

Harmony Spring 2008 Dye Trace

May 6, 2008 to June 13, 2008

Jeffrey A. Green, Andrew J. Peters¹, Andrew J. Luhmann²,
E. Calvin Alexander, Jr.² and Scott C. Alexander ²

¹ Minnesota Department of Natural Resources, Division of Waters, 2300 Silver Creek Road NE,
Rochester, Minnesota, 55906; Phone (507) 285-7430; Fax (507) 285-7144;
emails: jeff.green@dnr.state.mn.us & andrew.peters@dnr.state.mn.us

² Geology & Geophysics Department, University of Minnesota, 310 Pillsbury Drive. SE.,
Minneapolis, Minnesota, 55455; Phone (612) 624-3517; Fax (612) 625-3819;
emails: luhm0031@umn.edu, alexa001@umn.edu & alexa017@umn.edu

Trace Name: Harmony Spring 2008

Trace Purpose: The sinkhole traced from lies near a springshed divide and was traced from in an effort to better delineate the boundary between three separate springsheds.

County: Fillmore

Cooperators: City of Harmony Fire Department, Earth Systems Class - Fillmore Central High School, Kwik Trip of Harmony

Introduction

A dye trace was conducted in an area in the City of Harmony, Minnesota from May 6, 2008 to June 13, 2008 (Figure 1). Numerous dye traces have been completed in this area in the past and this effort was made in order to better delineate the Buggywhip, Hart, and the Big Spring springsheds in this area due to the close proximity of numerous State of Minnesota designated trout streams. Achieving a better understanding of the connection of these sinkholes receiving surface water flow and their connectivity to springs that provide a cold water source for the designated trout streams in the area was the goal of this trace.

Dye tracing entails using fluorescent dyes to track groundwater flow directions and travel times. The dye is poured into a sinkhole or sinking stream; from there, it flows through the karst conduit system until it re-emerges at a spring or springs. For this project, the dye used was Uranine. Both direct water samples and passive dye detectors were used and all the samples were analyzed at the University of Minnesota Geology Department using a Shimadzu scanning spectrofluorophotometer. The trace was designed and executed by Jeff Green and Andrew Peters of MNDNR Waters with help from the City of Harmony Fire Department (which provided water for the trace) and the Earth Systems Class from Fillmore Central High School (Darrin Ellsworth, teacher). E. Calvin Alexander, Jr., Andrew Luhmann, and Scott Alexander of the University of Minnesota Geology Department performed the sample analysis and interpretation.

Results

Prior to dye injection, dye receptors had been placed at all the sampling points to determine background levels of dyes. The dye trace began on May 6, 2008. Table 1 summarizes the dye input information.

Dye Inputs				
Dye Input Point	Dye (type, quantity)	Time	Water Input (Est.)	Dye Detection Point
Sinkhole 23:D6526	Uranine C, 881 grams	1649 hrs.	1,500 Gallons	Spring 23:A0237

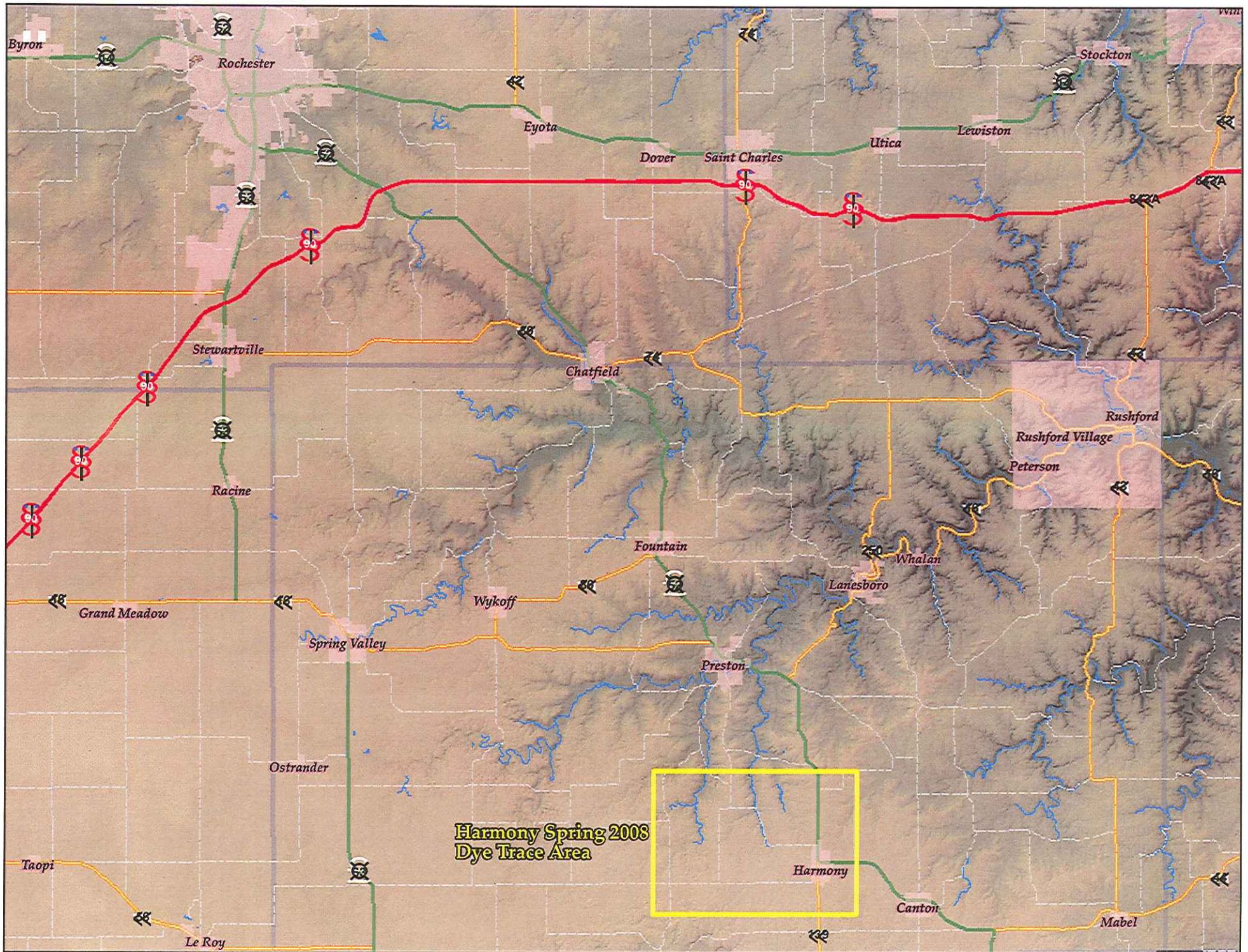
Table 1: Dye Inputs, Harmony Spring 2008 Dye Trace

Direct water samples were collected and charcoal dye detectors were in placed at all sampling locations from the start of the trace until mid-June of 2008. The dye was detected at levels high enough for positive identification. The dye, Uranine C, was detected in the water sample from spring 23:A0237 no more than 23 hours later. This translates to a groundwater flow rate of no greater than approximately 1.8-miles per day. This is consistent with previous traces in this geologic setting (Ordovician Galena limestone).

The dye input point and its known connection from this dye trace in addition to previously completed traces are shown in Figure 2. Through this trace, we have further delineated the springsheds feeding springs 23:A0237, 23:A0358 & 23:A0479. This new trace has expanded the known boundaries of that springshed.

