No. 2 EMAX-350.1 Rev. No. 0

Starting Date: 8-11-08

Time: 15:40

Ending Date: 8-11-08

Time: 15:32

Data File Name	Prep. Batch	Lab Sample ID	Matrix S W	Time	Vol. Colored (ml)	DF	Absorbance	Notes	Standard	ID	Wavelength: 425 nm	Conc. (mg/L)
* 1	NH4003W	S-0.0		15:00	20	1	0.000		S ₀			0.0
* 2		S-0.1		-01			0.019		S ₁	2402903-182		0.1
* 3		S-0.2		-02			0.048		S ₂			0.2
* 4		S-0.4		-03			0.076		S ₃			0.4
* 5		S-0.6		-04			0.105		S ₄			0.6
* 6		S-0.8		-05			0.143		S ₅			0.8
* 7		2-1.0		-06			0.172		S ₆			1.0
* 8		S-1.6		-07			0.240		S ₇			1.6
* 9		S-2.0		-08			0.356	1.02	S ₈			2.0
* 10		1.0V		-09			0.150	ND	S ₉	5W29-03-182		1.0
* 1		10.15		-10			0.000	ND	S ₁₀			1.0
* 2		NH4003W		-11			0.000	ND	ICV/MS			1.0
* 3		WLC		-12			0.178	1.009	OCV			1.0
* 4		WLC		-13			0.182	1.092	LCS			1.0
* 5		NH4003W		-14			0.012	ND	Reagent			
* 6		-02		-15			0.017	ND	Color Reagent	5W7A-06-141		
* 7		-03		-16			0.027	0.153				
* 8		-04		-17			0.021	0.119				
* 9		-06		-18			0.008	ND				
* 10		NH4003W		-19			0.016	ND	R	0.9496		
* 1		WLC		-20			0.016	ND	Y	0.1764		
* 2		00V1		-21			0.178	0.964	CF	50694		
* 3		CCB1		-22			0.000	ND	Comments:			
* 4		NH4003W		-23			0.190	1.077	Results are based on: <input type="checkbox"/> Dry Weight <input type="checkbox"/> Wet Weight			
* 5		6260-01		-24			0.005	ND				
* 6		-02		-25			0.009	ND				
* 7		-03		-26			0.005	ND				
* 8		-00		-27			0.016	ND				
* 9		-05		-28			0.028	0.159				
* 10		-04		-29			0.016	ND				

ANALYTICAL BATCH * NH4003W

8009

Analyzed By: NT/LA

This page is checked during data review.

ANALYSIS LOG FOR AMMONIA-N

Book # A70-NH₃-005SOP ☒ EMAX-350.2 Rev. No. 2 ☐ EMAX-350.1 ☐ Rev. No. 0 ☐

Starting Date: 8-11-05 Time: 15:00 Ending Date: 8-11-05 Time: 15:32

Data File Name	Prep. Batch	Lab Sample ID	Matrix S W	Time	Vol. Colored (ml)	DF	Absorbance	Notes
* 1	1111003W	1111003W		15:24	2.0	1	0.023	NAK
* 2		CCV2		15:24	2.0	1	0.023	0.187
* 3		CCV2		15:24	2.0	1	0.023	1.092
* 4		CCV2		15:24	2.0	1	0.023	ND
* 5								
* 6								
* 7								
* 8								
* 9								
* 0								
* 1								
* 2								
* 3								
* 4								
* 5								
* 6								
* 7								
* 8								
* 9								
* 0								
* 1								
* 2								
* 3								
* 4								
* 5								
* 6								
* 7								
* 8								
* 9								
* 0								

Standard	Instrument No: 70	ID	Wavelength: 425 nm	Conc. (mg/L)
S ₀		Samie acc 19.73		0.0
S ₁				0.1
S ₂				0.2
S ₃				0.4
S ₄				0.6
S ₅				0.8
S ₆				1.0
S ₇				1.6
S ₈				2.0
ICV/MS				1.0
CCV				1.0
LCS				1.0
Reagent		ID		
Color Reagent				

Standard Curve
R 0.9995
Y 0.1764
CF 5.6694

Comments:

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By: NT/2A

ANALYTICAL BATCH * 1111003W

8010

DISTILLATION LOG FOR NH_3 / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-006

SOP ☐ EMAX-351.2 Rev. No.: 2 ☐ EMAX-351.3 Rev. No.: 2 ☐

Start Date 8-11-05 Time 9:30 End Date 8-11-05 Time 14:00

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	5-0.0	9.6	0.1	10	5	100	100		ICVMS	5008-03-181	10.40
*02	5-0.1								LCS	5-179	10.8
*03	5-1.0								Reagent	Lot# / ID	
*04	5-2.0								NaOH	5074-06-211	
*05	10.0								Digestion Mixture	NA	
*06	10.0								Borate Buffer		
*07	11.0								H_3BO_3	5074-06-211	
*08	11.0								Distilling Soln.	NA	
*09	11.0								Comments:		
*10	11.0										
*11	11.0										
*12	11.0										
*13	11.0										
*14	11.0										
*15	11.0										
*16	11.0										
*17	11.0										
*18	11.0										
*19	11.0										
*20	11.0										
*21	11.0										
*22	11.0										
*23	11.0										
*24	11.0										
*25	11.0										
*26	11.0										

Prepared By: NT/LA

Standard Added By: NT

Checked By:

PREPARATION BATCH *

8011

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H006**

METHOD 300.0 ANIONS

Five (5) water samples were received on 08/02/05 for Chloride, Nitrate-N, Nitrite-N and Sulfate analyses by method 300.0 in accordance with "Method for Determination of Inorganic Anions by Ion Chromatography", EPA 600/84-017.

1. Holding Time

Analyses met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limits.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was not designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

Nitrate-N and Nitrite-N results were reported as Nitrogen concentration.

SAMPLE RESULTS

METHOD 300.0
CHLORIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H006

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBL K1W	ICH002WB	ND	1	NA	.2	.1	08/02/0522:03	NA	AH02-04	AH02-01	ICH002W	NA	NA
LCS1W	ICH002WL	4.73	1	NA	.2	.1	08/02/0522:17	NA	AH02-05	AH02-01	ICH002W	NA	NA
LCS1W	ICH002WC	4.71	1	NA	.2	.1	08/02/0522:31	NA	AH02-06	AH02-01	ICH002W	NA	NA
MM-20-5	H006-01	9.2	1	NA	.2	.1	08/02/0522:45	NA	AH02-07	AH02-01	ICH002W	08/01/05	08/02/05
MBL K2W	ICH010WB	ND	1	NA	.2	.1	08/08/0520:15	NA	AH08-03	AH08-01	ICH010W	NA	NA
LCS2W	ICH010WL	4.78	1	NA	.2	.1	08/08/0520:29	NA	AH08-04	AH08-01	ICH010W	NA	NA
LCS2W	ICH010WC	4.79	1	NA	.2	.1	08/08/0520:46	NA	AH08-05	AH08-01	ICH010W	NA	NA
MM-20-4	H006-02	10.1	2	NA	.4	.2	08/08/0523:27	NA	AH08-16	AH08-13	ICH010W	08/01/05	08/02/05
MM-20-3	H006-03	32.5	5	NA	1	.5	08/08/0523:41	NA	AH08-17	AH08-13	ICH010W	08/01/05	08/02/05
MM-20-2	H006-04	13.4	5	NA	1	.5	08/08/0523:55	NA	AH08-18	AH08-13	ICH010W	08/01/05	08/02/05
MM-20-1	H006-05	31	10	NA	2	1	08/09/0500:09	NA	AH08-19	AH08-13	ICH010W	08/01/05	08/02/05

8014

METHOD 300.0
NITRATE-N

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H006

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE TIME	Extraction DATE TIME	LFID	CAL REF	PREP BATCH	Collection DATE TIME	Received DATE TIME
MBLK1W	ICH002WB	ND	1	NA	.1	.05	08/02/0522:03	NA	AH02-04	AH02-01	ICH002W	NA	NA
LCS1W	ICH002WL	4.8	1	NA	.1	.05	08/02/0522:17	NA	AH02-05	AH02-01	ICH002W	NA	NA
LCD1W	ICH002WC	4.8	1	NA	.1	.05	08/02/0522:31	NA	AH02-06	AH02-01	ICH002W	NA	NA
MW-20-5	H006-01	ND	1	NA	.1	.05	08/02/0522:45	NA	AH02-07	AH02-01	ICH002W	08/01/05	08/02/05
MW-20-4	H006-02	ND	1	NA	.1	.05	08/02/0522:59	NA	AH02-08	AH02-01	ICH002W	08/01/05	08/02/05
MW-20-3	H006-03	2.94	1	NA	.1	.05	08/02/0523:13	NA	AH02-09	AH02-01	ICH002W	08/01/05	08/02/05
MW-20-2	H006-04	2.18	1	NA	.1	.05	08/02/0523:27	NA	AH02-10	AH02-01	ICH002W	08/01/05	08/02/05
MW-20-1	H006-05	6.11	1	NA	.1	.05	08/02/0523:42	NA	AH02-11	AH02-01	ICH002W	08/01/05	08/02/05

8015
2

METHOD 300.0
NITRITE-N

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H006
Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICH002WB	ND	1	NA	.1	.05	08/02/0522:03	NA	AH02-04	AH02-01	ICH002W	NA	NA
LCSTW	ICH002WL	4.8	1	NA	.1	.05	08/02/0522:17	NA	AH02-05	AH02-01	ICH002W	NA	NA
LCD1W	ICH002WC	4.8	1	NA	.1	.05	08/02/0522:31	NA	AH02-06	AH02-01	ICH002W	NA	NA
MW-20-5	H006-01	ND	1	NA	.1	.05	08/02/0522:45	NA	AH02-07	AH02-01	ICH002W	08/01/05	08/02/05
MW-20-4	H006-02	ND	1	NA	.1	.05	08/02/0522:59	NA	AH02-08	AH02-01	ICH002W	08/01/05	08/02/05
MW-20-3	H006-03	ND	1	NA	.1	.05	08/02/0523:13	NA	AH02-09	AH02-01	ICH002W	08/01/05	08/02/05
MW-20-2	H006-04	ND	1	NA	.1	.05	08/02/0523:27	NA	AH02-10	AH02-01	ICH002W	08/01/05	08/02/05
MW-20-1	H006-05	ND	1	NA	.1	.05	08/02/0523:42	NA	AH02-11	AH02-01	ICH002W	08/01/05	08/02/05

8016

METHOD 300.0
SULFATE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H006

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICH002MB	ND	1	NA	.5	.25	08/02/0522:03	NA	AH02-04	AH02-01	ICH002W	NA	NA
LCS1W	ICH002WL	4.53	1	NA	.5	.25	08/02/0522:17	NA	AH02-05	AH02-01	ICH002W	NA	NA
LCD1W	ICH002WC	4.52	1	NA	.5	.25	08/02/0522:31	NA	AH02-06	AH02-01	ICH002W	NA	NA
MW-20-5	H006-01	5.2	1	NA	.5	.25	08/02/0522:45	NA	AH02-07	AH02-01	ICH002W	08/01/05	08/02/05
MW-20-4	H006-02	14.6	1	NA	.5	.25	08/02/0522:59	NA	AH02-08	AH02-01	ICH002W	08/01/05	08/02/05
MBLK2W	ICH010WB	ND	1	NA	.5	.25	08/08/0520:15	NA	AH08-03	AH08-01	ICH010W	NA	NA
LCS2W	ICH010WL	4.75	1	NA	.5	.25	08/08/0520:29	NA	AH08-04	AH08-01	ICH010W	NA	NA
LCD2W	ICH010WC	4.82	1	NA	.5	.25	08/08/0520:46	NA	AH08-05	AH08-01	ICH010W	NA	NA
MW-20-3	H006-03	25.6	5	NA	2.5	1.25	08/08/0523:41	NA	AH08-17	AH08-13	ICH010W	08/01/05	08/02/05
MW-20-2	H006-04	28.7	5	NA	2.5	1.25	08/08/0523:55	NA	AH08-18	AH08-13	ICH010W	08/01/05	08/02/05
MW-20-1	H006-05	78.7	10	NA	5	2.5	08/09/0500:09	NA	AH08-19	AH08-13	ICH010W	08/01/05	08/02/05

8017

QC SUMMARIES

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05H006

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICH002WB ICH002WC
LAB FILE ID: AH02-04 AH02-06
DATE EXTRACTED: NA DATE COLLECTED: NA
DATE ANALYZED: 08/02/0522:03 08/02/0522:17 08/02/0522:31
PREP. BATCH: ICH002W ICH002W ICH002W
CALIB. REF: AH02-01 AH02-01 AH02-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Chloride-Cl	ND	5	4.73	95	5	4.71	94	0	90-110	20

8019
8

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05H006

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK2W
LAB SAMP ID: ICH010WL ICH010WC
LAB FILE ID: AH08-04 AH08-05
DATE EXTRACTED: NA
DATE ANALYZED: 08/08/0520:15 08/08/0520:29 08/08/0520:46
PREP. BATCH: ICH010W ICH010W
CALIB. REF: AH08-01 AH08-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Chloride-cl	ND	5	4.78	96	5	4.79	96	0	90-110	20

8020

22

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H006
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICH002WB
LAB FILE ID: AH02-04
DATE EXTRACTED: NA
DATE ANALYZED: 08/02/0522:03
PREP. BATCH: ICH002W
CALIB. REF: AH02-01

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	5.0	4.8	96	5.0	4.8	96	0	90-110	20

8021

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H006
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICH002WL ICH002WC
LAB FILE ID: AH02-04 AH02-05 AH02-06
DATE EXTRACTED: NA
DATE ANALYZED: 08/02/0522:03 08/02/0522:17 08/02/0522:31
PREP. BATCH: ICH002W ICH002W ICH002W
CALIB. REF: AH02-01 AH02-01 AH02-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrite-N	ND	5.0	4.8	96	5.0	4.8	96	0	90-110	20

8022

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05H006
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICH002WL ICH002WC
LAB FILE ID: AH02-04 AH02-05 AH02-06
DATE EXTRACTED: NA
DATE ANALYZED: 08/02/0522:03 08/02/0522:17 08/02/0522:31
PREP. BATCH: ICH002W ICH002W ICH002W
CALIB. REF: AH02-01 AH02-01 AH02-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Sulfate	ND	5	4.53	91	5	4.52	90	0	90-110	20

8023

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05H006

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK2W
LAB SAMP ID: ICH010WB ICH010WC
LAB FILE ID: AH08-03 AH08-04 AH08-05
DATE EXTRACTED: NA
DATE ANALYZED: 08/08/0520:15 08/08/0520:29 08/08/0520:46
PREP. BATCH: ICH010W ICH010W
CALIB. REF: AH08-01 AH08-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Sulfate	ND	5	4.75	95	5	4.82	96	1	90-110	20

8024

OK

INITIAL CALIBRATIONS

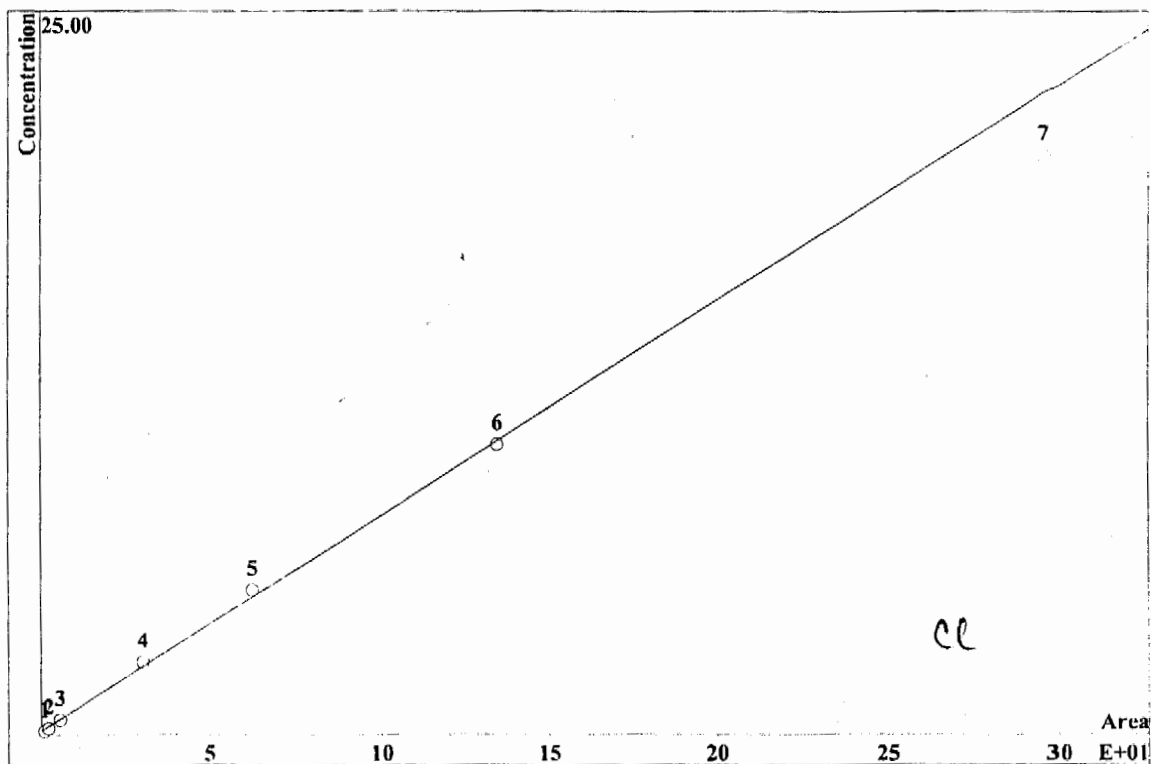
IC Result Check FormVersion : QH1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH01-01	IB	FCIBNPS	0	0	0	0	0	0	0	p8011625	1
AH01-02	S0	FCIBNPS	0	0	0	0	0	0	0	p8011639	1
AH01-03	S1	FCIBNPS	0.18836	0.20113	0.17432	0.2216	0.23129	0.23666	0.21269	p8011653	1
AH01-04	S2	FCIBNPS	0.27278	0.28754	0.25434	0.31636	0.304	0.31331	0.2938	p8011707	1
AH01-05	S3	FCIBNPS	0.53025	0.54412	0.50474	0.57579	0.53797	0.52755	0.55595	p8011721	1
AH01-06	S4	FCIBNPS	2.3695	2.3621	2.3884	2.4564	2.3144	2.2205	2.46	p8011735	1
AH01-07	S5	FCIBNPS	4.8345	4.7729	4.9114	4.8164	4.7699	4.9004	4.8979	p8011749	1
AH01-08	S6	FCIBNPS	10.105	10.132	10.067	9.7475	10.142	10.102	9.8172	p8011803	1
AH01-09	S7	FCIBNPS	20.268	22.156	20.839	20.166	22.614	21.9	20.324	p8011818	1
AH01-10	ICV	FCIBNPS	95.6%	93.6%	92.2%	99.1%	93.3%	90.6%	98.5%	p8011832	1
AH01-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8011846	1
AH01-12	ICH001WB	FCIBNPS	0	0	0	0	0	0	0	p8011900	1
AH01-13	ICH001WL	FCIBNPS	4.8635	4.7236	4.6805	4.8835	4.6546	4.6229	4.7245	p8011914	1
AH01-14	ICH001WC	FCIBNPS	4.9057	4.722	4.6814	4.8697	4.6509	4.6182	4.7516	p8011928	1
AH01-15	G126-01T	FCIBNPS	1.1839	138.72	0	0	6.1591	0	65.298	p8012025	5
AH01-16	G126-02T	FCIBNPS	3.2244	215.94	0	1.2074	9.0006	0	192.41	p8012040	5
AH01-17	G126-03T	FCIBNPS	2.2603	137.59	0	0	5.4868	0	162.34	p8012054	5
AH01-18	G126-04T	FCIBNPS	4.9866	306.58	0	1.3846	14.847	0	244.28	p8012108	5
AH01-19	G126-06T	FCIBNPS	4.8433	139.79	0	0	7.0632	0	159.73	p8012122	5
AH01-20	G126-07T	FCIBNPS	1.8163	100.33	0	0	15.019	0	285.93	p8012136	10
AH01-21	G818-02	FCIBNPS	5.67	181.29	0	0	8.4455	0	86.102	p8012150	50
AH01-22	CCV1	FCIBNPS	97.7%	95.4%	98.2%	93.7%	94.5%	96.9%	90.9%	p8012204	1
AH01-23	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8012218	1
AH01-24	G818-02D	FCIBNPS	0	182.67	0	0	8.5372	0	85.987	p8012233	50
AH01-25	G818-02M	FCIBNPS	245.13	430.51	238.71	234.77	240.79	119.04	305.82	p8012247	50
AH01-26	G818-03	FCIBNPS	0	179.51	0	6.961	0	0	85.432	p8012301	50
AH01-27	G818-04	FCIBNPS	2.3845	69.544	0	0	3.6042	0	116.42	p8012315	20
AH01-28	G818-05	FCIBNPS	2.3472	74.139	0	0	3.8114	0	124.21	p8012329	20
AH01-29	G820-02	FCIBNPS	0	153.08	0	0	0	0	167.66	p8012343	200
AH01-30	G184-05	FCIBNPS	2.2847	11.049	0	0	4.0779	0	32.802	p8012357	20
AH01-31	G147-01	FCIBNPS	1.0454	13208	0	50.116	0	0	1977.7	p8020011	5
AH01-32	G147-02	FCIBNPS	0	13488	0	2.8757	0	0	2019.9	p8020025	5
AH01-33	CCV2	FCIBNPS	97.7%	108.6%	97.8%	93.6%	94.4%	93.3%	92.5%	p8020039	1
AH01-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8020053	1

8025A

CALIBRATION OF COMPONENT chloride

Method: IC100-H01.mtw
 Equation: $Q = 0.0743917 \cdot A + 0.117752$
 RSD: 5.386 %
 Correlation coefficient: 0.999287 ✓



K3 = 0 K2 = 0 K1 = 0.0743917 K0 = 0.117752
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

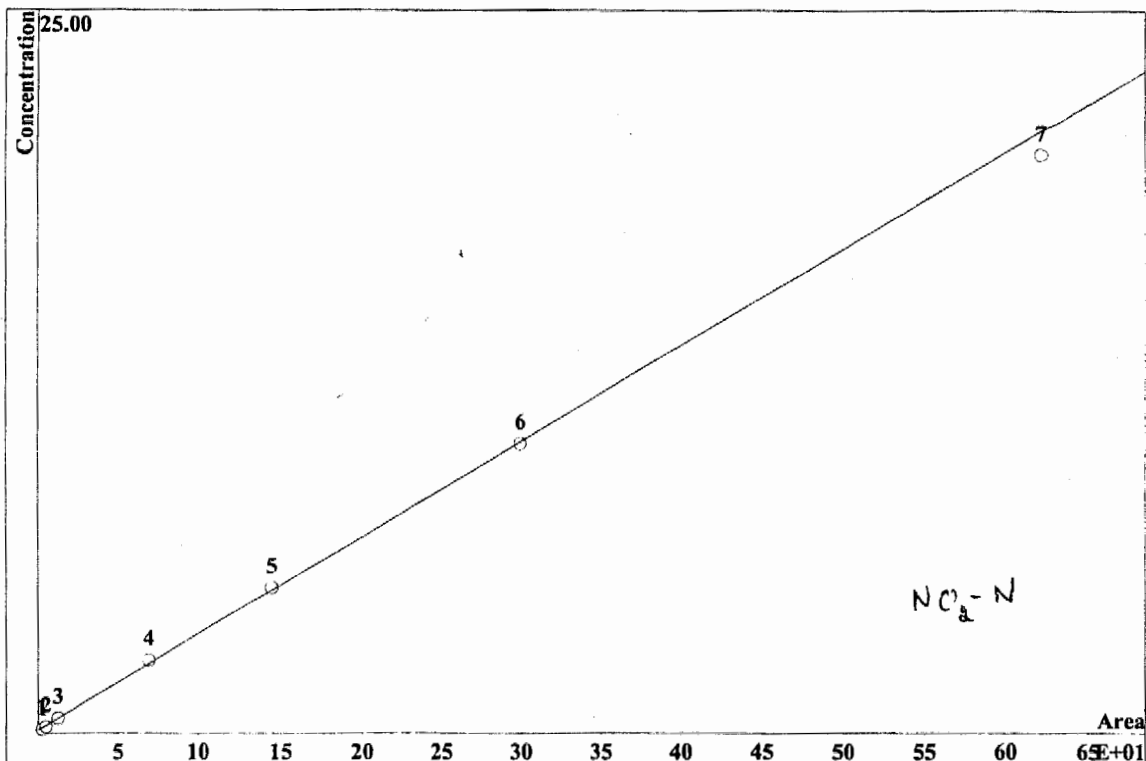
LR = 10

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.1281	1.121 ✓	0.1	1	3.37	Yes	p8011653.chw
2	0.2568	2.282 ✓	0.2	1	3.37	Yes	p8011707.chw
3	0.6501	5.731 ✓	0.5	1	3.37	Yes	p8011721.chw
4	3.457	30.17 ✓	2.5	1	3.37	Yes	p8011735.chw
5	7.342	62.58 ✓	5	1	3.37	Yes	p8011749.chw
6	16.29	134.6 ✓	10	1	3.37	Yes	p8011803.chw
7	36.06	296.2 ✗	20	1	3.37	No	p8011818.chw

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 8026

CALIBRATION OF COMPONENT nitrite

Method: IC100-H01.mtw
 Equation: $Q = 0.0333061 \cdot A + 0.0871128$
 RSD: 2.990 %
 Correlation coefficient: 0.999780 ✓



K3 = 0 K2 = 0 K1 = 0.0333061 K0 = 0.0871128
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

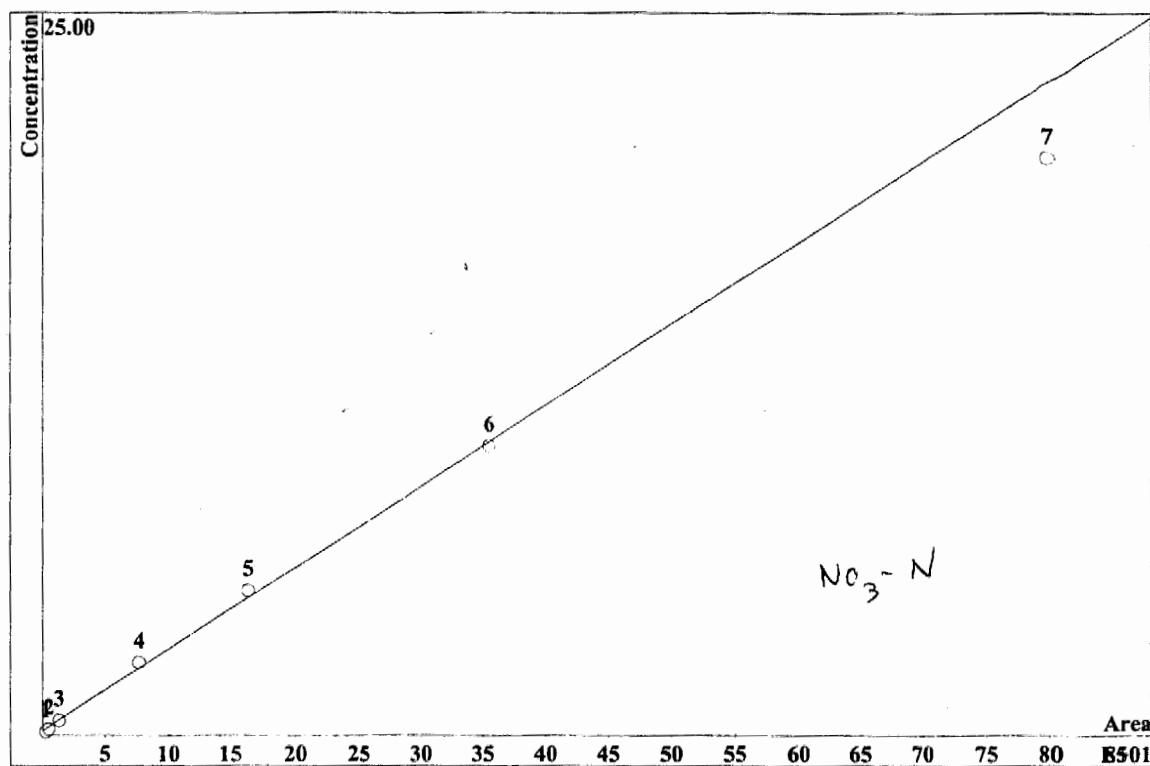
LA = 10

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2534	2.618 ✓	0.1	1	3.98	Yes	p8011653.chw
2	0.4871	5.021 ✓	0.2	1	3.98	Yes	p8011707.chw
3	1.231	12.54 ✓	0.5	1	3.98	Yes	p8011721.chw
4	6.737	69.09 ✓	2.5	1	3.98	Yes	p8011735.chw
5	14.03	144.8 ✓	5	1	3.98	Yes	p8011749.chw
6	28.16	299.6 ✓	10	1	3.98	Yes	p8011803.chw
7	54.14	623.1 x	20	1	3.98	No	p8011818.chw

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CALIBRATION OF COMPONENT nitrate

Method: IC100-H01.mtw
 Equation: $Q = 0.0281219 \cdot A + 0.154267$
 RSD: 6.071 %
 Correlation coefficient: 0.999094



K3 = 0 K2 = 0 K1 = 0.0281219 K0 = 0.154267
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

LR = 10

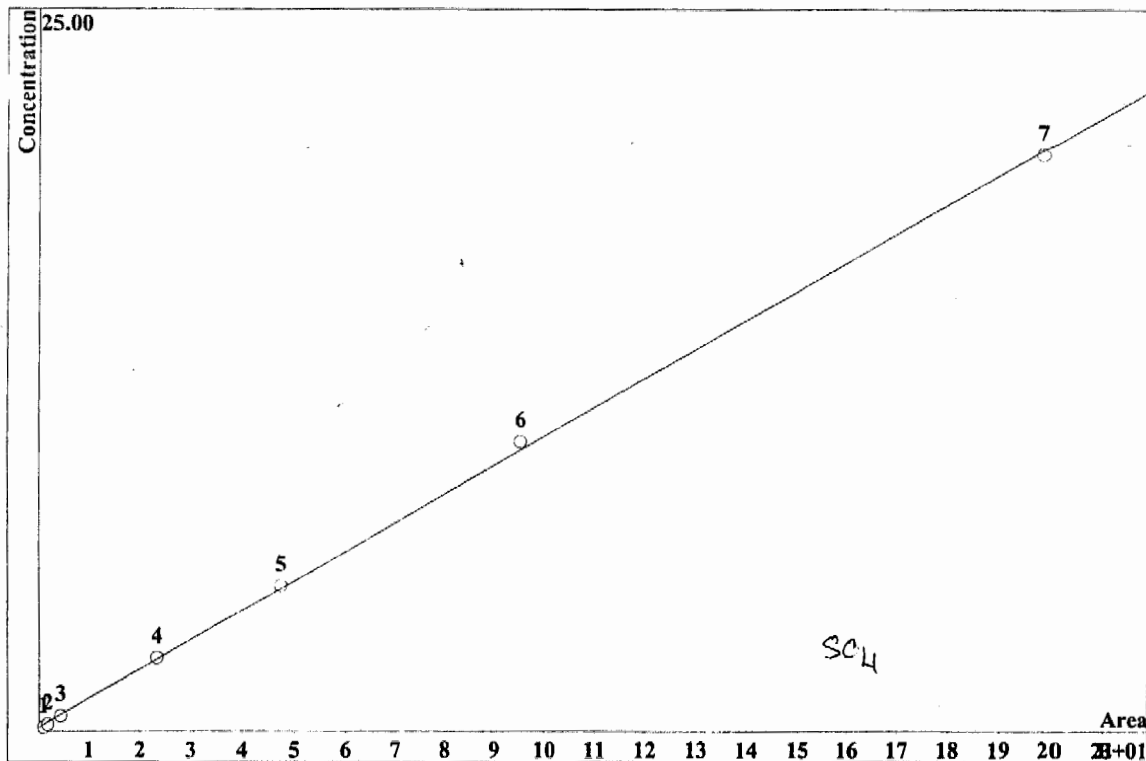
Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.203	2.739 ✓	0.1	1	5.56	Yes	p8011653.chw
2	0.3959	5.324 ✓	0.2	1	5.56	Yes	p8011707.chw
3	1.02	13.64 ✓	0.5	1	5.56	Yes	p8011721.chw
4	5.865	76.81 ✓	2.5	1	5.56	Yes	p8011735.chw
5	12.87	164.1 ✓	5	1	5.56	Yes	p8011749.chw
6	28.43	355.2 ✓	10	1	5.56	Yes	p8011803.chw
7	62.62	798.7 x	20	1	5.56	No	p8011818.chw

8/2/05

8028

CALIBRATION OF COMPONENT sulfate

Method: IC100-H01.mtw
 Equation: $Q = 0.100694 \cdot A + 0.113285$
 RSD: 3.081 %
 Correlation coefficient: 0.999779



K3 = 0 K2 = 0 K1 = 0.100694 K0 = 0.113285 LR = 20
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used File
1	0.05823	0.9672	0.1	1	8.35	Yes p8011653.chw
2	0.1026	1.793	0.2	1	8.35	Yes p8011707.chw
3	0.2493	4.396	0.5	1	8.35	Yes p8011721.chw
4	1.262	23.31	2.5	1	8.35	Yes p8011735.chw
5	2.566	47.52	5	1	8.35	Yes p8011749.chw
6	5.337	95.39	10	1	8.35	Yes p8011803.chw
7	11.44	199.1	20	1	8.35	Yes p8011818.chw

8/12/05

***SECOND SOURCE
VERIFICATION***

IC Result Check FormVersion : QH1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH01-01	IB	FCIBNPS	0	0	0	0	0	0	0	p8011625	1
AH01-10	ICV	FCIBNPS	95.6%	93.6%	92.2%	99.1%	93.3%	90.6%	98.5%	p8011832	1
AH01-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p8011846	1
AH01-22	CCV1	FCIBNPS	97.7%	95.4%	98.2%	93.7%	94.5%	96.9%	90.9%	p8012204	1
AH01-23	CCB1	FCIBNPS	0	0	0	0	0	0	0	p8012218	1
AH01-33	CCV2	FCIBNPS	97.7%	108.6%	97.8%	93.6%	94.4%	93.3%	92.5%	p8020039	1
AH01-34	CCB2	FCIBNPS	0	0	0	0	0	0	0	p8020053	1

DAILY CALIBRATIONS

8032

IC Result Check FormVersion : QH1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH08-01	CCV24	FCIBNPS	95.4%	96.8%	96.8%	98.4%	92.7%	95.8%	94.2%	p8081947	1
AH08-02	CCB24	FCIBNPS	0	0	0	0	0	0	0	p8082001	1
AH08-13	CCV25	FCIBNPS	96.5%	95.1%	95.4%	96.4%	92.4%	101.5%	95.2%	p8082244	1
AH08-14	CCB25	FCIBNPS	0	0	0	0	0	0	0	p8082259	1
AH08-25	CCV26	FCIBNPS	97%	96.7%	95.8%	99%	92.8%	100.5%	95.3%	p8090133	1
AH08-26	CCB26	FCIBNPS	0	0	0	0	0	0	0	p8090147	1
AH08-37	CCV27	FCIBNPS	96.7%	96.6%	95.4%	97.6%	92.2%	99.1%	95.9%	p8090422	1
AH08-38	CCB27	FCIBNPS	0	0	0	0	0	0	0	p8090436	1
AH08-49	CCV28	FCIBNPS	94.8%	97.2%	95.2%	97.3%	91%	90.2%	92%	p8090711	1
AH08-50	CCB28	FCIBNPS	0	0	0	0	0	0	0	p8090725	1
AH08-61	CCV29	FCIBNPS	95.8%	97.9%	96.3%	101.6%	93%	93.2%	95.6%	p8091000	1
AH08-62	CCB29	FCIBNPS	0	0	0	0	0	0	0	p8091014	1

IC Result Check FormVersion : QH1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AH02-01	CCV3	FCIBNPS	98.4%	96.5%	98.7%	95.2%	94.5%	101.1%	96.4%	p8022050	1
AH02-02	CCB3	FCIBNPS	0	0	0	0	0	0	0	p8022105	1
AH02-13	CCV4	FCIBNPS	98.2%	95.8%	98.2%	93.8%	94.6%	99.7%	91.1%	p8030010	1
AH02-14	CCB4	FCIBNPS	0	0	0	0	0	0	0	p8030024	1
AH02-25	CCV5	FCIBNPS	98.4%	95.8%	98.1%	93.9%	94.6%	99.5%	91%	p8030259	1
AH02-26	CCB5	FCIBNPS	0	0	0	0	0	0	0	p8030313	1
AH02-37	CCV6	FCIBNPS	98.1%	95.7%	98.3%	94.1%	94.6%	99.4%	91%	p8030547	1
AH02-38	CCB6	FCIBNPS	0	0	0	0	0	0	0	p8030602	1
AH02-49	CCV7	FCIBNPS	97.3%	95.8%	98.6%	94.2%	94.8%	98.3%	91.3%	p8030836	1
AH02-50	CCB7	FCIBNPS	0	0	0	0	0	0	0	p8030851	1
AH02-57	CCV8	FCIBNPS	99.3%	94.5%	96.3%	94.4%	96%	91%	90.9%	p8031037	1
AH02-58	CCB8	FCIBNPS	0	0	0	0	0	0	0	p8031053	1
AH02-69	CCV9	FCIBNPS	98.5%	95.2%	97.6%	93.8%	94.6%	97.4%	90.8%	p8031330	1
AH02-70	CCB9	FCIBNPS	0	0	0	0	0	0	0	p8031344	1
AH02-81	CCV10	FCIBNPS	98.7%	95.6%	97.8%	94%	95%	96.9%	91.2%	p8031637	1
AH02-82	CCB10	FCIBNPS	0	0	0	0	0	0	0	p8031651	1
AH02-93	CCV11	FCIBNPS	100%	94.3%	95.9%	94.7%	96.6%	96.8%	90.7%	p8032021	1
AH02-94	CCB11	FCIBNPS	0	0	0	0	0	0	0	p8032035	1
AH02-105	CCV12	FCIBNPS	99.8%	94.5%	96.1%	94.7%	96.5%	93.1%	90.9%	p8032310	1
AH02-106	CCB12	FCIBNPS	0	0	0	0	0	0	0	p8032324	1

EXTRACTION LOG

ANALYSIS RUN LOG FOR IC

SOP E EMAX-300.0-Rev. 3 EMAX-300.1 Rev. No. 0 EMAX-9056 Rev. No. 2

Book# A100 003

Start Date: 08/01/05		Time: 16:25		End Date: 08/02/05		Time: 00:53	
Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes (mg/L)	Sample Prep ID	Data Filename
* 1	AH01-01	IR	1	W		* 26	AH01-28
* 2	02	02				* 27	27
* 3	03	03			0.1 ppm	* 28	28
* 4	04	04			0.2	* 29	29
* 5	05	05			0.5	* 30	30
* 6	06	06			2.5	* 31	31
* 7	07	07			5	* 32	32
* 8	08	08			10	* 33	33
* 9	09	09			20	* 34	34
* 10	10	ICV				* 35	
* 11	11	ICB				* 36	
* 12	12	ICW01 WIP				* 37	
* 13	13	WL				* 38	
* 14	14	WL				* 39	
* 15	15	G126-01T	5			* 40	
* 16	16	12				* 41	
* 17	17	13				* 42	
* 18	18	14				* 43	
* 19	19	15				* 44	
* 20	20	17	10			* 45	
* 21	21	G126-02	50			* 46	
* 22	22	ICV1	1			* 47	
* 23	23	ICB1	1			* 48	
* 24	24	G126-02D	50			* 49	
* 25	25	12M	50			* 50	

Instrument No. 100		STANDARD	
Date	Method File	ICAL ID	ICV/ICB/MS ID
08/01/05	IC100-H01.mtw	G126-01-2-01	2
		G126-01-2-01	3 (5 ppm)
		MS ID	5 ppm Acc Std.

ELECTRONIC DATA ARCHIVAL	
Location	Date
<input type="checkbox"/> IC METROHM	
<input type="checkbox"/>	

Comments:

Analyzed By: al

This page is checked during data review.

* Sample Prep ID Prefix: ICH01W

** Sample Prep ID Prefix:

8036

Start Date: 02/08/15

[illegible]Analyzed By: A.J.

This page is checked during data review.

*** Sample Prep ID Prefix: TCHCW

* Sample Prep ID Prefix:

8037

ANALYSIS RUN LOG FOR IC

SOP # EMAX-300.0-Rev. 3 □ EMAX-300.1 Rev. No.0 □ EMAX-9056 Rev. No. 2

Book# A100 003

Start Date: 08/02/05		Time: 20:50		End Date: 08/03/05		Time: 23:24	
Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	AHC2-01	CCV3	1	M		* 26	AHC2-26
* 2	02	CCB3				* 7	27
* 3	03	NRL				* 8	28
* 4	04	ICH002WB				* 9	29
* 5	05	WL				* 30	30
* 6	06	WC				* 1	31
* 7	07	HCCU-01				** 2	32
* 8	08	02				* 3	33
* 9	09	03				* 4	34
* 10	10	04				* 5	35
* 11	11	05				* 6	36
* 12	12	RINSE				* 7	37
* 13	13	CCV4				* 8	38
* 14	14	CCB4				* 9	39
* 15	15	HG01-01	5			* 40	40
* 16	16	02	5			* 1	41
* 17	17	GH02-02	200			* 2	42
* 18	18	GH04-05	20			* 3	43
* 19	19	GH07-01	5			* 4	44
* 20	20	02	5			* 5	45
* 21	21	RINSE	1			* 6	46
* 22	22	GH09-02	1			* 7	47
* 23	23	03	5			* 8	48
* 24	24	04	5			* 9	49
* 25	25	CCV15	1			* 50	50

Sample Prep ID	Data Filename	Lab Sample ID	DF	Matrix	Notes	Sample Prep ID	Data Filename
* 1	AHC2-01	CCB5	1	M		* 26	AHC2-26
* 2	02	GH09-05	5			* 7	27
* 3	03	05D				* 8	28
* 4	04	05M				* 9	29
* 5	05	06				* 30	30
* 6	06	07	1			* 1	31
* 7	07	ICH003WB				** 2	32
* 8	08	WL				* 3	33
* 9	09	WC				* 4	34
* 10	10	GH04-01	200			* 5	35
* 11	11	01	2000			* 6	36
* 12	12	CCV6	1			* 7	37
* 13	13	CCB6	1			* 8	38
* 14	14	GH04-02	200			* 9	39
* 15	15	02	2000			* 40	40
* 16	16	03	200			* 1	41
* 17	17	03	2000			* 2	42
* 18	18	04	200			* 3	43
* 19	19	04	1000			* 4	44
* 20	20	05	200			* 5	45
* 21	21	05	1000			* 6	46
* 22	22	06	200			* 7	47
* 23	23	06	1000			* 8	48
* 24	24	CCV7	1			* 9	49
* 25	25	CCB7	1			* 50	50

Instrument No.	STANDARD	100
Date	08/01/05	
Method File	IC100-H01.mtw	
ICAL ID	010-01-1-1	
ICVACMS-ID	2	
CCV ID	3-2 (5 ppm)	
LCS ID	3 (5 ppm)	
MIS ID	5 ppm Acc Std.	
ELECTRONIC DATA ARCHIVAL		
Location		Date
IC METROHM		
Comments:		
Analized By:	ad	

This page is checked during data review.

** Sample Prep ID Prefix: ICH003W

* Sample Prep ID Prefix: ICH02W ** ICH003W

8038

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05H006

METHOD 120.1 SPECIFIC CONDUCTIVITY

Five (5) water samples were received on 08/02/05 for Specific Conductivity analysis by Method 120.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 120.1
SPECIFIC CONDUCTIVITY

Client : BAITELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H006

Matrix : WATER
Instrument ID : 129

SAMPLE ID	EMAX SAMPLE ID	RESULTS (umhos/cm)	DLF	MOIST	RL (umhos/cm)	MDL (umhos/cm)	Analysis DATETIME	Extraction DATETIME	LFID	CAL REF	PREP BATCH	Collection DATETIME	Received DATETIME
LCS1W	ECH005WL	512	1	NA	1	.5	08/16/0514:36	NA	ECH005W-02	NA	ECH005W	NA	NA
LCD1W	ECH005WC	510	1	NA	1	.5	08/16/0514:38	NA	ECH005W-03	NA	ECH005W	NA	NA
MW-20-5	H006-01	307	1	NA	1	.5	08/16/0514:46	NA	ECH005W-07	NA	ECH005W	08/01/05	08/02/05
MW-20-4	H006-02	331	1	NA	1	.5	08/16/0514:48	NA	ECH005W-08	NA	ECH005W	08/01/05	08/02/05
MW-20-3	H006-03	576	1	NA	1	.5	08/16/0514:50	NA	ECH005W-09	NA	ECH005W	08/01/05	08/02/05
MW-20-2	H006-04	424	1	NA	1	.5	08/16/0514:52	NA	ECH005W-10	NA	ECH005W	08/01/05	08/02/05
MW-20-1	H006-05	636	1	NA	1	.5	08/16/0514:54	NA	ECH005W-11	NA	ECH005W	08/01/05	08/02/05

8040

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 120.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H006
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: ECH005WL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 08/16/05 14:36/14:38

ACCESSION:

PARAMETER	SPIKE AMT (umhos/cm)	BS RSLT (umhos/cm)	BS % REC	SPIKE AMT (umhos/cm)	BSD RSLT (umhos/cm)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Specific Conductivity	510.00	512.00	100	510.00	510.00	100	0	80-120	20

8041

ANALYSIS LOG FOR SPECIFIC CONDUCTIVITY

Book # AEC-003

SOP ☒ EMAX-120.1 Revision No. 1 ☐

Start Date 8/16/05 Time 14:34 End Date 8/16/05 Time 15:02

Data File Name	Lab Sample ID	Time	Temp. °C	Temp. Correction Factor QT @ 25 °C	DF	Measured Resistance (ohms)	Notes
* 1	STD LOW 141.3	14:34	21.8	0.938	1	143.9	139.95 ± 140.0
* 2	ECH00SW	14:36	21.8	0.938		526	512 100%
* 3	↓ WC	14:38	21.4	0.932		521	510 100%
* 4	H133-01	14:40	21.4	0.931		209	205
* 5	↓ 03	14:42	21.0	0.924		207	205
* 6	↓ 03D	14:44	21.3	0.930		209	205
* 7	H006-01	14:46	21.2	0.928		312	307
* 8	02	14:48	21.3	0.929		337	331
* 9	03	14:50	21.3	0.930		587	576
* 0	04	14:52	21.3	0.929		432	424
* 1	↓ 05	14:54	21.5	0.933		650	636
* 2	H056-01	14:56	21.4	0.934		5.63	5.50
* 3	03	14:58	21.6	0.934		216	211.0 ± 211
* 4	↓ 03D	15:00	21.8	0.938		217	211.1 ± 211
* 5	STD High 14130	15:02	21.8	0.938	✓	14560	14160 100%
* 6							
* 7							
* 8							
* 9							
* 0							

Instrument No:	29
999 Trial	
KCl Standard	SW2A-02-SS
1	SW3B-02-654
2	Qt = 0.932
3	
LCS	SW7A-06-146
Calibration Temperature	21.4 °C
True Value	1413
Cell Constant (C)	0.913
KCl Standard	ID
Low-point	SW3B-02-729
Mid-point	SW7B-02-360
High-point	SW3B-02-715

Resistance ohms	Resistance μmhos/cm
Assay	
693	
↓	
510	510 μmhos/cm

Comments:

Analyzed By: nr

This page is checked during the data review process.

ANALYTICAL BATCH * ECH00SW

8042

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H006**

METHOD SM3500 FERROUS IRON

Five (5) water samples were received on 08/02/05 for Ferrous Iron analysis by Method SM3500 in accordance with "Standard Methods for the Examination of Water and Wastewater", 18th edition (1990).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample

Lab control result was within QC limit.

4. Duplicate

Sample H006-05 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

SM3500
FERROUS IRON

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H006

Matrix : WATER
Instrument ID : I70

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	FEH001WB	ND	1	NA	5	2.5	08/02/0520:58	NA	FEH001W-09	FEH001W-07	FEH001W	NA	NA
LCS1W	FEH001WL	21.2	1	NA	5	2.5	08/02/0520:59	NA	FEH001W-10	FEH001W-07	FEH001W	NA	NA
MW-20-5	H006-01	ND	1	NA	5	2.5	08/02/0521:00	NA	FEH001W-11	FEH001W-07	FEH001W	08/01/05	08/02/05
MW-20-4	H006-02	ND	1	NA	5	2.5	08/02/0521:01	NA	FEH001W-12	FEH001W-07	FEH001W	08/01/05	08/02/05
MW-20-3	H006-03	ND	1	NA	5	2.5	08/02/0521:02	NA	FEH001W-13	FEH001W-07	FEH001W	08/01/05	08/02/05
MW-20-2	H006-04	ND	1	NA	5	2.5	08/02/0521:03	NA	FEH001W-14	FEH001W-07	FEH001W	08/01/05	08/02/05
MW-20-1	H006-05	ND	1	NA	5	2.5	08/02/0521:04	NA	FEH001W-15	FEH001W-07	FEH001W	08/01/05	08/02/05
MW-20-1DUP	H006-05D	ND	1	NA	5	2.5	08/02/0521:05	NA	FEH001W-16	FEH001W-07	FEH001W	08/01/05	08/02/05

8044

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EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: SM3500
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H006 DATE RECEIVED: NA
SAMPLE ID: LCS1W DATE EXTRACTED: NA
CONTROL NO.: FEH001WL DATE ANALYZED: 08/02/05 20:59

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	LCS RSLT (mg/L)	LCS % REC	QC LIMIT (%)
Ferrous Iron	ND	20.00	21.20	106	80-120

8045
OK

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: SM3500
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H006
SAMPLE ID: MW-20-1DUP
CONTROL NO.: H006-05D

DATE RECEIVED: 08/02/05
DATE EXTRACTED: NA
DATE ANALYZED: 08/02/05 21:05

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Ferrous Iron	ND	ND	0	20

8046

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ANALYSIS LOG FOR FERROUS IRON

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SOP ☒ EMAX-3500-Fe D/C Rev. No. 0 ☐ Starting Date 08-02-05 Time 20:50 Ending Date 08-02-05 Time 21:07 Book # A70-Fe D/C-001

Data File Name	Preparative Batch	Lab Sample ID	Matrix		Sample Amount (ml)	DF	Abs. (510 nm)	Time	Ferrous Iron (mg/L)	Notes	Instrument No.: 70		Wavelength: 510 nm
			S	W							Standard	ID	
* 1	FEH001W	S - 0.0		✓	50	1	2.000	20:50					Conc. (mg/L)
* 2		S - 5					0.005	20:51					
* 3		S - 10					0.009	20:52					
* 4		S - 15					0.005	20:53					0.0
* 5		S - 25					0.004	20:54					5
* 6		S - 50					0.000	20:55					10
* 7		ICV					0.020	20:56	20.20				15
* 8		ICB					0.000	20:57	100				25
* 9		FEH001W					0.000	20:58	100				50
* 10		WOL					0.021	20:59	21.21				20
* 1		H006-01					0.002	21:00	100				20
* 2		-02					0.003	21:01	100				
* 3		-03					0.002	21:02	100				
* 4		-04					0.001	21:03	100				
* 5		-05					0.003	21:04	100				
* 6		-050					0.003	21:05	100				
* 7		CCV ₁					0.021	21:06	21.21				
* 8		CCB ₁					0.000	21:07	100				
* 9													
* 0													
* 1													
* 2													
* 3													
* 4													
* 5													
* 6													
* 7													
* 8													
* 9													
* 0													

Standard Curve	
R (≤0.995)	0.9972
Y	0.0010
CF	1010.1744

Comments:

Analyzed By: PHL

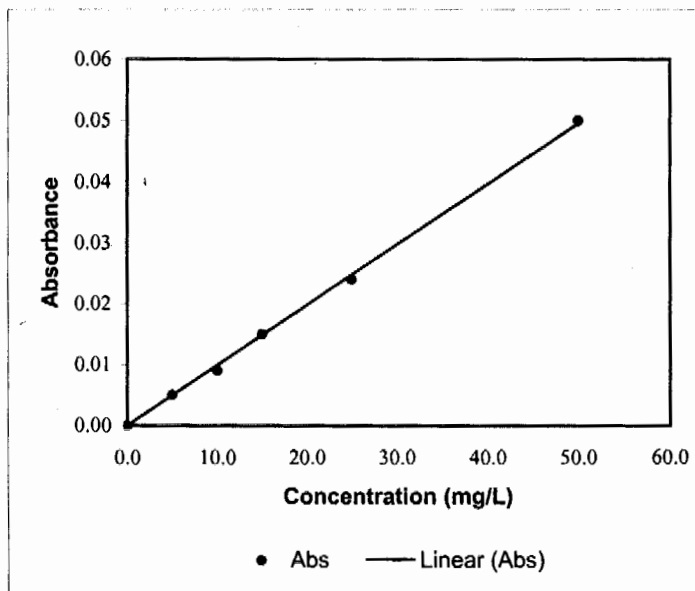
Disposal Date:

This page is checked during data review.

ANALYTICAL BATCH # FEH001W

CALIBRATION CURVE FERROUS FE

Conc.	Abs
0.0	0.000
5.0	0.005
10.0	0.009
15.0	0.015
25.0	0.024
50.0	0.050



R ²	0.9992
Eq.Line	0.0010
CF	1010.1744

Comments: **PASSED**

Analyzed by: LA

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05H006

METHOD 376.1 SULFIDE

Five (5) water samples were received on 08/02/05 for Sulfide analysis by Method 376.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 376.1
SULFIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H006

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
WBL-20-1	BDH002WB	ND	1	NA	1	.4	08/05/0510:30	NA	BDH002W-01	NA	BDH002W	NA	NA
LCS1W	BDH002WL	4.96	1	NA	1	.4	08/05/0510:33	NA	BDH002W-02	NA	BDH002W	NA	NA
LCD1W	BDH002WC	4.96	1	NA	1	.4	08/05/0510:36	NA	BDH002W-03	NA	BDH002W	NA	NA
W-20-5	H006-01	ND	1	NA	1	.4	08/05/0510:39	NA	BDH002W-04	NA	BDH002W	08/01/05	08/02/05
W-20-4	H006-02	3.25	1	NA	1	.4	08/05/0510:42	NA	BDH002W-05	NA	BDH002W	08/01/05	08/02/05
W-20-3	H006-03	ND	1	NA	1	.4	08/05/0510:45	NA	BDH002W-06	NA	BDH002W	08/01/05	08/02/05
W-20-2	H006-04	ND	1	NA	1	.4	08/05/0510:48	NA	BDH002W-07	NA	BDH002W	08/01/05	08/02/05
W-20-1	H006-05	ND	1	NA	1	.4	08/05/0510:51	NA	BDH002W-08	NA	BDH002W	08/01/05	08/02/05

8050

26

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 376.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H006
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: BDH002NL/C
DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 08/05/05 10:33/10:36

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Sulfide	ND	5.00	4.96	99	5.00	4.96	99	0	80-120	20

8051

9/6/

ANALYSIS LOG FOR SULFIDE

SOP ☒ EMAX-376.1 Rev. No. 1 ☐ EMAX-9034 Rev. No. 2 Start Date: 08/05/05 Time: 10:30 End Date: 08/05/05 Time: 11:18 Boc: JD-007

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Volume of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Notes $\frac{I_2}{I_2 + I_2}$	Standard	ID	Conc. (mg/L)
* 1	80H002003	10:30	100	10	10.0	ND	LCS	507A-00-178	5.0
* 2	WL	10:33			4.5	4.96	Spike		
* 3	WC	10:36			4.5	4.96	Na ₂ S ₂ O ₃	3033 02-735	0.00564
* 4	H000-01	10:39			9.8	ND	PAO		
* 5	02	10:42			6.4	3.25	Iodine	5033 02-734	0.00564
* 6	03	10:45			9.7	ND	HCL	5076 06-2310	1.1 (0.1)
* 7	04	10:48			9.9	ND	Indicator	507A-00-190	
* 8	05	10:51			9.8	ND	STANDARDIZATION		
* 9	H010-01	10:54				* Overranged	Vol. Of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Conc. Of Iodine (N)
* 0	012	10:57	25		4.8	18.77	10	12.0	0.00564
* 1	02	11:00	100		3.4	5.77	10	10.0	0.00564
* 2	04	11:03			6.4	3.25	10	12.0	0.00564
* 3	05	11:06			1.4	7.76			
* 4	07	11:09			3.2	6.14			
* 5	08	11:12				* Overranged	Average Iodine Conc. (N)		
* 6	08R	11:15	25		6.1	14.08			
* 7	08D	11:18			6.1	14.08			
* 8									
* 9									
* 0									
* 1									
* 2									
* 3									
* 4									
* 5									
* 6									
* 7									
* 0									

$$\text{Sulfide (mg/L)} = \frac{(V_{I_2} \times N_{I_2} - V_{PAO} \times N_{PAO}) \times 16,000}{V_{\text{sample}}}$$

Comments:

Analyzed By: JAYANIL

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H006**

METHOD 160.1 TOTAL DISSOLVED SOLIDS

Five (5) water samples were received on 08/02/05 for Total Dissolved Solids analysis by Method 160.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample H006-01 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 160.1
TOTAL DISSOLVED SOLIDS

Client : BATTTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05H006

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
WBLK7W	TDH004WB	ND	1	NA	10	5	08/06/0515:00	NA	TDH004W-01	NA	TDH004W	NA	NA
LCS1W	TDH004WL	332	1	NA	10	5	08/06/0515:01	NA	TDH004W-02	NA	TDH004W	NA	NA
LC01W	TDH004WC	330	1	NA	10	5	08/06/0515:02	NA	TDH004W-03	NA	TDH004W	NA	NA
MM-20-5	H006-01	180	1	NA	10	5	08/06/0515:03	NA	TDH004W-04	NA	TDH004W	08/01/05	08/02/05
MM-20-5DUP	H006-01D	182	1	NA	10	5	08/06/0515:04	NA	TDH004W-05	NA	TDH004W	08/01/05	08/02/05
MM-20-4	H006-02	205	1	NA	10	5	08/06/0515:05	NA	TDH004W-06	NA	TDH004W	08/01/05	08/02/05
MM-20-3	H006-03	340	1	NA	10	5	08/06/0515:06	NA	TDH004W-07	NA	TDH004W	08/01/05	08/02/05
MM-20-2	H006-04	275	1	NA	10	5	08/06/0515:07	NA	TDH004W-08	NA	TDH004W	08/01/05	08/02/05
MM-20-1	H006-05	440	1	NA	10	5	08/06/0515:08	NA	TDH004W-09	NA	TDH004W	08/01/05	08/02/05

8054

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 160.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05H006
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: TDH004WL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 08/06/05 15:01/15:02

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TDS	ND	336.00	332.00	99	336.00	330.00	98	1	80-120	20

8055

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 160.1
MATRIX: WATER
% MOISTURE: NA
=====

BATCH NO.: 05H006
SAMPLE ID: MW-20-5DUP
CONTROL NO.: H006-01D
DATE RECEIVED: 08/02/05
DATE EXTRACTED: NA
DATE ANALYZED: 08/06/05 15:04

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
TDS	180.00	182.00	1	20

8056
OK

GRAVIMETRIC ANALYSIS LOG

SOP ☒ EMAX-160.1 Rev. No. 3 ☐ EMAX-160.2 Rev. No. 2 ☐ EMAX-160.3 Rev. No. 1 ☐ EMAX-160.4 Rev. No. 0 ☐ EMAX-160.5 Rev. No. 0

Starting Date: 8/5/05 Time: 9:30 Oven Temp: 105°C Ending Date: 8/6/05 Time: 14:30 Oven Temp: 80°C

Data File Name	Lab Sample ID	Sample Amt. (ml)	Dish Wt. (g)	Dry Wt. Dish + Solids (g)			Solids (mg)	Result (mg/L)	Settleable Solids		Standard
				1st	2nd	3rd			Vol. of SS	Result (ml/L/hr)	
1	TDH100-4023	100	63.7181	63.7190	63.7187	1306	63.7188	1500.1			LCS ID 807A-06-146
2		WL 50	66.3125	66.3301	66.3293	01	66.3291	016.6			LCS TV(mg/L) 336
3		WL 50	64.2116	64.2295	64.2283	02	64.2281	0216.5			
4	H106-01	100	62.4154	62.4344	62.4335	03	62.4334	0318.0			
5		100	51.3667	51.3857	51.3851	04	51.3849	0418.2			Balance ID:
6		100	63.4300	63.4511	63.4504	05	63.4505	0520.5			40706360
7		100	67.3395	67.3896	67.3888	06	67.3885	0634.0			37030058
8		100	66.6612	66.6899	66.6886	07	66.6887	0727.5			Comments:
9	H106-05	100	66.3887	66.4311	66.4301	08	66.4299	0844.0			
10	H427-01	100	66.5306	66.6078	66.6065	09	66.6066	0976.0			
11		100	63.4194	63.4962	63.4952	10	63.4950	1075.6			
12	H428-01	100	59.7045	59.7829	59.7820	11	59.7819	1177.5			
13	H429-01	100	64.3824	64.4183	64.4177	12	64.4174	1235.0			
14		100	64.6240	64.6663	64.6651	13	64.6650	1341.0			
15		100	65.5185	65.5615	65.5603	14	65.5599	1441.4			
16	H430-01	100	68.6777	68.7155	68.7147	15	68.7146	1537.5			
17											
18											
19											
20											Analyzed By: AL/LA

ANALYTICAL BATCH # SS

TD H106-01

S

$R_{(mg/L)} = (DS - DW) \times 1000$
S

where: $R_{(mg/L)}$ = concentration of solids; $DS_{(mg)}$ = Dry weight of Dish + Solids; $DW_{(mg)}$ = Dish weight; $S_{(mg)}$ = sample amount

BALANCE CALIBRATION VERIFICATION LOG (DOE)

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OP ☐ EMAX-QC04 Revision No.: 1

QC04-036

Balance ID 10601202

Date 8/6/05

Range	Min:	1	Max:	600	g
TV	200	100	30	5	1
1	200.011	100.004	30.002	5.000	1.000
2	200.010	100.005	30.002	5.000	1.000
3	200.008	100.006	30.001	5.001	1.000
Criteria (±0.1%)	0.2	0.1	0.03	0.005	0.001
LL	199.8	99.9	29.97	4.995	0.999
UL	200.2	100.1	30.03	5.005	1.001

Comment:

Balance ID J77299

Date 8/6/05

Range	Min:	1	Max:	300	g
TV	200	100	50	30	20
1	200.00	100.00	50.00	30.00	20.00
2	200.00	100.00	50.00	30.00	20.00
3	200.00	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 10203192

Date 8/6/05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1					20.00
2					20.00
3					20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 10304418

Date

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 40706360

Date 8/6/05

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1	199.9999	100.0010	30.0000	1.0000	0.0200
2	199.9996	100.0008	30.0001	0.9999	0.0200
3	199.9991	100.0003	30.0002	1.0001	0.0200
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

RM

Balance ID 40706360

Date

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

8053



EMAX LABORATORIES, INC. 1835 W 205th St, Torrance, CA 90501

Verified by: RM

Checked by:

BALANCE CALIBRATION VERIFICATION LOG (DOE)

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OP ☐ EMAX-QC04 Revision No.: 1

QC04-036

Balance ID 10601202

Date 8-05-05

Balance ID J77299

Date 8-5-05

Range	Min:	1	Max:	600	g
TV	200	100	30	5	1
1	200.005	100.002	30.001	5.000	1.000
2	200.006	100.002	30.001	5.000	1.000
3	200.006	100.003	30.001	5.000	1.000
Criteria (±0.1%)	0.2	0.1	0.03	0.005	0.001
LL	199.8	99.9	29.97	4.995	0.999
UL	200.2	100.1	30.03	5.005	1.001

Comment:

Range	Min:	1	Max:	300	g
TV	200	100	50	30	20
1	200.00	100.00	50.00	30.00	20.00
2	200.00	100.00	50.00	30.00	20.00
3	200.00	100.00	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 10203192

Date 8-5-05

Balance ID 10304418

Date 8-5-05

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.00	100.00	30.00	30.00	20.00
2	200.00	100.00	30.00	30.00	20.00
3	200.00	100.00	30.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Range	Min:	1	Max:	6000	g
TV	200	100	50	30	20
1	200.05	100.02	50.00	30.00	20.00
2	200.03	100.01	50.00	30.00	20.00
3	200.03	100.01	50.00	30.00	20.00
Criteria (±0.1%)	0.2	0.1	0.05	0.03	0.02
LL	199.8	99.9	49.95	29.97	19.98
UL	200.2	100.1	50.05	30.03	20.02

Comment:

Balance ID 40706360

Date 8-5-05

Balance ID 40706360

Date

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1	199.9996	100.0009	29.9995	1.0000	0.0200
2	199.9995	100.0008	30.0000	1.0000	0.0200
3	199.9997	100.0011	30.0000	1.0000	0.0200
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:

Range	Min:	1	Max:	205	g
TV	200	100	30	1	0.02
1					
2					
3					
Criteria (±0.1%)	0.2	0.1	0.03	0.001	0.00002
LL	199.8	99.9	29.97	0.999	0.01998
UL	200.2	100.1	30.03	1.001	0.02002

Comment:



EMAX LABORATORIES, INC. 1935 W. 205th St. Torrance, CA 90501

Verified by: ANC

Checked by:

8059

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H006**

METHOD 351.3 TKN

Five (5) water samples were received on 08/02/05 for TKN analysis by Method 351.3 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Matrix Spike

MS sample was not designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

All results were reported as Nitrogen concentration.

METHOD 351.3

TKN

Client : BATTELLE MEMORIAL INSTITUTE

Project : JPL

Batch No. : 05H006

Matrix :

: WATER

Instrument ID : 170

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	KNH004WB	ND	1	NA	.1	.035	08/11/0516:10	08/11/0510:30	KNH004W-11	KNH004W-09	KNH004W	NA	08/11/05
LCS1W	KNH004WL	1.02	1	NA	.1	.035	08/11/0516:11	08/11/0510:30	KNH004W-12	KNH004W-09	KNH004W	NA	08/11/05
LCS1W	KNH004WC	1.01	1	NA	.1	.035	08/11/0516:12	08/11/0510:30	KNH004W-13	KNH004W-09	KNH004W	NA	08/11/05
MW-20-5	H006-01	.388	1	NA	.1	.035	08/11/0516:23	08/11/0510:30	KNH004W-24	KNH004W-21	KNH004W	08/01/05	08/02/05
MW-20-4	H006-02	.420	1	NA	.1	.035	08/11/0516:24	08/11/0510:30	KNH004W-25	KNH004W-21	KNH004W	08/01/05	08/02/05
MW-20-3	H006-03	.525	1	NA	.1	.035	08/11/0516:25	08/11/0510:30	KNH004W-26	KNH004W-21	KNH004W	08/01/05	08/02/05
MW-20-2	H006-04	.357	1	NA	.1	.035	08/11/0516:26	08/11/0510:30	KNH004W-27	KNH004W-21	KNH004W	08/01/05	08/02/05
MW-20-1	H006-05	.588	1	NA	.1	.035	08/11/0516:27	08/11/0510:30	KNH004W-28	KNH004W-21	KNH004W	08/01/05	08/02/05

8061

du

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: 351.3

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05H006

SAMPLE ID: LCS1W/LCD1W

CONTROL NO.: KNR004WL/C

DATE RECEIVED: 08/11/05

DATE EXTRACTED: 08/11/05 10:30

DATE ANALYZED: 08/11/05 16:11/16:12

ACCESSION:

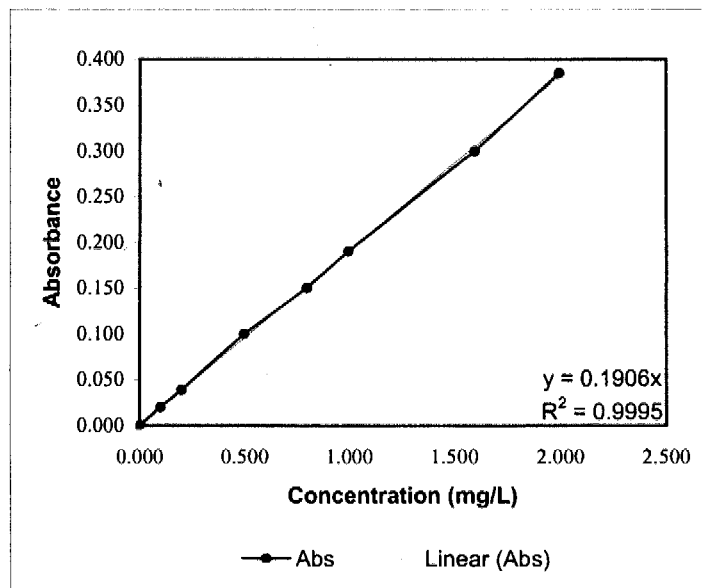
PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TKN	ND	1.00	1.02	102	1.00	1.01	101	1	80-120	20

8062

gdr

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.020
0.200	0.039
0.500	0.100
0.800	0.150
1.000	0.190
1.600	0.300
2.000	0.385



R^2 0.999494

y 0.1906

CF 5.2476

Comments: **PASSED**

K191

Analyzed by: NT/LA

8063

ANALYSIS LOG FOR TOTAL KJELDAHL NITROGEN (TKN)

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SOP ☒ EMAX-351.3 Rev. No. 1 ☐

Start Date:

8/11/05

Time:

16:00

End Date:

8/11/05

Time:

16:30

Book # A70-KN-004

Data File Name	Prep. Batch	Lab Sample ID	Matrix		Time	Vol. Colored (ml)	DF	Absorbance	Notes
			S	W					
* 1	KNH004W	S-0			16:00	20	1	0.000	
* 2		0.1			01			0.020	
* 3		0.2			02			0.039	
* 4		0.5			03			0.100	
* 5		0.8			04			0.150	
* 6		1.0			05			0.190	
* 7		1.6			06			0.300	
* 8		2.0			07			0.385	
* 9		ICV			08			0.197	1034
* 10		ICB			09	NT		0.0800	ND
* 11		KNH004WB	✓		10	8/11/05		0.04800	ND
* 12		WL			11			0.194	1.018
* 13		WC			12			0.192	1.008
* 14		G260-01			13			0.080	0.420
* 15		02			14			0.098	0.514
* 16		03			15			0.108	0.567
* 17		04			16			0.110	0.577
* 18		05			17			0.082	0.430
* 19		05D			18			0.092	0.483
* 20		05M	✓		19			0.273	0.908 1.432
* 21		CCV1			20			0.194	1.018
* 22		CCB1			21			0.000	ND
* 23		G260-06	✓		22			0.142	0.745
* 24		H006-01			23			0.074	0.388
* 25		02			24			0.080	0.420
* 26		03			25			0.100	0.525
* 27		04			26			0.068	0.357
* 28		05			27			0.112	0.588
* 29		H418-02	✓		28			0.164	0.861
* 30		CCV2			29			0.192	1.008
* 31		CCB2			16:30			0.000	ND

ANALYTICAL BATCH * KNH004W

EMAX

LABORATORIES, INC. 1805 W 20th St. Torrance, CA 90501

NT 8/11/05

8064

Analyzed By:

NT/LA

This page is checked during data review.

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-006

SOP □ EMAX-350.2 Rev. No.: 2 ☒ EMAX-351.3 Rev. No.: 2 □

Start Date 8/11/05 Time 10:30 End Date 8/11/05 Time 15:30

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	5-0	9.5	10	5	4	50	50		ICV/MS	SW2B-03-181	5mL of 10ppm
*02	↓ 0.1								LCS	↓	178 50mL
*03	↓ 1.0								Reagent		
*04	↓ 2.0								NaOH	N/A	
*05	ICV								Digestion Mixture	SW7A-06-204	
*06	ICB								Borate Buffer	↓	152
*07	KN4004WB								H ₃ BO ₃	SW7B-06-322	
*08	↓ WL								Distilling Soln.	↓	331
*09	↓ WC								Comments:		
*10	G260-01										
*11	02										
*12	03										
*13	04										
*14	05										
*15	05D										
*16	05M										
*17	06										
*18	4006-01										
*19	02										
*20	03										
*21	04										
*22	05										
*23	418-02										
*24											
*25											
*26											

Prepared By: NT/LA
 Standard Added By: NT/LA
 Checked By: _____

PREPARATION BATCH * KN4004W

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05H006

METHOD 415.1 DISSOLVED ORGANIC CARBON

Five (5) water samples were received on 08/02/05 for Dissolved Organic Carbon analysis by Method SW9060 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Method", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No Duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 415.1

DOC

Client : BATTELLE MEMORIAL INSTITUTE

Project : JPL

Batch No. : 05H006

Matrix : WATER

Instrument ID : 62

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBL K1W	TCH009MB	ND	1	NA	1	.5	08/11/0500:37	NA	TCH009-5	TCH009-2	TCH009W	NA	NA
LCS1W	TCH009ML	24.1	1	NA	1	.5	08/11/0500:47	NA	TCH009-6	TCH009-2	TCH009W	NA	NA
LCD 1W	TCH009WC	24.6	1	NA	1	.5	08/11/0500:57	NA	TCH009-7	TCH009-2	TCH009W	NA	NA
MM-20-5	H006-01	2.62	1	NA	1	.5	08/11/0502:40	NA	TCH009-18	TCH009-14	TCH009W	08/01/05	08/02/05
MM-20-4	H006-02	2.1	1	NA	1	.5	08/11/0502:50	NA	TCH009-19	TCH009-14	TCH009W	08/01/05	08/02/05
MM-20-3	H006-03	2.47	1	NA	1	.5	08/11/0502:59	NA	TCH009-20	TCH009-14	TCH009W	08/01/05	08/02/05
MM-20-2	H006-04	2.62	1	NA	1	.5	08/11/0503:08	NA	TCH009-21	TCH009-14	TCH009W	08/01/05	08/02/05
MM-20-1	H006-05	3.62	1	NA	1	.5	08/11/0503:17	NA	TCH009-22	TCH009-14	TCH009W	08/01/05	08/02/05

8067

2

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05H006

METHOD: METHOD 415.1

% MOISTURE: NA

MATRIX: WATER

DILUTION FACTOR: 1

SAMPLE ID: MBLK1W

LAB SAMP ID: TCH009WB

LAB FILE ID: TCH009-5

DATE EXTRACTED: NA

DATE ANALYZED: 08/11/0500:37

PREP. BATCH: TCH009W

CALIB. REF: TCH009-2

TCH009WL

TCH009-6

NA

08/11/0500:47

TCH009W

TCH009-2

TCH009WC

TCH009-7

NA

08/11/0500:57

TCH009W

TCH009-2

DATE COLLECTED: NA

DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
DOC	ND	25	24.1	96	25	24.6	99	2	80-120	20

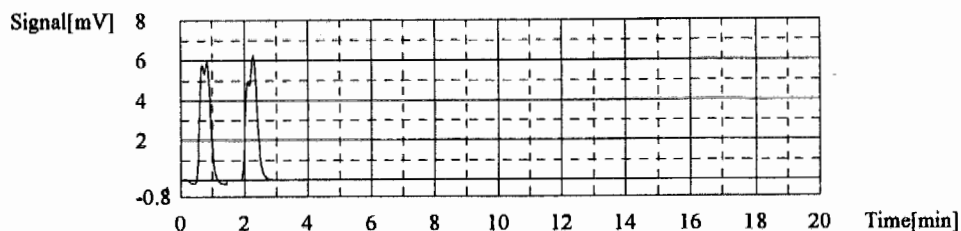
8063

	Type	Analysis	Sample Name	Sample ID	Object	Origin	Dilution	Result	Notes	Comment
1	Standard	NPOC	ICAL	TCH009-1	0A-12	C:\Progra	1.000			
2	Control	NPOC	ICV	TCH009-2	0A-12	C:\Progra	1.000	NPOC:24.67 m	Control valu	
3	Unknown	NPOC	ICB	TCH009-3	0A-12	C:\Progra	1.000	NPOC:0.1949		
4	Unknown	NPOC	HC03/CO3	TCH009-4	0A-12	C:\Progra	1.000	NPOC:0.7640		
5	Unknown	NPOC	TCH009WB	TCH009-5	0A-12	C:\Progra	1.000	NPOC:0.1857		
6	Unknown	NPOC	TCH009WL	TCH009-6	0A-12	C:\Progra	1.000	NPOC:24.07 m		
7	Unknown	NPOC	TCH009WC	TCH009-7	0A-12	C:\Progra	1.000	NPOC:24.63 m		
8	Unknown	NPOC	05G218-06	TCH009-8	0A-12	C:\Progra	1.000	NPOC:4.221 m		
9	Unknown	NPOC	05G218-06D	TCH009-9	0A-12	C:\Progra	1.000	NPOC:3.431 m		
10	Unknown	NPOC	05G218-06M	TCH009-10	0A-12	C:\Progra	1.000	NPOC:26.59 m		
11	Unknown	NPOC	05G231-03	TCH009-11	0A-12	C:\Progra	20.00	NPOC:289.2 m		
12	Unknown	NPOC	05G247-03	TCH009-12	0A-12	C:\Progra	10.00	NPOC:98.57 m		
13	Unknown	NPOC	05H421-01	TCH009-13	0A-12	C:\Progra	1.000	NPOC:0.8802		
14	Control	NPOC	CCV1	TCH009-14	0A-12	C:\Progra	1.000	NPOC:24.26 m	Control valu	
15	Unknown	NPOC	CCB1	TCH009-15	0A-12	C:\Progra	1.000	NPOC:0.2533		
16	Unknown	NPOC	05H421-02	TCH009-16	0A-12	C:\Progra	1.000	NPOC:0.3291		
17	Unknown	NPOC	05H421-03	TCH009-17	0A-12	C:\Progra	1.000	NPOC:0.3251		
18	Unknown	NPOC	05H006-01	TCH009-18	0A-12	C:\Progra	1.000	NPOC:2.616 m		
19	Unknown	NPOC	05H006-02	TCH009-19	0A-12	C:\Progra	1.000	NPOC:2.101 m		
20	Unknown	NPOC	05H006-03	TCH009-20	0A-12	C:\Progra	1.000	NPOC:2.468 m		
21	Unknown	NPOC	05H006-04	TCH009-21	0A-12	C:\Progra	1.000	NPOC:2.623 m		
22	Unknown	NPOC	05H006-05	TCH009-22	0A-12	C:\Progra	1.000	NPOC:3.621 m		
23	Unknown	NPOC	05H056-01	TCH009-23	0A-12	C:\Progra	1.000	NPOC:0.9740		
24	Unknown	NPOC	05H056-03	TCH009-24	0A-12	C:\Progra	1.000	NPOC:1.799 m		
25	Unknown	NPOC	05H056-03D	TCH009-25	0A-12	C:\Progra	1.000	NPOC:1.574 m		
26	Control	NPOC	CCV2	TCH009-26	0A-12	C:\Progra	1.000	NPOC:24.67 m	Control valu	
27	Unknown	NPOC	CCB2	TCH009-27	0A-12	C:\Progra	1.000	NPOC:0.3041		
28	Unknown	NPOC	05H056-03M	TCH009-28	0A-12	C:\Progra	1.000	NPOC:24.83 m		
29	Unknown	NPOC	TCH010WB	TCH009-29	0A-12	C:\Progra	1.000	NPOC:0.4161		
30	Unknown	NPOC	TCH010WL	TCH009-30	0A-12	C:\Progra	1.000	NPOC:24.82 m		
31	Unknown	NPOC	TCH010WC	TCH009-31	0A-12	C:\Progra	1.000	NPOC:24.87 m		
32	Unknown	NPOC	05H020-05	TCH009-32	0A-12	C:\Progra	1.000	NPOC:12.19 m		
33	Unknown	NPOC	05H020-11	TCH009-33	0A-12	C:\Progra	1.000	NPOC:0.3111		
34	Unknown	NPOC	05H020-15	TCH009-34	0A-12	C:\Progra	1.000	NPOC:6.952 m		
35	Unknown	NPOC	05H033-04	TCH009-35	0A-12	C:\Progra	1.000	NPOC:23.26 m		
36	Unknown	NPOC	05H033-06	TCH009-36	0A-12	C:\Progra	1.000	NPOC:4.615 m		
37	Unknown	NPOC	05H033-08	TCH009-37	0A-12	C:\Progra	1.000	NPOC:4.757 m		
38	Control	NPOC	CCV3	TCH009-38	0A-12	C:\Progra	1.000	NPOC:24.91 m	Control valu	
39	Unknown	NPOC	CCB3	TCH009-39	0A-12	C:\Progra	1.000	NPOC:0.3356		
40	Unknown	NPOC	05H033-10	TCH009-40	0A-12	C:\Progra	1.000	NPOC:26.52 m		
41	Unknown	NPOC	05H033-12	TCH009-41	0A-12	C:\Progra	1.000	NPOC:28.61 m		
42	Unknown	NPOC	05H033-18	TCH009-42	0A-12	C:\Progra	1.000	NPOC:0.3647		
43	Unknown	NPOC	05H032-03	TCH009-43	0A-12	C:\Progra	1.000	NPOC:29.17 m		
44	Unknown	NPOC	05H048-02	TCH009-44	0A-12	C:\Progra	1.000	NPOC:12.30 m		
45	Unknown	NPOC	05H048-04	TCH009-45	0A-12	C:\Progra	1.000	NPOC:9.733 m		
46	Unknown	NPOC	05H048-06	TCH009-46	0A-12	C:\Progra	1.000	NPOC:21.25 m		
47	Unknown	NPOC	05H048-10	TCH009-47	0A-12	C:\Progra	1.000	NPOC:0.3925		
48	Unknown	NPOC	05H048-13	TCH009-48	0A-12	C:\Progra	1.000	NPOC:7.608 m		
49	Unknown	NPOC	05H048-13D	TCH009-49	0A-12	C:\Progra	1.000	NPOC:7.837 m		
50	Unknown	NPOC	05H048-13M	TCH009-50	0A-12	C:\Progra	1.000	NPOC:31.31 m		
51	Control	NPOC	CCV4	TCH009-51	0A-12	C:\Progra	1.000	NPOC:24.97 m	Control valu	
52	Unknown	NPOC	CCB4	TCH009-52	0A-12	C:\Progra	1.000	NPOC:0.3625		
53	Unknown	NPOC	05H006-01	TCH009-53	0A-12	C:\Progra	1.000	NPOC:1.776 m		
54	Unknown	NPOC	05H006-02	TCH009-54	0A-12	C:\Progra	1.000	NPOC:1.579 m		
55	Unknown	NPOC	05H006-03	TCH009-55	0A-12	C:\Progra	1.000	NPOC:2.270 m		
56	Unknown	NPOC	05H006-04	TCH009-56	0A-12	C:\Progra	1.000	NPOC:1.949 m		
57	Unknown	NPOC	05H006-05	TCH009-57	0A-12	C:\Progra	1.000	NPOC:1.941 m		
58	Unknown	NPOC	05H006-05D	TCH009-58	0A-12	C:\Progra	1.000	NPOC:1.876 m		
59	Unknown	NPOC	05H006-05M	TCH009-59	0A-12	C:\Progra	1.000	NPOC:25.05 m		
60	Control	NPOC	CCV5	TCH009-60	0A-12	C:\Progra	1.000	NPOC:24.82 m	Control valu	
61	Unknown	NPOC	CCB5	TCH009-61	0A-12	C:\Progra	1.000	NPOC:0.4095		
62										
63										
64										
65										
66										

8069

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	14.40	50uL	2	*****		08/10/05 11:31:24 PM
2	14.51	50uL	2	*****		08/10/05 11:33:05 PM

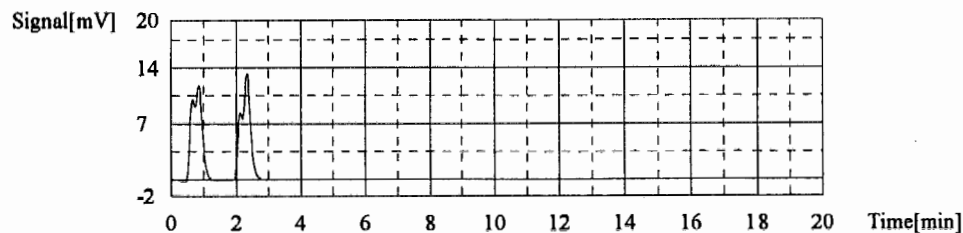
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 14.46



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	28.03	50uL	1	*****		08/10/05 11:39:08 PM
2	28.16	50uL	1	*****		08/10/05 11:40:49 PM

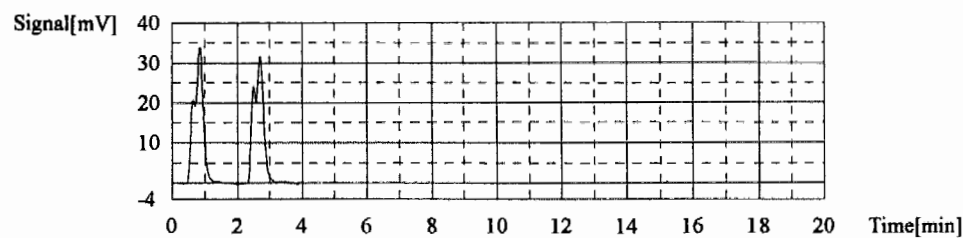
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 28.09



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	68.77	50uL	2	*****		08/10/05 11:49:53 PM
2	69.52	50uL	2	*****		08/10/05 11:52:08 PM

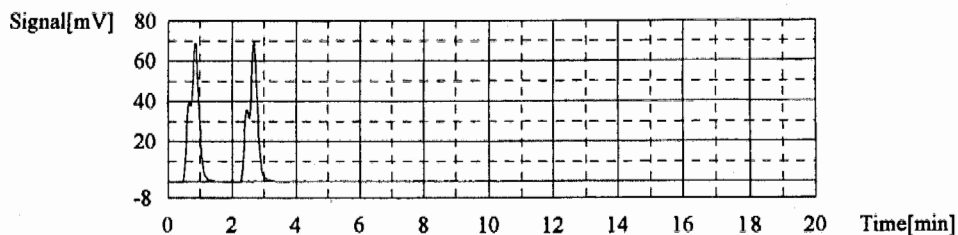
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 69.15



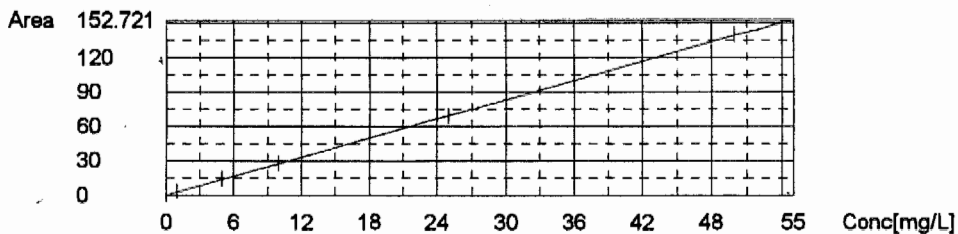
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	139.5	50uL	1	*****		08/10/05 11:58:31 PM
2	139.9	50uL	1	*****		08/11/05 12:00:31 AM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 139.7



Slope: 2.777
Intercept 0.000
 r^2 0.999941



Control Sample

Sample Name: ICV
Sample ID: TCH009-2
Method: TCH009.tpl
Chk. Result: Control value: 0.73% / Control within range!

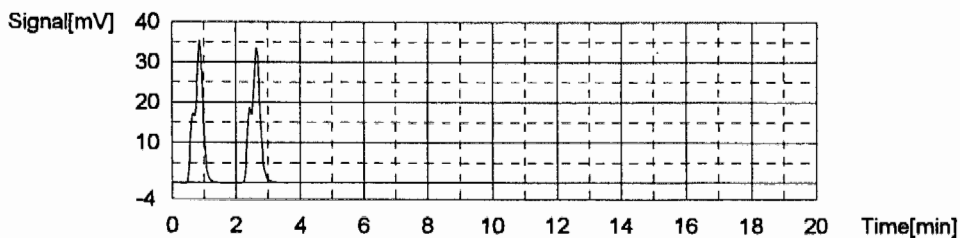
Type	Anal.	Dil.	Result
Control	NPOC	1.000	NPOC:24.67 mg/L

1. Det.

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	68.25	24.58mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:09:03 AM
2	68.75	24.76mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:11:02 AM

Mean Area 68.50
Mean Conc. 24.67mg/L



Sample

Sample Name: ICB
Sample ID: TCH009-3
Origin: TCH009.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.1949 mg/L

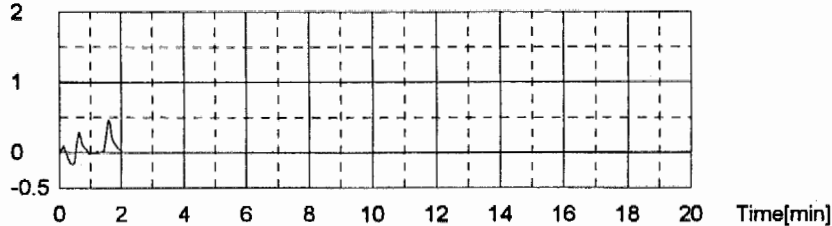
1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.5402	0.1945mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:18:30 AM
2	0.5419	0.1952mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:18:43 AM

Mean Area 0.5411
Mean Conc. 0.1949mg/L

Signal[mV] 2



Sample

Sample Name: HCO3/CO3
Sample ID: TCH009-4
Origin: TCH009.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.7640 mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2.098	0.7556mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:27:26 AM
2	2.145	0.7725mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:28:50 AM

ANALYSIS RUN LOG FOR TOC

SOP: 0 EMAX-9060 Revision No. 1 0 EMAX-415.1 Revision No. 1 0

Book # A62-006

Start Date: 8/10/05

Time: 23:15

Ending Date:

Time: 09:20

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix	Run Time	Notes
				S W		
* 1	TCH009-1	ICV	1	X	00:00	UPPER RUN
* 2	2	ICV			00:11	PH 2
* 3	3	ICV			00:19	
* 4	4	HCO ₃ /CO ₂			00:28	
* 5	5	TCH009WB			00:37	
* 6	6	WL			00:47	
* 7	7	WL			00:57	
* 8	8	056218-06			12:00	12:06
* 9	9	06D			01:16	
* 10	10	06M			01:25	
* 11	11	056231-03	20		01:35	
* 12	12	056247-03	10		01:45	
* 13	13	056247-01	1		01:54	
* 14	14	06V1			02:04	
* 15	15	06B1			02:13	
* 16	16	054421-02			02:22	
* 17	17	03			02:31	
* 18	18	054006-01			02:40	
* 19	19	02			02:50	
* 20	20	03			02:59	
* 21	21	04			03:08	
* 22	22	05			03:17	
* 23	23	054056-01			03:24	
* 24	24	03			03:35	
* 25	25	03D			03:45	
* 26	26	06V2			03:55	
* 27	27	06B2			04:04	
* 28	28	054056-03M			04:14	
* 29	29	TCH010WB			04:23	
* 30	30	06V			04:33	

ANALYTICAL BATCH * TCH009WB * TCH010WB

ANALYSIS RUN LOG FOR TOC

SOP: 0 EMAX-9060 Revision No. 1 0 EMAX-415.1 Revision No. 1 0

Book # A62-006

Start Date: 8/10/08

Time: 25:13

EndingDate: 8/1/25

Time: 07:28

[illegible]

This page is checked during data review.

Analyzed By: _____

8075

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05H006**

METHOD 415.1 TOTAL ORGANIC CARBON

Five (5) water samples were received on 08/02/05 for Total Organic Carbon analysis by Method SW9060 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Method", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample H006-05 was analyzed for Duplicate. % RPD was within QC limit.

5. Matrix Spike

Sample H006-05 was spiked. % Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 415.1

TOC

Client : BATTELLE MEMORIAL INSTITUTE

Project : JPL

Batch No. : 05H006

Matrix : WATER

Instrument ID : 62

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBL1W	TCH010WB	ND	1	NA	1	.5	08/11/0504:23	NA	TCH009-29	TCH009-26	TCH010W	NA	NA
LCS1W	TCH010WL	24.8	1	NA	1	.5	08/11/0504:33	NA	TCH009-30	TCH009-26	TCH010W	NA	NA
LCD1W	TCH010WC	24.9	1	NA	1	.5	08/11/0504:43	NA	TCH009-31	TCH009-26	TCH010W	NA	NA
MA-20-5	H006-01	1.78	1	NA	1	.5	08/11/0508:13	NA	TCH009-50	TCH009-48	TCH010W	08/01/05	08/02/05
MA-20-4	H006-02	1.58	1	NA	1	.5	08/11/0508:23	NA	TCH009-51	TCH009-48	TCH010W	08/01/05	08/02/05
MA-20-3	H006-03	2.27	1	NA	1	.5	08/11/0508:32	NA	TCH009-52	TCH009-48	TCH010W	08/01/05	08/02/05
MA-20-2	H006-04	1.95	1	NA	1	.5	08/11/0508:41	NA	TCH009-56	TCH009-48	TCH010W	08/01/05	08/02/05
MA-20-1	H006-05	1.94	1	NA	1	.5	08/11/0508:50	NA	TCH009-54	TCH009-48	TCH010W	08/01/05	08/02/05
MA-20-10UP	H006-050	1.88	1	NA	1	.5	08/11/0508:59	NA	TCH009-55	TCH009-48	TCH010W	08/01/05	08/02/05
MA-20-1NS	H006-05M	25	1	NA	1	.5	08/11/0509:09	NA	TCH009-59	TCH009-48	TCH010W	08/01/05	08/02/05

8077

ENAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05H006

METHOD: METHOD 415.1

MATRIX: WATER % MOISTURE: NA

DILUTION FACTOR: 1 1

SAMPLE ID: MBLK1W

LAB SAMP ID: TCH010MB

LAB FILE ID: TCH009-29

DATE EXTRACTED: NA

DATE ANALYZED: 08/11/0504:23

PREP. BATCH: TCH010W

CALIB. REF: TCH009-26

TCH010WC

TCH009-31

NA

08/11/0504:43

TCH010W

TCH009-26

DATE COLLECTED: NA

DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
TOC	ND	25	24.8	99	25	24.9	99	0	80-120	20

8078

EMAX QUALITY CONTROL DATA

MS ANALYSIS

CLIENT: BATTIELLE MEMORIAL INSTITUTE
 PROJECT: JPL
 BATCH NO.: 05H006
 METHOD: METHOD 415.1

MATRIX: WATER
 DILUTION FACTOR: 1
 SAMPLE ID: MW-20-1
 LAB SAMP ID: H006-05
 LAB FILE ID: TCH009-54
 DATE EXTRACTED: NA
 DATE ANALYZED: 08/11/0508:50
 PREP. BATCH: TCH010W
 CALIB. REF: TCH009-48

DATE COLLECTED: 08/01/05
 DATE RECEIVED: 08/02/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	% REC	MS QC LIMIT (%)
TOC	1.94	25	25	92	75-125

8079

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTIELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05H006

METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-20-1
EMAX SAMP ID: H006-05
LAB FILE ID: TCH009-54
DATE EXTRACTED: NA
DATE ANALYZED: 08/11/0508:50
PREP. BATCH: TCH010W
CALIB. REF: TCH009-48

% MOISTURE: NA
DATE COLLECTED: 08/01/05
DATE RECEIVED: 08/02/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
TOC	1.94	1.88	3	20

8080

	Type	Analysis	Sample Name	Sample ID	Object	Origin	Dilution	Result	Notes	Comment
1	Standard	NPOC	ICAL	TCH009-1	0A-12	C:\Progra	1.000			
2	Control	NPOC	ICV	TCH009-2	0A-12	C:\Progra	1.000	NPOC:24.67 m	Control valu	
3	Unknown	NPOC	ICB	TCH009-3	0A-12	C:\Progra	1.000	NPOC:0.1949		
4	Unknown	NPOC	HCO3/CO3	TCH009-4	0A-12	C:\Progra	1.000	NPOC:0.7640		
5	Unknown	NPOC	TCH009WB	TCH009-5	0A-12	C:\Progra	1.000	NPOC:0.1857		
6	Unknown	NPOC	TCH009WL	TCH009-6	0A-12	C:\Progra	1.000	NPOC:24.07 m		
7	Unknown	NPOC	TCH009WC	TCH009-7	0A-12	C:\Progra	1.000	NPOC:24.63 m		
8	Unknown	NPOC	05G218-06	TCH009-8	0A-12	C:\Progra	1.000	NPOC:4.221 m		
9	Unknown	NPOC	05G218-06D	TCH009-9	0A-12	C:\Progra	1.000	NPOC:3.431 m		
10	Unknown	NPOC	05G218-06M	TCH009-10	0A-12	C:\Progra	1.000	NPOC:26.59 m		
11	Unknown	NPOC	05G231-03	TCH009-11	0A-12	C:\Progra	20.00	NPOC:289.2 m		
12	Unknown	NPOC	05G247-03	TCH009-12	0A-12	C:\Progra	10.00	NPOC:98.57 m		
13	Unknown	NPOC	05H421-01	TCH009-13	0A-12	C:\Progra	1.000	NPOC:0.8802		
14	Control	NPOC	CCV1	TCH009-14	0A-12	C:\Progra	1.000	NPOC:24.26 m	Control valu	
15	Unknown	NPOC	CCB1	TCH009-15	0A-12	C:\Progra	1.000	NPOC:0.2533		
16	Unknown	NPOC	05H421-02	TCH009-16	0A-12	C:\Progra	1.000	NPOC:0.3291		
17	Unknown	NPOC	05H421-03	TCH009-17	0A-12	C:\Progra	1.000	NPOC:0.3251		
18	Unknown	NPOC	05H006-01	TCH009-18	0A-12	C:\Progra	1.000	NPOC:2.616 m		
19	Unknown	NPOC	05H006-02	TCH009-19	0A-12	C:\Progra	1.000	NPOC:2.101 m		
20	Unknown	NPOC	05H006-03	TCH009-20	0A-12	C:\Progra	1.000	NPOC:2.468 m		
21	Unknown	NPOC	05H006-04	TCH009-21	0A-12	C:\Progra	1.000	NPOC:2.623 m		
22	Unknown	NPOC	05H006-05	TCH009-22	0A-12	C:\Progra	1.000	NPOC:3.621 m		
23	Unknown	NPOC	05H056-01	TCH009-23	0A-12	C:\Progra	1.000	NPOC:0.9740		
24	Unknown	NPOC	05H056-03	TCH009-24	0A-12	C:\Progra	1.000	NPOC:1.799 m		
25	Unknown	NPOC	05H056-03D	TCH009-25	0A-12	C:\Progra	1.000	NPOC:1.574 m		
26	Control	NPOC	CCV2	TCH009-26	0A-12	C:\Progra	1.000	NPOC:24.67 m	Control valu	✓
27	Unknown	NPOC	CCB2	TCH009-27	0A-12	C:\Progra	1.000	NPOC:0.3041		
28	Unknown	NPOC	05H056-03M	TCH009-28	0A-12	C:\Progra	1.000	NPOC:24.83 m		
29	Unknown	NPOC	TCH010WB	TCH009-29	0A-12	C:\Progra	1.000	NPOC:0.4161		
30	Unknown	NPOC	TCH010WL	TCH009-30	0A-12	C:\Progra	1.000	NPOC:24.82 m		
31	Unknown	NPOC	TCH010WC	TCH009-31	0A-12	C:\Progra	1.000	NPOC:24.87 m		
32	Unknown	NPOC	05H020-05	TCH009-32	0A-12	C:\Progra	1.000	NPOC:12.19 m		
33	Unknown	NPOC	05H020-11	TCH009-33	0A-12	C:\Progra	1.000	NPOC:0.3111		
34	Unknown	NPOC	05H020-15	TCH009-34	0A-12	C:\Progra	1.000	NPOC:6.952 m		
35	Unknown	NPOC	05H033-04	TCH009-35	0A-12	C:\Progra	1.000	NPOC:23.26 m		
36	Unknown	NPOC	05H033-06	TCH009-36	0A-12	C:\Progra	1.000	NPOC:4.615 m		
37	Unknown	NPOC	05H033-08	TCH009-37	0A-12	C:\Progra	1.000	NPOC:4.757 m		
38	Control	NPOC	CCV3	TCH009-38	0A-12	C:\Progra	1.000	NPOC:24.91 m	Control valu	
39	Unknown	NPOC	CCB3	TCH009-39	0A-12	C:\Progra	1.000	NPOC:0.3356		
40	Unknown	NPOC	05H033-10	TCH009-40	0A-12	C:\Progra	1.000	NPOC:26.52 m		
41	Unknown	NPOC	05H033-12	TCH009-41	0A-12	C:\Progra	1.000	NPOC:28.61 m		
42	Unknown	NPOC	05H033-18	TCH009-42	0A-12	C:\Progra	1.000	NPOC:0.3647		
43	Unknown	NPOC	05H032-03	TCH009-43	0A-12	C:\Progra	1.000	NPOC:29.17 m		
44	Unknown	NPOC	05H048-02	TCH009-44	0A-12	C:\Progra	1.000	NPOC:12.30 m		
45	Unknown	NPOC	05H048-04	TCH009-45	0A-12	C:\Progra	1.000	NPOC:9.733 m		
46	Unknown	NPOC	05H048-06	TCH009-46	0A-12	C:\Progra	1.000	NPOC:21.25 m		
47	Unknown	NPOC	05H048-10	TCH009-47	0A-12	C:\Progra	1.000	NPOC:0.3925		
48	Unknown	NPOC	05H048-13	TCH009-48	0A-12	C:\Progra	1.000	NPOC:7.608 m		
49	Unknown	NPOC	05H048-13D	TCH009-49	0A-12	C:\Progra	1.000	NPOC:7.837 m		
50	Unknown	NPOC	05H048-13M	TCH009-50	0A-12	C:\Progra	1.000	NPOC:31.31 m		
51	Control	NPOC	CCV4	TCH009-51	0A-12	C:\Progra	1.000	NPOC:24.97 m	Control valu	
52	Unknown	NPOC	CCB4	TCH009-52	0A-12	C:\Progra	1.000	NPOC:0.3625	✓	
53	Unknown	NPOC	05H006-01	TCH009-53	0A-12	C:\Progra	1.000	NPOC:1.776 m		
54	Unknown	NPOC	05H006-02	TCH009-54	0A-12	C:\Progra	1.000	NPOC:1.579 m		
55	Unknown	NPOC	05H006-03	TCH009-55	0A-12	C:\Progra	1.000	NPOC:2.270 m		
56	Unknown	NPOC	05H006-04	TCH009-56	0A-12	C:\Progra	1.000	NPOC:1.949 m		
57	Unknown	NPOC	05H006-05	TCH009-57	0A-12	C:\Progra	1.000	NPOC:1.941 m		
58	Unknown	NPOC	05H006-05D	TCH009-58	0A-12	C:\Progra	1.000	NPOC:1.876 m		
59	Unknown	NPOC	05H006-05M	TCH009-59	0A-12	C:\Progra	1.000	NPOC:25.05 m		
60	Control	NPOC	CCV5	TCH009-60	0A-12	C:\Progra	1.000	NPOC:24.82 m	Control valu	
61	Unknown	NPOC	CCB5	TCH009-61	0A-12	C:\Progra	1.000	NPOC:0.4095		
62										
63										
64										
65										
66										8081

Instr. Information

System

Detector

Catalyst

Cell Length

toc

Combustion

Regular Sensitivity

long

Cal. Curve

Sample Name:

Sample ID:

Cal. Curve:

ICAL

TCH009-1

TCH009.2005_08_10_23_05_40.cal

Type	Anal.
Standard	NPOC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	0.8982	50uL	1	*****		08/10/05 11:13:04 PM
2	0.6816	50uL	1	*****		08/10/05 11:14:24 PM

Acid Add.

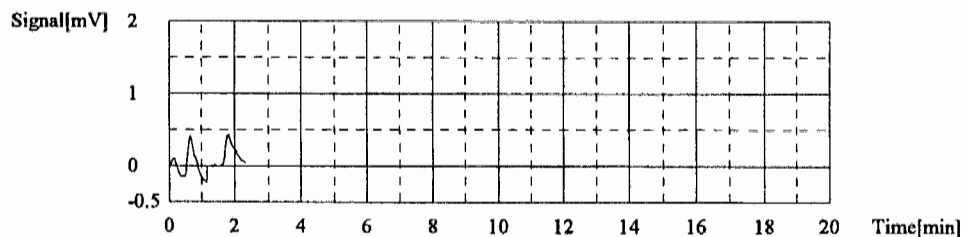
Sp. Time

Mean Area

2.500%

90.00sec

0.7899



Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	3.392	50uL	10	*****		08/10/05 11:23:04 PM
2	3.273	50uL	10	*****		08/10/05 11:24:41 PM

Acid Add.

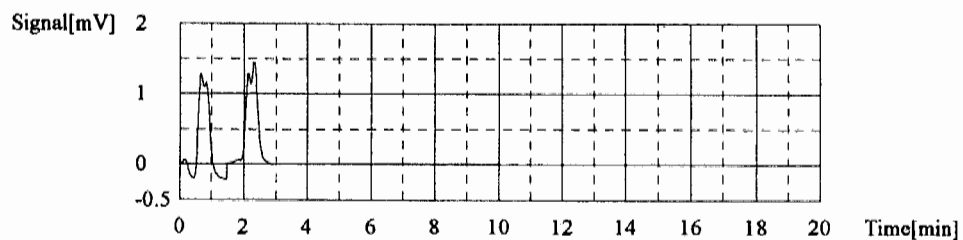
Sp. Time

Mean Area

2.500%

90.00sec

3.333

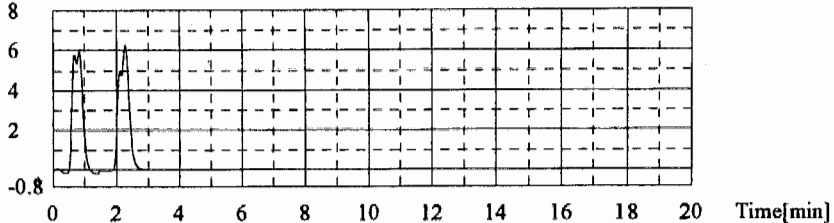


Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	14.40	50uL	2	*****		08/10/05 11:31:24 PM
2	14.51	50uL	2	*****		08/10/05 11:33:05 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 14.46

Signal[mV]

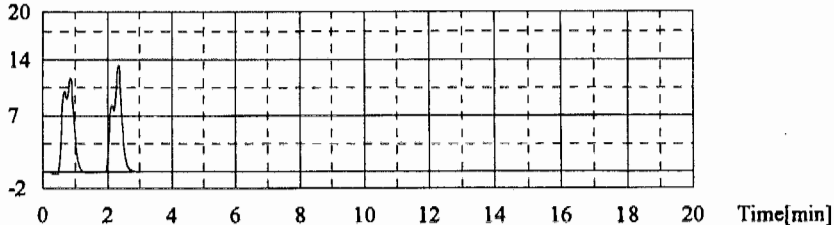


Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	28.03	50uL	1	*****		08/10/05 11:39:08 PM
2	28.16	50uL	1	*****		08/10/05 11:40:49 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 28.09

Signal[mV]

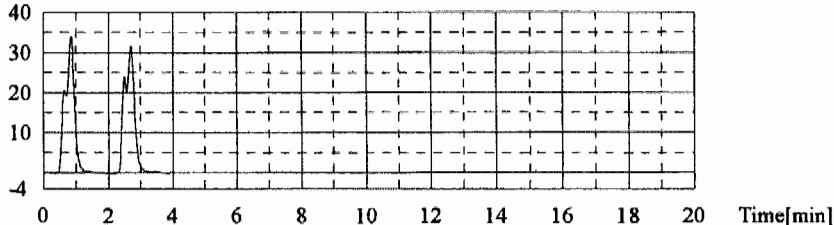


Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	68.77	50uL	2	*****		08/10/05 11:49:53 PM
2	69.52	50uL	2	*****		08/10/05 11:52:08 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 69.15

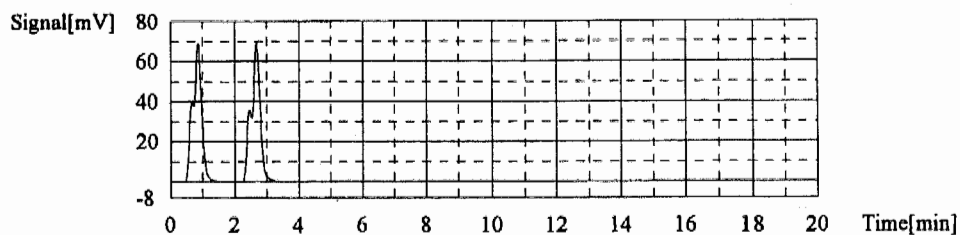
Signal[mV]



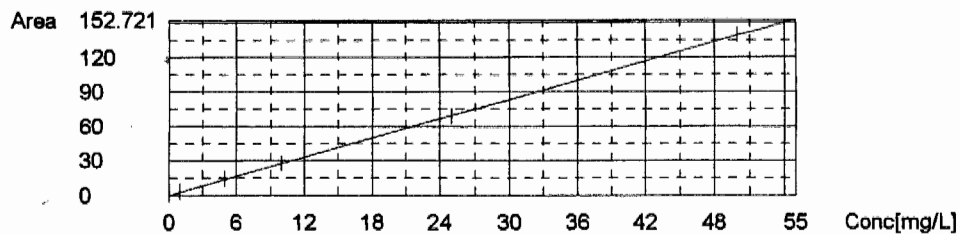
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	139.5	50uL	1	*****		08/10/05 11:58:31 PM
2	139.9	50uL	1	*****		08/11/05 12:00:31 AM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 139.7



Slope: 2.777
Intercept 0.000
 r^2 0.999941



Control Sample

Sample Name: ICV
Sample ID: TCH009-2
Method: TCH009.tpl
Chk. Result: Control value: 0.73% / Control within range

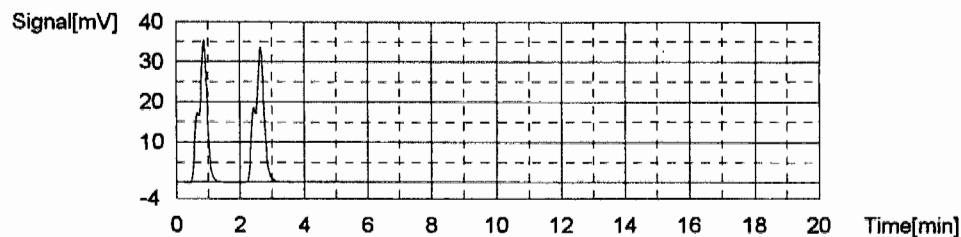
Type	Anal.	Dil.	Result
Control	NPOC	1.000	NPOC:24.67 mg/L

1. Det.

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	68.25	24.58mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:09:03 AM
2	68.75	24.76mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:11:02 AM

Mean Area 68.50
Mean Conc. 24.67mg/L



Sample

Sample Name: ICB
 Sample ID: TCH009-3
 Origin: TCH009.met
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.1949 mg/L

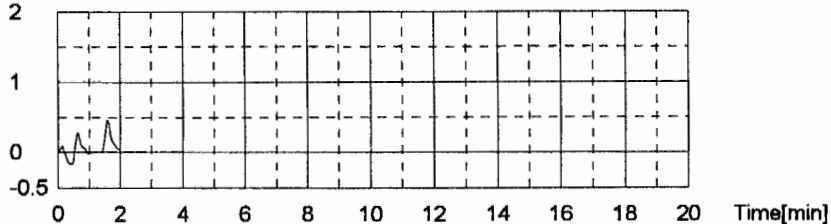
1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.5402	0.1945mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:18:30 AM
2	0.5419	0.1952mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:19:43 AM

Mean Area 0.5411
 Mean Conc. 0.1949mg/L

Signal[mV] 2



Sample

Sample Name: HCO3/CO3
 Sample ID: TCH009-4
 Origin: TCH009.met
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.7640 mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2.098	0.7556mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:27:26 AM
2	2.145	0.7725mg/L	50uL	1		TCH009.2005_08_10_23_05_40.cal	08/11/05 12:28:50 AM

ANALYSIS RUN LOG FOR TOC

SOP: 0 EMAX-9060 Revision No. 1 0 EMAX-415.1 Revision No. 1 0

Book # A62-006

Start Date: 8/10/05

Time: 23:15

Ending Date:

Time: 09:28

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix	Run Time	Notes
				S W		
* 1	TC4009-1	ICAV	1	X	00:00	NPOL Run
* 2	2	ICV			00:11	PH 2.2
* 3	3	ICP			00:19	
* 4	4	HCO ₃ /CO ₃			00:28	
* 5	5	TC4009WB			00:37	
* 6	6	WL			00:47	
* 7	7	WC			00:57	
* 8	8	056218-04			13:00 01:06	
* 9	9	06D			01:16	
* 10	10	06M			01:25	
* 11	11	056231-03	20		01:35	
* 12	12	056247-03	10		01:45	
* 13	13	056247-01	1		01:54	
* 14	14	04V1			02:04	
* 15	15	04B1			02:13	
* 16	16	051421-02			02:22	
* 17	17	03			02:31	
* 18	18	051006-01			02:40	
* 19	19	02			02:50	
* 20	20	03			02:59	
* 21	21	04			03:08	
* 22	22	05			03:17	
* 23	23	051056-01			03:24	
* 24	24	03			03:35	
* 25	25	03D			03:45	
* 26	26	02V2			03:55	
* 27	27	04B2			04:04	
* 28	28	051056-03M			04:14	
* 29	29	TC1010WB			04:23	
* 30	30	02L			04:33	

ANALYTICAL BATCH * TC4009W ** TC4010W

Analyzed By: W

This page is checked during data review.

ANALYSIS RUN LOG FOR TOC

SOP: 0 EMAX-9060 Revision No. 1 of EMAX-415.1 Revision No. 1 0

Book # A62-006

Start Date: 8/10/05 Time: 25:13 Ending Date: 8/10/05 Time: 09:28

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix	Run Time	Notes
				S W		
* 1	TEH009-31	TEH010LW	1	X	04:43	NPOC Run
* 2	32	05H020-05			04:52	pH < 2
* 3	33	11			05:01	
* 4	34	15			05:10	
* 5	35	05H033-04			05:21	
* 6	36	06			05:30	8/10/05
* 7	37	08			05:39	
* 8	38	02V3			05:50	
* 9	39	02B3			05:59	
* 0	40	05H033-10			06:09	
* 1	41	12			06:17	
* 2	42	18			06:28	
* 3	43	05H032-03			06:38	
* 4	44	05H048-02			06:47	
* 5	45	04			06:57	
* 6	46	06			07:07	
* 7	47	10			07:16	
* 8	48	13			07:25	
* 9	49	13D			07:35	
* 0	50	13M			07:45	
* 1	51	02V4			07:55	
* 2	52	02B4			08:04	
* 3	53	05H006-01			08:13	
* 4	54	02			08:23	
* 5	55	03			08:32	
* 6	56	04			08:41	
* 7	57	05			08:50	
* 8	58	05D			08:59	
* 9	59	05M			09:09	
* 0	60	02V5			09:20	
	61	02B5			09:28	

Instrument No.	62
Method File	TEH009
ICAL ID	(see previous page 86)
ICV ID	

ICAL Level	Conc.(mg/L)
S ₀	
S ₁	
S ₂	
S ₃	
S ₄	
S ₅	
S ₆	
ICV/LCS	
OCV	

Comments:

Analyzed By: ~

This page is checked during data review.

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PROJECT: **JPL**

SDG: **05G183**

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SM3500	8052 – 8057
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** - Not Requested



1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889
Fax: (310) 618-0818

Date: 08-05-2005
EMAX Batch No.: 05G183

Attn: Tien Shiao

Battelle Memorial Institute
505 King Ave.
Columbus OH 43201

Subject: Laboratory Report
Project: JPL

Enclosed is the Laboratory report for samples received on 07/22/05.
The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
MW-19-1	G183-01	07/20/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-18-5	G183-02	07/21/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N

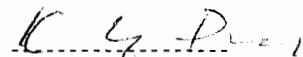
Sample ID -----	Control # -----	Col Date -----	Matrix -----	Analysis -----
				SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-18-4	G183-03	07/21/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-18-3	G183-04	07/21/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-18-1	G183-05	07/21/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-18-2	G183-06	07/21/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON

Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
				ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
DUPE-2-7/21/05	G183-07	07/21/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,



Kam Y. Pang, Ph.D.
Laboratory Director

1002



Battelle

Columbus Laboratories

CHAIN OF CUSTODY RECORD

Form No. 05G183

Proj. No.

6446111 T3

Project Title

Source Determination Study

SAMPLERS: (Signature)

D. Conner

DATE

TIME

SAMPLE I.D.

7/20/05

15:00

MW-19-1

7/21/05

0915

MW-18-5

7/21/05

1030

MW-18-4

7/21/05

1245

MW-18-3

7/21/05

1500

MW-18-1

7/21/05

1630

MW-18-2

7/21/05

1645

~~MW-18-2~~ DUPE-2-7/21/05

SAMPLE TYPE (V)

DOC (Filtered) ☒
 Fe/Mn/As Iron ☒
 Nitrite, Nitrate ☒
 Sulfate, Chloride ☒
 Ammonia ☒
 Sulfide ☒
 (Ca, Mg, K, Na) ☒
 Ferric Iron ☒
 Landfill ☒
 TKN ☒

Container No.

Number of Containers

Remarks

0.45um filter
rinsed w/ 500mL
of distilled H₂O
before filtering
DOC in the field.

PO #
191943

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received for Laboratory by: (Signature)

Date/Time

Remarks

To: EMAX

T-3.2

Type of Delivery	Delivered By/Airbill	ECN	056183
<input checked="" type="checkbox"/> EMAX Courier	SEE P.O.C.	Receipient	I. PATEL
<input type="checkbox"/> Client Delivery		Date	07.22.05.
<input type="checkbox"/> Third Party		Time	14:15

COC Inspection		
<input checked="" type="checkbox"/> Client Name	<input checked="" type="checkbox"/> Sampler Name	<input checked="" type="checkbox"/> Sampling Date/Time/Location
<input checked="" type="checkbox"/> Address	<input checked="" type="checkbox"/> Courier Signature/Date/Time	<input checked="" type="checkbox"/> Analysis Required
<input checked="" type="checkbox"/> Client PM/FC	<input type="checkbox"/> TAT	<input type="checkbox"/> Matrix
<input checked="" type="checkbox"/> Tel #/Fax #	<input checked="" type="checkbox"/> Sample ID	<input type="checkbox"/> Preservative (if any)
Safety Issues	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Superfund Site Samples
Comments:	<input type="checkbox"/> High Concentrations expected	
	<input type="checkbox"/> Rad Screening Required	

Packaging Inspection			
Container	<input checked="" type="checkbox"/> Cooler <i>ONE</i>	<input type="checkbox"/> Box	<input type="checkbox"/>
Condition	<input type="checkbox"/> Custody Seal	<input checked="" type="checkbox"/> Intact	<input type="checkbox"/> Damaged
Packaging	<input type="checkbox"/> Bubble Pack	<input type="checkbox"/> Styrofoam	<input checked="" type="checkbox"/> Sufficient
Temperatures	<input checked="" type="checkbox"/> Cooler 1 <i>3.2°C</i>	<input checked="" type="checkbox"/> Cooler 2 _____	<input type="checkbox"/> Cooler 3 _____
	<input type="checkbox"/> Cooler 5 _____	<input type="checkbox"/> Cooler 6 _____	<input type="checkbox"/> Cooler 4 _____
	<input type="checkbox"/> Cooler 9 _____	<input type="checkbox"/> Cooler 10 _____	<input type="checkbox"/> Cooler 7 _____
			<input type="checkbox"/> Cooler 8 _____
Comments:		<input type="checkbox"/> Cooler 11 _____	<input type="checkbox"/> Cooler 12 _____

[illegible]

Date _____

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

METHOD 200.7
METALS BY ICP-AES

SDG#: 05G183

7000

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G183**

METHOD 200.7 METALS BY ICP-AES

Seven (7) water samples were received on 07/22/05 for Metals analysis by Method 200.7 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample G183-07 was analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

Sample G183-07 was spiked. All recoveries were within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
METALS BY ICP-AES

SDG NO. : 05G183
Instrument ID : T-107

Client : BATTTELLE MEMORIAL INSTITUTE
Project : JPL

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	WATER		Sample Data FN	Calibration Data FN	Prep. Batch	Notes
					Extraction Date/Time	Extraction Date/Time				
MBLKTW	IPG052WB	1	NA	08/03/0519:11	07/29/0511:30	07/29/0511:30	107H007012	107H007010	IPG052W	Method Blank
LCS1W	IPG052WL	1	NA	08/03/0519:15	07/29/0511:30	07/29/0511:30	107H007013	107H007010	IPG052W	Lab Control Sample (LCS)
LCD1W	IPG052WC	1	NA	08/03/0519:20	07/29/0511:30	07/29/0511:30	107H007014	107H007010	IPG052W	LCS Duplicate
MU-19-1	G183-01	1	NA	08/03/0519:25	07/29/0511:30	07/29/0511:30	107H007015	107H007010	IPG052W	Field Sample
MU-18-5	G183-02	1	NA	08/03/0519:29	07/29/0511:30	07/29/0511:30	107H007016	107H007010	IPG052W	Field Sample
MU-18-4	G183-03	1	NA	08/03/0519:33	07/29/0511:30	07/29/0511:30	107H007017	107H007010	IPG052W	Field Sample
MU-18-3	G183-04	1	NA	08/03/0519:37	07/29/0511:30	07/29/0511:30	107H007018	107H007010	IPG052W	Field Sample
MU-18-1	G183-05	1	NA	08/03/0519:41	07/29/0511:30	07/29/0511:30	107H007019	107H007010	IPG052W	Field Sample
MU-18-2	G183-06	1	NA	08/03/0519:45	07/29/0511:30	07/29/0511:30	107H007020	107H007010	IPG052W	Field Sample
DUPE-2-7/21/05	G183-07	1	NA	08/03/0520:05	07/29/0511:30	07/29/0511:30	107H007021	107H007010	IPG052W	Field Sample
DUPE-2-7/21/05DL	G183-07T	5	NA	08/03/0520:05	07/29/0511:30	07/29/0511:30	107H007024	107H007022	IPG052W	Diluted Sample
DUPE-2-7/21/05AS	G183-07A	1	NA	08/03/0520:09	07/29/0511:30	07/29/0511:30	107H007025	107H007022	IPG052W	Analytical Spike Sample
DUPE-2-7/21/05MS	G183-07M	1	NA	08/03/0520:13	07/29/0511:30	07/29/0511:30	107H007026	107H007022	IPG052W	Matrix Spike Sample (MS)
DUPE-2-7/21/05MSD	G183-07S	1	NA	08/03/0520:17	07/29/0511:30	07/29/0511:30	107H007027	107H007022	IPG052W	MS Duplicate (MSD)

FN - Filename
% Moist - Percent Moisture

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/20/05
Project     : JPL                          Date Received: 07/22/05
SDG NO.     : 05G183                      Date Extracted: 07/29/05 11:30
Sample ID   : MW-19-1                     Date Analyzed: 08/03/05 19:25
Lab Samp ID : G183-01                     Dilution Factor: 1
Lab File ID : I07H007015                  Matrix          : WATER
Ext Btch ID : IPG052W                     % Moisture       : NA
Calib. Ref. : I07H007010                  Instrument ID    : EMAXTI07
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	42.5	1	.1
Iron	2.52	.2	.04
Magnesium	16.8	1	.1
Potassium	3.41	2	1.4
Sodium	19.8	1	.25

7003
ck

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/21/05
Project     : JPL                         Date Received: 07/22/05
SDG NO.     : 05G183                     Date Extracted: 07/29/05 11:30
Sample ID   : MW-18-5                     Date Analyzed: 08/03/05 19:29
Lab Samp ID : G183-02                     Dilution Factor: 1
Lab File ID : I07H007016                  Matrix          : WATER
Ext Btch ID : IPG052W                     % Moisture       : NA
Calib. Ref. : I07H007010                  Instrument ID    : EMAXTI07
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
-----	-----	-----	-----
Calcium	9.25	1	.1
Iron	ND	.2	.04
Magnesium	4.39	1	.1
Potassium	ND	2	1.4
Sodium	53.1	1	.25

7004
cl

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/21/05
Project     : JPL                          Date Received: 07/22/05
SDG NO.     : 05G183                       Date Extracted: 07/29/05 11:30
Sample ID   : MW-18-4                      Date Analyzed: 08/03/05 19:33
Lab Samp ID : G183-03                      Dilution Factor: 1
Lab File ID : I07H007017                   Matrix          : WATER
Ext Btch ID : IPG052W                       % Moisture       : NA
Calib. Ref. : I07H007010                   Instrument ID    : EMAXT107
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	39	1	.1
Iron	.215	.2	.04
Magnesium	13.4	1	.1
Potassium	2.06	2	1.4
Sodium	29.3	1	.25

7005

24

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/21/05
Project     : JPL                         Date Received: 07/22/05
SDG NO.     : 05G183                     Date Extracted: 07/29/05 11:30
Sample ID   : MW-18-3                    Date Analyzed: 08/03/05 19:37
Lab Samp ID : G183-04                     Dilution Factor: 1
Lab File ID : I07H007018                  Matrix       : WATER
Ext Btch ID : IPG052W                     % Moisture    : NA
Calib. Ref. : I07H007010                  Instrument ID : EMAXT107
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	66.2	1	.1
Iron	ND	.2	.04
Magnesium	19.7	1	.1
Potassium	2.94	2	1.4
Sodium	23.8	1	.25

7006

ch

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/21/05
Project     : JPL                          Date Received: 07/22/05
SDG NO.     : 05G183                      Date Extracted: 07/29/05 11:30
Sample ID   : MW-18-1                     Date Analyzed: 08/03/05 19:41
Lab Samp ID : G183-05                     Dilution Factor: 1
Lab File ID : I07H007019                  Matrix          : WATER
Ext Btch ID : IPG052W                     % Moisture       : NA
Calib. Ref. : I07H007010                  Instrument ID    : EMAXT107
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	41.9	1	.1
Iron	ND	.2	.04
Magnesium	14	1	.1
Potassium	2.59	2	1.4
Sodium	15.8	1	.25

7007

ch

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/21/05
Project     : JPL                          Date Received: 07/22/05
SDG NO.     : 05G183                      Date Extracted: 07/29/05 11:30
Sample ID   : MW-18-2                     Date Analyzed: 08/03/05 19:45
Lab Samp ID : G183-06                     Dilution Factor: 1
Lab File ID : I07H007020                  Matrix          : WATER
Ext Btch ID : IPG052W                     % Moisture       : NA
Calib. Ref. : I07H007010                  Instrument ID    : EMAXTI07
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	56.8	1	.1
Iron	.269	.2	.04
Magnesium	18.8	1	.1
Potassium	2.35	2	1.4
Sodium	20.3	1	.25

7008

ML

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/21/05
Project     : JPL                         Date Received: 07/22/05
SDG NO.     : 05G183                     Date Extracted: 07/29/05 11:30
Sample ID   : DUPE-2-7/21/05             Date Analyzed: 08/03/05 19:49
Lab Samp ID : G183-07                    Dilution Factor: 1
Lab File ID : I07H007021                 Matrix          : WATER
Ext Btch ID : IPG052W                     % Moisture       : NA
Calib. Ref. : I07H007010                 Instrument ID    : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	56.5	1	.1
Iron	ND	.2	.04
Magnesium	18.7	1	.1
Potassium	2.51	2	1.4
Sodium	19.8	1	.25

7009

gm

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: NA
Project     : JPL                          Date Received: 07/29/05
SDG NO.     : 05G183                      Date Extracted: 07/29/05 11:30
Sample ID   : MBLK1W                      Date Analyzed: 08/03/05 19:11
Lab Samp ID : IPG052WB                    Dilution Factor: 1
Lab File ID : I07H007012                  Matrix       : WATER
Ext Btch ID : IPG052W                     % Moisture    : NA
Calib. Ref. : I07H007010                  Instrument ID : EMAXT107
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	ND	1	.1
Iron	ND	.2	.04
Magnesium	ND	1	.1
Potassium	ND	2	1.4
Sodium	ND	1	.25

7010

du

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05G183
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILT N FACTR: 1 1 1
SAMPLE ID: MBLK1W
CONTROL NO.: IPG052WB IPG052WL IPG052WC
LAB FILE ID: I07H007012 I07H007013 I07H007014
DATE TIME EXTRCTD: 07/29/0511:30 07/29/0511:30 07/29/0511:30 DATE COLLECTED: NA
DATE TIME ANALYZD: 08/03/0519:11 08/03/0519:15 08/03/0519:20 DATE RECEIVED: 07/29/05
PREP. BATCH: IPG052W IPG052W IPG052W
CALIB. REF: I07H007010 I07H007010 I07H007010

ACCESSION:

PARAMETER	BLNK RSLT mg/L	SPIKE AMT mg/L	BS RSLT mg/L	BS % REC	SPIKE AMT mg/L	BSD RSLT mg/L	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	ND	50	50.9	102	50	50.4	101	1	85-115	20
Iron	ND	10	10.6	106	10	10.4	104	2	85-115	20
Magnesium	ND	50	51.6	103	50	50.8	102	2	85-115	20
Potassium	ND	50	51.1	102	50	50.6	101	1	85-115	20
Sodium	ND	50	50.9	102	50	50.5	101	1	85-115	20

7011

du

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05G183
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILTN FACTR: 1 1 1
SAMPLE ID: DUPE-2-7/21/05
CONTROL NO.: G183-07 G183-07M G183-07S
LAB FILE ID: I07H007021 I07H007026 I07H007027
DATIME EXTRCTD: 07/29/0511:30 07/29/0511:30 07/29/0511:30 DATE COLLECTED: 07/21/05
DATIME ANALYZD: 08/03/0519:49 08/03/0520:13 08/03/0520:17 DATE RECEIVED: 07/22/05
PREP. BATCH: IPG052W IPG052W IPG052W
CALIB. REF: I07H007010 I07H007022 I07H007022

ACCESSION:

PARAMETER	SMPL RSLT mg/L	SPIKE AMT mg/L	MS RSLT mg/L	MS % REC	SPIKE AMT mg/L	MSD RSLT mg/L	MSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	56.5	50	108	102	50	107	101	1	70-130	20
Iron	ND	10	10.6	106	10	10.6	106	0	70-130	20
Magnesium	18.7	50	71.1	105	50	69.6	102	2	70-130	20
Potassium	2.51	50	55.3	106	50	55.1	105	0	70-130	20
Sodium	19.8	50	71.4	103	50	70.2	101	2	70-130	20

7012

du

EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G183
METHOD: METHOD 200.7

=====

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 5
SAMPLE ID: DUPE-2-7/21/05 DUPE-2-7/21/05DL
EMAX SAMP ID: G183-07 G183-07T
LAB FILE ID: I07H007021 I07H007024
DATE EXTRACTED: 07/29/0511:30 07/29/0511:30 DATE COLLECTED: 07/21/05
DATE ANALYZED: 08/03/0519:49 08/03/0520:05 DATE RECEIVED: 07/22/05
PREP. BATCH: IPG052W IPG052W
CALIB. REF: I07H007010 I07H007022

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SERIAL DIL RSLT (mg/L)	DIF RSLT (%)	QC LIMIT (%)
Calcium	56.5	56.6	0	10
Iron	ND	ND	0	10
Magnesium	18.7	18.8	0	10
Potassium	2.51	ND	NA	10
Sodium	19.8	21.1	7	10

7013

qk

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05G183
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILT N FACTR: 1 1
SAMPLE ID: DUPE-2-7/21/05
CONTROL NO.: G183-07 G183-07A
LAB FILE ID: I07H007021 I07H007025
DATIME EXTRCTD: 07/29/0511:30 07/29/0511:30 DATE COLLECTED: 07/21/05
DATIME ANALYZD: 08/03/0519:49 08/03/0520:09 DATE RECEIVED: 07/22/05
PREP. BATCH: IPG052W IPG052W
CALIB. REF: I07H007010 I07H007022

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	AS RSLT (mg/L)	AS % REC	QC LIMIT (%)
Calcium	56.5	50	104	95	75-125
Iron	ND	10	10.2	102	75-125
Magnesium	18.7	50	68.9	100	75-125
Potassium	2.51	50	53.6	102	75-125
Sodium	19.8	50	69	98	75-125

7014

du

REGULAR ICP QC CHECK TABLE

QC Limit%	ICV HIGH 95-105 mg/L	ICV 90-110 mg/L	CCV 90-110 mg/L	ICSAB 80-120 mg/L	ICSA 80-120 mg/L
Al	10	5	5	500	500
Sb	2	1	1	1	0
As	2	1	1	1	0
Ba	2	1	1	0.5	0
Be	2	1	1	0.5	0
B	2	1	1	0.5	0
Cd	2	1	1	1	0
Ca	100	50	50	500	500
Cr	2	1	1	0.5	0
Co	2	1	1	0.5	0
Cu	2	1	1	0.5	0
Fe	10	5	5	200	200
Pb	2	1	1	1	0
Mg	100	50	50	500	500
Mn	2	1	1	0.5	0
Mo	2	1	1	1	0
Ni	2	1	1	1	0
K	100	50	50	50	0
Se	2	1	1	3.6	0
Ag	2	1	1	1	0
Na	100	50	50	10	0
Sr	2	1	1	0.5	0
Tl	2	1	1	3.6	0
Sn	10	5	5	1	0
Ti	2	1	1	1	0
V	2	1	1	0.5	0
Zn	2	1	1	1	0

ANALYSIS RUN LOG FOR ICP

SOP EMAX-6010-Rev. 3 ☐ EMAX-CLP-TAL 280.7 Method File: 601002 Autosampler Table: 21.10 Book# A24 -038Matrix: WaterStart Date: 8/7/03Time: 18:22End Date: 8/3/03Time: 21:10

Data File Name	Prep. Batch	Lab Sample ID	DF	Matrix	Notes	ANALYTICAL BATCH* <u>107H007</u>			
						01	02	03	04
01		40							
02		93							
03		56							
04		ICV (ACS)							
05		ICV							
06		CCV (ITC)							
07		CCV							
08		ICSA							
09		ICSA (ITC)							
10		CCV (ITC)							
11		CCV							
12	176052W	176052W							
13		↓							
14		↓							
15		G183-01							
16		↓							
17		63							
18		64							
19		65							
20		66							
21		↓							
22		CCV2 (ITC)							
23		CCV2							
24		G183-07T							
25		↓							
						ANALYTICAL BATCH *			
26	176052W	G183-07M	1	W	(LRM)				
27		↓							
28		G218-01	1		(LRM)				
29		62	1						
30		63	1						
31		64	1						
32		65	1						
33		↓							
34		CCV2 (ITC)	1						
35		CCV2	1						
36		ICSA	1						
37		ICSA (ITC)	1						
38		CCV4 (ITC)	1						
39		CCV4	1						
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									

Comments:

OK

Analyzed By: ANUM

Date Disposed:

This page is checked during data review.

SEQUENCE FILE : I07H007

4-18	19-33	34-43	44-53	54-63
LFID	LSID	TIME	DATE	DF
I07H007001	S0	18:22	08/03/05	1
I07H007002	S3	18:26	08/03/05	1
I07H007003	S6	18:31	08/03/05	1
I07H007004	ICV	18:34	08/03/05	1
I07H007005	ICB	18:40	08/03/05	1
I07H007006	CCV	18:44	08/03/05	1
I07H007007	CCB	18:48	08/03/05	1
I07H007008	ICSAI	18:54	08/03/05	1
I07H007009	ICSABI	18:58	08/03/05	1
I07H007010	CCV1	19:02	08/03/05	1
I07H007011	CCB1	19:07	08/03/05	1
I07H007012	IPG052WB	19:11	08/03/05	1
I07H007013	IPG052WL	19:15	08/03/05	1
I07H007014	IPG052WC	19:20	08/03/05	1
I07H007015	G183-01	19:25	08/03/05	1
I07H007016	G183-02	19:29	08/03/05	1
I07H007017	G183-03	19:33	08/03/05	1
I07H007018	G183-04	19:37	08/03/05	1
I07H007019	G183-05	19:41	08/03/05	1
I07H007020	G183-06	19:45	08/03/05	1
I07H007021	G183-07	19:49	08/03/05	1
I07H007022	CCV2	19:55	08/03/05	1
I07H007023	CCB2	20:01	08/03/05	1
I07H007024	G183-07T	20:05	08/03/05	5
I07H007025	G183-07A	20:09	08/03/05	1
I07H007026	G183-07M	20:13	08/03/05	1
I07H007027	G183-07S	20:17	08/03/05	1
I07H007028	G218-01	20:23	08/03/05	1
I07H007029	G218-02	20:27	08/03/05	1
I07H007030	G218-03	20:31	08/03/05	1
I07H007031	G218-04	20:35	08/03/05	1
I07H007032	G218-05	20:39	08/03/05	1
I07H007033	G218-06	20:43	08/03/05	1
I07H007034	CCV2	20:49	08/03/05	1
I07H007035	CCB2	20:54	08/03/05	1
I07H007036	ICSAF	20:58	08/03/05	1
I07H007037	ICSABF	21:02	08/03/05	1
I07H007038	CCV3	21:06	08/03/05	1
I07H007039	CCB3	21:10	08/03/05	1

SDG : 56183

UNIT : %

ICP CHECK : 107H007

DATE : 08/03/05

INST : EMAXT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
S0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICV	99	98	99	97	100	102	97	99	97	97	98	101	97	101	98	98	96	98	105	97	100	97	98	98	100	98	97
ICB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV	100	96	101	98	98	98	99	100	98	97	98	101	98	100	98	99	97	100	104	99	99	98	96	98	98	98	98
CCB	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA1	97	...	...	...	...	...	...	93	...	...	...	91	...	99	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA81	96	88	106	94	94	95	92	92	88	86	98	90	96	98	90	89	86	100	106	97	104	92	102	86	92	97	93
CCV1	100	96	98	99	98	98	99	100	97	96	98	101	97	99	97	98	96	98	99	99	100	98	102	98	98	97	97
CCB1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPG052W8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPG052W4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IPG052WC	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-06	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-07	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV2	101	98	97	99	99	99	100	101	97	96	98	101	99	100	97	99	98	102	100	100	99	98	100	99	98	98	97
CCB2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-07T	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-07A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-07M	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G183-07S	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G218-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G218-02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G218-03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G218-04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G218-05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
G218-06	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CCV2	100	97	95	98	97	99	98	99	95	93	96	99	97	99	95	96	96	101	98	99	99	97	101	96	97	96	94
CCB2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSAF	95	...	...	...	...	...	...	91	...	...	...	88	...	97	...	...	...	...	...	...	...	...	...	...	...	...	...
ICSA8F	95	88	99	93	91	95	92	91	85	83	96	87	90	96	88	85	86	105	102	97	104	90	99	84	90	93	90
CCV3	99	99	97	98	97	98	99	99	95	93	96	99	99	98	95	95	97	102	98	99	98	97	98	96	97	96	94
CCB3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

QC limit of each parameter are listed in a table attached next to all the ICP check forms
* : Out of QC Limit

SDG : 05683

UNIT : UG/L

SUMMARY of CALIBRATION BLANKS : 107H007 (WATER)

DATE : 08/03/05

INST : EMAX1107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
SO
S3
S6
ICV
ICB	4.74	19.9	11.5	0.90	0.60	3.65	260	600	0.00	660	1.16	1.11	14.7	7.82	1.49	9.24	3.46	619	54.5	170	7.41	120	19.0	27.2	120	2.10	940
CCV
CCB	4.75	5.03	3.13	0.90	0.60	1.83	520	4.70	2.11	2.12	0.00	3.05	1.60	7.81	0.00	9.24	3.80	277	4.71	2.25	0.00	0.90	13.8	9.52	0.20	1.62	470
ICSA1	...	34.0	145	210	120	7.23	1.13	...	8.79	280	8.11	...	78.8	...	...	3.41	1.92	659	219	14.7	7.41	1.84	297	6.46	11.3	3.64	2.06
ICSA81
CCV1
CCB1	-4.59	16.2	2.09	0.00	0.50	920	0.30	3.38	1.81	2.26	1.16	1.66	5.74	28.2	670	11.9	4.04	906	47.0	1.03	7.41	0.90	37.9	21.8	110	4.63	350
IPG052W8
IPG052WL
IPG052WC
GI83-01
GI83-02
GI83-03
GI83-04
GI83-05
GI83-06
GI83-07
CCV2
CCB2	2.08	7.32	2.09	0.90	1.30	1.37	260	3.04	300	520	390	1.11	2.18	12.8	1.49	5.28	2.88	431	36.7	1.55	7.41	120	20.7	12.2	320	1.80	380
GI83-07T
GI83-07A
GI83-07M
GI83-07S
G218-01
G218-02
G218-03
G218-04
G218-05
G218-06
CCV2
CCB2	-15.9	6.32	13.6	0.90	0.260	1.37	1.16	1.27	1.21	3.45	1.17	830	290	6.22	810	5.28	4.81	4.95	41.4	510	7.41	220	7.76	4.05	760	2.73	1.14
ICSAF	...	45.3	23.9	270	250	14.2	880	...	9.77	1.34	8.96	...	5.97	...	2.92	14.0	570	1179	259	15.1	7.41	1.57	190	5.06	12.1	7.11	1.67
ICSA8F
CCV3
CCB3	-1.32	16.4	3.14	0.90	0.260	2.29	280	5.08	2.10	1.59	0.00	2.22	10.3	8.57	810	13.2	2.11	267	31.9	510	0.00	250	18.1	13.6	660	2.86	1.39

QC limit of each parameter are listed in a table attached next to all the ICP check forms

* : Out of QC Limit

7019

Matrix: WATER Start Date: 7-29-05

Sample Prep ID	Lab Sample ID	Matrix Description		Turbidity <1 NTU	Sample Amount (g/ml)	pH	Extract Volume (ml)	Digestate Description
		Color	Texture / Clarity					
01	IPG 052-WB				50	-	50	
02	-WL				50	-	50	
03	-WC				50	-	50	
04	G 183-01				50	<2	50	
05	-02				50		50	
06	-03				50		50	
07	-04				50		50	
08	-05				50		50	
09	-06				50		50	
10	-07				50		50	
11	-07M				50		50	
12	G 158-01				50		50	
13	-02				50		50	
14	G 539-01				50		50	
15	G 218-01				50		50	
16	-02				50		50	
17	-03				50		50	
18	-04				50		50	
19	-05				50		50	
20	-06				50		50	
21					50		50	
22								
23								
24								
25								

BATCH: IPG 052-W

7-29-05 MAC

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

WET CHEMICAL ANALYSES

SDG#: 05G183

8000

CASE NARRATIVE

CLIENT: BATTELL MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G183

METHOD 300.0 ANIONS

Seven (7) water samples were received on 07/22/05 for Chloride, Nitrate-N, Nitrite-N and Sulfate analyses by method 300.0 in accordance with "Method for Determination of Inorganic Anions by Ion Chromatography", EPA 600/84-017.

1. Holding Time

Analyses met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limits.

4. Duplicate

Sample G183-03 was analyzed for duplicate. %RPDs were within QC limit.

5. Matrix Spike

Sample G183-03 was spiked. Recoveries were within QC limit except Chloride was out of the limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met with the aforementioned exception.

Two DCCS associated with Nitrate-N and Nitrite-N were bias high. The samples were not reanalyzed due to holding time criteria.

Nitrate/Nitrite-N were reported as Nitrogen concentration.

SAMPLE RESULTS

METHOD 300.0
CHLORIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G183

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICG038WB	ND	1	NA	.2	.1	07/29/0504:18	NA	AG28-64	AG28-61	ICG038W	NA	NA
LCS1W	ICG038WL	4.7	1	NA	.2	.1	07/29/0504:33	NA	AG28-65	AG28-61	ICG038W	NA	NA
LCD1W	ICG038WC	4.68	1	NA	.2	.1	07/29/0504:47	NA	AG28-66	AG28-61	ICG038W	NA	NA
MW-19-1	G183-01	20.1	5	NA	1	.5	07/29/0505:01	NA	AG28-67	AG28-61	ICG038W	07/20/05	07/22/05
MW-18-5	G183-02	10.4	2	NA	.4	.2	07/29/0505:15	NA	AG28-68	AG28-61	ICG038W	07/21/05	07/22/05
MW-18-4	G183-03	10.7	5	NA	1	.5	07/29/0505:29	NA	AG28-69	AG28-61	ICG038W	07/21/05	07/22/05
MW-18-4DUP	G183-03D	10.8	5	NA	1	.5	07/29/0505:43	NA	AG28-70	AG28-61	ICG038W	07/21/05	07/22/05
MW-18-4MS	G183-03M	29.7	5	NA	1	.5	07/29/0505:57	NA	AG28-71	AG28-61	ICG038W	07/21/05	07/22/05
MW-18-3	G183-04	16.1	5	NA	1	.5	07/29/0506:11	NA	AG28-72	AG28-61	ICG038W	07/21/05	07/22/05
MW-18-1	G183-05	9.52	5	NA	1	.5	07/29/0506:53	NA	AG28-75	AG28-73	ICG038W	07/21/05	07/22/05
MW-18-2	G183-06	14.3	5	NA	1	.5	07/29/0507:07	NA	AG28-76	AG28-73	ICG038W	07/21/05	07/22/05
DUPE-2-7/21/05	G183-07	14.2	5	NA	1	.5	07/29/0507:21	NA	AG28-77	AG28-73	ICG038W	07/21/05	07/22/05

8003

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METHOD 300.0
NITRATE-N

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G183

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICG026WB	ND	1	NA	.1	.05	07/22/0521:44	NA	AG22-04	AG22-01	ICG026W	NA	NA
LCS1W	ICG026WL	2.4	1	NA	.1	.05	07/22/0521:58	NA	AG22-05	AG22-01	ICG026W	NA	NA
LCD1W	ICG026WC	2.41	1	NA	.1	.05	07/22/0522:12	NA	AG22-06	AG22-01	ICG026W	NA	NA
MW-19-1	G183-01	1.38	1	NA	.1	.05	07/22/0522:26	NA	AG22-07	AG22-01	ICG026W	07/20/05	07/22/05
MW-18-5	G183-02	ND	1	NA	.1	.05	07/22/0522:40	NA	AG22-08	AG22-01	ICG026W	07/21/05	07/22/05
MW-18-4	G183-03	1.13	1	NA	.1	.05	07/22/0522:54	NA	AG22-09	AG22-01	ICG026W	07/21/05	07/22/05
MW-18-4DUP	G183-03D	1.13	1	NA	.1	.05	07/22/0523:08	NA	AG22-10	AG22-01	ICG026W	07/21/05	07/22/05
MW-18-4MS	G183-03M	3.71	1	NA	.1	.05	07/22/0523:22	NA	AG22-11	AG22-01	ICG026W	07/21/05	07/22/05
MW-18-3	G183-04	1.33	1	NA	.1	.05	07/22/0523:37	NA	AG22-12	AG22-01	ICG026W	07/21/05	07/22/05
MW-18-1	G183-05	1.58	1	NA	.1	.05	07/23/0500:33	NA	AG22-16	AG22-14	ICG026W	07/21/05	07/22/05
MW-18-2	G183-06	1.05	1	NA	.1	.05	07/23/0500:47	NA	AG22-17	AG22-14	ICG026W	07/21/05	07/22/05
DUPE-2-7/21/05	G183-07	1.3	1	NA	.1	.05	07/23/0501:01	NA	AG22-18	AG22-14	ICG026W	07/21/05	07/22/05

METHOD 300.0
NITRITE-N

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G183

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
NBLK1W	ICG026WB	ND	1	NA	.1	.05	07/22/0521:44	NA	AG22-04	AG22-01	ICG026W	NA	NA
LCS1W	ICG026WL	2.45	1	NA	.1	.05	07/22/0521:58	NA	AG22-05	AG22-01	ICG026W	NA	NA
LCD1W	ICG026WC	2.39	1	NA	.1	.05	07/22/0522:12	NA	AG22-06	AG22-01	ICG026W	NA	NA
MU-19-1	G183-01	ND	1	NA	.1	.05	07/22/0522:26	NA	AG22-07	AG22-01	ICG026W	07/20/05	07/22/05
MU-18-5	G183-02	ND	1	NA	.1	.05	07/22/0522:40	NA	AG22-08	AG22-01	ICG026W	07/21/05	07/22/05
MU-18-4	G183-03	ND	1	NA	.1	.05	07/22/0522:54	NA	AG22-09	AG22-01	ICG026W	07/21/05	07/22/05
MU-18-4DUJ	G183-03D	ND	1	NA	.1	.05	07/22/0523:08	NA	AG22-10	AG22-01	ICG026W	07/21/05	07/22/05
MU-18-4MS	G183-03M	2.46	1	NA	.1	.05	07/22/0523:22	NA	AG22-11	AG22-01	ICG026W	07/21/05	07/22/05
MU-18-3	G183-04	ND	1	NA	.1	.05	07/22/0523:37	NA	AG22-12	AG22-01	ICG026W	07/21/05	07/22/05
MU-18-1	G183-05	ND	1	NA	.1	.05	07/23/0500:33	NA	AG22-16	AG22-14	ICG026W	07/21/05	07/22/05
MU-18-2	G183-06	ND	1	NA	.1	.05	07/23/0500:47	NA	AG22-17	AG22-14	ICG026W	07/21/05	07/22/05
DUPE-2-7/21/05	G183-07	ND	1	NA	.1	.05	07/23/0501:01	NA	AG22-18	AG22-14	ICG026W	07/21/05	07/22/05

8005

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METHOD 300.0
SULFATE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G183

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICG038WB	ND	1	NA	.5	.25	07/29/0504:18	NA	AG28-64	AG28-61	ICG038W	NA	NA
LCS1W	ICG038WL	7.1	1	NA	.5	.25	07/29/0504:33	NA	AG28-65	AG28-61	ICG038W	NA	NA
LCD1W	ICG038WC	7.12	1	NA	.5	.25	07/29/0504:47	NA	AG28-66	AG28-61	ICG038W	NA	NA
MW-19-1	G183-01	26.3	5	NA	2.5	1.25	07/29/0505:01	NA	AG28-67	AG28-61	ICG038W	07/20/05	07/22/05
MW-18-5	G183-02	4.87	2	NA	1	.5	07/29/0505:15	NA	AG28-68	AG28-61	ICG038W	07/21/05	07/22/05
MW-18-4	G183-03	24.2	5	NA	2.5	1.25	07/29/0505:29	NA	AG28-69	AG28-61	ICG038W	07/21/05	07/22/05
MW-18-4DUP	G183-03D	24.2	5	NA	2.5	1.25	07/29/0505:43	NA	AG28-70	AG28-61	ICG038W	07/21/05	07/22/05
MW-18-4MS	G183-03M	60.7	5	NA	2.5	1.25	07/29/0505:57	NA	AG28-71	AG28-61	ICG038W	07/21/05	07/22/05
MW-18-3	G183-04	40.7	5	NA	2.5	1.25	07/29/0506:11	NA	AG28-72	AG28-61	ICG038W	07/21/05	07/22/05
MW-18-1	G183-05	33.1	5	NA	2.5	1.25	07/29/0506:53	NA	AG28-75	AG28-73	ICG038W	07/21/05	07/22/05
MW-18-2	G183-06	39.3	5	NA	2.5	1.25	07/29/0507:07	NA	AG28-76	AG28-73	ICG038W	07/21/05	07/22/05
DUPE-2-7/21/05	G183-07	39.2	5	NA	2.5	1.25	07/29/0507:21	NA	AG28-77	AG28-73	ICG038W	07/21/05	07/22/05

8006

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QC SUMMARIES

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G183
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICG038WL ICG038WC
LAB FILE ID: AG28-65 AG28-66
DATE EXTRACTED: NA DATE COLLECTED: NA
DATE ANALYZED: 07/29/0504:18 07/29/0504:47
PREP. BATCH: ICG038W ICG038W
CALIB. REF: AG28-61 AG28-61

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Chloride-Cl	ND	5	4.7	94	5	4.68	94	0	90-110	20

8008

EMAX QUALITY CONTROL DATA

MS ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
 PROJECT: JPL
 BATCH NO.: 05G183
 METHOD: METHOD 300.0

MATRIX: WATER
 DILUTION FACTOR: 5
 SAMPLE ID: MW-18-4
 LAB SAMP ID: G183-03M
 LAB FILE ID: AG28-71
 DATE EXTRACTED: NA
 DATE ANALYZED: 07/29/0505:29
 PREP. BATCH: ICG038W
 CALIB. REF: AG28-61

DATE COLLECTED: 07/21/05
 DATE RECEIVED: 07/22/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Chloride-Cl	10.7	25	29.7	76*	80-120

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G183
METHOD: METHOD 300.0
=====

MATRIX: WATER
DILUTION FACTOR: 5
SAMPLE ID: MW-18-4
EMAX SAMP ID: G183-03D
LAB FILE ID: AG28-70
DATE EXTRACTED: NA
DATE ANALYZED: 07/29/0505:29
PREP. BATCH: ICG038W
CALIB. REF: AG28-61
% MOISTURE: NA
DATE COLLECTED: 07/21/05
DATE RECEIVED: 07/22/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
Chloride-Cl	10.7	10.8	0	20

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G183

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICG026WL ICG026WC
LAB FILE ID: AG22-04 AG22-05 AG22-06
DATE EXTRACTED: NA NA
DATE ANALYZED: 07/22/0521:44 07/22/0521:58 07/22/0522:12
PREP. BATCH: ICG026W ICG026W
CALIB. REF: AG22-01 AG22-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	2.5	2.4	96	2.5	2.41	96	0	90-110	20

EMAX QUALITY CONTROL DATA

MS ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
 PROJECT: JPL
 BATCH NO.: 05G183
 METHOD: METHOD 300.0

MATRIX: WATER
 DILUTION FACTOR: 1
 SAMPLE ID: MW-18-4
 LAB SAMP ID: G183-03
 LAB FILE ID: AG22-09
 DATE EXTRACTED: NA
 DATE ANALYZED: 07/22/0522:54
 PREP. BATCH: ICG026W
 CALIB. REF: AG22-01

DATE COLLECTED: 07/21/05
 DATE RECEIVED: 07/22/05

% MOISTURE: NA

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Nitrate-N	1.13	2.5	3.71	103	80-120

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G183
METHOD: METHOD 300.0
=====

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-18-4
EMAX SAMP ID: G183-03
LAB FILE ID: AG22-09
DATE EXTRACTED: NA
DATE ANALYZED: 07/22/0522:54
PREP. BATCH: ICG026W
CALIB. REF: AG22-01
% MOISTURE: NA
DATE COLLECTED: 07/21/05
DATE RECEIVED: 07/22/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
Nitrate-N	1.13	1.13	0	20

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 056183
METHOD: METHOD 300.0

=====

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICG026WL ICG026WC
LAB FILE ID: AG22-05 AG22-06
DATE EXTRACTED: NA
DATE ANALYZED: 07/22/0521:44 07/22/0521:58 07/22/0522:12
PREP. BATCH: ICG026W ICG026W
CALIB. REF: AG22-01 AG22-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrite-N	ND	2.5	2.45	98	2.5	2.39	96	3	90-110	20

EMAX QUALITY CONTROL DATA

MS ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
 PROJECT: JPL
 BATCH NO.: 05G183
 METHOD: METHOD 300.0

=====

MATRIX: WATER
 DILUTION FACTOR: 1
 SAMPLE ID: MW-18-4
 LAB SAMP ID: G183-03M
 LAB FILE ID: AG22-09
 DATE EXTRACTED: NA
 DATE ANALYZED: 07/22/0522:54
 PREP. BATCH: ICG026W
 CALIB. REF: AG22-01

% MOISTURE: NA

DATE COLLECTED: 07/21/05
 DATE RECEIVED: 07/22/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Nitrite-N	ND	2.5	2.46	98	80-120

8015

dr

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G183

METHOD: METHOD 300.0

=====

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-18-4
EMAX SAMP ID: G183-030
LAB FILE ID: AG22-09
DATE EXTRACTED: NA
DATE ANALYZED: 07/22/0522:54
PREP. BATCH: ICG026W
CALIB. REF: AG22-01

% MOISTURE: NA

DATE COLLECTED: 07/21/05
DATE RECEIVED: 07/22/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT (%)	QC LIMIT (%)
Nitrite-N	ND	ND	0	20

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G183

METHOD: METHOD 300.0

MATRIX: WATER DILUTION FACTOR: 1 1 % MOISTURE: NA

SAMPLE ID: MBLK1W

LAB SAMP ID: ICG038WB

LAB FILE ID: AG28-64

DATE EXTRACTED: NA

DATE ANALYZED: 07/29/0504:18

PREP. BATCH: ICG038W

CALIB. REF: AG28-61

ICG038WL

AG28-65

NA

07/29/0504:33

ICG038W

AG28-61

ICG038WC

AG28-66

NA

07/29/0504:47

ICG038W

AG28-61

DATE COLLECTED: NA

DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Sulfate	ND	7.5	7.1	95	7.5	7.12	95	0	90-110	20

8017

df

EMAX QUALITY CONTROL DATA

MS ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
 PROJECT: JPL
 BATCH NO.: 05G183
 METHOD: METHOD 300.0

MATRIX: WATER
 DILUTION FACTOR: 5
 SAMPLE ID: HW-18-4
 LAB SAMP ID: G183-03M
 LAB FILE ID: AG28-69
 DATE EXTRACTED: NA
 DATE ANALYZED: 07/29/0505:29
 PREP. BATCH: ICG038W
 CALIB. REF: AG28-61

% MOISTURE: NA
 DATE COLLECTED: 07/21/05
 DATE RECEIVED: 07/22/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Sulfate	24.2	37.5	60.7	97	80-120

8018

4

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G183
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 5
SAMPLE ID: MW-18-4
EMAX SAMP ID: G183-03
LAB FILE ID: AG28-69
DATE EXTRACTED: NA
DATE ANALYZED: 07/29/0505:29
PREP. BATCH: ICG038W
CALIB. REF: AG28-61

% MOISTURE: NA
DATE COLLECTED: 07/21/05
DATE RECEIVED: 07/22/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
Sulfate	24.2	24.2	0	20