Appendix 1

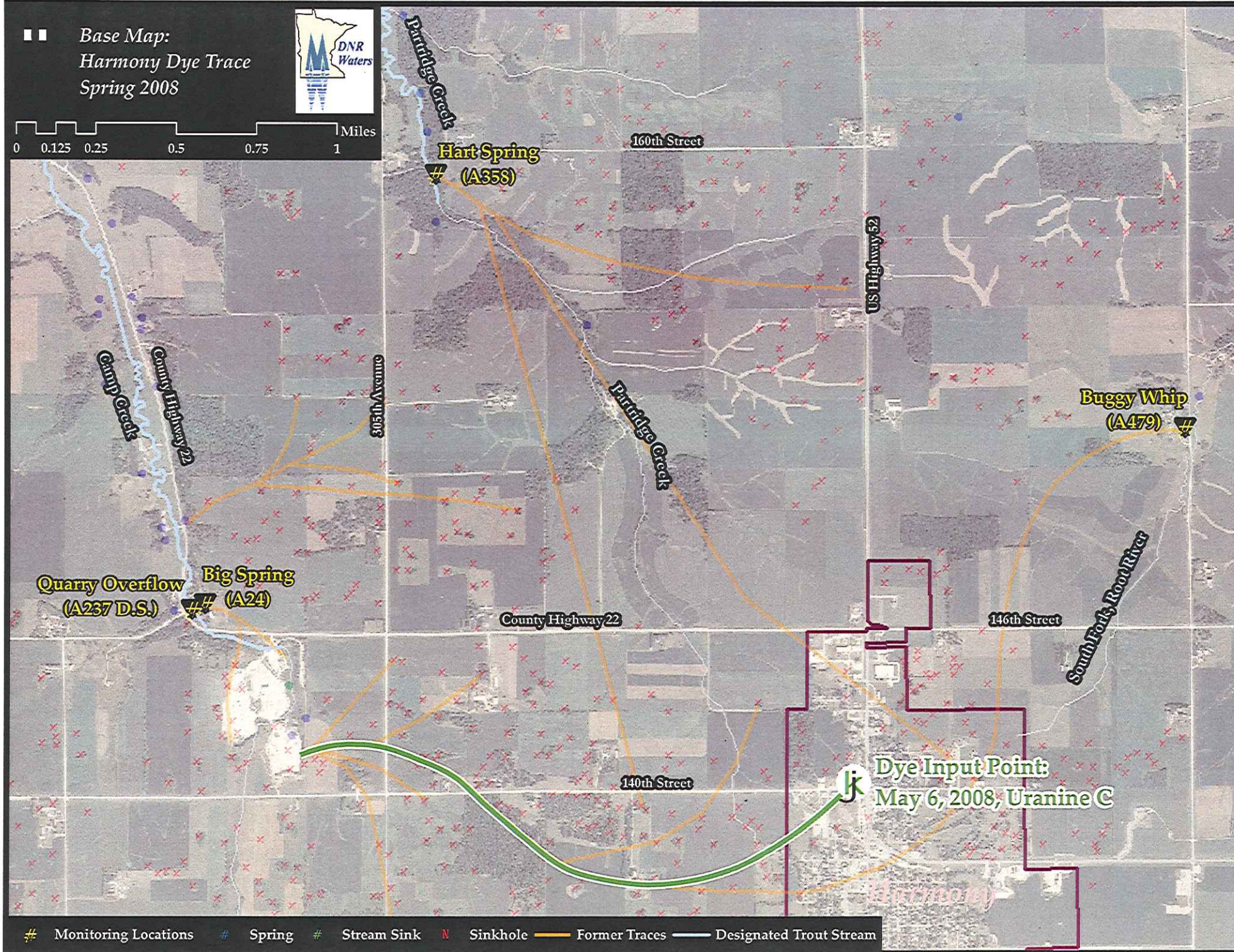
Figures



■ ■ Base Map:
Harmony Dye Trace
Spring 2008



0 0.125 0.25 0.5 0.75 1 Miles



Monitoring Locations # Spring # Stream Sink X Sinkhole — Former Traces — Designated Trout Stream

Appendix 2

Dye Input

Harmony Spring 2008 Dye Trace: May 6, 2008 to June 13, 2008

Dye Input Points:

Input Point #1:

Sinkhole D6526:

Minnesota Karst Feature Database Number - MN23:D6526

UTM:

579,853 E, 4,823,346 N

Township, Range, Section:

SE ¼ of the SE ¼ of Section 10, T101N, R10W

Elevation:

~1330 feet

At 1649 CDT on 6 May 2008, approximately 881 grams of Uranine dye solution was introduced into an open swallow hole in D6526 with approximately 1,500 gallons of water.

Harmony Dye Train

6 May 2008

Background water samples at
Bugsywhip, Hart, Quarry Overflows
Big Spring, Big Spring East
Background bugs @ these sites

Kwik Trip sink hole 579853/1823346

Uranine & Chromatech OB2207-C

554.2 gm + 051807-C

Chromatech 326.62 gm

554.2

326.6

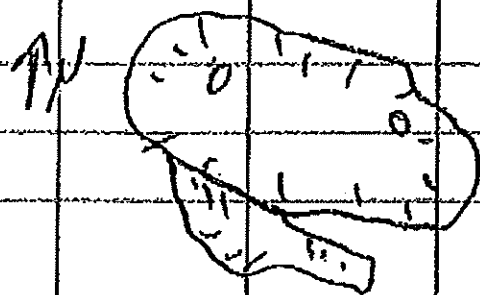
880.8 gm

Water @ 1643

Dye @ 1649

Water @ 1651

Dye into swallow hole on W side
of sink, ponding, drainage
thru this hole & 1 on east side
sink approx 1500 gal water



Appendix 3

Dye Receptors

Harmony Spring 2008 Dye Trace: May 6, 2008 to June 13, 2008

Dye Receptor Locations:

Dye Receptor #1:

Big Spring

Minnesota Karst Feature Database Number - MN23:A0024

UTM:

576,647 E, 4,824,238 N

Notes: Receptor located 10 feet upstream of confluence with Quarry Overflow near steel debris

Dye Receptor #2:

Big Spring East

Minnesota Karst Feature Database Number - MN23:A0237

UTM:

577,080 E, 4,823,582 N

Notes: Receptor located in riffle just downstream of main spring discharge point

Dye Receptor #3:

Hart Spring

Minnesota Karst Feature Database Number - MN23:A0358

UTM:

577,803 E, 4,826,382 N

Notes: Receptor located on south side of road on the west bank of the stream just south of bridge

Dye Receptor #4:

Buggy Whip

Minnesota Karst Feature Database Number - MN23:A0479

UTM:

581,549 E, 4,825,118 N

Notes: Receptor located in the culvert discharge on the east side of road

Dye Receptor #5:

Quarry Overflow

Minnesota Karst Feature Database Number - MN23:X???

UTM:

576,581 E, 4,824,208 N

Notes: Receptor located 10 feet upstream from confluence with Big Spring flow

Appendix 4

Summary of Analytical Results

Harmony Spring 2008 Dye Trace: Summary of Analytical Results of Carbon Samples				
Sampling Location	4/9/08 to 5/6/08	5/6/08 to 5/14/08	5/14/08 to 5/22/08	5/22/08 to 6/13/08
Big Spring	None	Uranine	Uranine	-
Quarry Overflow	-	Uranine	None	Uranine
Buggy Whip	-	None	None	-
Hart Spring	-	-	None	-
Big Spring East	-	-	Uranine	-

Harmony Spring 2008 Dye Trace: Summary of Analytical Results of Water Samples							
Sampling Location	5/6/08	5/7/08	5/8/08	5/9/08	5/14/08	5/22/08	6/13/08
Big Spring	-	Uranine	Uranine	Uranine	None	None	-
Quarry Overflow	None	Uranine	Uranine	None	None	None	None
Buggy Whip	-	-	-	-	-	-	None
Hart Spring	None	None	None	None	-	-	None
Big Spring East	None	Uranine	Uranine	Uranine	None	None	None

Appendix 5

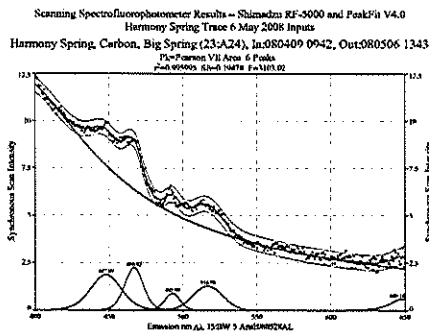
Scanning Spectrofluorophotometer Results

The following analytical results were completed by project participants associated with the Geology & Geophysics Department at the University of Minnesota. Analysis of the samples was completed by Andrew J. Luhmann² and Scott C. Alexander². Interpretation of the analytical results was completed by Jeffrey A. Green¹, Andrew J. Peters¹, Andrew J. Luhmann², E. Calvin Alexander, Jr.² and Scott C. Alexander¹.