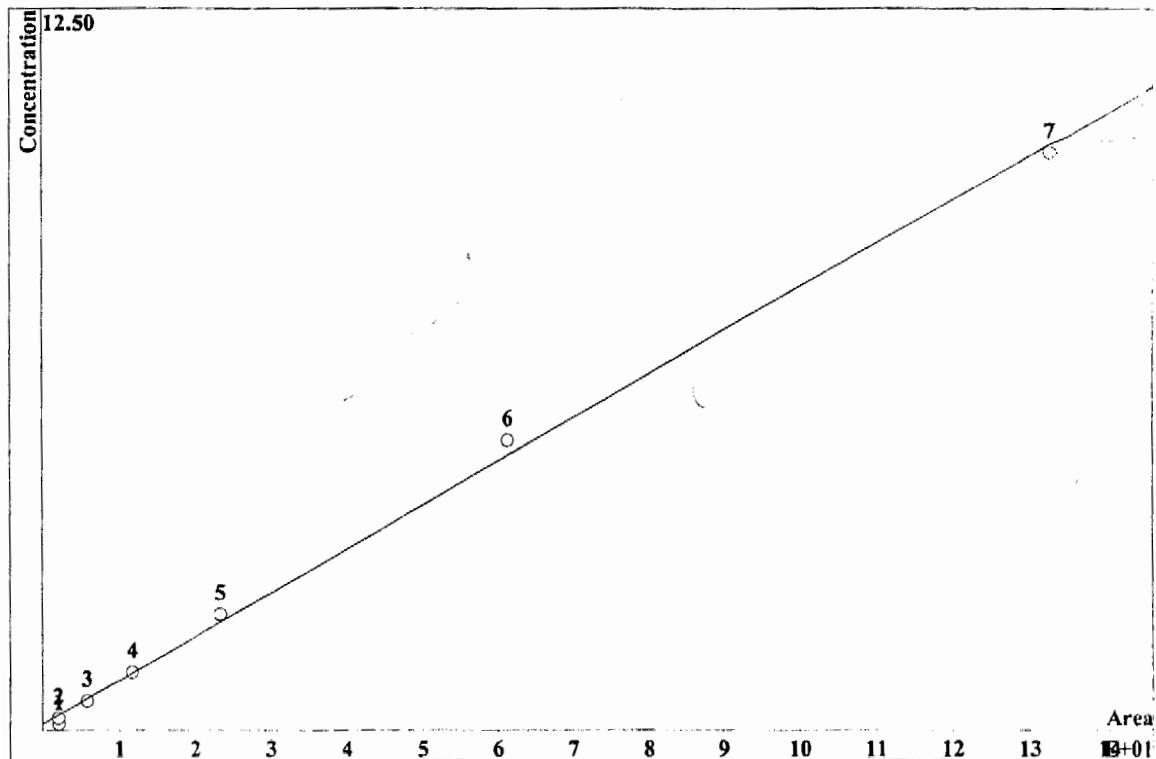
INITIAL CALIBRATIONS

IC Result Check FormVersion : qG1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AG12-01	1B	FCIBNPS	0	0	0	0	0	0	0	p7121933	1
AG12-02	S0	FCIBNPS	0	0	0	0	0	0	0	p7121947	1
AG12-03	S1	FCIBNPS	0.20922	0.26528	0.13263	0.17713	0.15064	0.23059	0.62598	p7122001	1
AG12-04	S2	FCIBNPS	0.27777	0.26131	0.22143	0.24989	0.23142	0.30903	0.72351	p7122016	1
AG12-05	S3	FCIBNPS	0.58991	0.54378	0.49016	0.55127	0.49616	0.56439	1.454	p7122030	1
AG12-06	S4	FCIBNPS	1.0109	0.98258	0.97309	1.0085	0.95747	1.027	2.868	p7122044	1
AG12-07	S5	FCIBNPS	1.9049	1.8679	1.9644	1.9839	1.9331	2.0024	5.7811	p7122058	1
AG12-08	S6	FCIBNPS	4.9656	4.7397	5.0183	4.9153	5.0312	4.8329	15.101	p7122112	1
AG12-09	S7	FCIBNPS	10.029	10.139	10.729	10.041	11.159	10.073	32.87	p7122126	1
AG12-10	ICV	FCIBNPS	97.2%	92.9%	97.1%	99.8%	97%	97.6%	97.4%	p7122140	1
AG12-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p7122154	1
AG12-12	CCV1	FCIBNPS	93.8%	90%	94.6%	96.4%	93.3%	97%	94.4%	p7122208	1
AG12-13	CCB1	FCIBNPS	0	0	0	0	0	0	0	p7122222	1
AG12-14	ICG011WB	FCIBNPS	0	0	0	0	0	0	0	p7122236	1
AG12-15	ICG011WL	FCIBNPS	4.9443	2.4394	2.4005	5.0644	2.3517	4.8648	7.0588	p7122250	1
AG12-16	ICG011WC	FCIBNPS	4.9971	2.4088	2.3901	5.0721	2.3585	5.016	7.2809	p7122305	1
AG12-17	MRL	FCIBNPS	0	0.25633	0	0	0.14022	0	0.49989	p7122319	1
AG12-18	G608-01	FCIBNPS	0	17.852	0	0	4.4945	0	15.463	p7122333	5
AG12-19	G608-02	FCIBNPS	0	19.873	0	0	2.0438	0	15.346	p7122347	5
AG12-20	G608-02D	FCIBNPS	0	19.907	0	0	2.0568	0	15.409	p7130001	5
AG12-21	G608-02M	FCIBNPS	25.496	32.238	12.127	24.026	14.648	25.773	51.746	p7130015	5
AG12-22	G058-17	FCIBNPS	0	0.86159	0	0	0.13449	0	5.2827	p7130029	1
AG12-23	RINSE	FCIBNPS	0	0	0	0	0	0	0	p7130043	1
AG12-24	CCV2	FCIBNPS	100.4%	95.6%	95.5%	101.3%	94.3%	100.6%	97.8%	p7130057	1
AG12-25	CCB2	FCIBNPS	0	0	0	0	0	0	0	p7130111	1
AG12-26	G058-18	F*IBNP*	0.42065	23.035E	0	2.6521	0	0	69.943E	p7130125	1
AG12-27	G058-19	FCIBNP*	0.52238	8.3145	0	0	0	0	63.422E	p7130139	1
AG12-28	G058-20	FCIBNP*	0.52701	8.2627	0	0	0	0	63.425E	p7130153	1
AG12-29	G058-21	FCIBNP*	0.49273	6.0643	0	0	0.091894	0	61.446E	p7130208	1
AG12-30	G058-22	F*IBNP*	0	995.75E	0	0.23033	0	0	15.385E	p7130222	1
AG12-31	G058-23	FCIBNPS	0.61192	6.4321	0	0.2531	0	0	7.0539	p7130236	1
AG12-32	G058-24	FCIBNPS	0.32896	2.8076	0	3.1748	0	0	10.156	p7130250	1
AG12-33	G058-25	F*IBNP*	0.34649	11.301E	0	2.5751	0	0	89.86E	p7130304	1
AG12-34	RINSE	FCIBNPS	0	0	0	0	0	0	0	p7130318	1
AG12-35	RINSE	FCIBNPS	0	0	0	0	0	0	0	p7130332	1
AG12-36	CCV3	FCIBNPS	100.2%	95.6%	95.6%	101.8%	94.8%	96.8%	97.9%	p7130346	1
AG12-37	CCB3	FCIBNPS	0	0	0	0	0	0.1887	0	p7130400	1
AG12-38	MRL	FCIBNPS	0	0.25923	0	0	0.13842	0	0.49672	p7130414	1
AG12-39	MDL	FCIBNPS	0	0.25447	0	0	0.13519	0	0.48865	p7130428	1
AG12-40	CCV4	FCIBNPS	96.9%	93.9%	92.9%	99.9%	92.5%	98%	95.5%	p7130442	1
AG12-41	CCB4	FCIBNPS	0.21534	0	0.090606	0	0	0.92427	0	p7130456	1

CALIBRATION OF COMPONENT chloride

Method: IC100-G12.mtw
 Equation: $Q = 0.0757087 \cdot A + 0.100061$
 RSD: 6.184 %
 Correlation coefficient: 0.999136



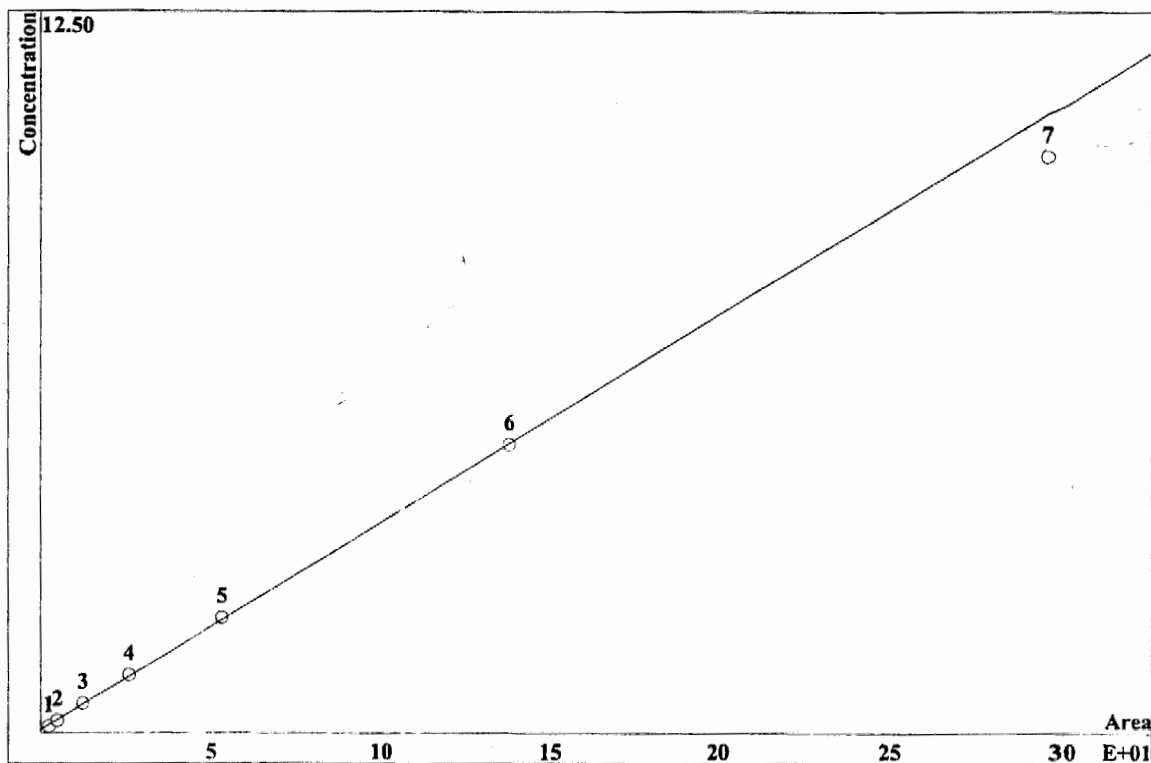
K3 = 0 K2 = 0 K1 = 0.0757087 K0 = 0.100061
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2455	2.182 ✓	0.1	1	3.4	Yes	p7122001.cnw
2	0.2371	2.13 ✓	0.2	1	3.4	Yes	p7122016.cnw
3	0.6644	5.861 ✓	0.5	1	3.4	Yes	p7122030.cnw
4	1.319	11.66 ✓	1	1	3.4	Yes	p7122044.cnw
5	2.661	23.35 ✓	2	1	3.4	Yes	p7122058.cnw
6	7.225	61.28 ✓	5	1	3.4	Yes	p7122112.cnw
7	15.92	132.6 ✓	10	1	3.4	Yes	p7122126.cnw

7-15-05
 8022

CALIBRATION OF COMPONENT nitrite

Method: IC100-G12.mtw
 Equation: $Q = 0.0360261 \cdot A + 0.0453635$
 RSD: 2.142 %
 Correlation coefficient: 0.999886



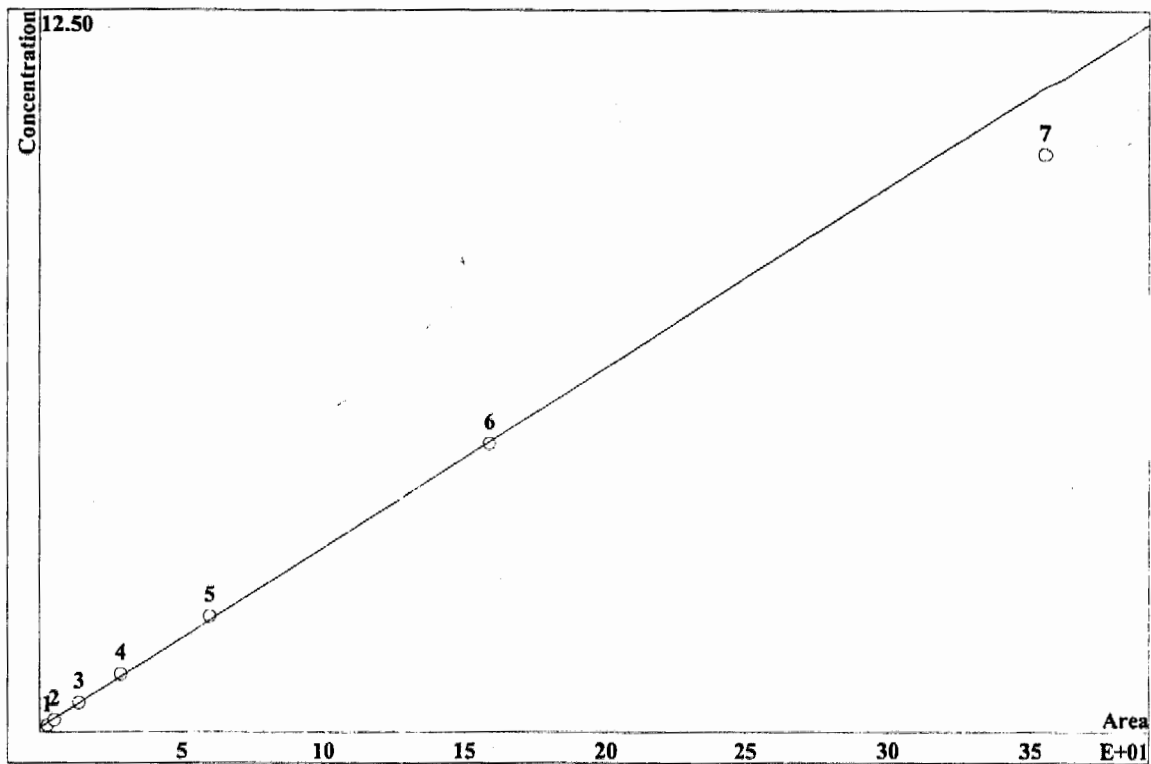
K3 = 0 K2 = 0 K1 = 0.0360261 K0 = 0.0453635
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2338	2.422 ✓	0.1	1	4.04	Yes	p7122001.chw
2	0.4699	4.887 ✓	0.2	1	4.04	Yes	p7122016.chw
3	1.199	12.35 ✓	0.5	1	4.04	Yes	p7122030.chw
4	2.505	25.75 ✓	1	1	4.04	Yes	p7122044.chw
5	5.149	53.27 ✓	2	1	4.04	Yes	p7122058.chw
6	13.25	138 ✓	5	1	4.04	Yes	p7122112.chw
7	27.46	296.6	10	1	4.04	No	p7122126.chw

7-15-05
 8023

CALIBRATION OF COMPONENT nitrate

Method: IC100-G12.mtw
 Equation: $Q = 0.0311912 \cdot A + 0.0620763$
 RSD: 3.547 %
 Correlation coefficient: 0.999689



K3 = 0 K2 = 0 K1 = 0.0311912 K0 = 0.0620763

Base: Area

Ref.channel: Cond

ISTD:

Formula: Linear

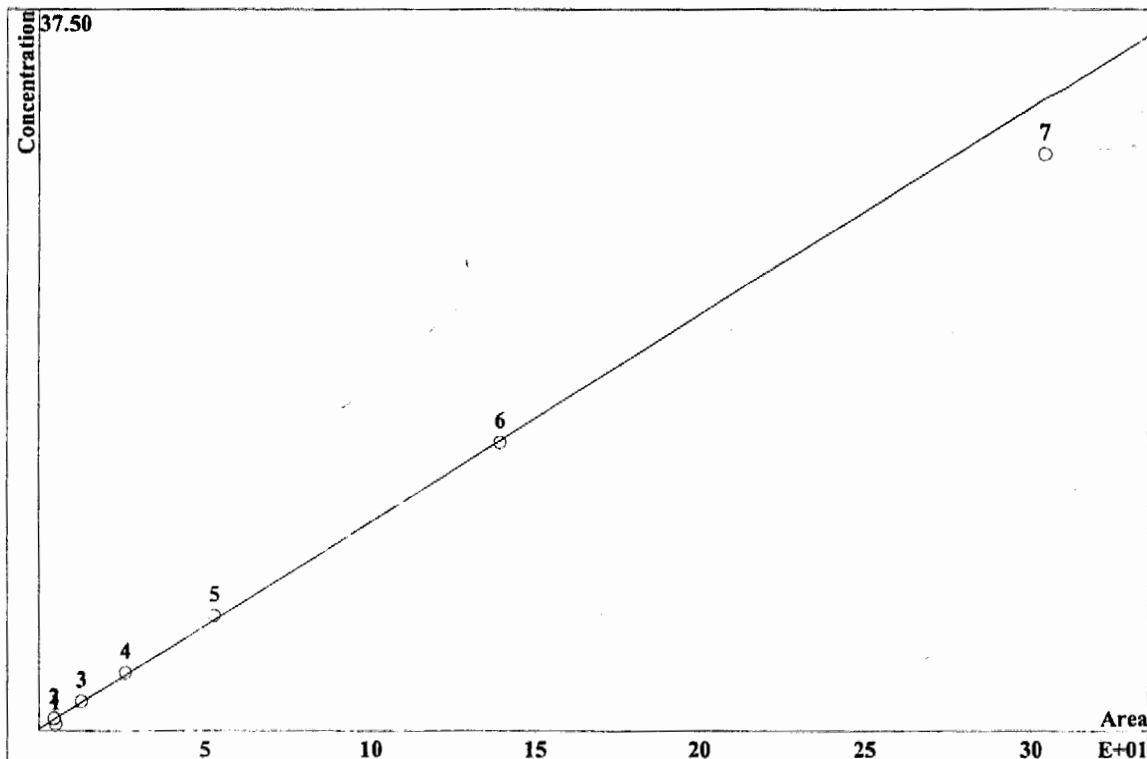
Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2165	2.84 ✓	0.1	1	5.72	Yes	p7122001.cnw
2	0.415	5.429 ✓	0.2	1	5.72	Yes	p7122016.cnw
3	1.072	13.92 ✓	0.5	1	5.72	Yes	p7122030.cnw
4	2.23	28.71 ✓	1	1	5.72	Yes	p7122044.cnw
5	4.699	59.99 ✓	2	1	5.72	Yes	p7122058.cnw
6	12.88	159.3 ✓	5	1	5.72	Yes	p7122112.cnw
7	29.17	355.8 ✗	10	1	5.72	No	p7122126.cnw

pw
1-15-03
8024

CALIBRATION OF COMPONENT sulfate

Method: IC100-G12.mtw
 Equation: $Q = 0.10777 \cdot A + 0.0673535$
 RSD: 4.885 %
 Correlation coefficient: 0.999410



K3 = 0 K2 = 0 K1 = 0.10777 K0 = 0.0673535

Base: Area

Ref.channel: Cond

ISTD:

Formula: Linear

Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.3229	5.184 ✓	0.3	1	8.36	Yes	p7122001.chw
2	0.2916	4.664 ✓	0.6	1	8.36	Yes	p7122016.chw
3	0.8086	12.87 ✓	1.5	1	8.36	Yes	p7122030.chw
4	1.631	25.99 ✓	3	1	8.36	Yes	p7122044.chw
5	3.365	53.02 ✓	6	1	8.36	Yes	p7122058.chw
6	9.065	139.5 ✓	15	1	8.36	Yes	p7122112.chw
7	20.13	304.4	30	1	8.36	No	p7122126.chw

100
 1-15-05
 8025

***SECOND SOURCE
VERIFICATION***

IC Result Check FormVersion : QG1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AG12-10	ICV	FCIBNPS	97.2%	92.9%	97.1%	99.8%	97%	97.6%	97.4%	p7122140	1
AG12-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p7122154	1
AG12-12	CCV1	FCIBNPS	93.8%	90%	94.6%	96.4%	93.3%	97%	94.4%	p7122208	1
AG12-13	CCB1	FCIBNPS	0	0	0	0	0	0	0	p7122222	1
AG12-24	CCV2	FCIBNPS	100.4%	95.6%	95.5%	101.3%	94.3%	100.6%	97.8%	p7130057	1
AG12-25	CCB2	FCIBNPS	0	0	0	0	0	0	0	p7130111	1
AG12-36	CCV3	FCIBNPS	100.2%	95.6%	95.6%	101.8%	94.8%	96.8%	97.9%	p7130346	1
AG12-37	CCB3	FCIBNPS	0	0	0	0	0	0.1887	0	p7130400	1
AG12-40	CCV4	FCIBNPS	96.9%	93.9%	92.9%	99.9%	92.5%	98%	95.5%	p7130442	1
AG12-41	CCB4	FCIBNPS	0.21534	0	0.090606	0	0	0.92427	0	p7130456	1

Report date: 7/15/2005 11:36:34 AM
Printed by: Cherry Dam

Ident: AG12-10 ICV
Analysis from: 7/12/2005 9:40:38 PM
File: p7122140.CHW

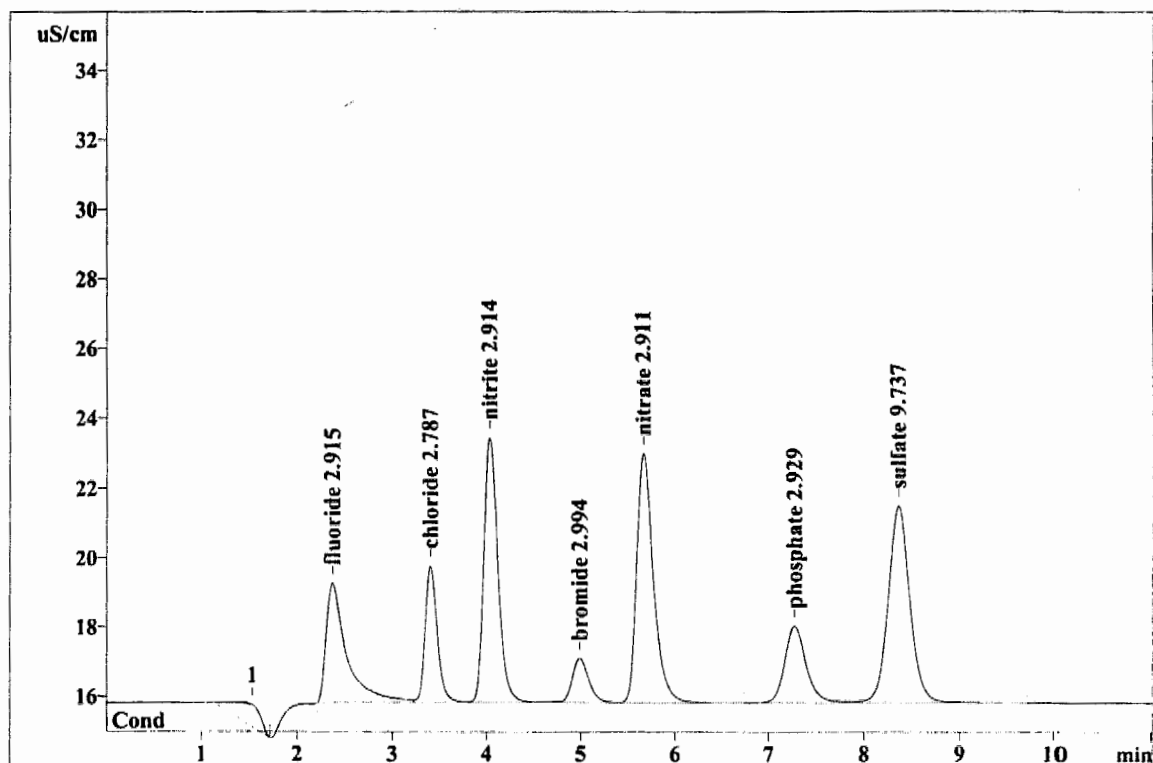
Last save: 7/15/2005 11:36:34 AM

Method: IC100-G12.mtw
Run operator: Cherry Dam
Analysis number: 3519

Last save: 7/12/2005 6:10:15 PM

SAMPLE:

Vial number: 10
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000



Quantitation method: Custom

No	Retention min	Height uS/cm	Area uS/cm*sec	Conc. mg/L	Name
1	1.54	0.65	12.518	0.000	
2	2.37	3.45	50.967	2.915 ✓	fluoride
3	3.40	3.95	35.486	2.787 ✓	chloride
4	4.04	7.62	79.620	2.914 ✓	nitrite
5	4.99	1.27	15.285	2.994 ✓	bromide
6	5.67	7.18	91.323	2.911 ✓	nitrate
7	7.27	2.21	34.497	2.929 ✓	phosphate
8	8.36	5.67	89.728	9.737 ✓	sulfate
8	11.00	32.01	409.423	27.185	

This report has been created by IC Net
METROHM LTD

RM
7-15-05

8028

Report date: 7/15/2005 11:36:34 AM
Printed by: Cherry Dam

Ident: AG12-11 ICB
Analysis from: 7/12/2005 9:54:42 PM
File: p7122154.CHW

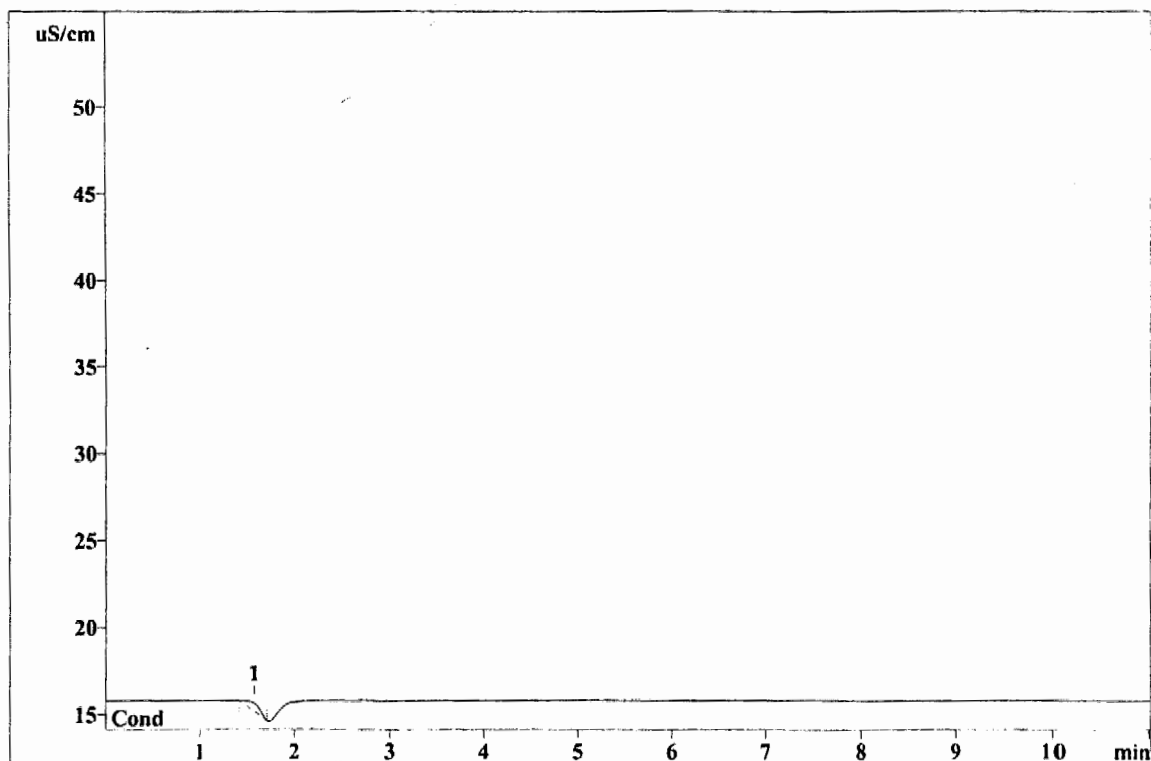
Last save: 7/15/2005 11:36:34 AM

Method: IC100-G12.mtw
Run operator: Cherry Dam
Analysis number: 3520

Last save: 7/12/2005 6:10:15 PM

SAMPLE:

Vial number: 11
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000



Quantitation method: Custom

No	Retention min	Height uS/cm	Area uS/cm*sec	Conc. mg/L	Name
1	1.58	0.47	4.654	0.000	

This report has been created by IC Net
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7-15-05

8029

DAILY CALIBRATIONS

IC Result Check FormVersion : QG1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AG22-01	CCV48	FCIBNPS	94.1%	91.5%	95.1%	94.6%	92.6%	94.9%	92.1%	p7222101	1
AG22-02	CCB48	FCIBNPS	0	0	0	0	0	0	0	p7222116	1
AG22-03	MRL	FCIBNPS	0	0.24891	0	0	0.12667	0	0.47194	p7222130	1
AG22-04	ICG026WB	FCIBNPS	0	0	0	0	0	0	0	p7222144	1
AG22-05	ICG026WL	FCIBNPS	4.9954	4.5709	2.4501	4.6767	2.402	4.4521	6.9072	p7222158	1
AG22-06	ICG026WC	FCIBNPS	4.7085	4.5398	2.3879	4.7714	2.4061	4.7977	6.9765	p7222212	1
AG22-07	G183-01	F*IBNP*	0.39903	23.833E	0.097786	0	1.382	0	29.371E	p7222226	1
AG22-08	G183-02	F*IBNPS	0.69479	10.991E	0	0	0.072099	0	4.8437	p7222240	1
AG22-09	G183-03	F*IBNP*	0.70961	11.901E	0	0	1.1296	0	27.061E	p7222254	1
AG22-10	G183-03D	F*IBNP*	0.71597	11.884E	0	0	1.1293	0	27.008E	p7222308	1
AG22-11	G183-03M	F*IBNP*	6.0839	17.533E	2.4625	4.7959	3.7133	5.0657	34.906E	p7222322	1
AG22-12	G183-04	F*IBNP*	0.77037	18.517E	0	0	1.3297	0.18886	47.768E	p7222337	1
AG22-13	RINSE	FCIBNPS	0	0	0	0	0	0	0	p7222351	1
AG22-14	CCV49	FCIBNPS	104.1%	113.7%*	131.8%*	93.1%	113.8%*	94.2%	92.2%	p7230005	1
AG22-15	CCB49	FCIBNPS	0	0	0	0	0	0	0	p7230019	1
AG22-16	G183-05	F*IBNP*	0.41561	10.275E	0	0	1.5821	0	38.065E	p7230033	1
AG22-17	G183-06	F*IBNP*	0.64824	16.147E	0	0	1.0471	0	45.517E	p7230047	1
AG22-18	G183-07	F*IBNP*	0.62503	16.125E	0.097307	0	1.3044	0	45.754E	p7230101	1
AG22-19	G182-01	F*IBNP*	0.55394	102.95E	0	0	0	0	206.39E	p7230115	1
AG22-20	G182-02	F*IBNP*	4.5107	600.83E	0	0.21877	1.9486	0	134.69E	p7230129	1
AG22-21	G182-03	F*IBNP*	2.27	468.38E	0	0	3.1874	0	73.939E	p7230143	1
AG22-22	G182-04	F*IBNP*	0.71822	143.1E	0	0	0.23316	0	393.89E	p7230157	1
AG22-23	G182-05	F*IBNP*	1.695	439.8E	0	0.30126	1.7509	0	662.09E	p7230211	1
AG22-24	G182-06	F*IBNP*	0.78219	361.16E	0	0.10913	0.69841	0	803.86E	p7230225	1
AG22-25	RINSE	FCIBNPS	0	0.14002	0	0	0	0	0	p7230239	1
AG22-26	CCV50	FCIBNPS	101.9%	113.8%*	130.8%*	93.7%	113.8%*	95.3%	92.9%	p7230254	1
AG22-27	CCB50	FCIBNPS	0	0	0	0	0	0	0	p7230308	1
AG22-28	MRL	FCIBNPS	0	0.25601	0	0	0.1288	0	0.49503	p7230322	1
AG22-29	MDL	FCIBNPS	0	0.25764	0	0	0.12844	0	0.49774	p7230336	1
AG22-30	G182-07	F*IBNP*	2.2662	472.75E	0	0	3.1866	0	74.459E	p7230350	1
AG22-31	G169-02	FCIBNPS	0.29182	2.3834	0	2.9682	0	0	7.939	p7230404	1
AG22-32	G169-03	F*IBNPS	0.27275	18.789E	0	0.359	0.20904	0	8.7321	p7230418	1
AG22-33	RINSE	FCIBNPS	0	0	0	0	0	0	0	p7230432	1
AG22-34	RINSE	FCIBNPS	0	0	0	0	0	0	0	p7230446	1
AG22-35	ICG027WB	FCIBNPS	0	0	0	0	0	0	0	p7230500	1
AG22-36	ICG027WL	FCIBNPS	4.7431	5.6657	3.2298	4.7467	2.8517	4.7855	6.9654	p7230514	1
AG22-37	ICG027WC	FCIBNPS	4.6747	5.6629	3.2333	4.7449	2.8519	4.8254	6.9684	p7230528	1
AG22-38	CCV51	FCIBNPS	89.5%*	102.2%	94.2%	94.6%	95.5%	110.2%*	99.4%	p7230542	1
AG22-39	CCB51	FCIBNPS	0	0	0	0	0	0	0	p7230556	1
AG22-40	G169-04	F*IBNPS	0.45644	16.779E	0	2.4019	0.20349	0	8.3516	p7230611	1
AG22-41	G169-05	F*IBNPS	0.41501	16.584E	0	2.759	0.077496	0	7.9264	p7230625	1
AG22-42	G169-05D	F*IBNPS	0.45763	16.632E	0	0	0.077874	0	7.9135	p7230639	1
AG22-43	G169-05M	F*IBNP*	5.174	21.926E	0	4.3023	2.4463	5.3041	15.251E	p7230653	1
AG22-44	G169-06	F*IBNPS	0.29744	14.559E	0.065165	0.2042	0.1411	0	7.1493	p7230707	1
AG22-45	G169-07	FCIBNPS	0	0.31002	0	0	0	0	0.27111	p7230721	1
AG22-46	G184-01	F*IBNP*	0.46619	516.95E	0	0.69232	0.074378	0	2069.7E	p7230735	1
AG22-47	G184-02	F*IBNP*	0.57969	894.58E	0	1.3494	0.22368	0	1362E	p7230749	1
AG22-48	G184-03	F*IBNP*	0.26082	1469.1E	0	2.2235	0.25331	0.24301	319.48E	p7230803	1
AG22-49	RINSE	FCIBNPS	0	14.898	0	0	0	0.2154	5.4194	p7230817	1
AG22-50	CCV52	FCIBNPS	92.2%	129.2%*	92.8%	93.9%	94.6%	114.8%*	108.6%	p7230831	1
AG22-51	CCB52	FCIBNPS	0.23819	0.52768	0.10893	0.20018	0.12318	0.98052	0.49653	p7230845	1
AG22-52	G184-04	F*IBNP*	0.27953	1306.5E	0	1.7752	0.24829	0.36439	265.7E	p7230859	1
AG22-53	G184-05	F*IBNP*	0.31256	650.24E	0	0.826	6.002E	0.35311	127.96E	p7230914	1
AG22-54	G184-06	F*IBNPS	0.30499	553.96E	0	0.75846	0	0	0.9173	p7230928	1
AG22-55	G184-07	F*IBNPS	0.26084	576.65E	0	1.3837	0	0	0.78738	p7230942	1
AG22-56	G180-01	FC*BNP*	0	0	5084.8E	0	0.33683	0	106.97E	p7230956	1
AG22-57	G180-02	F*IBNP*	0.26271	1301.9E	0	0.70809	0	0	1808.5E	p7231010	1
AG22-58	G180-03	F*IBNP*	0.56603	708.44E	0	0.60003	18.677E	1.0033	778.97E	p7231024	1
AG22-59	G178-02	F*IBNP*	0.16077	51.708E	0	0	2.3869	0	391.64E	p7231038	5
AG22-60	MRL	FCIBNPS	0	0.28015	0	0	0.12641	0	0.58287	p7231052	1
AG22-61	MDL	FCIBNPS	0	0.26158	0	0	0.12585	0	0.51058	p7231106	1
AG22-62	CCV53	FCIBNPS	92.1%	102.3%	93.8%	94.3%	95%	100.2%	98.9%	p7231120	1
AG22-63	CCB53	FCIBNPS	0	0	0	0	0	0	0	p7231134	1

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LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AG22-01 ✓	CCV48	FCIBNPS	94.1%	91.5%	95.1%	94.6%	92.6%	94.9%	92.1%	p7222101	1
AG22-02	CCB48	FCIBNPS	0	0	0	0	0	0	0	p7222116	1
AG22-14 ✓	CCV49	FCIBNPS	104.1%	113.7%*	131.8%*	93.1%	113.8%*	94.2%	92.2%	p7230005	1
AG22-15	CCB49	FCIBNPS	0	0	0	0	0	0	0	p7230019	1
AG22-26 ✓	CCV50	FCIBNPS	101.9%	113.8%*	130.8%*	93.7%	113.8%*	95.3%	92.9%	p7230254	1
AG22-27	CCB50	FCIBNPS	0	0	0	0	0	0	0	p7230308	1
AG22-38	CCV51	FCIBNPS	89.5%*	102.2%	94.2%	94.6%	95.5%	110.2%*	99.4%	p7230542	1
AG22-39	CCB51	FCIBNPS	0	0	0	0	0	0	0	p7230556	1
AG22-50	CCV52	FCIBNPS	92.2%	129.2%*	92.8%	93.9%	94.6%	114.8%*	108.6%	p7230831	1
AG22-51	CCB52	FCIBNPS	0.23819	0.52768	0.10893	0.20018	0.12318	0.98052	0.49653	p7230845	1
AG22-62	CCV53	FCIBNPS	92.1%	102.3%	93.8%	94.3%	95%	100.2%	98.9%	p7231120	1
AG22-63	CCB53	FCIBNPS	0	0	0	0	0	0	0	p7231134	1

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LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AG28-01	CCV77	FCIBNPS	92%	92.8%	99%	97.6%	97.9%	93.8%	94.2%	p7281114	1
AG28-02	CCB77	FCIBNPS	0	0	0	0	0	0	0	p7281128	1
AG28-03	MRL	FCIBNPS	0	0.24789	0	0	0.12898	0	0.49823	p7281142	1
AG28-04	ICG036WB	FCIBNPS	0	0	0	0	0	0	0	p7281200	1
AG28-05	ICG036WL	FCIBNPS	4.8275	4.8051	2.6152	4.9819	2.5044	5.0095	7.193	p7281214	1
AG28-06	ICG036WC	FCIBNPS	4.5569	4.7075	2.5262	4.9393	2.4966	4.9065	7.1103	p7281229	1
AG28-07	G230-06	F*IBNPS	0	2664.8E	0	3.3458	0	0	0.61569	p7281255	5
AG28-08	G230-08	F*IBNPS	0	231.69E	0	0.10913	0	0.32824	1.969	p7281309	1
AG28-09	G237-01	F*IBNP*	0	12985E	0	27.442	0	0	2062.4E	p7281323	5
AG28-10	G237-02	F*IBNP*	0	13571E	0	29.232	0	0	2159.8E	p7281337	5
AG28-11	G237-03	F*IBNP*	3.2518	13366E	0	28.735	0	0	2025E	p7281351	5
AG28-12	RINSE	FCIBNPS	0	0.68151	0	0	0	0	0.18725	p7281405	1
AG28-13	CCV78	FCIBNPS	94.5%	96.5%	100.5%	99.1%	100%	99.7%	95.3%	p7281419	1
AG28-14	CCB78	FCIBNPS	0	0	0	0	0	0	0	p7281433	1
AG28-15	G237-04	F*IBNP*	2.5331	13263E	0	54.47E	0	0	2055.3E	p7281447	5
AG28-16	G221-02	FCIBNPS	0	325.51	0	0	0	0	73.96	p7281502	50
AG28-17	G221-02D	FCIBNPS	0	297.27	0	0	0	0	71.431	p7281516	50
AG28-18	G221-02M	F*IBNPS	234.71	548.93E	121.26	246.8	122.88	181.08	415.7	p7281530	50
AG28-19	G221-03	FCIBNPS	0	497	0	0	0	0	187.55	p7281544	100
AG28-20	G221-04	FCIBNPS	0	98.917	0	0	0	0	72.183	p7281558	20
AG28-21	G221-05	FCIBNPS	0	231.43	0	0	0	0	73.196	p7281612	50
AG28-22	G221-06	FCIBNPS	0	230.83E	0	0	0	0	24.322	p7281626	10
AG28-23	G221-06	*C*****	0	231.44	0	0	0	0	67.19	p7281640	500
AG28-24	G134-03	FCIBNPS	0	41.113	0	0	1.4665	0	225.32	p7281654	20
AG28-25	CCV79	FCIBNPS	96.3%	96.3%	105.2%	100.2%	100.9%	89.1%*	97.8%	p7281708	1
AG28-26	CCB79	FCIBNPS	0	0	0	0	0	0	0	p7281722	1
AG28-27	G134-04	FCIBNPS	0	40.066	0	0	0	0	226.75	p7281736	20
AG28-28	G134-06	FCIBNPS	0	34.391	0	0	1.6336	0	208.5	p7281750	20
AG28-29	G244-01	FC*BNP*	1.1428	0	4468.8E	0	0.34043	0	585.51E	p7281805	1
AG28-30	G244-02	F*IBNP*	2.306	2408.9E	0	0	0.99788	0	437.19E	p7281819	1
AG28-31	RINSE	FCIBNPS	0	0.65252	0	0	0	0	0.21185	p7281833	1
AG28-32	RINSE	FCIBNPS	0	0.20112	0	0	0	0	0.12225	p7281847	1
AG28-33	ICG037WB	FCIBNPS	0	0	0	0	0	0	0	p7281901	1
AG28-34	ICG037WL	FCIBNPS	4.7424	4.6994	2.4778	4.9426	2.465	4.2726	7.1342	p7281915	1
AG28-35	ICG037WC	FCIBNPS	4.8137	4.6992	2.4716	4.9508	2.47	4.3879	7.1465	p7281929	1
AG28-36	RINSE	FCIBNPS	0	0	0	0	0	0	0	p7282144	1
AG28-37	CCV80	FCIBNPS	96.7%	94.7%	104.7%	99.8%	100.3%	101.7%	95.4%	p7282158	1
AG28-38	CCB80	FCIBNPS	0	0	0	0	0	0	0	p7282213	1
AG28-39	G247-02	F*IBNP*	1.392	1595E	0	3.0535	0	0	238.84E	p7282227	5
AG28-40	G247-03	F*IBNP*	1.0729	294.68E	0	0	0	1.5996	169.02E	p7282241	5
AG28-41	G247-04	F*IBNP*	1.596	629.06E	0	1.0759	0	0	708.1E	p7282255	5
AG28-42	G247-05	F*IBNP*	1.3667	630.26E	0	0	0	0	704.32E	p7282309	5
AG28-43	G247-06	F*IBNP*	2.678	1058.7E	0	1.7847	0	0	618.68E	p7282323	5
AG28-44	G247-07	F*IBNP*	1.871	5821E	0	13.323	0	0	431.61E	p7282337	5
AG28-45	RINSE	FCIBNPS	0	0.20008	0	0	0	0	0	p7282351	1
AG28-46	G247-08	FCIBNPS	0	0	0	0	0	0	0	p7290005	1
AG28-47	G124-01	F*IBNPS	0	1092.9E	0	0	0	0	203.9	p7290019	50
AG28-48	G124-02	F*IBNPS	0	584.56E	0	1.7681	0	0	70.314	p7290033	10
AG28-49	CCV81	FCIBNPS	95.3%	95%	101%	99.8%	100.6%	102%	95%	p7290047	1
AG28-50	CCB81	FCIBNPS	0	0	0	0	0	0	0	p7290102	1
AG28-51	G124-03	F*IBNPS	0	1257.3E	0	0	0	0	335.6	p7290116	50
AG28-52	G124-04	F*IBNPS	0	1944.8E	0	0	0	0	378.8	p7290130	50
AG28-53	G124-07	F*IBNPS	0	42849E	0	0	0	0	597.7	p7290144	500
AG28-54	G124-07D	F*IBNPS	0	42808E	0	0	0	0	590.73	p7290158	500
AG28-55	G124-07M	F*IBNPS	2305.7	44754E	1199.3	1608.7	1234.1	2581.6	4169	p7290212	500
AG28-56	G124-08	F*IBNPS	0	1028.7E	0	0	0	0	548.99	p7290226	100
AG28-57	G150-02	FCIBNPS	0	30.784	0	0	0	0	146.14	p7290240	20
AG28-58	G150-04	FCIBNPS	0	28.826	0	0	2.0751	0	168	p7290254	20
AG28-59	G150-05	FCIBNPS	1.6035	32.621	0	0	0	0	57.708	p7290308	10
AG28-60	G150-06	FCIBNPS	0	32.835	0	0	0	0	102.79	p7290322	10
AG28-61	CCV82	FCIBNPS	95.1%	94.8%	100.8%	99.7%	100.3%	102.1%	95%	p7290336	1
AG28-62	CCB82	FCIBNPS	0	0	0	0	0	0	0	p7290350	1
AG28-63	G150-07	FCIBNPS	0	34.134	0	0	0	0	169.25	p7290404	20
AG28-64	ICG038WB	FCIBNPS	0	0	0	0	0	0	0	p7290418	1
AG28-65	ICG038WL	FCIBNPS	4.5783	4.6951	2.4683	4.952	2.4681	4.8839	7.1024	p7290433	1
AG28-66	ICG038WC	FCIBNPS	4.7008	4.6826	2.4704	4.9573	2.4686	4.9304	7.1172	p7290447	1
AG28-67	G183-01	FCIBNPS	0.8649	20.148	0	0	1.5098	0	26.297	p7290501	5
AG28-68	G183-02	FCIBNPS	0.76333	10.38	0	0	0	0	4.8653	p7290515	2
AG28-69	G183-03	FCIBNPS	1.1183	10.73	0	0	1.0774	0	24.157	p7290529	5
AG28-70	G183-03D	FCIBNPS	1.1146	10.777	0	0	1.0799	0	24.16	p7290543	5
AG28-71	G183-03M	FCIBNPS	23.618	29.661	11.975	23.781	13.25	24.054	60.697	p7290557	5
AG28-72	G183-04	FCIBNPS	1.1683	16.056	0	0	1.1379	0	40.73	p7290611	5
AG28-73	CCV83	FCIBNPS	95.7%	95.2%	105.3%	100.2%	100.5%	102.5%	96.3%	p7290625	1
AG28-74	CCB83	FCIBNPS	0	0	0	0	0	0	0	p7290639	1

AG28-75	G183-05	FCIBNPS	0.84937	9.5159	0	0	1.6658	0	33.12	p7290653	5
AG28-76	G183-06	FCIBNPS	1.0308	14.28	0	0	1.082	0	39.335	p7290707	5
AG28-77	G183-07	FCIBNPS	1.0069	14.209	0.29357	0	1.2965	0	39.183	p7290721	5
AG28-78	G146-02	F*IBNPS	2.4869	4647.8E	0	10.654	0	0	73.93	p7290736	10
AG28-79	G146-02	*C*****	0	3090	0	0	0	0	0	p7290750	1000
AG28-80	G146-03	F*IBNPS	2.2767	4733.5E	0	10.88	0	0	66.386	p7290804	10
AG28-81	G146-03	*C*****	0	3142	0	0	0	0	0	p7290818	1000
AG28-82	G146-04	F*IBNPS	0	2561.3E	0	0	0	0	331.9	p7290832	50
AG28-83	G146-04	*C*****	0	1929.5	0	0	0	0	382.51	p7290846	1000
AG28-84	G146-05	F*IBNPS	2.0687	552.02E	0	0	0	3.7389	112.26	p7290900	10
AG28-85	CCV84	FCIBNPS	95.6%	95.5%	105.3%	100.3%	100.6%	100.2%	96.5%	p7290914	1
AG28-86	CCB84	FCIBNPS	0	0	0	0	0	0	0	p7290928	1
AG28-87	G146-05	*C*****	0	408.78	0	0	0	0	109.82	p7290942	100
AG28-88	G159-01	FCIBNPS	0	2088.3	0	0	0	0	539.64	p7290956	500
AG28-89	G159-02	FCIBNPS	0	6183.9	0	0	0	0	1019.6	p7291010	1000
AG28-90	G159-03	FCIBNPS	0	588.72	0	0	0	0	387.13	p7291024	100
AG28-91	CCV85	FCIBNPS	95.5%	95.2%	105.2%	100.2%	100.5%	99.5%	96.4%	p7291038	1
AG28-92	CCB85	FCIBNPS	0	0	0	0	0	0	0	p7291053	1

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AG28-01	CCV77	FCIBNPS	92%	92.8%	99%	97.6%	97.9%	93.8%	94.2%	p7281114	1
AG28-02	CCB77	FCIBNPS	0	0	0	0	0	0	0	p7281128	1
AG28-13	CCV78	FCIBNPS	94.5%	96.5%	100.5%	99.1%	100%	99.7%	95.3%	p7281419	1
AG28-14	CCB78	FCIBNPS	0	0	0	0	0	0	0	p7281433	1
AG28-25	CCV79	FCIBNPS	96.3%	96.3%	105.2%	100.2%	100.9%	89.1%*	97.8%	p7281708	1
AG28-26	CCB79	FCIBNPS	0	0	0	0	0	0	0	p7281722	1
AG28-37	CCV80	FCIBNPS	96.7%	94.7%	104.7%	99.8%	100.3%	101.7%	95.4%	p7282158	1
AG28-38	CCB80	FCIBNPS	0	0	0	0	0	0	0	p7282213	1
AG28-49	CCV81	FCIBNPS	95.3%	95%	101%	99.8%	100.6%	102%	95%	p7290047	1
AG28-50	CCB81	FCIBNPS	0	0	0	0	0	0	0	p7290102	1
AG28-61	CCV82	FCIBNPS	95.1%	94.8%	100.8%	99.7%	100.3%	102.1%	95%	p7290336	1
AG28-62	CCB82	FCIBNPS	0	0	0	0	0	0	0	p7290350	1
AG28-73	CCV83	FCIBNPS	95.7%	95.2%	105.3%	100.2%	100.5%	102.5%	96.3%	p7290625	1
AG28-74	CCB83	FCIBNPS	0	0	0	0	0	0	0	p7290639	1
AG28-85	CCV84	FCIBNPS	95.6%	95.5%	105.3%	100.3%	100.6%	100.2%	96.5%	p7290914	1
AG28-86	CCB84	FCIBNPS	0	0	0	0	0	0	0	p7290928	1

ANALYTICAL LOG

ANALYSIS RUN LOG FOR IC

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 07/12/05 Time: 14:33 Ending Date: 07/13/05 Time: 04:56 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix		Notes
				S	W	
* 1	AG12-01	1B	1		✓	
* 2	02	SC				
* 3	03	S1				
* 4	04	S2				
* 5	05	S3				
* 6	06	S4				
* 7	07	S5				
* 8	08	S6				
* 9	09	S7				
* 10	10	ICV				
* 1	11	ICB				
* 2	12	CCV				
* 3	13	CCB				
* 4	14	ICG11WB				
* 5	15	ICG11WB				
* 6	16	ICG11WB				
* 7	17	MRL				
* 8	18	G606-01				PF-10
* 9	19	G606-02				
* 20	20	G606-02B				
* 1	21	G606-02M				
* 2	22	G606-17				
* 3	23	RINSE				
* 4	24	CCV				
* 5	25	CCB				
* 6	26	G606-18				
* 7	27	G606-19				
* 8	28	G606-20				
* 9	29	G606-21				
* 30	30	G606-22				

ANALYTICAL BATCH * IC G611W

Instrument Number		22/02/2015							
INITIAL CALIBRATION REFERENCE									
Method File	I C100 - G12 .mhw	Date							
ICAL ID	SW5B-12-628 - 634	07/12/05							
ICV ID	SW5B-12-635 - 641	07/12/05							
Standards-A									
Name	ID	Conc. (mg/L)							
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄	
ICAL	S ₁	SW5B-12-648	0.1						0.3
	S ₂	629	0.2						0.6
	S ₃	633	0.5						1.5
	S ₄	631	1						3
	S ₅	632	2						6
ICV	S ₆	633	5						15
	S ₇	634	10						30
LCS ICV	SW5B-12-635 - 641	3							10
MS x10	LCS sample	5	5	2.5	5	2.5	5		7.5
Standards-B									
Name	ID	Conc. (mg/L)							
		BrO ₃	DCA	ClO ₃					
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
ICV	SW5B-12-642 - 645	5	5	2.5	5				
CCV	SW5B-12-646 - 652	5	5	2.5	5				
LCS									

Comments:

Analyzed By: AL

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ANALYSIS RUN LOG FOR IC

Page 55

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 07/12/05 Time: 14:33 Ending Date: 07/13/05 Time: 14:56 Book # A100-001

Instrument Number		22100 01/12/05	
INITIAL CALIBRATION REFERENCE			
Method File		Date	
ICAL ID			
ICV ID			
Standards-A			
Name	ID	Conc. (mg/L)	
		F	Cl
		NO ₂	NO ₃
		Br	P
		SO ₄	
ICAL	S ₁		
	S ₂		
	S ₃		
	S ₄		
	S ₅		
ICV			
CCV			
LCS			
MS			
Standards-B			
Name	ID	Conc. (mg/L)	
		BrO ₃	DCA
		ClO ₃	
ICAL	S ₁		
	S ₂		
	S ₃		
	S ₄		
ICV			
CCV			
LCS			
Comments:			
Analyzed By: <u>cl</u>			
This page is checked during the data review process.			

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix		Notes
				S	W	
* 1	AG12-31	6058-23	1		✓	
* 2	32	6058-24				
* 3	33	6058-25				
* 4	34	RINSE				
* 5	35	RINSE				
* 6	36	CCV3				
* 7	37	CCB3				
* 8	38	HRL				
* 9	39	HRL				
* 10	40	CCV-1				
* 11	41	CCB-1				
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						

ANALYTICAL BATCH *		IC 6011W
* 1		
* 2		
* 3		
* 4		
* 5		
* 6		
* 7		
* 8		
* 9		
* 0		

ANALYSIS RUN LOG FOR IC

Page 75

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 11/21/05 Time: 21:01

Ending Date: 11/23/05

Time: 21:01

Time: 11:24

Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix	Notes
* 1	A622-C1	CCV-16	1	S	
* 2	C2	CCB-1	1	W	✓
* 3	C3	MRL			
* 4	C4	ICG126W P			
* 5	C5	ICG126W L			
* 6	C6	ICG126W C			
* 7	C7	G183-C1			
* 8	C8	G183-C2			
* 9	C9	G183-C3			
* 10	C10	G183-C3 D			
* 1	C11	G183-C3 M			
* 2	C12	G183-C4			
* 3	C13	RINSE			
* 4	C14	CCV-15			* C1, NG5, NG6, failed due to bad injection
* 5	C15	CCB-1			
* 6	C16	G183-C5			
* 7	C17	G183-C6			
* 8	C18	G183-C7			
* 9	C19	G182-C1			
* 20	C20	G182-C2			
* 1	C21	G182-C3			
* 2	C22	G182-C4			
* 3	C23	G182-C5			
* 4	C24	G182-C6			
* 5	C25	G182-C RINSE			
* 6	C26	CCV-16			* C1, NG5, NG6, failed due to bad injection
* 7	C27	CCB-1			
* 8	C28	MRL			
* 9	C29	MPL			
* 30	C30	G182-C7			

ANALYTICAL BATCH * IC G02LW

8039

Instrument Number		22 ICC 05 07/6						
INITIAL CALIBRATION REFERENCE								
Method File	IC100 - G12. m100	Date						
ICAL ID	SW5B-12-625-634		07/10/04					
ICV ID	SW5B-12-635-641		07/10/04					
Standards-A								
Name	ID	Conc. (mg/L)						
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄
ICAL	S ₁							
	S ₂							
	S ₃							
	S ₄							
	S ₅							
ICV								
CCV	SW5B-12-721-734	5	5	2.5	5	2.5	5	7.5
LCS	SW5B-12-735-738							
MS \NF	LCS SOURCE							
Standards-B								
Name	ID	Conc. (mg/L)						
		BrO ₃	DCA	ClO ₃				
ICAL	S ₁							
	S ₂							
	S ₃							
	S ₄							
ICV								
CCV								
LCS								

Comments:

Analyzed By: 02

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ANALYSIS RUN LOG FOR IC

Page 89

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 07/28/05 Time: 11:14 Ending Date: 07/29/05 Time: 0:53 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Notes
* 1	6428-01	CC177	1		✓
* 2	01	CC177			
* 3	03	MR1			
* 4	04	IC6036W			
* 5	05	IC6036W			
* 6	06	IC6036W	✓		
* 7	07	G230-06	5		
* 8	08	G230-08	1		
* 9	09	G237-01	5		
* 10	10	G237-02	5		
* 11	11	G237-03	5		
* 12	12	RINSE	1		
* 13	13	CC176	1		
* 14	14	CC178	1		
* 15	15	G237-04	5		
* 16	16	G221-02	40		
* 17	17	G221-02D	50		
* 18	18	G221-02H	50		
* 19	19	G221-03	100		
* 20	20	G221-04	20		
* 21	21	G221-05	50		
* 22	22	G221-06	10		
* 23	23	G221-06	500		
* 24	24	G134-03	20		
* 25	25	CC175	1		
* 26	26	CC179	1		
* 27	27	G224-04	20		
* 28	28	G234-06	20		
* 29	29	G244-01	1		
* 30	30	G244-02	1		✓

INITIAL CALIBRATION REFERENCE									
Method File	IC100 - G12 - m1w	Date							
ICAL ID	SW50B-12-626-634	07/12/05							
ICV ID	SW50B-12-630-641	07/12/05							
Standards-A									
Name	ID	F	Cl	NO ₂	Br	NO ₃	P	SO ₄	
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
	S ₅								
ICV									
CCV	SW50B-12-626-634	5	5	2.5	5	2.5	5	5	7.5
LCS	SW50B-12-630-641	↓	↓	↓	↓	↓	↓	↓	↓
MS xDF	LCS SOURCE	↓	↓	↓	↓	↓	↓	↓	↓
Standards-B									
Name	ID	BrO ₃	DCA	ClO ₃					
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
ICV									
CCV									
LCS	↓								

Comments:

Analyzed By:

This page is checked during the data review process.

ANALYTICAL BATCH * IC 6036W

ANALYSIS RUN LOG FOR IC

Page 90

SOP E/ EMAX-300.0 Rev. No. 3 □ EMAX-9056 Rev. No. 2 □ EMAX-300.1 Rev. No. 0 □

Start Date: 07/28/05 Time: 11:10 Ending Date: 07/29/05 Time: 10:53 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix	Notes
				S W	
* 1	A126-31	RINSE	1		✓
* 2	32	RINSE			
** 3	33	IC6037W-B			
* 4	34	IC6037W-L			
* 5	35	IC6037W-C			
* 6	36	RINSE			
* 7	37	CCV80			
* 8	38	CCB60	✓		
* 9	39	G1247-02	5		
* 40	40	G1247-03			
* 1	41	G1247-04			
* 2	42	G1247-05			
* 3	43	G1247-06			
* 4	44	G1247-07	✓		
* 5	45	RINSE			
* 6	46	G1247-08			
* 7	47	G1247-09	50		
* 8	48	G1247-10	10		
* 9	49	CCV81	1		
* 50	50	CCB81	1		
* 1	51	G1247-03	50		
* 2	52	G1247-04	50		
* 3	53	G1247-07	50		
* 4	54	G1247-07D	50		
* 5	55	G1247-07H	50		
* 6	56	G1247-08	100		
* 7	57	G150-02	20		
* 8	58	G150-04	20		
* 9	59	G150-05	10		
* 60	60	G150-06	10		✓

Instrument Number		22100 03 07/28/05	
INITIAL CALIBRATION REFERENCE			
Method File	ICAL ID	ICV ID	Date
Standards-A			
Name	ID	Conc. (mg/L)	
ICAL	S1	F	Cl NO2 Br NO3 P SO4
	S2		
	S3		
	S4		
	S5		
ICV			
CCV			
LCS			
MS			
Standards-B			
Name	ID	Conc. (mg/L)	
ICAL	S1	BrO3	DCA ClO3
	S2		
	S3		
	S4		
ICV			
CCV			
LCS			

Comments:

Analyzed By: CL

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ANALYTICAL BATCH * IC 6036W ** IC 6037W

ANALYSIS RUN LOG FOR IC

Page 91

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 03/28/05 Time: 11:14 Ending Date: 04/01/05 Time: 10:53 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix	Notes
				S	W
** 61	A122-61	C1002	1		✓
* 2	62	C1002	1		
* 3	63	G100-C-3	20		
*** 4	64	I100030505	1		
* 5	65	T10030505	1		
* 6	66	I10030505	1		
* 7	67	G1003-01	5		
* 8	68	G1003-02	2		
* 9	69	G1003-03	5		
* 10	70	G1003-04	5		
* 11	71	G1003-05	5		
* 12	72	G1003-06	5		
* 13	73	C1003	1		
* 14	74	C1003	1		
* 15	75	G1003-05	5		
* 16	76	G1003-06	5		
* 17	77	G1003-07	5		
* 18	78	G1003-08	10		
* 19	79	G1003-09	100		
* 20	80	G1003-10	10		
* 1	81	G1003-03	1000		
* 2	82	G1003-04	50		
* 3	83	G1003-05	1000		
* 4	84	G1003-06	10		
* 5	85	C1003	1		
* 6	86	C1003	1		
* 7	87	G1003-05	100		
* 8	88	G1003-01	500		
* 9	89	G1003-02	1000		
* 10	90	G1003-03	100		✓

INITIAL CALIBRATION REFERENCE											
Method File	Instrument Number	Date									
ICAL ID	22020728/05										
ICV ID											

Standards-A									
Name	ID	Conc. (mg/L)						SO ₄	
		F	Cl	NO ₂	Br	NO ₃	P		
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
	S ₅								
ICV									
CCV									
LCS									
MS									

Standards-B					
Name	ID	Conc. (mg/L)			
		BrO ₃	DCA	ClO ₃	
ICAL	S ₁				
	S ₂				
	S ₃				
	S ₄				
ICV					
CCV					
LCS					

Comments:	
Analyzed By: <u>AL</u>	
This page is checked during the data review process.	

ANALYTICAL BATCH ** IC6037W ***IC6038W

ANALYSIS RUN LOG FOR IC

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SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 01/08/05 Time: 11:44 Ending Date: 01/09/05 Time: 10:53 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Notes
*** 51	AG28-51	CCV85	1		
*** 52	AG28-52	CCB85	1		
* 3					
* 4					
* 5					
* 6					
* 7					
* 8					
* 9					
* 0					
* 1					
* 2					
* 3					
* 4					
* 5					
* 6					
* 7					
* 8					
* 9					
* 0					
* 1					
* 2					
* 3					
* 4					
* 5					
* 6					
* 7					
* 8					
* 9					
* 0					

ANALYTICAL BATCH *** IC G038W

Instrument Number		Date	
2200		01/08/05	
INITIAL CALIBRATION REFERENCE			
Method File			
ICAL ID			
ICV ID			
Standards-A			
Name	ID	Conc. (mg/L)	
ICAL	S ₁	F	Cl
	S ₂	NO ₂	Br
	S ₃	NO ₃	P
	S ₄		SO ₄
	S ₅		
ICV			
CCV			
LCS			
MS			
Standards-B			
Name	ID	Conc. (mg/L)	
ICAL	S ₁	BrO ₃	DCA
	S ₂		ClO ₃
	S ₃		
	S ₄		
ICV			
CCV			
LCS			

Comments:

Analyzed By: AL

This page is checked during the data review process.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G183**

METHOD 350.2 AMMONIA (NH₃-N)

Seven (7) water samples were received on 07/22/05 for Ammonia analysis by Method 350.2 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

All results were reported as Nitrogen concentration.

METHOD 350.2
AMMONIA (NH3-N)

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G183

Matrix : WATER
Instrument ID : 170

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATETIME	Extraction DATETIME	LFID	CAL REF	PREP BATCH	Collection DATETIME	Received DATETIME
MBLK1W	NHG008WB	ND	1	NA	.1	.03	07/31/0510:11	07/30/0509:30	NHG008W-12	NHG008W-10	NHG008W	NA	07/30/05
LCS1W	NHG008WL	1.01	1	NA	.1	.03	07/31/0510:12	07/30/0509:30	NHG008W-13	NHG008W-10	NHG008W	NA	07/30/05
LC01W	NHG008WC	1.005	1	NA	.1	.03	07/31/0510:13	07/30/0509:30	NHG008W-14	NHG008W-10	NHG008W	NA	07/30/05
MW-19-1	G183-01	.202	1	NA	.1	.03	07/31/0510:28	07/30/0509:30	NHG008W-29	NHG008W-22	NHG008W	07/20/05	07/22/05
MW-18-5	G183-02	ND	1	NA	.1	.03	07/31/0510:29	07/30/0509:30	NHG008W-30	NHG008W-22	NHG008W	07/21/05	07/22/05
MW-18-4	G183-03	ND	1	NA	.1	.03	07/31/0510:30	07/30/0509:30	NHG008W-31	NHG008W-22	NHG008W	07/21/05	07/22/05
MW-18-3	G183-04	ND	1	NA	.1	.03	07/31/0510:31	07/30/0509:30	NHG008W-32	NHG008W-22	NHG008W	07/21/05	07/22/05
MW-18-1	G183-05	ND	1	NA	.1	.03	07/31/0510:32	07/30/0509:30	NHG008W-33	NHG008W-22	NHG008W	07/21/05	07/22/05
MW-18-2	G183-06	ND	1	NA	.1	.03	07/31/0510:35	07/30/0509:30	NHG008W-36	NHG008W-34	NHG008W	07/21/05	07/22/05
DUPE-2-7/21/05	G183-07	ND	1	NA	.1	.03	07/31/0510:36	07/30/0509:30	NHG008W-37	NHG008W-34	NHG008W	07/21/05	07/22/05

8045

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 350.2
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G183
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: NHG008WL/C

DATE RECEIVED: 07/30/05
DATE EXTRACTED: 07/30/05 09:30
DATE ANALYZED: 07/31/05 10:12/10:13

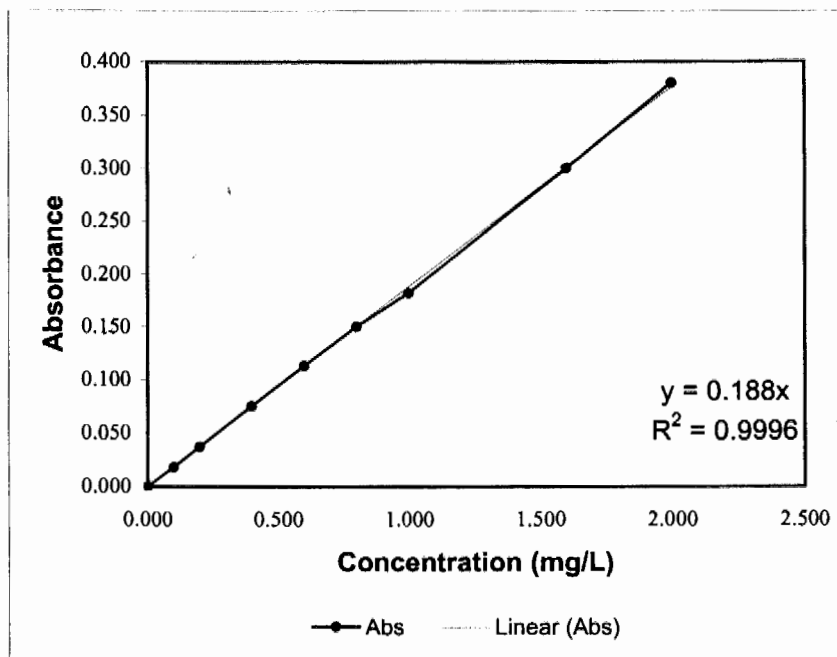
ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Ammonia (NH3-N)	ND	1.00	1.01	101	1.00	1.00	100	0	80-120	20

8046

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.018
0.200	0.037
0.400	0.075
0.600	0.113
0.800	0.150
1.000	0.182
1.600	0.300
2.000	0.380



R^2 0.999645

y 0.1880

CF 5.3184

Comments: **PASSED**

Analyzed by: RM/LA

ANALYSIS LOG FOR AMMONIA-N

Book # A70-NH₃-005

SOP # EMAX-350.2 Rev. No. 2 □ EMAX-350.1 □ Rev. No. 0 □

Starting Date: 7-21-05 Time: 10:00 Ending Date: 7-21-05 Time: 10:50

Data File Name	Prep. Batch	Lab Sample ID	Matrix S W	Time	Vol. Colored (ml)	DF	Absorbance	Notes	Instrument No: 70	Wavelength: 425 nm	Conc. (mg/L)
* 1	NH6009W	g-010	✓	0:00	20	1	0.000	mg/L			
* 2		g-011		01			0.048				
* 3		g-012		02			0.047				
* 4		g-014		03			0.073				
* 5		g-016		04			0.113				
* 6		g-018		05			0.150				
* 7		g-110		06			0.182				
* 8		g-116		07			0.200				
* 9		g-220		08			0.340				
* 10		10V		09			0.186	0.989			
* 1		10P		10			0.000	NP			
* 2		NH6008WB		11			0.000	NP			
* 3		WC		12			0.190	1.01			
* 4		WC		13			0.189	1.006			
* 5		6105-01		14			0.001	ND			
* 6		01D		15			0.002	ND			
* 7		-014		16			0.188	1.000			
* 8		-02		17			0.009	ND			
* 9		-03		18			0.006	ND			
* 10		-04		19			0.013	ND			
* 1		✓ -05		20			0.020	0.106			
* 2		CCV1		21			0.187	0.995			
* 3		CCV1		22			0.000	ND			
* 4		61145-05		23			0.001	ND			
* 5		-07		24			0.052	0.277			
* 6		-08		25			0.008	ND			
* 7		-09		26			0.006	ND			
* 8		✓ -10		27			0.027	0.144			
* 9		61189-01		28			0.038	0.102			
* 10		-02		29			0.001	ND			

ANALYTICAL BATCH * NH6008W

Comments:

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By: PMM KA

This page is checked during data review.

ANALYSIS LOG FOR AMMONIA-N

Book # A70-NH₃-005

SOP EMAX-350.2 Rev. No. 2 EMAX-350.1 Rev. No. 9

Starting Date: 7-21-05 Ending Date: 7-21-05 Time: 10:50

Data File Name	Prep. Batch	Lab Sample ID	Matrix S W	Time	Vol. Colored (ml)	DF	Absorbance	Notes	Instrument No: 70		Wavelength: 425 nm
									Standard	ID	
* 1	NH608W	G183-03		4:50	20	1	0.002	ND	S ₀	same as 8964	Conc. (mg/L)
* 2		✓ -08		4:51			0.001	ND	S ₁		0.0
* 3		✓ -05		4:52			0.001	0.09 = NT	S ₂		0.1
* 4		CCV1		4:53			0.182	0.989	S ₃		0.2
* 5		CCV2		4:54			0.000	ND	S ₄		0.4
* 6		G183-06		4:55			0.001	ND	S ₅		0.6
* 7		✓ -07		4:56			0.002	ND	S ₆		0.8
* 8		NH609WB		4:57			0.000	ND	S ₇		1.0
* 9		✓ WC		4:58			0.189	1.005	S ₈		1.6
* 0		G190-01		4:59			0.001	ND	S ₉		2.0
* 1		✓ -07		4:59			0.002	ND	ICV/MS		1.0
* 2		✓ -07		4:59			0.182	0.993	OCV		1.0
* 3		✓ -02		4:59			0.002	ND	LCS		1.0
* 4		✓ -03		4:59			0.001	ND	Reagent	ID	
* 5		✓ -04		4:59			0.002	ND	Color Reagent	DWTA-06-141	
* 6		CCV3		4:59			0.185	0.984			
* 7		CCV3		4:59			0.000	ND			
* 8		G190-05		4:59			0.001	ND			
* 9		✓ -06		4:59			0.019	0.101			
* 0		CCV4		4:59			0.185	1.000			
* 1		CCV4		4:59			0.000	ND			
* 2											
* 3											
* 4											
* 5											
* 6											
* 7											
* 8											
* 9											
* 0											

ANALYTICAL BATCH * NH608W

Standard Curve

R	Y	CF
	0.9995	
	0.1880	
	5.8184	

Comments:

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By: pm

This page is checked during data review.

Book # EKN-006

SOP ☒ EMAX-350.2 Rev. No.: 2 ☐ EMAX-351.3 Rev. No.: 2 ☐

Start Date	Time	End Date	Time
7-17-05	9:30	7-20-05	14:00

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	5-0-0	9.5	0.1	1.2	5	1.40	1.00		ICV/MS	5-0-0-03-157	10.00
*02	4-0-1								LCS	4-0-1	10.00
*03	5-1-0										
*04	5-2-0										
*05	10-0										
*06	10-0										
*07	11-0										
*08	12-0										
*09	13-0										
*10	14-0										
*11	15-0										
*12	16-0										
*13	17-0										
*14	18-0										
*15	19-0										
*16	20-0										
*17	21-0										
*18	22-0										
*19	23-0										
*20	24-0										
*21	25-0										
*22	26-0										
*23	27-0										
*24	28-0										
*25	29-0										
*26	30-0										

Prepared By: DM

Standard Added By: DM

Checked By: DM

Comments:

PREPARATION BATCH * 11-1-2008

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKN

SOP E MAX-350.2 Rev. No.: 2 □ EMAX-351.3 Rev. No.: 2 □

Start Date 7-20-05 Time 9:30 End Date 7-30-05 Time 1:00

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01 17	G183-01	9.5	0.8	10	5	100	100		ICV/MS	same as pg. 2	
*02 25	↓ -07		0.7						LCS	↓	
*03 29	G190-01		0.9						Reagent		
*04 30	-01 D		0.8						NaOH	same as pg. 2	
*05 31	-01 A1		0.9						Digestion Mixture		
*06 32	-02		0.8						Borate Buffer		
*07 33	-03		0.9						H ₃ BO ₃		
*08 34	-04		0.8						Distilling Soln.		
*09 35	-05		0.7						Comments:		
*10 36	↓ -06		0.8								
*11 37	G186-01	9.5	0.1	10	5	100	100				
*12 38	↓ -07		0.1								
*13 39											
*14 40											
*15											
*16											
*17											
*18											
*19											
*20											
*21											
*22											
*23											
*24											
*25											
*26											

PREPARATION BATCH *

Prepared By: pm

Standard Added By: pm

Checked By: pm

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G183

SM3500 FERROUS IRON

Seven (7) water samples were received on 07/22/05 for Ferrous Iron analysis by Method SM3500 in accordance with "Standard Methods for the Examination of Water and Wastewater", 18th edition (1990).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample

Lab control result was within QC limit.

4. Duplicate

Sample G183-07 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

SM3500
FERROUS IRON

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G183

Matrix : WATER
Instrument ID : 170

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	FEG003WB	ND	1	NA	5	2.5	07/22/0517:38	NA	FEG003W-09	FEG003W-07	FEG003W	NA	NA
LCS1W	FEG003WL	20.8	1	NA	5	2.5	07/22/0517:39	NA	FEG003W-10	FEG003W-07	FEG003W	NA	NA
MW-19-1	G183-01	ND	1	NA	5	2.5	07/22/0517:40	NA	FEG003W-11	FEG003W-07	FEG003W	07/20/05	07/22/05
MW-18-5	G183-02	ND	1	NA	5	2.5	07/22/0517:41	NA	FEG003W-12	FEG003W-07	FEG003W	07/21/05	07/22/05
MW-18-4	G183-03	ND	1	NA	5	2.5	07/22/0517:42	NA	FEG003W-13	FEG003W-07	FEG003W	07/21/05	07/22/05
MW-18-3	G183-04	ND	1	NA	5	2.5	07/22/0517:43	NA	FEG003W-14	FEG003W-07	FEG003W	07/21/05	07/22/05
MW-18-1	G183-05	ND	1	NA	5	2.5	07/22/0517:44	NA	FEG003W-15	FEG003W-07	FEG003W	07/21/05	07/22/05
MW-18-2	G183-06	ND	1	NA	5	2.5	07/22/0517:45	NA	FEG003W-16	FEG003W-07	FEG003W	07/21/05	07/22/05
DUPE-2-7/21/05	G183-07	ND	1	NA	5	2.5	07/22/0517:46	NA	FEG003W-17	FEG003W-07	FEG003W	07/21/05	07/22/05
DUPE-2-7/21/05DUP	G183-07D	ND	1	NA	5	2.5	07/22/0517:47	NA	FEG003W-18	FEG003W-07	FEG003W	07/21/05	07/22/05

8053

EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT:	BATTELLE MEMORIAL INSTITUTE	DATE RECEIVED:	NA
PROJECT:	JPL	DATE EXTRACTED:	NA
METHOD:	SM3500	DATE ANALYZED:	07/22/05 17:39
MATRIX:	WATER		
% MOISTURE:	NA		

BATCH NO.:	05G183
SAMPLE ID:	LCS1W
CONTROL NO.:	FEG003WL

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	LCS RSLT (mg/L)	LCS % REC	QC LIMIT (%)
Ferrous Iron	ND	20.00	20.80	104	80-120

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: SM3500

MATRIX: WATER

% MOISTURE: NA

=====

BATCH NO.: 05G183 DATE RECEIVED: 07/22/05
SAMPLE ID: DUPE-2-7/21/05DUP DATE EXTRACTED: NA
CONTROL NO.: G183-070 DATE ANALYZED: 07/22/05 17:47

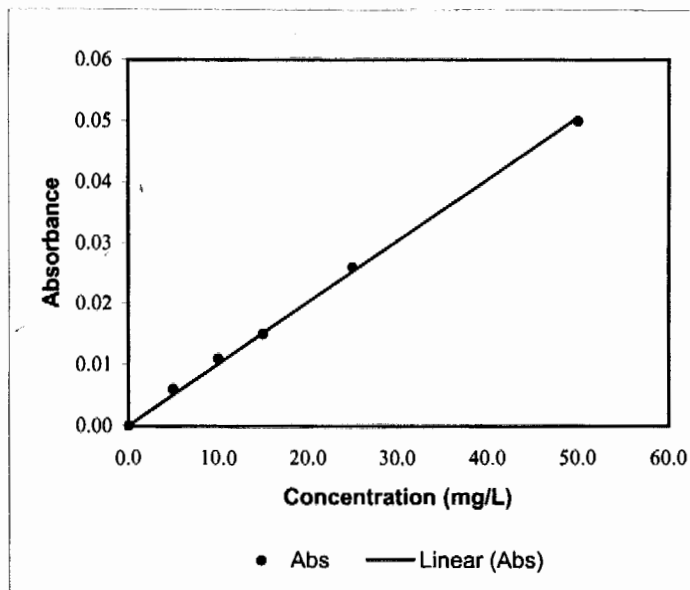
ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Ferrous Iron	ND	ND	0	20

8055

CALIBRATION CURVE FERROUS FE

Conc.	Abs
0.0	0.000
5.0	0.006
10.0	0.011
15.0	0.015
25.0	0.026
50.0	0.050



R^2	0.9991
Eq.Line	0.0010
CF	988.6202

Comments: **PASSED**

Analyzed by: LA

ANALYSIS LOG FOR FERROUS IRON

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SOP # EMAX-3500-Fe D/C Rev. No. 0 □

Starting Date 7-22-05 Time 17:30

Ending Date 7-22-05 Time 17:49

Book # A70-Fe D/C-001

Data File Name	Preparative Batch	Lab Sample ID	Matrix		Sample Amount (ml)	DF	Abs. (510 nm)	Time	Ferrous Iron (mg/L)	Notes	Instrument No.: 70		Wavelength: 510 nm
			S	W							Standard	ID	
* 1	FEG003W	3-0	✓		20	1	0.000	17:30					
* 2		3-5		✓			0.006	31					
* 3		3-10					0.011	32					
* 4		3-15					0.005	33					
* 5		3-25					0.004	34					
* 6		3-50					0.000	35					
* 7		101					0.019	36	19.78				
* 8		103					0.000	37	ND				
* 9		FEG003W					0.000	38	ND				
* 0		↓ NC					0.000	39	ND				
* 1		G183-01					0.002	40	ND				
* 2		↓ NC					0.006	41	ND				
* 3		↓ NC					0.007	42	ND				
* 4		↓ NC					0.002	43	ND				
* 5		↓ NC					0.000	44	ND				
* 6		↓ NC					0.001	45	ND				
* 7		↓ NC					0.004	46	ND				
* 8		↓ NC					0.005	47	ND				
* 9		COB1		✓			0.000	48	ND				
* 0		COB1		✓	50	1	0.000	49	ND				
* 1													
* 2													
* 3													
* 4													
* 5													
* 6													
* 7													
* 8													
* 9													
* 0													

Reagents	
Name	ID
HCl	SW1A-02-1331
NH ₄ C ₂ H ₃ O ₂ Buffer	SW1B-04-228B
Phenanthroline Sol'n	↓ - 228A
NaC ₂ H ₃ O ₂ Sol'n	N/A
Hydroxylamine Sol'n	↓

Standard Curve	
R (≥0.995)	Y
0.9991	0.0010
CF	958.6202

Comments:	

Analyzed By:	Disposal Date:
SA/MB	

ANALYTICAL BATCH * FEG003W

This page is checked during data review.

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G183

METHOD 310.1 TOTAL ALKALINITY

Seven (7) water samples were received on 07/22/05 for Total Alkalinity analysis by Method 310.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G183-07 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 310.1
TOTAL ALKALINITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G183

Matrix : WATER
Instrument ID : 153

SAMPLE ID	ENAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATETIME	Extraction DATETIME	LFID	CAL REF	PREP BATCH	Collection DATETIME	Received DATETIME
MBLK1W	ALG016WB	ND	1	NA	5	1	07/27/0513:15	NA	ALG016W-01	NA	ALG016W	NA	NA
LCS1W	ALG016WL	45.7	1	NA	5	1	07/27/0513:20	NA	ALG016W-02	NA	ALG016W	NA	NA
LCD1W	ALG016WC	45.7	1	NA	5	1	07/27/0513:25	NA	ALG016W-03	NA	ALG016W	NA	NA
MW-19-1	G183-01	145	1	NA	5	1	07/27/0514:35	NA	ALG016W-17	NA	ALG016W	07/20/05	07/22/05
MW-18-5	G183-02	127	1	NA	5	1	07/27/0514:40	NA	ALG016W-18	NA	ALG016W	07/21/05	07/22/05
MW-18-4	G183-03	163	1	NA	5	1	07/27/0514:45	NA	ALG016W-19	NA	ALG016W	07/21/05	07/22/05
MW-18-3	G183-04	211	1	NA	5	1	07/27/0514:50	NA	ALG016W-20	NA	ALG016W	07/21/05	07/22/05
MW-18-1	G183-05	127	1	NA	5	1	07/27/0514:55	NA	ALG016W-21	NA	ALG016W	07/21/05	07/22/05
MW-18-2	G183-06	183	1	NA	5	1	07/27/0515:00	NA	ALG016W-22	NA	ALG016W	07/21/05	07/22/05
DUPE-2-7/21/05	G183-07	183	1	NA	5	1	07/27/0515:05	NA	ALG016W-23	NA	ALG016W	07/21/05	07/22/05
DUPE-2-7/21/05DUP	G183-07D	186	1	NA	5	1	07/27/0515:10	NA	ALG016W-24	NA	ALG016W	07/21/05	07/22/05

8059

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: 310.1

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05G183

SAMPLE ID: LCS1W/LCD1W

CONTROL NO.: ALG016WL/C

ACCESSION:

DATE RECEIVED: NA

DATE EXTRACTED: NA

DATE ANALYZED: 07/27/05 13:20/13:25

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Total Alkalinity	ND	49.20	45.70	93	49.20	45.70	93	0	80-120	20

8060

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 310.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G183
SAMPLE ID: DUPE-2-7/21/05DUP
CONTROL NO.: G183-07D
DATE RECEIVED: 07/22/05
DATE EXTRACTED: NA
DATE ANALYZED: 07/27/05 15:10

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Total Alkalinity	183.00	186.00	2	20

8061

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 310.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G183
SAMPLE ID: DUPE-2-7/21/05DUP
CONTROL NO.: G183-07D
DATE RECEIVED: 07/22/05
DATE EXTRACTED: NA
DATE ANALYZED: 07/27/05 15:10

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Total Alkalinity	183.00	186.00	2	20

8062
de

ANALYSIS LOG FOR ALKALINITY

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SOP ☐ EMAX-310.1 Rev. No. 2 ☐ SM2320B Rev. No. 0 ☐

Book # AAL-009

Start Date: 7/27/09 Time: 13:15 Ending Date: 7/27/09 Time: 15:10 Instrument No: 1533 □ 97

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Initial pH	Acid Titrant			Final pH	ALKALINITY (mg/L)			Notes	Standard Reagent	ID	Conc. (mg/L)
					pH=8.3	pH=4.5	pH=4.2		Total	Phosphate (mg)	Calcium (mg)					Bicarbonate (mg)
*01	ALG016WB	13:15	20	5.10	NA	0.085	NA	4.40	ND			LCS	SW7A-06-174	49.2	
*02	WL	13:20		6.55		0.10		4.53	45.7			Spike	NA		
*03	WC	13:25		6.43		0.10		4.50	45.7			Na ₂ CO ₃ Sola	SW7A-06-120	2360	
*04	Q145-01	13:30		6.33		2.05		4.52	145			Acid Titrant	SW3B-02-732	0.02 N	
*05	-02	13:35		7.87		4.15		4.50	211						
*06	-03	13:40		7.96		3.45		4.49	175						
*07	-04	13:45		9.19		2.65		4.52	135						
*08	-05	13:50		7.43		3.00		4.51	152						
*09	-06	13:55		7.94		3.75		4.47	141						
*10	-07	14:00		7.95		3.75		4.47	141						
*11	-08	14:05		7.94		3.65		4.47	146						
*12	-09	14:10		7.60		3.45		4.52	175						
*13	-10	14:15	✓	7.20		3.95		4.47	201						
*14	G1900-01	14:20	10	7.35		10.45		4.53	1062						
*15	-02	14:25	20	7.65		9.60		4.51	996						
*16	-03	14:30		7.45		8.65		4.47	446	✓					
*17	G1903-01	14:35		7.65		2.95		4.46	145	✓					
*18	-02	14:40		8.63		2.50		4.53	127	✓					
*19	-03	14:45		8.02		3.20		4.52	163	✓					
*20	-04	14:50		7.80		4.15		4.52	211	✓					
*21	-05	14:55		7.37		2.50		4.47	127	✓					
*22	-06	15:00		7.90		3.60		4.52	183	✓					
*23	-07	15:05		7.80		3.60		4.47	143	✓					
*24	✓ -07D	15:10	✓	7.83	✓	3.65	✓	4.53	186	✓					
*25															

ANALYTICAL BATCH * ALG016W

Standardization
Na₂CO₃ Sola. (ml) Normality, N
6.24 0.025 ND
5 11.05 0.02024
5 11.55 0.02042
5 11.60 0.02033
Avg N 0.02033

pH METER CALIBRATION

pH Buffer	ID	Reading
pH 4	SW7A-06-047	4.01
pH 7	-090	7.00
pH 10	-100	10.00
Slope	100.2	

Comments:

G190-01-1X average

Analyzed By: MW / Pan

This page is checked during data review.

Pan 7/27/09

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G183

METHOD 120.1 SPECIFIC CONDUCTIVITY

Seven (7) water samples were received on 07/22/05 for Specific Conductivity analysis by Method 120.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Duplicate

Sample G183-07 was analyzed for duplicate. %RPD was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 120.1
SPECIFIC CONDUCTIVITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G183

Matrix : WATER
Instrument ID : 129

SAMPLE ID	EMAX SAMPLE ID	RESULTS (umhos/cm)	DLF MOIST	RL DATETIME	MDL	Analysis DATETIME	LFID	Extraction	CAL REF	PREP BATCH	DATETIME	Collection DATETIME	Received
MW-19-1	G183-01	409	1	1	.5	07/28/0515:16		NA	ECH001W-9	ECH001W-1	ECH001W	07/20/05	07/22/05
MW-18-5	G183-02	288	1	1	.5	07/28/0515:18		NA	ECH001W-10	ECH001W-1	ECH001W	07/21/05	07/22/05
MW-18-4	G183-03	405	1	1	.5	07/28/0515:20		NA	ECH001W-11	ECH001W-1	ECH001W	07/21/05	07/22/05
MW-18-3	G183-04	547	1	1	.5	07/28/0515:22		NA	ECH001W-12	ECH001W-1	ECH001W	07/21/05	07/22/05
MW-18-1	G183-05	364	1	1	.5	07/28/0515:24		NA	ECH001W-13	ECH001W-1	ECH001W	07/21/05	07/22/05
MW-18-2	G183-06	489	1	1	.5	07/28/0515:26		NA	ECH001W-14	ECH001W-1	ECH001W	07/21/05	07/22/05
DUPE-2-7/21/05	G183-07	488	1	1	.5	07/28/0515:28		NA	ECH001W-15	ECH001W-1	ECH001W	07/21/05	07/22/05
DUPE-2-7/21/05DUP	G183-07D	488	1	1	.5	07/28/0515:30		NA	ECH001W-16	ECH001W-1	ECH001W	07/21/05	07/22/05

8065

ANALYSIS LOG FOR SPECIFIC CONDUCTIVITY

SOP ☒ EMAX-120.1 Revision No. 1 □

Book # AEC-003

Start Date 7/28/05 Time 15:00 End Date 7/28/05 Time 15:46

Data File Name	Lab Sample ID	Time	Temp. °C	Temp. Correction Factor QT @ 25 °C	DF	Measured Resistance (ohms)	Notes
* 1	STD-high	15:00	21.8	0.939	1	133.8	1412
* 2	EC900806	-02	21.8	↓		381.5	403
* 3	↓ WC	004	21.8	0.939		381.5	403
* 4	G145-01	-01	21.7	0.937		412	435.72 436
* 5	↑ -02	-08	21.7	↓		642	678.92 679
* 6	-03	-10	21.7	0.937		613	648
* 7	06	-12	21.7	0.937		748	579.62 580
* 8	↓ -05	-14	21.8	0.939		818	863
* 9	G183-1	-16	21.8	↓		388	409 ✓
* 10	↑ -2	-18	21.8	0.939		273	288 ✓
* 1	-3	-20	21.7	0.937		383	405 ✓
* 2	-4	-22	21.7	↓		517	546.82 547 ✓
* 3	-5	-20	21.8	0.939		345	364 ✓
* 4	-6	-26	21.8	↓		463	488.52 489 ✓
* 5	-7	-28	21.8	↓		462	488 ✓
* 6	↓ -70	-30	21.8	↓		462	488 ✓
* 7	G218-1	-32	21.8	↓		281	297
* 8	↑ 2	-34	21.8	↓		346	365
* 19	↑ 3	-36	21.8	↓		427	451
* 20	↓ 4	-38	21.8	↓	1	461	487

ANALYTICAL BATCH * = EC900806

Trial	ID	Resistance ohms
KCI Standard	SW7A02-55	Asay
1	SW7A02-654	747
2	QT = 939	747
3		747
LCS	SW7A-06-174	402 μmhos/cm

Calibration Temperature	21.8 °C
True Value	1413 μmhos/cm
Cell Constant (C)	0.991

KCI Standard	ID	μmhos/cm
Low-point	SW7A02-729	141.3
Mid-point	N/A	
High-point	SW7A02-610	1413

Comments:

Analyzed By: UP/da

This page is checked during the data review process.

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G183**

METHOD 376.1 SULFIDE

Seven (7) water samples were received on 07/22/05 for Sulfide analysis by Method 376.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G183-07 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 376.1
SULFIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G183

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	SDG010WB	ND	1	NA	1	.4	07/26/05 18:09	NA	SDG010W-24	NA	SDG010W	NA	NA
LCS1W	SDG010WL	4.87	1	NA	1	.4	07/26/05 18:12	NA	SDG010W-25	NA	SDG010W	NA	NA
LCD1W	SDG010WC	4.92	1	NA	1	.4	07/26/05 18:15	NA	SDG010W-26	NA	SDG010W	NA	NA
MW-19-1	G183-01	ND	1	NA	1	.4	07/26/05 18:18	NA	SDG010W-27	NA	SDG010W	07/20/05	07/22/05
MW-18-5	G183-02	ND	1	NA	1	.4	07/26/05 18:21	NA	SDG010W-30	NA	SDG010W	07/21/05	07/22/05
MW-18-4	G183-03	ND	1	NA	1	.4	07/26/05 18:24	NA	SDG010W-31	NA	SDG010W	07/21/05	07/22/05
MW-18-3	G183-04	ND	1	NA	1	.4	07/26/05 18:27	NA	SDG010W-32	NA	SDG010W	07/21/05	07/22/05
MW-18-1	G183-05	ND	1	NA	1	.4	07/26/05 18:30	NA	SDG010W-33	NA	SDG010W	07/21/05	07/22/05
MW-18-2	G183-06	ND	1	NA	1	.4	07/26/05 18:33	NA	SDG010W-34	NA	SDG010W	07/21/05	07/22/05
DUPE-2-7/21/05	G183-07	ND	1	NA	1	.4	07/26/05 18:36	NA	SDG010W-35	NA	SDG010W	07/21/05	07/22/05
DUPE-2-7/21/05DUP	G183-07D	ND	1	NA	1	.4	07/26/05 18:39	NA	SDG010W-36	NA	SDG010W	07/21/05	07/22/05

8068

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 376.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G183
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: SDG010WL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 07/26/05 18:12/18:15

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS % REC	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Sulfide	ND	5.00	97	4.87	4.92	98	1 80-120	20

8069

2

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 376.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G183
SAMPLE ID: DUPE-2-7/21/05DUP
CONTROL NO.: G183-07D

DATE RECEIVED: 07/22/05
DATE EXTRACTED: NA
DATE ANALYZED: 07/26/05 18:39

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Sulfide	ND	ND	0	20

8070

ANALYSIS LOG FOR SULFIDE

Book # ASD-007

SOP EMAX-376.1 Rev. No. 1 EMAX-9034 Rev. No. 9

Start Date: 7-16-05 Time: 17:00 End Date: 7-26-05 Time: 19:00

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Volume of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Notes	Standard	ID	Conc. (mg/L)
* 1	SD000900B	14:00	100	10	10.0	ND	LCS	707A-00-178	5.0
* 2	↓ WC	-03			4.50	4.96	Spike		
* 3	↓ WC	-06			4.50	4.92	Na ₂ S ₂ O ₃	5W08B-02-785	0.00564
* 4	67169-02	-09			9.4	ND	PAO		
* 5	↓ -04	-12			9.7	ND	Iodine	5W08B-02-784	0.00564
* 6	↓ -04	-15			9.4	ND	HCL	5W08B-06-281C	1.1
* 7	↓ -04	-18			9.6	ND	Indicator	5W08B-06-190	
* 8	↓ -05	-21			9.3	ND	STANDARDIZATION		
* 9	↓ -06	-24			9.5	ND			
* 10	↓ -07	-27			9.7	ND			
* 1	67195-02	-30			9.4	ND			
* 2	↓ -03	-33			9.5	ND			
* 3	↓ -05	-36			9.6	ND			
* 4	↓ -06	-39			9.7	ND			
* 5	↓ -07	-42			9.8	ND			
* 6	↓ -10	-45			9.2	ND			
* 7	67182-01	-48			9.4	ND			
* 8	↓ -02	-51			9.5	ND			
* 9	↓ -03	-54			9.6	ND			
* 10	↓ -04	-57			9.7	ND			
* 1	↓ -05	-60			9.8	ND			
* 2	↓ -06	-63			9.7	ND			
* 3	↓ -07	-66			9.5	ND			
* 4	SD000900B	-69			10.0	ND			
* 5	↓ WC	-72			4.6	4.87			
* 6	↓ WC	-75			4.50	4.92			
* 7	67183-01	-78			9.6	ND			
* 8	↓ -02	-81			9.7	ND			
* 9	↓ -03	-84			9.7	ND			

$$\text{Sulfide (mg/L)} = \frac{(V_1 \times N_{I_2} - V_{PAO} \times N_{PAO}) \times 16,000}{V_{\text{sample}}}$$

Comments:

Analyzed By: *du*

ANALYTICAL BATCH • SD000900

ANALYSIS LOG FOR SULFIDE

SOP ☐ EMAX-376.1 Rev. No. 1 ☐ EMAX-9034 Rev. No. 9

Start Date: 7-16-05

End Date: 7-16-05

Time: 19:02

Book # ASD-007

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Volume of Iodine (ml)	Volume of PAO/ $\text{Na}_2\text{S}_2\text{O}_3$ (ml)	Notes
* 1	G182-09	18:24	100	10	9.8	MD
* 2	-06	-27			9.4	MD
* 3	-05	-28			9.4	MD
* 4	-06	-33			9.9	MD
* 5	-07	-36			9.5	MD
* 6	V-07D	-39			9.7	MD
* 7	G190-01	-42			9.8	MD
* 8	-02	-43			9.7	MD
* 9	-03	-46			9.8	MD
* 10	-08	-51			9.9	MD
* 1	-05	-57		✓	9.2	MD
* 2	✓ -06	19:00	100	10	9.4	MD
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 0						

Standard	ID	Conc. (mg/L)
LCS	Same as pg 13	
Spike		
$\text{Na}_2\text{S}_2\text{O}_3$		
PAO		
Iodine		
HCL		
Indicator		

STANDARDIZATION		
Vol. Of Iodine (ml)	Volume of PAO/ $\text{Na}_2\text{S}_2\text{O}_3$ (ml)	Conc. Of Iodine (N)
10	10.0	0.0044
10	10.0	↓
10	10.0	
Average Iodine Conc. (N)		0.0044

$$\text{Sulfide (mg/L)} = \frac{(V_{I_2} \times N_{I_2} - V_{PAO} \times N_{PAO}) \times 16,000}{V_{\text{sample}}}$$

Comments:

Analyzed By: du

ANALYTICAL BATCH • 2000000

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G183**

METHOD 160.1 TOTAL DISSOLVED SOLIDS

Seven (7) water samples were received on 07/22/05 for Total Dissolved Solids analysis by Method 160.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 160.1
TOTAL DISSOLVED SOLIDS

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G183

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TDG022MB	ND	1	NA	10	5	07/23/05 14:00	NA	TDG022W-01	NA	TDG022W	NA	NA
LCS1W	TDG022WL	164	1	NA	10	5	07/23/05 14:01	NA	TDG022W-02	NA	TDG022W	NA	NA
LCD1W	TDG022WC	162	1	NA	10	5	07/31/05 14:02	NA	TDG022W-03	NA	TDG022W	NA	NA
MW-19-1	G183-01	600	1	NA	10	5	07/23/05 14:11	NA	TDG022W-12	NA	TDG022W	07/20/05	07/22/05
MW-18-5	G183-02	400	1	NA	10	5	07/23/05 14:12	NA	TDG022W-13	NA	TDG022W	07/21/05	07/22/05
MW-18-4	G183-03	560	1	NA	10	5	07/23/05 14:13	NA	TDG022W-14	NA	TDG022W	07/21/05	07/22/05
MW-18-3	G183-04	790	1	NA	10	5	07/23/05 14:14	NA	TDG022W-15	NA	TDG022W	07/21/05	07/22/05
MW-18-1	G183-05	235	1	NA	10	5	07/23/05 14:15	NA	TDG022W-16	NA	TDG022W	07/21/05	07/22/05
MW-18-2	G183-06	690	1	NA	10	5	07/31/05 14:16	NA	TDG022W-17	NA	TDG022W	07/21/05	07/22/05
DUPE-2-7/21/05	G183-07	665	1	NA	10	5	07/31/05 14:17	NA	TDG022W-18	NA	TDG022W	07/21/05	07/22/05

8074

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 160.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G183
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: TDG022WL/C
DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 07/23/05 14:01/14:02

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TDS	ND	162.00	164.00	101	162.00	1620.00	1002	163	80-120	20

8075

GRAVIMETRIC ANALYSIS LOG

SOP ☒ EMAX-160.1 Rev. No. 3 ☐ EMAX-160.2 Rev. No. 2 ☐ EMAX-160.3 Rev. No. 1 ☐ EMAX-160.4 Rev. No. 0 ☐ EMAX-160.5 Rev. No. 0

Book # AGV-017

Oven/Furnace Temp. 1050C Starting Date 7/22/05 Time 1945 Ending Date 7/23/05 Time 1330

Data File Name	Lab Sample ID	Sample Amt. (ml)	Dish Wt. (g)	Dry Wt. Dish + Solids (g)				Solids (mg)	Result (mg/L)	Seifable Solids		Comments
				1st	Time	2nd	Time	3rd	Time	Vol. of SS	Result (ml/L)	
1	TP502210A	100	45.8812	45.8818	1000	45.8810	1200	45.8810	1400	2.00	ND	LCSTV 162 mg/L
2	W2	50	61.8152	61.8244	01	61.8233	01	61.8234	01	8.400	16.4	LCSTV 162 mg/L
3	W2	50	66.0309	66.0399	02	66.0391	02	66.0390	02	8.100	16.2	Balance: 160-4070636 D ✓
4	G182-01	20	12.9899	13.0233	03	13.0030	03	13.0027	03	12.8	640	I -37030058
5	W2	20	12.8155	12.8679	04	12.8677	04	12.8677	04	12.2	610	
6	W2	20	12.8152	12.8330	06	12.8310	05	12.8307	05	19.5	975	
7	W3	20	12.8876	12.9051	07	12.9045	06	12.9046	06	17.0	850	
8	W4	20	12.9063	12.9210	08	12.9215	07	12.9216	07	15.3	765	
9	W5	20	12.9336	12.9648	09	12.9643	08	12.9662	08	30.6	1530	
0	W6	20	12.9113	12.9538	10	12.9530	09	12.9533	09	32.0	1600	
1	W7	20	12.9303	12.9526	11	12.9518	10	12.9517	10	17.4	870	
2	G183-01	20	12.9774	12.9347	12	12.9343	11	12.9344	11	42.0	240	600
3	W8	20	13.0671	13.0757	13	13.0750	12	13.0751	12	8.0	160	400
4	W9	20	12.8864	12.8922	14	12.8917	13	12.8916	13	11.2	224	560
5	W10	20	12.9998	13.0168	15	13.0167	14	13.0168	14	15.8	316	790
6	W11	20	12.9352	12.9477	16	12.9471	15	12.9476	15	11.8	236	235
7	W12	20	13.0070	13.0215	17	13.0210	16	13.0208	16	13.8	276	690
8	W13	20	12.9805	12.9646	18	12.9638	17	12.9638	17	13.3	266	665
9												
0												

ANALYTICAL BATCH * SS

TD 5022W

VS

Analyzed By: NPS/LA
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CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G183**

METHOD 351.3 TKN

Seven (7) water samples were received on 07/22/05 for TKN analysis by Method 351.3 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spiked

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

All results were reported as Nitrogen concentration.

METHOD 351.3
TKN

Client : BATTLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G183

Matrix : WATER
Instrument ID : I70

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	KNG010WB	ND	1	NA	.1	.035	07/31/0511:10	07/30/0510:30	KNG010W-11	KNG010W-09	KNG010W	NA	07/30/05
LCS1W	KNG010WL	1.03	1	NA	.1	.035	07/31/0511:11	07/30/0510:30	KNG010W-12	KNG010W-09	KNG010W	NA	07/30/05
LCD1W	KNG010WC	1.04	1	NA	.1	.035	07/31/0511:12	07/30/0510:30	KNG010W-13	KNG010W-09	KNG010W	NA	07/30/05
MW-19-1	G183-01	.473	1	NA	.1	.035	07/31/0511:27	07/30/0510:30	KNG010W-28	KNG010W-21	KNG010W	07/20/05	07/22/05
MW-18-5	G183-02	ND	1	NA	.1	.035	07/31/0511:28	07/30/0510:30	KNG010W-29	KNG010W-21	KNG010W	07/21/05	07/22/05
MW-18-4	G183-03	ND	1	NA	.1	.035	07/31/0511:29	07/30/0510:30	KNG010W-30	KNG010W-21	KNG010W	07/21/05	07/22/05
MW-18-3	G183-04	ND	1	NA	.1	.035	07/31/0511:30	07/30/0510:30	KNG010W-31	KNG010W-21	KNG010W	07/21/05	07/22/05
MW-18-1	G183-05	.244	1	NA	.1	.035	07/31/0511:31	07/30/0510:30	KNG010W-32	KNG010W-21	KNG010W	07/21/05	07/22/05
MW-18-2	G183-06	ND	1	NA	.1	.035	07/31/0511:34	07/30/0510:30	KNG010W-35	KNG010W-33	KNG010W	07/21/05	07/22/05
DUPE-2-7/21/05	G183-07	ND	1	NA	.1	.035	07/31/0511:35	07/30/0510:30	KNG010W-36	KNG010W-33	KNG010W	07/21/05	07/22/05

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 351.3
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G183
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: KNG010WL/C

DATE RECEIVED: 07/30/05

DATE EXTRACTED: 07/30/05 10:30

DATE ANALYZED: 07/31/05 11:11:12

ACCESSION:

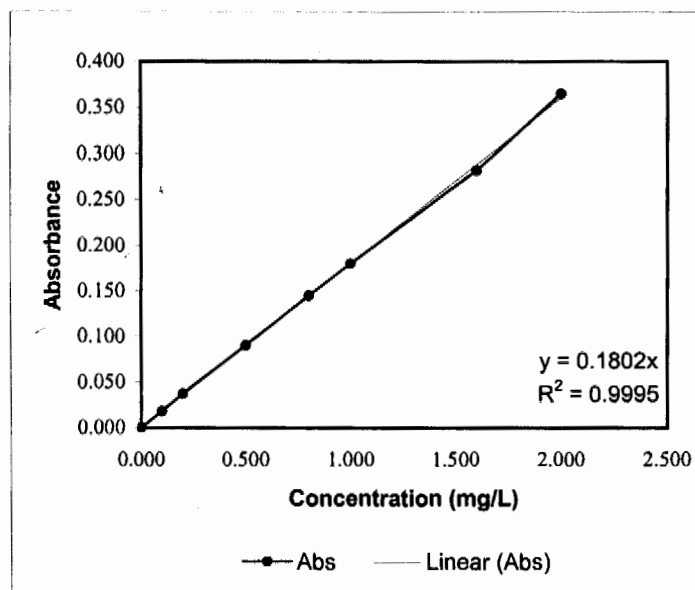
PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TKN	ND	1.00	1.03	103	1.00	1.04	104	1	80-120	20

8079

8

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.018
0.200	0.037
0.500	0.090
0.800	0.145
1.000	0.180
1.600	0.282
2.000	0.365



R^2 0.999477

y 0.1802

CF 5.5505

Comments: **PASSED**

Analyzed by: RM/LA

ANALYSIS LOG FOR TOTAL KJELDAHL NITROGEN (TKN)

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Book # A70-KN-004

SOP EMAX-351.3 Rev. No. 1

Start Date: 7-31-05 Time: 11:00

End Date: 7-31-05 Time: 11:49

Data File Name		Prep. Batch	Lab Sample ID	Matrix	Time	Vol. Colored (ml)	DF	Absorbance	Notes
S	W								
1		K16010W	G-0.0		11:00	20	1	0.000	neg
2			G-0.1		-01			0.018	
3			G-0.2		-02			0.027	
4			G-0.5		-03			0.090	
5			G-0.8		-04			0.145	
6			G-1.0		-05			0.180	
7			G-1.6		-06			0.282	
8			G-2.0		-07			0.365	
9			10V		-08			0.152	1.01
10			10B		-09			0.000	ND
11			K16010WB		-10			0.000	ND
12			WC		-11			0.185	1.021
13			WC		-12			0.157	1.028
14			G145-0.1		-13			0.012	ND
15			-0.1D		-14			0.012	ND
16			-0.1M		-15			0.197	1.093
17			-0.2		-16			0.080	0.444
18			-0.3		-17			0.094	0.522
19			-0.4		-18			0.060	0.333
20			-0.5		-19			0.092	0.511
21			CCV1		-20			0.184	1.021
22			CCB1		-21			0.000	ND
23			G145-0.6		-22			0.142	0.788
24			-0.7		-23			0.096	0.523
25			-0.8		-24			0.110	0.611
26			-0.9		-25			0.068	0.347
27			-1.0		-26			0.074	0.389
28			G189-0.1		-27			0.084	0.473
29			-0.2		-28			0.002	ND
30			-0.3		-29			0.004	ND

ANALYTICAL BATCH * K16010W

Standard	ID	Wavelength: 425 nm	Conc. (mg/L)
S ₀	raw pure		0.0
S ₁	G145-0.5-152		0.1
S ₂			0.2
S ₃			0.5
S ₄			0.8
S ₅			1.0
S ₆			1.6
S ₇	G145-0.5-152		2.0
ICV/MS	-151		1.0
CCV	-152		1.0
LCS	-178		1.0
Reagent	ID		
Color Reagent	G145-0.6-141		
Standard Curve			
R ²	0.9995		
Y	0.1502		
CF	5.505		

Comments:

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By: RM/12

This page is checked during data review.

ANALYSIS LOG FOR TOTAL KJELDAHL NITROGEN (TKN)

Data File Name	Prep. Batch	Lab Sample ID	Matrix		Time	Vol. Colored (ml)	DF	Absorbance	Notes	Instrument No: 70		Wavelength: 425 nm	Conc. (mg/L)
			S	W						Standard	ID		
* 1	KN6011W	6183-04	✓		11:30	20	1	0.012	WY	S ₀	Same as 84.84		0.0
* 2		↓ -05			11:31			0.044	0.244	S ₁			0.1
* 3		CCB2			11:32			0.183	1.016	S ₂			0.2
* 4		CCB2			11:33			0.000	ND	S ₃			0.5
* 5		6183-04			11:34			0.008	ND	S ₄			0.8
* 6		↓ -07			11:35			0.010	ND	S ₅			1.0
* 7		KN6011W			11:36			0.000	ND	S ₆			1.6
* 8		↓ WC			11:37			0.186	0.42	S ₇			2.0
* 9		6190-01			11:38			0.020	0.141	ICV/MS			1.0
* 10		↓ -01D			11:39			0.026	0.193	CCV			1.0
* 1		↓ -01M			11:40			0.220	1.221	LCS			1.0
* 2		↓ -02			11:41			0.022	0.122				1.0
* 3		↓ -03			11:42			0.090	0.500				
* 4		↓ -04			11:43			0.044	0.244	Reagent	ID		
* 5		CCB3			11:44			0.184	1.021	Color Reagent	SW7A-06-141		
* 6		CCB3			11:45			0.000	ND	Standard Curve			
* 7		6190-05			11:46			0.072	0.400				
* 8		↓ -06			11:47			0.044	0.244				
* 9		CCV4			11:48			0.183	1.016				
* 10	✓	CCB4			11:49	20	1	0.000	ND	R ²	0.9995		
* 1										Y	0.1302		
* 2										CF	5.5505		

Comments:

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By: PM 1/4

This page is checked during data review.

ANALYTICAL BATCH * KN6011W

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKNSOP ☐ EMAX-350.2 Rev. No.: 2 ☐ EMAX-351.3 Rev. No.: 2 ☐

Book # EKN-006

Start Date 7-20-05 Time 10:30 End Date 7-20-05 Time 15:30

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	5-0.0	9.5	10	5	4	50	50		ICV/MS	5W2B-00-151	50
*02	2-0.1								LCS	✓ - 178	50
*03	5-1.0								Reagent	Lot# / ID	
*04	5-2.0								NaOH	NA	
*05	10.0								Digestion Mixture	5W7A-00-2024	
*06	10.0								Borate Buffer	✓ - 152	
*07	KN6W10B								H ₃ BO ₃	5W7B-00-322	
*08	✓ we								Distilling Soln.	✓ - 315B	
*09	✓ we								Comments:		
*10	6145-01										
*11	-02										
*12	-03										
*13	-04										
*14	-05										
*15	-06										
*16	-07										
*17	-08										
*18	-09										
*19	-10										
*20	6189-01										
*21	-01										
*22	-03										
*23	-04										
*24	-05										
*25	-06										
*26	✓ -07										

Prepared By: RM

Standard Added By: RM

Checked By: RM

PREPARATION BATCH

KN6W10B

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-006

SOP □ EMAX-350.2 Rev. No.: 2 □ EMAX-351.3 Rev. No.: 2 □

Start Date	Time	End Date	Time
7-20-05	10:30	7-20-05	15:20

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*0129	6145-01D	9.5	10	5	4	20	42		ICV/MS	Same as pg. 4	
*0229	↓ -01H								LCS		
*0329	6190-01										
*0429	↓ -02										
*0529	↓ -03										
*0629	↓ -04										
*0729	↓ -05										
*0829	↓ -06										
*0929	KARGO 11 100										
*10	↓ wL-95										
*11											
*12											
*13											
*14											
*15											
*16											
*17											
*18											
*19											
*20											
*21											
*22											
*23											
*24	↓ wL-95										
*25											
*26											

Reagent	Lot# / ID
NaOH	Same as pg. 4
Digestion Mixture	
Borate Buffer	
H ₃ BO ₃	
Distilling Soln.	

Comments:

Prepared By: RM
 Standard Added By: RM
 Checked By: RM

PREPARATION BATCH * KARGO 11 100

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G183

METHOD 415.1 DOC

Seven (7) water samples were received on 07/22/05 for DOC analysis by Method 415.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 415.1
DOC

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G183

Matrix : WATER
Instrument ID : 62

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TCG021WB	ND	1	NA	1	.5	07/31/0521:08	NA	TCG021-5	TCG021-2	TCG021W	NA	NA
LCS1W	TCG021WL	24.8	1	NA	1	.5	07/31/0521:18	NA	TCG021-6	TCG021-2	TCG021W	NA	NA
LC01W	TCG021WC	25	1	NA	1	.5	07/31/0521:28	NA	TCG021-7	TCG021-2	TCG021W	NA	NA
MW-19-1	G183-01	8.67	1	NA	1	.5	07/31/0523:50	NA	TCG021-22	TCG021-14	TCG021W	07/20/05	07/22/05
MW-18-5	G183-02	2.53	1	NA	1	.5	07/31/0523:59	NA	TCG021-23	TCG021-14	TCG021W	07/21/05	07/22/05
MW-18-4	G183-03	7.29	1	NA	1	.5	08/01/0500:12	NA	TCG021-24	TCG021-14	TCG021W	07/21/05	07/22/05
MW-18-3	G183-04	6.72	1	NA	1	.5	08/01/0500:22	NA	TCG021-25	TCG021-14	TCG021W	07/21/05	07/22/05
MW-18-1	G183-05	7.82	1	NA	1	.5	08/01/0500:53	NA	TCG021-28	TCG021-26	TCG021W	07/21/05	07/22/05
MW-18-2	G183-06	7.02	1	NA	1	.5	08/01/0501:02	NA	TCG021-29	TCG021-26	TCG021W	07/21/05	07/22/05
DUPE-2-7/21/05	G183-07	3.27	1	NA	1	.5	08/01/0501:11	NA	TCG021-30	TCG021-26	TCG021W	07/21/05	07/22/05

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EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G183
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: TCG021WB TCG021WC
LAB FILE ID: TCG021-5 TCG021-6 TCG021-7
DATE EXTRACTED: NA
DATE ANALYZED: 07/31/0521:08 07/31/0521:18 07/31/0521:28
PREP. BATCH: TCG021W TCG021W
CALIB. REF: TCG021-2 TCG021-2

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
DOC	ND	25	24.8	99	25	25	100	1	80-120	20

8087

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G183

METHOD 415.1 TOC

Seven (7) water samples were received on 07/22/05 for TOC analysis by Method 415.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

No duplicate sample was designated in this SDG.

5. Matrix Spike

No MS sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 415.1
TOC

Client : BATTILLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G183

Matrix : WATER
Instrument ID : 62

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TCG022MB	ND	1	NA	1	.5	08/01/0501:20	NA	TCG021-31	TCG021-26	TCG022W	NA	NA
LCS1W	TCG022WL	24.5	1	NA	1	.5	08/01/0501:30	NA	TCG021-32	TCG021-26	TCG022W	NA	NA
LCD1W	TCG022WC	24.6	1	NA	1	.5	08/01/0501:41	NA	TCG021-33	TCG021-26	TCG022W	NA	NA
MU-19-1	G183-01	2.98	1	NA	1	.5	08/01/0504:01	NA	TCG021-48	TCG021-38	TCG022W	07/20/05	07/22/05
MU-18-5	G183-02	1.15	1	NA	1	.5	08/01/0504:10	NA	TCG021-49	TCG021-38	TCG022W	07/21/05	07/22/05
MU-18-4	G183-03	1.36	1	NA	1	.5	08/01/0504:40	NA	TCG021-52	TCG021-50	TCG022W	07/21/05	07/22/05
MU-18-3	G183-04	1.63	1	NA	1	.5	08/01/0504:49	NA	TCG021-53	TCG021-50	TCG022W	07/21/05	07/22/05
MU-18-1	G183-05	1.91	1	NA	1	.5	08/01/0504:58	NA	TCG021-54	TCG021-50	TCG022W	07/21/05	07/22/05
MU-18-2	G183-06	2.48	1	NA	1	.5	08/01/0505:07	NA	TCG021-55	TCG021-50	TCG022W	07/21/05	07/22/05
DUPE-2-7/21/05	G183-07	1.92	1	NA	1	.5	08/01/0505:16	NA	TCG021-56	TCG021-50	TCG022W	07/21/05	07/22/05

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2

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G183
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: TCG022WB
LAB FILE ID: TCG021-31
DATE EXTRACTED: NA
DATE ANALYZED: 08/01/0501:20
PREP. BATCH: TCG022W
CALIB. REF: TCG021-26

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
TOC	ND	25	24.5	98	25	24.6	98	0	80-120	20

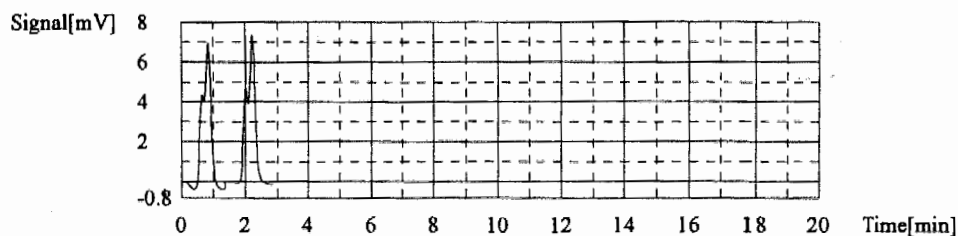
8090

	Type	Analysis	Sample Name	Sample ID	Object	Origin	Dilution	Result	Notes	Comment
1	Standard	NPOC	ICAL	TCG021-1	0A-12	C:\Progra	1.000			
2	Control	NPOC	ICV	TCG021-2	0A-12	C:\Progra	1.000	NPOC:24.08 m	Control valu	
3	Unknown	NPOC	ICB	TCG021-3	0A-12	C:\Progra	1.000	NPOC:0.06296		
4	Unknown	NPOC	HCO3/CO3	TCG021-4	0A-12	C:\Progra	1.000	NPOC:0.5786		
5	Unknown	NPOC	TCG021WB	TCG021-5	0A-12	C:\Progra	1.000	NPOC:0.000 m		
6	Unknown	NPOC	TCG021WL	TCG021-6	0A-12	C:\Progra	1.000	NPOC:24.84 m		
7	Unknown	NPOC	TCG021WC	TCG021-7	0A-12	C:\Progra	1.000	NPOC:25.03 m		
8	Unknown	NPOC	05G145-01	TCG021-8	0A-12	C:\Progra	1.000	NPOC:2.822 m		DOC
9	Unknown	NPOC	05G145-02	TCG021-9	0A-12	C:\Progra	1.000	NPOC:6.448 m		DOC
10	Unknown	NPOC	05G145-03	TCG021-10	0A-12	C:\Progra	1.000	NPOC:2.921 m		DOC
11	Unknown	NPOC	05G145-04	TCG021-11	0A-12	C:\Progra	1.000	NPOC:3.161 m		DOC
12	Unknown	NPOC	05G145-05	TCG021-12	0A-12	C:\Progra	1.000	NPOC:12.06 m		DOC
13	Unknown	NPOC	05G145-06	TCG021-13	0A-12	C:\Progra	1.000	NPOC:5.107 m		DOC
14	Control	NPOC	CCV1	TCG021-14	0A-12	C:\Progra	1.000	NPOC:24.81 m	Control valu	
15	Unknown	NPOC	CCB1	TCG021-15	0A-12	C:\Progra	1.000	NPOC:0.06106		
16	Unknown	NPOC	05G145-07	TCG021-16	0A-12	C:\Progra	1.000	NPOC:1.793 m		DOC
17	Unknown	NPOC	05G145-08	TCG021-17	0A-12	C:\Progra	1.000	NPOC:1.842 m		DOC
18	Unknown	NPOC	05G145-09	TCG021-18	0A-12	C:\Progra	1.000	NPOC:8.597 m		DOC
19	Unknown	NPOC	05G145-10	TCG021-19	0A-12	C:\Progra	1.000	NPOC:8.069 m		DOC
20	Unknown	NPOC	05G145-10D	TCG021-20	0A-12	C:\Progra	1.000	NPOC:7.922 m		DOC
21	Unknown	NPOC	05G145-10M	TCG021-21	0A-12	C:\Progra	1.000	NPOC:32.14 m		DOC
22	Unknown	NPOC	05G183-01	TCG021-22	0A-12	C:\Progra	1.000	NPOC:8.667 m		DOC
23	Unknown	NPOC	05G183-02	TCG021-23	0A-12	C:\Progra	1.000	NPOC:2.531 m		DOC
24	Unknown	NPOC	05G183-03	TCG021-24	0A-12	C:\Progra	1.000	NPOC:7.289 m		DOC
25	Unknown	NPOC	05G183-04	TCG021-25	0A-12	C:\Progra	1.000	NPOC:6.715 m		DOC
26	Control	NPOC	CCV2	TCG021-26	0A-12	C:\Progra	1.000	NPOC:24.60 m	Control valu	
27	Unknown	NPOC	CCB2	TCG021-27	0A-12	C:\Progra	1.000	NPOC:0.000 m		
28	Unknown	NPOC	05G183-05	TCG021-28	0A-12	C:\Progra	1.000	NPOC:7.824 m		DOC
29	Unknown	NPOC	05G183-06	TCG021-29	0A-12	C:\Progra	1.000	NPOC:7.021 m		DOC
30	Unknown	NPOC	05G183-07	TCG021-30	0A-12	C:\Progra	1.000	NPOC:3.269 m		DOC
31	Unknown	NPOC	TCG022WB	TCG021-31	0A-12	C:\Progra	1.000	NPOC:0.2118		
32	Unknown	NPOC	TCG022WL	TCG021-32	0A-12	C:\Progra	1.000	NPOC:24.55 m		
33	Unknown	NPOC	TCG022WC	TCG021-33	0A-12	C:\Progra	1.000	NPOC:24.62 m		
34	Unknown	NPOC	05G145-01	TCG021-34	0A-12	C:\Progra	1.000	NPOC:1.217 m		
35	Unknown	NPOC	05G145-02	TCG021-35	0A-12	C:\Progra	1.000	NPOC:1.293 m		
36	Unknown	NPOC	05G145-03	TCG021-36	0A-12	C:\Progra	1.000	NPOC:1.349 m		
37	Unknown	NPOC	05G145-04	TCG021-37	0A-12	C:\Progra	1.000	NPOC:1.491 m		
38	Control	NPOC	CCV3	TCG021-38	0A-12	C:\Progra	1.000	NPOC:24.56 m	Control valu	
39	Unknown	NPOC	CCB3	TCG021-39	0A-12	C:\Progra	1.000	NPOC:0.000 m		
40	Unknown	NPOC	05G145-05	TCG021-40	0A-12	C:\Progra	1.000	NPOC:1.692 m		
41	Unknown	NPOC	05G145-06	TCG021-41	0A-12	C:\Progra	1.000	NPOC:1.480 m		
42	Unknown	NPOC	05G145-07	TCG021-42	0A-12	C:\Progra	1.000	NPOC:1.338 m		
43	Unknown	NPOC	05G145-08	TCG021-43	0A-12	C:\Progra	1.000	NPOC:1.625 m		
44	Unknown	NPOC	05G145-09	TCG021-44	0A-12	C:\Progra	1.000	NPOC:1.299 m		
45	Unknown	NPOC	05G145-10	TCG021-45	0A-12	C:\Progra	1.000	NPOC:1.778 m		
46	Unknown	NPOC	05G145-10D	TCG021-46	0A-12	C:\Progra	1.000	NPOC:1.778 m		
47	Unknown	NPOC	05G145-10M	TCG021-47	0A-12	C:\Progra	1.000	NPOC:25.65 m		
48	Unknown	NPOC	05G183-01	TCG021-48	0A-12	C:\Progra	1.000	NPOC:2.979 m		
49	Unknown	NPOC	05G183-02	TCG021-49	0A-12	C:\Progra	1.000	NPOC:1.155 m		
50	Control	NPOC	CCV4	TCG021-50	0A-12	C:\Progra	1.000	NPOC:24.64 m	Control valu	
51	Unknown	NPOC	CCB4	TCG021-51	0A-12	C:\Progra	1.000	NPOC:0.04559		
52	Unknown	NPOC	05G183-03	TCG021-52	0A-12	C:\Progra	1.000	NPOC:1.356 m		
53	Unknown	NPOC	05G183-04	TCG021-53	0A-12	C:\Progra	1.000	NPOC:1.629 m		
54	Unknown	NPOC	05G183-05	TCG021-54	0A-12	C:\Progra	1.000	NPOC:1.910 m		
55	Unknown	NPOC	05G183-06	TCG021-55	0A-12	C:\Progra	1.000	NPOC:2.484 m		
56	Unknown	NPOC	05G183-07	TCG021-56	0A-12	C:\Progra	1.000	NPOC:1.923 m		
57	Control	NPOC	CCV5	TCG021-57	0A-12	C:\Progra	1.000	NPOC:24.69 m	Control valu	
58	Unknown	NPOC	CCB5	TCG021-58	0A-12	C:\Progra	1.000	NPOC:0.05648		
59										
60										
61										
62										
63										
64										
65										
66										

8091

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	13.65	50uL	2	*****		07/31/05 08:00:18 PM
2	14.30	50uL	2	*****		07/31/05 08:01:56 PM

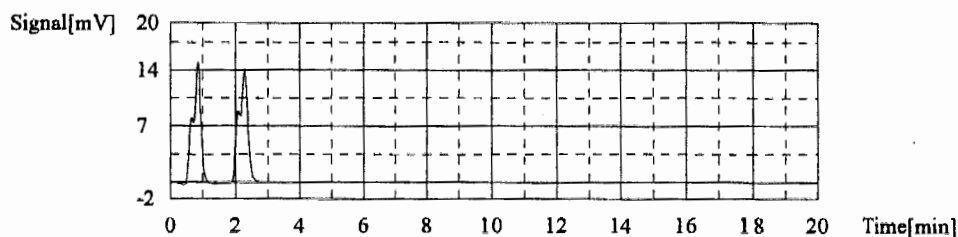
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 13.98



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	27.15	50uL	1	*****		07/31/05 08:07:58 PM
2	27.91	50uL	1	*****		07/31/05 08:09:40 PM

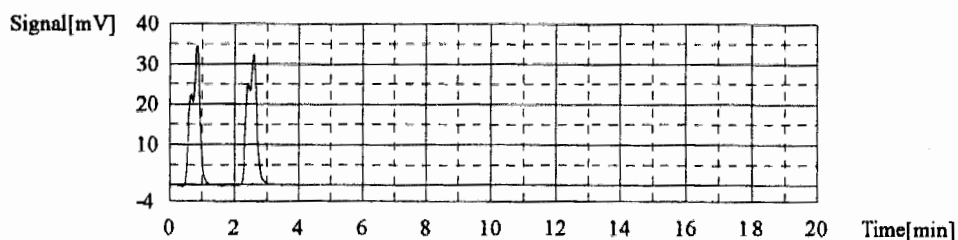
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 27.53



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	66.75	50uL	2	*****		07/31/05 08:18:39 PM
2	68.02	50uL	2	*****		07/31/05 08:20:34 PM

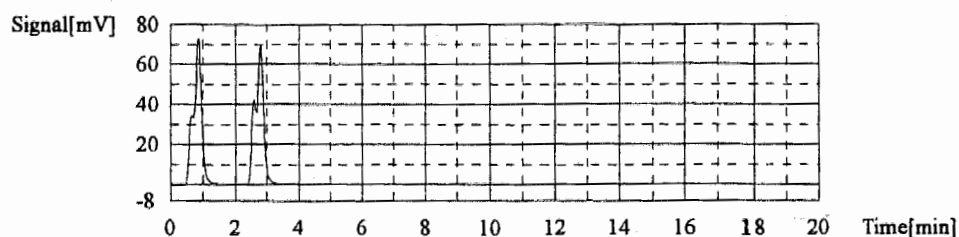
Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 67.39



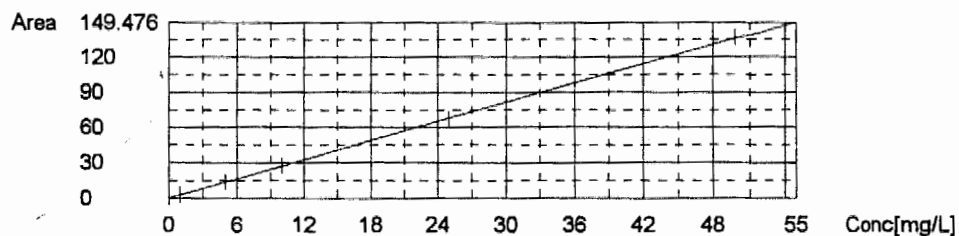
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	135.2	50uL	1	*****		07/31/05 08:27:05 PM
2	137.9	50uL	1	*****		07/31/05 08:29:10 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 136.6



Slope: 2.718
Intercept 0.000
 r^2 0.999935



Control Sample

Sample Name: ICV
Sample ID: TCG021-2
Method: TCG021.tpl
Chk. Result: Control value: 0.09% / Control within range!

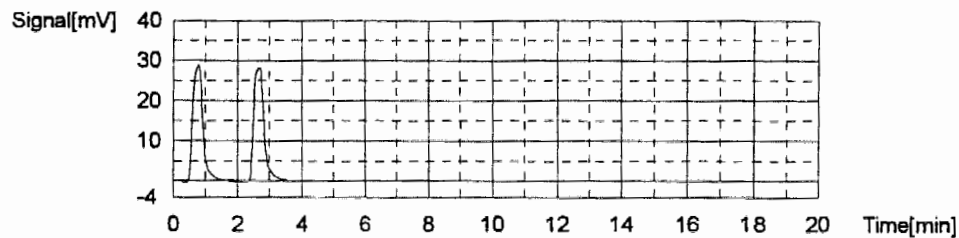
Type	Anal.	Dil.	Result
Control	NPOC	1.000	NPOC:24.08 mg/L

1. Det.

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	65.42	24.07mg/L	50uL	1		TCG021.2005_07_31_19_35_03.cal	07/31/05 08:37:50 PM
2	65.48	24.09mg/L	50uL	1		TCG021.2005_07_31_19_35_03.cal	07/31/05 08:39:52 PM

Mean Area 65.45
Mean Conc. 24.08mg/L



Sample

Sample Name: ICB
Sample ID: TCG021-3
Origin: TCG021.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.06296 mg/L

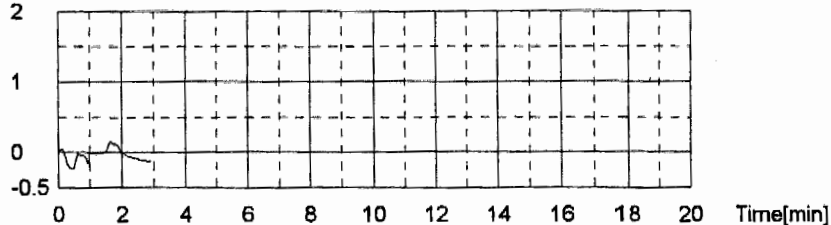
1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.3422	0.1259mg/L	50uL	1		TCG021.2005_07_31_19_35_03.cal	07/31/05 08:47:23 PM
2	0.000	0.000mg/L	50uL	1		TCG021.2005_07_31_19_35_03.cal	07/31/05 08:49:27 PM

Mean Area 0.1711
Mean Conc. 0.06296mg/L

Signal[mV] 2



Sample

Sample Name: HCO3/CO3
Sample ID: TCG021-4
Origin: TCG021.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.5766 mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1.591	0.5854mg/L	50uL	1		TCG021.2005_07_31_19_35_03.cal	07/31/05 08:57:07 PM
2	1.543	0.5677mg/L	50uL	1		TCG021.2005_07_31_19_35_03.cal	07/31/05 08:58:28 PM

ANALYSIS RUN LOG FOR TOC

SOP: 0 EMAX-9060 Revision No. 1 of EMAX-415.1 Revision No. 1 of

Start Date: 7/31/05
Time: 19:42
Ending Date: 8/01/05
Time: 05:36

62

INITIAL CALIBRATION REFERENCE

Method File	120521
-------------	--------

ICAL ID	SW10B-01-605
---------	--------------

ICV ID	↑	-
--------	---	---

STANDARDS

Conc. (mg/L)

C

509-12-90105

—

10

2.

50

32

2

29

1

1

1

1

Comments:

Analyzed By:

This page is checked during data review.

ANALYTICAL BATCH * TC6021 ** TC6022

8096

EMAX LABORATORIES, INC. 1835 W. 205th St. Torrance, CA 90501

	Type	Analysis	Sample Name	Sample ID	Object	Origin	Dilution	Result	Notes	Comment
1	Standard	NPOC	ICAL	TCG021-1	0A-12	C:\Progra	1.000			
2	Control	NPOC	ICV	TCG021-2	0A-12	C:\Progra	1.000			
3	Unknown	NPOC	ICB	TCG021-3	0A-12	C:\Progra	1.000			
4	Unknown	NPOC	HC03/CO3	TCG021-4	0A-12	C:\Progra	1.000			
5	Unknown	NPOC	TCG021WB	TCG021-5	0A-12	C:\Progra	1.000	x		
6	Unknown	NPOC	TCG021WL	TCG021-6	0A-12	C:\Progra	1.000	x		
7	Unknown	NPOC	TCG021WC	TCG021-7	0A-12	C:\Progra	1.000	x		
8	Unknown	NPOC	05G145-01	TCG021-8	0A-12	C:\Progra	1.000			DOC
9	Unknown	NPOC	05G145-02	TCG021-9	0A-12	C:\Progra	1.000			DOC
10	Unknown	NPOC	05G145-03	TCG021-10	0A-12	C:\Progra	1.000			DOC
11	Unknown	NPOC	05G145-04	TCG021-11	0A-12	C:\Progra	1.000			DOC
12	Unknown	NPOC	05G145-05	TCG021-12	0A-12	C:\Progra	1.000			DOC
13	Unknown	NPOC	05G145-06	TCG021-13	0A-12	C:\Progra	1.000			DOC
14	Control	NPOC	CCV1	TCG021-14	0A-12	C:\Progra	1.000			
15	Unknown	NPOC	CCB1	TCG021-15	0A-12	C:\Progra	1.000			
16	Unknown	NPOC	05G145-07	TCG021-16	0A-12	C:\Progra	1.000			DOC
17	Unknown	NPOC	05G145-08	TCG021-17	0A-12	C:\Progra	1.000			DOC
18	Unknown	NPOC	05G145-09	TCG021-18	0A-12	C:\Progra	1.000			DOC
19	Unknown	NPOC	05G145-10	TCG021-19	0A-12	C:\Progra	1.000			DOC
20	Unknown	NPOC	05G145-10D	TCG021-20	0A-12	C:\Progra	1.000			DOC
21	Unknown	NPOC	05G145-10M	TCG021-21	0A-12	C:\Progra	1.000			DOC
22	Unknown	NPOC	05G183-01	TCG021-22	0A-12	C:\Progra	1.000	x		DOC
23	Unknown	NPOC	05G183-02	TCG021-23	0A-12	C:\Progra	1.000	x		DOC
24	Unknown	NPOC	05G183-03	TCG021-24	0A-12	C:\Progra	1.000	x		DOC
25	Unknown	NPOC	05G183-04	TCG021-25	0A-12	C:\Progra	1.000	x		DOC
26	Control	NPOC	CCV2	TCG021-26	0A-12	C:\Progra	1.000			
27	Unknown	NPOC	CCB2	TCG021-27	0A-12	C:\Progra	1.000			
28	Unknown	NPOC	05G183-05	TCG021-28	0A-12	C:\Progra	1.000	x		DOC
29	Unknown	NPOC	05G183-06	TCG021-29	0A-12	C:\Progra	1.000	x		DOC
30	Unknown	NPOC	05G183-07	TCG021-30	0A-12	C:\Progra	1.000	x		DOC
31	Unknown	NPOC	TCG022WB	TCG021-31	0A-12	C:\Progra	1.000	TCG021-31		
32	Unknown	NPOC	TCG022WL	TCG021-32	0A-12	C:\Progra	1.000	✓		
33	Unknown	NPOC	TCG022WC	TCG021-33	0A-12	C:\Progra	1.000	✓		
34	Unknown	NPOC	05G145-01	TCG021-34	0A-12	C:\Progra	1.000	✓		
35	Unknown	NPOC	05G145-02	TCG021-35	0A-12	C:\Progra	1.000			
36	Unknown	NPOC	05G145-03	TCG021-36	0A-12	C:\Progra	1.000			
37	Unknown	NPOC	05G145-04	TCG021-37	0A-12	C:\Progra	1.000			
38	Control	NPOC	CCV3	TCG021-38	0A-12	C:\Progra	1.000			
39	Unknown	NPOC	CCB3	TCG021-39	0A-12	C:\Progra	1.000			
40	Unknown	NPOC	05G145-05	TCG021-40	0A-12	C:\Progra	1.000			
41	Unknown	NPOC	05G145-06	TCG021-41	0A-12	C:\Progra	1.000			
42	Unknown	NPOC	05G145-07	TCG021-42	0A-12	C:\Progra	1.000			
43	Unknown	NPOC	05G145-08	TCG021-43	0A-12	C:\Progra	1.000			
44	Unknown	NPOC	05G145-09	TCG021-44	0A-12	C:\Progra	1.000			
45	Unknown	NPOC	05G145-10	TCG021-45	0A-12	C:\Progra	1.000			
46	Unknown	NPOC	05G145-10D	TCG021-46	0A-12	C:\Progra	1.000			
47	Unknown	NPOC	05G145-10M	TCG021-47	0A-12	C:\Progra	1.000			
48	Unknown	NPOC	05G183-01	TCG021-48	0A-12	C:\Progra	1.000	✓		
49	Unknown	NPOC	05G183-02	TCG021-49	0A-12	C:\Progra	1.000	✓		
50	Control	NPOC	CCV4	TCG021-50	0A-12	C:\Progra	1.000			
51	Unknown	NPOC	CCB4	TCG021-51	0A-12	C:\Progra	1.000			
52	Unknown	NPOC	05G183-03	TCG021-52	0A-12	C:\Progra	1.000	✓		
53	Unknown	NPOC	05G183-04	TCG021-53	0A-12	C:\Progra	1.000	✓		
54	Unknown	NPOC	05G183-05	TCG021-54	0A-12	C:\Progra	1.000	✓		
55	Unknown	NPOC	05G183-06	TCG021-55	0A-12	C:\Progra	1.000	✓		
56	Unknown	NPOC	05G183-07	TCG021-56	0A-12	C:\Progra	1.000	✓		
57	Control	NPOC	CCV5	TCG021-57	0A-12	C:\Progra	1.000			
58	Unknown	NPOC	CCB5	TCG021-58	0A-12	C:\Progra	1.000			
59										
60										
61								✓ = TOL		
62										
63								X = DOC		
64										
65										
66										

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PROJECT: **JPL**

SDG: **05G145**

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GC-VOA **	4000 –
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HPLC **	6000 –
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WET	METHOD 300.0 8000 – 8041
	METHOD 310.1 8042 – 8045
	METHOD 350.2 8046 – 8055
	METHOD 120.1 8056 – 8059
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	METHOD 376.1 8066 – 8070
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** - Not Requested



LABORATORIES, INC.

1835 W. 205th Street

Torrance, CA 90501

Tel: (310) 618-8889

Fax: (310) 618-0818

Date: 08-04-2005

EMAX Batch No.: 05G145

Attn: Tien Shiao

Battelle Memorial Institute

505 King Ave.

Columbus OH 43201

Subject: Laboratory Report

Project: JPL

Enclosed is the Laboratory report for samples received on 07/20/05.
The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
MW-25-5	G145-01	07/19/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-25-4	G145-02	07/19/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N

Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
				SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-25-3	G145-03	07/19/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-25-2	G145-04	07/19/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-25-1	G145-05	07/19/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-19-5	G145-06	07/20/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON

Sample ID -----	Control # -----	Col Date -----	Matrix -----	Analysis -----
				ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-19-4	G145-07	07/20/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
DUPE-1-7/20/05	G145-08	07/20/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-19-3	G145-09	07/20/05	WATER	ANIONS BY IC FERROUS IRON METALS IN WATER & WASTE TOTAL ORGANIC CARBON DISSOLVED ORGANIC CARBON ALKALINITY SULFIDE AMMONIA-N SPECIFIC CONDUCTANCE SOLIDS TOTAL DISSOLVED TKN
MW-19-2	G145-10	07/20/05	WATER	ANIONS BY IC FERROUS IRON

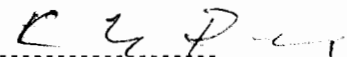
1002

Sample ID	Control #	Col Date	Matrix	Analysis
-----	-----	-----	-----	-----
				METALS IN WATER & WASTE
				TOTAL ORGANIC CARBON
				DISSOLVED ORGANIC CARBON
				ALKALINITY
				SULFIDE
				AMMONIA-N
				SPECIFIC CONDUCTANCE
				SOLIDS TOTAL DISSOLVED
				TKN

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,



Kam Y. Pang, Ph.D.
Laboratory Director

1003

CHAIN OF CUSTODY RECORD

Form No.

Proj. No.

Project Title

648611-T3

Source Determination Study

SAMPLE RS: (Signature)

D. Leiner

	DATE	TIME	SAMPLE I.D.
①	7/19/2005	12:30	MW-25-5
②	7/19/2005	14:00	MW-25-4
③	7/19/2005	15:10	MW-25-3
④	7/19/2005	16:15	MW-25-2
⑤	7/19/2005	17:20	MW-25-1






[illegible]

Number of Containers	Remarks
	0.45 mm
	filter rinsed
	w/ 500 mL of
	distilled H ₂ O
	before filtering
	Doc in the
	field.

PO # 191943

① ② ③ ④ ⑤

$T = 3.4^\circ\text{C}$	$T = 3.2^\circ\text{C}$	$T = 3.6^\circ\text{C}$	$T = 3.0^\circ\text{C}$
-------------------------	-------------------------	-------------------------	-------------------------

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	7/20/05 15:00				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	7/20/05 15:45				
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Remarks		
			Date/Time		To: EMAX LABS

To: EMAX LABS



Battelle I16/I17
Columbus Laboratories

CHAIN OF CUSTODY RECORD

Form No. _____

05G145

Proj. No. 648611-T3
Project Title Source Determination Study

SAMPLERS: (Signature)

D. L. Lavel

SAMPLE I.D.

TIME

DATE

- ① 7/19/2005 12:30 MW-25-5
- ② 7/19/2005 14:00 MW-25-4
- ③ 7/19/2005 15:10 MW-25-3
- ④ 7/19/2005 16:15 MW-25-2
- ⑤ 7/19/2005 17:30 MW-25-1

SAMPLE TYPE (V)

✓
TOC (Filtered)
✓
Nitrate/Nitrite
✓
Sulfate
✓
Sulfate Chloride
✓
Ammonia
✓
Cadmium
✓
Chromium
✓
Copper
✓
Iron
✓
Lead
✓
Manganese
✓
Mercury
✓
Nickel
✓
Silver
✓
Zinc

Container No.

Number of Containers

Remarks

0.45 mm
filter rinsed
w/ 500 mL of
distilled H₂O
before filtering
DOC in the
field.

PO #
191943

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received for Laboratory by: (Signature)

Date/Time

Remarks

To: EMAX LABS

Hanh Bui

From: Shiao, Tien [shiaoh@BATTELLE.ORG]
Sent: Monday, July 25, 2005 6:09 AM
To: Hanh Bui
Cc: Fields, Keith A; Ohart, Carolyn J; Conner, David J
Subject: RE: COC for samples received on 7/20 SDG: 05G145 (Battelle/JPL)

Hi Hanh,

Below is the address and GW sampling contact for APC labs:

Eric Wendland
Manager, Laboratory Services
Applied Physics and Chemistry Laboratory 13760 Magnolia Ave.
Chino, CA 91710

909-590-1828 x104
email: ericw@apclab.com

When sending the samples, send to **Sample Receiving**.

Our FedEx number is: 04320127-1.

Please send the perchlorate samples (125 mL each) for MW-19 -4, MW-19-4-dupe-1, MW-18-2, and MW-18-2-dupe-2 to APC labs. There should be 4 bottles total. Wait until MW-18-2 is received before sending all 4 bottles together and let me know the date the bottles are sent.

MW-19 -4 & MW-19-4-dupe-1 were sent to EMAX by FedEx on Wed 07/20/05 and MW-18-2 & MW-18-2-dupe-2 were sent to EMAX by FedEx on Fri 07/22/05.

Thanks for your help!
Tien

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Friday, July 22, 2005 4:34 PM
To: Shiao, Tien
Subject: RE: COC for samples received on 7/20 SDG: 05G145 (Battelle/JPL)

Hi Tien,
I just checked the bottles of all Perchlorate. On labels of all 500mL HDPE bottles were shown Perchlorate/Ferrous Iron/Anion (Nitrate/Nitrite/Chloride/Sulfate)/TDS/ Alkalinity/Specific Conductivity. Could you please give us the information of the other lab to send 125mL Perchlorate samples, and the FedEx # too. We will ship these samples on Monday 7/25, thanks.
Hanh

7/25/2005

1007

Hanh Bui

From: Shiao, Tien [shiaoh@BATTELLE.ORG]
Sent: Friday, July 22, 2005 9:28 AM
To: Hanh Bui
Subject: RE: COC for samples received on 7/20 SDG: 05G145 (Battelle/JPL)

Hanh,

Thanks for checking. Yes we will need the perchlorate results for the sample ID DUPE-1-7/20/05.

Tien

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Friday, July 22, 2005 11:32 AM
To: Shiao, Tien
Subject: RE: COC for samples received on 7/20 SDG: 05G145 (Battelle/JPL)

Hi Tien,
We will cancel Perchlorate analysis for all samples MW-19- and MW-25- on COC. Thus, there is one sample ID DUPE-1-7/20/05 11:15 still requested for perchlorate, isn't it? Please let me know, thanks.
Hanh

-----Original Message-----

From: Shiao, Tien [mailto:shiaoh@BATTELLE.ORG]
Sent: Friday, July 22, 2005 6:53 AM
To: Hanh Bui
Subject: RE: COC for samples received on 7/20 SDG: 05G145 (Battelle/JPL)

Hanh,

Can you take out perchlorate analysis for all locations on both the MW-25 COC and MW-19 COC?
Otherwise, they look good to me.

Thanks,
Tien

From: Hanh Bui [mailto:HDBui@emaxlabs.com]
Sent: Thursday, July 21, 2005 7:53 PM
To: Shiao, Tien
Subject: COC for samples received on 7/20 SDG: 05G145 (Battelle/JPL)

Hi Tien,
Enclosed the COC for samples we received on 7/20. If you want to change something, please let me know, thanks.
Hanh

7/22/2005

1003

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

METALS

SDG#: 05G145

7000

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G145

METHOD 200.7 METALS BY ICP

Ten (10) water samples were received on 07/20/05 for Metals analysis by Method 200.7 in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample G145-10 was analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

Sample G145-10 was spiked. All recoveries were within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
METALS BY ICP-AES

SDG NO. : 05G145
Instrument ID : T-107

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	Extraction Date/Time	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
					WATER				
MBLK1W	IPG037WB	1	NA	07/27/0518:48	07/25/0510:30	107G027012	107G027010	IPG037W	Method Blank
LCS1W	IPG037WL	1	NA	07/27/0518:52	07/25/0510:30	107G027013	107G027010	IPG037W	Lab Control Sample (LCS)
LCD1W	IPG037WC	1	NA	07/27/0518:57	07/25/0510:30	107G027014	107G027010	IPG037W	LCS Duplicate
MW-25-5	G145-01	1	NA	07/27/0519:49	07/25/0510:30	107G027025	107G027022	IPG037W	Field Sample
MW-25-4	G145-02	1	NA	07/27/0519:53	07/25/0510:30	107G027026	107G027022	IPG037W	Field Sample
MW-25-3	G145-03	1	NA	07/27/0519:57	07/25/0510:30	107G027027	107G027022	IPG037W	Field Sample
MW-25-2	G145-04	1	NA	07/27/0520:01	07/25/0510:30	107G027028	107G027022	IPG037W	Field Sample
MW-25-1	G145-05	1	NA	07/27/0520:05	07/25/0510:30	107G027029	107G027022	IPG037W	Field Sample
MW-19-5	G145-06	1	NA	07/27/0520:09	07/25/0510:30	107G027030	107G027022	IPG037W	Field Sample
MW-19-4	G145-07	1	NA	07/27/0520:13	07/25/0510:30	107G027031	107G027022	IPG037W	Field Sample
DUPE-1-7/20/05	G145-08	1	NA	07/27/0520:18	07/25/0510:30	107G027032	107G027022	IPG037W	Field Sample
MW-19-3	G145-09	1	NA	07/27/0520:22	07/25/0510:30	107G027033	107G027022	IPG037W	Field Sample
MW-19-2DL	G145-10T	5	NA	07/27/0520:43	07/25/0510:30	107G027037	107G027034	IPG037W	Diluted Sample
MW-19-2	G145-10	1	NA	07/27/0520:47	07/25/0510:30	107G027038	107G027034	IPG037W	Field Sample
MW-19-2AS	G145-10A	1	NA	07/27/0520:51	07/25/0510:30	107G027039	107G027034	IPG037W	Analytical Spike Sample
MW-19-2MS	G145-10M	1	NA	07/27/0520:55	07/25/0510:30	107G027040	107G027034	IPG037W	Matrix Spike Sample (MS)
MW-19-2MSD	G145-10S	1	NA	07/27/0520:59	07/25/0510:30	107G027041	107G027034	IPG037W	MS Duplicate (MSD)

FN - Filename
% Moist - Percent Moisture

7002

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METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/19/05
Project     : JPL                         Date Received: 07/20/05
SDG NO.     : 05G145                     Date Extracted: 07/25/05 10:30
Sample ID   : MW-25-5                    Date Analyzed: 07/27/05 19:49
Lab Samp ID : G145-01                    Dilution Factor: 1
Lab File ID : I07G027025                 Matrix          : WATER
Ext Btch ID : IPG037W                     % Moisture       : NA
Calib. Ref.: I07G027022                 Instrument ID    : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	21.9	1	.1
Iron	ND	.2	.04
Magnesium	6.08	1	.1
Potassium	ND	2	1.4
Sodium	68.4	1	.25

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/19/05
Project     : JPL                         Date Received: 07/20/05
SDG NO.     : 05G145                     Date Extracted: 07/25/05 10:30
Sample ID   : MW-25-4                    Date Analyzed: 07/27/05 19:53
Lab Samp ID : G145-02                    Dilution Factor: 1
Lab File ID : I07G027026                 Matrix          : WATER
Ext Btch ID : IPG037W                    % Moisture       : NA
Calib. Ref. : I07G027022                 Instrument ID    : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	64.5	1	.1
Iron	ND	.2	.04
Magnesium	19.5	1	.1
Potassium	ND	2	1.4
Sodium	58.4	1	.25

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/19/05
Project     : JPL                         Date Received: 07/20/05
SDG NO.    : 05G145                     Date Extracted: 07/25/05 10:30
Sample ID: MW-25-3                     Date Analyzed: 07/27/05 19:57
Lab Samp ID: G145-03                   Dilution Factor: 1
Lab File ID: I07G027027                Matrix          : WATER
Ext Btch ID: IPG037W                   % Moisture       : NA
Calib. Ref.: I07G027022                Instrument ID    : EMAXT107
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	68.4	1	.1
Iron	.323	.2	.04
Magnesium	25.1	1	.1
Potassium	2.08	2	1.4
Sodium	39.5	1	.25

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/19/05
Project     : JPL                         Date Received: 07/20/05
SDG NO.    : 05G145                     Date Extracted: 07/25/05 10:30
Sample ID: MW-25-2                       Date Analyzed: 07/27/05 20:01
Lab Samp ID: G145-04                     Dilution Factor: 1
Lab File ID: 107G027028                  Matrix          : WATER
Ext Btch ID: IPG037W                     % Moisture       : NA
Calib. Ref.: 107G027022                  Instrument ID    : EMAXT107
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	14.9	1	.1
Iron	.44	.2	.04
Magnesium	19.8	1	.1
Potassium	2.49	2	1.4
Sodium	81.2	1	.25

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/19/05
Project     : JPL                          Date Received: 07/20/05
SDG NO.     : 05G145                      Date Extracted: 07/25/05 10:30
Sample ID:  : MW-25-1                     Date Analyzed: 07/27/05 20:05
Lab Samp ID: G145-05                      Dilution Factor: 1
Lab File ID: 107G027029                   Matrix          : WATER
Ext Btch ID: 1PG037W                      % Moisture       : NA
Calib. Ref.: 107G027022                   Instrument ID    : EMAXTI07
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	98.7	1	.1
Iron	.338	.2	.04
Magnesium	32.9	1	.1
Potassium	2.98	2	1.4
Sodium	32	1	.25

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/20/05
Project     : JPL                          Date Received: 07/20/05
SDG NO.     : 05G145                       Date Extracted: 07/25/05 10:30
Sample ID:  MW-19-5                         Date Analyzed: 07/27/05 20:09
Lab Samp ID: G145-06                       Dilution Factor: 1
Lab File ID: I07G027030                    Matrix          : WATER
Ext Btch ID: IPG037W                       % Moisture       : NA
Calib. Ref.: I07G027022                    Instrument ID    : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	67.8	1	.1
Iron	.763	.2	.04
Magnesium	41.5	1	.1
Potassium	2.51	2	1.4
Sodium	35.9	1	.25

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/20/05
Project     : JPL                          Date Received:  07/20/05
SDG NO.     : 05G145                      Date Extracted: 07/25/05 10:30
Sample ID:  MW-19-4                       Date Analyzed:  07/27/05 20:13
Lab Samp ID: G145-07                      Dilution Factor: 1
Lab File ID: I07G027031                   Matrix          : WATER
Ext Btch ID: IPG037W                      % Moisture      : NA
Calib. Ref.: I07G027022                   Instrument ID   : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	69.7	1	.1
Iron	ND	.2	.04
Magnesium	31.9	1	.1
Potassium	ND	2	1.4
Sodium	33.3	1	.25

METHOD 200.7
METALS BY ICP-AES

```

=====
Client   : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/20/05
Project  : JPL                           Date Received: 07/20/05
SDG NO.  : 05G145                         Date Extracted: 07/25/05 10:30
Sample ID: DUPE-1-7/20/05                 Date Analyzed: 07/27/05 20:18
Lab Samp ID: G145-08                       Dilution Factor: 1
Lab File ID: 107G027032                     Matrix       : WATER
Ext Btch ID: IPG037W                         % Moisture    : NA
Calib. Ref.: 107G027022                     Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	71.5	1	.1
Iron	ND	.2	.04
Magnesium	32.7	1	.1
Potassium	2.24	2	1.4
Sodium	33.9	1	.25

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/20/05
Project     : JPL                          Date Received: 07/20/05
SDG NO.     : 05G145                      Date Extracted: 07/25/05 10:30
Sample ID   : MW-19-3                     Date Analyzed: 07/27/05 20:22
Lab Samp ID : G145-09                     Dilution Factor: 1
Lab File ID : I07G027033                  Matrix          : WATER
Ext Btch ID : IPG037W                     % Moisture       : NA
Calib. Ref.: I07G027022                  Instrument ID    : EMAXT107
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	64.8	1	.1
Iron	ND	.2	.04
Magnesium	25.4	1	.1
Potassium	ND	2	1.4
Sodium	28.9	1	.25

METHOD 200.7
METALS BY ICP-AES

```
=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: 07/20/05
Project     : JPL                          Date Received: 07/20/05
SDG NO.     : 05G145                       Date Extracted: 07/25/05 10:30
Sample ID   : MW-19-2                      Date Analyzed: 07/27/05 20:47
Lab Samp ID : G145-10                      Dilution Factor: 1
Lab File ID : I07G027038                   Matrix          : WATER
Ext Btch ID : IPG037W                      % Moisture       : NA
Calib. Ref. : I07G027034                   Instrument ID    : EMAXT107
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	115	1	.1
Iron	.473	.2	.04
Magnesium	43.1	1	.1
Potassium	ND	2	1.4
Sodium	34.4	1	.25