¹ Minnesota Department of Natural Resources, Division of Waters, 2300 Silver Creek Road NE, Rochester, Minnesota, 55906; Phone (507) 285-7430; Fax (507) 285-7144; emails: jeff.green@dnr.state.mn.us & andrew.peters@dnr.state.mn.us

² Geology & Geophysics Department, University of Minnesota, 310 Pillsbury Drive. SE., Minneapolis, Minnesota, 55455; Phone (612) 624-3517; Fax (612) 625-3819; emails: luhm0031@umn.edu, alexa001@umn.edu & alexa017@umn.edu

Archived file source: Andrew Peters – D:/Documents/Final Trace Reports/Harmony Spring 2008/HarmonySpringTrace All Curves



Description: Harmony Spring, Carbon, Big Spring (23/A24), In:080409 0942, Out:080506 1343
X Variable: Emission nm Δλ 15:20W 5 Anal:080526AL
Y Variable: Synchronous Scan Intensity
File Source: g:\hydro\harmospring\080506\080506\harmospring080506-080514\data\080514

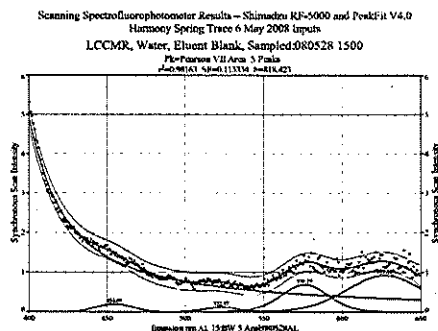
Fitted Parameters

Peak	Type	Amplitude	Center	FWHM	Asym10	FW Base	Asym10
1	Parson VII Area	42765.5411	384.487922	188.509870	0.51000000	0.00000000	0.00000000
2	Parson VII Area	50.7171717	447.892744	24.2864757	5.81680926	1.00000000	1.00000000
3	Parson VII Area	36.2487215	466.823172	14.7201881	0.77669196	1.00000000	1.00000000
4	Parson VII Area	11.6560222	492.954466	12.9411009	0.15046621	1.00000000	1.00000000
5	Parson VII Area	32.2348720	516.987707	23.6678111	167.655943	1.00000000	1.00000000
6	Parson VII Area	15.7642990	648.139194	18.9200232	1.33844133	1.00000000	1.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym10	FW Base	Asym10
1	Parson VII Area	12.4977228	385.039933	188.515496	0.50000000	0.00000000	0.00000000
2	Parson VII Area	1.8278806	447.892744	24.2864757	1.00000000	1.00000000	1.00000000
3	Parson VII Area	2.2795334	466.823172	14.7201881	1.00000000	1.00000000	1.00000000
4	Parson VII Area	0.8830011	492.954466	12.9411009	0.00000000	22.5232000	0.00000000
5	Parson VII Area	1.27795612	516.987707	23.6678111	1.00000000	47.4940841	1.00000000
6	Parson VII Area	0.61587073	648.139194	18.9200232	1.00000000	34.5113150	1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu



Description: LCCMR, Water, Eluent Blank, Sampled:080528 1300
X Variable: Emission nm Δλ 15:20W 5 Anal:080526AL
Y Variable: Synchronous Scan Intensity
File Source: g:\hydro\harmospring\080528\080528\harmospring080528-080514\data\080514

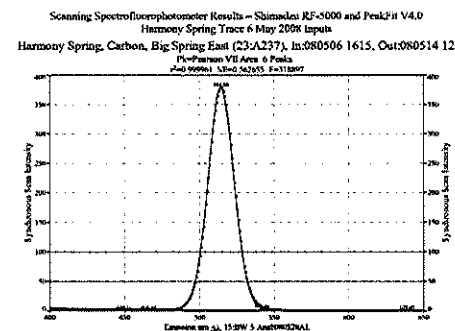
Fitted Parameters

Peak	Type	Amplitude	Center	FWHM	Asym10	FW Base	Asym10
1	Parson VII Area	4891.04534	387.581708	48.1837870	0.52416643	0.00000000	0.00000000
2	Parson VII Area	6.11781837	447.892744	24.2864757	167.990040	1.00000000	1.00000000
3	Parson VII Area	1.43339190	522.967895	26.8923588	17.7495333	1.00000000	1.00000000
4	Parson VII Area	26.8020150	576.191331	35.1953604	6.21536203	1.00000000	1.00000000
5	Parson VII Area	37.4221126	627.138692	27.1103396	16.5603435	1.00000000	1.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym10	FW Base	Asym10
1	Parson VII Area	6.57336125	387.582342	48.1837870	0.99994720	0.00000000	0.00000000
2	Parson VII Area	0.16992307	454.682278	27.7844195	0.99999979	35.7546200	0.99999999
3	Parson VII Area	0.11924612	522.967896	26.8923588	0.00000000	55.1151018	0.00000000
4	Parson VII Area	0.69073867	576.191331	35.1953604	1.00000000	79.5178120	1.00000000
5	Parson VII Area	0.92650096	627.138692	27.1103396	1.00000000	118.979997	1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu



Description: Harmony Spring, Carbon, Big Spring East (23/A237), In:080506 1615, Out:080514 12
X Variable: Emission nm Δλ 15:20W 5 Anal:080526AL
Y Variable: Synchronous Scan Intensity
File Source: g:\hydro\harmospring\080506\080506\harmospring080506-080514\data\080514

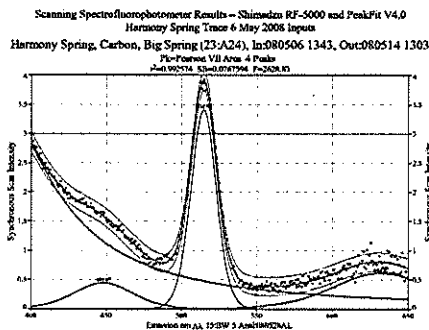
Fitted Parameters

Peak	Type	Amplitude	Center	FWHM	Asym10	FW Base	Asym10
1	Parson VII Area	13376.6997	378.324590	144.794734	0.16966481	0.00000000	0.00000000
2	Parson VII Area	12.6752028	449.303234	26.9290920	10.1700601	1.00000000	1.00000000
3	Parson VII Area	6.11203468	465.943973	11.4796899	6.27112560	1.00000000	1.00000000
4	Parson VII Area	8045.8742	534.677864	19.754073	23.705347	1.00000000	1.00000000
5	Parson VII Area	27.1441923	541.477429	15.320970	167.827690	1.00000000	1.00000000
6	Parson VII Area	17.9466375	636.254466	19.134034	0.2567016	1.00000000	1.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym10	FW Base	Asym10
1	Parson VII Area	2.29421181	378.324590	144.794734	1.00000000	0.00000000	0.00000000
2	Parson VII Area	0.43205973	449.303234	26.9290920	1.00000000	56.2051253	1.00000000
3	Parson VII Area	0.48254460	465.943973	11.4796899	0.99999999	24.6157685	0.99999999
4	Parson VII Area	878.111255	534.677864	19.754073	1.00000000	48.7542510	1.00000000
5	Parson VII Area	1.66446677	541.477429	15.320970	1.00000001	70.7440991	1.00000011
6	Parson VII Area	0.27884203	636.254466	19.134034	1.00000001	123.973791	1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu



Description: Harmony Spring, Carbon, Big Spring (23/A24), In:080506 1343, Out:080514 1303
X Variable: Emission nm Δλ 15:20W 5 Anal:080526AL
Y Variable: Synchronous Scan Intensity
File Source: g:\hydro\harmospring\080506\080506\harmospring080506-080514\data\080514

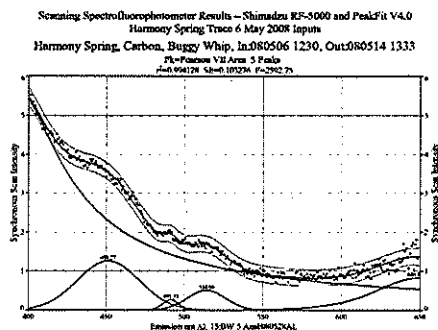
Fitted Parameters

Peak	Type	Amplitude	Center	FWHM	Asym10	FW Base	Asym10
1	Parson VII Area	491.148805	377.612288	94.5708676	0.70727096	0.00000000	0.00000000
2	Parson VII Area	22.6109296	446.072094	46.5663879	6.32000118	1.00000000	1.00000000
3	Parson VII Area	73.7133619	534.578957	19.729128	7.84744502	1.00000000	1.00000000
4	Parson VII Area	51.4783396	632.263892	74.9133699	4.54031162	1.00000000	1.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym10	FW Base	Asym10
1	Parson VII Area	1.76489047	374.197238	94.5838275	0.97550071	0.00000000	0.00000000
2	Parson VII Area	0.44249748	446.072094	46.5663879	9.91339971	1.00000000	1.00000000
3	Parson VII Area	3.40663206	534.578957	19.729128	1.00000000	41.8902974	1.00000000
4	Parson VII Area	0.61375306	632.263892	74.9133699	1.00000000	165.124365	1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu



Description: Harmony Spring, Carbon, Buggy Whip, In:080506 1230, Out:080514 1333
X Variable: Emission nm Δλ 15:20W 5 Anal:080526AL
Y Variable: Synchronous Scan Intensity
File Source: g:\hydro\harmospring\080506\080506\harmospring080506-080514\data\080514

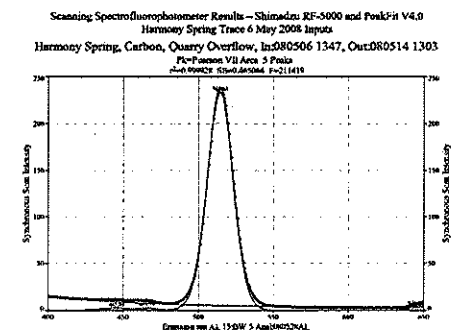
Fitted Parameters

Peak	Type	Amplitude	Center	FWHM	Asym10	FW Base	Asym10
1	Parson VII Area	4827.9250	389.317578	92.6502680	0.55622325	0.00000000	0.00000000
2	Parson VII Area	62.013607	451.262566	46.575384	101.891336	1.00000000	1.00000000
3	Parson VII Area	3.51801541	491.234966	11.9992407	5.68704886	1.00000000	1.00000000
4	Parson VII Area	15.6351037	514.858716	28.6695922	27.6415994	1.00000000	1.00000000
5	Parson VII Area	66.5657340	648.910867	61.2955161	2.87011194	1.00000000	1.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym10	FW Base	Asym10
1	Parson VII Area	5.85643643	389.302292	92.6502680	0.99676252	0.00000000	0.00000000
2	Parson VII Area	1.23257865	451.267566	46.4575394	1.00000000	93.2233233	1.00000000
3	Parson VII Area	0.20482654	491.234966	11.9999997	1.00000000	22.5705602	1.00000011
4	Parson VII Area	0.59812499	514.857316	28.6695922	1.00000000	58.5079797	1.00000000
5	Parson VII Area	0.82343533	648.909991	61.3664148	1.01360929	148.214643	1.01512640

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu



Description: Harmony Spring, Carbon, Quarry Overflow, In:080506 1347, Out:080514 1303
X Variable: Emission nm Δλ 15:20W 5 Anal:080526AL
Y Variable: Synchronous Scan Intensity
File Source: g:\hydro\harmospring\080506\080506\harmospring080506-080514\data\080514

Fitted Parameters

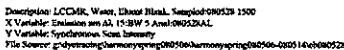
Peak	Type	Amplitude	Center	FWHM	Asym10	FW Base	Asym10
1	Parson VII Area	7733.3915	371.954898	148.549577	0.51050666	0.00000000	0.00000000
2	Parson VII Area	72.9271365	445.438615	25.3421362	6.31488628	1.00000000	1.00000000
3	Parson VII Area	46.7868280	465.786640	15.5267499	166.021011	1.00000000	1.00000000
4	Parson VII Area	4997.87899	514.632105	19.6731789	6.42240376	1.00000000	1.00000000
5	Parson VII Area	76.8878900	648.379956	55.8134997	13.7662523	1.00000000	1.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym10	FW Base	Asym10
1	Parson VII Area	18.4214276	372.026467	148.530227	0.99795013	0.00000000	0.00000000
2	Parson VII Area	2.61027453	445.438615	25.3421362	1.00000000	54.3146131	1.00000000
3	Parson VII Area	2.42626166	465.786640	15.5267499	1.00000000	31.1570605	1.00000000
4	Parson VII Area	23.290201	514.672104	19.6731789	1.00000000	41.2013616	1.00000014
5	Parson VII Area	4.61515187	648.379956	55.8134997	1.00000000	15.8134997	1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

LCCMR, Water, Eluent Blank, Sampled:080528 1500



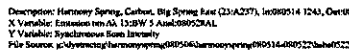
Fitted Parameters		Fit Std Err	P-value
Coef Det	Adj R ²		
0.98163000	0.98836310	0.11333391	818.423496

Peak	Type	a ₁	a ₂	a ₃
1	Positron VII Area	46081.04834	287.581706	48.1837893
2	Positron VII Area	6.117811857	54.682297	27.7044195
3	Positron VII Area	3.453391900	322.967895	26.8892658
4	Positron VII Area	26.80205194	576.191331	33.1952504
5	Positron VII Area	57.45321126	1157.136602	57.1103306

Proc.	Type	Amplitude	Center	FWHM	AvgSig	FW Base	AvgSigU
1	Process VII Area	6.57336125	387.532342	48.183789	0.99994729	0.00000000	0.00000000
2	Process VII Area	0.19592297	454.602298	27.794419	0.99999995	53.774420	0.00000000
3	Process VII Area	0.11924412	568.289266	26.889266	0.99999996	55.174018	0.00000000
4	Process VII Area	0.00015867	576.191331	35.195204	0.00000001	75.517612	1.00000000
5	Process VII Area	0.92600096	627.133682	57.113336	0.99999999	118.979997	0.00000000

Hydrogeochemistry Laboratory
Geology & Geophysics, University of
Alabama at Birmingham