METHOD 200.7
METALS BY ICP-AES

```

=====
Client      : BATTELLE MEMORIAL INSTITUTE   Date Collected: NA
Project     : JPL                          Date Received: 07/25/05
SDG NO.     : 05G145                      Date Extracted: 07/25/05 10:30
Sample ID   : MBLK1W                      Date Analyzed: 07/27/05 18:48
Lab Samp ID : IPG037WB                    Dilution Factor: 1
Lab File ID : I07G027012                 Matrix          : WATER
Ext Btch ID : IPG037W                     % Moisture       : NA
Calib. Ref. : I07G027010                 Instrument ID    : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	ND	1	.1
Iron	ND	.2	.04
Magnesium	ND	1	.1
Potassium	ND	2	1.4
Sodium	ND	1	.25

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05G145
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILT N FACTR: 1 1 1
SAMPLE ID: MBLK1W
CONTROL NO.: IPG037WB IPG037WL IPG037WC
LAB FILE ID: 107G027012 107G027013 107G027014
DATIME EXTRCTD: 07/25/0510:30 07/25/0510:30 07/25/0510:30 DATE COLLECTED: NA
DATIME ANALYZD: 07/27/0518:48 07/27/0518:52 07/27/0518:57 DATE RECEIVED: 07/25/05
PREP. BATCH: IPG037W IPG037W IPG037W
CALIB. REF: 107G027010 107G027010 107G027010

ACCESSION:

PARAMETER	BLNK RSLT mg/L	SPIKE AMT mg/L	BS RSLT mg/L	BS % REC	SPIKE AMT mg/L	BSD RSLT mg/L	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	ND	50	52.7	105	50	51.7	103	2	85-115	20
Iron	ND	10	11	110	10	11.2	112	2	85-115	20
Magnesium	ND	50	52.7	105	50	52.5	105	0	85-115	20
Potassium	ND	50	53.4	107	50	52	104	3	85-115	20
Sodium	ND	50	53.6	107	50	53	106	1	85-115	20

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05G145
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILT N FACTR: 1 1 1
SAMPLE ID: MW-19-2
CONTROL NO.: G145-10 G145-10M G145-10S
LAB FILE ID: I07G027038 I07G027040 I07G027041
DATE EXTRACTED: 07/25/0510:30 07/25/0510:30 07/25/0510:30 DATE COLLECTED: 07/20/05
DATE ANALYZED: 07/27/0520:47 07/27/0520:55 07/27/0520:59 DATE RECEIVED: 07/20/05
PREP. BATCH: IPG037W IPG037W IPG037W
CALIB. REF: I07G027034 I07G027034 I07G027034

ACCESSION:

PARAMETER	SMPL RSLT mg/L	SPIKE AMT mg/L	MS RSLT mg/L	MS % REC	SPIKE AMT mg/L	MSD RSLT mg/L	MSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	115	50	155	81	50	162	94	4	70-130	20
Iron	.473	10	10.2	97	10	10.7	102	4	70-130	20
Magnesium	43.1	50	89.5	93	50	93.2	100	4	70-130	20
Potassium	ND	50	55.4	111	50	58	116	5	70-130	20
Sodium	34.4	50	80.8	93	50	84.3	100	4	70-130	20

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EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G145
METHOD: METHOD 200.7

=====

MATRIX:	WATER		% MOISTURE:	NA
DILUTION FACTOR:	1	5		
SAMPLE ID:	MW-19-2	MW-19-2DL		
EMAX SAMP ID:	G145-10	G145-10T		
LAB FILE ID:	I07G027038	I07G027037		
DATE EXTRACTED:	07/25/0510:30	07/25/0510:30	DATE COLLECTED:	07/20/05
DATE ANALYZED:	07/27/0520:47	07/27/0520:43	DATE RECEIVED:	07/20/05
PREP. BATCH:	IPG037W	IPG037W		
CALIB. REF:	I07G027034	I07G027034		

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SERIAL DIL RSLT (mg/L)	DIF RSLT %	QC LIMIT (%)
Calcium	115	109	5	10
Iron	.473	ND	NA	10
Magnesium	43.1	40.5	6	10
Potassium	ND	ND	0	10
Sodium	34.4	31.3	9	10

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
SDG NO.: 05G145
METHOD: METHOD 200.7

MATRIX: WATER % MOISTURE: NA
DILTN FACTR: 1 1
SAMPLE ID: MW-19-2
CONTROL NO.: G145-10 G145-10A
LAB FILE ID: I07G027038 I07G027039
DATIME EXTRCTD: 07/25/0510:30 07/25/0510:30 DATE COLLECTED: 07/20/05
DATIME ANALYZD: 07/27/0520:47 07/27/0520:51 DATE RECEIVED: 07/20/05
PREP. BATCH: IPG037W IPG037W
CALIB. REF: I07G027034 I07G027034

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	AS RSLT (mg/L)	AS % REC	QC LIMIT (%)
Calcium	115	50	156	83	75-125
Iron	.473	10	9.91	94	75-125
Magnesium	43.1	50	88.7	91	75-125
Potassium	ND	50	53	106	75-125
Sodium	34.4	50	80	91	75-125

REGULAR ICP QC CHECK TABLE

QC	ICV HIGH	ICV	CCV	ICSAB	ICSA
Limit%	95-105	90-110	90-110	80-120	80-120
Comp	mg/L	mg/L	mg/L	mg/L	mg/L
Al	10	5	5	500	500
Sb	2	1	1	1	0
As	2	1	1	1	0
Ba	2	1	1	0.5	0
Be	2	1	1	0.5	0
B	2	1	1	0.5	0
Cd	2	1	1	1	0
Ca	100	50	50	500	500
Cr	2	1	1	0.5	0
Co	2	1	1	0.5	0
Cu	2	1	1	0.5	0
Fe	10	5	5	200	200
Pb	2	1	1	1	0
Mg	100	50	50	500	500
Mn	2	1	1	0.5	0
Mo	2	1	1	1	0
Ni	2	1	1	1	0
K	100	50	50	50	0
Se	2	1	1	3.6	0
Ag	2	1	1	1	0
Na	100	50	50	10	0
Sr	2	1	1	0.5	0
Tl	2	1	1	3.6	0
Sn	10	5	5	1	0
Ti	2	1	1	1	0
V	2	1	1	0.5	0
Zn	2	1	1	1	0

ANALYSIS RUN LOG FOR ICP

SOP ☒ EMAX-6010-Rev. 3 ☐ EMAX-CLP-TAL ☐ 2to.7 Method File: 601031 Autosampler Table: 1CP

Matrix: WATER		Start Date: 7/27/05		Time: 18:01		End Date: 7/27/05		Time: 21:20		Book# A24 -037	
Data File Name	Prep. Batch	Lab Sample ID	DF	Matrix	Notes	Lab Sample ID	DF	Matrix	Notes	Instrument No.	ID
01		G0				G145-02	1	W		S0	SM1109-38-01
02		G2								S1	NA
03		G6								S2	NA
04		ICV								S3	SM1109-44-04
05		ICV								S4	NA
06		ICV								S5	NA
07		ICV								S6	SM1109-45-02
08		ICV								ICV	09-42-01
09		ICV								ICVH1	NA
10		ICV								ICVH2	NA
11		ICV								CCV	SM1109-60-02
12		ICV								ICSA	09-63-09
13		ICV								ICSAB	09-60-01
14		ICV								MRL	NA
15		ICV									
16		ICV									
17		ICV									
18		ICV									
19		ICV									
20		ICV									
21		ICV									
22		ICV									
23		ICV									
24		ICV									
25		ICV									
ANALYTICAL BATCH # 1076027											
ANALYTICAL BATCH #											
26		ICV									
27		ICV									
28		ICV									
29		ICV									
30		ICV									
31		ICV									
32		ICV									
33		ICV									
34		ICV									
35		ICV									
36		ICV									
37		ICV									
38		ICV									
39		ICV									
40		ICV									
41		ICV									
42		ICV									
43		ICV									
44		ICV									
45		ICV									
46		ICV									
47		ICV									
48		ICV									
49		ICV									
50		ICV									
ANALYTICAL BATCH #											
Comments: RETURN FOR G115/G125											
OK FOR G145/G470											
Analyzed By: <u>Quin</u>											
Date Disposed: <u>7/27/05</u>											
This page is checked during data review.											

SEQUENCE FILE : I07G027

4-18	19-33	34-43	44-53	54-63
LFID	LSID	TIME	DATE	DF
I07G027001	S0	18:01	07/27/05	1
I07G027002	S3	18:05	07/27/05	1
I07G027003	S6	18:09	07/27/05	1
I07G027004	ICV	18:13	07/27/05	1
I07G027005	ICB	18:19	07/27/05	1
I07G027006	CCV	18:23	07/27/05	1
I07G027007	CCB	18:27	07/27/05	1
I07G027008	ICSA1	18:31	07/27/05	1
I07G027009	ICSAB1	18:35	07/27/05	1
I07G027010	CCV1	18:40	07/27/05	1
I07G027011	CCB1	18:44	07/27/05	1
I07G027012	IPG037MB	18:48	07/27/05	1
I07G027013	IPG037WL	18:52	07/27/05	1
I07G027014	IPG037WC	18:57	07/27/05	1
I07G027015	G115-01	19:02	07/27/05	1
I07G027016	G115-02	19:08	07/27/05	1
I07G027017	G125-01	19:14	07/27/05	1
I07G027018	G125-02	19:18	07/27/05	1
I07G027019	G125-04	19:22	07/27/05	1
I07G027020	G125-05	19:26	07/27/05	1
I07G027021	G125-07	19:30	07/27/05	1
I07G027022	CCV2	19:36	07/27/05	1
I07G027023	CCB2	19:41	07/27/05	1
I07G027024	G125-09	19:45	07/27/05	1
I07G027025	G145-01	19:49	07/27/05	1
I07G027026	G145-02	19:53	07/27/05	1
I07G027027	G145-03	19:57	07/27/05	1
I07G027028	G145-04	20:01	07/27/05	1
I07G027029	G145-05	20:05	07/27/05	1
I07G027030	G145-06	20:09	07/27/05	1
I07G027031	G145-07	20:13	07/27/05	1
I07G027032	G145-08	20:18	07/27/05	1
I07G027033	G145-09	20:22	07/27/05	1
I07G027034	CCV3	20:27	07/27/05	1
I07G027035	CCB3	20:33	07/27/05	1
I07G027036	G470-01	20:37	07/27/05	1
I07G027037	G145-10T	20:43	07/27/05	5
I07G027038	G145-10	20:47	07/27/05	1
I07G027039	G145-10A	20:51	07/27/05	1
I07G027040	G145-10M	20:55	07/27/05	1
I07G027041	G145-10S	20:59	07/27/05	1
I07G027042	ICSAF	21:06	07/27/05	1
I07G027043	ICSABF	21:10	07/27/05	1
I07G027044	CCV4	21:16	07/27/05	1
I07G027045	CCB4	21:20	07/27/05	1

SDG : 056145

UNIT : UG/L

SUMMARY OF CALIBRATION BLANKS : I07G027 (WATER)

DATE : 07/27/05

INST : EMAXT107

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn
S0
S3
S6
ICV	-12.6	-17.9	38.8	-180	.000	-.890	2.18	.120	-1.76	-.900	-1.47	2.17	4.44	4.88	.130	.000	-8.15	-244	-23.0	-.840	.000	.140	15.7	-.050	-.440	1.79	1.91
ICB
CCV
CCB	-6.39	-13.9	20.4	.090	-.060	-2.68	2.02	-2.82	-1.17	-1.56	-1.47	-.810	4.72	4.97	-.520	3.79	-.190	-1153	-25.5	.000	.000	.030	11.7	-.040	-.280	2.08	1.29
ICSAI	...	-21.4	-73.5	.120	.130	-.300	3.30	...	.180	4.14	1.45	...	22.5	...	2.88	3.25	-3.10	-1225	-124	-.760	.000	-2.13	-10.3	-13.0	-9.95	-5.22	-.760
ICSAB1
CCV1
CCB1	-17.9	-3.57	8.19	-.180	.060	-.900	2.23	-2.07	.580	1.04	-1.84	3.26	-6.94	2.35	.000	-3.79	-5.62	-550	-64.6	-2.37	-7.04	.110	.750	1.30	-.310	.610	1.22
IPG037MB
IPG037WL
IPG037WC
GI15-01
GI15-02
GI25-01
GI25-02
GI25-04
GI25-05
GI25-07
CCV2
CCB2	-12.1	-7.17	27.6	.000	-.060	-2.69	2.61	-6.58	-.580	-.520	-2.58	1.35	8.32	-15.9	.660	1.26	-3.49	-1392	-17.0	-2.88	.000	.030	-6.28	-.020	-.440	.090	.010
GI25-09
GI45-01
GI45-02
GI45-03
GI45-04
GI45-05
GI45-06
GI45-07
GI45-08
GI45-09
CCV3
CCB3	-27.4	-19.9	-15.2	-.180	-.180	-.890	2.40	-3.30	-2.06	2.08	-1.47	-.540	-1.10	-2.51	-1.19	-2.53	-6.40	-358	-34.0	-3.05	.000	.060	-1.57	-.060	-.750	.690	.410
G470-01
GI45-10T
GI45-10
GI45-10A
GI45-10M
GI45-10S
ICSAF	...	4.66	-41.3	-.380	-.300	6.63	3.35	...	-3.07	-5.83	-2.39	...	14.2	...	3.56	-6.83	-2.32	-1734	120	-2.77	.000	-1.37	40.0	-20.8	-11.1	-10.7	-1.40
ICSABF
CCV4
CCB4	-23.2	-5.57	-14.2	.090	-.250	1.34	.480	-2.29	.000	-.260	-1.10	-.260	-8.59	11.0	.390	-1.26	-.190	-317	-37.4	-2.03	.000	.290	-25.1	-.020	-.890	1.70	-.950

QC limit of each parameter are listed in a table attached next to all the ICP check forms

* : Out of QC Limit

7022

DIGESTION LOG FOR ICP METALS

Book # EIP-046

SOP ☐ EMAX-3005 Rev. No. 3 ☐ EMAX-3010 Rev. No. 2 ☐ EMAX-CLP-TAL ☒ 200.7

Matrix: WATER		Start Date: 7/25/05	Time: 10:30	Temp: 85 °C	Ending Date: 7-25-05	Time: 12:30	Temp: 85 °C					
Sample Prep ID	Lab Sample ID	Matrix Description	Color	Turbidity	Sample Amount (μg)	pH	Extract Volume (ml)	Digestate Description	Standards	ID	Amount Added (ml)	
01	IPG037-WB				50	-	50		LCS -1	SMIA - 09 - 42	0.5	
02	-WL				50	-	50		LCS -2	SMIA - 09 - 43	0.5	
03	-WC				50	-	50		LCS -3	SMIA - 09 - 44	0.5	
04	G115-01				50	12	50		MS			
05	-02				50		50		Reagent	Lot# / ID	Amount Added (ml)	
06	G125-01				50		50		HNO ₃	SWIA - 03 - 120	0.5	
07	-02				50		50		HCl	SWIA - 03 - 115	0.25	
08	-04				50		50		H ₂ O ₂	N/A		
09	-05				50		50		HNO ₃ (1:1)	N/A		
10	-07				50		50		Digestate Location	ICP LAB		
11	-09				50		50		Extract Location			
12	G145-01				50		50		Legend:			
13	-02				50		50		Texture	Cs = Coarse	Md = Medium	Fu = Fine
14	-03				50		50		Clarity	Cr = Clear	Cy = Cloudy	Td = Turbid
15	-04				50		50		Artifacts	Rk = rocks	Sl = Shale	Vg = Vegetation
16	-05				50		50		Color	Bu = blue	Bk = Black	Bn = Brown
17	-06				50		50			Gn = Green	Og = Orange	Rd = Red
18	-07				50		50			Yw = Yellow	Cl = Colorless	
19	-08				50		50		Comments:	Samples for Methods 200.7 or 200.8 Analyses		
20	-09				50		50		If turbidity ≤ 1 NTU no digestion is required unless otherwise required by the project			
21	-10				50		50					
22	-10M				50		50		Prepared By:	mc	Standard Added By:	mc
23	-10S				50		50		Witnessed By:	NT	Extracts Revd. By:	NT 7/25/05
24	G470-01				50		50		Checked By:	NT		
25					50		50		Date Disposed:		Disposed by:	

BATCH: IPG037-W

LABORATORY REPORT FOR

BATTELLE MEMORIAL INSTITUTE

JPL

WET CHEMICAL ANALYSES

SDG#: 05G145

8000

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G145

METHOD 300.0 ANIONS

Ten (10) water samples were received on 07/20/05 for Chloride, Nitrate-N, Nitrite-N and Sulfate analyses by method 300.0 in accordance with "Method for Determination of Inorganic Anions by Ion Chromatography", EPA 600/84-017.

1. Holding Time

Analyses met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limits.

4. Duplicate

Sample G145-02 was analyzed for duplicate. %RPDs were within QC limit.

5. Matrix Spike

Sample G145-02 was spiked. Recoveries were within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

All results were reported as Nitrogen concentration.

SAMPLE RESULTS

METHOD 300.0
CHLORIDE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G145

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
NBLK1W	ICG029WB	ND	1	NA	.2	.1	07/25/0513:06	NA	AG25-04	AG25-01	ICG029W	NA	NA
LCS1W	ICG029WL	4.52	1	NA	.2	.1	07/25/0513:20	NA	AG25-05	AG25-01	ICG029W	NA	NA
LCD1W	ICG029WC	4.58	1	NA	.2	.1	07/25/0513:34	NA	AG25-06	AG25-01	ICG029W	NA	NA
MW-25-5	G145-01	13.4	5	NA	1	.5	07/25/0516:01	NA	AG25-16	AG25-13	ICG029W	07/19/05	07/20/05
MW-25-4	G145-02	32.6	10	NA	2	1	07/25/0516:15	NA	AG25-17	AG25-13	ICG029W	07/19/05	07/20/05
MW-25-4DUP	G145-02D	32.6	10	NA	2	1	07/25/0516:29	NA	AG25-18	AG25-13	ICG029W	07/19/05	07/20/05
MW-25-4MS	G145-02M	82.3	10	NA	2	1	07/25/0516:44	NA	AG25-19	AG25-13	ICG029W	07/19/05	07/20/05
MW-25-3	G145-03	33.4	10	NA	2	1	07/25/0517:03	NA	AG25-20	AG25-13	ICG029W	07/19/05	07/20/05
MW-25-2	G145-04	34	10	NA	2	1	07/25/0517:17	NA	AG25-21	AG25-13	ICG029W	07/19/05	07/20/05
MW-25-1	G145-05	70	20	NA	4	2	07/25/0517:31	NA	AG25-22	AG25-13	ICG029W	07/19/05	07/20/05
MW-19-5	G145-06	68.4	10	NA	2	1	07/25/0517:45	NA	AG25-23	AG25-13	ICG029W	07/20/05	07/20/05
MW-19-4	G145-07	54.4	10	NA	2	1	07/25/0517:59	NA	AG25-24	AG25-13	ICG029W	07/20/05	07/20/05
DUPE-1-7/20/05	G145-08	54.8	10	NA	2	1	07/25/0518:42	NA	AG25-27	AG25-25	ICG029W	07/20/05	07/20/05
MW-19-3	G145-09	39.9	10	NA	2	1	07/25/0518:56	NA	AG25-28	AG25-25	ICG029W	07/20/05	07/20/05
MW-19-2	G145-10	92	20	NA	4	2	07/25/0519:10	NA	AG25-29	AG25-25	ICG029W	07/20/05	07/20/05

8003

dr

METHOD 300.0
NITRATE-N

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G145

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
M8LK1W	ICG023WB	ND	1	NA	.1	.05	07/20/0519:41	NA	AG20-33	AG20-25	ICG023W	NA	NA
LCS1W	ICG023WL	2.44	1	NA	.1	.05	07/20/0519:59	NA	AG20-34	AG20-25	ICG023W	NA	NA
LCD1W	ICG023WC	2.43	1	NA	.1	.05	07/20/0520:13	NA	AG20-35	AG20-25	ICG023W	NA	NA
MW-25-5	G145-01	ND	1	NA	.1	.05	07/20/0521:10	NA	AG20-39	AG20-36	ICG023W	07/19/05	07/20/05
MW-25-4	G145-02	5.38E	1	NA	.1	.05	07/20/0521:24	NA	AG20-40	AG20-36	ICG023W	07/19/05	07/20/05
MW-25-4DUP	G145-02D	5.37E	1	NA	.1	.05	07/20/0521:38	NA	AG20-41	AG20-36	ICG023W	07/19/05	07/20/05
MW-25-4MS	G145-02M	7.86E	1	NA	.1	.05	07/20/0521:52	NA	AG20-42	AG20-36	ICG023W	07/19/05	07/20/05
MW-25-3	G145-03	9.7E	1	NA	.1	.05	07/20/0522:06	NA	AG20-43	AG20-36	ICG023W	07/19/05	07/20/05
MW-25-2	G145-04	3.01	1	NA	.1	.05	07/20/0522:20	NA	AG20-44	AG20-36	ICG023W	07/19/05	07/20/05
MW-25-1	G145-05	13.1E	1	NA	.1	.05	07/20/0522:34	NA	AG20-45	AG20-36	ICG023W	07/19/05	07/20/05
MW-19-5	G145-06	6.67E	1	NA	.1	.05	07/20/0522:48	NA	AG20-46	AG20-36	ICG023W	07/20/05	07/20/05
MW-19-4	G145-07	8.44E	1	NA	.1	.05	07/21/0500:13	NA	AG20-52	AG20-48	ICG023W	07/20/05	07/20/05
DUPE-1-7/20/05	G145-08	8.89E	1	NA	.1	.05	07/21/0500:27	NA	AG20-53	AG20-48	ICG023W	07/20/05	07/20/05
MW-19-3	G145-09	10.3E	1	NA	.1	.05	07/21/0500:41	NA	AG20-54	AG20-48	ICG023W	07/20/05	07/20/05
MW-19-2	G145-10	18.1E	1	NA	.1	.05	07/21/0500:55	NA	AG20-55	AG20-48	ICG023W	07/20/05	07/20/05
M8LK2W	ICG029WB	ND	1	NA	.1	.05	07/25/0513:06	NA	AG25-04	AG25-01	ICG029W	NA	NA
LCS2W	ICG029WL	2.42	1	NA	.1	.05	07/25/0513:20	NA	AG25-05	AG25-01	ICG029W	NA	NA
LCD2W	ICG029WC	2.43	1	NA	.1	.05	07/25/0513:34	NA	AG25-06	AG25-01	ICG029W	NA	NA
MW-25-4DL	G145-02T	4.99	10	NA	1	.5	07/25/0516:15	NA	AG25-17	AG25-13	ICG029W	07/19/05	07/20/05
MW-25-4DUP	G145-02Z	5.03	10	NA	1	.5	07/25/0516:29	NA	AG25-18	AG25-13	ICG029W	07/19/05	07/20/05
MW-25-4MS	G145-02G	29.7	10	NA	1	.5	07/25/0516:44	NA	AG25-19	AG25-13	ICG029W	07/19/05	07/20/05
MW-25-3DL	G145-03T	7.98	10	NA	1	.5	07/25/0517:03	NA	AG25-20	AG25-13	ICG029W	07/19/05	07/20/05
MW-25-1DL	G145-05T	10.9	20	NA	2	1	07/25/0517:31	NA	AG25-22	AG25-13	ICG029W	07/19/05	07/20/05
MW-19-5DL	G145-06T	5.99	10	NA	1	.5	07/25/0517:45	NA	AG25-23	AG25-13	ICG029W	07/20/05	07/20/05
MW-19-4DL	G145-07T	7.19	10	NA	1	.5	07/25/0517:59	NA	AG25-24	AG25-13	ICG029W	07/20/05	07/20/05
DUPE-1-7/20/05DL	G145-08T	7.6	10	NA	1	.5	07/25/0518:42	NA	AG25-27	AG25-25	ICG029W	07/20/05	07/20/05
MW-19-3DL	G145-09T	8.49	10	NA	1	.5	07/25/0518:56	NA	AG25-28	AG25-25	ICG029W	07/20/05	07/20/05
MW-19-2DL	G145-10T	14.2	20	NA	2	1	07/25/0519:10	NA	AG25-29	AG25-25	ICG029W	07/20/05	07/20/05

8004

METHOD 300.0
NITRITE-N

Client : BATTILLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G145

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
M6LK1W	ICG023WB	ND	1	NA	.1	.05	07/20/0519:41	NA	AG20-33	AG20-25	ICG023W	NA	NA
LCS1W	ICG023WL	2.41	1	NA	.1	.05	07/20/0519:59	NA	AG20-34	AG20-25	ICG023W	NA	NA
LCD1W	ICG023WC	2.39	1	NA	.1	.05	07/20/0520:13	NA	AG20-35	AG20-25	ICG023W	NA	NA
MW-25-5	G145-01	ND	1	NA	.1	.05	07/20/0521:10	NA	AG20-39	AG20-36	ICG023W	07/19/05	07/20/05
MW-25-4	G145-02	ND	1	NA	.1	.05	07/20/0521:24	NA	AG20-40	AG20-36	ICG023W	07/19/05	07/20/05
MW-25-4DUP	G145-02D	ND	1	NA	.1	.05	07/20/0521:38	NA	AG20-41	AG20-36	ICG023W	07/19/05	07/20/05
MW-25-4MS	G145-02M	2.21	1	NA	.1	.05	07/20/0521:52	NA	AG20-42	AG20-36	ICG023W	07/19/05	07/20/05
MW-25-3	G145-03	ND	1	NA	.1	.05	07/20/0522:06	NA	AG20-43	AG20-36	ICG023W	07/19/05	07/20/05
MW-25-2	G145-04	ND	1	NA	.1	.05	07/20/0522:20	NA	AG20-44	AG20-36	ICG023W	07/19/05	07/20/05
MW-25-1	G145-05	ND	1	NA	.1	.05	07/20/0522:34	NA	AG20-45	AG20-36	ICG023W	07/19/05	07/20/05
MW-19-5	G145-06	ND	1	NA	.1	.05	07/20/0522:48	NA	AG20-46	AG20-36	ICG023W	07/20/05	07/20/05
MW-19-4	G145-07	ND	1	NA	.1	.05	07/21/0500:13	NA	AG20-52	AG20-48	ICG023W	07/20/05	07/20/05
DUPE-1-7/20/05	G145-08	.101	1	NA	.1	.05	07/21/0500:27	NA	AG20-53	AG20-48	ICG023W	07/20/05	07/20/05
MW-19-3	G145-09	ND	1	NA	.1	.05	07/21/0500:41	NA	AG20-54	AG20-48	ICG023W	07/20/05	07/20/05
MW-19-2	G145-10	ND	1	NA	.1	.05	07/21/0500:55	NA	AG20-55	AG20-48	ICG023W	07/20/05	07/20/05

METHOD 300.0
SULFATE

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G145

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
NBLK1W	ICG029WB	ND	1	NA	.5	.25	07/25/0513:06	NA	AG25-04	AG25-01	ICG029W	NA	NA
LCS1W	ICG029WL	6.91	1	NA	.5	.25	07/25/0513:20	NA	AG25-05	AG25-01	ICG029W	NA	NA
LCD1W	ICG029WC	6.92	1	NA	.5	.25	07/25/0513:34	NA	AG25-06	AG25-01	ICG029W	NA	NA
NW-25-5	G145-01	54.1	5	NA	2.5	1.25	07/25/0516:01	NA	AG25-16	AG25-13	ICG029W	07/19/05	07/20/05
NW-25-4	G145-02	63.6	10	NA	5	2.5	07/25/0516:15	NA	AG25-17	AG25-13	ICG029W	07/19/05	07/20/05
NW-25-4DUP	G145-02D	63.6	10	NA	5	2.5	07/25/0516:29	NA	AG25-18	AG25-13	ICG029W	07/19/05	07/20/05
NW-25-4MS	G145-02M	138	10	NA	5	2.5	07/25/0516:44	NA	AG25-19	AG25-13	ICG029W	07/19/05	07/20/05
NW-25-3	G145-03	62.3	10	NA	5	2.5	07/25/0517:03	NA	AG25-20	AG25-13	ICG029W	07/19/05	07/20/05
NW-25-2	G145-04	82.4	10	NA	5	2.5	07/25/0517:17	NA	AG25-21	AG25-13	ICG029W	07/19/05	07/20/05
NW-25-1	G145-05	127	20	NA	10	5	07/25/0517:31	NA	AG25-22	AG25-13	ICG029W	07/19/05	07/20/05
NW-19-5	G145-06	75.3	10	NA	5	2.5	07/25/0517:45	NA	AG25-23	AG25-13	ICG029W	07/20/05	07/20/05
NW-19-4	G145-07	57.8	10	NA	5	2.5	07/25/0517:59	NA	AG25-24	AG25-13	ICG029W	07/20/05	07/20/05
DUPE-1-7/20/05	G145-08	58.1	10	NA	5	2.5	07/25/0518:42	NA	AG25-27	AG25-25	ICG029W	07/20/05	07/20/05
NW-19-3	G145-09	42.2	10	NA	5	2.5	07/25/0518:56	NA	AG25-28	AG25-25	ICG029W	07/20/05	07/20/05
NW-19-2	G145-10	135	20	NA	10	5	07/25/0519:10	NA	AG25-29	AG25-25	ICG029W	07/20/05	07/20/05

8006

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QC SUMMARIES

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G145

METHOD: METHOD 300.0

MATRIX: WATER % MOISTURE: NA

DILUTION FACTOR: 1 1

SAMPLE ID: MBLK1W

LAB SAMP ID: ICG029WB ICG029WC

LAB FILE ID: AG25-04 AG25-05 AG25-06

DATE EXTRACTED: NA DATE COLLECTED: NA

DATE ANALYZED: 07/25/0513:20 07/25/0513:34

PREP. BATCH: ICG029W ICG029W

CALIB. REF: AG25-01 AG25-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Chloride-Cl	ND	5	4.52	90	5	4.58	92	1	90-110	20

8008

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G145
METHOD: METHOD 300.0
=====

MATRIX: WATER
DILUTION FACTOR: 10
SAMPLE ID: MM-25-4
LAB SAMP ID: G145-02
LAB FILE ID: AG25-17
DATE EXTRACTED: NA
DATE ANALYZED: 07/25/05 16:15
PREP. BATCH: ICG029W
CALIB. REF: AG25-13

% MOISTURE: NA
DATE COLLECTED: 07/19/05
DATE RECEIVED: 07/20/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Chloride-Cl	32.6	50	82.3	99	80-120

8009

8

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G145

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 10
SAMPLE ID: MW-25-4
EMAX SAMP ID: G145-02
LAB FILE ID: AG25-17
DATE EXTRACTED: NA
DATE ANALYZED: 07/25/05 16:15
PREP. BATCH: ICG029W
CALIB. REF: AG25-13

% MOISTURE: NA
DATE COLLECTED: 07/19/05
DATE RECEIVED: 07/20/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
Chloride-cl	32.6	32.6	0	20

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G145

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICG023WL ICG023WC
LAB FILE ID: AG20-34 AG20-35
DATE EXTRACTED: NA
DATE ANALYZED: 07/20/0519:41 07/20/0520:13
PREP. BATCH: ICG023W ICG023W
CALIB. REF: AG20-25 AG20-25

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrite-N	ND	2.5	2.41	96	2.5	2.39	96	1	90-110	20

8011

2

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G145
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-25-4
LAB SAMP ID: G145-02M
LAB FILE ID: AG20-42
DATE EXTRACTED: NA
DATE ANALYZED: 07/20/0521:24
PREP. BATCH: ICG023W
CALIB. REF: AG20-36

% MOISTURE: NA
DATE COLLECTED: 07/19/05
DATE RECEIVED: 07/20/05

ACCESSION:

PARAMETER	SNPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Nitrite-N	ND	2.5	2.21	88	80-120

80118

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G145

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-25-4
EMAX SAMP ID: G145-02
LAB FILE ID: AG20-41
DATE EXTRACTED: NA
DATE ANALYZED: 07/20/0521:24
PREP. BATCH: ICG023W
CALIB. REF: AG20-36

% MOISTURE: NA

DATE COLLECTED: 07/19/05
DATE RECEIVED: 07/20/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
Nitrite-N	ND	ND	0	20

8013

h

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G145

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICG023WL ICG023WC
LAB FILE ID: AG20-34 AG20-35
DATE EXTRACTED: NA DATE COLLECTED: NA
DATE ANALYZED: 07/20/0519:41 07/20/0520:13
PREP. BATCH: ICG023W ICG023W
CALIB. REF: AG20-25 AG20-25

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	2.5	2.44	97	2.5	2.43	97	0	90-110	20

8014

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G145
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK2W
LAB SAMP ID: ICG029WL ICG029WC
LAB FILE ID: AG25-05 AG25-06
DATE EXTRACTED: NA
DATE ANALYZED: 07/25/0513:20 07/25/0513:34
PREP. BATCH: ICG029W ICG029W
CALIB. REF: AG25-01 AG25-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Nitrate-N	ND	2.5	2.42	97	2.5	2.43	97	0	90-110	20

8015

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G145
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-25-4
LAB SAMP ID: G145-02M
LAB FILE ID: AG20-42
DATE EXTRACTED: NA
DATE ANALYZED: 07/20/0521:24
PREP. BATCH: ICG023W
CALIB. REF: AG20-36

% MOISTURE: NA
DATE COLLECTED: 07/19/05
DATE RECEIVED: 07/20/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Nitrate-N	5.38	2.5	7.86	99	80-120

8016

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G145
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 10
SAMPLE ID: MW-25-4DL
LAB SAMP ID: G145-02G
LAB FILE ID: AG25-19
DATE EXTRACTED: NA
DATE ANALYZED: 07/25/0516:15
PREP. BATCH: ICG029W
CALIB. REF: AG25-13

% MOISTURE: NA
DATE COLLECTED: 07/19/05
DATE RECEIVED: 07/20/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Nitrate-N	4.99	25	29.7	99	80-120

8017

2

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G145

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-25-4
EMAX SAMP ID: G145-02D
LAB FILE ID: AG20-41
DATE EXTRACTED: NA
DATE ANALYZED: 07/20/0521:24
PREP. BATCH: ICG023W
CALIB. REF: AG20-36

% MOISTURE: NA

DATE COLLECTED: 07/19/05
DATE RECEIVED: 07/20/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
Nitrate-N	5.38	5.37	0	20

8018

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G145

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 10
SAMPLE ID: MW-25-4DL
EMAX SAMP ID: G145-02T
LAB FILE ID: AG25-17
DATE EXTRACTED: NA
DATE ANALYZED: 07/25/05 16:15
PREP. BATCH: ICG029W
CALIB. REF: AG25-13

% MOISTURE: NA
DATE COLLECTED: 07/19/05
DATE RECEIVED: 07/20/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
Nitrate-N	4.99	5.03	1	20

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G145
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: ICG029WL ICG029WC
LAB FILE ID: AG25-04 AG25-06
DATE EXTRACTED: NA DATE COLLECTED: NA
DATE ANALYZED: 07/25/0513:20 07/25/0513:34
PREP. BATCH: ICG029W ICG029W
CALIB. REF: AG25-01 AG25-01

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Sulfate	ND	7.5	6.91	92	7.5	6.92	92	0	90-110	20

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G145
METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 10
SAMPLE ID: MW-25-4
LAB SAMP ID: G145-02M
LAB FILE ID: AG25-19
DATE EXTRACTED: NA
DATE ANALYZED: 07/25/05 16:15
PREP. BATCH: ICG029W
CALIB. REF: AG25-13
% MOISTURE: NA
DATE COLLECTED: 07/19/05
DATE RECEIVED: 07/20/05

ACCESSION:

PARAMETER	SAMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Sulfate	63.6	75	138	100	80-120

8021

21

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G145

METHOD: METHOD 300.0

MATRIX: WATER
DILUTION FACTOR: 10
SAMPLE ID: MW-25-4
EMAX SAMP ID: G145-02
LAB FILE ID: AG25-17
DATE EXTRACTED: NA
DATE ANALYZED: 07/25/05 16:29
PREP. BATCH: ICG029W
CALIB. REF: AG25-13

MATRIX: WATER
DILUTION FACTOR: 10
SAMPLE ID: MW-25-4DUP
EMAX SAMP ID: G145-02D
LAB FILE ID: AG25-18
DATE EXTRACTED: NA
DATE ANALYZED: 07/25/05 16:29
PREP. BATCH: ICG029W
CALIB. REF: AG25-13

% MOISTURE: NA
DATE COLLECTED: 07/19/05
DATE RECEIVED: 07/20/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
Sulfate	63.6	63.6	0	20

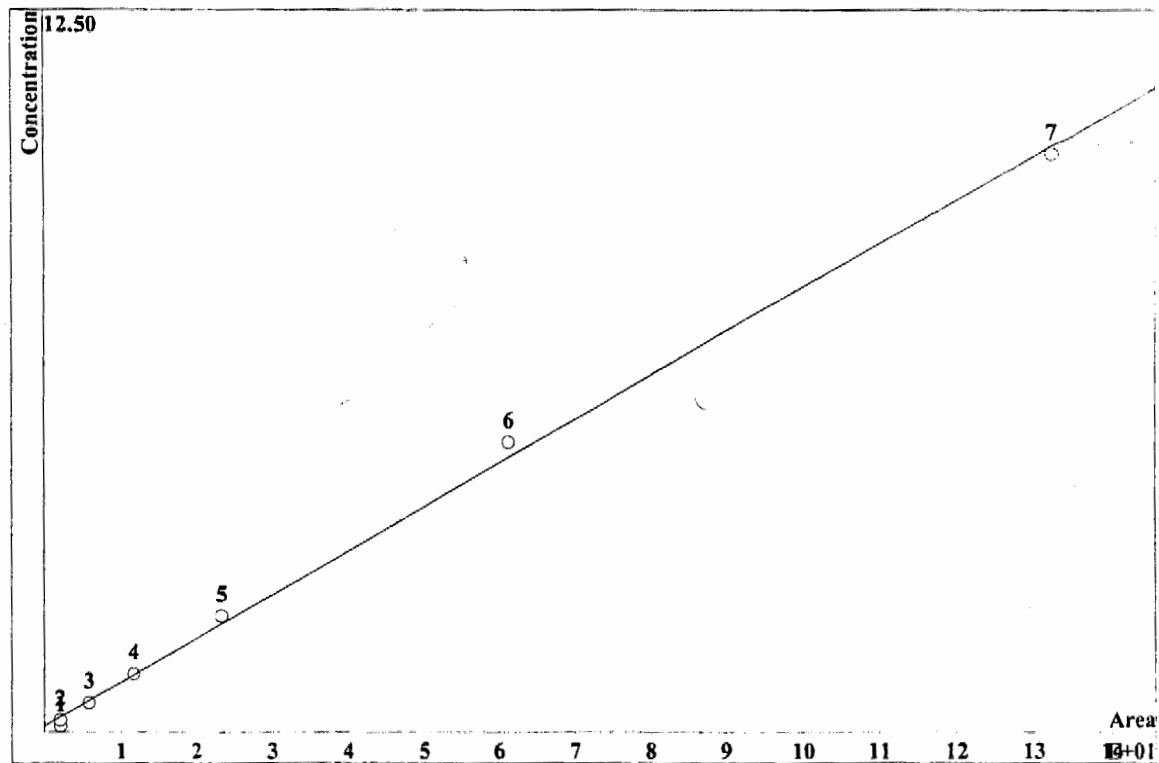
INITIAL CALIBRATIONS

IC Result Check FormVersion : qG1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AG12-01	IB	FCIBNPS	0	0	0	0	0	0	0	p7121933	1
AG12-02	S0	FCIBNPS	0	0	0	0	0	0	0	p7121947	1
AG12-03	S1	FCIBNPS	0.20922	0.26528	0.13263	0.17713	0.15064	0.23059	0.62598	p7122001	1
AG12-04	S2	FCIBNPS	0.27777	0.26131	0.22143	0.24989	0.23142	0.30903	0.72351	p7122016	1
AG12-05	S3	FCIBNPS	0.58991	0.54378	0.49016	0.55127	0.49616	0.56439	1.454	p7122030	1
AG12-06	S4	FCIBNPS	1.0109	0.98258	0.97309	1.0085	0.95747	1.027	2.868	p7122044	1
AG12-07	S5	FCIBNPS	1.9049	1.8679	1.9644	1.9839	1.9331	2.0024	5.7811	p7122058	1
AG12-08	S6	FCIBNPS	4.9656	4.7397	5.0183	4.9153	5.0312	4.8329	15.101	p7122112	1
AG12-09	S7	FCIBNPS	10.029	10.139	10.729	10.041	11.159	10.073	32.87	p7122126	1
AG12-10	ICV	FCIBNPS	97.2%	92.9%	97.1%	99.8%	97%	97.6%	97.4%	p7122140	1
AG12-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p7122154	1
AG12-12	CCV1	FCIBNPS	93.8%	90%	94.6%	96.4%	93.3%	97%	94.4%	p7122208	1
AG12-13	CCB1	FCIBNPS	0	0	0	0	0	0	0	p7122222	1
AG12-14	ICG011WB	FCIBNPS	0	0	0	0	0	0	0	p7122236	1
AG12-15	ICG011WL	FCIBNPS	4.9443	2.4394	2.4005	5.0644	2.3517	4.8648	7.0588	p7122250	1
AG12-16	ICG011WC	FCIBNPS	4.9971	2.4088	2.3901	5.0721	2.3585	5.016	7.2809	p7122305	1
AG12-17	MRL	FCIBNPS	0	0.25633	0	0	0.14022	0	0.49989	p7122319	1
AG12-18	G608-01	FCIBNPS	0	17.852	0	0	4.4945	0	15.463	p7122333	5
AG12-19	G608-02	FCIBNPS	0	19.873	0	0	2.0438	0	15.346	p7122347	5
AG12-20	G608-02D	FCIBNPS	0	19.907	0	0	2.0568	0	15.409	p7130001	5
AG12-21	G608-02M	FCIBNPS	25.496	32.238	12.127	24.026	14.648	25.773	51.746	p7130015	5
AG12-22	G058-17	FCIBNPS	0	0.86159	0	0	0.13449	0	5.2827	p7130029	1
AG12-23	RINSE	FCIBNPS	0	0	0	0	0	0	0	p7130043	1
AG12-24	CCV2	FCIBNPS	100.4%	95.6%	95.5%	101.3%	94.3%	100.6%	97.8%	p7130057	1
AG12-25	CCB2	FCIBNPS	0	0	0	0	0	0	0	p7130111	1
AG12-26	G058-18	F*IBNP*	0.42065	23.035E	0	2.6521	0	0	69.943E	p7130125	1
AG12-27	G058-19	FCIBNP*	0.52238	8.3145	0	0	0	0	63.422E	p7130139	1
AG12-28	G058-20	FCIBNP*	0.52701	8.2627	0	0	0	0	63.425E	p7130153	1
AG12-29	G058-21	FCIBNP*	0.49273	6.0643	0	0	0.091894	0	61.446E	p7130208	1
AG12-30	G058-22	F*IBNP*	0	995.75E	0	0.23033	0	0	15.385E	p7130222	1
AG12-31	G058-23	FCIBNPS	0.61192	6.4321	0	0.2531	0	0	7.0539	p7130236	1
AG12-32	G058-24	FCIBNPS	0.32896	2.8076	0	3.1748	0	0	10.156	p7130250	1
AG12-33	G058-25	F*IBNP*	0.34649	11.301E	0	2.5751	0	0	89.86E	p7130304	1
AG12-34	RINSE	FCIBNPS	0	0	0	0	0	0	0	p7130318	1
AG12-35	RINSE	FCIBNPS	0	0	0	0	0	0	0	p7130332	1
AG12-36	CCV3	FCIBNPS	100.2%	95.6%	95.6%	101.8%	94.8%	96.8%	97.9%	p7130346	1
AG12-37	CCB3	FCIBNPS	0	0	0	0	0	0.1887	0	p7130400	1
AG12-38	MRL	FCIBNPS	0	0.25923	0	0	0.13842	0	0.49672	p7130414	1
AG12-39	MDL	FCIBNPS	0	0.25447	0	0	0.13519	0	0.48865	p7130428	1
AG12-40	CCV4	FCIBNPS	96.9%	93.9%	92.9%	99.9%	92.5%	98%	95.5%	p7130442	1
AG12-41	CCB4	FCIBNPS	0.21534	0	0.090606	0	0	0.92427	0	p7130456	1

CALIBRATION OF COMPONENT chloride

Method: IC100-G12.mtw
 Equation: $Q = 0.0757087 \cdot A + 0.100061$
 RSD: 6.184 %
 Correlation coefficient: 0.999136



K3 = 0 K2 = 0 K1 = 0.0757087 K0 = 0.100061

Base: Area

Ref.channel: Cond

ISTD:

Formula: Linear

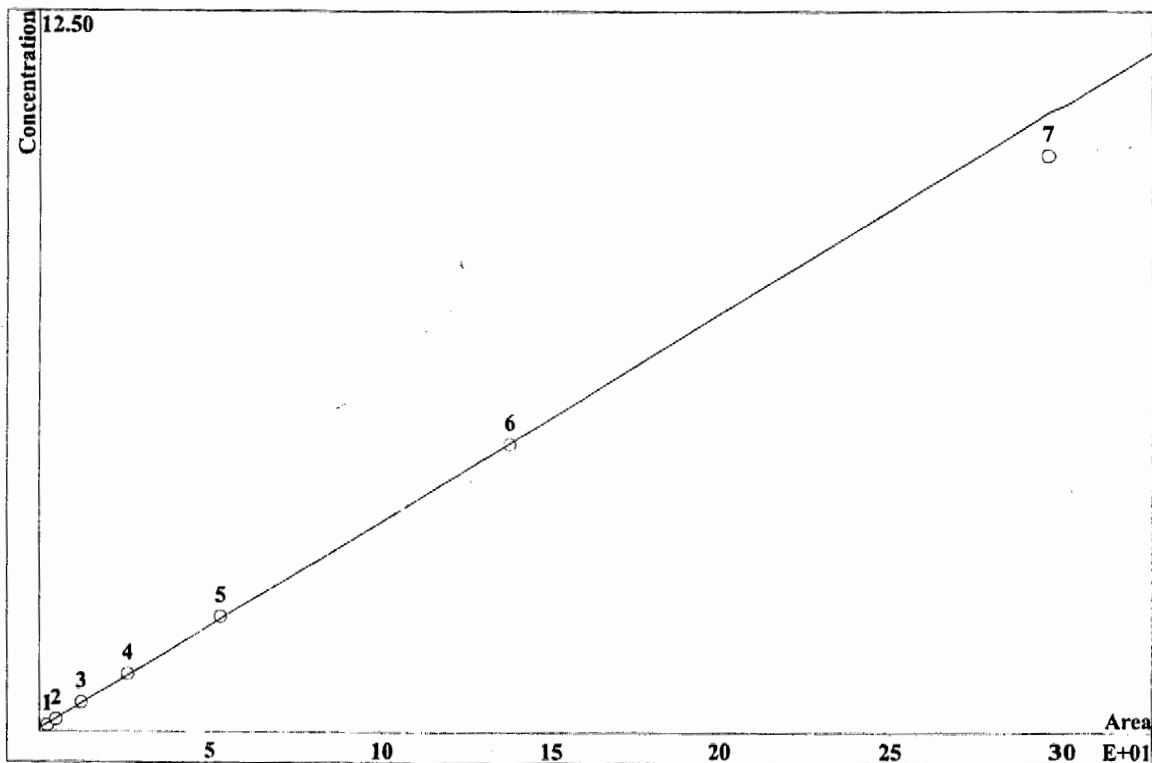
Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2455	2.182 ✓	0.1	1	3.4	Yes	p7122001.chw
2	0.2371	2.13 ✓	0.2	1	3.4	Yes	p7122016.chw
3	0.6644	5.861 ✓	0.5	1	3.4	Yes	p7122030.chw
4	1.319	11.66 ✓	1	1	3.4	Yes	p7122044.chw
5	2.661	23.35 ✓	2	1	3.4	Yes	p7122058.chw
6	7.225	61.28 ✓	5	1	3.4	Yes	p7122112.chw
7	15.92	132.6 ✓	10	1	3.4	Yes	p7122126.chw

7-15-05
8025

CALIBRATION OF COMPONENT nitrite

Method: IC100-G12.mtw
 Equation: $Q = 0.0360261 \cdot A + 0.0453635$
 RSD: 2.142 %
 Correlation coefficient: 0.999886



K3 = 0 K2 = 0 K1 = 0.0360261 K0 = 0.0453635

Base: Area

Ref.channel: Cond

ISTD:

Formula: Linear

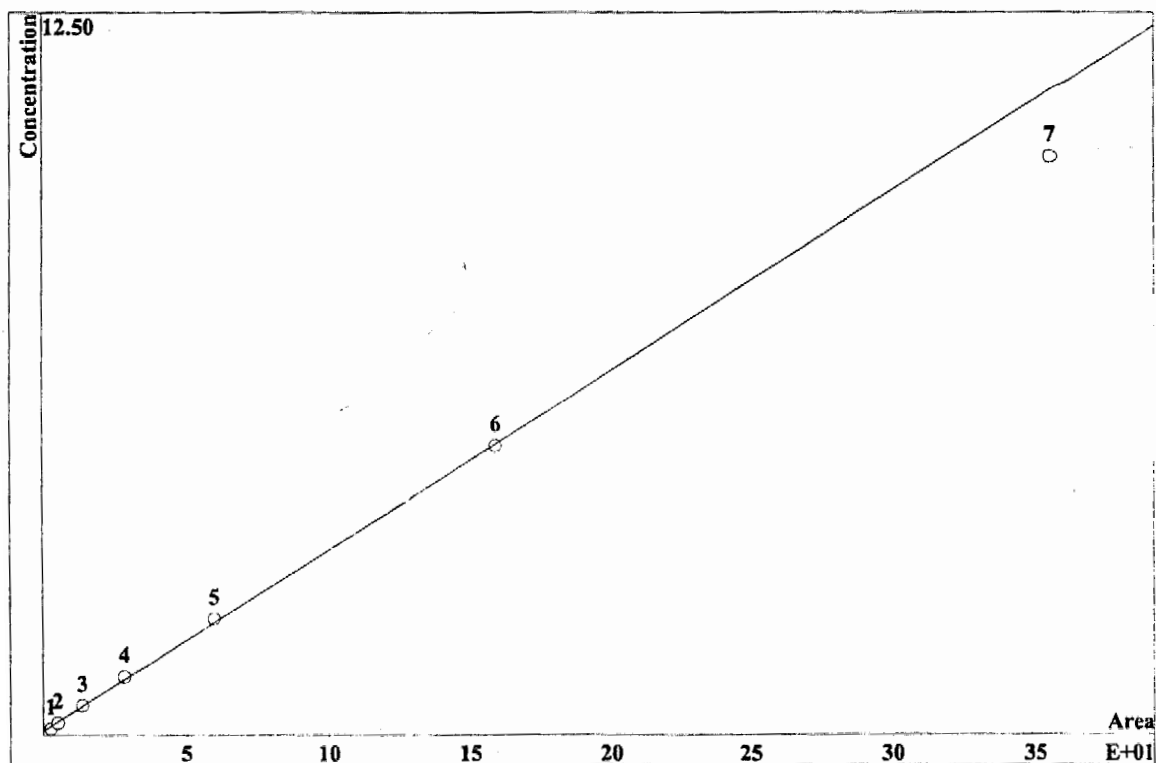
Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2338	2.422	0.1	1	4.04	Yes	p7122001.cnw
2	0.4699	4.887	0.2	1	4.04	Yes	p7122016.cnw
3	1.199	12.35	0.5	1	4.04	Yes	p7122030.cnw
4	2.505	25.75	1	1	4.04	Yes	p7122044.cnw
5	5.149	53.27	2	1	4.04	Yes	p7122058.cnw
6	13.25	138	5	1	4.04	Yes	p7122112.cnw
7	27.46	296.6	10	1	4.04	No	p7122126.cnw

7-15-05
8026"

CALIBRATION OF COMPONENT nitrate

Method: IC100-G12.mtw
 Equation: $Q = 0.0311912 \cdot A + 0.0620763$
 RSD: 3.547 %
 Correlation coefficient: 0.999689



K3 = 0 K2 = 0 K1 = 0.0311912 K0 = 0.0620763
 Base: Area
 Ref.channel: Cond
 ISTD:
 Formula: Linear
 Weight: 1

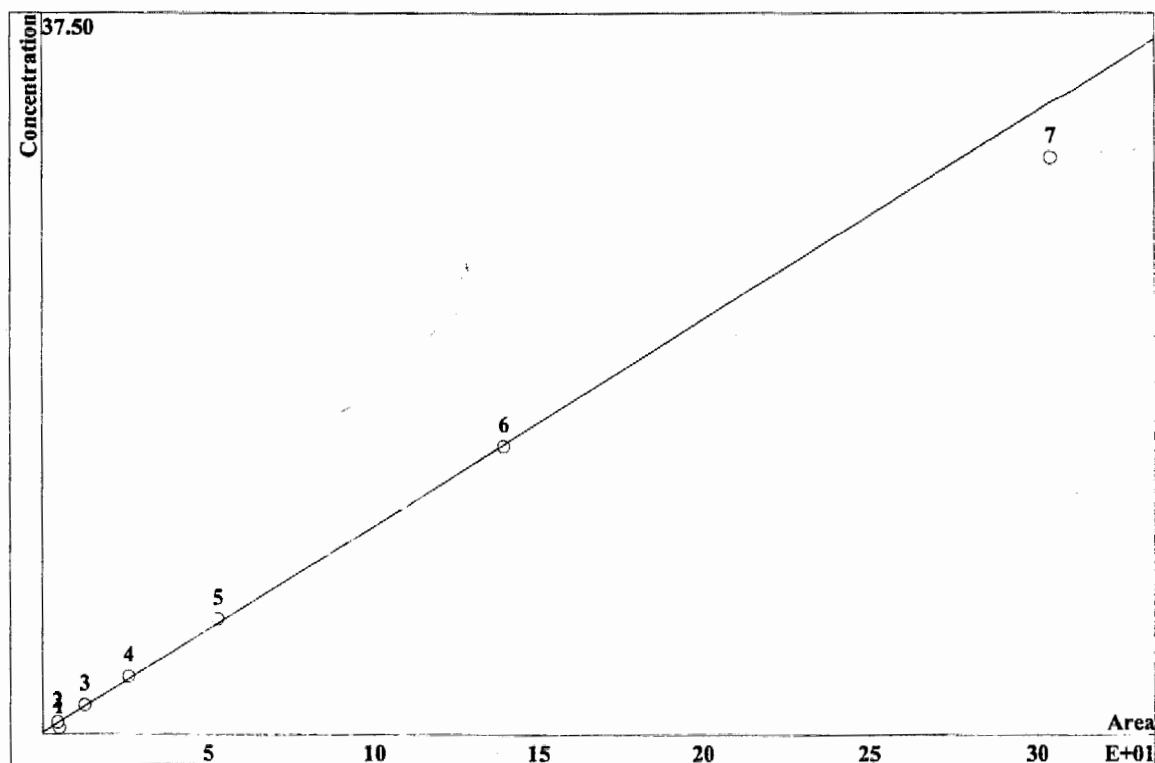
Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.2165	2.84 ✓	0.1	1	5.72	Yes	p7122001.chw
2	0.415	5.429 ✓	0.2	1	5.72	Yes	p7122016.chw
3	1.072	13.92 ✓	0.5	1	5.72	Yes	p7122030.chw
4	2.23	28.71 ✓	1	1	5.72	Yes	p7122044.chw
5	4.699	59.99 ✓	2	1	5.72	Yes	p7122058.chw
6	12.88	159.3 ✓	5	1	5.72	Yes	p7122112.chw
7	29.17	355.8 ✗	10	1	5.72	No	p7122126.chw

70
1-15-05

8027

CALIBRATION OF COMPONENT sulfate

Method: IC100-G12.mtw
 Equation: $Q = 0.10777 \cdot A + 0.0673535$
 RSD: 4.885 %
 Correlation coefficient: 0.999410



K3 = 0 K2 = 0 K1 = 0.10777 K0 = 0.0673535

Base: Area

Ref.channel: Cond

ISTD:

Formula: Linear

Weight: 1

Level	Height	Area	Conc.	Vol/Dil	Retention	Used	File
1	0.3229	5.184 ✓	0.3	1	8.36	Yes	p7122001.chw
2	0.2916	4.664 ✓	0.6	1	8.36	Yes	p7122016.chw
3	0.8086	12.87 ✓	1.5	1	8.36	Yes	p7122030.chw
4	1.631	25.99 ✓	3	1	8.36	Yes	p7122044.chw
5	3.365	53.02 ✓	6	1	8.36	Yes	p7122058.chw
6	9.065	139.5 ✓	15	1	8.36	Yes	p7122112.chw
7	20.13	304.4	30	1	8.36	No	p7122126.chw

100
7-15-05

8028

***SECOND SOURCE
VERIFICATION***

IC Result Check FormVersion : QG1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AG12-10	ICV	FCIBNPS	97.2%	92.9%	97.1%	99.8%	97%	97.6%	97.4%	p7122140	1
AG12-11	ICB	FCIBNPS	0	0	0	0	0	0	0	p7122154	1
AG12-12	CCV1	FCIBNPS	93.8%	90%	94.6%	96.4%	93.3%	97%	94.4%	p7122208	1
AG12-13	CCB1	FCIBNPS	0	0	0	0	0	0	0	p7122222	1
AG12-24	CCV2	FCIBNPS	100.4%	95.6%	95.5%	101.3%	94.3%	100.6%	97.8%	p7130057	1
AG12-25	CCB2	FCIBNPS	0	0	0	0	0	0	0	p7130111	1
AG12-36	CCV3	FCIBNPS	100.2%	95.6%	95.6%	101.8%	94.8%	96.8%	97.9%	p7130346	1
AG12-37	CCB3	FCIBNPS	0	0	0	0	0	0.1887	0	p7130400	1
AG12-40	CCV4	FCIBNPS	96.9%	93.9%	92.9%	99.9%	92.5%	98%	95.5%	p7130442	1
AG12-41	CCB4	FCIBNPS	0.21534	0	0.090606	0	0	0.92427	0	p7130456	1

DAILY CALIBRATIONS

IC Result Check FormVersion : QG1

LFID	LSID	Selection	fluoride	chloride	nitrite ✓	bromide	nitrate ✓	phosphate	sulfate	RawNetID	DF
AG20-01	CCV34	FCIBNPS	96%	91%	100.7%	96.1%	96.2%	99.1%	92.6%	p7201128	1
AG20-02	CCB34	FCIBNPS	0	0	0	0	0	0	0	p7201143	1
AG20-13	CCV35	FCIBNPS	107.5%	91%	100.4%	96.8%	96.4%	108.8%	105.4%	p7201420	1
AG20-14	CCB35	FCIBNPS	0	0	0	0	0	0	0	p7201434	1
AG20-25 ✓	CCV36	FCIBNPS	108.9%	105.4%	100.4%	97.1%	96.6%	109.1%	104.9%	p7201721	1
AG20-26	CCB36	FCIBNPS	0	0	0	0	0	0	0	p7201735	1
AG20-36 ✓	CCV37	FCIBNPS	106.8%	105.4%	100.5%	96.8%	96.5%	107.6%	104.7%	p7202027	1
AG20-37	CCB37	FCIBNPS	0	0	0	0	0	0	0	p7202041	1
AG20-48 ✓	CCV38	FCIBNPS	107.7%	105.6%	99.4%	95.4%	96.7%	105.1%	105.1%	p7202316	1
AG20-49	CCB38	FCIBNPS	0	0	0	0	0	0	0	p7202330	1
AG20-60 ✓	CCV39	FCIBNPS	108.6%	106.5%	100%	96.8%	96.6%	104%	105.1%	p7210205	1
AG20-61	CCB39	FCIBNPS	0	0	0	0	0	0	0	p7210219	1
AG20-67	CCV40	FCIBNPS	109.6%	105.9%	100.3%	96.6%	96.5%	103.8%	105%	p7210344	1
AG20-68	CCB40	FCIBNPS	0	0	0	0	0	0	0	p7210358	1
AG20-69	CCB40	FCIBNPS	0	0	0	0	0	0	0	p7210412	1

IC Result Check FormVersion : QG1

LFID	LSID	Selection	fluoride	chloride	nitrite	bromide	nitrate	phosphate	sulfate	RawNetID	DF
AG25-01 ✓	CCV57	FCIBNPS	94.2%	91%	100.7%	96.4%	96.6%	94.7%	92.8%	p7251224	1
AG25-02	CCB57	FCIBNPS	0	0	0	0	0	0	0	p7251238	1
AG25-13 ✓	CCV58	FCIBNPS	95.6%	91.2%	100.4%	97.1%	96.9%	97.1%	93%	p7251519	1
AG25-14	CCB58	FCIBNPS	0	0	0	0	0	0	0	p7251533	1
AG25-25 ✓	CCV59	FCIBNPS	95.3%	91.4%	100.6%	97.3%	97.4%	97.4%	93.4%	p7251813	1
AG25-26	CCB59	FCIBNPS	0	0.14142	0	0	0	0	0	p7251827	1
AG25-37 ✓	CCV60	FCIBNPS	95.8%	91.5%	100.6%	97.3%	96.8%	97.7%	93.9%	p7252102	1
AG25-38	CCB60	FCIBNPS	0	0	0	0	0	0	0	p7252116	1
AG25-49	CCV61	FCIBNPS	96.1%	91.2%	100.5%	97.3%	96.9%	96.7%	93.2%	p7252353	1
AG25-50	CCB61	FCIBNPS	0	0	0	0	0	0	0	p7260007	1
AG25-61	CCV62	FCIBNPS	95.8%	91.5%	100.7%	97.5%	97.1%	96.6%	93.5%	p7260242	1
AG25-62	CCB62	FCIBNPS	0	0	0	0	0	0	0	p7260256	1
AG25-73	CCV63	FCIBNPS	94.3%	91.2%	97.3%	96.1%	97.7%	96.3%	94%	p7260530	1
AG25-74	CCB63	FCIBNPS	0	0	0	0	0	0	0	p7260544	1
AG25-75	CCV63	FCIBNPS	95.9%	91.3%	97.3%	96.2%	97.7%	94.6%	93.4%	p7260559	1
AG25-76	CCB63	FCIBNPS	0	0	0	0	0	0	0	p7260613	1

ANALYTICAL LOG

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 07/12/05

Time: 19:33

Ending Date: 07/13/05

Time: 04:56

Book # A100-001

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Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix		Notes
				S	W	
* 1	AG12-01	2B	1		✓	
* 2	02	SC				
* 3	03	S1				
* 4	04	S2				
* 5	05	S3				
* 6	06	S4				
* 7	07	S5				
* 8	08	S6				
* 9	09	S7				
* 10	10	ICV				
* 1	11	ICB				
* 2	12	CCV				
* 3	13	CCB				
* 4	14	ICG01WB				
* 5	15	ICG01WB				
* 6	16	ICG01WB				
* 7	17	MRL				
* 8	18	G605-01				DF-ID
* 9	19	G605-02				
* 20	20	G605-02b				
* 1	21	G605-02M				
* 2	22	G605-03				
* 3	23	RINSE				
* 4	24	CV2				
* 5	25	CR2				
* 6	26	G605-06				
* 7	27	G605-05				
* 8	28	G605-20				
* 9	29	G605-21				
* 30	30	G605-22				

ANALYTICAL BATCH # IC G011W

Analyzed By:

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ANALYSIS RUN LOG FOR IC

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 03/12/05 Time: 14:33 Ending Date: 03/13/05 Time: 04:56 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Notes
* 1	AG12-31	G056-23	1	✓	
* 2	32	G056-24			
* 3	33	G056-25			
* 4	34	RINSE			
* 5	35	RINSE			
* 6	36	CCV3			
* 7	37	CCR3			
* 8	38	HRL			
* 9	39	MPL			
* 10	40	CCV4			
* 11	41	CCR4			
* 2					
* 3					
* 4					
* 5					
* 6					
* 7					
* 8					
* 9					
* 0					
* 1					
* 2					
* 3					
* 4					
* 5					
* 6					
* 7					
* 8					
* 9					
* 0					

Instrument Number		22100 01 01/12/05	
INITIAL CALIBRATION REFERENCE			
Method File		Date	
ICAL ID			
ICV ID			
Standards-A			
Name	ID	Conc. (mg/L)	
ICAL	S1	F	Cl NO2 Br NO3 P SO4
	S2		
	S3		
	S4		
	S5		
ICV			
CCV			
LCS			
MS			
Standards-B			
Name	ID	Conc. (mg/L)	
ICAL	S1	BrO3	DCA ClO3
	S2		
	S3		
	S4		
ICV			
CCV			
LCS			

Comments:

Analyzed By: cl

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ANALYTICAL BATCH * IC 6011W

ANALYSIS RUN LOG FOR IC

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SOP EMAX-300.0 Rev. No. 3 EMAX-9056 Rev. No. 2 EMAX-300.1 Rev. No. 0

Start Date: 07/20/05 Time: 07:20 Ending Date: 07/21/05 Time: 04:16 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix	Notes
				S W	
* 1	A720-01	CCV34	1		✓
* 2	B7	CCB34			
* 3	05	ICG024WB			
* 4	04	WL			
* 5	05	WL			
* 6	06	G134-02			
* 7	07	03			
* 8	08	04			
* 9	09	06			
* 10	10	07			
* 11	11	RINSE			
* 12	12				
* 13	13	CCV35			
* 14	14	CCB35			
* 15	15	MPL			
* 16	16	G134-06			
* 17	17	09			
* 18	18	09D			
* 19	19	09M			
* 20	20	RINSE			
* 21	21	G136-02			
* 22	22	03			
* 23	23	RINSE			
* 24	24				
* 25	25	CCV136			
* 26	26	CCB136			
* 27	27	G136-04			
* 28	28	05			
* 29	29	06			
* 30	30	07			

INITIAL CALIBRATION REFERENCE									
Method File	Instrument Number	22/00 06 04/05							
ICAL ID	ICAL ID	Date							
ICV ID	ICV ID	Date							
ICAL	ICAL	07/12/05							
ICV	ICV	07/12/05							

Standards-A									
Name	ID	Conc. (mg/L)						SO ₄	
		F	Cl	NO ₂	Br	NO ₃	P		
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
	S ₅								

Standards-B									
Name	ID	Conc. (mg/L)						ClO ₃	
		BrO ₃	DCA						
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
ICV									
CCV									
LCS									

Comments:

Analyzed By: J.K.

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ANALYTICAL BATCH * IC G022W

EMAX LABORATORIES, INC. 1835 W. 302nd St. Torrance, CA 90501

8037

ANALYSIS RUN LOG FOR IC

Page 70

SOP □ EMAX-300.0 Rev. No. 3 □ EMAX-9056 Rev. No. 2 □ EMAX-300.1 Rev. No. 0 □

Start Date: 07/20/05 Time: 11:28 Ending Date: 07/21/05 Time: 04:16 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Notes
* 1	AG000-31	G104-21	100		
* 2	32	↓ 01	500		
* 3	33	ICG023WB	1		
* 4	34	↓ 101			
* 5	35	↓ 102			
* 6	36	CCV137			
* 7	37	CCB137			
* 8	38	G144-01			
* 9	39	G145-01			
* 10	40	↓ 02			
* 11	41	020			
* 12	42	0201			
* 13	43	03			
* 14	44	04			
* 15	45	05			
* 16	46	06			
* 17	47	RINSE			
* 18	48	CCB133			
* 19	49	CCB133			
* 50	50	MRL			
* 1	51	MRL			
* 2	52	G145-17			
* 3	53	08			
* 4	54	09			
* 5	55	↓ 10			
* 6	56	G146-02			
* 7	57	↓ 03			
* 8	58	RINSE			
* 9	59	↓			
* 60	60	CCV139			

INITIAL CALIBRATION REFERENCE									
Instrument Number	22100 cal 07/20/05								
Method File	Date								
ICAL ID									
ICV ID									
Standards-A									
Name	ID	F	Cl	NO ₂	Br	NO ₃	P	SO ₄	Conc. (mg/L)
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
	S ₅								
ICV									
CCV									
LCS									
MS									
Standards-B									
Name	ID	BrO ₃	DCA	ClO ₃	Conc. (mg/L)				
ICAL	S ₁								
	S ₂								
	S ₃								
	S ₄								
ICV									
CCV									
LCS									

Comments:	
Analyzed By: <u>OL</u>	
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ANALYTICAL BATCH * IC G022W** ICG023W

ANALYSIS RUN LOG FOR IC

SOP ☒ EMAX-300.0 Rev. No. 3 ☐ EMAX-9056 Rev. No. 2 ☐ EMAX-300.1 Rev. No. 0 ☐

Start Date: 07/20/05 Time: 11:26 Ending Date: 07/21/05 Time: 04:20 Book # A100-001

Instrument Number		22100						
INITIAL CALIBRATION REFERENCE								
Method File	Date							
ICAL ID								
ICV ID								
Standards-A								
Name	ID	Conc. (mg/L)						
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄
ICAL	S ₁							
	S ₂							
	S ₃							
	S ₄							
	S ₅							
ICV								
CCV								
LCS								
MS								
Standards-B								
Name	ID	Conc. (mg/L)						
		BrO ₃	DCA	ClO ₃				
ICAL	S ₁							
	S ₂							
	S ₃							
	S ₄							
ICV								
CCV								
LCS								

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix		Notes
				S	W	
* 1	AG20-61	CCB 139	1		✓	
* 2	62	6146-04				
* 3	63	↓ 65				
* 4	64	RINSE				
* 5	65	↓				
* 6	66	↓				
* 7	67	CCV140				
* 8	68	CCB140				
* 9	69	EL				
* 10	70	EL				
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 20						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 10						

ANALYTICAL BATCH ** IC 6023W

Comments:

Analyzed By: ad

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ANALYSIS RUN LOG FOR IC

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SOP □ EMAX-300.0 Rev. No. 3 □ EMAX-9056 Rev. No. 2 □ EMAX-300.1 Rev. No. 0 □

Start Date: 07/26/05 Time: 12:24 Ending Date: 07/26/05 Time: 06:44 Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Notes
* 1	AG25 - 01	PCV57	1	✓	
* 2	02	PCV57			
* 3	03	NPI			
* 4	04	ICG07902			
* 5	05	WL			
* 6	06	WL	✓		
* 7	07	G126 - 01	20		
* 8	08	02	50		
* 9	09	03	20		
* 10	10	04	50		
* 11	11	05	10		
* 12	12	06	20		
* 13	13	PCV58	1		
* 14	14	CCV58	1		
* 15	15	G126 - 01	20		
* 16	16	G115 - 01	5		
* 17	17	02	10		
* 18	18	020	10		
* 19	19	024	10		
* 20	20	03	10		
* 21	21	02	10		
* 22	22	05	20		
* 23	23	06	10		
* 24	24	07	10		
* 25	25	PCV59	1		
* 26	26	CCV59	1		
* 27	27	G126 - 03	10		
* 28	28	09	10		
* 29	29	10	20		
* 30	30	G127 - 01	100	✓	

INITIAL CALIBRATION REFERENCE									
Method File	IC100 - 012 .m4w	Date							
ICAL ID	SW5A-12-628-634	07/12/05							
ICV ID	SW5A-12-635-641	07/12/05							

Name	ID	Conc. (mg/L)						
		F	Cl	NO ₂	Br	NO ₃	P	SO ₄
ICAL	S1							
	S2							
	S3							
	S4							
	S5							
ICV								
CCV	SW5A-12-635-641							
LCS	SW5A-12-741-752							
MS v DF	LCS-24710							

Standards-B					
Name	ID	Conc. (mg/L)			
		BrO ₃	DCA	ClO ₃	
ICAL	S1				
	S2				
	S3				
	S4				
ICV					
CCV					
LCS					

Comments:

Analyzed By: dx

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ANALYTICAL BATCH * IC 6029W

ANALYSIS RUN LOG FOR IC

Page 81

SOP □ EMAX-300.0 Rev. No. 3 □ EMAX-9056 Rev. No. 2 □ EMAX-300.1 Rev. No. 0 □

Start Date: 07/15/05

Time: 12:24

Ending Date: 07/26/05

Time: 06:44

Book # A100-001

Sample Prep ID	Data File Name	Lab Sample ID	DF	Matrix S W	Notes
* 31	A0205-31	G127-02	50	✓	
* 32		G144-01	200		
* 33		ICG030WB	1		
* 34		WL	1		
* 35		WL	1		
* 36		G138-02	5		
* 37		ICV00	1		
* 38		ICB00	1		
* 39		G184-02			
* 40		05			
* 41		050			
* 42		0204			
* 43		G102-01	5		
* 44		01	500		
* 45		05	500		
* 46		04	50		
* 47		05			
* 48		06			
* 49		ICV01	1		
* 50		ICB01	1		
* 51		G133-02	20		
* 52		020			
* 53		0204			
* 54		G102-01			
* 55		01	10		
* 56		03	50		
* 57		04	50		
* 58		05	100		
* 59		00	100		
* 60		07	50		

Instrument Number		221030125/05	
INITIAL CALIBRATION REFERENCE			
Method File		Date	
ICAL ID			
ICV ID			
Standards-A			
Name	ID	Conc. (mg/L)	
ICAL	S1	F	Cl NO2 Br NO3 P SO4
	S2		
	S3		
	S4		
	S5		
ICV			
CCV			
LCS			
MS			
Standards-B			
Name	ID	Conc. (mg/L)	
ICAL	S1	BrO3	DCA ClO3
	S2		
	S3		
	S4		
ICV			
CCV			
LCS			
Comments:			
Analyzed By: <u>ack</u>			
This page is checked during the data review process.			

ANALYTICAL BATCH * IC A020W ** ICG030W

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G145**

METHOD 310.1 TOTAL ALKALINITY

Ten (10) water samples were received on 07/20/05 for Total Alkalinity analysis by Method 310.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 310.1
TOTAL ALKALINITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G145

Matrix : WATER
Instrument ID : 153

SAMPLE ID	ENAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ALG016WB	ND	1	NA	5	1	07/27/0513:15	NA	ALG016W-01	NA	ALG016W	NA	NA
LCSTW	ALG016WL	45.7	1	NA	5	1	07/27/0513:20	NA	ALG016W-02	NA	ALG016W	NA	NA
LC01W	ALG016WC	45.7	1	NA	5	1	07/27/0513:25	NA	ALG016W-03	NA	ALG016W	NA	NA
MU-25-5	G145-01	145	1	NA	5	1	07/27/0513:30	NA	ALG016W-04	NA	ALG016W	07/19/05	07/20/05
MU-25-4	G145-02	211	1	NA	5	1	07/27/0513:35	NA	ALG016W-05	NA	ALG016W	07/19/05	07/20/05
MU-25-3	G145-03	175	1	NA	5	1	07/27/0513:40	NA	ALG016W-06	NA	ALG016W	07/19/05	07/20/05
MU-25-2	G145-04	135	1	NA	5	1	07/27/0513:45	NA	ALG016W-07	NA	ALG016W	07/19/05	07/20/05
MU-25-1	G145-05	152	1	NA	5	1	07/27/0513:50	NA	ALG016W-08	NA	ALG016W	07/19/05	07/20/05
MU-19-5	G145-06	191	1	NA	5	1	07/27/0513:55	NA	ALG016W-09	NA	ALG016W	07/20/05	07/20/05
MU-19-4	G145-07	191	1	NA	5	1	07/27/0514:00	NA	ALG016W-10	NA	ALG016W	07/20/05	07/20/05
DUPE-1-7/20/05	G145-08	186	1	NA	5	1	07/27/0514:05	NA	ALG016W-11	NA	ALG016W	07/20/05	07/20/05
MU-19-3	G145-09	175	1	NA	5	1	07/27/0514:10	NA	ALG016W-12	NA	ALG016W	07/20/05	07/20/05
MU-19-2	G145-10	201	1	NA	5	1	07/27/0514:15	NA	ALG016W-13	NA	ALG016W	07/20/05	07/20/05

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

BATTELLE MEMORIAL INSTITUTE

CLIENT:
PROJECT:
METHOD:
MATRIX:
% MOISTURE:

JPL
METHOD 310.1
WATER
NA

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 07/27/05 13:20/13:25

BATCH NO.: 05G145
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: ALG016WL/C

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Total Alkalinity	ND	49.20	45.70	93	49.20	45.70	93	0	80-120	20

8044

ANALYSIS LOG FOR ALKALINITY

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SOP ☒ EMAX-310.1 Rev. No. 2 ☐ SM2320B Rev. No. 0 ☐ Book # AAL-009Start Date: 7/27/09 Time: 13:15 Ending Date: 7/27/09 Time: 15:10 Instrument No: P-53 ☐ 97

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Initial pH	Acid Titrant			Final pH	ALKALINITY (mg/L)			Notes	Standard Reagent	ID	Conc. (M/L)
					pH=8.3	pH=4.5	pH=4.2		Total	Residual (mg)	Calculation (mg/L)				
*01	ALG016 WB	13:15	20	5.10	NA	0.085	NA	4.40	ND			LCS	SW7A-06-174	49.2	
*02	WL	13:20		6.55		0.40		4.53	45.7			Spike	NA		
*03	WC	13:25		8.43		0.90		4.50	45.7			Na ₂ CO ₃ Soln	SW7A-06-120	2360	
*04	G145-01	13:30		8.33		2.85		4.52	145	✓		Acid Titrant HCL	SW35-02-732	0.02 N	
*05	-02	13:35		7.87		4.15		4.50	84	211	20.8/14.05				
*06	-03	13:40		7.96		3.45		4.49	175	✓					
*07	-04	13:45		9.19		2.65		4.52	135	✓		Na ₂ CO ₃ Soln. (ml)		Normality, N	
*08	-05	13:50		7.43		3.00		4.51	152	✓		6.2K	0.025	ND	
*09	-06	13:55		7.94		3.75		4.47	191	✓		5	11.65	0.02624	
*10	-07	14:00		7.95		3.75		4.47	191	✓		5	11.55	0.02042	
*11	-08	14:05		7.94		3.65		4.47	186	✓		5	11.60	0.02033	
*12	-09	14:10		7.60		3.45		4.52	175	✓					
*13	-10	14:15	✓	7.26		3.95		4.47	201	✓					
*14	G100-01	14:20	10	7.35		10.45		4.53	162			pH Buffer		ID	
*15	-02	14:25	20	7.65		9.60		4.51	488			pH 4	SW7A-06-017	4.01	
*16	-03	14:30		7.45		8.65		4.47	440			pH 7		4.96	
*17	G193-01	14:35		7.65		2.85		4.48	145			pH 10	✓	-100	
*18	-02	14:40		8.63		2.50		4.53	127			Slope		100.2	
*19	-03	14:45		8.02		3.20		4.52	163						
*20	-04	14:50		7.86		4.15		4.52	211						
*21	-05	14:55		7.37		2.50		4.47	127						
*22	-06	15:00		7.96		3.60		4.52	183						
*23	-07	15:05		7.96		3.60		4.47	183						
*24	✓ -07D	15:10	✓	7.83	✓	3.65	✓	4.53	186						
*25															

ANALYTICAL BATCH * ALG016W

Comments: G100-01-1X average

Analyzed By: MB

This page is checked during data review.

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G145

METHOD 350.2 AMMONIA (NH₃-N)

Ten (10) water samples were received on 07/20/05 for Ammonia analysis by Method 350.2 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G145-01 was analyzed for duplicate. %RPD was within QC limit.

5. Matrix Spike

Sample G145-01 was spiked. Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

All results were reported as Nitrogen concentration.

METHOD 350.2
AMMONIA (NH3-N)

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G145

Matrix : WATER
Instrument ID : 170

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	NHG008WB	ND	1	NA	.1	.03	07/31/05 10:11	07/30/05 09:30	NHG008W-12	NHG008W-10	NHG008W	NA	07/30/05
LCS1W	NHG008WL	1.01	1	NA	.1	.03	07/31/05 10:12	07/30/05 09:30	NHG008W-13	NHG008W-10	NHG008W	NA	07/30/05
LCD1W	NHG008WC	1.00	1	NA	.1	.03	07/31/05 10:13	07/30/05 09:30	NHG008W-14	NHG008W-10	NHG008W	NA	07/30/05
MW-25-5	G145-01	ND	1	NA	.1	.03	07/31/05 10:14	07/30/05 09:30	NHG008W-15	NHG008W-10	NHG008W	07/19/05	07/20/05
MW-25-5DUP	G145-01D	ND	1	NA	.1	.03	07/31/05 10:15	07/30/05 09:30	NHG008W-16	NHG008W-10	NHG008W	07/19/05	07/20/05
MW-25-5MS	G145-01M	1.00	1	NA	.1	.03	07/31/05 10:16	07/30/05 09:30	NHG008W-17	NHG008W-10	NHG008W	07/19/05	07/20/05
MW-25-4	G145-02	ND	1	NA	.1	.03	07/31/05 10:17	07/30/05 09:30	NHG008W-18	NHG008W-10	NHG008W	07/19/05	07/20/05
MW-25-3	G145-03	ND	1	NA	.1	.03	07/31/05 10:18	07/30/05 09:30	NHG008W-19	NHG008W-10	NHG008W	07/19/05	07/20/05
MW-25-2	G145-04	ND	1	NA	.1	.03	07/31/05 10:19	07/30/05 09:30	NHG008W-20	NHG008W-10	NHG008W	07/19/05	07/20/05
MW-25-1	G145-05	.106	1	NA	.1	.03	07/31/05 10:20	07/30/05 09:30	NHG008W-21	NHG008W-10	NHG008W	07/20/05	07/20/05
MW-19-5	G145-06	ND	1	NA	.1	.03	07/31/05 10:23	07/30/05 09:30	NHG008W-24	NHG008W-22	NHG008W	07/20/05	07/20/05
MW-19-4	G145-07	.277	1	NA	.1	.03	07/31/05 10:24	07/30/05 09:30	NHG008W-25	NHG008W-22	NHG008W	07/20/05	07/20/05
DUPE-1-7/20/05	G145-08	ND	1	NA	.1	.03	07/31/05 10:25	07/30/05 09:30	NHG008W-26	NHG008W-22	NHG008W	07/20/05	07/20/05
MW-19-3	G145-09	ND	1	NA	.1	.03	07/31/05 10:26	07/30/05 09:30	NHG008W-27	NHG008W-22	NHG008W	07/20/05	07/20/05
MW-19-2	G145-10	.144	1	NA	.1	.03	07/31/05 10:27	07/30/05 09:30	NHG008W-28	NHG008W-22	NHG008W	07/20/05	07/20/05

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

BATTELLE MEMORIAL INSTITUTE

CLIENT:
PROJECT:
METHOD:
MATRIX:
% MOISTURE:

JPL
METHOD 350.2
WATER
NA

DATE RECEIVED: 07/30/05
DATE EXTRACTED: 07/30/05 09:30
DATE ANALYZED: 07/31/05 10:12/10:13

BATCH NO.: 05G145
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: NHG008WL/C

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
Ammonia (NH3-N)	ND	1.00	1.01	101	1.00	1.00	100	0	80-120	20

8048

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 350.2
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G145
SAMPLE ID: MW-25-SMS
CONTROL NO.: G145-01M
DATE RECEIVED: 07/20/05
DATE EXTRACTED: 07/30/05 09:30
DATE ANALYZED: 07/31/05 10:16

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
Ammonia (NH3-N)	ND	1.00	1.00	100.00	75-125

8049 *sk*

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: METHOD 350.2

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05G145
 SAMPLE ID: MW-25-5DUP
 CONTROL NO.: G145-01D
 DATE RECEIVED: 07/20/05
 DATE EXTRACTED: 07/30/05 09:30
 DATE ANALYZED: 07/31/05 10:15

ACCESSION:

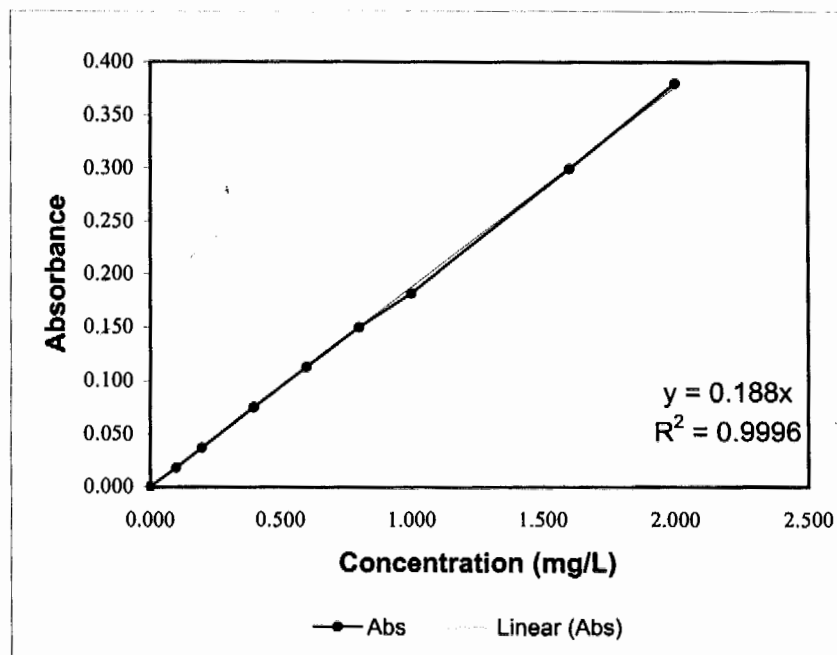
PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Ammonia (NH3-N)	ND	ND	0	20

8050

an

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.018
0.200	0.037
0.400	0.075
0.600	0.113
0.800	0.150
1.000	0.182
1.600	0.300
2.000	0.380



R^2 0.999645

y 0.1880

CF 5.3184

Comments: **PASSED**

Analyzed by: RM/LA

ANALYSIS LOG FOR AMMONIA-N

Book # A70-NH₃-005

SOP # EMAX-350.2 Rev. No. 2 □ EMAX-350.1 □ Rev. No. 0 □

Starting Date: 7-21-05 Time: 10:00 Ending Date: 7-21-05 Time: 10:50

Data File Name	Prep. Batch	Lab Sample ID	Matrix S W	Time	Vol. Colored (ml)	DF	Absorbance	Notes	Instrument No. 70	Wavelength: 425 nm	Conc. (mg/L)
* 1	NH6008W	2-0.0	✓	0.00	20	1	0.000	mg/L			
* 2		2-0.1		0.01			0.008				
* 3		2-0.2		0.02			0.007				0.0
* 4		2-0.4		0.04			0.005				0.1
* 5		2-0.6		0.06			0.019				0.2
* 6		2-0.8		0.08			0.140				0.4
* 7		2-1.0		0.10			0.182				0.6
* 8		2-1.6		0.16			0.400				0.8
* 9		2-2.0		0.20			0.340				1.0
* 10		10.0		0.29			0.186	0.989			1.6
* 11		10.0		0.10			0.000	47			2.0
* 12		NH6008WB		0.11			0.000	NP			1.0
* 13		10.0		0.12			0.190	101			1.0
* 14		10.0		0.13			0.189	1.006			1.0
* 15		6105-01		0.14			0.001	ND			
* 16		0.17		0.15			0.002	ND			
* 17		0.14		0.16			0.188	1.000			
* 18		0.12		0.17			0.009	NP			
* 19		0.03		0.18			0.004	ND			
* 20		0.08		0.19			0.019	ND			
* 21		0.05		0.20			0.020	0.106			
* 22		0.01		0.21			0.187	0.995			
* 23		0.01		0.22			0.000	ND			
* 24		0.05		0.23			0.001	ND			
* 25		0.07		0.24			0.052	0.277			
* 26		0.08		0.25			0.008	ND			
* 27		0.09		0.26			0.004	ND			
* 28		0.10		0.27			0.007	0.144			
* 29		6105-01		0.28			0.028	0.202			
* 30		0.02		0.29			0.001	ND			

Standard	ID	Conc. (mg/L)
S ₀		0.0
S ₁	2W2A-06-141	0.1
S ₂		0.2
S ₃		0.4
S ₄		0.6
S ₅		0.8
S ₆		1.0
S ₇		1.6
S ₈		2.0
ICVMS		1.0
OCV		1.0
LCS		1.0
Reagent	ID	
Color Reagent	2W2A-06-141	

Standard Curve
R
Y
CF

Comments:
Results are based on: <input type="checkbox"/> Dry Weight <input type="checkbox"/> Wet Weight

Analyzed By:
pm la

This page is checked during data review.

ANALYSIS LOG FOR AMMONIA-N

Book # A70-NH₃-005

SOP E/EMAX-350.2 Rev. No. 2 □ EMAX-350.1 □ Rev. No. 0 □

Starting Date: 7-31-05 Time: 10:50 Ending Date: 7-31-05 Time: 10:50

Data File Name	Prep. Batch	Lab Sample ID	Matrix S W	Time	Vol. Colored (ml)	DF	Absorbance	Notes mg	Instrument No: 70	Wavelength: 425 nm
* 1	NH008W	G187-03		40	20	1	0.002	ND	Standard	Conc. (mg/L)
* 2		08		41			0.001	ND	S ₀	Same as 8964
* 3		05		42			0.017	0.09 = NT	S ₁	0.0
* 4		CEV1		43			0.182	0.589	S ₂	0.1
* 5		CEV1		44			0.000	ND	S ₃	0.2
* 6		G187-02		45			0.001	ND	S ₄	0.4
* 7		01		46			0.002	ND	S ₅	0.6
* 8		NH009WB		47			0.000	ND	S ₆	0.8
* 9		WC		48			0.159	1.005	S ₇	1.0
* 0		G190-01		49			0.001	ND	S ₈	1.6
* 1		017		50			0.002	ND	S ₉	2.0
* 2		011		51			0.147	0.995	ICV/MS	1.0
* 3		02		52			0.002	ND	OCV	1.0
* 4		03		53			0.001	ND	LCS	1.0
* 5		04		54			0.002	ND	Reagent	ID
* 6		05		55			0.155	0.984	Color Reagent	2W7A-0C-141
* 7		06B3		56			0.000	ND		
* 8		G190-05		57			0.001	ND		
* 9		06		58			0.019	0.101		
* 0		07		59			0.158	1.000		
* 1		08		60			0.000	ND		
* 2		09		61						
* 3										
* 4										
* 5										
* 6										
* 7										
* 8										
* 9										
* 0										

ANALYTICAL BATCH * NH009W

Comments:

Results are based on: ☐ Dry Weight ☐ Wet Weight

Analyzed By: pm/da

This page is checked during data review.

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-006

SOP ☒ EMAX-350.2 Rev. No.: 2 ☐ EMAX-351.3 Rev. No.: 2 ☐

Start Date	Time	End Date	Time
7-20-02	9:30	7-20-02	14:00

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	2-0-0	9.5	0.1	112	5	140	140		ICV/MS	Sw 74-03-157	10 ml
*02	4-0-1								LCS	1-121	10 ml
*03	5-1-0								Reagent	Lot# / ID	
*04	2-2-0								NaOH	Sw 74-06-112	
*05	10-1								Digestion Mixture	NA	
*06	10-19								Borate Buffer	Sw 74-06-152	
*07	11-6-00-9-00-3								H ₃ BO ₃	Sw 74-06-152	
*08	1-0-0								Distilling Soln.	NA	
*09	1-0-0								Comments:		
*10	6-1-45-0-1		0.1								
*11	-0-1-0		0.5								
*12	-0-1-1		0.5								
*13	-0-2		0.7								
*14	-0-3		0.8								
*15	-0-4		0.9								
*16	-0-5		0.8								
*17	-0-6		0.7								
*18	-0-7		0.8								
*19	-0-8		0.9								
*20	-0-9		0.9								
*21	-1-0		0.8								
*22	6-1-8-0-1		0.8								
*23	-0-2		0.9								
*24	-0-3		0.7								
*25	-0-4		0.8								
*26	-0-5		0.7								

PREPARATION BATCH * 11-6-00-8-0-0

Prepared By: MM
Standard Added By: MM
Checked By: MM

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-006

SOP EMAX-350.2 Rev. No.: 2 □ EMAX-351.3 Rev. No.: 2 □

Start Date 7-20-05 Time 9:30 End Date 7-30-05 Time 1:00

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards		Lot# / ID	Amount Added (ml)
									ICV/MS	LCS		
*01 27	G183-06	9.5	0.8	10	5	100	100			Same as pg. 2		
*02 28	↓ -07		0.7									
*03 29	G190-01		0.9									
*04 30	-01D		0.8									
*05 31	-01M		0.9									
*06 32	-02		0.8									
*07 33	-03		0.9									
*08 34	-04		0.8									
*09 35	-05		0.7									
*10 36	↓ -06		0.8									
*11 37	L1H6009003	9.5	0.1	10	5	100	100					
*12 38	↓ -07		0.1									
*13 39												
*14 40												
*15												
*16												
*17												
*18												
*19												
*20												
*21												
*22												
*23												
*24												
*25												
*26												

PREPARATION BATCH *

Prepared By: pmStandard Added By: pmChecked By: pm

EMAX LABORATORIES, INC. 1805 W. 30th St. Torrance, CA 90501

8055

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G145**

METHOD 120.1 SPECIFIC CONDUCTIVITY

Ten (10) water samples were received on 07/20/05 for Specific Conductivity analysis by Method 120.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Duplicate

Duplicate sample was not designated in this SDG.

3. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 120.1
SPECIFIC CONDUCTIVITY

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G145

Matrix : WATER
Instrument ID : 129

SAMPLE ID	EMAX SAMPLE ID	RESULTS (umhos/cm)	DLF	MOIST	RL (umhos/cm)	MDL (umhos/cm)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
NW-25-5	G145-01	436	1	NA	1	.5	07/28/05 15:06	NA	ECG008W-4	ECG008W-1	ECG008W	07/19/05	07/20/05
NW-25-4	G145-02	679	1	NA	1	.5	07/28/05 15:08	NA	ECG008W-5	ECG008W-1	ECG008W	07/19/05	07/20/05
NW-25-3	G145-03	648	1	NA	1	.5	07/28/05 15:10	NA	ECG008W-6	ECG008W-1	ECG008W	07/19/05	07/20/05
NW-25-2	G145-04	580	1	NA	1	.5	07/28/05 15:12	NA	ECG008W-7	ECG008W-1	ECG008W	07/19/05	07/20/05
NW-25-1	G145-05	863	1	NA	1	.5	07/28/05 15:14	NA	ECG008W-8	ECG008W-1	ECG008W	07/19/05	07/20/05
NW-19-5	G145-06	785	1	NA	1	.5	08/02/05 14:16	NA	ECH001W-4	ECH001W-1	ECH001W	07/20/05	07/20/05
NW-19-4	G145-07	718	1	NA	1	.5	08/02/05 14:18	NA	ECH001W-5	ECH001W-1	ECH001W	07/20/05	07/20/05
DUPE-1-7/20/05	G145-08	706	1	NA	1	.5	08/02/05 14:20	NA	ECH001W-6	ECH001W-1	ECH001W	07/20/05	07/20/05
NW-19-3	G145-09	629	1	NA	1	.5	08/02/05 14:22	NA	ECH001W-7	ECH001W-1	ECH001W	07/20/05	07/20/05
NW-19-2	G145-10	1040	1	NA	1	.5	08/02/05 14:24	NA	ECH001W-8	ECH001W-1	ECH001W	07/20/05	07/20/05

ANALYSIS LOG FOR SPECIFIC CONDUCTIVITY

Book # AEC-003

SOP EMAX-120.1 Revision No. 1

Start Date 7/28/05 Time 15:00 End Date 7/28/05 Time 15:46

Data File Name	Lab Sample ID	Time	Temp. °C	Temp. Correction Factor QT @ 25 °C	DF	Measured Resistance (ohms)	Notes
* 1	STD High 413	15:00	21.8	0.939	1	1338	1412
* 2	EC9008WCL	-02	21.8	↓		381.5	403
* 3	↓ WCL	-04	21.8	0.939		381.5	403
* 4	G145-01	-01	21.7	0.937		412	435.72 436
* 5	↑ -02	-08	21.7	↓		642	678.92 679
* 6	-03	-10	21.7	0.937		613	648
* 7	02	-12	21.7	0.937		748	579.62 580
* 8	↓ -05	-14	21.8	0.939		818	863
* 9	G183-1	-16	21.8	↓		388	409
* 10	1 -2	-18	21.8	0.939		273	268
* 1	-3	-20	21.7	0.937		383	405
* 2	-4	-22	21.7	↓		517	546.82 547
* 3	-5	-20	21.8	0.939		345	364
* 4	-6	-26	21.8	↓		463	488.52 489
* 5	-7	-25	21.8			462	488
* 6	↓ -740	-24	21.8			462	488
* 7	G218-1	-32	21.8			281	297
* 8	2	-34	21.8			346	365
* 19	3	-36	21.8			427	451
* 20	↓ 4	-38	21.8	↓	1	461	487

ANALYTICAL BATCH * EC9008W

Trial	ID	Resistance ohms
-------	----	-----------------

KCI Standard	GW7A 02-55	Asseg
1	803B-02-684	747
2	QT = 939	747
3		747
LCS	GW7A-06-174	402 μmhos/cm
Calibration Temperature	21.8 °C	
True Value	1413	μmhos/cm
Cell Constant (C)	0.991	

KCI Standard	ID	μmhos/cm
Low-point	GW7A 02-55	141.3
Mid-point	21.8	
High-point	GW7A 02-55	1413

Comments:

Analyzed By: pk/la

This page is checked during the data review process.

ANALYSIS LOG FOR SPECIFIC CONDUCTIVITY

Book # AEC-003

SOP □ EMAX-120.1 Revision No. 1 □

Time 14:46

End Date 8/2/05

Time 14:10

Start Date 8/2/05

Data File Name	Lab Sample ID	Time	Temp. °C	Temp. Correction Factor QT @ 25 °C	DF	Measured Resistance (ohms)	Notes
* 1	STD High 1413	14:10	21.3	0.930	1x	1307	1409 ± 1410
* 2	ECH001 WL	14:12	21.8	0.938		375	401
* 3	↓ WC	14:14	21.4	0.932		373	401
* 4	G145-06	14:16	20.7	0.918		719 785	785
* 5	07	14:18	19.7	0.898		643 748	718
* 6	08	14:20	19.7	0.898		633 706	706
* 7	09	14:22	19.2	0.889		558	629
* 8	10	14:24	19.6	0.896		934	1040
* 9	G265-01	14:26	21.3	0.930		1971	2120
* 0	02	14:28	21.1	0.925		1950	2110
* 1	03	14:30	22.2	0.946		1786	1890
* 2	04	14:32	21.6	0.934		6620	7100
* 3	05	14:34	21.9	0.941		13390	14300
* 4	06	14:36	22.1	0.944		1644	1750
* 5	07	14:38	21.0	0.924		8410	9130
* 6	08	14:40	21.1	0.926		11350	12300
* 7	G244-01	14:42	21.4	0.931		9660	10400
* 8	02	14:44	22.0	0.943		5700	6060
* 9	STD LOW 1413	14:46	21.8	0.938	✓	132.7	142. (141.7)
* 0							142. (141.7)

ANALYTICAL BATCH * ECH001 WL

Trial	ID	Resistance ohms
-------	----	-----------------

KCl Standard	SW7A-02-SS	Assay
1	SW3B-02-654	763
2	Q _k = 0.930	762
3		762
LCS	SW7A-06-174	402 μmhos/cm
Calibration Temperature	21.3 °C	
True Value	1413	μmhos/cm
Cell Constant (C)	1.0023	

KCl Standard	ID	μmhos/cm
--------------	----	----------

Comments:

Analyzed By: AL

This page is checked during the data review process.

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G145

SM3500 FERROUS IRON

Ten (10) water samples were received on 07/20/05 for Ferrous Iron analysis by Method SM3500 in accordance with "Standard Methods for the Examination of Water and Wastewater", 18th edition (1990).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample

Lab control result was within QC limit.

4. Duplicate