Harmony Spring, Carbon, Big Spring East (23:A237). In:080514 1243, Out:080522 14

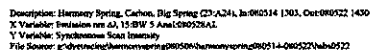


Fitted Parameters		Fit Std Err	F-value
ρ	Coef (Det. Adj. r^2)		
0.9970/0.696	0.9967/0.664	4.127135577	4170.59071
Pump Type		β_1	β_2
1. Perseus VII Area		7762.38332	66.83194467
2. Perseus VII Area		2317379.79	53.5678708
3. Perseus VII Area		6.50053669	20.5612836
4. Perseus VII Area		181.252527	167.828150
5. Perseus VII Area		515.085537	0.55661472
6. Perseus VII Area		526.927738	14.1259000
7. Perseus VII Area		38.4093366	15.6017829

Peak	Type	Amplitude	Center	FWHM	Area ^a	FWHM
1	Feon VII Arm	1.625975762	348.052031	56.8430435	0.00000000	0.000000
2	Feon VII Arm	7.456785718	359.5900010	95.5678310	1.00000000	115.2960
3	Feon VII Arm	0.51317676	403.1440000	20.5612956	0.00000000	41.2599
4	Feon VII Arm	8.63755718	515.005532	20.1679411	0.99999999	42.1522
5	Feon VII Arm	0.38193757	536.972738	14.1259700	1.00000002	29.1803
6	Feon VII Arm	0.5771683	647.029398	61.6895087	0.00000000	126.850

Hydrogeochemistry Laboratory
Geology & Geophysics, University of
Alabama, Tuscaloosa, AL 35489-0001
e-mail: jls017@uam.edu

Harmony Spring, Carbon, Big Spring (23:A24), In:080514 1303, Out:080522 1430

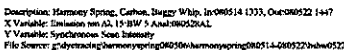


Fixed Parameters		Fit Std Err	Formula		
r^2	Conf. Int.	DF	Adj. r^2		
0.99472278	0.99427704	0.12018045	2352.07499		
Param.	Type	θ_1	θ_2		
1	Proportion V2 Area	9983.29074	390.973207	84.0817495	0.51825567
2	Proportion V3 Area	62.0787511	445.646443	54.1272705	14.36481121
3	Proportion V4 Area	22.1591651	479.997227	34.1625882	49.4902977
4	Proportion V5 Area	53.2417195	515.103872	24.1905368	8.87430289
5	Proportion V6 Area	6.53404042	540.151258	17.8344545	167.202354
6	Proportion V7 Area	27.4108308	499.922614	64.8332183	5.49436270

Pos.	Type	Amplitude	Center	FWHM	Asym%	FW Base
1	Posion VII Area	6.97244182	390.252694	0.864665160	0.0445254	1.00000000
2	Posion VII Area	1.66496330	645.666443	34.9127205	1.00000001	0.91718435
3	Posion VII Area	0.45253409	470.972227	36.1020682	0.99999998	72.3640775
4	Posion VII Area	2.18325748	515.101072	22.3411958	0.99999999	46.9240745
5	Posion VII Area	0.54313873	505.151258	17.3984535	1.00000000	35.8871822
6	Posion VII Area	0.38081130	648.564514	65.0675123	1.08723100	44.6455660

Hydrogeochemistry Laboratory
Ecology & Geophysics, University
almsB12@uconn.edu

Harmony Spring, Carbon, Buggy Whip, In:080514 1333, Out:080522 144



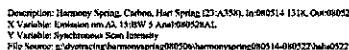
Fixed Parameters		Est. Std. Err.	N-value
α Coef. Den.	DF Adj. r^2		
0.90492002	0.90450688	0.11828066	2099.61626

Posk.	Type	μ_1	σ_1	μ_2	σ_2
1	Poscon VII Area	1204.20406	309.919202	80.3670881	0.514863376
2	Poscon VII Area	771.083040	447.322533	39.0102401	0.822960706
3	Poscon VII Area	12.7620765	480.134530	29.8324751	187.666920
4	Poscon VII Area	24.3307782	516.068166	45.0471983	58.5831358

Peak		Amplitude	Center	FWHM	Azimuth	FW Base	Azimuth
1	Passive VII Ane	6.839641E12	390.9194202	36.26796641	1.00000000	0.00000000	0.00000000
2	Passive VII Ane	1.9957071E14	427.522534	39.41023601	1.00000001	83.2077651	1.00000000
3	Passive VII Ane	0.4007747E15	430.1345133	29.38527475	1.00000000	90.4947124	1.00000017
4	Passive VII Ane	0.5057747E15	430.648164	45.2477985	1.00000001	90.816148	1.00000000
5	Passive VII Ane	0.6378465E15	469.7133601	31.57946151	1.11114612	124.5727621	1.04948499

Hydrogeochemistry Laboratory
Geology & Geophysics, University of
Alabama, 2017

Harmony Spring, Carbon, Hart Spring (23-A358). In:080514 131R, Out:080522 1437

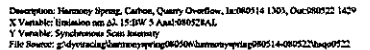


Fitted Parameters				Ht.Sid.Err	p-value
r ²	Coeff.Dt	DF	Adj.r ²		
0.99502826	0.99453527		0.10452605	2097.994444	
Param	Type	Estimate	Std.Err	DF	t-Statistic
1	Person Vt Area	x127.47291	386.45435	86.9022014	0.52271539
2	Person Vt Area	67.759091	445.56121	39.3298580	0.50920355
3	Person Vt Area	17.220661	487.840579	33.3050029	0.12416306
4	Person Vt Area	9.83257284	515.596549	19.6215926	3.87754768

Rank	Type	Area	Center	FWHM	Azimuth	FW FWHM
1	Pavement VII Area	6.821235616	387.099424	84.642334	0.99257784	0.000000
2	Pavement VII Area	1.57442125	445.561218	9.10000000	1.00000000	0.257450
3	Pavement VII Area	0.84966637	487.344249	33.3200000	0.99999996	0.251003

Hydrogeochemistry Laboratory
Geology & Geophysics, University of
Alabama at Birmingham, Birmingham, AL 35294-1170
e-mail: o17@uab.edu

Harmony Spring, Carbon, Quarry Overflow. In:080514 1303. Out:080522 1429

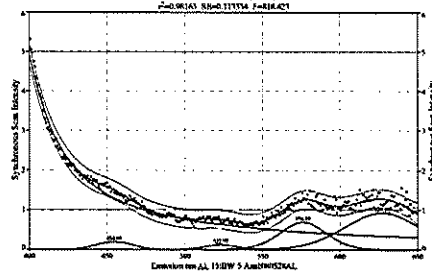


Fitted Parameters		Pst Std Err	F-value
r ²	Coeff Dot DF Adj r ²		
0.98933024	0.98859440	0.11611528	1429.12327
Type	Type	β_1	β_2
1 Pearson VII Area		0.079, 1.4395	335.434889 [21.890]40
2 Pearson VII Area		37.1426409	454.953595 [22.51]3807
3 Pearson VII Area		0.98405440	515.214023 [23.31]4025
4 Pearson VII Area		22.0751718	615.320581 [27.70]8514

Measured Values						
Peak	Type	Amplitude	Center	FWHM	Asym30	FW Base
1	Positive VII Area	5.24191502	335.460138	121.493435	0.99744003	0.80000000
2	Positive VII Area	0.81964077	455.958559	42.5110475	1.00000000	85.3415447
3	Positive VII Area	0.29075925	515.240409	33.104275	1.00000000	67.025033
4	Positive VII Area	0.42221532	515.320541	27.7083414	1.00000000	100.881788
5	Positive VII Area	1.74547793	617.29252	61.040493	0.99999995	49.2762538

Hydrogeochemistry Laboratory
Geology & Geophysics, University
alex@17@umn.edu

Scanning Spectrofluorophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Inputs
LCCMR, Water, Eluent Blank, Sampled:080528 1500



Description: LCCMR, Water, Eluent Blank, Sampled:080528 1500
X Variable: Emission nm (Å), 15.0W 5 Ånm/0.0001Å
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\harmony\spring\080508\harmony\spring\080528-080528-080528

Fitted Parameters

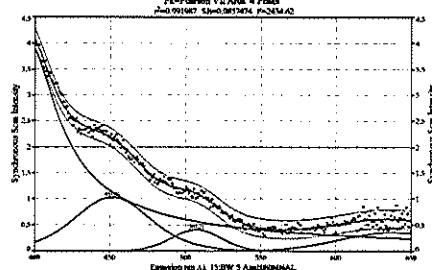
Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	4291.04354	387.581704	48.183793	0.00000000	0.00000000	0.00000000
2	Peak	6.11781857	454.682297	27.794495	167.930840	0.00000000	0.00000000
3	Peak	3.65339109	522.567895	26.889268	17.3495539	0.00000000	0.00000000
4	Peak	26.8029516	578.191351	35.195264	6.21532623	0.00000000	0.00000000
5	Peak	57.432126	627.136892	57.110396	10.6548145	0.00000000	0.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	6.57336125	387.582342	48.183793	0.00000000	0.00000000	0.00000000
2	Peak	0.1992527	454.682297	27.794495	167.930840	0.00000000	0.00000000
3	Peak	0.11924412	522.567895	26.889268	17.3495539	0.00000000	0.00000000
4	Peak	0.66635867	578.191351	35.195264	6.21532623	0.00000000	0.00000000
5	Peak	0.02600096	627.136892	57.110396	10.6548145	0.00000000	0.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

Scanning Spectrofluorophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Inputs
Harmony Spring, Water, Big Spring East (23-A237), Sampled:080506 1614



Description: Harmony Spring, Water, Big Spring East (23-A237), Sampled:080506 1614
X Variable: Emission nm (Å), 15.0W 5 Ånm/0.0001Å
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\harmony\spring\080506\harmony\spring\080506-080522-080522

Fitted Parameters

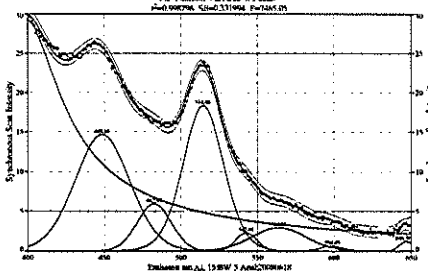
Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	2181.21669	395.705633	57.3866284	0.222522981	0.00000000	0.00000000
2	Peak	67.9024681	451.539021	39.1329329	4.680177483	0.00000000	0.00000000
3	Peak	16.9484003	507.208361	39.0188639	41.0200127	0.00000000	0.00000000
4	Peak	31.2325800	637.968011	61.7710932	167.919889	0.00000000	0.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	6.0115348	395.705633	57.3866284	0.222522981	0.00000000	0.00000000
2	Peak	1.02832176	451.539021	39.1329329	4.680177483	0.00000000	0.00000000
3	Peak	0.40594224	507.208361	39.0188639	41.0200127	0.00000000	0.00000000
4	Peak	0.39978879	637.968011	61.7710932	167.919889	0.00000000	0.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

Scanning Spectrofluorophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Inputs
Harmony creek, Carbon, Quarry Overflow, In:080522 1424, Out:080613 1324



Description: Harmony creek, Carbon, Quarry Overflow, In:080522 1424, Out:080613 1324
X Variable: Emission nm (Å), 15.0W 5 Ånm/0.0001Å
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\harmony\spring\080522\harmony\spring\080522-080613-080613

Fitted Parameters

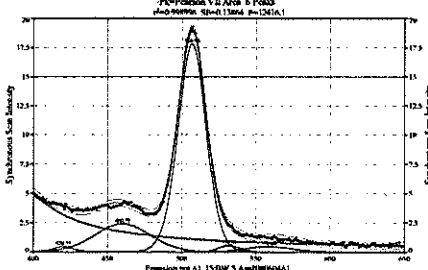
Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	20144.8084	396.837960	71.4327165	0.53341082	0.00000000	0.00000000
2	Peak	80.722073	448.634623	42.805813	12.4122548	0.00000000	0.00000000
3	Peak	163.650111	482.472095	26.1621359	43.2783292	0.00000000	0.00000000
4	Peak	629.121869	514.482322	30.7984670	7.11811471	0.00000000	0.00000000
5	Peak	40.1343403	542.613444	18.437395	187.917794	0.00000000	0.00000000
6	Peak	133.781863	564.038451	41.7974370	11.7417237	0.00000000	0.00000000
7	Peak	12.5154579	598.484302	18.4484918	34.1581214	0.00000000	0.00000000
8	Peak	14.313354	646.961728	10.8922668	59.6815277	0.00000000	0.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	29.6887564	396.837960	71.4327165	0.53341082	0.00000000	0.00000000
2	Peak	14.8835907	448.634623	42.805813	12.4122548	0.00000000	0.00000000
3	Peak	5.02082997	482.472095	26.1621359	43.2783292	0.00000000	0.00000000
4	Peak	18.3424173	514.482322	30.7984670	7.11811471	0.00000000	0.00000000
5	Peak	2.34424566	542.613444	18.437395	187.917794	0.00000000	0.00000000
6	Peak	2.93222440	564.038451	41.7974370	11.7417237	0.00000000	0.00000000
7	Peak	0.13373739	598.484302	18.4484918	34.1581214	0.00000000	0.00000000
8	Peak	1.25012788	646.961728	10.8922668	59.6815277	0.00000000	0.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

Scanning Spectrofluorophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Inputs
Harmony Spring, Water, Big Spring East (23-A237), Sampled:080507 1530



Description: Harmony Spring, Water, Big Spring East (23-A237), Sampled:080507 1530
X Variable: Emission nm (Å), 15.0W 5 Ånm/0.0001Å
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\harmony\spring\080506\harmony\spring\080506-080522-080522

Fitted Parameters

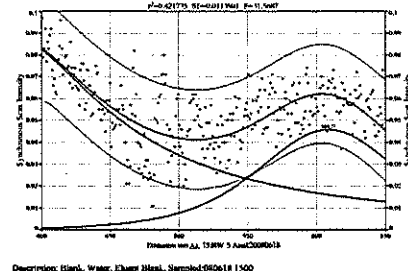
Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	8900.01021	376.248974	64.9422391	0.51818455	0.00000000	0.00000000
2	Peak	9.66871189	420.327051	16.3400933	1.29151743	0.00000000	0.00000000
3	Peak	113.299185	460.39429	43.3616839	11.0714344	0.00000000	0.00000000
4	Peak	423.815466	506.956121	21.7776316	6.64602679	0.00000000	0.00000000
5	Peak	16.077993	532.488068	18.0651782	147.919490	0.00000000	0.00000000
6	Peak	19.3621942	558.837797	37.3887742	7.50670455	0.00000000	0.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	8.14387715	376.248974	64.9422391	0.51818455	0.00000000	0.00000000
2	Peak	0.87055589	420.327051	16.3400933	1.29151743	0.00000000	0.00000000
3	Peak	2.89798278	460.39429	43.3616839	11.0714344	0.00000000	0.00000000
4	Peak	17.0208095	506.956121	21.7776316	6.64602679	0.00000000	0.00000000
5	Peak	0.54579527	532.488068	18.0651782	147.919490	0.00000000	0.00000000
6	Peak	0.68961633	558.837797	37.3887742	7.50670455	0.00000000	0.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

Scanning Spectrofluorophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Inputs
Blank, Water, Eluent Blank, Sampled:080618 1500



Description: Blank, Water, Eluent Blank, Sampled:080618 1500
X Variable: Emission nm (Å), 15.0W 5 Ånm/0.0001Å
Y Variable: Synchronous Scan Intensity
File Source: c:\data\data\080618.p