Sample G145-01 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

SM3500
FERROUS IRON

Client : BATTILLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G145

Matrix : WATER
Instrument ID : I70

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	FEG002WB	ND	1	NA	5	2.5	07/20/0519:08	NA	FEG002W-09	FEG002W-07	FEG002W	NA	NA
LCS1W	FEG002WL	20.79	1	NA	5	2.5	07/20/0519:09	NA	FEG002W-10	FEG002W-07	FEG002W	NA	NA
MW-25-5	G145-01	ND	1	NA	5	2.5	07/20/0519:10	NA	FEG002W-11	FEG002W-07	FEG002W	07/19/05	07/20/05
MW-25-5DUP	G145-01D	ND	1	NA	5	2.5	07/20/0519:11	NA	FEG002W-12	FEG002W-07	FEG002W	07/19/05	07/20/05
MW-25-4	G145-02	ND	1	NA	5	2.5	07/20/0519:12	NA	FEG002W-13	FEG002W-07	FEG002W	07/19/05	07/20/05
MW-25-3	G145-03	ND	1	NA	5	2.5	07/20/0519:13	NA	FEG002W-14	FEG002W-07	FEG002W	07/19/05	07/20/05
MW-25-2	G145-04	ND	1	NA	5	2.5	07/20/0519:14	NA	FEG002W-15	FEG002W-07	FEG002W	07/19/05	07/20/05
MW-25-1	G145-05	ND	1	NA	5	2.5	07/20/0519:15	NA	FEG002W-16	FEG002W-07	FEG002W	07/19/05	07/20/05
MW-19-5	G145-06	ND	1	NA	5	2.5	07/20/0519:16	NA	FEG002W-17	FEG002W-23	FEG002W	07/20/05	07/20/05
MW-19-4	G145-07	ND	1	NA	5	2.5	07/20/0519:17	NA	FEG002W-18	FEG002W-07	FEG002W	07/20/05	07/20/05
DUPE-1-7/20/05	G145-08	ND	1	NA	5	2.5	07/20/0519:17	NA	FEG002W-19	FEG002W-19	FEG002W	07/20/05	07/20/05
MW-19-3	G145-09	ND	1	NA	5	2.5	07/20/0519:20	NA	FEG002W-21	FEG002W-19	FEG002W	07/20/05	07/20/05
MW-19-2	G145-10	ND	1	NA	5	2.5	07/20/0519:21	NA	FEG002W-22	FEG002W-19	FEG002W	07/20/05	07/20/05

EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT:	BATTELLE MEMORIAL INSTITUTE	DATE RECEIVED:	NA
PROJECT:	JPL	DATE EXTRACTED:	NA
METHOD:	SM3500	DATE ANALYZED:	07/20/05 19:09
MATRIX:	WATER		
% MOISTURE:	NA		

BATCH NO.: 05G145
SAMPLE ID: LCS1W
CONTROL NO.: FEG002WL

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	LCS RSLT (mg/L)	LCS % REC	QC LIMIT (%)
Ferrous Iron	ND	20.00	20.80	104	80-120

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTILLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: SM3500
MATRIX: WATER
% MOISTURE: NA
=====

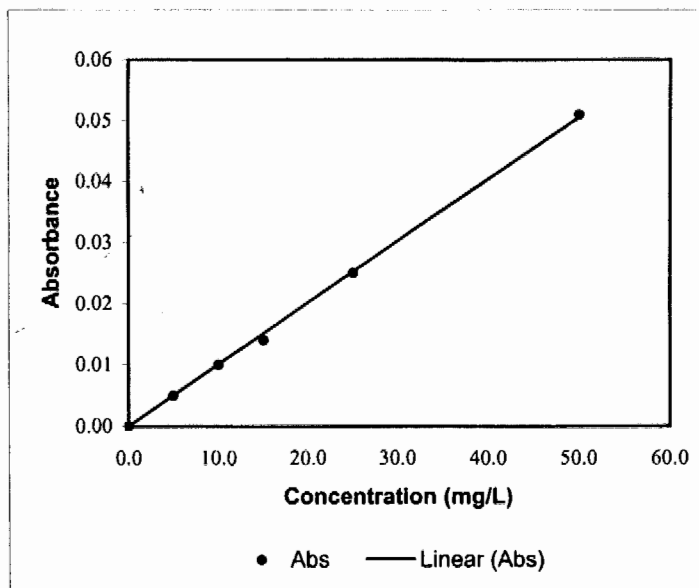
BATCH NO.: 05G145
SAMPLE ID: MW-25-5DUP
CONTROL NO.: G145-01D
DATE RECEIVED: 07/20/05
DATE EXTRACTED: NA
DATE ANALYZED: 07/20/05 19:11

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Ferrous Iron	ND	ND	0	20

CALIBRATION CURVE FERROUS FE

Conc.	Abs
0.0	0.000
5.0	0.005
10.0	0.010
15.0	0.014
25.0	0.025
50.0	0.051



R^2 0.9993

Eq.Line 0.0010

CF 990.0285

Comments: **PASSED**

Analyzed by: LA

ANALYSIS LOG FOR FERROUS IRON

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SOP EMAX-3500-Fe D/C Rev. No. 0 ☐ Starting Date 7/20/05 Time 19:00 Ending Date 7/20/05 Time 19:25 Book # A70-Fe D/C-001

Data File Name	Preparative Batch	Lab Sample ID	Matrix	Sample Amount (ml)	DF	Abs. (510 nm)	Time	Ferrous Iron (mg/L)	Notes
* 1	FE6002W	5-0	S	50	1	0.000	19:00		
* 2		5-5				0.005	-01		
* 3		5-10				0.010	-02		
* 4		7-16				0.014	-03		
* 5		5-25				0.025	-04		
* 6		5-30				0.05	-05		
* 7		10-1				0.019	-06	1591	
* 8		10-2				0.000	-07	ND	
* 9		FE6002W				0.000	-08	ND	
* 10		6145-01				0.001	-09	20.79	
* 1		6145-01				0.001	-10	ND	
* 2		-01D				0.002	-11	ND	
* 3		-02A				0.001	-12	ND	
* 4		-03				0.003	-13	ND	
* 5		-04				0.002	-14	ND	
* 6		-05				0.001	-15	ND	
* 7		-07				0.004	-16	ND	
* 8		-08				0.004	-17	ND	
* 9		CCV1				0.020	-18	19.50	
* 10		CCV1				0.000	-19	ND	
* 1		6145-09				0.001	-20	ND	
* 2		-10				0.006	-21	ND	
* 3		CCV2				0.001	-22	20.79	
* 4		CCV2				0.000	-23	ND	
* 5		6145-06				0.001	-24	ND	
* 6		CCV3				0.019	-25	15.81	
* 7		CCV3				0.000	-26	ND	
* 8									
* 9									
* 10									

ANALYTICAL BATCH * FE6002W

Instrument No.:	70	Wavelength: 510 nm
Standard	ID	Conc. (mg/L)
S ₀		0.0
S ₁		5
S ₂		10
S ₃		15
S ₄		25
S ₅		50
ICV/LCS/MS		20
CCV		20
Name	ID	
HCl	SW1A-02-1589	
NH ₄ C ₂ H ₃ O ₂ Buffer	SW1B-06-2480	
Phenanthroline Sol'n	-1028A	
Na ₂ C ₂ H ₃ O ₂ Sol'n	NA	
Hydroxylamine Sol'n		
Standard Curve		
R (≤0.995)	0.9993	
Y	0.0010	
CF	9900285	
Comments:		
Analyzed By:	SPD/AB	
Disposal Date:		

This page is checked during data review.

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G145

METHOD 376.1 SULFIDE

Ten (10) water samples were received on 07/20/05 for Sulfide analysis by Method 376.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample

Lab control result was within QC limit.

4. Duplicate

Sample G145-05 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 376.1
SULFIDE

Client : BATTTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G145

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	SDG008WB	ND	1	NA	1	.4	07/25/0518:45	NA	SDG008W-01	NA	SDG008W	NA	NA
LCS1W	SDG008WL	4.87	1	NA	1	.4	07/25/0518:48	NA	SDG008W-02	NA	SDG008W	NA	NA
MW-25-5	G145-01	ND	1	NA	1	.4	07/25/0518:51	NA	SDG008W-03	NA	SDG008W	07/19/05	07/20/05
MW-25-4	G145-02	ND	1	NA	1	.4	07/25/0518:54	NA	SDG008W-04	NA	SDG008W	07/19/05	07/20/05
MW-25-3	G145-03	ND	1	NA	1	.4	07/25/0518:57	NA	SDG008W-05	NA	SDG008W	07/19/05	07/20/05
MW-25-2	G145-04	ND	1	NA	1	.4	07/25/0519:00	NA	SDG008W-06	NA	SDG008W	07/19/05	07/20/05
MW-25-1	G145-05	ND	1	NA	1	.4	07/25/0519:03	NA	SDG008W-07	NA	SDG008W	07/19/05	07/20/05
MW-25-1DUP	G145-05D	ND	1	NA	1	.4	07/25/0519:06	NA	SDG008W-08	NA	SDG008W	07/19/05	07/20/05
MW-19-5	G145-06	ND	1	NA	1	.4	07/25/0519:09	NA	SDG008W-09	NA	SDG008W	07/20/05	07/20/05
MW-19-4	G145-07	ND	1	NA	1	.4	07/25/0519:12	NA	SDG008W-10	NA	SDG008W	07/20/05	07/20/05
DUPE-1-7/20/05	G145-08	ND	1	NA	1	.4	07/25/0519:15	NA	SDG008W-11	NA	SDG008W	07/20/05	07/20/05
MW-19-3	G145-09	ND	1	NA	1	.4	07/25/0519:18	NA	SDG008W-12	NA	SDG008W	07/20/05	07/20/05
MW-19-2	G145-10	ND	1	NA	1	.4	07/25/0519:21	NA	SDG008W-13	NA	SDG008W	07/20/05	07/20/05

EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: 376.1

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05G145

SAMPLE ID: LCD1W

CONTROL NO.: SDG008WC

DATE RECEIVED: NA

DATE EXTRACTED: NA

DATE ANALYZED: 07/25/05 18:48

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	LCS RSLT (mg/L)	LCS % REC	QC LIMIT (%)
Sulfide	ND	5.00	4.87	97	80-120

8068

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: METHOD 376.1

MATRIX: WATER

% MOISTURE: NA

BATCH NO.: 05G145
 SAMPLE ID: MW-25-1DUP
 CONTROL NO.: G145-05D

DATE RECEIVED: 07/20/05

DATE EXTRACTED: NA

DATE ANALYZED: 07/25/05 19:06

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
Sulfide	ND	ND	0	20

8069

ANALYSIS LOG FOR SULFIDE

SOP ☒ EMAX-376.1 Rev. No. 1 ☐ EMAX-9034 Rev. No. 0

Start Date: 7-25-05

Time: 8:45

End Date: 7-25-05

Time: 19:21

Book # ASD-007

Data File Name	Lab Sample ID	Time	Sample Amt. (ml)	Volume of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Notes	Standard	ID	Conc. (mg/L)
* 1	SD6608 W 2	18:05	100	10	9.9	ND	LCS	SW1A-06-178	50
* 2	L 100	18:48			4.6	4.81	Spike	NA	
* 3	L 145-01	18:54			9.8	ND	Na ₂ S ₂ O ₃	SW1A-02-785	0.0056
* 4		18:58			9.7	ND	PAO		
* 5		19:03			9.6	ND	Iodine	SW1B-02-784	0.0056
* 6		19:04			9.8	ND	HCL	SW1B-02-781C	1:1
* 7		19:09			9.7	ND	Indicator	SW1A-00-190	
* 8		19:09			9.7	ND	STANDARDIZATION		
* 9		19:09			9.8	ND	Vol. Of Iodine (ml)	Volume of PAO/Na ₂ S ₂ O ₃ (ml)	Conc. Of Iodine (N)
* 0		19:07			9.9	ND	10	10.0	0.0056
* 1		19:08			9.8	ND	10	10.0	0.0056
* 2		19:18			9.7	ND	10	10.0	0.0056
* 3		19:21	100	10	9.6	ND			
* 4							Average Iodine Conc. (N)		
* 5									
* 6									
* 7									
* 8									
* 9									
* 0									
* 1									
* 2									
* 3									
* 4									
* 5									
* 6									
* 7									
* 0									

ANALYTICAL BATCH * SD6608 W

$$\text{Sulfide (mg/L)} = \frac{(V_{I_2} \times N_{I_2} - V_{PAO} \times N_{PAO}) \times 16,000}{V_{\text{sample}}}$$

Comments:

Analyzed By: *SA*

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G145**

METHOD 351.3 TKN

Ten (10) water samples were received on 07/20/05 for TKN analysis by Method 351.3 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G145-01 was analyzed for duplicate. %RPD was within QC limit.

5. Matrix Spiked

Sample G145-01 was spiked. Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

All results were reported as Nitrogen concentration.

METHOD 351.3
TKN

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G145
Matrix : WATER
Instrument ID : I70

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	KNG010WB	ND	1	NA	.1	.035	07/31/0511:10	07/30/0510:30	KNG010W-11	KNG010W-09	KNG010W	NA	07/30/05
LCS1W	KNG010WL	1.03	1	NA	.1	.035	07/31/0511:11	07/30/0510:30	KNG010W-12	KNG010W-09	KNG010W	NA	07/30/05
LCD1W	KNG010WC	1.04	1	NA	.1	.035	07/31/0511:12	07/30/0510:30	KNG010W-13	KNG010W-09	KNG010W	NA	07/30/05
MW-25-5	G145-01	ND	1	NA	.1	.035	07/31/0511:13	07/30/0510:30	KNG010W-14	KNG010W-09	KNG010W	07/19/05	07/20/05
MW-25-5DUP	G145-01D	ND	1	NA	.1	.035	07/31/0511:14	07/30/0510:30	KNG010W-15	KNG010W-09	KNG010W	07/19/05	07/20/05
MW-25-5MS	G145-01M	1.09	1	NA	.1	.035	07/31/0511:15	07/30/0510:30	KNG010W-16	KNG010W-09	KNG010W	07/19/05	07/20/05
MW-25-6	G145-02	.444	1	NA	.1	.035	07/31/0511:16	07/30/0510:30	KNG010W-17	KNG010W-09	KNG010W	07/19/05	07/20/05
MW-25-3	G145-03	.522	1	NA	.1	.035	07/31/0511:17	07/30/0510:30	KNG010W-18	KNG010W-09	KNG010W	07/19/05	07/20/05
MW-25-2	G145-04	.333	1	NA	.1	.035	07/31/0511:18	07/30/0510:30	KNG010W-19	KNG010W-09	KNG010W	07/19/05	07/20/05
MW-25-1	G145-05	.511	1	NA	.1	.035	07/31/0511:19	07/30/0510:30	KNG010W-20	KNG010W-21	KNG010W	07/19/05	07/20/05
MW-19-5	G145-06	.788	1	NA	.1	.035	07/31/0511:22	07/30/0510:30	KNG010W-23	KNG010W-21	KNG010W	07/20/05	07/20/05
MW-19-4	G145-07	.533	1	NA	.1	.035	07/31/0511:23	07/30/0510:30	KNG010W-24	KNG010W-21	KNG010W	07/20/05	07/20/05
DUPE-1-7/20/05	G145-08	.611	1	NA	.1	.035	07/31/0511:24	07/30/0510:30	KNG010W-25	KNG010W-21	KNG010W	07/20/05	07/20/05
MW-19-3	G145-09	.377	1	NA	.1	.035	07/31/0511:25	07/30/0510:30	KNG010W-26	KNG010W-21	KNG010W	07/20/05	07/20/05
MW-19-2	G145-10	.389	1	NA	.1	.035	07/31/0511:26	07/30/0510:30	KNG010W-27	KNG010W-21	KNG010W	07/20/05	07/20/05

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTTELLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: METHOD 351.3
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G145
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: KNG010WL/C

DATE RECEIVED: 07/30/05
DATE EXTRACTED: 07/30/05 10:30
DATE ANALYZED: 07/31/05 11:11/11:12

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TKN	ND	1.00	1.03	103	1.00	1.04	104	1	80-120	20

8073

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: 351.3

MATRIX: WATER

% MOISTURE: NA

=====

BATCH NO.: 05G145

SAMPLE ID: MW-25-5MS

CONTROL NO.: G145-01M

DATE RECEIVED: 07/20/05

DATE EXTRACTED: 07/30/05 10:30

DATE ANALYZED: 07/31/05 11:15

ACCESSION:

PARAMETER	SMPL RSLT	SPIKE AMT	MS RSLT	MS	QC LIMIT
	(mg/L)	(mg/L)	(mg/L)	% REC	(%)
TKN	ND	1.00	1.09	109	75-125

8074

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT:	BATTELLE MEMORIAL INSTITUTE		
PROJECT:	JPL	DATE RECEIVED:	07/20/05
METHOD:	METHOD 351.3	DATE EXTRACTED:	07/30/05 10:30
MATRIX:	WATER	DATE ANALYZED:	07/31/05 11:14
% MOISTURE:	NA		

BATCH NO.:	05G145
SAMPLE ID:	MW-25-5DUP
CONTROL NO.:	G145-01D

ACCESSION:

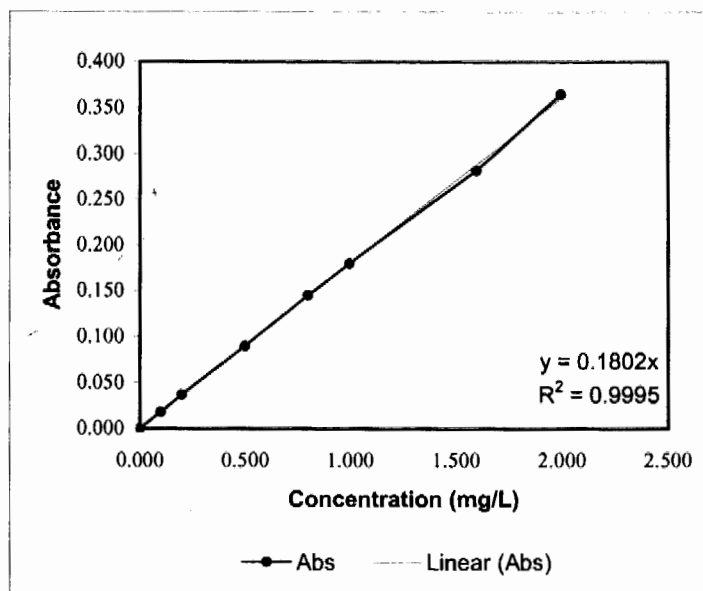
PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
TKN	ND	ND	0	20

8075

OK

CALIBRATION CURVE **AMMONIA _NH3 _TKN**

Conc.	Abs
0.000	0.000
0.100	0.018
0.200	0.037
0.500	0.090
0.800	0.145
1.000	0.180
1.600	0.282
2.000	0.365



R^2 0.999477

 y 0.1802

CF 5.5505

Comments: **PASSED**

Analyzed by: RM/LA

ANALYSIS LOG FOR TOTAL KJELDAHL NITROGEN (TKN)

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SOP (E) EMAX-351.3 Rev. No. 1

□

Start Date: 7-31-05

Time: 11:00

End Date: 7-31-05

Time: 11:09

Book # A70-KN-004

Data File Name	Prep. Batch	Lab Sample ID	Matrix		Time	Vol. Colored (ml)	DF	Absorbance	Notes	Instrument No: 70		Wavelength: 425 nm
			S	W						Standard	ID	
* 1	KN6010W	G-0.0			11:00	20	1	0.002				
* 2		G-0.1			01			0.018				
* 3		G-0.2			02			0.037				
* 4		G-0.5			03			0.090				
* 5		G-0.8			04			0.148				
* 6		G-1.0			05			0.180				
* 7		G-1.6			06			0.282				
* 8		G-2.0			07			0.365				
* 9		10V			08			0.182	1.01			
* 10		10B			09			0.000	NID			
* 1		KN6010WB			10			0.000	NID			
* 2		10C			11			0.185	1.021			
* 3		10C			12			0.187	1.028			
* 4		6145-0.1			13			0.012	NID			
* 5		-0.1D			14			0.012	NID			
* 6		-0.1M			15			0.197	1.093			
* 7		-0.2			16			0.080	0.444			
* 8		-0.3			17			0.094	0.522			
* 9		-0.4			18			0.060	0.333			
* 20		-0.5			19			0.092	0.511			
* 1		00V1			20			0.184	1.021			
* 2		00B1			21			0.000	NID			
* 3		6145-0.6			22			0.142	0.788			
* 4		-0.7			23			0.096	0.523			
* 5		-0.5			24			0.110	0.611			
* 6		0.9			25			0.068	0.377			
* 7		-1.0			26			0.070	0.389			
* 8		6145-0.1			27			0.086	0.473			
* 9		-0.2			28			0.002	NID			
* 20		-0.3			29			0.004	NID			

ANALYTICAL BATCH *		KN6010W	
Reagent	ID		
Color Reagent	8W7A-06-141		
Standard Curve			
R ²	0.9995		
Y	0.1302		
CF	5.5305		
Comments:			
Results are based on: <input type="checkbox"/> Dry Weight <input type="checkbox"/> Wet Weight			
Analyzed By: <u>DM 12</u>			

This page is checked during data review.

ANALYSIS LOG FOR TOTAL KJELDAHL NITROGEN (TKN)

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SOP ☒ EMAX-351.3 Rev. No. 1 ☐

Start Date: 7-26-05 Time: 11:00

End Date: 7-21-05 Time: 11:49

Book # A70-KN-004

Data File Name	Prep. Batch	Lab Sample ID	Matrix		Time	Vol. Colored (ml)	DF	Absorbance	Notes	Instrument No: 70			Wavelength: 425 nm
			S	W						Standard	ID	Conc. (mg/L)	
1	KN6000	6183-04			11:21	20	1	0.012	MP	S ₀	same as pg. 84	0.0	
2		d -05			11:21			0.046	0.244	S ₁		0.1	
3		CCB2			11:21			0.183	1.016	S ₂		0.2	
4		CCB2			11:21			0.000	ND	S ₃		0.5	
5		6183-04			11:21			0.008	ND	S ₄		0.8	
6		d -05			11:21			0.010	ND	S ₅		1.0	
7		KN6011003			11:21			0.000	ND	S ₆		1.6	
8		d -05			11:21			0.186	0.92	S ₇		2.0	
9		6190-01			11:21			0.020	0.41	ICV/MS		1.0	
10		-01D			11:21			0.028	0.155	CCV		1.0	
1		-01M			11:21			0.220	1.221	LCS		1.0	
2		-02			11:21			0.022	0.122				
3		-03			11:21			0.090	0.500				
4		-04			11:21			0.044	0.244				
5		CCV3			11:21			0.184	1.021	Reagent	ID		
6		CCB3			11:21			0.000	ND	Color Reagent	SW7A-06-141		
7		6190-05			11:21			0.092	0.400				
8		d -05			11:21			0.046	0.353				
9		CCV4			11:21			0.183	1.016	R ²	0.9995		
10		CCB4			11:21			0.000	ND	Y	0.182		
1					11:21					CF	5.5505		
2										Comments:			
3										Results are based on: <input type="checkbox"/> Dry Weight <input type="checkbox"/> Wet Weight			
4													
5													
6													
7													
8													
9													
0													

ANALYTICAL BATCH * KN6011W

Analyzed By: PAV1/1A

This page is checked during data review.

DISTILLATION LOG FOR NH₃ / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-006

SOP □ EMAX-350.2 Rev. No.: 2 □ EMAX-351.3 Rev. No.: 2 □

Start Date 7-30-05 Time 10:30 End Date 7-30-05 Time 15:30

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	5-0-0	9.5	10	5	4	50	50		ICV/MS	50210-00-151	50210
*02	2-0-1								LCS	✓ - 178	10 g/L
*03	5-1-0								Reagent	Lot# / ID	
*04	5-2-0								NaOH	11A	
*05	10V								Digestion Mixture	5021A-00-202	
*06	10P								Borate Buffer	✓ - 152	
*07	KNEX-00B								H ₃ BO ₃	5021B-00-322	
*08	✓ WC								Distilling Soln.	✓ - 315B	
*09	✓ WC								Comments:		
*10	6145-01										
*11	-02										
*12	-03										
*13	-04										
*14	-05										
*15	-06										
*16	-07										
*17	-08										
*18	-09										
*19	-10										
*20	✓ 6183-01										
*21	-01										
*22	-03										
*23	-04										
*24	-05										
*25	-06										
*26	✓ -07										

Prepared By: PM
 Standard Added By: PM
 Checked By:

PREPARATION BATCH KN601010

DISTILLATION LOG FOR NH_3 / DIGESTION AND DISTILLATION FOR TKN

Book # EKN-006

SOP □ EMAX-350.2 Rev. No.: 2 □ EMAX-351.3 Rev. No.: 2 □

Start Date 1-20-05 Time 10:40 End Date 1-20-05 Time 15:20

Sample Prep ID	Lab Sample ID	Sample pH	NaOH Added (ml)	Boric Acid (ml)	Borate Buffer (ml)	Sample Amount (ml)	Extract Volume (ml)	Notes	Standards	ID	Amount Added (ml)
*01	6145-010	9.5	10	5	4	20	20		ICV/MS	Same as pg. 4	
*02	6190-01								LCS		
*03									Reagent	Lot# / ID	
*04									NaOH	Same as pg. 4	
*05									Digestion Mixture		
*06									Borate Buffer		
*07									H_3BO_3		
*08									Distilling Soln.		
*09	KNG01100								Comments:		
*10											
*11											
*12											
*13											
*14											
*15											
*16											
*17											
*18											
*19											
*20											
*21											
*22											
*23											
*24											
*25											
*26											

PREPARATION BATCH * KNG01100

Prepared By: RM

Standard Added By: RM

Checked By: RM

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G145

METHOD 160.1 TOTAL DISSOLVED SOLIDS

Ten (10) water samples were received on 07/20/05 for Total Dissolved Solids analysis by Method 160.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G145-10 was analyzed for duplicate. %RPD was within QC limit.

5. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 160.1
TOTAL DISSOLVED SOLIDS

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G145

Matrix : WATER
Instrument ID : NA

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TDG020WB	ND	1	NA	10	5	07/21/0513:00	NA	TDG020W-01	NA	TDG020W	NA	NA
LCS1W	TDG020WL	164	1	NA	10	5	07/21/0513:01	NA	TDG020W-02	NA	TDG020W	NA	NA
LCD1W	TDG020WC	162	1	NA	10	5	07/21/0513:02	NA	TDG020W-03	NA	TDG020W	NA	NA
MW-25-5	G145-01	264	1	NA	10	5	07/21/0513:04	NA	TDG020W-05	NA	TDG020W	07/19/05	07/20/05
MW-25-4	G145-02	420	1	NA	10	5	07/21/0513:05	NA	TDG020W-06	NA	TDG020W	07/19/05	07/20/05
MW-25-3	G145-03	414	1	NA	10	5	07/21/0513:06	NA	TDG020W-07	NA	TDG020W	07/19/05	07/20/05
MW-25-2	G145-04	324	1	NA	10	5	07/21/0513:07	NA	TDG020W-08	NA	TDG020W	07/19/05	07/20/05
MW-25-1	G145-05	610	1	NA	10	5	07/21/0513:08	NA	TDG020W-09	NA	TDG020W	07/19/05	07/20/05
MW-19-5	G145-06	504	1	NA	10	5	07/21/0513:09	NA	TDG020W-10	NA	TDG020W	07/20/05	07/20/05
MW-19-4	G145-07	494	1	NA	10	5	07/21/0513:10	NA	TDG020W-11	NA	TDG020W	07/20/05	07/20/05
DUPE-1-7/20/05	G145-08	450	1	NA	10	5	07/21/0513:11	NA	TDG020W-12	NA	TDG020W	07/20/05	07/20/05
MW-19-3	G145-09	426	1	NA	10	5	07/21/0513:12	NA	TDG020W-13	NA	TDG020W	07/20/05	07/20/05
MW-19-2	G145-10	736	1	NA	10	5	07/21/0513:13	NA	TDG020W-14	NA	TDG020W	07/20/05	07/20/05
MW-19-2DUP	G145-10D	736	1	NA	10	5	07/21/0513:14	NA	TDG020W-15	NA	TDG020W	07/20/05	07/20/05

8082

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE
PROJECT: JPL
METHOD: 160.1
MATRIX: WATER
% MOISTURE: NA

BATCH NO.: 05G145
SAMPLE ID: LCS1W/LCD1W
CONTROL NO.: TDG020WL/C

DATE RECEIVED: NA
DATE EXTRACTED: NA
DATE ANALYZED: 07/21/05 13:01/13:02

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD %	QC LIMIT %	RPD LIMIT %
TDS	ND	162.00	164.00	101	162.00	162.00	100	1	80-120	20

8083
22

EMAX QUALITY CONTROL DATA
DUPLICATE ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

METHOD: METHOD 160.1

MATRIX: WATER

% MOISTURE: NA

=====

BATCH NO.: 05G145
 SAMPLE ID: MW-19-2DUP
 CONTROL NO.: G145-10D
 DATE RECEIVED: 07/20/05
 DATE EXTRACTED: NA
 DATE ANALYZED: 07/21/05 13:14

ACCESSION:

PARAMETER	SAMPLE (mg/L)	DUP. SAMPLE (mg/L)	RPD (%)	RPD LIMIT (%)
TDS	736.00	736.00	0	20

8084

de

GRAVIMETRIC ANALYSIS LOG

SOP ☒ EMAX-160.1 Rev. No. 3 ☐ EMAX-160.2 Rev. No. 2 ☐ EMAX-160.3 Rev. No. 1 ☐ EMAX-160.4 Rev. No. 0 ☐ EMAX-160.5 Rev. No. 0

Book # AGV-017

Oven/Furnace Temp. 105°C Starting Date 7/20/05 Time 1930 Ending Date 7/21/05 Time 1230

Data File Name	Lab Sample ID	Sample Amt. (ml)	Dish Wt. (g)	Dry Wt. Dish + Solids (g)				Solids (mg)	Result (mg/L)	Settleable Solids	
				1st	Time	2nd	Time	3rd	Time	Vol. of SS	Result (ml/L)
1	TDG020W0	100	65.2178	65.2180	0900	65.2175	1100	65.2177	1300	-0.1	ND
2		50	60.5523	60.5031	01	60.5025	01	60.5025	01	8.2	164
3		50	61.2849	61.2933	02	61.2978	02	61.2930	02	8.1	162
4	G829-02	50	52.9003	52.9262	03	52.9256	03	52.9255	03	15.2	504
5	G145-01	50	48.9452	48.9589	04	48.9585	04	48.9584	04	13.2	264
6		50	60.9590	60.9808	05	60.9803	05	60.9800	05	21.0	420
7		50	56.9048	56.9261	06	56.9254	06	56.9255	06	20.7	414
8		50	66.9237	66.9408	07	66.9398	07	66.9399	07	16.2	324
9		50	72.9828	73.0137	08	73.0132	08	73.0133	08	30.5	610
10		50	52.8389	52.8649	09	52.8640	09	52.8641	09	15.2	504
1		50	67.9397	67.9648	10	67.9642	10	67.9644	10	24.7	494
2		50	52.9761	53.0195	11	53.0188	11	53.0186	11	22.5	450
3		50	55.9035	55.9255	12	55.9250	12	55.9248	12	21.3	426
4		50	63.9891	64.0266	13	64.0260	13	64.0259	13	26.8	736
5		50	62.8720	62.9099	14	62.9093	14	62.9094	14	26.8	730
6											
7											
8											
9											
0											

ANALYTICAL BATCH * SS TDG020W S VS

Analyzed By: DMK/AC
This page is checked during the data review process.

CASE NARRATIVE

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

SDG: 05G145

METHOD 415.1 DOC

Ten (10) water samples were received on 07/20/05 for DOC analysis by Method 415.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G145-10 was analyzed for duplicate. %RPD was within QC limit.

5. Matrix Spike

Sample G145-10 was spiked. Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 415.1
DOC

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G145

Matrix : WATER
Instrument ID : 62

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TCG021WB	ND	1	NA	1	.5	07/31/0521:08	NA	TCG021-5	TCG021-2	TCG021W	NA	NA
LCS1W	TCG021WL	24.8	1	NA	1	.5	07/31/0521:18	NA	TCG021-6	TCG021-2	TCG021W	NA	NA
LCD1W	TCG021WC	25	1	NA	1	.5	07/31/0521:28	NA	TCG021-7	TCG021-2	TCG021W	NA	NA
MU-25-5	G145-01	2.82	1	NA	1	.5	07/31/0521:38	NA	TCG021-8	TCG021-2	TCG021W	07/19/05	07/20/05
MU-25-4	G145-02	6.45	1	NA	1	.5	07/31/0521:47	NA	TCG021-9	TCG021-2	TCG021W	07/19/05	07/20/05
MU-25-3	G145-03	2.92	1	NA	1	.5	07/31/0521:56	NA	TCG021-10	TCG021-2	TCG021W	07/19/05	07/20/05
MU-25-2	G145-04	3.16	1	NA	1	.5	07/31/0522:05	NA	TCG021-11	TCG021-2	TCG021W	07/19/05	07/20/05
MU-25-1	G145-05	12.1	1	NA	1	.5	07/31/0522:15	NA	TCG021-12	TCG021-2	TCG021W	07/19/05	07/20/05
MU-19-5	G145-06	5.11	1	NA	1	.5	07/31/0522:24	NA	TCG021-13	TCG021-2	TCG021W	07/20/05	07/20/05
MU-19-4	G145-07	1.79	1	NA	1	.5	07/31/0522:53	NA	TCG021-16	TCG021-14	TCG021W	07/20/05	07/20/05
DUPE-1-7/20/05	G145-08	1.84	1	NA	1	.5	07/31/0523:02	NA	TCG021-17	TCG021-14	TCG021W	07/20/05	07/20/05
MU-19-3	G145-09	8.6	1	NA	1	.5	07/31/0523:12	NA	TCG021-18	TCG021-14	TCG021W	07/20/05	07/20/05
MU-19-2	G145-10	8.07	1	NA	1	.5	07/31/0523:21	NA	TCG021-19	TCG021-14	TCG021W	07/20/05	07/20/05
MU-19-2DUP	G145-100	7.92	1	NA	1	.5	07/31/0523:31	NA	TCG021-20	TCG021-14	TCG021W	07/20/05	07/20/05
MU-19-2MS	G145-10M	32.1	1	NA	1	.5	07/31/0523:41	NA	TCG021-21	TCG021-14	TCG021W	07/20/05	07/20/05

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 056145
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: TCG021WB TCG021WC
LAB FILE ID: TCG021-5 TCG021-6 TCG021-7
DATE EXTRACTED: NA
DATE ANALYZED: 07/31/0521:08 07/31/0521:18 07/31/0521:28
PREP. BATCH: TCG021W TCG021W
CALIB. REF: TCG021-2 TCG021-2

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
DOC	ND	25	24.8	99	25	25	100	1	80-120	20

8088

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G145
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-19-2
LAB SAMP ID: G145-10
LAB FILE ID: TCG021-19
DATE EXTRACTED: NA
DATE ANALYZED: 07/31/0523:21
PREP. BATCH: TCG021W
CALIB. REF: TCG021-14

% MOISTURE: NA

DATE COLLECTED: 07/20/05
DATE RECEIVED: 07/20/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
DOC	8.07	25	32.1	96	75-125

8089

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G145
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-19-2
EMAX SAMP ID: G145-100
LAB FILE ID: TCG021-19
DATE EXTRACTED: NA
DATE ANALYZED: 07/31/0523:21
PREP. BATCH: TCG021W
CALIB. REF: TCG021-14

% MOISTURE: NA
DATE COLLECTED: 07/20/05
DATE RECEIVED: 07/20/05

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
DOC	8.07	7.92	2	20

8090
1

CASE NARRATIVE

CLIENT: **BATTELLE MEMORIAL INSTITUTE**

PROJECT: **JPL**

SDG: **05G145**

METHOD 415.1 TOC

Ten (10) water samples were received on 07/20/05 for TOC analysis by Method 415.1 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Duplicate

Sample G145-10 was analyzed for duplicate. %RPD was within QC limit.

5. Matrix Spike

Sample G145-10 was spiked. Recovery was within QC limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

Client : BATTELLE MEMORIAL INSTITUTE
Project : JPL
Batch No. : 05G145

Matrix : WATER
Instrument ID : 62

SAMPLE ID	EMAX	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	TCG022MB	ND	1	NA	1	.5	08/01/0501:20	NA	TCG021-31	TCG021-26	TCG022W	NA	NA
LCS1W	TCG022WL	24.5	1	NA	1	.5	08/01/0501:30	NA	TCG021-32	TCG021-26	TCG022W	NA	NA
LCD1W	TCG022WC	24.6	1	NA	1	.5	08/01/0501:41	NA	TCG021-33	TCG021-26	TCG022W	NA	NA
MW-25-5	G145-01	1.22	1	NA	1	.5	08/01/0501:50	NA	TCG021-34	TCG021-26	TCG022W	07/19/05	07/20/05
MW-25-4	G145-02	1.29	1	NA	1	.5	08/01/0501:59	NA	TCG021-35	TCG021-26	TCG022W	07/19/05	07/20/05
MW-25-3	G145-03	1.35	1	NA	1	.5	08/01/0502:08	NA	TCG021-36	TCG021-26	TCG022W	07/19/05	07/20/05
MW-25-2	G145-04	1.49	1	NA	1	.5	08/01/0502:17	NA	TCG021-37	TCG021-26	TCG022W	07/19/05	07/20/05
MW-25-1	G145-05	1.69	1	NA	1	.5	08/01/0502:47	NA	TCG021-40	TCG021-38	TCG022W	07/19/05	07/20/05
MW-19-5	G145-06	1.48	1	NA	1	.5	08/01/0502:56	NA	TCG021-41	TCG021-38	TCG022W	07/20/05	07/20/05
MW-19-4	G145-07	1.34	1	NA	1	.5	08/01/0503:06	NA	TCG021-42	TCG021-38	TCG022W	07/20/05	07/20/05
DUPE-1-7/20/05	G145-08	1.62	1	NA	1	.5	08/01/0503:15	NA	TCG021-43	TCG021-38	TCG022W	07/20/05	07/20/05
MW-19-3	G145-09	1.3	1	NA	1	.5	08/01/0503:24	NA	TCG021-44	TCG021-38	TCG022W	07/20/05	07/20/05
MW-19-2	G145-10	1.78	1	NA	1	.5	08/01/0503:33	NA	TCG021-45	TCG021-38	TCG022W	07/20/05	07/20/05
MW-19-2DUP	G145-100	1.78	1	NA	1	.5	08/01/0503:42	NA	TCG021-46	TCG021-38	TCG022W	07/20/05	07/20/05
MW-19-2MS	G145-10M	25.6	1	NA	1	.5	08/01/0503:52	NA	TCG021-47	TCG021-38	TCG022W	07/20/05	07/20/05

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: BATTLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G145

METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1
LAB ID: HBLK1W
LAB FILE ID: TCG022WB
DATE EXTRACTED: NA
DATE ANALYZED: 08/01/0501:20
PREP. BATCH: TCG022W
CALIB. REF: TCG021-26

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: NA

ACCESSION:

PARAMETER	BLK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
TOC	ND	25	24.5	98	25	24.6	98	0	80-120	20

8093

EMAX QUALITY CONTROL DATA
MS ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE
PROJECT: JPL
BATCH NO.: 05G145
METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-19-2
LAB SAMP ID: G145-10
LAB FILE ID: TCG021-45
DATE EXTRACTED: NA
DATE ANALYZED: 08/01/0503:33
PREP. BATCH: TCG022W
CALIB. REF: TCG021-38

% MOISTURE: NA
DATE COLLECTED: 07/20/05
DATE RECEIVED: 07/20/05

ACCESSION:

PARAMETER	SAMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	QC LIMIT (%)
TOC	1.78	25	25.6	95	75-125

8094

all

EMAX QUALITY CONTROL DATA
DUPLICATE SAMPLE ANALYSIS

CLIENT: BATTELLE MEMORIAL INSTITUTE

PROJECT: JPL

BATCH NO.: 05G145

METHOD: METHOD 415.1

MATRIX: WATER
DILUTION FACTOR: 1
SAMPLE ID: MW-19-2
EMAX SAMP ID: G145-10
LAB FILE ID: TCG021-45
DATE EXTRACTED: NA
DATE ANALYZED: 08/01/0503:33
PREP. BATCH: TCG022W
CALIB. REF: TCG021-38

% MOISTURE: NA
DATE COLLECTED: 07/20/05
DATE RECEIVED: 07/20/05

ACCESSION:

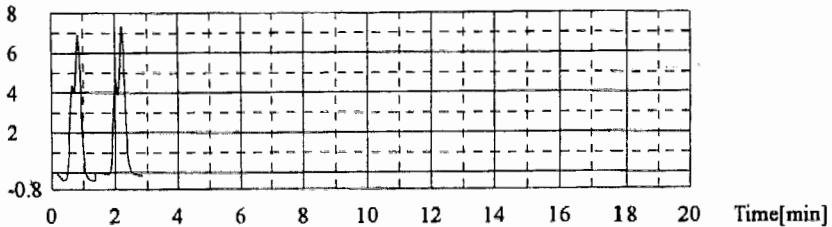
PARAMETER	SMPL RSLT (mg/L)	DUPL RSLT (mg/L)	RPD RSLT %	QC LIMIT (%)
TOC	1.78	1.78	0	20

8095

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	13.65	50uL	2	*****		07/31/05 08:00:18 PM
2	14.30	50uL	2	*****		07/31/05 08:01:58 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 13.98

Signal[mV]

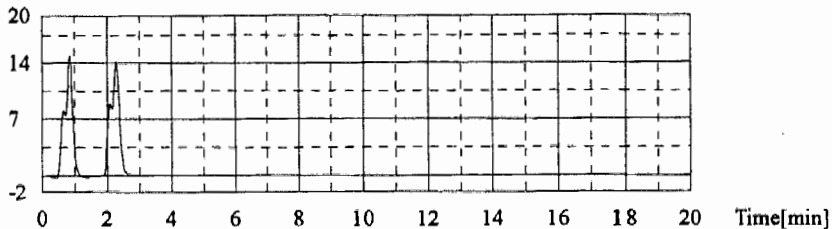


Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	27.15	50uL	1	*****		07/31/05 08:07:58 PM
2	27.91	50uL	1	*****		07/31/05 08:09:40 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 27.53

Signal[mV]

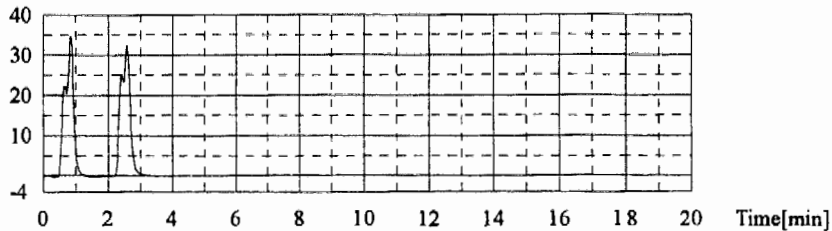


Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	66.75	50uL	2	*****		07/31/05 08:18:39 PM
2	68.02	50uL	2	*****		07/31/05 08:20:34 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 67.39

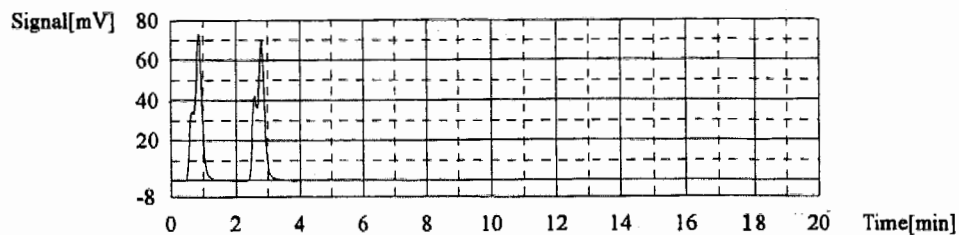
Signal[mV]



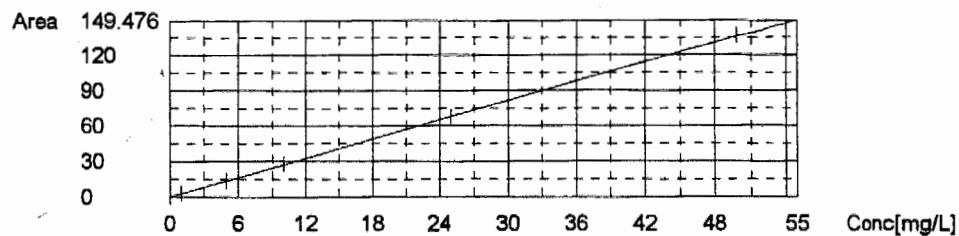
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	135.2	50uL	1	*****		07/31/05 08:27:05 PM
2	137.9	50uL	1	*****		07/31/05 08:29:10 PM

Acid Add. 2.500%
Sp. Time 90.00sec
Mean Area 136.6



Slope: 2.718
Intercept 0.000
 r^2 0.999935



Control Sample

Sample Name: ICV
Sample ID: TCG021-2
Method: TCG021.tpi
Chk. Result: Control value: 0.09% / Control within range!

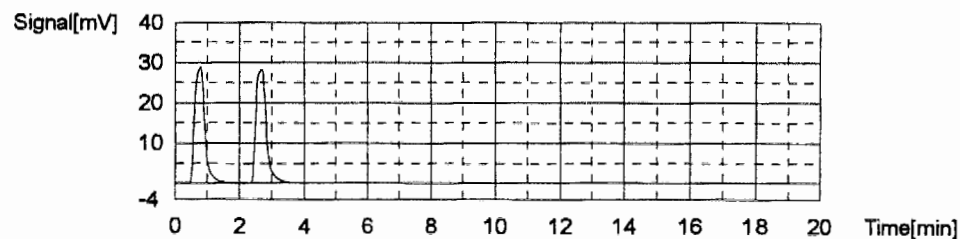
Type	Anal.	Dil.	Result
Control	NPOC	1.000	NPOC:24.08 mg/L

1. Det.

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	65.42	24.07mg/L	50uL	1		TCG021.2005_07_31_19_35_03.cal	07/31/05 08:37:50 PM
2	65.48	24.09mg/L	50uL	1		TCG021.2005_07_31_19_35_03.cal	07/31/05 08:39:52 PM

Mean Area 65.45
Mean Conc. 24.08mg/L



Sample

Sample Name: ICB
Sample ID: TCG021-3
Origin: TCG021.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.06296 mg/L

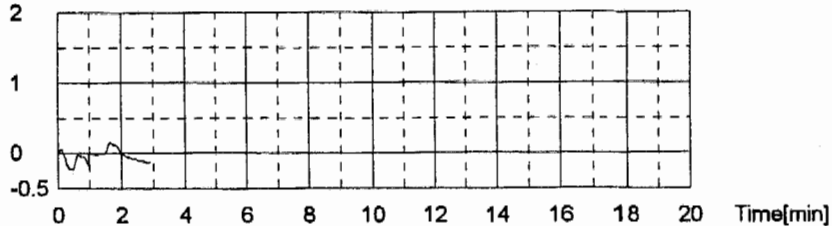
1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.3422	0.1259mg/L	50uL	1		TCG021.2005_07_31_19_35_03.cal	07/31/05 08:47:23 PM
2	0.000	0.000mg/L	50uL	1		TCG021.2005_07_31_19_35_03.cal	07/31/05 08:49:27 PM

Mean Area 0.1711
Mean Conc. 0.06296mg/L

Signal[mV] 2



Sample

Sample Name: HCO3/CO3
Sample ID: TCG021-4
Origin: TCG021.met
Chk. Result

Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.5766 mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1.591	0.5854mg/L	50uL	1		TCG021.2005_07_31_19_35_03.cal	07/31/05 08:57:07 PM
2	1.543	0.5677mg/L	50uL	1		TCG021.2005_07_31_19_35_03.cal	07/31/05 08:58:28 PM

ANALYSIS RUN LOG FOR TOC

SOP: 0 EMAX-9060 Revision No. 1 0 EMAX-415.1 Revision No. 1 0

Book # A62-006

Start Date: 7/31/05

Time: 17:42

Ending Date: 8/01/05

Time: 08:36

Sample Prep. ID	Data File Name	Lab Sample ID	DF	Matrix S W	Run Time	Notes
* 1	TC6021					
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						
* 1						
* 2						
* 3						
* 4						
* 5						
* 6						
* 7						
* 8						
* 9						
* 0						

SEE ATTACHED INSTRUMENT SED. 7/31/05

Instrument No.	62
Method File	TC6021
ICAL ID	SW10B-01-605
ICV ID	↓ -606

STANDARDS

ICAL Level	Conc. (mg/L)
S ₀	0
S ₁	1
S ₂	5
S ₃	10
S ₄	25
S ₅	50
S ₆	75
ICV/LCS	SW10B-01-606
CCV	↓ 607

Comments:

Analyzed By: ✓

This page is checked during data review

	Type	Analysis	Sample Name	Sample ID	Object	Origin	Dilution	Result	Notes	Comment
1	Standard	NPOC	ICAL	TCG021-1	0A-12	C:\Progra	1.000			
2	Control	NPOC	ICV	TCG021-2	0A-12	C:\Progra	1.000			
3	Unknown	NPOC	ICB	TCG021-3	0A-12	C:\Progra	1.000			
4	Unknown	NPOC	HCO3/CO3	TCG021-4	0A-12	C:\Progra	1.000			
5	Unknown	NPOC	TCG021WB	TCG021-5	0A-12	C:\Progra	1.000			
6	Unknown	NPOC	TCG021WL	TCG021-6	0A-12	C:\Progra	1.000			
7	Unknown	NPOC	TCG021WC	TCG021-7	0A-12	C:\Progra	1.000			
8	Unknown	NPOC	05G145-01	TCG021-8	0A-12	C:\Progra	1.000			DOC
9	Unknown	NPOC	05G145-02	TCG021-9	0A-12	C:\Progra	1.000			DOC
10	Unknown	NPOC	05G145-03	TCG021-10	0A-12	C:\Progra	1.000			DOC
11	Unknown	NPOC	05G145-04	TCG021-11	0A-12	C:\Progra	1.000			DOC
12	Unknown	NPOC	05G145-05	TCG021-12	0A-12	C:\Progra	1.000			DOC
13	Unknown	NPOC	05G145-06	TCG021-13	0A-12	C:\Progra	1.000			DOC
14	Control	NPOC	CCV1	TCG021-14	0A-12	C:\Progra	1.000			
15	Unknown	NPOC	CCB1	TCG021-15	0A-12	C:\Progra	1.000			
16	Unknown	NPOC	05G145-07	TCG021-16	0A-12	C:\Progra	1.000			DOC
17	Unknown	NPOC	05G145-08	TCG021-17	0A-12	C:\Progra	1.000			DOC
18	Unknown	NPOC	05G145-09	TCG021-18	0A-12	C:\Progra	1.000			DOC
19	Unknown	NPOC	05G145-10	TCG021-19	0A-12	C:\Progra	1.000			DOC
20	Unknown	NPOC	05G145-10D	TCG021-20	0A-12	C:\Progra	1.000			DOC
21	Unknown	NPOC	05G145-10M	TCG021-21	0A-12	C:\Progra	1.000			DOC
22	Unknown	NPOC	05G183-01	TCG021-22	0A-12	C:\Progra	1.000			DOC
23	Unknown	NPOC	05G183-02	TCG021-23	0A-12	C:\Progra	1.000			DOC
24	Unknown	NPOC	05G183-03	TCG021-24	0A-12	C:\Progra	1.000			DOC
25	Unknown	NPOC	05G183-04	TCG021-25	0A-12	C:\Progra	1.000			DOC
26	Control	NPOC	CCV2	TCG021-26	0A-12	C:\Progra	1.000			
27	Unknown	NPOC	CCB2	TCG021-27	0A-12	C:\Progra	1.000			
28	Unknown	NPOC	05G183-05	TCG021-28	0A-12	C:\Progra	1.000			DOC
29	Unknown	NPOC	05G183-06	TCG021-29	0A-12	C:\Progra	1.000			DOC
30	Unknown	NPOC	05G183-07	TCG021-30	0A-12	C:\Progra	1.000			DOC
31	Unknown	NPOC	TCG022WB	TCG021-31	0A-12	C:\Progra	1.000			
32	Unknown	NPOC	TCG022WL	TCG021-32	0A-12	C:\Progra	1.000			
33	Unknown	NPOC	TCG022WC	TCG021-33	0A-12	C:\Progra	1.000			
34	Unknown	NPOC	05G145-01	TCG021-34	0A-12	C:\Progra	1.000			
35	Unknown	NPOC	05G145-02	TCG021-35	0A-12	C:\Progra	1.000			
36	Unknown	NPOC	05G145-03	TCG021-36	0A-12	C:\Progra	1.000			
37	Unknown	NPOC	05G145-04	TCG021-37	0A-12	C:\Progra	1.000			
38	Control	NPOC	CCV3	TCG021-38	0A-12	C:\Progra	1.000			
39	Unknown	NPOC	CCB3	TCG021-39	0A-12	C:\Progra	1.000			
40	Unknown	NPOC	05G145-05	TCG021-40	0A-12	C:\Progra	1.000			
41	Unknown	NPOC	05G145-06	TCG021-41	0A-12	C:\Progra	1.000			
42	Unknown	NPOC	05G145-07	TCG021-42	0A-12	C:\Progra	1.000			
43	Unknown	NPOC	05G145-08	TCG021-43	0A-12	C:\Progra	1.000			
44	Unknown	NPOC	05G145-09	TCG021-44	0A-12	C:\Progra	1.000			
45	Unknown	NPOC	05G145-10	TCG021-45	0A-12	C:\Progra	1.000			
46	Unknown	NPOC	05G145-10D	TCG021-46	0A-12	C:\Progra	1.000			
47	Unknown	NPOC	05G145-10M	TCG021-47	0A-12	C:\Progra	1.000			
48	Unknown	NPOC	05G183-01	TCG021-48	0A-12	C:\Progra	1.000			
49	Unknown	NPOC	05G183-02	TCG021-49	0A-12	C:\Progra	1.000			
50	Control	NPOC	CCV4	TCG021-50	0A-12	C:\Progra	1.000			
51	Unknown	NPOC	CCB4	TCG021-51	0A-12	C:\Progra	1.000			
52	Unknown	NPOC	05G183-03	TCG021-52	0A-12	C:\Progra	1.000			
53	Unknown	NPOC	05G183-04	TCG021-53	0A-12	C:\Progra	1.000			
54	Unknown	NPOC	05G183-05	TCG021-54	0A-12	C:\Progra	1.000			
55	Unknown	NPOC	05G183-06	TCG021-55	0A-12	C:\Progra	1.000			
56	Unknown	NPOC	05G183-07	TCG021-56	0A-12	C:\Progra	1.000			
57	Control	NPOC	CCV5	TCG021-57	0A-12	C:\Progra	1.000			
58	Unknown	NPOC	CCB5	TCG021-58	0A-12	C:\Progra	1.000			
59										
60										
61										
62										
63										
64										
65										
66										

	Type	Analysis	Sample Name	Sample ID	Object	Origin	Dilution	Result	Notes	Comment
1	Standard	NPOC	ICAL	TCG021-1	0A-12	C:\Progra	1.000			
2	Control	NPOC	ICV	TCG021-2	0A-12	C:\Progra	1.000	NPOC:24.08 m	Control valu	
3	Unknown	NPOC	ICB	TCG021-3	0A-12	C:\Progra	1.000	NPOC:0.06296		
4	Unknown	NPOC	HCO3/CO3	TCG021-4	0A-12	C:\Progra	1.000	NPOC:0.5766		
5	Unknown	NPOC	TCG021WB	TCG021-5	0A-12	C:\Progra	1.000	NPOC:0.000 m	X	
6	Unknown	NPOC	TCG021WL	TCG021-6	0A-12	C:\Progra	1.000	NPOC:24.84 m	X	
7	Unknown	NPOC	TCG021WC	TCG021-7	0A-12	C:\Progra	1.000	NPOC:25.03 m	X	
8	Unknown	NPOC	05G145-01	TCG021-8	0A-12	C:\Progra	1.000	NPOC:2.822 m	X	DOC
9	Unknown	NPOC	05G145-02	TCG021-9	0A-12	C:\Progra	1.000	NPOC:6.448 m	X	DOC
10	Unknown	NPOC	05G145-03	TCG021-10	0A-12	C:\Progra	1.000	NPOC:2.921 m	X	DOC
11	Unknown	NPOC	05G145-04	TCG021-11	0A-12	C:\Progra	1.000	NPOC:3.161 m	X	DOC
12	Unknown	NPOC	05G145-05	TCG021-12	0A-12	C:\Progra	1.000	NPOC:12.06 m	X	DOC
13	Unknown	NPOC	05G145-06	TCG021-13	0A-12	C:\Progra	1.000	NPOC:5.107 m	X	DOC
14	Control	NPOC	CCV1	TCG021-14	0A-12	C:\Progra	1.000	NPOC:24.81 m	Control valu	
15	Unknown	NPOC	CCB1	TCG021-15	0A-12	C:\Progra	1.000	NPOC:0.06106	X	
16	Unknown	NPOC	05G145-07	TCG021-16	0A-12	C:\Progra	1.000	NPOC:1.793 m	X	DOC
17	Unknown	NPOC	05G145-08	TCG021-17	0A-12	C:\Progra	1.000	NPOC:1.842 m	X	DOC
18	Unknown	NPOC	05G145-09	TCG021-18	0A-12	C:\Progra	1.000	NPOC:8.597 m	X	DOC
19	Unknown	NPOC	05G145-10	TCG021-19	0A-12	C:\Progra	1.000	NPOC:8.069 m	X	DOC
20	Unknown	NPOC	05G145-10D	TCG021-20	0A-12	C:\Progra	1.000	NPOC:7.922 m	X	DOC
21	Unknown	NPOC	05G145-10M	TCG021-21	0A-12	C:\Progra	1.000	NPOC:32.14 m		DOC
22	Unknown	NPOC	05G183-01	TCG021-22	0A-12	C:\Progra	1.000	NPOC:8.667 m		DOC
23	Unknown	NPOC	05G183-02	TCG021-23	0A-12	C:\Progra	1.000	NPOC:2.531 m		DOC
24	Unknown	NPOC	05G183-03	TCG021-24	0A-12	C:\Progra	1.000	NPOC:7.289 m		DOC
25	Unknown	NPOC	05G183-04	TCG021-25	0A-12	C:\Progra	1.000	NPOC:6.715 m		DOC
26	Control	NPOC	CCV2	TCG021-26	0A-12	C:\Progra	1.000	NPOC:24.60 m	Control valu	
27	Unknown	NPOC	CCB2	TCG021-27	0A-12	C:\Progra	1.000	NPOC:0.000 m		
28	Unknown	NPOC	05G183-05	TCG021-28	0A-12	C:\Progra	1.000	NPOC:7.824 m		DOC
29	Unknown	NPOC	05G183-06	TCG021-29	0A-12	C:\Progra	1.000	NPOC:7.021 m		DOC
30	Unknown	NPOC	05G183-07	TCG021-30	0A-12	C:\Progra	1.000	NPOC:3.269 m		DOC
31	Unknown	NPOC	TCG022WB	TCG021-31	0A-12	C:\Progra	1.000	NPOC:0.2118	✓	
32	Unknown	NPOC	TCG022WL	TCG021-32	0A-12	C:\Progra	1.000	NPOC:24.55 m	✓	
33	Unknown	NPOC	TCG022WC	TCG021-33	0A-12	C:\Progra	1.000	NPOC:24.62 m	✓	
34	Unknown	NPOC	05G145-01	TCG021-34	0A-12	C:\Progra	1.000	NPOC:1.217 m	✓	
35	Unknown	NPOC	05G145-02	TCG021-35	0A-12	C:\Progra	1.000	NPOC:1.293 m	✓	
36	Unknown	NPOC	05G145-03	TCG021-36	0A-12	C:\Progra	1.000	NPOC:1.349 m	✓	
37	Unknown	NPOC	05G145-04	TCG021-37	0A-12	C:\Progra	1.000	NPOC:1.491 m	✓	
38	Control	NPOC	CCV3	TCG021-38	0A-12	C:\Progra	1.000	NPOC:24.56 m	Control valu	
39	Unknown	NPOC	CCB3	TCG021-39	0A-12	C:\Progra	1.000	NPOC:0.000 m		
40	Unknown	NPOC	05G145-05	TCG021-40	0A-12	C:\Progra	1.000	NPOC:1.692 m	✓	
41	Unknown	NPOC	05G145-06	TCG021-41	0A-12	C:\Progra	1.000	NPOC:1.480 m	✓	
42	Unknown	NPOC	05G145-07	TCG021-42	0A-12	C:\Progra	1.000	NPOC:1.338 m	✓	
43	Unknown	NPOC	05G145-08	TCG021-43	0A-12	C:\Progra	1.000	NPOC:1.625 m	✓	
44	Unknown	NPOC	05G145-09	TCG021-44	0A-12	C:\Progra	1.000	NPOC:1.299 m	✓	
45	Unknown	NPOC	05G145-10	TCG021-45	0A-12	C:\Progra	1.000	NPOC:1.778 m	✓	
46	Unknown	NPOC	05G145-10D	TCG021-46	0A-12	C:\Progra	1.000	NPOC:1.778 m	✓	
47	Unknown	NPOC	05G145-10M	TCG021-47	0A-12	C:\Progra	1.000	NPOC:25.65 m	✓	
48	Unknown	NPOC	05G183-01	TCG021-48	0A-12	C:\Progra	1.000	NPOC:2.979 m		
49	Unknown	NPOC	05G183-02	TCG021-49	0A-12	C:\Progra	1.000	NPOC:1.155 m		
50	Control	NPOC	CCV4	TCG021-50	0A-12	C:\Progra	1.000	NPOC:24.64 m	Control valu	
51	Unknown	NPOC	CCB4	TCG021-51	0A-12	C:\Progra	1.000	NPOC:0.04559		
52	Unknown	NPOC	05G183-03	TCG021-52	0A-12	C:\Progra	1.000	NPOC:1.356 m		
53	Unknown	NPOC	05G183-04	TCG021-53	0A-12	C:\Progra	1.000	NPOC:1.629 m		
54	Unknown	NPOC	05G183-05	TCG021-54	0A-12	C:\Progra	1.000	NPOC:1.910 m		
55	Unknown	NPOC	05G183-06	TCG021-55	0A-12	C:\Progra	1.000	NPOC:2.484 m		
56	Unknown	NPOC	05G183-07	TCG021-56	0A-12	C:\Progra	1.000	NPOC:1.923 m		
57	Control	NPOC	CCV5	TCG021-57	0A-12	C:\Progra	1.000	NPOC:24.69 m	Control valu	
58	Unknown	NPOC	CCB5	TCG021-58	0A-12	C:\Progra	1.000	NPOC:0.05648		
59										
60										
61										
62										
63										
64										
65										
66										

✓ = TOC X = DOC for 05G145



MW-17, MW-18, MW-19, MW-20,
MW-21, MW-24, MW-25

PH, Temp, conductivity.
(taken while samples were taken)

Well ID: MW-3

Sampling Zone No.: Sta 1

Depth (ft): 653, 558, 346, 252, 172

Start Time: 8:30
Finish Time: 12:09

Date: 7/27/85
Page: 1 of 1

Water Pressure Inside Casing: _____

Beginning of Session: 14.05 p.m.
End of Session: 14.14 p.m.

Surface Function Checks										Position Sampler	Sample Collection Checks								Water Quality Parameters				
Port #	Run #	Shoe Out	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Shoe In	Arm In	Deactivate Set Arm Locate Port	Arm out	Pressure in MP	Shoe Out	Zone Pressure	Open Valve	Zone Pressure	Close Valve	Shoe In	Pressure in MP	Time	PH	Turb. (NTU)	Temp. (°C)	Cond (mmhos)
5	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	252.77	✓	263.06	✓	263.07	✓	✓	252.79	858	5.47	3.6	23.6	511.0
5	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	251.24	✓	263.10	✓	263.09	✓	✓	251.32	—	—	—	—	—
4	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	212.35	✓	222.01	✓	221.01	✓	✓	212.37	448	5.87	1.6	24.8	40.8
4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	211.83	✓	222.02	✓	222.01	✓	✓	211.86	—	—	—	—	—
3	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	119.49	✓	132.82	✓	132.86	✓	✓	119.46	1045	6.46	1.2	25.8	47.6
3	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	119.47	✓	132.82	✓	132.84	✓	✓	119.47	—	—	—	—	—
2	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	79.48	✓	92.15	✓	92.20	✓	✓	79.46	1140	6.51	3.9	27.8	51.9
2	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	79.47	✓	92.14	✓	92.19	✓	✓	79.49	—	—	—	—	—
2	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	79.41	✓	92.15	✓	92.21	✓	✓	79.40	—	—	—	—	—
1	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	44.53	✓	58.92	✓	59.02	✓	✓	44.65	1301	7.44	6.8	25.2	49.0
														</									

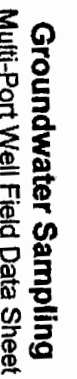
Notes:

port 5: CLEAR, SUGGEST CODE port 4: CLEAR, NO CODE port 3: CLEAR, NO CODE

part 2: CLEAR, no update
part 1: CLEAR, no update

Total Volume: _____

2/5/20



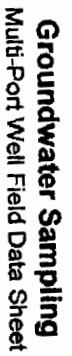
Date: 8/2/05
Page: 1 of 1

Beginning of Session: 14.11 psia
End of Session: 14.17 psia

[illegible]

Total Volume: —

port5: NO SAMPLE TAKEN	port4: NO SAMPLE TAKEN	port3: NO DATA, YELLOWISH COLOR
port2: CURRENT NO DATA	port1: CURRENT NO DATA	



Groundwater Sampling Multi-Port Well Field Data Sheet

Well ID: MW-11
Sampling Zone No.: 4 to 7

Start Time: 1035
Finish Time: 1410

Date: 8/2/05
Page: 1 of 1

Water Pressure Inside Casing: _____

Beginning of Session: 14.06.2014
End of Session: 14.07.2014

[illegible]

Total Volume: _____

port 5: NO SAMPLE TAKEN
port 4: C-LEVEL, NO D-DOL
port 3: C-LEVEL, NO D-DOL

port 2: C:\CAG, No O Disk	port 1: C:\CAG, NO ODR
---------------------------	------------------------



Date: 7/28/25
Page: 1 of 1

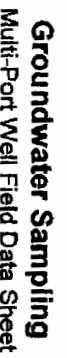
Beginning of Session: 14.09.2016
End of Session: 14.10.2016

[illegible]

Total Volume: —

port 5: CLEAR, NO OVER port 4: CLEAR, NO OVER port 3: CLEAR, NO OVER

port 2: CLEARY, AN DON	port 1: CLEARY, AN DON
------------------------	------------------------



Groundwater Sampling

Multi-Port Well Field Data Sheet

Well ID: MW-14
Sampling Zone No.: 541

Start Time: 1/25

Finish Time: 14:53

Date: 8/3/15
Page: 1 of 1

Water Pressure Inside Casing: _____

Beginning of Session: 14.05 PM
End of Session: 14.02 PM

[illegible]

Total Volume: _____

port 5: CLEAR, NO ODOOR	port 4: CLEAR, NO ODOOR	port 3: CLEAR, NO ODOOR
-------------------------	-------------------------	-------------------------

port 2: CLEAR, NO SOUND port 1: CLEAR, NO SOUND



Groundwater Sampling
Multi-Port Well Field Data Sheet

JPL Pasadena
Contract #:

Well ID: MW-17

Sampling Zone No.: 511
Depth (ft): 726, 582, 468, 370, 250
Beginning of Session: 14:01 p.m.
End of Session: 14:02 p.m.

Start Time: 8:03
Finish Time: 16:00

Date: 8/15/05
Page: 1 of 1

Port # Run #		Surface Function Checks						Position Sampler	Sample Collection Checks						Water Quality Parameters							
		Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Shoe In	Arm In	Deactivate Set Arm Locate Port	Arm out	Pressure in MP	Shoe Out	Zone Pressure	Open Valve	Zone Pressure	Close Valve	Shoe In	Pressure in MP	Time	PH	Turb. (NTU)	Temp. (°C)	Cond (mmhos)
5	1	✓	✓	✓	✓	✓	✓	✓	✓	170.95	✓	252.17	✓	252.06	✓	✓	170.97	833	5.92	50	18.0	36.8
5	2	✓	✓	✓	✓	✓	✓	✓	✓	170.92	✓	252.16	✓	252.10	✓	✓	170.97					
5	3	✓	✓	✓	✓	✓	✓	✓	✓	170.87	✓	252.18	✓	252.10	✓	✓	170.92					
4	1	✓	✓	✓	✓	✓	✓	✓	✓	109.21	✓	190.22	✓	190.24	✓	✓	109.22	1232	6.17	2.0	14.9	34.3
4	2	✓	✓	✓	✓	✓	✓	✓	✓	109.20	✓	190.31	✓	190.27	✓	✓	109.17					
4	3	✓	✓	✓	✓	✓	✓	✓	✓	108.61	✓	190.33	✓	190.29	✓	✓	108.67					
3	1	✓	✓	✓	✓	✓	✓	✓	✓	59.36	✓	141.17	✓	141.14	✓	✓	59.35	1201	6.23	2.1	22.2	73.9
3	2	✓	✓	✓	✓	✓	✓	✓	✓	59.33	✓	141.18	✓	141.18	✓	✓	59.35					
3	3	✓	✓	✓	✓	✓	✓	✓	✓	59.28	✓	141.16	✓	141.15	✓	✓	59.32					
2	1	✓	✓	✓	✓	✓	✓	✓	✓	16.46	✓	100.49	✓	100.49	✓	✓	16.48	1381	6.57	4.3	23.8	82.2
2	2	✓	✓	✓	✓	✓	✓	✓	✓	16.39	✓	100.51	✓	100.54	✓	✓	16.45					
2	3	✓	✓	✓	✓	✓	✓	✓	✓	15.61	✓	100.52	✓	100.53	✓	✓	15.94					
1	1	✓	✓	✓	✓	✓	✓	✓	✓	14.05	✓	49.99	✓	49.80	✓	✓	14.16	1522	7.12	0.85	24.4	34.1
1	2	✓	✓	✓	✓	✓	✓	✓	✓	14.06	✓	49.78	✓	49.76	✓	✓	14.12					

Notes: (3 down), port 5: Clean, no 0.034 port 4: Clean, no 0.034 port 3: Clean, no 0.034
port 2: Clean, no 0.034 port 1: Clean, no 0.034

Total Volume: —



Groundwater Sampling Multi-Port Well Field Data Sheet

JPL Pasadena
Contract #:

Well ID: MW-18

Sampling Zone No.: 5
Depth (ft): 684, 564, 424, 330, 270
Beginning of Session: 14:04
End of Session: 14:07

Start Time: 8:00
Finish Time: 17:30

Date: 7/2/05
Page: 1 of 1

Port #	Run #	Surface Function Checks						Position Sampler	Sample Collection Checks						Water Quality Parameters								
		Shoe Out	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Shoe In		Arm In	Deactivate Set Arm Locate Port	Arm out	Pressure in MP	Shoe Out	Zone Pressure	Open Valve	Zone Pressure	Close Valve	Shoe In	Pressure in MP	Time	PH	Turb. (NTU)	Temp. (°C)	Cond (mmhos)
5	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	160.04	✓	216.29	✓	216.35	✓	✓	160.03	828	596	1.7	23.4	34.0
5	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	159.99	✓	216.31	✓	216.30	✓	✓	159.97	—	—	—	—	—
5	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	159.92	✓	216.30	✓	216.28	✓	✓	159.93	—	—	—	—	—
5	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	157.84	✓	216.30	✓	216.27	✓	✓	157.91	—	—	—	—	—
4	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	108.57	✓	165.82	✓	165.84	✓	✓	108.57	1028	5.87	3.4	27.3	44.4
4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	108.47	✓	165.78	✓	165.82	✓	✓	108.52	—	—	—	—	—
4	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	108.32	✓	165.73	✓	165.78	✓	✓	108.43	—	—	—	—	—
3	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	47.37	✓	109.95	✓	109.11	✓	✓	47.44	1239	6.02	0.65	30.2	60.5
3	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	47.33	✓	109.04	✓	109.08	✓	✓	47.40	—	—	—	—	—
3	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	46.81	✓	109.05	✓	109.07	✓	✓	46.87	—	—	—	—	—
2	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	14.15	✓	69.46	✓	69.41	✓	✓	14.16	440	6.64	1.6	31.4	58.5
1	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	14.10	✓	44.22	✓	44.21	✓	✓	14.18	1455	6.92	1.9	30.5	40.0
1	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	14.11	✓	44.23	✓	44.22	✓	✓	14.21	—	—	—	—	—
1	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	14.11	✓	44.23	✓	44.19	✓	✓	14.13	—	—	—	—	—
2	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	14.15	✓	69.48	✓	69.43	✓	✓	14.16	—	—	—	—	—
2	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	14.14	✓	69.47	✓	69.43	✓	✓	14.16	—	—	—	—	—
2	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	14.15	✓	69.46	✓	69.42	✓	✓	14.15	—	—	—	—	—

Notes:

port 5: CLEAN, NO SODL port 4: CLEAN, NO SODL port 3: CLEAN, NO SODL

port 2: CLEAN, NO SODL port 1: CLEAN, NO SODL

Total Volume: —



Groundwater Sampling
Multi-Port Well Field Data Sheet

JPL Pasadena
Contract #:

Well ID: MW-19

Sampling Zone No.: 54.1
Depth (ft): 499, 444, 392, 314, & 242
Beginning of Session: 14.12.2014
End of Session: 14.06.2014

Start Time: 740
Finish Time: 1502

Date: 7/20/15
Page: 1 of 1

Port #	Run #	Surface Function Checks					Position Sampler	Sample Collection Checks							Water Quality Parameters							
		Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Shoe In		Arm In	Deactivate Set Arm Locate Port	Arm out	Pressure in MP	Shoe Out	Zone Pressure	Open Valve	Zone Pressure	Close Valve	Shoe In	Pressure in MP	Time	PH	Turb. (NTU)	Temp. (°C)	Cond (µmhos)
5	1	✓	✓	✓	✓	✓	✓	✓	✓	176.16	✓	175.60	✓	175.12	✓	✓	176.17	816	5.38	1.5	23.5	2.19
5	2	✓	✓	✓	✓	✓	✓	✓	✓	176.17	✓	175.60	✓	175.59	✓	✓	176.17	—	—	—	—	—
5	3	✓	✓	✓	✓	✓	✓	✓	✓	176.16	✓	175.56	✓	175.56	✓	✓	176.17	—	—	—	—	—
4	1	✓	✓	✓	✓	✓	✓	✓	✓	152.75	✓	152.10	✓	152.14	✓	✓	152.77	1022	6.00	0.20	26.6	2.11
4	2	✓	✓	✓	✓	✓	✓	✓	✓	152.74	✓	152.09	✓	152.12	✓	✓	152.77	—	—	—	—	—
4	3	✓	✓	✓	✓	✓	✓	✓	✓	152.73	✓	152.07	✓	152.10	✓	✓	152.74	—	—	—	—	—
4	4	✓	✓	✓	✓	✓	✓	✓	✓	152.76	✓	152.11	✓	152.11	✓	✓	152.75	—	—	—	—	—
3	1	✓	✓	✓	✓	✓	✓	✓	✓	130.20	✓	129.87	✓	129.94	✓	✓	130.25	1210	6.59	2.0	22.5	2.10
3	2	✓	✓	✓	✓	✓	✓	✓	✓	130.21	✓	129.89	✓	129.93	✓	✓	130.27	—	—	—	—	—
3	3	✓	✓	✓	✓	✓	✓	✓	✓	130.21	✓	129.88	✓	129.91	✓	✓	130.23	—	—	—	—	—
2	1	✓	✓	✓	✓	✓	✓	✓	✓	96.42	✓	95.83	✓	95.87	✓	✓	96.46	1317	7.01	2.8	24.3	2.143
2	2	✓	✓	✓	✓	✓	✓	✓	✓	96.41	✓	95.81	✓	95.87	✓	✓	96.47	—	—	—	—	—
1	1	✓	✓	✓	✓	✓	✓	✓	✓	65.19	✓	65.20	✓	65.28	✓	✓	65.27	1415	7.97	2.9	29.7	48.1
1	2	✓	✓	✓	✓	✓	✓	✓	✓	65.19	✓	65.25	✓	65.30	✓	✓	65.31	—	—	—	—	—
1	3	✓	✓	✓	✓	✓	✓	✓	✓	65.25	✓	65.29	✓	65.27	✓	✓	65.26	—	—	—	—	—

Notes:

port 5: CLEAR, NO ODORE port 4: CLEAR, NO ODORE port 3: CLEAR, NO ODORE

Total Volume: —

port 2: CLEAR, NO ODORE port 1: SLIGHT BROWNISH HUE, NO ODORE



Groundwater Sampling
Multi-Port Well Field Data Sheet

JPL Pasadena
Contract #:

Well ID: MW-20

Sampling Zone No.: 54.1
Depth (ft): 900, 700, 562, 382, 230
Beginning of Session: 14.09 05:15
End of Session: 14.11 13:15

Start Time: 07:55
Finish Time: 16:45

Date: 8/1/05
Page: 1 of 1

Port # Run #		Surface Function Checks						Position Sampler	Sample Collection Checks								Water Quality Parameters						
		Shoe Out	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Shoe In		Arm In	Deactivate Set Arm Locate Port	Arm out	Pressure in MP	Shoe Out	Zone Pressure	Open Valve	Zone Pressure						Close Valve	Shoe In	Pressure in MP	Time	PH	Turb. (NTU)	Temp. (°C)	Cond (mmhos)
5	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	308.77	✓	333.72	✓	333.71	✓	✓	308.77	6:27	6.07	0.40	20.2	36.6
5	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	308.72	✓	333.73	✓	333.72	✓	✓	308.68	—	—	—	—	—
5	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	308.64	✓	333.71	✓	333.71	✓	✓	308.63	—	—	—	—	—
5	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	307.08	✓	333.73	✓	333.71	✓	✓	307.07	—	—	—	—	—
4	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	302.40	✓	344.81	✓	344.75	✓	✓	302.41	10:31	6.47	8.0	23.1	34.7
4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	302.37	✓	344.77	✓	344.69	✓	✓	302.40	—	—	—	—	—
4	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	301.33	✓	344.71	✓	344.68	✓	✓	301.31	—	—	—	—	—
3	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	162.15	✓	177.02	✓	177.04	✓	✓	162.15	12:05	6.04	0.90	25.8	63.2
3	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	162.06	✓	177.00	✓	177.02	✓	✓	162.11	—	—	—	—	—
3	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	161.00	✓	176.96	✓	176.97	✓	✓	161.01	—	—	—	—	—
2	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	87.83	✓	111.24	✓	111.33	✓	✓	87.94	14:06	7.01	0.15	26.6	41.6
2	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	87.80	✓	111.29	✓	111.28	✓	✓	87.90	—	—	—	—	—
2	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	86.79	✓	111.28	✓	111.34	✓	✓	86.83	—	—	—	—	—
1	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	17.13	✓	41.46	✓	41.43	✓	✓	17.15	15:22	6.81	7.5	28.8	66.6
1	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	16.95	✓	41.43	✓	41.41	✓	✓	17.10	—	—	—	—	—
1	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	17.05	✓	41.45	✓	41.44	✓	✓	17.09	—	—	—	—	—

Notes:

port 5: CLEAR, SLIGHT ODOOR port 4: CLEAR, SLIGHT ODOOR port 3: CLEAR, NO ODOOR

port 2: CLEAR, NO ODOOR port 1: CLEAR, NO ODOOR

Total Volume: —



Groundwater Sampling
Multi-Port Well Field Data Sheet

JPL Pasadena
Contract #:

Well ID: MW-21

Sampling Zone No.: 5751
Depth (ft): 372, 310, 240, 161, 90
Beginning of Session: 14/12/2014
End of Session: 14/03/2016

Start Time: 747
Finish Time: 423

Date: 7/26/15
Page: 1 of 1

Port #		Run #	Surface Function Checks						Position Sampler	Sample Collection Checks								Water Quality Parameters					
			Shoe Out	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Shoe In	Arm In	Deactivate Set Arm Locate Port	Arm out	Pressure In MP	Shoe Out	Zone Pressure	Open Valve	Zone Pressure	Close Valve	Shoe In	Pressure In MP	Time	PH	Turb. (NTU)	Temp. (°C)	Cond (mmhos)
5	1		✓	✓	✓	✓	✓	✓	✓	✓	129.78	✓	164.06	✓	164.06	✓	✓	125.77	817	5.11	1.1	22.8	0.130
5	2		✓	✓	✓	✓	✓	✓	✓	✓	129.72	✓	164.07	✓	164.07	✓	✓	129.73	—	—	—	—	—
5	3		✓	✓	✓	✓	✓	✓	✓	✓	129.66	✓	164.07	✓	164.07	✓	✓	129.69	—	—	—	—	—
5	4		✓	✓	✓	✓	✓	✓	✓	✓	128.46	✓	164.08	✓	164.08	✓	✓	128.65	—	—	—	—	—
4	1		✓	✓	✓	✓	✓	✓	✓	✓	103.55	✓	132.22	✓	132.23	✓	✓	103.57	938	6.20	0.55	25.6	0.124
4	2		✓	✓	✓	✓	✓	✓	✓	✓	103.50	✓	132.19	✓	132.23	✓	✓	103.53	—	—	—	—	—
4	3		✓	✓	✓	✓	✓	✓	✓	✓	102.43	✓	132.17	✓	132.21	✓	✓	102.47	—	—	—	—	—
3	1		✓	✓	✓	✓	✓	✓	✓	✓	73.30	✓	102.29	✓	102.35	✓	✓	73.37	1125	7.53	3.2	25.9	0.162
3	2		✓	✓	✓	✓	✓	✓	✓	✓	73.31	✓	107.32	✓	107.34	✓	✓	73.32	—	—	—	—	—
3	3		✓	✓	✓	✓	✓	✓	✓	✓	73.20	✓	107.28	✓	107.32	✓	✓	73.26	—	—	—	—	—
3	4		✓	✓	✓	✓	✓	✓	✓	✓	73.17	✓	107.27	✓	107.33	✓	✓	73.24	—	—	—	—	—
3	5		✓	✓	✓	✓	✓	✓	✓	✓	73.16	✓	107.31	✓	107.30	✓	✓	73.19	—	—	—	—	—
2	1		✓	✓	✓	✓	✓	✓	✓	✓	38.68	✓	73.14	✓	73.19	✓	✓	38.73	1353	7.45	1.4	25.9	0.183
2	2		✓	✓	✓	✓	✓	✓	✓	✓	38.65	✓	73.14	✓	73.18	✓	✓	38.68	—	—	—	—	—
2	3		✓	✓	✓	✓	✓	✓	✓	✓	38.62	✓	73.13	✓	73.17	✓	✓	38.65	—	—	—	—	—
1	1		✓	✓	✓	✓	✓	✓	✓	✓	14.14	✓	41.98	✓	41.95	✓	✓	14.13	1515	7.39	3.7	32.2	0.143
1	2		✓	✓	✓	✓	✓	✓	✓	✓	14.13	✓	41.99	✓	41.90	✓	✓	14.12	—	—	—	—	—
1	3		✓	✓	✓	✓	✓	✓	✓	✓	14.11	✓	41.97	✓	41.94	✓	✓	14.18	—	—	—	—	—

Notes:

port 5: CLEAR, NO O2 OR port 4: CLEAR, NO O2 OR port 3: CLEAR, NO O2 OR

Total Volume: —

port 2: CUEING, NO O2 OR port 1: SIGHTING, NO O2 OR



Water Pressure Inside Casing: _____

Well ID: MW-22

Sampling Zone No.:	3 to 1
Depth (ft):	596, 467, 389, 329, 245
Beginning of Session:	14.09 p.m.
End of Session:	14.10 p.m.

Start Time: 8/5
Finish Time: 1033

Date: 8/3/05
Page: 1 of 1

[illegible]

Notes:

port 5: NOT SAMPLED

port 4: NOT SAMPLED

post 3: CLEARY SLICAT 270K

Total Volume: _____

part 2: CLEAR, NO ODDOR

part 1: CUTAN, NO DATE



Groundwater Sampling Multi-Port Well Field Data Sheet

Multi-Port Well Field Data Sheet

Well ID: MW-23

Sampling Zone No.: 4701

Depth (ft): ~~542~~ 445, 319, 254, 174

Beginning of Session: 14.02 pm

Water Pressure Inside Casing: _____

Start Time: 8:00
Finish Time: 1:15

Date: 8/4/05
Page: 1 of 1

[illegible]

Total Volume: —

port 5: NOT SAMPLED	port 4: CLIENT, NO DIAL	port 3: CLIENT, NO DIAL
---------------------	-------------------------	-------------------------

port 2: CUEADK, NO ODS	port 1: CUEADK, NO ODS
------------------------	------------------------



Groundwater Sampling
Multi-Port Well Field Data Sheet

JPL Pasadena
Contract #:

Well ID: MW-24

Sampling Zone No.: 5+1

Depth (ft): 678, 554, 435, 373, 279

Start Time: 7:50

Date: 7/25/95

Beginning of Session: 14.26 psia

End of Session: 14.05 psia

Water Pressure Inside Casing: _____

		Surface Function Checks						Position Sampler		Sample Collection Checks						Water Quality Parameters							
Port #	Run #	Shoe Out	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Shoe In	Arm In	Deactivate Set Arm Locate Port	Arm out	Pressure in MP	Shoe Out	Zone Pressure	Open Valve	Zone Pressure	Close Valve	Shoe In	Pressure in MP	Time	PH	Turb. (NTU)	Temp. (°C)	Cond (mmhos)
4	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	145.37	✓	180.07	✓	180.11	✓	✓	145.38	825	5.52	1.6	24.3	34.0
4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	145.35	✓	180.07	✓	180.10	✓	✓	145.37	—	—	—	—	—
4	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	145.31	✓	180.10	✓	180.11	✓	✓	145.35	—	—	—	—	—
3	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	93.67	✓	129.96	✓	129.98	✓	✓	93.70	453	5.94	2.9	26.2	37.7
3	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	93.70	✓	129.97	✓	129.98	✓	✓	93.70	—	—	—	—	—
3	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	93.64	✓	129.95	✓	129.94	✓	✓	93.68	—	—	—	—	—
2	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	66.70	✓	103.45	✓	103.51	✓	✓	66.71	1137	7.00	3.4	25.0	45.0
2	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	66.69	✓	103.47	✓	103.51	✓	✓	66.72	—	—	—	—	—
2	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	66.58	✓	103.47	✓	103.51	✓	✓	66.64	—	—	—	—	—
1	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	25.96	✓	64.48	✓	64.51	✓	✓	25.94	1205	6.95	4.9	25.3	49.3
1	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	25.98	✓	64.47	✓	64.49	✓	✓	25.93	—	—	—	—	—
1	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	25.85	✓	64.43	✓	64.47	✓	✓	25.91	—	—	—	—	—
1	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	25.87	✓	64.41	✓	64.44	✓	✓	25.90	—	—	—	—	—
1	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	25.01	✓	64.42	✓	64.47	✓	✓	25.02	—	—	—	—	—
5	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	198.37	✓	232.59	✓	232.62	✓	✓	198.36	320	7.28	1.3	26.4	39.9
5	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	198.35	✓	232.60	✓	232.62	✓	✓	198.35	—	—	—	—	—
5	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	198.32	✓	232.61	✓	232.62	✓	✓	198.36	—	—	—	—	—

Notes:

port 5: CLEAR, NO SPARE port 4: STROKE SP4, CLEAR port 3: CLEAR, NO SPARE

port 2: CLEAR, NO SPARE port 1: CLEAR, NO SPARE

Total Volume: _____



Groundwater Sampling
Multi-Port Well Field Data Sheet

JPL Pasadena
Contract #:

Water Pressure Inside Casing: _____

Well ID: MW-25
Sampling Zone No.: 5 to 1
Depth (ft): 713.633, 503.423, 358
Beginning of Session: 14:27 p.m.
End of Session: 14:04 p.m.

Start Time: 5:05
Finish Time: 18:20

Date: 7/19/05
Page: 1 of 1

Surface Function Checks										Position Sampler		Sample Collection Checks								Water Quality Parameters					
Port #	Run #	Shoe Out	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Shoe In	Arm In	Deactivate Set Arm	Locate Port	Arm out	Pressure in MP	Shoe Out	Zone Pressure	Open Valve	Zone Pressure	Close Valve	Shoe In	Pressure in MP	Time	PH	Turb. (NTU)	Temp. (°C)	Cond (mmhos)	
5	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	203.14	✓	204.61	✓	204.62	✓	✓	203.16	859	5:80	6.18	4.10	28.5	46.8
4	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	168.53	✓	170.92	✓	170.52	✓	✓	168.54	934	6:18	6.25	6.4	25.2	67.0
3	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	112.59	✓	115.71	✓	115.73	✓	✓	112.62	1015	6:25	6.4	25.2	63.9	
2	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	77.73	✓	81.18	✓	81.26	✓	✓	77.74	1049	6:52	7.3	26.6	56.8	
1	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	49.35	✓	52.39	✓	52.46	✓	✓	49.42	1126	6:52	5.8	27.3	55.8	
5	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	202.81	✓	204.55	✓	204.58	✓	✓	202.88	—	—	—	—	—	—
5	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	202.77	✓	204.56	✓	204.58	✓	✓	202.79	—	—	—	—	—	—
5	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	201.77	✓	204.56	✓	204.56	✓	✓	201.76	—	—	—	—	—	—
4	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	168.57	✓	170.89	✓	170.91	✓	✓	168.60	1249	—	—	—	—	—
4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	168.51	✓	170.89	✓	170.91	✓	✓	168.50	1421	—	—	—	—	—
4	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	166.01	✓	170.82	✓	170.88	✓	✓	166.04	1449	—	—	—	—	—
3	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	112.59	✓	115.72	✓	115.76	✓	✓	112.56	1510	—	—	—	—	—
3	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	112.56	✓	115.72	✓	115.73	✓	✓	112.53	—	—	—	—	—	—
2	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	77.58	✓	81.20	✓	81.27	✓	✓	77.63	1609	—	—	—	—	—
2	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	77.58	✓	81.20	✓	81.27	✓	✓	77.63	—	—	—	—	—	—
2	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	109.89	✓	115.74	✓	115.74	✓	✓	109.88	—	—	—	—	—	—
1	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	48.73	✓	52.45	✓	52.44	✓	✓	48.72	—	—	—	—	—	—
1	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	48.70	✓	52.45	✓	52.46	✓	✓	48.68	—	—	—	—	—	—

Notes:

port 5: CLEAN, NO ODO

port 4: CLEAN, NO ODO

port 3: CLEAN, NO ODO

port 2: CLEAN, NO ODO

port 1: CLEAN, NO ODO

Total Volume: _____



Groundwater Sampling Multi-Port Well Field Data Sheet

Date: 8/4/05
Page: 1 of 1

Beginning of Session: 14.07 p.m.
End of Session: 14.15 p.m.

[illegible]

Total Volume: —

port 2: Clear, no data	port 1: Clear, no data
------------------------	------------------------

From: Headington, Gregory
Sent: Monday, June 27, 2005 1:33 PM
To: Shiao, Tien

Subject: RE: Temperature, ORP, DO, pH for the production wells and MW-1
Garfield and Sunset and Bingham taken on 6-02-05 and the others were taken on 6-03-05.

MW1 was sampled on 6-05-05, pH – 7.59 cond – 0.597 DO – 0.81 temp – 14.1 ORP – 222mv

From: Shiao, Tien
Sent: Monday, June 27, 2005 1:24 PM
To: Headington, Gregory
Subject: RE: Temperature, ORP, DO, pH for the production wells and MW-1

Hi Greg,

Just a few quick questions.

Were these parameters taken on 06/03/05? And were these parameters taken for MW-1?

Thanks,
Tien

From: Headington, Gregory
Sent: Monday, June 27, 2005 1:08 PM
To: Shiao, Tien

Subject: RE: Temperature, ORP, DO, pH for the production wells and MW-1

Garfield, pH – 7.95 cond – 0.485 DO – 8.10 temp – 22.3 ORP – 266mv

Bingham, pH – 8.30 cond – 0.644 DO – 7.06 temp – 20.2 ORP – 215mv

LFWC-2, pH – 6.41 cond – 0.716 DO – 10.57 temp – 19.7 ORP – 211mv

LAWC-3, pH – 7.51 cond – 0.503 DO – 10.54 temp – 16.9 ORP – 175.3mv

Sunset, pH – 7.81 cond – 0.883 DO – 7.23 temp – 19.2 ORP – 234mv

From: Shiao, Tien
Sent: Monday, June 27, 2005 11:44 AM
To: Headington, Gregory
Subject: Temperature, ORP, DO, pH for the production wells and MW-1

Hi Greg,

I hope you had a great weekend! When you get the chance could you provide the above for me? I can photocopy the information from your field log book too.

Thanks,
Tien

Tien Shiao
Battelle Memorial Institute
Environmental Restoration Dept.
505 King Ave., Columbus, OH 43204
Room: 10-1-80
Business: (614) 424-3754

Mobile: (614) 370-3939
Fax: (614) 458-3754
shiaoh@battelle.org
www.battelle.org

From: Headington, Gregory
Sent: Monday, June 27, 2005 1:08 PM
To: Shiao, Tien
Subject: RE: Temperature, ORP, DO, pH for the production wells and MW-1
Garfield, pH – 7.95 cond – 0.485 DO – 8.10 temp – 22.3 ORP – 266mv

Bangham, pH – 8.30 cond – 0.644 DO – 7.06 temp – 20.2 ORP – 215mv

LFWC-2, pH – 6.41 cond – 0.716 DO – 10.57 temp – 19.7 ORP – 211mv

LAWC-3, pH – 7.51 cond – 0.503 DO – 10.54 temp – 16.9 ORP – 175.3mv

Sunset, pH – 7.81 cond – 0.883 DO – 7.23 temp – 19.2 ORP – 234mv

From: Shiao, Tien
Sent: Monday, June 27, 2005 11:44 AM
To: Headington, Gregory
Subject: Temperature, ORP, DO, pH for the production wells and MW-1

Hi Greg,

I hope you had a great weekend! When you get the chance could you provide the above for me? I can photocopy the information from your field log book too.

Thanks,
Tien

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shiaoh@battelle.org
www.battelle.org

DO & ORP were taken
later b/c they were missed
when the actual samples
were taken.

DO & ORP for
MW-17, MW-18, MW-19,
MW-20, MW-21, MW-24,
and MW-25

JPL 4Q05 Groundwater Monitoring Water Quality Parameters

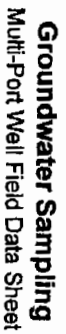
Well ID	Date	Time	pH	Turbidity (NTU)	Conductivity (mmhos)	Dissolved Oxygen	Temperature (°C)	ORP
MW-1	11/18/2005	12:22	6.96	0.85	66.5	11.4	19.2	148
MW-3-1	11/4/2005	11:32	6.60	3.6	46.5	11.4	18.4	169
MW-3-2		10:59	6.37	2.3	50.2	11.9	19.1	179
MW-3-3		10:09	6.06	0.40	51.0	12.4	18.4	160
MW-3-4		9:10	5.86	2.9	45.0	11.9	19.6	111
MW-3-5		8:38	5.67	3.4	42.2	11.3	18.8	218
MW-4-1	11/14/2005	10:44	7.15	4.0	37.8	13.3	23.5	123
MW-4-2		9:58	6.22	19	0.100	12.2	26.1	276
MW-4-3		9:28	6.19	14	47.2	9.7	22.9	185
MW-4-4		8:39	5.80	4.8	41.1	8.3	20.7	178
MW-4-5		8:04	5.51	19	39.9	9.0	19.3	224
MW-5	10/27/2005	12:21	6.07	1.3	31.7	10.5	18.1	162
MW-6	10/28/2005	9:34	6.19	1.9	0.101	10.1	20.1	257
MW-7	11/22/2005	8:59	6.13	6.0	58.0	8.8	20.5	147
MW-8	11/21/2005	12:44	6.71	0.25	44.9	9.2	18.7	133
MW-9	10/20/2005	12:59	6.24	12	35.9	7.6	22.7	42
MW-10	11/21/2005	8:37	6.29	0.30	96.6	9.9	17.1	88
MW-11-1	11/15/2005	11:37	6.30	1.1	60.9	10.9	23.1	179
MW-11-2		10:58	6.44	2.7	50.0	10.3	23.0	201
MW-11-3		10:10	5.98	7.9	45.2	10.2	23.3	60
MW-11-4		9:36	5.97	1.5	25.6	10.7	21.7	117
MW-11-5		8:43	5.70	7.0	38.7	10.9	21.2	206
MW-12-1	11/17/2005	10:15	6.45	10.0	49.6	14.5	22.3	167
MW-12-2		9:38	6.29	1.7	61.5	11.1	22.0	146
MW-12-3		9:11	6.11	0.85	44.6	11.2	21.4	104
MW-12-4		8:24	5.59	0.40	55.8	9.9	18.5	140
MW-12-5		7:56	5.40	1.5	52.3	10.3	17.8	214
MW-13	11/22/2005	11:38	6.59	7.3	65.8	11.5	26.4	202
MW-14-1	11/7/2005	11:36	6.21	3.3	0.131	10.8	22.0	328
MW-14-2		10:57	5.99	3.1	0.125	10.2	21.2	268
MW-14-3		10:25	5.73	0.90	0.113	10.5	20.9	291
MW-14-4		9:54	5.59	0.55	64.8	11.0	20.6	211
MW-14-5		8:58	5.62	2.5	39.4	10.8	19.8	246
MW-15	10/27/2005	13:58	6.70	2.9	52.1	8.8	19.0	144
MW-16	10/28/2005	12:44	6.69	0.25	48.9	12.1	23.1	147
MW-17-1	11/1/2005	10:39	6.50	0.4	35.1	11.2	21.1	204
MW-17-2		10:07	6.08	2.7	90.5	12.1	21.4	210
MW-17-3		9:11	5.74	4.8	72.1	10.6	20.5	172
MW-17-4		8:40	5.85	1.5	34.4	11.2	20.2	178
MW-17-5		8:07	5.55	110	36.1	11.6	17.8	233
MW-18-1	11/3/2005	10:55	6.72	2.8	37.9	12.7	20.8	195
MW-18-2		10:21	6.51	7.1	55.0	12.0	20.5	162
MW-18-3		9:50	5.83	1.2	60.2	11.0	19.1	194
MW-18-4		9:21	5.66	2.6	45.7	10.9	19.8	210
MW-18-5		8:47	5.60	2.1	36.1	10.1	18.0	241
MW-19-1	11/2/2005	10:21	6.53	34	40.2	8.5	18.7	166
MW-19-2		9:49	6.19	50	0.104	8.6	19.3	276
MW-19-3		9:18	6.14	2.2	65.5	9.1	18.2	145
MW-19-4		8:48	5.77	0.30	72.3	9.3	18.1	164
MW-19-5		7:58	5.27	0.65	78.4	10.3	15.8	227
MW-20-1		10:47	6.12	1.5	72.5	11.1	18.5	126

JPL 4Q05 Groundwater Monitoring Water Quality Parameters

Well ID	Date	Time	pH	Turbidity (NTU)	Conductivity (mmhos)	Dissolved Oxygen	Temperature (°C)	ORP
MW-1	11/18/2005	12:22	6.96	0.85	66.5	11.4	19.2	148
MW-3-1	11/4/2005	11:32	6.60	3.6	46.5	11.4	18.4	169
MW-3-2		10:59	6.37	2.3	50.2	11.9	19.1	179
MW-3-3		10:09	6.06	0.40	51.0	12.4	18.4	160
MW-3-4		9:10	5.86	2.9	45.0	11.9	19.6	111
MW-3-5		8:38	5.67	3.4	42.2	11.3	18.8	218
MW-4-1	11/14/2005	10:44	7.15	4.0	37.8	13.3	23.5	123
MW-4-2		9:58	6.22	19	0.100	12.2	26.1	276
MW-4-3		9:28	6.19	14	47.2	9.7	22.9	185
MW-4-4		8:39	5.80	4.8	41.1	8.3	20.7	178
MW-4-5		8:04	5.51	19	39.9	9.0	19.3	224
MW-5	10/27/2005	12:21	6.07	1.3	31.7	10.5	18.1	162
MW-6	10/28/2005	9:34	6.19	1.9	0.101	10.1	20.1	257
MW-7	11/22/2005	8:59	6.13	6.0	58.0	8.8	20.5	147
MW-8	11/21/2005	12:44	6.71	0.25	44.9	9.2	18.7	133
MW-9	10/20/2005	12:59	6.24	12	35.9	7.6	22.7	42
MW-10	11/21/2005	8:37	6.29	0.30	96.6	9.9	17.1	88
MW-11-1	11/15/2005	11:37	6.30	1.1	60.9	10.9	23.1	179
MW-11-2		10:58	6.44	2.7	50.0	10.3	23.0	201
MW-11-3		10:10	5.98	7.9	45.2	10.2	23.3	60
MW-11-4		9:36	5.97	1.5	25.6	10.7	21.7	117
MW-11-5		8:43	5.70	7.0	38.7	10.9	21.2	206
MW-12-1	11/17/2005	10:15	6.45	10.0	49.6	14.5	22.3	167
MW-12-2		9:38	6.29	1.7	61.5	11.1	22.0	146
MW-12-3		9:11	6.11	0.85	44.6	11.2	21.4	104
MW-12-4		8:24	5.59	0.40	55.8	9.9	18.5	140
MW-12-5		7:56	5.40	1.5	52.3	10.3	17.8	214
MW-13	11/22/2005	11:38	6.59	7.3	65.8	11.5	26.4	202
MW-14-1	11/7/2005	11:36	6.21	3.3	0.131	10.8	22.0	328
MW-14-2		10:57	5.99	3.1	0.125	10.2	21.2	268
MW-14-3		10:25	5.73	0.90	0.113	10.5	20.9	291
MW-14-4		9:54	5.59	0.55	64.8	11.0	20.6	211
MW-14-5		8:58	5.62	2.5	39.4	10.8	19.8	246
MW-15	10/27/2005	13:58	6.70	2.9	52.1	8.8	19.0	144
MW-16	10/28/2005	12:44	6.69	0.25	48.9	12.1	23.1	147
MW-17-1	11/1/2005	10:39	6.50	0.4	35.1	11.2	21.1	204
MW-17-2		10:07	6.08	2.7	90.5	12.1	21.4	210
MW-17-3		9:11	5.74	4.8	72.1	10.6	20.5	172
MW-17-4		8:40	5.85	1.5	34.4	11.2	20.2	178
MW-17-5		8:07	5.55	110	36.1	11.6	17.8	233
MW-18-1	11/3/2005	10:55	6.72	2.8	37.9	12.7	20.8	195
MW-18-2		10:21	6.51	7.1	55.0	12.0	20.5	162
MW-18-3		9:50	5.83	1.2	60.2	11.0	19.1	194
MW-18-4		9:21	5.66	2.6	45.7	10.9	19.8	210
MW-18-5		8:47	5.60	2.1	36.1	10.1	18.0	241
MW-19-1	11/2/2005	10:21	6.53	34	40.2	8.5	18.7	166
MW-19-2		9:49	6.19	50	0.104	8.6	19.3	276
MW-19-3		9:18	6.14	2.2	65.5	9.1	18.2	145
MW-19-4		8:48	5.77	0.30	72.3	9.3	18.1	164
MW-19-5		7:58	5.27	0.65	78.4	10.3	15.8	227

#3 & He³ results provided = Garfield, Bangham, Sunset, LAWC-3 MW1, LFwc-2

MW-20-1	11/8/2005	10:47	6.12	1.5	72.5	11.1	18.5	126
MW-20-2		10:14	6.13	0.60	41.9	10.7	18.3	92
MW-20-3		9:44	6.13	0.65	61.8	10.9	17.9	113
MW-20-4		9:07	6.27	3.7	36.8	10.3	17.4	-35
MW-20-5		8:29	5.86	1.8	37.0	11.1	17.7	-39
MW-21-1	10/21/2005	10:15	6.41	7.6	0.114	9.9	17.4	156
MW-21-2		9:46	6.10	4.3	0.134	11.6	17.4	161
MW-21-3		9:10	5.86	3.4	0.124	9.8	16.8	171
MW-21-4		8:42	5.57	3.4	82.3	10.9	17.1	59
MW-21-5		8:13	5.41	1.8	0.093	12.1	18.1	200
MW-22-1	11/9/2005	11:08	6.40	11	0.110	9.3	18.0	170
MW-22-2		10:23	6.31	1.2	57.8	9.2	18.2	51
MW-22-3		9:17	5.79	0.15	68.6	10.0	18.4	85
MW-22-4		8:47	6.02	2.7	40.5	8.9	19.2	91
MW-22-5		8:17	5.87	0.70	44.2	8.7	19.0	24
MW-23-1	11/11/2005	10:24	6.52	5.9	0.128	11.9	20.3	310
MW-23-2		9:47	6.52	2.5	98.6	11.9	19.9	108
MW-23-3		9:19	6.25	1.9	44.1	11.3	18.9	132
MW-23-4		8:34	6.86	1.7	42.0	8.5	17.9	171
MW-23-5		7:30	6.78	2.7	48.0	9.0	16.3	89
MW-24-1	10/31/2005	10:35	6.66	4.0	53.2	9.5	22.3	170
MW-24-2		9:58	6.40	2.2	50.8	8.8	22.7	145
MW-24-3		9:21	6.30	2.0	39.0	9.2	21.4	123
MW-24-4		8:45	6.14	1.0	32.6	10.0	21.7	82
MW-24-5		8:10	5.56	0.70	44.8	10.1	21.1	203
MW-25-1	11/16/2005	11:28	6.50	9.8	99.1	9.7	24.8	210
MW-25-2		10:44	6.38	1.7	64.6	9.0	24.6	179
MW-25-3		10:00	6.03	7.8	70.2	6.3	22.6	187
MW-25-4		9:16	5.64	21	73.3	7.8	21.9	154
MW-25-5		8:14	5.46	1.1	52.6	8.8	19.4	237
MW-26-1	11/18/2005	10:10	6.39	0.65	97.4	12.9	24.2	238
MW-26-2		8:48	5.32	6.1	86.5	13.7	22.4	232



Date: 10/21/05
Page: 1 of 1

[illegible]



Date: 10/31/05
Page: 1 of 1

[illegible]

Total Volume:

port 5: CLEAR, SILENT DOOR	port 4: CLEAR, SILENT DOOR	port 3: CLEAR, STRONG DOOR
port 2: CLEAR, NO DOOR	port 1: CLEAR, NO DOOR	



Groundwater Sampling Multi-Port Well Field Data Sheet

Date: 11/1/55
Page: 1 of 1

[illegible]

Total Volume: _____

port 5: Slightly cloudy, no odor	port 4: Clear, no odor	port 3: Clear, no odor
port 2: Clear, no odor	port 1: Clear, no odor	



Groundwater Sampling Multi-Port Well Field Data Sheet

Groundwater Sampling Multi-Port Well Field Data Sheet

Well ID: MW-19
Sampling Zone No.: 5+1

Start Time: 7:25

Date: 11/2/25
Page: 1 of 1

Water Pressure Inside Casing: _____

Beginning of Session: 14.10 psia
End of Session: 14.14 psia

Start Time: 7:25
Finish Time: 10:25

Date: 11/2/25
Page: 1 of 1

[illegible]

Notes:

port 5:	port 4:	port 3:
CLEAR, NO OPEN	CLEAR, NO OPEN	CLEAR, NO OPEN

Total Volume:

Port 2: 5 Liters, No odor. Port 1: 5 Liters, Yellowish Odor, No odor.



Groundwater Sampling Multi-Port Well Field Data Sheet

Well ID: MW-18

Sampling Zone No.: 5 to 1

Depth (ft): 684, 564, 424, 330, 270

Water Pressure Inside Casing:

End of Session: 14.08 psia

Start Time: 8:10
Finish Time: 11:55

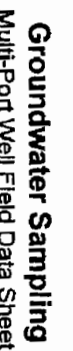
Date: 11/3/95
Page: 1 of 1

[illegible]

Total Volume: —

port 5: CLEAR, NO OPOL port 4: CLEAR, SLIGHT OPOL port 3: CLEAR, NO OPOL

port 2: CLEAR, NO ORDER port 1: CLEAR, NO ORDER



Date: 11/14/25
Page: 1 of 1

1

[illegible]

Total Volume:

port 5: <u>CLEAR, STANDBY 220R</u>	port 4: <u>CLEAR, SLIGHT 220R</u>	port 3: <u>CLEAR, NO 020R</u>
port 2: <u>CLEAR, NO 020R</u>	port 1: <u>CLEAR, NO 020R</u>	



Groundwater Sampling
Multi-Port Well Field Data Sheet

JPL Pasadena
Contract #Battelle

Well ID: MW-14

Sampling Zone No.: 540.1
Depth (ft): 540.456, 382.277, 207
Beginning of Session: 1407
End of Session: psia

Start Time: 820
Finish Time: 1225

Date: 11/7/05
Page: 1 of 1

Port #	Run #	Surface Function Checks						Position Sampler	Sample Collection Checks								Water Quality Parameters								
		Shoe Out	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Shoe In		Arm In	Deactivate Set Arm Local Port	Arm out	Pressure in MP	Shoe Out	Zone Pressure	Open Valve	Zone Pressure	Close Valve	Shoe In	Pressure in MP	Time	PH	Turb. (NTU)	Cond (mmhos)	Dissolved Oxygen	Temp. (oC)	ORP
5	1	✓	✓	✓	✓	✓	✓	✓	✓	185.58	✓	189.70	✓	189.68	✓	✓	185.43	752	5.42	2.5	344	10.8	19.8	246	-
5	2	✓	✓	✓	✓	✓	✓	✓	✓	186.57	✓	189.70	✓	189.68	✓	✓	185.59	-	-	-	-	-	-	-	-
4	1	✓	✓	✓	✓	✓	✓	✓	✓	158.87	✓	153.16	✓	153.18	✓	✓	158.85	954	5.59	0.55	648	11.0	20.6	241	
3	1	✓	✓	✓	✓	✓	✓	✓	✓	126.55	✓	124.05	✓	124.06	✓	✓	126.59	1025	5.73	0.90	0.113	10.5	20.9	251	
2	1	✓	✓	✓	✓	✓	✓	✓	✓	80.76	✓	75.36	✓	75.38	✓	✓	80.76	1057	5.99	3.1	1.25	10.2	21.2	268	
1	1	✓	✓	✓	✓	✓	✓	✓	✓	50.65	✓	45.15	✓	45.15	✓	✓	50.68	1136	6.21	3.3	1.31	10.8	22.0	328	
1	2	✓	✓	✓	✓	✓	✓	✓	✓	50.16	✓	45.13	✓	45.16	✓	✓	50.14	-	-	-	-	-	-	-	-

Notes:

port 5: CLEAR, STRAW, DOOR port 4: CLEAR, NO DOOR port 3: CLEAR, NO DOOR

port 2: CLEAR, NO DOOR port 1: CLEAR, NO DOOR

Total Volume: —



Well ID: MW-20

Sampling Zone No.: 54.1

Sampling Zone No.: 5+1

Depth (ft): 900, 700, 562, 392, 230

Beginning of Session: 14.13 psia

Water Pressure Inside Casing:

End of Session: 14.11 psia

Start Time: 755
Finish Time: 1052

Date: 11/8/25
Page: 1 of 1

Page: 1 of 1

1 of 1

[illegible]



Date: 11/9/25
Page: 1 of 1

Port Run #	Shoes Out	Surface Function Checks					Position Sampler	Sample Collection Checks							Water Quality Parameters									
		Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Shoe In		Arm In	Deactivate Set Arm Locate Port	Arm out	Pressure In MP	Shoe Out	Zone Pressure	Open Valve	Zone Pressure	Close Valve	Shoe In	Pressure In MP	Time	pH	Turb. (NTU)	Cond (mmhos)	Dissolved Oxygen	Temp. (oC)	ORP
5	1	✓	✓	✓	✓	✓	✓	✓	✓	201.70	✓	203.66	✓	203.65	✓	✓	201.66	817	5.87	0.70	44.2	8.7	19.0	24
4	1	✓	✓	✓	✓	✓	✓	✓	✓	149.23	✓	152.68	✓	152.61	✓	✓	149.22	847	6.02	2.7	40.5	8.9	19.2	91
3	1	✓	✓	✓	✓	✓	✓	✓	✓	115.42	✓	120.37	✓	120.35	✓	✓	115.42	917	5.79	1.5	68.6	10.0	18.4	85
3	2	✓	✓	✓	✓	✓	✓	✓	✓	115.40	✓	120.36	✓	120.36	✓	✓	115.41	—	—	—	—	—	—	—
2	1	✓	✓	✓	✓	✓	✓	✓	✓	89.35	✓	94.24	✓	94.23	✓	✓	89.33	1023	6.34	1.2	57.8	9.2	18.2	51
1	1	✓	✓	✓	✓	✓	✓	✓	✓	52.71	✓	57.18	✓	57.16	✓	✓	52.69	108	6.40	11	11.0	9.3	18.0	170
							</																	

Total Volume:

port5: CLEAN, STRONG ODOOR	port4: CLEAN, STRONG ODOOR	port3: CLEAN, NO ODOOR
port2: CLEAN, NO ODOOR	port1: CLEAN, NO ODOOR,	



Battelle

Columbus Laboratories

Proj. No.

G48611-13

Project Title

Source Determination Study

SAMPLE RS: (Signature)

G. Hendrix / D. Bonner / B. Headington

DATE

6-5-2005 11:30

TIME

SAMPLE ID.

MW-1

SAMPLE TYPE (✓)

Disseminated
DIC
2

Number
of
Containers

Remarks

Form No.

PC506100

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)

[Signature]

Date/Time

6-6-2005 16:00

Received by: (Signature)

[Signature]

Relinquished by: (Signature)

Received by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

[Signature]

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

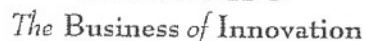
Received for Laboratory by: (Signature)

Date/Time

Date/Time

Remarks

Sent to Microseps
(06 JUN 2005)



PO508313
CH

CHAIN OF CUSTODY RECORD

Form No. _____

[illegible]



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 1 of 6
Lab Proj #: P0508313
Report Date: 09/06/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

Laboratory Results

Total pages in data package: 7

<u>Lab Sample #</u>	<u>Client Sample ID</u>
P0508313-01	MW-17-5
P0508313-02	MW-17-4
P0508313-03	MW-17-3
P0508313-04	MW-17-2
P0508313-05	MW-17-1

Microseeps test results meet all the requirements of the NELAC standards.

Approved By:

The analytical results reported here are reliable and usable to the precision expressed in this report. As required by some regulating authorities, a full discussion of the uncertainty in our analytical results can be obtained at our web site or through customer service. Unless otherwise specified, all results are reported on a wet weight basis.

*As a valued client we would appreciate your comments on our service.
Please call customer service at (412)826-5245 or email bhans@microseeps.com*

Case Narrative:

Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 2 of 6
Lab Proj #: P0508313
Report Date: 09/06/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-17-5	Water	P0508313-01	15 Aug. 05 9:30	18 Aug. 05 12:14		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	21.000	0.400	mg/L	AM20GAX	8/29/05	sl
TIC	220.0	4	mg/l CaCO3	AM20GAX	8/29/05	rw



N - NELAC certified analysis

Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 3 of 6
Lab Proj #: P0508313
Report Date: 09/06/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-17-4	Water	P0508313-02	15 Aug. 05 10:45	18 Aug. 05 12:14		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	22.000	0.400	mg/L	AM20GAX	8/29/05	sl
TIC	250.0	4	mg/l CaCO3	AM20GAX	8/29/05	rw



N - NELAC certified analysis

Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 4 of 6
Lab Proj #: P0508313
Report Date: 09/06/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-17-3	Water	P0508313-03	15 Aug. 05 12:45	18 Aug. 05 12:14		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	18.000	0.400	mg/L	AM20GAX	8/29/05	sl
TIC	380.0	4	mg/l CaCO3	AM20GAX	8/29/05	rw



N - NELAC certified analysis

Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 5 of 6
Lab Proj #: P0508313
Report Date: 09/06/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-17-2	Water	P0508313-04	15 Aug. 05 13:45	18 Aug. 05 12:14		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	19.000	0.400	mg/L	AM20GAX	8/29/05	sl
TIC	450.0	4	mg/l CaCO3	AM20GAX	8/29/05	rw



N - NELAC certified analysis

Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 6 of 6
Lab Proj #: P0508313
Report Date: 09/06/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-17-1	Water	P0508313-05	15 Aug. 05 15:30	18 Aug. 05 12:14		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	21.000	0.400	mg/L	AM20GAX	8/29/05	sl
TIC	250.0	4	mg/l CaCO3	AM20GAX	8/29/05	rw



N - NELAC certified analysis



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 1 of 6
Lab Proj #: P0506087
Report Date: 06/20/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

Laboratory Results

Total pages in data package: 7

<u>Lab Sample #</u>	<u>Client Sample ID</u>
P0506087-01	Garfield
P0506087-02	Sunset
P0506087-03	Bangham
P0506087-04	LFWC-2
P0506087-05	LAWC-3

Microseeps test results meet all the requirements of the NELAC standards.

Approved By:

The analytical results reported here are reliable and usable to the precision expressed in this report. As required by some regulating authorities, a full discussion of the uncertainty in our analytical results can be obtained at our web site or through customer service. Unless otherwise specified, all results are reported on a wet weight basis.

*As a valued client we would appreciate your comments on our service.
Please call customer service at (412)826-5245 or email bhans@microseeps.com*

Case Narrative: The Inorganic Carbon is reported as dissolved. The TIC analyses for samples P0506087/01-03 were performed outside of the laboratory recommended holding time.

Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 2 of 6
Lab Proj #: P0506087
Report Date: 06/20/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
Garfield	Water	P0506087-01	02 Jun. 05 13:40	06 Jun. 05 15:28		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	27.000	0.400	mg/L	AM20GAX	6/16/05	sl
TIC	210.0	4.0	mg/l	AM20GAX	6/17/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 3 of 6
Lab Proj #: P0506087
Report Date: 06/20/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
Sunset	Water	P0506087-02	02 Jun. 05 10:52	06 Jun. 05 15:28		
Analyte(s)	Result	PQL	Units	Method #	Analysis Date	By
<u>RiskAnalysis</u>						
Nitrogen	22.000	0.400	mg/L	AM20GAX	6/16/05	sl
TIC	500.0	4.0	mg/l	AM20GAX	6/17/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 4 of 6
Lab Proj #: P0506087
Report Date: 06/20/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
Bangham	Water	P0506087-03	02 Jun. 05 15:30	06 Jun. 05 15:28		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	24.000	0.400	mg/L	AM20GAX	6/16/05	sl
TIC	360.0	4.0	mg/l	AM20GAX	6/17/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 5 of 6
Lab Proj #: P0506087
Report Date: 06/20/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
LFWC-2	Water	P0506087-04	03 Jun. 05 9:30	06 Jun. 05 15:28		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	24.000	0.400	mg/L	AM20GAX	6/16/05	sl
TIC	360.0	4.0	mg/l	AM20GAX	6/17/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 6 of 6
Lab Proj #: P0506087
Report Date: 06/20/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
LAWC-3	Water	P0506087-05	03 Jun. 05 13:30	06 Jun. 05 15:28		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	25.000	0.400	mg/L	AM20GAX	6/16/05	sl
TIC	370.0	4.0	mg/l	AM20GAX	6/17/05	sl





Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 1 of 6
Lab Proj #: P0507334
Report Date: 08/02/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

Laboratory Results

Total pages in data package: 7

<u>Lab Sample #</u>	<u>Client Sample ID</u>
P0507334-01	MW-25-5
P0507334-02	MW-25-4
P0507334-03	MW-25-3
P0507334-04	MW-25-2
P0507334-05	MW-25-1

Microseeps test results meet all the requirements of the NELAC standards.

Approved By:

The analytical results reported here are reliable and usable to the precision expressed in this report. As required by some regulating authorities, a full discussion of the uncertainty in our analytical results can be obtained at our web site or through customer service. Unless otherwise specified, all results are reported on a wet weight basis.

*As a valued client we would appreciate your comments on our service.
Please call customer service at (412)826-5245 or email bhans@microseeps.com*

Case Narrative:

Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 2 of 6
Lab Proj #: P0507334
Report Date: 08/02/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-25-5	Water	P0507334-01	19 Jul. 05 12:30	21 Jul. 05 13:11		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	16.000	0.400	mg/L	AM20GAX	7/29/05	jl
TIC	280.0	4.0	mg/l	AM20GAX	8/1/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 3 of 6
Lab Proj #: P0507334
Report Date: 08/02/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-25-4	Water	P0507334-02	19 Jul. 05 14:00	21 Jul. 05 13:11		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	33.000	0.400	mg/L	AM20GAX	7/29/05	jl
TIC	420.0	4.0	mg/l	AM20GAX	8/1/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 4 of 6
Lab Proj #: P0507334
Report Date: 08/02/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-25-3	Water	P0507334-03	19 Jul. 05 15:10	21 Jul. 05 13:11		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	26.000	0.400	mg/L	AM20GAX	7/29/05	jl
TIC	370.0	4.0	mg/l	AM20GAX	8/1/05	sl



N - NELAC certified analysis

Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 5 of 6
Lab Proj #: P0507334
Report Date: 08/02/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-25-2	Water	P0507334-04	19 Jul. 05 16:15	21 Jul. 05 13:11		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	27.000	0.400	mg/L	AM20GAX	7/29/05	jl
TIC	230.0	4.0	mg/l	AM20GAX	8/1/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 6 of 6
Lab Proj #: P0507334
Report Date: 08/02/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-25-1	Water	P0507334-05	19 Jul. 05 17:30	21 Jul. 05 13:11		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	26.000	0.400	mg/L	AM20GAX	7/29/05	jl
TIC	360.0	4.0	mg/l	AM20GAX	8/1/05	sl



Proj. No.

G486111-T3

D. bonnell

TIME

MW-19-5
MW-19-4
MW-19-3
MW-19-2
MW-19-1

TIME

0960	1100	1210	1400	2051
------	------	------	------	------

Container No.

Number
of
Containers

Remarks

DIC samples
are not filtered
in the field,
please filter
in the lab.

PO# 1915

Form No. 07/201005

CHAIN OF CUSTODY RECORD

90507335

Date/Time

Received for Laboratory by:

Date/Time

Remarks

Remarks

10

10

(Signature)

7/21/05	1312
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To: Microseeps

Page _____ of 01



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 1 of 6
Lab Proj #: P0507335
Report Date: 08/02/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

Laboratory Results

Total pages in data package: 7

<u>Lab Sample #</u>	<u>Client Sample ID</u>
P0507335-01	MW-19-5
P0507335-02	MW-19-4
P0507335-03	MW-19-3
P0507335-04	MW-19-2
P0507335-05	MW-19-1

Microseeps test results meet all the requirements of the NELAC standards.

Approved By:

The analytical results reported here are reliable and usable to the precision expressed in this report. As required by some regulating authorities, a full discussion of the uncertainty in our analytical results can be obtained at our web site or through customer service. Unless otherwise specified, all results are reported on a wet weight basis.

*As a valued client we would appreciate your comments on our service.
Please call customer service at (412)826-5245 or email bhans@microseeps.com*

Case Narrative:

Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 2 of 6
Lab Proj #: P0507335
Report Date: 08/02/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-19-5	Water	P0507335-01	20 Jul. 05 9:00	21 Jul. 05 13:16		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	16.000	0.400	mg/L	AM20GAX	7/29/05	jl
TIC	390.0	4.0	mg/l	AM20GAX	8/1/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 3 of 6
Lab Proj #: P0507335
Report Date: 08/02/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-19-4	Water	P0507335-02	20 Jul. 05 11:00	21 Jul. 05 13:16		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	16.000	0.400	mg/L	AM20GAX	7/29/05	rw
TIC	390.0	4.0	mg/l	AM20GAX	8/1/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 4 of 6
Lab Proj #: P0507335
Report Date: 08/02/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-19-3	Water	P0507335-03	20 Jul. 05 12:10	21 Jul. 05 13:16		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	18.000	0.400	mg/L	AM20GAX	7/29/05	rw
TIC	370.0	4.0	mg/l	AM20GAX	8/1/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 5 of 6
Lab Proj #: P0507335
Report Date: 08/02/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-19-2	Water	P0507335-04	20 Jul. 05 14:00	21 Jul. 05 13:16		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	20.000	0.400	mg/L	AM20GAX	7/29/05	rw
TIC	280.0	4.0	mg/l	AM20GAX	8/1/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 6 of 6
Lab Proj #: P0507335
Report Date: 08/02/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-19-1	Water	P0507335-05	20 Jul. 05 15:00	21 Jul. 05 13:16		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	19.000	0.400	mg/L	AM20GAX	7/29/05	rw
TIC	420.0	4.0	mg/l	AM20GAX	8/1/05	sl





Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 1 of 6
Lab Proj #: P0507368
Report Date: 08/05/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

Laboratory Results

Total pages in data package: 7

<u>Lab Sample #</u>	<u>Client Sample ID</u>
P0507368-01	MW-18-5
P0507368-02	MW-18-4
P0507368-03	MW-18-3
P0507368-04	MW-18-2
P0507368-05	MW-18-1

Microseeps test results meet all the requirements of the NELAC standards.

Approved By:

The analytical results reported here are reliable and usable to the precision expressed in this report. As required by some regulating authorities, a full discussion of the uncertainty in our analytical results can be obtained at our web site or through customer service. Unless otherwise specified, all results are reported on a wet weight basis.

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Case Narrative:

Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 2 of 6
Lab Proj #: P0507368
Report Date: 08/05/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-18-5	Water	P0507368-01	21 Jul. 05 9:15	22 Jul. 05 15:17		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	21.000	0.400	mg/L	AM20GAX	8/3/05	sl
TIC	250.0	4.0	mg/l	AM20GAX	8/1/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 3 of 6
Lab Proj #: P0507368
Report Date: 08/05/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-18-4	Water	P0507368-02	21 Jul. 05 10:30	22 Jul. 05 15:17		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	22.000	0.400	mg/L	AM20GAX	8/3/05	sl
TIC	340.0	4.0	mg/l	AM20GAX	8/1/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 4 of 6
Lab Proj #: P0507368
Report Date: 08/05/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-18-3	Water	P0507368-03	21 Jul. 05 12:45	22 Jul. 05 15:17		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	15.000	0.400	mg/L	AM20GAX	8/3/05	sl
TIC	430.0	4.0	mg/l	AM20GAX	8/1/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 5 of 6
Lab Proj #: P0507368
Report Date: 08/05/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-18-2	Water	P0507368-04	21 Jul. 05 16:30	22 Jul. 05 15:17		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	18.000	0.400	mg/L	AM20GAX	8/3/05	sl
TIC	380.0	4.0	mg/l	AM20GAX	8/1/05	sl



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 6 of 6
Lab Proj #: P0507368
Report Date: 08/05/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-18-1	Water	P0507368-05	21 Jul. 05 15:00	22 Jul. 05 15:17		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	19.000	0.400	mg/L	AM20GAX	8/4/05	rw
TIC	270.0	4.0	mg/l	AM20GAX	8/1/05	sl





Battelle

Columbus Laboratories

Proj. No.

Project Title

G48611-13

Source Determination Study

SAMPLERS: (Signature)

D. Conrad

DATE

TIME

SAMPLE I.D.

01
02
03
04
05

1-Aug-05 0857
1-Aug-05 1050
1-Aug-05 1230
1-Aug-05 1407
1-Aug-05 1608

MW-20-5
MW-20-4
MW-20-3
MW-20-2
MW-20-1

SAMPLE TYPE (✓)

Container No.

Number of Containers

Remarks

DIC samples are not filtered in the field, please filter in the lab.
MW20-3 Bubble could not be helped

Form No.

CHAIN OF CUSTODY RECORD

Form No.

Revised 50C

PO #
191503

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Date/Time

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Date/Time

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received for Laboratory by: (Signature)

Date/Time

Remarks

To: Microseeps



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 1 of 6
Lab Proj #: P0508066
Report Date: 08/16/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

Laboratory Results

Total pages in data package: 7

<u>Lab Sample #</u>	<u>Client Sample ID</u>
P0508066-01	MW-20-5
P0508066-02	MW-20-4
P0508066-03	MW-20-3
P0508066-04	MW-20-2
P0508066-05	MW-20-1

Microseeps test results meet all the requirements of the NELAC standards.

Approved By:

The analytical results reported here are reliable and usable to the precision expressed in this report. As required by some regulating authorities, a full discussion of the uncertainty in our analytical results can be obtained at our web site or through customer service. Unless otherwise specified, all results are reported on a wet weight basis.

*As a valued client we would appreciate your comments on our service.
Please call customer service at (412)826-5245 or email bhans@microseeps.com*

Case Narrative: The inorganic carbon samples were filtered in the lab according to the previously supplied instructions.

Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

Page: Page 2 of 6
Lab Proj #: P0508066
Report Date: 08/16/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-20-5	Water	P0508066-01	01 Aug. 05 8:57	04 Aug. 05 14:03		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	23.000	0.400	mg/L	AM20GAX	8/15/05	sl
TIC	260.0	4.0	mg/l	AM20GAX	8/7/05	sl



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Contact: Tien Shiao
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Columbus, OH 43228

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Report Date: 08/16/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-20-4	Water	P0508066-02	01 Aug. 05 10:50	04 Aug. 05 14:03		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	21.000	0.400	mg/L	AM20GAX	8/15/05	sl
TIC	260.0	4.0	mg/l	AM20GAX	8/7/05	sl



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Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-20-3	Water	P0508066-03	01 Aug. 05 12:30	04 Aug. 05 14:03		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	21.000	0.400	mg/L	AM20GAX	8/15/05	sl
TIC	430.0	4.0	mg/l	AM20GAX	8/7/05	sl

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Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-20-2	Water	P0508066-04	01 Aug. 05 14:07	04 Aug. 05 14:03		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	20.000	0.400	mg/L	AM20GAX	8/15/05	sl
TIC	310.0	4.0	mg/l	AM20GAX	8/7/05	sl



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Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-20-1	Water	P0508066-05	01 Aug. 05 16:08	04 Aug. 05 14:03		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	18.000	0.400	mg/L	AM20GAX	8/15/05	sl
TIC	340.0	4.0	mg/l	AM20GAX	8/7/05	sl





Battelle

Columbus Laboratories

PO507426

CHAIN OF CUSTODY RECORD

Form No. _____

Project Title		SAMPLE TYPE (✓)		Container No.	Number of Containers	Remarks
Proj. No.						
SAMPLERS: (Signature) <i>D. Gennel</i>						
DATE	TIME	SAMPLE I.D.				
7/25/2005	09:00	MW-24-4	X	X		DIC samples are not filtered in the field, please filter in the lab.
7/25/2005	10:30	MW-24-3	X	X		
7/25/2005	12:00	MW-24-2	X	X		
7/25/2005	13:15	MW-24-1	X	X		
7/25/2005	15:30	MW-24-5	X	X		
7/26/2005	08:30	MW-21-5	X	X		
7/26/2005	10:30	MW-21-4	X	X		
7/26/2005	12:15	MW-21-3	X	X		
7/26/2005	14:45	MW-21-2	X	X		
7/26/2005	16:00	MW-21-1	X	X		
Relinquished by: (Signature) <i>[Signature]</i> Date/Time 7/26/05 17:00 Received by: (Signature) _____ Date/Time _____						
Relinquished by: (Signature) <i>[Signature]</i> Date/Time _____ Received by: (Signature) _____ Date/Time _____						
Relinquished by: (Signature) _____ Date/Time 7/27/05 1211 Received for Laboratory by: (Signature) <i>[Signature]</i> Date/Time _____						

To: Microseeps



Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

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Lab Proj #: P0507426
Report Date: 08/08/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

Laboratory Results

Total pages in data package: 12

<u>Lab Sample #</u>	<u>Client Sample ID</u>
P0507426-01	MW-24-4
P0507426-02	MW-24-3
P0507426-03	MW-24-2
P0507426-04	MW-24-1
P0507426-05	MW-24-5
P0507426-06	MW-21-5
P0507426-07	MW-21-4
P0507426-08	MW-21-3
P0507426-09	MW-21-2
P0507426-10	MW-21-1

Microseeps test results meet all the requirements of the NELAC standards.

Approved By:

The analytical results reported here are reliable and usable to the precision expressed in this report. As required by some regulating authorities, a full discussion of the uncertainty in our analytical results can be obtained at our web site or through customer service. Unless otherwise specified, all results are reported on a wet weight basis.

*As a valued client we would appreciate your comments on our service.
Please call customer service at (412)826-5245 or email bhans@microseeps.com*

Case Narrative:

Client Name: Battelle Memorial Institute
Contact: Tien Shiao
Address: 505 King Ave
Columbus, OH 43228

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Lab Proj #: P0507426
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Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-24-4	Water	P0507426-01	25 Jul. 05 9:00	27 Jul. 05 12:12		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	18.000	0.400	mg/L	AM20GAX	8/6/05	mm
TIC	220.0	4.0	mg/l	AM20GAX	8/7/05	sl



Client Name: Battelle Memorial Institute
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Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-24-3	Water	P0507426-02	25 Jul 05 10:30	27 Jul 05 12:12		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	16.000	0.400	mg/L	AM20GAX	8/6/05	mm
TIC	270.0	4.0	mg/l	AM20GAX	8/7/05	sl



N - NELAC certified analysis

Client Name: Battelle Memorial Institute
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Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-24-2	Water	P0507426-03	25 Jul. 05 12:00	27 Jul. 05 12:12		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	18.000	0.400	mg/L	AM20GAX	8/6/05	mm
TIC	290.0	4.0	mg/l	AM20GAX	8/7/05	sl



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Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-24-1	Water	P0507426-04	25 Jul. 05 13:15	27 Jul. 05 12:12		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	17.000	0.400	mg/L	AM20GAX	8/6/05	mm
TIC	300.0	4.0	mg/l	AM20GAX	8/7/05	sl



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Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-24-5	Water	P0507426-05	25 Jul. 05 15:30	27 Jul. 05 12:12		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	17.000	0.400	mg/L	AM20GAX	8/6/05	mm
TIC	330.0	4.0	mg/l	AM20GAX	8/7/05	sl



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<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-21-5	Water	P0507426-06	26 Jul. 05 8:30	27 Jul. 05 12:12		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	19.000	0.400	mg/L	AM20GAX	8/6/05	mm
TIC	390.0	4.0	mg/l	AM20GAX	8/7/05	sl



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<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-21-4	Water	P0507426-07	26 Jul. 05 10:30	27 Jul. 05 12:12		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	18.000	0.400	mg/L	AM20GAX	8/6/05	mm
TIC	400.0	4.0	mg/l	AM20GAX	8/7/05	sl



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<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-21-3	Water	P0507426-08	26 Jul. 05 12:15	27 Jul. 05 12:12		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	21.000	0.400	mg/L	AM20GAX	8/6/05	mm
TIC	590.0	4.0	mg/l	AM20GAX	8/7/05	sl



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<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-21-2	Water	P0507426-09	26 Jul. 05 14:45	27 Jul. 05 12:12		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	19.000	0.400	mg/L	AM20GAX	8/6/05	mm
TIC	610.0	4.0	mg/l	AM20GAX	8/7/05	sl

Client Name: Battelle Memorial Institute
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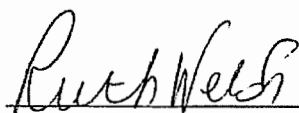
Page: Page 11 of 11
Lab Proj #: P0507426
Report Date: 08/08/05
Client Proj Name: JPL Task 3 OU3
Client Proj #: G486111-T3

<u>Sample Description</u>	<u>Matrix</u>	<u>Lab Sample #</u>	<u>Sampled Date/Time</u>	<u>Received</u>		
MW-21-1	Water	P0507426-10	26 Jul. 05 16:00	27 Jul. 05 12:12		
<u>Analyte(s)</u>	<u>Result</u>	<u>PQL</u>	<u>Units</u>	<u>Method #</u>	<u>Analysis Date</u>	<u>By</u>
<u>RiskAnalysis</u>						
Nitrogen	11.000	0.400	mg/L	AM20GAX	8/6/05	mm
TIC	340.0	4.0	mg/l	AM20GAX	8/7/05	sl

Microseeps, Incorporated

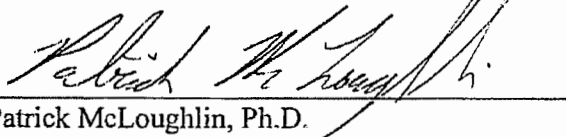
Analytical Method AM20GAx Standard Operating Procedure for the Analysis of Biodegradation Indicator Gases

Controlled Copy No. _____



Ruth Welsh
Laboratory Manager

Signature of Final Approval:



Patrick McLoughlin, Ph.D.
Technical Director

3-1-05

Date

SOP Review Date: March 1, 2005

1.0 Scope and Application

Method AM20GAx is used to determine the concentration of biodegradation indicator gases in vapor samples. Specifically, Method AM20GAx is used to determine the dissolved concentration of the following gases:

Gases	CAS Number
Acetylene	74-86-2
Carbon dioxide	124-38-9
Oxygen	7782-44-7
Nitrogen	7727-37-9
Hydrogen	1333-74-0
Methane	74-82-8
Ethane	74-84-0
Ethene	74-85-1
Propane	74-98-6
Propene	115-07-1
n-Butane	106-97-8
i-Butane	75-28-5
Carbon Monoxide	630-08-0
Total Inorganic Carbon*	

*Total inorganic carbon (TIC) is converted to carbon dioxide using the steps outlined in SOP-PM01. The sample is then analyzed for carbon dioxide according to this SOP. Any differences in method are specified in the appropriate section.

This method is recommended for use by, or under the supervision of, analysts experienced in sample preparation, the operation of gas chromatographs and in the interpretation of chromatograms.

2.0 Method Summary

The sample gas is analyzed with a gas chromatograph capable of simultaneous analysis of all of the target analytes from a single 10 mL gas sample. A single injection of gas from integral, simultaneously filled sample loops is used to assure consistent injection volume. The permanent gases are analyzed using a thermal conductivity detector (TCD). The light hydrocarbons are analyzed using a flame ionization detector (FID). Hydrogen is analyzed using a reduction gas detector (RGD). The data are transferred to a microcomputer, converted to digital format, stored, and processed using a chromatography data system.

2.1 Definitions

Batch: A sample batch consists of twenty or fewer samples run during an eight-hour work shift.

Instrument Flush: The front end of the sample loop is flushed with ultra high purity helium injected into the loop directly from the cylinder to remove possible interference by ambient air and to avoid cross contamination between samples.

Method Blank: A sample analyzed by all three detectors that consists of ultra high purity helium. The method blank is free from the analytes of interest.

Laboratory Control Sample: A sample spiked with verified known amounts of analytes. A LCS is used to assess the performance of the measurement system.

Matrix Spike and Matrix Spike Duplicate: A sample prepared by adding a known concentration of target analyte to a specific amount of sample. Matrix spikes are used to determine the effect of sample matrix on a method's recovery efficiency.

3.0 Apparatus and Materials and Operating Conditions

3.1 Apparatus

Gas Chromatograph: The chromatographs designed and built by Microseeps are equipped with multiple packed columns and multi-port valves, a TCD, a FID, a RGD, and multiple sample loops. The FIDs, which were also built by Microseeps, are of a special design that allows considerably more sensitivity than commercially available models. To increase the working range of the system, there are two outputs to the FID. Thus, it is a four-channel system: (1) FID low; (2) TCD; (3) RGD; and (4) FID high. As discussed in Section 5.3, each channel is calibrated separately. This instrument provides rapid turn-around for consecutive analyses and a clean baseline for accurate, reproducible results.

3.1.1 Column Specifications

- **Column 1:** 80/100 mesh alumina packing material; 6' length, 3/16" OD; stainless steel, pre-washed (for hydrocarbon analysis).
- **Column 2:** 80/100 mesh Molesier 5A packing material; 12' length, 1/8" OD; stainless steel, pre-washed, preconditioned (for dissolved gas analysis).
- **Column 3:** 80/100 mesh Haysep Q packing material; 12' length; 1/8" OD; stainless steel, pre-washed, preconditioned (for dissolved gas analysis).

3.2 Materials

- Sample vials (Supelco, Inc, Bellefonte, PA or equivalent)
- Syringe: locking gas tight

3.3 Operating Conditions

Gas Chromatograph:

- | | |
|--|--------------------------------------|
| • Sample Loop Temperature: | ambient |
| • Thermal Conductivity Detector Temperature: | 100°C |
| • Flame Ionization Detector Temperature: | ambient |
| • Reduction Gas Detector Temperature: | 280°C |
| • Oven Temp.: | 100 °C. isothermal |
| • TCD Signal Range: | 1 |
| • FID Signal Range: | variable depending on concentrations |
| • RGD Signal Range: | 1 |
| • He Carrier Gas Regulator Pressure: | 60 psig |
| • Sample carrier flow: | 30 mL/min. |
| • Reference flow: | 30 mL/min. |
| • N2 Carrier Gas Regulator Pressure: | 25 psig |
| • Sample carrier flow: | 25 mL/min |
| • Valve Air Pressure: | 60 psig. |

3.3.1 Interferences

The most likely source of "interference" is ambient air. Due to the relatively high concentrations of oxygen and nitrogen, a very small amount of air as a contaminant will dramatically affect the results. The analyst must take great care to ensure that air is flushed from the gas tight syringe before sample preparation and that no air has entered the syringe or needle prior to injection of the sample into the gas chromatograph.

Contamination by carryover can occur whenever high-level and low-level samples are sequentially analyzed. An unrestricted flow (Instrument flush) of pure carrier gas from a 10 psig source should be allowed to flow through each sample loop for 30 seconds prior to each analysis.

As required, the analyst should demonstrate the absence of carryover contamination by analysis of the contents of the sample loop when purged with carrier gas. This demonstration should be performed when carryover contamination is suspected (after high samples). In the event that 'ghost peaks' (peaks similar to previous sample) appear when a pure carrier gas sample is analyzed (method blank), measures should be taken to eliminate the carryover contamination.

4.0 Reagents

- Helium (UHP Gas)
- Nitrogen (UHP Gas)
- Certified Commercial Gas Standards
- Benzalkonium chloride (BAK) solution – Prepared by dissolving 12.08 g into 1L DI water.
- Tri-sodium phosphate (TSP) – purchased as the dodecahydrate

4.1 Standard Preparation Procedures

Calibration standards are prepared by using the procedures below:

4.1.1 Vial Preparation

Headspace vials used for instrument calibration standards for this method are prepared as follows:

- Crimp and cap each vial, with stopper septa.
- Evacuate each vial to vacuum below 100 milli torr.
- Flush each vial to atmospheric pressure with the vial preparation gas. The gas used depends upon the detector that is being calibrated and is specified in Table 4.1 below:

Table 4-1

Detector	Vial Balance Gas	Standard Mix Vendor
FID	Nitrogen	Spectra
TCD	Helium	Scotty
RGD	Nitrogen	Spectra and Scotty

4.1.1 Preparing Calibration Standards

Instrumentation is calibrated using dilutions of custom certified gas mixes. (Refer to Table 4.1.1 for the correct amounts of standard mix and vial preparation gas to inject into prepared vials.)

- Prepare the correct number of vials for the detector being calibrated.
- Inject the specified amount of standard by extracting it from the standard mix gas cylinder using a gas-tight syringe and injecting it into a prepared vial.
- Then the specified amount of vial balance gas is added to the same vial.

The dilution factor of one is achieved by directly injecting the standard gas mix from the cylinder into the GC.

Table 4.1.1
Standard Gas and Balance Gas Injection Volumes in ml

Dilution Levels	Standard Gas Mix	Balance Gas	Final Gas Volume
1	N/A	N/A	N/A
2	21	21	42
5	10	40	50
10	5	45	50
25	2	48	50
100	2	198	200
250	1	249	250
2500	20 (of 250x)	180	200

4.1.2 Calibration Standard Concentrations

Calibration standards are made up in the following concentrations as specified in Tables 4.1.2 A, B, and C. The true values of the calibration standards vary slightly from cylinder to cylinder. The values below are very close approximations. All standards are prepared using 22 cc headspace vials with stopper septum or 160cc serum bottles.

Table 4.1.2 A
FID Calibration
In PPMV

Compound	1X	5X	25X	250X	2500X
Methane	500	100	20	2	0.2
Ethane	500	100	20	2	0.2
Ethene	500	100	20	2	0.2
Propane	500	100	20	2	0.2
Propene	500	100	20	2	0.2
n-Butane	500	100	20	2	0.2
i-Butane	500	100	20	2	0.2
Compound	1X	2X	10X	50X	250X
Acetylene	100	50	10	2	0.4

Table 4.1.2 B
TCD Calibration
In PPMV

Compound	1X	2X	10X	25X	100X
Carbon Dioxide	150,000	75,000	15,000	6,000	1,500
Oxygen	70,000	35,000	7,000	2,800	700
Nitrogen	665,000	332,500	66,500	26,600	6650
Methane	45,000	22,500	4,500	1,800	450
Carbon Monoxide	70,000	35,000	7,000	2,800	700

Table 4.1.2 C
RGD Calibration
In PPMV

Compound	10X	25X	100X	250X	2500X
Hydrogen	50	20	5	2	0.2

4.2 Quality Control Sample Preparation

Quality control samples are prepared as indicated below.

4.2.1 Laboratory Control Sample (LCS) and LCS Duplicate (LCSD)

The LCS and LCSD are prepared at a mid-calibration range and are made from the same source as the matrix spike and spike duplicate. The type of LCS/LCSD depends upon the original matrix of the sample. For samples that arrive as vapors, the LCS/LCSD is injected as a gas. For samples that arrive as waters, DI water is spiked with a gas mixture of target analytes and prepared the same as the samples. Water that is free of the principle atmospheric components of nitrogen and oxygen is very difficult to make and similarly difficult to store. Toward that end, LCS/LCSD results for nitrogen will not be reported with client data. Table 4.2.2 below gives the true values of both the LCSs and MS/MSDs.

4.2.1.1 Total Inorganic Carbon LCS

Mix approximately 0.20g NaHCO₃ into 200ml H₂O, prepare according to the TIC procedures outlined in PM01 and analyze in duplicate as a sample. The true value of the spike is calculated as follows:

$$\text{Mg/L CaCO}_3 = \frac{\text{Mass(g)NaHCO}_3}{\text{H}_2\text{O(L)}} \times \frac{100.09}{84.01} \times (1,000,000)$$

4.2.2 Matrix Spike (MS) and Matrix Spike Duplicate (MSD)

MS and MSDs are prepared, analyzed, and reported when clients' request and send sufficient numbers of aliquots to prepare them (e.g. one 40 ml vial each for the MS and the MSD). They are prepared, one at a time, as follows:

- Using a clean 50ml gas-tight locking syringe, withdraw a volume of water from the bottom of the sample vial.
- Withdraw 10 cc of the certified standard gas used for preparing the LCSs and lock the syringe.
- Shake the syringe by hand (for use a wrist action shaker) for five minutes.
- The equilibrated MS and/or MSD is/are now ready to be analyzed.

Table 4.2.2
LCS/MS/MSD True Values

Compound	Vapor (ppmv)	Water
Methane	300	65.84 µg/L
Ethane	100	41,700 ng/L
Ethene	100	38,540 ng/L
Propane	100	60,560 ng/L
Propene	100	57,810 ng/L
iso-Butane	100	79,830 ng/L
n-Butane	100	79,830 ng/L
Carbon dioxide	50,000	30.22 mg/L
Oxygen	20,000	8.720 mg/L
Nitrogen	balance gas	balance gas
Hydrogen	25	344.1 nM

Notes on Table 4.2.2

- MS/MSD not performed on vapor samples and results are corrected for water samples.
- Actual values vary slightly from lot to lot of cylinders of calibration gases.
- MS/MSD prepared by using 10cc of standard instead of 10cc He in the headspace prep. procedure.

4.2.2.1 Total Inorganic Carbon MS and MSD

Mix approximately 0.04g NaHCO₃ directly into client samples (when provided and requested), prepare according to the TIC procedures outlined in PM01 and analyze in duplicate as a sample. The true value of the spike is calculated as follows:

$$\text{Mg/L CaCO}_3 = \frac{\text{Mass(g)NaHCO}_3}{\text{H}_2\text{O(L)}} \times \frac{100.09}{84.01} \times (1,000,000)$$

4.2.3 Method Blank

Method blanks are made up of ultra high purity helium injected into a vial and then into the instrument.

4.2.3.1 Total Inorganic Carbon Method Blank

The method blank for TIC is made up of deionized water in a 40 ml vial, prepared according to the TIC procedures outlined in PM01, and analyzed as a sample.

4.3 Glassware and Storage Requirements for Reagents and Standards

Reagents are stored at room temperature (70°F ±5°) and all standards are prepared fresh for each use immediately prior to each analysis. Standards are made up from compressed gas cylinders. Those standards expire after 2 years.

5.0 Procedure

Water samples should be cooled upon shipment and stored at a temperature of 4°C ±2°. Gas samples are shipped and received at a positive pressure, which eliminates a cross-contamination issue during sample shipment. It is preferable that gas samples be shipped without cooling. However, it is not a sample receipt non-conformance if received packed in ice (sample may experience slight loss in pressure.) Gas samples are stored in the laboratory at room temperature (70°F ±5°). The pressure in gas vials is not checked upon receipt in the laboratory because of the inherent risk of losing sample, or inadvertently introducing atmospheric gases, when the septum is pierced. The number of times the septum is pierced should be as few as absolutely possible. See Section 5.2.2 for a discussion on how the laboratory checks and documents vial pressure. Holding time for both gas and water samples is fourteen days.

Water samples for light hydrocarbon analyses only (methane, ethane, ethane, propane, propene, n-butane, i-butane, acetylene) are collected in 40ml VOA vials with zero headspace and preserved with tri-sodium phosphate (TSP). TSP is added as the dodecahydrate at 200 mg/40 ml vial. This results in a sample pH > 10. Water samples collected for either permanent gases only

or permanent gases and light hydrocarbon analyses are collected in 40ml amber VOA vials with zero headspace and preserved with four drops of BAK solution.

Analysts who use this method have been certified for the method by running Initial Demonstration of Proficiency (IDOP) Samples in accordance with Microseeps Standard Operating Procedure for Administering and Documenting Training in Laboratory Procedures and Instrumentation (SOP ADM 02). IDOPs are run any time there is significant change to an instrument, method, or in the training procedure for training a new analyst.

5.1 Sample Preparation

Samples that are collected using the Bubble Strip Sampling Technique, Microseeps Sampling Method SM9, do not require additional preparation prior to analysis.

Samples that are collected as waters and are to be analyzed for dissolved gases (methane, ethane, ethene, acetylene, CO₂, N₂, O₂, propane, propene, iso-butane, n-butane, TIC), must be prepared using Microseeps Standard Operating Procedure PM01G.

Samples that are collected as gases, for example from a soil gas survey or from the headspace of a microcosm sample, need not be collected by a Microseeps sampling method, nor do they require additional preparation.

5.2 Analysis

5.2.1 If the sample is prepared via SOP-PM 01, it can be injected from the gastight syringe in which it is prepared by inserting the needle of the syringe through the septum on the "sample in" port. If the sample is a calibration standard, a bubble strip sample (SM9), or a gas, the septum inlet to the "sample in" port of the GC must be removed and a luer-lock needle receptacle is plumbed to the "sample in" port in place of the needle. A needle is attached to the luer-lock receptacle and inserted through the septa of the calibration standard, bubble stripped sample, or gas sample.

5.2.2 In order to initiate analysis and introduce the sample into the GC sample loop, a needle is attached to the entry port on the GC and inserted through the sample septum. The flow through the sample loop is monitored by a flow meter connected to the sample-loop vent-port on the gas chromatograph.

When a vial is sufficiently filled, the ball in the flow meter will shoot to the top of the column. This indicates that there is sufficient pressure in the vial to fill the sample loop. If the loop is not properly pressurized, this is reflected on the flow meter immediately. The ball in the flow meter will go up the column part way and drop back to the bottom. This indicates there is not sufficient pressure in the sample vial. If this happens, the analyst will remove the vial from the inlet port as quickly as possible and withdraw 10 – 12ccs of sample from the sample vial using a locking

syringe. This is then injected into the instrument. The lack of sufficient pressure in the vial and the means of sample injection are then documented on the case narrative.

5.2.3 Once the flow out of the sample loop ceases (3 seconds if SOP-PM 01 is used) the sample loop valves are activated.

5.2.4 Once the sample loop valves are activated, the ports to and from the sample loop are flushed with ultra high purity helium injected into the loop directly from the cylinder to remove any interference from ambient air and to avoid cross contamination between samples.

5.3 Calibration and Results

5.3.1 The standard calibration gas should be introduced in the same manner as described in section 5.2.1 above. Measured peak areas are converted to concentrations using certified commercial gas standards. Dilutions are made to achieve multi-point calibration curves for each detector.

Methane can be detected on both the FID and the TCD. If the methane concentration causes an FID signal output level of 8000 millivolts, then any output exceeding that is quantified on the TCD.

5.3.2 Initial calibration is accomplished by analyzing multiple standards of appropriate calibration ranges.

Note: Due to the nature of preparing custom gas standards, the component concentration can fluctuate between purchased lots. This is accounted for during method/calibration development. These results will be used to establish a multi-point calibration curve.

Acceptance Criteria: A linear fit to an area response versus concentration plot is formed with the origin forced to zero, and the calibration is accepted for use if r^2 , the coefficient of determination is ≥ 0.995 .

Corrective Action: If the acceptance criteria specified above is not met, the reason is determined and a new set of calibration standards are analyzed.

5.3.3 An Initial Calibration Verification (ICV) standard immediately follows the initial calibration. The ICV is made up from a second source and is identical to the LCS used for the analysis of vapors. Acceptance criterion for the ICV is an instrument response of \leq (less than or equal to) 20% (%D).

Acceptance Criteria and Corrective Action: If the instrument response for the ICV standard varies by more than 20% (%D), the analyst will not analyze samples until, either the reason is determined and the problem is corrected, or a new multi-point calibration is analyzed.

5.3.4 An initial calibration blank follows the ICV. The blank is made up of the carrier gas. Compounds must not be detected above the reporting limits.

Corrective Action: If the blank does not meet the acceptance criterion, another blank is injected until the results are within the acceptance criterion.

5.3.5 The analytes of this method are indicators. Every attempt to achieve and deliver precise results is made. However, it is realized that for indicator parameters measuring the range of the analyte concentration (*i.e.* is the concentration of methane gas >1 mg/l or <0.1 mg/l) is the primary goal of employing these analyses. The calibration range is chosen to extend over most of the bio-indicator concentration range. If the concentration of an analyte exceeds that of the highest calibration standard, but does not saturate the instrument response, the concentration is calculated by assuming detector response linearity and using an extrapolation of the calibration plot. If the instrument response is saturated the sample is diluted to bring the analyte concentration into the calibration range.

5.4 Quality Control

The following quality control samples shall be analyzed with each analytical batch of twenty or fewer samples.

5.4.1 A Continuing Calibration Verification: The CCV is made up from a source other than what was used to make up the initial calibration. The acceptance criterion for the CCV is a percent drift of $\pm 20\%$.

Corrective Action: If the CCV fails, the instrument shall be recalibrated, and all samples since the last acceptable calibration shall be reanalyzed, provided sufficient sample volume is present and the samples have not been compromised by exposure to air.

5.4.2 A Continuing Calibration Blank: A CCB follows each CCV. The blanks are made up of the carrier gas. The acceptance criterion for the blank is the result must be less than the reporting limits for all compounds.

Corrective Action: If the blank does not meet the acceptance criterion, another blank is injected until the results are within the acceptance criterion.

5.4.3 Laboratory Control Sample and Laboratory Control Sample Duplicate: The LCS and LCSD are prepared and analyzed at a mid-calibration range.

Acceptance Criteria: Percent recovery is required to be between 75% and 125%, inclusive. Acceptance criterion is based upon the percent recovery and the RPD as calculated by:

$$\text{Percent Recovery} = \frac{\text{Measured Value}}{\text{True Value}} \times 100\%$$

$$RPD = \frac{|C1 - C2|}{\frac{C1 + C2}{2}} \times 100\%$$

Where: C1=LCS
C2=LCSD

RPD (Relative Percent Difference) is required to be less than or equal to 20%.

Corrective Action: If the LCS fails, a new LCS is prepared and analyzed. If the new LCS fails within the acceptance criterion, analysis continues. If the new LCS fails, analysis is stopped and the instrument is checked with a series of standards to determine the cause. Once the cause is determined and the instrument repaired, calibration is conducted and analysis continues.

5.4.4 Matrix Spike and Matrix Spike Duplicate: Matrix spikes and spike duplicates are analyzed for water samples only when requested by a client and sufficient sample aliquots are provided. Acceptance criterion is a percent recovery between 70% and 130%, and a relative percent difference of less than or equal to 20%.