Fitted Parameters

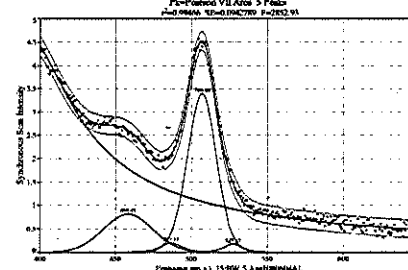
Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	0.42173487	0.40641659	0.01139012	31.5487287	0.00000000	0.00000000
2	Peak	38.18663349	372.840808	193.362892	0.73676466	0.00000000	0.00000000
3	Peak	6.31116843	608.767242	320.981930	2.55944744	0.00000000	0.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	0.08779445	338.242326	471.746636	0.00000000	0.00000000	0.00000000
2	Peak	0.04576765	608.767242	320.981930	1.00000000	289.150438	1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

Scanning Spectrofluorophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Inputs
Harmony Spring, Water, Big Spring East (23-A237), Sampled:080508 1610



Description: Harmony Spring, Water, Big Spring East (23-A237), Sampled:080508 1610
X Variable: Emission nm (Å), 15.0W 5 Ånm/0.0001Å
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\harmony\spring\080506\harmony\spring\080506-080522-080522

Fitted Parameters

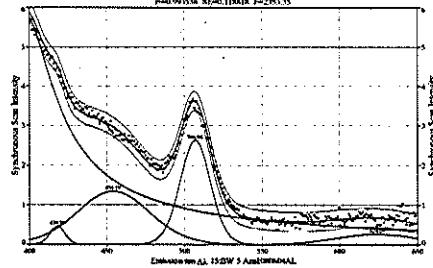
Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	8447.24632	399.627798	68.5792680	0.51637377	0.00000000	0.00000000
2	Peak	33.2770341	458.425754	38.8315075	47.7931012	0.00000000	0.00000000
3	Peak	4.12883515	487.110100	16.4716421	1.70780543	0.00000000	0.00000000
4	Peak	82.4578834	506.883789	22.9452217	8.96760321	0.00000000	0.00000000
5	Peak	7.21787670	527.865767	14.076165	1.77487611	0.00000000	0.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	4.00200000	399.627798	68.5792680	0.51637377	0.00000000	0.00000000
2	Peak	0.81117766	458.425754	38.8315075	47.7931012	0.00000000	0.00000000
3	Peak	0.19811108	487.110100	16.4716421	1.70780543	0.00000000	0.00000000
4	Peak	3.40028117	506.883789	22.9452217	8.96760321	0.00000000	0.00000000
5	Peak	0.17347130	527.865767	14.076165	1.77487611	0.00000000	0.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

Scanning Spectrophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Input
Harmony Spring, Water, Big Spring East (23-A237), Sampled:080509 1605
FW=Parsons VII Area 5 Peaks
FW=0.991534 R2=0.11848 R=2903.35



Description: Harmony Spring, Water, Big Spring East (23-A237), Sampled:080509 1605
X Variable: Emission nm ΔL 15.0W 5 Ånm0.000000
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\harmony\spring\080509\harmony\spring\water\080509-080522\labw509

Fitted Parameters

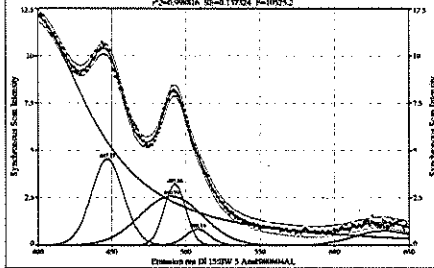
Peak	Type	FW	FW Std Err	FW Adj R ²	FW Std Err	FW Value
1	Parsons VII Area	586.87561	397.16560	57.729605	0.51142091	0.00000000
2	Parsons VII Area	573.812971	418.061927	11.4670999	10.0000000	0.00000000
3	Parsons VII Area	80.4259460	454.185780	55.8458716	10.0000000	0.00000000
4	Parsons VII Area	45.0797562	506.934077	22.7385763	10.0000000	0.00000000
5	Parsons VII Area	17.7771168	624.897824	62.8187635	167.905252	0.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Area	FW Base	Area10
1	Parsons VII Area	5.8472581	397.165624	57.729605	0.00000000	0.00000000	0.00000000
2	Parsons VII Area	6.4602270	418.061927	11.4670999	1.00000000	23.915755	1.00000000
3	Parsons VII Area	1.34359829	454.185780	55.8458716	1.00000000	114.977163	1.00000000
4	Parsons VII Area	2.63190184	506.934077	22.7385763	1.00000000	47.4952430	1.00000000
5	Parsons VII Area	0.26353528	624.897824	62.8187635	1.00000000	126.046721	1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alexad17@umn.edu

Scanning Spectrophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Input
Harmony Spring, Water, Big Spring East (23-A237), Sampled:080514 1243
FW=Parsons VII Area 6 Peaks
FW=0.998316 R2=0.117524 R=10295.2



Description: Harmony Spring, Water, Big Spring East (23-A237), Sampled:080514 1243
X Variable: Emission nm ΔL 15.0W 5 Ånm0.000000
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\harmony\spring\080514\harmony\spring\water\080514-080522\labw514

Fitted Parameters

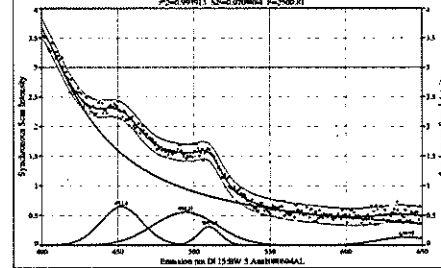
Peak	Type	FW	FW Std Err	FW Adj R ²	FW Std Err	FW Value
1	Parsons VII Area	176.153366	396.372296	91.792390	1.00188411	0.00000000
2	Parsons VII Area	123.755003	447.147629	23.2711039	12.5104966	0.00000000
3	Parsons VII Area	136.311516	490.297994	49.5042989	48.8028712	0.00000000
4	Parsons VII Area	56.2543770	492.677094	17.1286823	79.0816412	0.00000000
5	Parsons VII Area	17.7381832	506.126440	10.0445769	7.03480763	0.00000000
6	Parsons VII Area	39.2018040	633.572570	47.8392557	167.917176	0.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Area	FW Base	Area10
1	Parsons VII Area	12.2543546	396.355463	91.8091481	0.00000000	0.00000000	0.00000000
2	Parsons VII Area	4.52322559	447.147629	23.2711039	1.00000000	52.3277070	1.00000000
3	Parsons VII Area	2.57729963	490.297994	49.5042989	1.00000000	99.9450677	1.00000000
4	Parsons VII Area	3.79153453	492.677094	17.1286823	1.00000000	44.4942429	1.00000000
5	Parsons VII Area	0.62596481	506.126440	10.0445769	1.00000000	48.6246967	1.00000000
6	Parsons VII Area	0.74889708	633.572570	47.8392557	1.00000000	95.9974901	1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alexad17@umn.edu

Scanning Spectrophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Input
Harmony Spring, Water, Big Spring East (23-A237), Sampled:080522 1420
FW=Parsons VII Area 5 Peaks
FW=0.999115 R2=0.0700664 R=2900.81



Description: Harmony Spring, Water, Big Spring East (23-A237), Sampled:080522 1420
X Variable: Emission nm ΔL 15.0W 5 Ånm0.000000
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\harmony\spring\080522\harmony\spring\water\080522-080522\labw522