Corrective Action: If the matrix spike and spike duplicate fail but all the other quality control samples are within the acceptance criteria, matrix interference is noted in the Case Narrative.

5.4.5 Method Blank: A method blank is analyzed with each sample batch. The blanks are made up of UHP helium for all of the gases except for blanks for TIC. TIC blanks are made up of deionized water. The acceptance criterion for the blank is the result must be less than the reporting limits for all compounds.

Corrective Action: If the blank does not meet the acceptance criterion, another blank is injected until the results are within the acceptance criterion.

5.4.6 Contingency for Handling Out of Control or Unacceptable Data

If the requirements set forth in section 5.4 are not met, the analytical program will be terminated until the cause is determined and a solution is affected. All samples associated with out of control quality control samples (with the exception of matrix interference) must be reanalyzed provided another vial of sample has been provided by the client. If quality control acceptance criteria cannot be met using the corrective action above, a detailed check of the analytical system is made. Reagents, standards, and other quality control samples are re-prepared and analyzed. If problems persist, sample analysis will be halted and the Laboratory Manager shall be contacted immediately to determine the cause and implement corrective action.

Any data submitted with unacceptable quality control sample results shall be qualified in a case narrative. The narrative should indicate the out of control event that occurred, the corrective action that was taken, and any other pertinent information to inform the client of exactly what occurred.

5.4.7 An experienced analyst shall examine all chromatograms.

5.4.8 Through out analysis the gas samples are injected mechanically into the GC flow path utilizing a sample loop to achieve a uniform sample size from a flow directly from the sample preparation syringe. The uniform sample size achieved using the sample loop assures consistent and accurate results. Table 5.4.8 (see next page) gives example data from a study performed via this analysis. That data can also be used for accuracy and precision estimates.

Table 5.4.8
Example Data for Precision and Accuracy Studies

	Carbon Dioxide	Oxygen	Nitrogen	Methane	Hydrogen	Methane	Ethane	Ethylene	Propane	Propylene	Iso-Butane	N-Butane
REP. #	(%v)	(%v)	(%v)	(%v)	(PPMV)	(PPMV)	(PPMV)	(PPMV)	(PPMV)	(PPMV)	(PPMV)	(PPMV)
1	0.1221	0.0670	0.5744	0.0410	0.1118	0.2512	0.0525	0.0453	0.0461	0.0581	0.0473	0.0358
2	0.1267	0.0690	0.6020	0.0428	0.1122	0.2608	0.0518	0.0468	0.0521	0.0465	0.0439	0.0407
3	0.1207	0.0657	0.5838	0.0446	0.1247	0.2812	0.0509	0.0485	0.0529	0.0588	0.0436	0.0405
4	0.1193	0.0667	0.6036	0.0444	0.1244	0.2779	0.0549	0.0460	0.0461	0.0536	0.0549	0.0476
5	0.1261	0.0703	0.5860	0.0439	0.1120	0.2894	0.0551	0.0497	0.0520	0.0549	0.0417	0.0460
6	0.1193	0.0665	0.5861	0.0478	0.0943	0.2970	0.0515	0.0467	0.0458	0.0542	0.0435	0.0514
7	0.1227	0.0732	0.5748	0.0353	0.1296	0.3053	0.0532	0.0473	0.0485	0.0584	0.0483	0.0535
AVERAGE	0.1224	0.0683	0.5872	0.0428	0.1156	0.2804	0.0528	0.0472	0.0491	0.0549	0.0462	0.0451
KNOWN	0.1500	0.0700	0.6649	0.0450	0.0999	0.1500	0.0500	0.0500	0.0500	0.0500	0.0500	0.0500
STD. DEV.	0.003	0.003	0.012	0.004	0.012	0.019	0.002	0.001	0.003	0.004	0.004	0.006

5.4.9 The gas matrix for this analysis minimizes the opportunity for matrix effects. If the gas is prepared from a matrix other than that which is injected into the GC (*e.g.* prepared through headspace extraction via Microseeps SOP-PM01), the client should request that matrix spike (MS) and matrix spike duplicate (MSD) analyses be conducted and should supply sufficient sample volume. Since matrix effects are extremely site dependent, the MS and MSD are not part of the regular analytical quality assurance program.

5.4.10 All of the target analytes are gases at room temperature so the opportunity for carry over is negligible. Because of the configuration of the GC used in this analysis, any possible carryover would only manifest itself as a ghost peak, well out of the RT windows of any analytes and thus never misinterpreted. For these reasons, samples that have high concentrations of analytes do not need to be followed by a blank analysis.

5.5 Capturing and Submitting Data

The output of the chromatograph is directed to a microcomputer where the signal is converted to digital format, stored, and processed using a chromatography data system.

Automated valve control: Digital control is provided by the microcomputer through the chromatography data-system software. This control provides constant start and stop times for directing carrier gas flow. The event times are programmed and saved using the method editor module of the software.

5.5.1 Total Inorganic Carbon Result Calculation

The total inorganic carbon result is calculated as follows:

$$\text{TIC as mg/L CaCO}_3 = (\% \text{CO}_2)((\text{Volume headspace})(2.08) + 43.3)$$

This analysis produces concentration of the analyzed gas in PPMV or % V. If the sample was collected via the bubble-strip method (Microseeps SOP SM9) or prepared through static headspace preparation (Microseeps SOP DGPM 01), the gas phase concentrations can be used to specify sample water concentrations via the calculations presented in those Standard Operating Procedures.

5.5.2 Retention Time Windows

Retention time studies have been conducted for this analysis. These studies are kept on file in the Quality Systems Office. The retention times in Table 5.5.2 below are examples. The exact retention times will vary as a function of column type, column age, and column history. For the instruments that use this method, true retention times and retention time windows are taken from the most recent retention time window study conducted.

Table 5.5.2
Retention Time Windows

Compound	RT Window (Min.)	RT Window (Min.)	RT Window (Min.)	RT Window (Min.)
	BioRem I Unit		BioRem II Unit	
Carbon Dioxide	5.171	5.340	4.058	4.635
Oxygen	6.537	7.015	5.686	5.721
Nitrogen	7.200	7.626	6.510	6.570
Methane	9.523	9.933	8.874	8.999
Carbon Monoxide	10.475	10.841	10.938	11.302
Methane	0.586	0.609	0.420	0.420
Ethane	0.809	0.835	0.730	0.730
Ethene	1.027	1.050	1.029	1.064
Propane	1.545	1.570	1.871	1.962
Propene	2.822	2.850	3.942	4.225
iso-Butane	3.763	3.807	5.804	6.230
n-Butane	4.351	4.399	6.855	7.379
Hydrogen	4.404	4.480	NA	NA

6.0 Secondary Data Review

All analytical data must undergo a minimum of a two-tiered review. The analyst first reviews the data for completeness and accuracy. The data is then submitted to the Group Lead Analyst for final review and the data is entered into the LIMS. Once approved at this level, the data is released as a final report.

7.0 Reporting Limits

The reporting limits for this analysis are listed in Table 7.0 below. Method detection limit studies are run annually in accordance with Microseeps Standard Operating Procedure for the Determination of Method Detection Limits and PQLs (SOP-ADM 18).

Those MDLs must be less than the reporting limits specified below. MDL studies are also performed when there is reason to suspect that method sensitivity has changed. The MDL studies are kept on file in the Quality Systems Office.

**Reporting Limits
Table 7.0**

Parameter	Reporting Limit	Units
Carbon Dioxide	0.02	%V
Oxygen	0.02	%V
Nitrogen	0.04	%V
Hydrogen	0.02	ppmv
Acetylene	0.34	ppmv
Methane	0.06	ppmv
Ethane	0.01	ppmv
Ethene	0.01	ppmv
Propane	0.01	ppmv
Propene	0.01	ppmv
n-butane	0.01	ppmv
i-butane	0.02	ppmv
Acetylene	500	ng/L

7.1 Conversion Factors

This procedure is used to measure the volume concentration of the analytes in a gas. Two methods are used to extract that gas from the groundwater. The conversion factors that are used to convert the concentration of the analytes in the water from the concentration of the analytes as they are measured using this method, are specific to the collection or preparation method and can be found in either SOP-SM9 or SOP-PM 01.

8.0 Safety

Gloves, proper eye protection, and a laboratory coat shall be worn when handling samples and standards. The major hazard in this laboratory area is stick from needles. All needles must be capped when not in use and when moving about the laboratory. The proper way of capping a needle is to place the cap on the laboratory bench and direct the needle into the cap. A needle is never to be directed into a cap while the cap is being held.

All compressed gases are to be moved using a dolly made for transporting gases and shall be chained in place when in the laboratory. The chain shall be tightened sufficiently to keep the cylinder upright if jostled.

9.0 Laboratory Waste

Samples are kept for 30 days following analysis. Samples are disposed according to Microseeps Standard Operation Procedure for Waste Disposal (SOP-ADM 14).

9.1 Waste Minimization

Where possible, Microseeps takes steps to minimize the amount of waste generated in the laboratory by using substitution, where possible, and good chemical handling procedures. For specific information on waste minimization consult SOP-ADM 14.

10.0 References

Citing a reference does not imply that all of the recommendations and/or requirements in those cited methods is required in this Standard Operating Procedure. This section simply refers to sources that were consulted to gather information or knowledge in order to write an informed technical procedure.

U.S. Environmental Protection Agency, Test Methods for Evaluating Solid Waste. SW-846, 3rd ed., Office of Solid Waste and Emergency Response, Washington, DC. 1986.

Newel, B.S., RSKSOP-175, Sample Preparation and Calculations for Dissolved Gas Analysis in Water Samples using a GC Headspace Equilibration Technique. Revision No. 0, August 1994.

Newel, B.S., RSK-SOP-147, Gas Chromatographic Analysis of Gaseous Samples for Part-Per-Million Levels of Nitrous Oxide, Methane, Ethylene, and Ethane. Revision No. 0, August 1993.

American Society for Testing and Materials, Standard Practice for Analysis of Reformed Gas by Gas Chromatography. Annual Book of ASTM Standards. Vol. 14.02, 1994.

Kampbell, D.H. and Vandegrift, S.A., Analysis of Dissolved Methane, Ethane, and Ethylene in Ground Water by a Standard Gas Chromatographic Technique. Journal of Chromatographic Science. Vol. 36, May 1998.



CHAIN OF CUSTODY RECORD

Proj. No.

SAMPLE TYPE (✓)

Number
of
Containers

Remarks

6486111-73

Source Determination Study

SAMPLERS: (Signature)

SAVIR LENS: (Signature)
Dr. Hendrick / D. Conner / 8. Hendrick

DATI

TIME

SAMPLE I.D.

02-50005

1340

GARFIELD

0250105

1052

SUNSET

02 Jun 05

1530

~~Deborah~~ 6H

035002

0930

LF WC-2

03 JUN 82

1336

LA WC -3

X

7

Relinquished By: (Signature)

Date/Time

Received by: (Signature) / 12/05

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Date/Time

Received by:
(Signature)

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Date/Time

Received by:

Relinquished by: (Signature)

Date/Time

Received by:
(Signature)

Relinquished by: (Signature)

Date/Time

Received for Laboratory by:

Date/Time

Remarks SENT TO: MAT



Columbus Laboratories

CHAIN OF CUSTODY RECORD

Fourth No

Proj. No.

Project Title


648611-73

Source Determination Study

SAMPLEERS: (Signature)

D. Bond

DATE	TIME	SAMPLE I.D.	Remarks	
7/19/2005	17:30	MW-75-5	X	
7/19/2005	14:00	MW-75-4	X	
7/19/2005	15:10	MW-75-3	X	
7/19/2005	16:15	MW-75-2	X	
7/19/2005	17:30	MW-75-1	X	
7/20/2005	09:00	MW-19-5	X	
7/20/2005	11:00	MW-19-4	X	
7/20/2005	12:10	MW-19-3	X	
7/20/2005	14:00	MW-19-2	X	
7/20/2005	15:00	MW-19-1	X	
7/21/2005	09:15	MW-18-5	X	
7/21/2005	10:30	MW-18-4	X	
7/21/2005	12:45	MW-18-3	X	
7/21/2005	16:30	MW-18-2	X	
7/21/2005	15:00	MW-18-1	X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	7-21-05 17:00				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Remarks		

TD: MIT

PD# 191723



Columbus Laboratories

CHAIN OF CUSTODY RECORD

Form No.

Proj. No.

Project Title

648611-73

Project Title	Source Determination	Study
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SAMPLERS: (Signature)

SAMPLE TYPE (✓)

Container No.Number
of
Containers

Remarks

DATE	TIME	SAMPLE I.D.	Cont	C	Remarks
7/25/2005	09:00	MW-24-4	X		
7/25/2005	10:30	MW-24-3	X		
7/25/2005	12:00	MW-24-2	X		
7/25/2005	13:15	MW-24-1	X		
7/25/2005	15:30	MW-24-5	X		
7/26/2005	08:30	MW-21-5	X		
7/26/2005	10:30	MW-21-4	X		
7/26/2005	12:15	MW-21-3	X		
7/26/2005	14:45	MW-21-2	X		
7/26/2005	16:00	MW-21-1	X		
1-Aug-05	0857	MW-20-5	X		
1-Aug-05	1050	MW-20-4	X		
1-Aug-05	1230	MW-20-3	X		
1-Aug-05	1407	MW-20-2	X		
1-Aug-05	1608	MW-20-1	X		

Relinquished by: (Signature)

Date/Time

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Received by:
(Signature)


Relinquished by: (Signature)

Date/Time

Received for Laboratory by:

Date/Time

Remarks

(Signature) 

8/4/05	09:45
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To: MIT

Results of Isotopic Analysis					
MIT TIMS Lab					
Date: 6/29/05					
MIT #	Client #	(1)	(2)	2-sigma s.e.	(3)
		87Sr/86Sr	% S.E.		Sr, ppm
T-359	Garfield	0.711182	0.0008	0.000011	0.292
T-360	Sunset	0.711227	0.0007	0.000010	0.748
T-361	Bangham	0.710709	0.0005	0.000007	0.493
T-362	LF WC-2	0.711467	0.0006	0.000009	0.483
T-363	LA WC-3	0.711392	0.0006	0.000009	0.399
T-364	MW-1	0.711281	0.0006	0.000009	0.438
(1) Long term reproducibility of NBS-987 at MIT: 0.710240 ± 0.000014 (2-sigma s.d.).					
(2) Within-run internal precision of measured ratio.					
(3) Determined by isotope dilution using an 84Sr spike.					

Results of Isotopic Analysis					
MIT TIMS Lab					
Date: 8/23/05; corrected 8/29/05					
MIT #	Client #	(1)	(2)	2-sigma s.e.	(3)
		87Sr/86Sr	% S.E.		Sr, ppm
T-388	MW-18-1	0.711352	0.0005	0.000007	0.3116
T-389	MW-18-2	0.711256	0.0009	0.000013	0.4044
T-390	MW-18-3	0.711604	0.0006	0.000009	0.4563
T-391	MW-18-4	0.712158	0.0013	0.000019	0.4017
T-392	MW-18-5	0.710518	0.0006	0.000009	0.1661
T-393	MW-19-1	0.711065	0.0006	0.000009	0.3832
T-394	MW-19-2	0.710640	0.0005	0.000007	0.8825
T-395	MW-19-3	0.710658	0.0007	0.000010	0.5283
T-396	MW-19-4	0.710927	0.0005	0.000007	0.6719
T-397	MW-19-5	0.710953	0.0006	0.000009	0.7753
T-398	MW-25-1	0.711020	0.0006	0.000009	0.6963
T-399	MW-25-2	0.711214	0.0008	0.000011	0.2645
T-400	MW-25-3	0.711333	0.0007	0.000010	0.5392
T-401	MW-25-4	0.711233	0.0009	0.000013	0.5186
T-402	MW-25-5	0.710950	0.0007	0.000010	0.1892
(1) Long term reproducibility of NBS-987 at MIT: 0.710240 ± 0.000014 (2-sigma s.d.).					
(2) Within-run internal precision of measured ratio.					
(3) Determined by isotope dilution using an 84Sr spike.					

Results of Isotopic Analysis					
MIT TIMS Lab					
Date: 8/23/05; corrected 8/29/05					
MIT #	Client #	(1)	(2)	2-sigma s.e.	(3)
		87Sr/86Sr	% S.E.		Sr, ppm
T-391	MW-18-4	0.712158	0.0013	0.000019	0.4017
T-396	MW-19-4	0.710927	0.0005	0.000007	0.6719
T-400	MW-25-3	0.711333	0.0007	0.000010	0.5392
T-391R	MW-18-4	0.712170	0.0009	0.000013	0.4028
T-396R	MW-19-4	0.710916	0.0005	0.000007	0.6723
T-400R	MW-25-3	0.711345	0.0006	0.000009	0.5400
Blank*					30 pg
(1) Long term reproducibility of NBS-987 at MIT: 0.710240 ± 0.000014 (2-sigma s.d.).					
(2) Within-run internal precision of measured ratio.					
(3) Determined by isotope dilution using an 84Sr spike.					
* The blank was near the detection limit; the analysis was within uncertainty of our spike value.					

Results of Isotopic Analysis

MIT TIMS Lab

Date: 9/2/05

MIT #	Other #	(1)	(2)	2-sigma s.e.	(3)
T 403 IC	MW-20-1	0.711068	0.0010	0.000014	0.5093
T 404 IC	MW-20-2	0.710817	0.0009	0.000013	0.3725
T 405 IC	MW-20-3	0.711339	0.0007	0.000010	0.4900
T 406 IC	MW-20-4	0.711024	0.0010	0.000014	0.1102
T 407 IC	MW-20-5	0.710147	0.0007	0.000010	0.0922
T 408 IC	MW-21-1	0.710318	0.0006	0.000009	1.209
T 409 IC	MW-21-2	0.710631	0.0007	0.000010	1.290
T 410 IC	MW-21-3	0.710885	0.0006	0.000009	0.9985
T 411 IC	MW-21-4	0.710945	0.0008	0.000011	0.6032
T 412 IC	MW-21-5	0.710997	0.0009	0.000013	0.7226
T 413 IC	MW-24-1	0.711387	0.0009	0.000013	0.3870
T 414 IC	MW-24-2	0.712020	0.0010	0.000014	0.3696
T 415 IC	MW-24-3	0.712963	0.0010	0.000014	0.2969
T 416 IC	MW-24-4	0.710896	0.0008	0.000011	0.2420
T 417 IC	MW-24-5	0.711249	0.0006	0.000009	0.3453
T 409R IC	MW-21-2	0.710639	0.0006	0.000009	1.278
T 415R IC	MW-24-3	0.712967	0.0008	0.000011	0.2958

- (1) Long term reproducibility of NBS-987 at MIT: 0.710240 ± 0.000014 (2-sigma s.d.).
 (2) Within-run internal precision of measured ratio.
 (3) Determined by isotope dilution using an 84Sr spike.

Results of Isotopic Analysis

MIT TIMS Lab

Date: 9/8/05

MIT #	Other #	(1)	(2)	2-sigma s.e.	
87Sr/86Sr					
% S.E.					
Sr, ppm					
T 469 IC	MW-17-1	0.711363	0.0006	0.000009	0.2513
T 470 IC	MW-17-2	0.711189	0.0006	0.000009	0.8619
T 471 IC	MW-17-3	0.711635	0.0006	0.000009	0.6489
T 472 IC	MW-17-4	0.710836	0.0007	0.000010	0.1851
T 473 IC	MW-17-5	0.711013	0.0008	0.000011	0.1494
T 469R IC	MW-17-1	0.711375	0.0007	0.000010	0.2508

Replicates are done on Sr isotopic compositions and Sr concentration determinations. The replicates are total procedure replicates meaning new aliquots of the same samples were processed completely independently of the original analysis. Replicates are done on 10% of the total number of samples.

Shiao, Hsin T

From: Frank Dudas [fdudas@MIT.EDU]
Sent: Monday, December 13, 2004 5:07 PM
To: Shiao, Hsin T
Subject: RE: Sr isotopic analyses in groundwater

Hi Tien,

We typically do not do duplicates of our Sr isotopic composition measurements because we use our Sr isotopic standard as a measure of analytical precision. The two-sigma, external reproducibility (i.e., precision of analyses done on separate samples, at separate times) of our standard is about 20 ppm over a period of about 10 years.

When we have had to do replicates because of what we have regarded as irregularities in our analyses, we have replicated the 87Sr/86Sr of samples - these are complete replicates, starting from raw sample material - to within 0.00003 (roughly 40 ppm), keeping in mind that the first of these analyses was "questionable," for whatever reason.

When I have done large batches of samples (> 20 samples) for a single project, I have usually done one or two replicates, just out of curiosity, and at no charge to the client. I've never collated the data from these replicates, but my recollection is that the data replicate to within 0.00003. If a client specifically requests us to do replicates, there is no problem in doing them; for small sets of samples (<10), we would have to charge the client for the replicate.

For larger sample sets, we would be happy to do one replicate per 20 samples at no additional charge if the client requests it.

For determinations involving Sr concentration, we would have to do more replicates to assess both the precision and the accuracy of the concentration determinations. Relatively little of our work involves isotope dilution determinations of Sr concentration, so I can't give you good estimates of the precision and accuracy of these. I am confident that we can reproduce our concentration determinations to within 0.5%; again, if a client asks us to do replicates to assess the precision of concentration determinations, we would be happy to do so.

Our standard charge for Sr isotope composition determinations is \$200 per sample. If a concentration determination is also requested, that is an additional \$50. There is no separate sample preparation charge for water samples, but there is a \$50 sample preparation charge for rock or soil samples, and for water samples in which a separate hydrocarbon phase is present.

Our standard turn-around time is 30 days from receipt of the samples. We can provide two-week turn-around at a 50% premium over the standard charges. Assuming the groundwater samples behave as other groundwater samples we have analyzed in the past, we would have no trouble in providing data within 30 days of receipt of samples for a batch of 25 analyses.

Regards,
Frank

>Hi Frank,

>Thanks for the information below. It has been a while since I emailed
>you. We have been working on a report and incorporating the information
>you have provided us. I just wanted find out a few additional
>information if you don't mind.

>(1) I'd like to know whether duplicates are taken during the Sr
>isotopic analyses to determine precision of measurements.



Battelle

Columbus Laboratories

CHAIN OF CUSTODY RECORD

Form No. _____

Proj. No.

Project Title

648611-T3

SOURCE Determination Study

SAMPLERS: (Signature)

G. Heath Jr. / D. Conner / B. Heeding Jr.

DATE

TIME

SAMPLE I.D.

SAMPLE TYPE (N)

Container No.

Number of Containers

Remarks

PD# 191648

GROUNDWATER
ISOTOPES
INORGANIC CHLORIDE
PERCHLORATE ISOTOPES

INORGANIC CHLORIDE
SAMPLES UNFILTERED

DATE	TIME	SAMPLE I.D.
02 JUN 05	1340	CARFIELD
02 JUN 05	1052	SUNSET
02 JUN 05	1530	BATHAMPTON BANGHAM
03 JUN 05	0930	LEWIS-2
03 JUN 05	1330	LEWIS-3
05 JUN 05	1130	PMW 1

Container No.	Number of Containers
	3
	3
	3
	3
	3
	3

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

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Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received for Laboratory by: (Signature)

Date/Time

Remarks Sent to:

University of ILLINOIS CHICAGO



Battelle

Columbus Laboratories

CHAIN OF CUSTODY RECORD

Form No. 1051

Proj. No.

Project Title

SAMPLE TYPE (✓)

Container No.

Number of Containers

Remarks

Source Determination Study

G48611-T3

SAMPLES: (Signature)

G. Hendry/D. Connery/B. Hendry/S. Serpa

DATE

TIME

SAMPLE I.D.

Perchlorate Isotopes

Container No.

Number of Containers

Remarks

02 JUN 05

04052134

SUNSET

X

Column #30

02 JUN 05

04340165

GARFIELD

X

Column #63

02 JUN 05

1530

BATHAM

X

Column #31

03 JUN 05

0930

LEWC-2

X

Column #29

03 JUN 05

1330

LA WC-3

X

Column #28

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

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Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received for Laboratory by: (Signature)

Date/Time

Remarks

Sam Serpa

6-16-05 18:00

Relinquished by: (Signature)

6/17/05 1:30pm

Received by: (Signature)

University of Tennessee CHTRC



Battelle

Columbus Laboratories

CHAIN OF CUSTODY RECORD

Form No. _____

Proj. No. **G48611-T3** Project Title **Source Determination Study**

SAMPLERS: (Signature) **D. Lamm**

DATE	TIME	SAMPLE I.D.	SAMPLE TYPE (V)			Container No.	Number of Containers	Remarks
			Groundwater Isotopes	Inorganic Chloride	Perchlorate Isotopes			
7/19/2005	12:30	MW-25-5	X	X				Inorganic Chloride sample are not filtered in the field, please filter in the lab.
7/19/2005	14:00	MW-25-4	X	X				
7/19/2005	15:10	MW-25-3	X	X				
7/19/2005	16:15	MW-25-2	X	X				
7/19/2005	17:30	MW-25-1	X	X				
7/20/2005	09:00	MW-19-5	X					
7/20/2005	11:00	MW-19-4	X					
7/20/2005	12:10	MW-19-3	X					
7/20/2005	14:00	MW-19-2	X					
7/20/2005	15:00	MW-19-1	X					
7/21/2005	09:15	MW-18-5	X					
7/21/2005	10:30	MW-18-4	X					
7/21/2005	12:45	MW-18-3	X					
7/21/2005	16:30	MW-18-2	X					
7/21/2005	15:00	MW-18-1	X					

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
<i>[Signature]</i>	7/21/05 17:00	<i>[Signature]</i>			
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	
				To: University of Illinois Champaign	

The Business of Innovation

CHAIN OF CUSTODY RECORD

424.05754
456
Form No. 10
Ten Shu

Proj. No.		Project Title		SAMPLE TYPE (✓)		Container No.		Number of Containers		Remarks	
648611-T3		Source Determination Study								PD #: 171648	
SAMPLE RS: (Signature)		D. Lowe									
DATE	TIME	SAMPLE I.D.									
8/15/05	09:30	MW-17-5		✓							
8/15/05	10:45	MW-17-4		✓							
8/15/05	12:45	MW-17-3		✓							
8/15/05	13:45	MW-17-2		✓							
8/15/05	15:30	MW-17-1		✓							
				Groundwater Isotopes							
				Inorganic Chloride Isotopes							
				note - arrived							
				unlabeled but in same bag as labeled water samples							
Relinquished by: (Signature)		Date/Time		Received by: (Signature)		Relinquished by: (Signature)		Date/Time		Received by: (Signature)	
8-16-05		16:00									
Relinquished by: (Signature)		Date/Time		Received by: (Signature)		Relinquished by: (Signature)		Date/Time		Received by: (Signature)	
Relinquished by: (Signature)		Date/Time		Received for Laboratory by: (Signature)		Date/Time		Remarks		To: University of Illinois Chicago	



Battelle

Columbus Laboratories

CHAIN OF CUSTODY RECORD

Form No. _____

Proj. No.

G4611-73

Project Title

Source Determination Study

SAMPLERS: (Signature)

J. Linnell

DATE

TIME

SAMPLE I.D.

SAMPLE TYPE (✓)

Container No.

Number of Containers

Remarks

PD#:

191648

Granular
Isotopes
Inorganic Chlorides

7/25/2005

09:00

MW-24-4

✓

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CHAIN OF CUSTODY RECORD

Form No. _____

Project No.		Project Title		SAMPLE TYPE (✓)		Container No.	Number of Containers	Remarks
648611-13		Source Determination Study						PO#: 191648
SAMPLERS: (Signature)		D. L. L...						
DATE	TIME	SAMPLE I.D.						
8-10-05	12:30	MW-24-2 ✓	X					
8-11-05	19:00	MW-24-1 ✓	X					
8-12-05	15:12	MW-25-4 ✓	X					
8-14-05	14:00	MW-19-2 ✓	X					
8-29-05	07:35	MW-25-3 ✓	X					
8-30-05	08:27	MW-25-2 ✓	X					
9-8-05	17:05	MW-17-3 ✓	X					
9-10-05	07:35	MW-25-1 ✓	X					
Relinquished by: (Signature)		Date/Time	Received by: (Signature)	Relinquished by: (Signature)		Date/Time	Received by: (Signature)	
Relinquished by: (Signature)		9-12-05 16:00	Received by: (Signature)	Relinquished by: (Signature)		Date/Time	Received by: (Signature)	
Relinquished by: (Signature)		Date/Time	Received for Laboratory by: (Signature)	Relinquished by: (Signature)		Date/Time	Received by: (Signature)	
Relinquished by: (Signature)				Relinquished by: (Signature)				
Remarks To: Univ. of Illinois Chicago								



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Columbus Laboratories

P.001/001

CHAIN OF CUSTODY RECORD

Form No. _____

Proj. No.

Project Title

648411-73

Source Determination Study

SAMPLERS: (Signature)

M. McLeese

DATE

TIME

SAMPLE I.D.

9/13/05

1055

MW-25-2

SAMPLE TYPE (V)

Inorganic
Carbon
Isotope

Container No.

Number
of
Containers

Remarks

70#
191648

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

Received for Laboratory by: (Signature)

Date/Time

Remarks

9/13/05/1200

[Signature]

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[Signature]

[Signature]

Remarks

To: University of Illinois
Chicago

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CHAIN OF CUSTODY RECORD

Form No. _____

Proj. No.

G486111-T3

Project Title

SPL Source Determination
Study

SAMPLES: (Signature)

David J. Conner

DATE

TIME

SAMPLE I.D.

2/9/06

12:45

SPL-MW-16

SAMPLE TYPE (V)

Perchlorate
Isotopes

Container No.

Number
of
Containers

8

Remarks

1L Poly non-
preserved

Relinquished by: (Signature)

Date/Time

2-9-06 1430

Received by: (Signature)

AB

Relinquished by: (Signature)

Date/Time

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Date/Time

Received by: (Signature)

Relinquished by: (Signature)

Date/Time

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Received for Laboratory by: (Signature)

Date/Time

Remarks

Shiao, Tien

From: Neil C Sturchio [sturchio@uic.edu]
Sent: Friday, February 17, 2006 12:27 PM
To: Shiao, Tien
Cc: Fields, Keith A; Sass, Bruce M; Ohart, Carolyn J
Subject: Re: QA/QC Procedures and BackUp for the Perchlorate, Groundwater, and Inorganic Chloride Results
Importance: High
Attachments: final data for JPL isotope project 2.17.06.xls; BATELLE chlorides 1.13.06.xls

Tien,

Attached are two spreadsheets.

One spreadsheet contains the final results for H and O isotopes in water, Cl isotopes in chloride, and Cl and O isotopes in perchlorate. For the perchlorate data, there are two changes from the preliminary spreadsheet that I brought to Columbus on Feb. 3: (1) a typo for the d18O value of MW25-4 such that the preliminary reported value of -17.8 is revised to the corrected value of -17.2, and (2) the perchlorate data initially reported for MW-1 belongs instead to LFWC-2 (which I recall that we realized when I was at the meeting in Columbus). Analytical precisions are stated at the bottom of the spreadsheet.

Also attached is another copy of the Cl isotope data spreadsheet for chloride that contains the QA/QC data for the chloride isotope analyses. This is exactly the same spreadsheet that I sent to you on January 13. Note that the QA/QC data is listed at the bottom of the spreadsheet - the samples named "CBN..." are samples of our reference seawater chloride that were prepared and run alongside the JPL samples, using exactly the same procedures and materials as used to prepare the JPL chloride samples.. The mean and standard deviation of the delta-37-Cl value for these 5 seawater chloride samples is +0.01 +/- 0.08 per mil. This means that the measurements are precise to within 0.1 per mil, as we stated, and our value for seawater chloride agrees perfectly with the accepted value of 0.00 per mil.

I will get the procedural descriptions and QA/QC results (standard values) for waters and perchlorates to you by later today, or possibly tomorrow. Unfortunately our lab manager (Linnea Heraty) has been on vacation for over a week, but she is supposed to return today and be in the lab for a while tomorrow. So, I may need to consult with her tomorrow to find all of the relevant QA/QC results and latest procedural documentation.

-Neil

At 09:14 AM 2/17/2006 -0500, you wrote:

Dear Dr. Sturchio,

Keith Fields, the project manager for the JPL/NASA project, is going to California to present the isotope results to the client on Monday (02/17/06). It would help us out to receive the QC back up for all results UIC helped us analyze, the QA/QC procedures including the procedure to extract the high sulfate concentrations from our samples, and the final perchlorate isotope results (were the results presented on 02/03/06 final?).

5/16/2006

Final Data Report -- Battelle/JPL waters
University of Illinois at Chicago/Environmental Isotope Geochemistry Laboratory
17-Feb-06

OurLabID	Sample ID	H ₂ O			chloride $\delta^{37}\text{Cl}$	perchlorate		
		$\delta^2\text{H}$	$\delta^{18}\text{O}$	$\delta^2\text{H}$		$\delta^{18}\text{O}$	$\Delta^{17}\text{O}$	$\delta^{37}\text{Cl}$
W-118	MW-25-5	-48.0	-7.4	-48.0				
W-119	MW-25-4	-44.8	-6.7	-44.8	0.13	-17.2	0.99	2.19
W-120	MW-25-3	-46.1	-6.9	-46.1	0.11	-16.8	2.01	0.06
W-121	MW-25-2	-46.2	-6.8	-46.2	0.12	-16.3	2.00	0.18
W-122	MW-25-1		-7.0		-0.02	-18.7	0.83	2.05
W-123	MW-19-5	-50.4	-7.4	-50.4				
W-124	MW-19-4	-50.5	-7.2	-50.5				
W-125	MW-19-3	-46.9	-7.1	-46.9				
W-126	MW-19-2	-54.0	-7.8	-54.0	0.18	-18.2	0.17	0.48
W-127	MW-19-1	-52.8	-7.7	-52.8				
W-128	MW-18-5	-44.2	-6.7	-44.2				
W-129	MW-18-4	-42.3	-6.9	-42.3				
W-130	MW-18-3	-48.7	-7.0	-48.7				
W-131	MW-18-2	-46.9	-6.8	-46.9				
W-132	MW-18-1	-49.8	-7.5	-49.8				
W-133	MW-24-4	-44.0	-6.9	-44.0				
W-134	MW-24-3	-43.7	-6.8	-43.7				
W-135	MW-24-2	-45.6	-7.0	-45.6	0.03			
W-136	MW-24-1	-47.3	-6.7	-47.3	0.03			0.3
W-137	MW-24-5	-46.7	-7.0	-46.7				
W-138	MW-21-5	-62.1	-8.3	-62.1				
W-139	MW-21-4	-57.9	-8.1	-57.9				
W-140	MW-21-3	-60.0	-8.1	-60.0				
W-141	MW-20-5	-48.4	-7.3	-48.4				
W-142	MW-20-4	-51.6	-7.5	-51.6				
W-143	MW-20-3	-45.5	-6.8	-45.5				
W-144	MW-20-2	-47.7	-7.2	-47.7				
W-145	MW-20-1	-51.1	-7.7	-51.1				
W-146	MW-21-1	-58.3	-7.9	-58.3				
W-147	MW-21-2	-57.4	-8.2	-57.4				
W-148	MW-17-5	-55.2	-7.9	-55.2				
W-149	MW-17-4	-52.0	-7.5	-52.0				
W-150	MW-17-3	-51.0	-7.5	-51.0	0.17	-21.8	0.12	
W-151	MW-17-2	-55.6	-7.7	-55.6				
W-152	MW-17-1	-49.1	-7.5	-49.1				
W-153	LAWC-3	-47.0	-7.4	-47.0	0.01	-20.4	-0.3	0.21
W-154	Garfield	-45.7	-6.9	-45.7	0.01	-15.0	1.74	
W-155	Sunset	-48.4	-6.9	-48.4	0.08	-17.8	-0.06	0.27
W-156	Bangham	-52.6	-7.5	-52.6	0.03	-10.2	1.27	-3.01
W-157	LFWC-2	-48.4	-7.3	-48.4	0.06	-13.4	-0.13	1.1
W-158	MW-1	-42.7	-6.5	-42.7	0.06			
	MW-16					-21.7	0.028	
	Attacama desert 1					-8.4	8.95	
	Attacama desert 2					-9.3	8.93	
	Attacama desert 3					-4.2	9.57	
	Attacama desert 4					-7.6	9.25	
	Las Vegas Wash 1					-15.8	0.04	
	Las Vegas Wash 2					-14.5	0	

std dev of $\delta^2\text{H}$ values is +/- 1.3 per mil (water)

std dev of $\delta^{18}\text{O}$ values is +/- 0.2 per mil (water) and +/- 0.3 per mil (perchlorate)

std dev of $\delta^{37}\text{Cl}$ values is +/- 0.1 per mil (chloride) and +/- 0.3 per mil (perchlorate)

UIC Environmental Isotope Geochemistry Laboratory

Client: Battelle Memorial Institute/JPL project

Report Date: 1/13/2006 (with additional duplicate analyses)

Subject: Results of $^{37}\text{Cl}/^{35}\text{Cl}$ analyses of dissolved chloride in groundwater samples

DATE	SPEC#	ID1	ID2	UMOL	comment	$\delta^{37}\text{Cl}$ SMOC	
9/20/2005	L-6245	J-276	Bangham	129.8		0.03	
9/20/2005	L-6233	J-273	Garfield	131.4		0.01	
9/20/2005	L-6230	J-277	Sunset	125.4		0.08	
9/23/2005	L-6267	J-275	LFWC-2	91		0.06	
9/20/2005	L-6217	J-274	LWAC-3	115.5		0.01	instrument duplicate
9/20/2005	L-6221	J-274	LWAC-3	115.5		0.01	
9/20/2005	L-6239	J-272	MW1	126.2		0.05	instrument duplicate
9/20/2005	L-6242	J-272	MW1	126.2		0.07	
10/11/2005	L-6352	J-287	MW-17-3 A	82.6		0.19	method duplicate
10/11/2005	L-6358	J-284	MW-17-3 B			0.15	
9/20/2005	L-6224	J-286	MW-19-2	125.7		0.18	instrument duplicate
9/20/2005	L-6227	J-286	MW-19-2	125.7		0.18	
9/20/2005	L-6248	J-281	MW-24-1	129.1		0.03	instrument duplicate
9/23/2005	L-6257	J-281	MW-24-1	129.1		0.03	
9/23/2005	L-6264	J-280	MW-24-2	126.9		0.03	
9/20/2005	L-6236	J-285	MW-25-1	128.1		-0.02	
10/11/2005	L-6349	J-288	MW-25-2 A			0.15	method duplicate
10/11/2005	L-6355	J-288	MW-25-2 B	48.5		0.09	
9/23/2005	L-6270	J-284	MW-25-3	200	impure gas	-2.47	rerun in duplicate
10/11/2005	L-6346	J-284	MW-25-3 A	59.4		0.01	
10/11/2005	L-6343	J-284	MW-25-3 B	65.1		0.20	
9/23/2005	L-6261	J-283	MW-25-4		impure gas	-0.23	rerun in duplicate
11/16/2005	L-7684	J-283	MW-25-4 A	58.4		0.17	
11/16/2005	L-7687	J-283	MW-25-4 A	58.4		0.18	
11/16/2005	L-7690	J-283	MW-25-4 B	49.6		0.09	
11/16/2005	L-7693	J-283	MW-25-4 B	49.6		0.08	
11/16/2005	L-7696	J-283	MW-25-4 B	49.6		0.08	

Note: analytical precision of $\delta^{37}\text{Cl}$ values is +/- 0.1 per mil

Cl isotope ratios reported relative to SMOC = standard mean ocean chloride

9/20/2005	L-6214	J-2	CBN LP55E	-0.02	REFERENCE SEAWATER
10/11/2005	L-6337	J-2	CBN J2-7 AB	0.08	REFERENCE SEAWATER
9/23/2005	L-6273	J-2	CBN J2-2 NM	-0.04	REFERENCE SEAWATER
10/11/2005	L-6340	J-2	CBN J2-4 NM	-0.08	REFERENCE SEAWATER
10/11/2005	L-6361	J-2	CBN J2-8 AB	0.10	REFERENCE SEAWATER

0.01	0.08	REFERENCE SEAWATER
mean	std dev	

DATE	SPEC#	ID1	ID2	UMOL	d52	d37CI	SMOC	AVG	STDV	V
9/20/2005	L-6214	J-2	LP55E CBN	17.7	-6.139		-0.02	0.00	0.02	5.5
9/20/2005	L-6215	J-2	LP55E CBN	17.7	-6.114		0.01			5.5
9/20/2005	L-6216	J-2	LP55E CBN	17.7	-6.109		0.01			5.5
10/11/2005	L-6337	J-2	CBN J2-7 AB	78.7	-6.038		0.08	0.09	0.01	5
10/11/2005	L-6338	J-2	CBN J2-7 AB	78.7	-6.028		0.09			5
10/11/2005	L-6339	J-2	CBN J2-7 AB	78.7	-6.019		0.10			5
9/23/2005	L-6273	J-2	J2-2 NM	65.4	-6.160		-0.04	-0.03	0.01	5
9/23/2005	L-6274	J-2	J2-2 NM	65.4	-6.140		-0.02			5
9/23/2005	L-6275	J-2	J2-2 NM	65.4	-6.141		-0.02			5
10/11/2005	L-6340	J-2	CBN J2-4 NM		-6.200		-0.08	-0.08	0.00	5
10/11/2005	L-6341	J-2	CBN J2-4 NM		-6.194		-0.07			5
10/11/2005	L-6342	J-2	CBN J2-4 NM		-6.194		-0.07			5
10/11/2005	L-6361	J-2	CBN J2-8 AB	69.6	-6.019		0.10	0.10	0.00	5
10/11/2005	L-6362	J-2	CBN J2-8 AB	69.6	-6.016		0.10			5
10/11/2005	L-6363	J-2	CBN J2-8 AB	69.6	-6.022		0.10			5
11/15/2005	L-7659	J-2	LP51A CBN	11.5	-6.036		0.085	0.08	0.00	4
11/15/2005	L-7660	J-2	LP51A CBN	11.5	-6.039		0.082			4
11/15/2005	L-7661	J-2	LP51A CBN	11.5	-6.033		0.088			4
11/14/2005	L-7620	J-2	J2-5 CBN	77.0	-6.259		-0.138	-0.14	0.00	4
11/14/2005	L-7621	J-2	J2-5 CBN	77.0	-6.261		-0.140			4
11/14/2005	L-7622	J-2	J2-5 CBN	77.0	-6.254		-0.133			4
11/15/2005	L-7659	J-2	LP51A CBN 4V	11.5	-6.036		0.085	0.08	0.00	4
11/15/2005	L-7660	J-2	LP51A CBN 4V	11.5	-6.039		0.082			4
11/15/2005	L-7661	J-2	LP51A CBN 4V	11.5	-6.033		0.088			4
11/15/2005	L-7662	J-2	LP51A CBN 2V	11.5	-6.041		0.080	0.08	0.00	2
11/15/2005	L-7663	J-2	LP51A CBN 2V	11.5	-6.042		0.079			2
11/15/2005	L-7664	J-2	LP51A CBN 2V	11.5	-6.038		0.083			2
11/16/2005	L-7681	J-2	J-2B AB CBN	47.6	-6.015		0.106	0.11	0.00	
11/16/2005	L-7682	J-2	J-2B AB CBN	47.6	-6.013		0.108			
11/16/2005	L-7683	J-2	J-2B AB CBN	47.6	-6.012		0.109			
					-6.089		0.031		0.08326722	

DATE	SPEC#	ID1	ID2	UMOL	d52	d37CI	SMOC	AVG	STDV	V
9/20/2005	L-6239	J-272	MW1	126.2	-6.078		0.04	0.05	0.01	5
9/20/2005	L-6240	J-272	MW1	126.2	-6.067		0.05			5
9/20/2005	L-6241	J-272	MW1	126.2	-6.061		0.06			5
9/20/2005	L-6242	J-272	MW1	126.2	-6.062		0.06	0.07	0.01	5
9/20/2005	L-6243	J-272	MW1	126.2	-6.054		0.07			5
9/20/2005	L-6244	J-272	MW1	126.2	-6.050		0.07			5
9/20/2005	L-6233	J-273	Garfield	131.4	-6.109		0.01	0.01	0.00	5
9/20/2005	L-6234	J-273	Garfield	131.4	-6.116		0.00			5
9/20/2005	L-6235	J-273	Garfield	131.4	-6.107		0.01			5
9/20/2005	L-6217	J-274	LWAC-3	115.5	-6.111		0.01	0.01	0.00	5.5
9/20/2005	L-6218	J-274	LWAC-3	115.5	-6.112		0.01			5.5
9/20/2005	L-6219	J-274	LWAC-3	115.5	-6.120		0.00			5.5
9/20/2005	L-6221	J-274	LWAC-3	115.5	-6.119		0.00	0.01	0.00	5.5
9/20/2005	L-6222	J-274	LWAC-3	115.5	-6.112		0.01			5.5
9/20/2005	L-6223	J-274	LWAC-3	115.5	-6.111		0.01			5.5
9/23/2005	L-6267	J-275	LFWC-2	91	-6.064		0.06	0.06	0.00	5
9/23/2005	L-6268	J-275	LFWC-2	91	-6.062		0.06			5

9/23/2005	L-6269	J-275	LFWC-2	91	-6.070	0.05			5
9/20/2005	L-6245	J-276	Bangham	129.8	-6.092	0.03	0.03	0.00	5
9/20/2005	L-6246	J-276	Bangham	129.8	-6.096	0.02			5
9/20/2005	L-6247	J-276	Bangham	129.8	-6.093	0.03			5
9/20/2005	L-6230	J-277	Sunset	125.4	-6.044	0.08	0.08	0.00	5
9/20/2005	L-6231	J-277	Sunset	125.4	-6.039	0.08			5
9/20/2005	L-6232	J-277	Sunset	125.4	-6.035	0.09			5
9/23/2005	L-6264	J-280	MW-24-2	126.9	-6.087	0.03	0.03	0.00	5
9/23/2005	L-6265	J-280	MW-24-2	126.9	-6.083	0.04			5
9/23/2005	L-6266	J-280	MW-24-2	126.9	-6.089	0.03			5
9/20/2005	L-6248	J-281	MW-24-1	129.1	-6.092	0.03	0.03	0.00	5
9/20/2005	L-6249	J-281	MW-24-1	129.1	-6.096	0.02			5
9/20/2005	L-6250	J-281	MW-24-1	129.1	-6.093	0.03			5
9/23/2005	L-6257	J-281	MW-24-1	129.1	-6.093	0.03	0.03	0.00	5
9/23/2005	L-6258	J-281	MW-24-1	129.1	-6.097	0.02			5
9/23/2005	L-6259	J-281	MW-24-1	129.1	-6.096	0.02			5
9/23/2005	L-6261	J-283	MW-25-4		-6.348	-0.23	-0.23	0.00	5
9/23/2005	L-6262	J-283	MW-25-4		-6.348	-0.23			5
9/23/2005	L-6263	J-283	MW-25-4		-6.347	-0.23			5
11/16/2005	L-7684	J-283	MW-25-4 A	58.4	-5.954	0.167	0.17	0.00	
11/16/2005	L-7685	J-283	MW-25-4 A	58.4	-5.951	0.170			
11/16/2005	L-7686	J-283	MW-25-4 A	58.4	-5.957	0.164			
11/16/2005	L-7687	J-283	MW-25-4 A	58.4	-5.942	0.179	0.18	0.01	
11/16/2005	L-7688	J-283	MW-25-4 A	58.4	-5.945	0.176			
11/16/2005	L-7689	J-283	MW-25-4 A	58.4	-5.930	0.191			
11/16/2005	L-7690	J-283	MW-25-4 B	49.6	-6.030	0.091	0.09	0.01	
11/16/2005	L-7691	J-283	MW-25-4 B	49.6	-6.026	0.095			
11/16/2005	L-7692	J-283	MW-25-4 B	49.6	-6.039	0.082			
11/16/2005	L-7693	J-283	MW-25-4 B	49.6	-6.042	0.079	0.08	0.00	
11/16/2005	L-7694	J-283	MW-25-4 B	49.6	-6.037	0.084			
11/16/2005	L-7695	J-283	MW-25-4 B	49.6	-6.036	0.085			
11/16/2005	L-7696	J-283	MW-25-4 B	49.6	-6.045	0.076	0.08	0.00	
11/16/2005	L-7697	J-283	MW-25-4 B	49.6	-6.043	0.078			
11/16/2005	L-7698	J-283	MW-25-4 B	49.6	-6.039	0.082			
9/23/2005	L-6270	J-284	MW-25-3	200	-8.595	-2.47	-2.47	0.01	5
9/23/2005	L-6271	J-284	MW-25-3	200	-8.590	-2.47			5
9/23/2005	L-6272	J-284	MW-25-3	200	-8.581	-2.46			5
10/11/2005	L-6343	J-284	MW-25-3 B	65.1	-5.926	0.19	0.20	0.00	5
10/11/2005	L-6344	J-284	MW-25-3 B	65.1	-5.919	0.20			5
10/11/2005	L-6345	J-284	MW-25-3 B	65.1	-5.925	0.20			5
10/11/2005	L-6346	J-284	MW-25-3 A	59.4	-6.108	0.01	0.01	0.00	5
10/11/2005	L-6347	J-284	MW-25-3 A	59.4	-6.107	0.01			5
10/11/2005	L-6348	J-284	MW-25-3 A	59.4	-6.108	0.01			5
10/11/2005	L-6358	J-284	MW-17-3 B		-5.974	0.15	0.15	0.00	5
10/11/2005	L-6359	J-284	MW-17-3 B		-5.972	0.15			5
10/11/2005	L-6360	J-284	MW-17-3 B		-5.971	0.15			5
9/20/2005	L-6236	J-285	MW-25-1	128.1	-6.144	-0.02	-0.02	0.00	5
9/20/2005	L-6237	J-285	MW-25-1	128.1	-6.141	-0.02			5
9/20/2005	L-6238	J-285	MW-25-1	128.1	-6.148	-0.03			5
9/20/2005	L-6224	J-286	MW-19-2	125.7	-5.941	0.18	0.18	0.00	5.5
9/20/2005	L-6225	J-286	MW-19-2	125.7	-5.938	0.18			5.5
9/20/2005	L-6226	J-286	MW-19-2	125.7	-5.941	0.18			5.5

9/20/2005	L-6227	J-286	MW-19-2	125.7	-5.941	0.18	0.18	0.00	5
9/20/2005	L-6228	J-286	MW-19-2	125.7	-5.948	0.17			5
9/20/2005	L-6229	J-286	MW-19-2	125.7	-5.940	0.18			5
10/11/2005	L-6352	J-287	MW-17-3 A	82.6	-5.902	0.22	0.19	0.05	5
10/11/2005	L-6353	J-287	MW-17-3 A	82.6	-5.895	0.23			5
10/11/2005	L-6354	J-287	MW-17-3 A	82.6	-5.989	0.13			5
10/11/2005	L-6349	J-288	MW-25-2 A		-5.974	0.15	0.15	0.00	5
10/11/2005	L-6350	J-288	MW-25-2 A		-5.968	0.15			5
10/11/2005	L-6351	J-288	MW-25-2 A		-5.969	0.15			5
10/11/2005	L-6355	J-288	MW-25-2 B	48.5	-6.041	0.08	0.09	0.01	5
10/11/2005	L-6356	J-288	MW-25-2 B	48.5	-6.032	0.09			5
10/11/2005	L-6357	J-288	MW-25-2 B	48.5	-6.030	0.09			5

Shiao, Tien

From: Neil C Sturchio [sturchio@uic.edu]
Sent: Monday, April 03, 2006 4:36 PM
To: Shiao, Tien
Subject: MW-16 Perchlorate Isotope Data for oxygen
Importance: High

Tien,

Here are the final results for duplicate analysis of oxygen isotope ratios of MW-16. We will report Cl isotope ratios by next week.

Note that the delta 18-O result is lower than any of the other samples we measured, meaning it is consistent with the JPL site perchlorate being an end-member in mixtures of perchlorate as we discussed in Columbus.

-Neil

**oxygen isotope results
MW-16 perchlorate**

delta 18-O	Delta 17-O
-21.711	0.017
-21.950	0.028

5/16/2006

Shiao, Tien

From: Linnea Heraty [lheraty@uic.edu]
Sent: Friday, April 28, 2006 5:56 PM
To: Shiao, Tien; Sass, Bruce M
Cc: Neil Sturchio
Subject: Re: MW-16 for Perchlorate Isotope Analysis

Hot off the press, here is the chlorine isotope data for MW-16

MW-16a d37Cl = 0.47

MW-16b d37Cl = 0.32

The average for a and b splits = 0.39

Linnea

Linnea Heraty
Department of Earth and Environmental Sciences
University of Illinois at Chicago (MC-186)
845 West Taylor Street SES 2438
Chicago, Illinois 60607-7059
office/lab: 312-413-0098
fax: 312-413-2279
email: lheraty@uic.edu

5/16/2006

Shiao, Tien

From: Sturchio, Neil C. [sturchio@uic.edu]
Sent: Monday, February 20, 2006 8:12 PM
To: Shiao, Tien; filedsk@BATTELLE.ORG; Sass, Bruce M; Ohart, Carolyn J
Subject: QA/QC tests of perchlorate isotope analysis methods

Attachments: QA-QC Perchlorate Isotope Analyses.xls



QA-QC Perchlorate
Isotope Anal...

Attached is a spreadsheet showing results of several tests in which we ran multiple perchlorate isotope reference materials through the entire extraction/purification procedure to ensure that the isotopic composition of perchlorate was not changed by the procedure.

Shiao, Tien

From: Cutie, Betsy
Sent: Thursday, January 25, 2007 5:21 PM
To: Shiao, Tien
Subject: FW: Cl isotope ratios for new JPL samples

Tien,

Here is the new isotope data.

Betsy

-----Original Message-----

From: Sturchio, Neil C. [mailto:sturchio@uic.edu]
Sent: Thursday, January 25, 2007 9:21 AM
To: Fields, Keith A
Cc: Cutie, Betsy
Subject: RE: Cl isotope ratios for new JPL samples

Keith,

I'll send the QA/QC data later this morning.

Neil

On Thu, January 25, 2007 8:11 am, Fields, Keith A wrote:

> Neil,
>
> We need QA/QC data package for these new data as soon as possible.
> Please send them to me and Betsy. Thanks.
>
> Keith A. Fields
> Battelle
> Environmental Restoration Department
> phone: (614) 424-7723
> fax: (614) 424-3667
>

> -----Original Message-----

> From: Sturchio, Neil C. [mailto:sturchio@uic.edu]
> Sent: Thursday, January 18, 2007 9:45 PM
> To: Fields, Keith A; Sass, Bruce M
> Subject: Cl isotope ratios for new JPL samples
>

> Keith and Bruce,
>
> Here are the final values for the new JPL samples.
>

	d18O	D17O	d37Cl
OU-1	-19.3	+0.1	+0.3
MW-16	-20.7	-0.2	+0.1

> -Neil
>
>

--

Neil C. Sturchio
Professor and Head
Department of Earth and Environmental Sciences University of Illinois at Chicago, MC-186
845 West Taylor Street, Room 2442

UIC Environmental Isotope Geochemistry Laboratory

QA/QC analyses of Perchlorate Isotopic Reference Materials Measured With MW-16 and OU-1

Date	Sample	$\delta^{18}\text{O}$	accepted value	$\Delta^{17}\text{O}$	accepted value	$\delta^{37}\text{Cl}$	accepted value
1/15/2007	RSIL-4	-17.0	-17.0	-0.16	0.00		
1/15/2007	RSIL-5	52.5	52.5	72.50	*		
1/18/2007	RSIL-4					0.77	0.60
1/18/2007	RSIL-5					-87.2	-87.2
1/18/2007	CBN-1					-0.07	0.00

*No final reference value has yet been established for $\Delta^{17}\text{O}$ in RSIL-5

Note: RSIL-4 and RSIL-5 are synthetic KClO_4 salts; CBN-1 is seawater from Conception Bay, Newfoundland.

QA/QC analyses of Perchlorate Isotopic Reference Materials

Date	Sample	$\delta^{18}\text{O}$	accepted value	$\Delta^{17}\text{O}$	accepted value	$\delta^{37}\text{Cl}$	accepted value
<i>Perchlorate isotope reference materials prepared using initial procedure</i>							
2/6/2005	RSIL-4-A	-16.8	-17.0	-0.01	0.00	0.6	0.6
2/6/2005	RSIL-4-B	-17.3	-17.0	0.03	0.00	0.3	0.6
6/6/2005	RSIL-2-A	-14.9	-14.6	-0.15	0.00	na	na
6/6/2005	RSIL-2-B	-14.9	-14.6	-0.09	0.00	na	na
6/6/2005	RSIL-2-C	-14.7	-14.6	-0.13	0.00	na	na
6/6/2005	RSIL-2-D	-15.1	-14.6	-0.13	0.00	na	na
6/6/2005	RSIL-2-E	-15.0	-14.6	-0.17	0.00	na	na
5/12/2005	UIC-1-A	na		na		1.2	1.2
5/12/2005	UIC-1-B	na		na		0.9	1.2
<i>Perchlorate isotope reference materials prepared using revised procedure</i>							
12/22/2005	UIC-1-A	-16.0	-16.0	-0.12	0.00	na	na
12/22/2005	UIC-1-B	-16.0	-16.0	-0.05	0.00	na	na
12/22/2005	UIC-1-C	-16.0	-16.0	-0.11	0.00	na	na
12/22/2005	UIC-2-A	-24.9	-24.8	0.19	0.00	na	na
12/22/2005	UIC-2-B	-24.1	-24.8	0.05	0.00	na	na

Shiao, Tien

From: Sturchio, Neil C. [sturchio@uic.edu]
Sent: Sunday, February 19, 2006 1:32 AM
To: Shiao, Tien; Fields, Keith A; Ohart, Carolyn J; Sass, Bruce M
Subject: summary of revised perchlorate procedure

Attached is a revised version of the extraction and purification procedure for perchlorate that we used for most of the JPL water samples (because of high sulfate encountered).

I will send some QA/QC data tomorrow morning (results for standard reference materials that we analyzed along with the JPL samples).

-Neil

--

Neil C. Sturchio
Director, Environmental Isotope Geochemistry Laboratory Professor and Head Department of
Earth and Environmental Sciences University of Illinois at Chicago, MC-186
845 West Taylor Street, Room 2442
Chicago, IL 60607-7059

312-355-1182 phone
312-413-2279 fax
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i. Resin and sample preparation

The resin from the field columns is transferred to beakers and about 15 to 20 bed volumes D.I. water (enough for resin to move around) is added and sonified 3 minutes at med/low power. The liquor is then decanted into a poly bottle. The number of times the samples are sonified will depend on how murky the water is after each sonification. All washes are transferred into bottles and stored for IC analysis.

I. Displacement of ClO_4

Resins are transferred to 500-mL bottles (wet-transfer; use as little water as possible) for elution. Add 3.0 bed volumes of FeCl_3/HCl and place it on the shaker. Shake it in low setting for 1 hour. Pass the resins through a clean empty column to filter out the resins and save the eluent in a beaker. Properly label all beakers and bottles.

II. Removal of Fe:

The FeCl_3/HCl eluent is diluted by 4 (to get 1M HCl) then passed through a Ag-50W 100-200 mesh, H+ form resin column. Sample and water washes are combined and 10mL 6% H_2O_2 is added to oxidize any organics.

III. Sample concentration and precipitation

Sample volume is reduced by evaporation at med-low heat to ~100 mL. 1mL aliquot is removed for IC analysis to determine whether BaSO_4 precipitation is necessary for sulfate removal. If needed, add 2.0mL of a 0.1M BaCl_2 solution. Solid BaSO_4 is removed by centrifugation and the washes saved. Excess Cl^- is removed by passing through Dionex OnGuard Ag cartridges (prepared by flushing with 200mL DiH_2O) at 1.5mL/min. Excess Ba and displaced Ag is removed by passing through a 1mL cation column.

The sample is further evaporated to a volume of <1.0mL low heat and 0.2 mL of 10M CsOH is added. CsClO_4 is allowed to precipitate overnight.

IV. Sample purification

CsOH is removed by washing the solids in methanol with centrifugation. If nitrate or phosphate anions were detected by IC analysis, the solid sample is further rinsed with small aliquots of deionized H_2O until the contaminants are rinsed away (monitored by IC analysis of each wash). The remaining solid is transferred into an 8" long 9-mm o.d. pyrex tube with 2 constrictions, at 1" and 2".

V. Combustion and measurement of perchlorate salt isotopes:

The CsClO_4 is dried completely and sealed under vacuum using a hand torch. The sealed sample is then combusted at 600°C for 30 minutes.

The combusted sample is attached to vacuum using a tube cracker. The O_2 gas is transferred onto silica beads at liquid nitrogen temperature and saved for later dual inlet $\delta^{18}\text{O}$ and $\delta^{17}\text{O}$ analysis. The contents (CsCl) of the combustion tube are rinsed into a beaker and chloride is reprecipitated using AgNO_3 . The AgCl is dried and combined with CH_3I and

sealed under vacuum, then combusted at 300°C for 2 hours. The resulting CH_3Cl gas is cryogenically purified and sealed in individual ampoules for dual inlet $\delta^{37}\text{Cl}$ analysis.

Perchlorate parts and materials list

Part	Company	Part #/catalogue #
Field column, 30 mL (Chromatographic pre-column, #11 threads)	Ace glass	5796-34
Field column, 90 mL (Chromatographic column, #11 threads, 21 x 300 mm)	Ace glass	5795-10
Field column, 220 mL (Chromatographic column, #11 threads, 40 x 350 mm)	Ace glass	5795-16
End fittings, 11 mm adapter	Ace glass	5801-14
Plugs		
Elbow joints (L "1/8" NPT x 3/8" ID)	Cole-Parmer	30622-87 or L2-6NN
Field tubing	Cole-Parmer	06408-12
Test pump (Masterflex L/S)		
Coarse glass wool		
Purolite A-530E resin (same as D-3696)		
Teflon barbed pipe adaptors (1/8 x 5/32")	Cole-Parmer	06373-90
Ion exchange columns	Lab Glass	
Cation exchange resin (Biorad AG-50W 100-200 mesh)		
Large teflon beakers with caps		
Small teflon beakers		
8" long, 9-mm o.d. pyrex tubes, constrictions at 1" and 2"		

University of
Miami

TO: University of Oregon

BATTELLE GROUNDWATER SAMPLES

Tien Shiao

Collected: June 2005; Analyzed: June/November 2005

SAMPLE	HELIUM 1E-8cc/g	NEON 1E-8cc/g	He corr. 1E-8cc/g	DEL He4 %	Del He3 %	R(3/4) in Ra	TRITIUM TU	UNCERT. +/-TU	3H-3He AGE (y)	UNCERT. (y)
GARFIELD	10.59	24.34	8.85	97.1	17.3	0.592	2.165	0.030	19.5	0.9
BANGHAM	8.89	26.60	6.56	45.3	27.4	0.866	2.589	0.039	23.1	0.7
SUNSET	7.04	20.31	6.56	44.8	48.5	1.012	5.671	0.050	20.4	0.4
LAWC-3	4.68	18.95	4.67	2.3	0.0	0.961	4.576	0.050	0.0	1.0
MMW1	-	-	-	-	-	-	3.902	0.050	-	-
LFWC-2	-	-	-	-	-	-	5.079	0.050	-	-

NOTES:

- 1- HELIUM column denotes observed total helium
- 2- NEON column denotes observed total neon
- 3- He corr. column denotes corrected total helium based on excess neon.

- 4- DEL He4 column is the corrected helium excess in percent, above solubility equilibrium.
 - 5- DEL He3 column is He3 excess in percent, above solubility equilibrium, i.e. assumed to be tritiogenic He3.
 - 6- R(3/4) column is the He3/He4 ratio in sample normalized to the same ratio in air.
 - 7- TRITIUM column is the tritium concentration in Tritium Units.
 - 8- H3-He3 AGE column is the apparent tritium-helium age of the sample in years.
 - 9- UNCERT. column is the analytical uncertainty in tritium-He3 age, in years.
- MW1 and LFWC-2 helium samplers did not yield viable helium samples, hence no helium measurements.

BATTELLE TRITIUM MEASUREMENTS: FINAL RESULTS
12/12/2005

SAMPLE	TRIT.(TU) UNCER.(TU)
MW-17-1	2.929
MW-17-2	6.596
MW-17-3	7.75
MW-17-4	0.537
MW-17-5	0.865
MW-17-5	2.006
MW-18-1	2.472
MW-18-2	2.91
MW-18-3	2.394
MW-18-4	0.337
MW-18-5	0.136
MW-19-1	1.153
MW-19-2	11.763
MW-19-3	2.365
MW-19-4	3.927
MW-19-5	9.255
MW-20-1	4.355
MW-20-2	3.352
MW-20-3	2.475
MW-20-4	1.19
MW-20-5	0.079
MW-21-1	7.591
MW-21-2	8.04
MW-21-3	8.229
MW-21-4	3.878
MW-21-5	4.996
MW-24-1	3.131
MW-24-2	3.194
MW-24-3	0.788
MW-24-4	0.299
MW-24-5	0.171
MW-25-1	5.549
MW-25-2	2.299
MW-25-3	2.693
MW-25-4	2.436
MW-25-5	0.141

BATTELLE MEMORIAL INSTITUTE
Tien Shiao
Samples collected: June-Sep. 2005; Analyses: Nov.-Dec., 2005

SAMPLE	HELIUM 1E-8cc/g	NEON 1E-8cc/g	He corr. 1E-8cc/g	DEL He4 %	Del He3 %	R(3/4) in Ra	TRITIUM TU	UNCERT. +/-TU	3H-3He AGE (y)	UNCERT. (y)
MW-17-3	6.41	22.12	5.32	18.5	29.0	1.073	7.750	0.054	11.7	0.4
MW-19-2	40.28	61.85	27.61	524.4	983.4	1.717	11.763	0.071	54.8	0.1
MW-24-1	5.39	18.35	5.32	19.3	4.5	0.863	3.131	0.039	5.4	1.1
MW-24-2	38.74	69.64	23.89	435.7	820.6	1.700	3.194	0.040	74.5	0.2
MW-25-1	19.88	47.11	11.48	158.7	190.1	1.111	5.549	0.050	40.1	0.2
MW-25-2	16.67	40.83	10.09	127.1	2.9	0.453	2.299	0.034	4.8	1.5
MW-25-3	17.67	48.70	8.85	98.4	121.7	1.105	2.693	0.034	44.6	0.3
MW-25-4	17.38	33.52	12.97	189.8	35.4	0.468	2.436	0.030	27.2	0.6

NOTES:

- 1- HELIUM column denotes observed total helium
- 2- NEON column denotes observed total neon
- 3- He corr. column denotes corrected total helium based on excess neon.
- 4- DEL He4 column is the corrected helium excess in percent, above solubility equilibrium.

- 5-DEL He3 column is He3 excess in percent, above solubility equilibrium, i.e. assumed to be tritogenic He3.
- 6- R(3/4) column is the He3/He4 ratio in sample normalized to the same ratio in air.
- 7- TRITIUM column is the tritium concentration, at the time of measurement, in Tritium Units.
- 8- H3-He3 AGE column is the apparent tritium-helium age of the sample in years.
- 9- UNCERT. column is the analytical uncertainty in tritium-He3 age, in years.
- 10- With the exception of MW-17-3 and MW-24-1, all samples had very large air components in them. Correction for this component using neon increases the uncertainty in age determination well beyond the analytical uncertainty given under UNCERT. Column. Replicates were also run to minimize the uncertainty without much success: they contained just as much air. Therefore the real ages may be much shorter, in the 10-20y range.
- 11- MW-25-2 result is preliminary; the replicate for this sample could not be included with the rest, but it is now being re-analyzed. That result will be reported as an update within two weeks.

Shiao, Tien

From: Shiao, Tien
Sent: Friday, September 09, 2005 11:17 AM
To: 'Zafer Top'
Subject: RE: Tritium Sample Volume

Zafer,

The current situation is that you will receive two or three sample bottles for each location for the tritium analysis. The bottles are non-preserved and I am assuming contact with the air should not be a problem since the tritium samples are grab samples. In addition I am assuming there are no hold time issues.

How about if the samples are kept cool for a previous analysis but currently kept at ambient temperature, would that be a problem?

The following samples collected for other analysis and their collection dates are provided below. We are trying to retrieve them from other labs to send to you for tritium analysis.

Sample ID Date Collected

MW-17-3	August 15
MW-19-2	July 20
MW-24-1	July 25
MW-24-2	July 25
MW-25-1	July 19
MW-25-3	July 19
MW-24-4	July 19

Please let me know if there are any additional issues you can think of. We want to cover all bases and be sure the samples we sent to you is fine for the tritium analysis. If not, then we will have to go back to the field to re-sample and we will need to know about this as soon as possible. Sorry about this and thank you for your help. I will keep you posted.

Thanks,
Tien

At 10:13 AM 9/9/2005 -0400, you wrote:

>Zafer,

>
>
>

>I left you a message on your voicemail this morning. The helium
>samplers will be sent to you early next week. I will let you know the
>exact date. Please let me know if you encounter any problems with the
>helium samplers we sent you. The helium samplers were taken in
>duplicate in case any of the clamps were over tightened.

>
>
>

>In addition, our field technician missed taking 7 tritium samples.
>Therefore, either we will go back to take the additional tritium
>samples or we can send you the bottles already collected for other
>analysis. Therefore we were wondering what the exact volume needed for
>tritium analysis is. Currently, we have been sending you 1 L
>polyethylene containers of water for tritium analysis. Please let me
>know about this as soon as you can. Any suggestions will be appreciated.

>
>

From: Shiao, Tien
Sent: Monday, September 12, 2005 6:16 PM
To: 'Zafer Top'
Cc: Ohart, Carolyn J; Conner, David J
Subject: Helium Samplers
Zafer,

8 He samplers are being sent to you today (09/12/05) to arrive to you tomorrow. You should receive the He samplers in duplicate. The sample IDs are:

MW-17-3
MW-19-2
MW-24-1
MW-24-2
MW-25-1
MW-25-2
MW-25-3
MW-25-4

Please confirm receipt of samples and to fax me the COCs when you have verified the actual samples corresponds with the sample IDs on the COCs. On a side note, you are probably not going to get the tritium samples tomorrow. I will keep you updated.

Thanks for your help!

Best Regards,

Tien Shiao

Battelle Memorial Institute
Environmental Restoration Dept.
505 King Ave., Columbus, OH 43204
Room: 10-1-80
Business: (614) 424-3754
Mobile: (614) 370-3939
Fax: (614) 458-3754
shiaoh@battelle.org
www.battelle.org

Shiao, Tien

From: Shiao, Tien
Sent: Tuesday, September 13, 2005 2:22 PM
To: 'Zafer Top'
Subject: FW: samples

Dr. Top,

You will receive the following samples from APC Labs.

Sample ID	Date Collected	Volume Required
MW-17-3	August 15	At least 400 mL
MW-19-2	July 20	At least 400 mL
MW-24-1	July 25	At least 400 mL
MW-24-2	July 25	At least 400 mL
MW-25-1	July 19	At least 400 mL
MW-25-3	July 19	At least 400 mL
MW-25-4	July 19	At least 400 mL

Combined with MIT, you will have more than 500 mL of non preserved samples for the tritium analysis. Please let me know if there are any problems/issues.

Sincerely,
Tien

From: Frank Dudas [mailto:fdudas@MIT.EDU]
Sent: Tuesday, September 13, 2005 2:11 PM
To: Shiao, Tien
Cc: ztop@rsmas.miami.edu; sbowring@mit.edu
Subject: samples

Dear Tien,

I sent the following samples to Dr. Top by FedEx this afternoon (picked up at 2 pm), standard overnight delivery. They should arrive tomorrow (9/14) afternoon. Each of the samples is at least 200 mL.

Sample ID	Date Collected	Volume Required
MW-17-3	August 15	At least 200 mL
MW-19-2	July 20	At least 200 mL
MW-24-1	July 25	At least 200 mL
MW-24-2	July 25	At least 200 mL
MW-25-1	July 19	At least 200 mL
MW-25-3	July 19	At least 200 mL
MW-25-4	July 19	At least 200 mL

Regards,
Frank

--
Dr. Francis Ö. Dudás
Laboratory Manager, 54-1116

1/26/2007

Shiao, Tien

From: Zafer Top [ztop@rsmas.miami.edu]
Sent: Friday, September 23, 2005 9:39 AM
To: Shiao, Tien
Subject: Re: Tritium Samples

Tien:

I received the rest of the tritium samples and processed them. Helium and tritium measurements are independent and are reported separately. I will be away from the office until October 20.

Zafer

At 05:34 PM 9/22/2005 -0400, you wrote:

>Zafer,

>

>

>

>I left a voice message with you this afternoon. I wanted to check
>whether you received the tritium samples from MIT and APC Labs. I also
>wanted to check how the helium and the tritium are reported. For
>example, at locations where both tritium and helium samples are taken,
>will you be reporting a ratio for the results, or will tritium and
>helium be reported separately?

>

>

>

>Thanks,

>

>Tien

>

>