Fitted Parameters

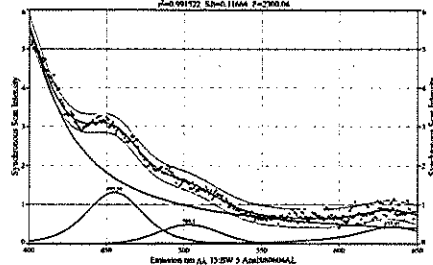
Peak	Type	FW	FW Std Err	FW Adj R ²	FW Std Err	FW Value
1	Parsons VII Area	779.644976	395.184170	94.2740400	0.50991308	0.00000000
2	Parsons VII Area	22.4039560	432.404145	32.1264209	16.8977346	0.00000000
3	Parsons VII Area	29.2803474	444.213655	49.4878243	167.828664	0.00000000
4	Parsons VII Area	5.81234412	508.944276	17.1749510	8.16434429	0.00000000
5	Parsons VII Area	6.62000000	639.977881	42.993328	15.4225310	0.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Area	FW Base	Area10
1	Parsons VII Area	3.8822051	395.184170	94.2740400	0.00000000	0.00000000	0.00000000
2	Parsons VII Area	0.84444917	432.404145	32.1264209	1.00000000	16.8171306	1.00000000
3	Parsons VII Area	0.5552101	444.213655	49.4878243	1.00000000	99.2981144	1.00000000
4	Parsons VII Area	0.31040075	509.944276	17.1749510	1.00000000	36.2309809	1.00000000
5	Parsons VII Area	0.13828545	639.977881	42.993328	0.99999999	88.4169860	0.99999999

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alexad17@umn.edu

Scanning Spectrophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Input
Harmony Spring, Water, Big Spring (23-A24), Sampled:080506 1600
FW=Parsons VII Area 4 Peaks
FW=0.991972 R2=0.11666 R=2700.04



Description: Harmony Spring, Water, Big Spring (23-A24), Sampled:080506 1600
X Variable: Emission nm ΔL 15.0W 5 Ånm0.000000
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\harmony\spring\080506\harmony\spring\water\080506-080522\labw506

Fitted Parameters

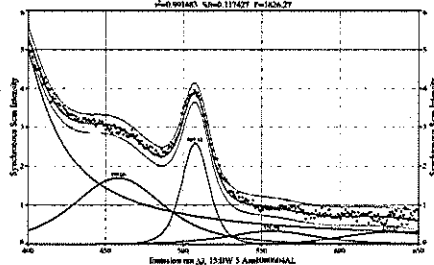
Peak	Type	FW	FW Std Err	FW Adj R ²	FW Std Err	FW Value
1	Parsons VII Area	6076.39387	391.282155	65.1218690	0.52653109	0.00000000
2	Parsons VII Area	68.3631611	455.180644	45.1807614	3.24267647	0.00000000
3	Parsons VII Area	23.9976602	505.180789	45.9974897	160.820991	0.00000000
4	Parsons VII Area	36.7400259	633.911494	53.6937520	1.0631132	0.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Area	FW Base	Area10
1	Parsons VII Area	6.0737386	391.282155	65.1218690	0.00000000	0.00000000	0.00000000
2	Parsons VII Area	1.3052131	455.180644	45.1807614	0.00000000	99.1805215	1.00000000
3	Parsons VII Area	0.48953366	505.180789	45.9974897	1.00000000	92.3072430	1.00000000
4	Parsons VII Area	0.4575791	633.911494	53.6937520	0.99999994	176.912341	0.99999994

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alexad17@umn.edu

Scanning Spectrophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Input
Harmony Spring, Water, Big Spring (23-A24), Sampled:080507 1540
FW=Parsons VII Area 5 Peaks
FW=0.991485 R2=0.117427 R=1624.27



Description: Harmony Spring, Water, Big Spring (23-A24), Sampled:080507 1540
X Variable: Emission nm ΔL 15.0W 5 Ånm0.000000
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\harmony\spring\080507\harmony\spring\water\080507-080522\labw507

Fitted Parameters

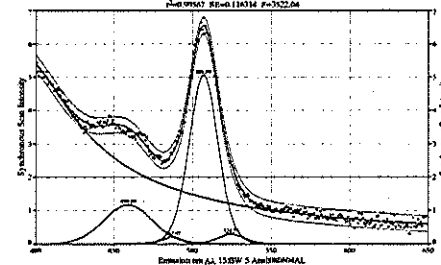
Peak	Type	FW	FW Std Err	FW Adj R ²	FW Std Err	FW Value
1	Parsons VII Area	3723.11652	391.240630	54.8355026	0.52612633	0.00000000
2	Parsons VII Area	140.062509	454.060851	45.3337623	2.68761391	0.00000000
3	Parsons VII Area	67.9071195	507.311468	20.4425218	2.86329643	0.00000000
4	Parsons VII Area	27.8104022	556.536697	65.8842596	1.81697076	0.00000000
5	Parsons VII Area	24.1647668	632.134015	73.6349900	167.901429	0.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Area	FW Base	Area10
1	Parsons VII Area	5.86629098	391.399383	54.8355026	0.00000000	0.00000000	0.00000000
2	Parsons VII Area	1.69224870	454.060851	45.3337623	1.00000000	170.718489	1.00000000
3	Parsons VII Area	2.5858957	507.311468	20.4425218	1.00000000	48.3551933	1.00000000
4	Parsons VII Area	0.36494900	556.536697	65.8842596	1.00000000	770.234012	1.00000000
5	Parsons VII Area	0.31041520	632.134015	73.6349900	1.00000000	144.575551	1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alexad17@umn.edu

Scanning Spectrophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Input
Harmony Spring, Water, Big Spring (23-A24), Sampled:080508 1710
FW=Parsons VII Area 5 Peaks
FW=0.995657 R2=0.118314 R=3322.84



Description: Harmony Spring, Water, Big Spring (23-A24), Sampled:080508 1710
X Variable: Emission nm ΔL 15.0W 5 Ånm0.000000
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\harmony\spring\080508\harmony\spring\water\080508-080522\labw508

Fitted Parameters

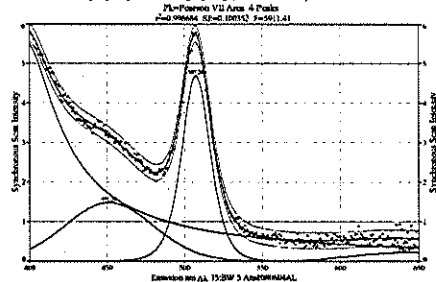
Peak	Type	FW	FW Std Err	FW Adj R ²	FW Std Err	FW Value
1	Parsons VII Area	6.99565707	0.99537167	0.1183140	3522.83931	0.00000000
2	Parsons VII Area	4345.38104	398.299838	107.509443	0.54467840	0.00000000
3	Parsons VII Area	45.8189706	454.077035	56.3486163	14.8490919	0.00000000
4	Parsons VII Area	6.81161170	487.467463	14.4710699	0.73488974	0.00000000
5	Parsons VII Area	118.727792	506.838183	21.4344314	7.88124551	0.00000000
6	Parsons VII Area	7.93363689	624.766630	20.2813739	2.72413373	0.00000000

Measured Values

Peak	Type	Amplitude	Center	FWHM	Area	FW Base	Area10
1	Parsons VII Area	5.86211381	389.392282	107.510007	0.99464302	0.00000000	0.00000000
2	Parsons VII Area	1.16970194	459.077935	56.3486163	1.00000000	74.5744993	1.00000000
3	Parsons VII Area	0.88860190	487.467463	14.4710699	1.00000000	9.34757632	1.00000000
4	Parsons VII Area	0.59022713	506.838183	21.4344314	1.00000000	45.3017897	1.00000000
5	Parsons VII Area	0.29722263	624.766629	20.2813739	1.00000001	47.9232643	1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alexad17@umn.edu

Scanning Spectrofluorophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Inputs
Harmony Spring, Water, Big Spring (23-A24), Sampled:080509 1612



Description: Harmony Spring, Water, Big Spring (23-A24), Sampled:080509 1612
X Variable: Emission nm Δ : 15.00W 5 Ams:080509AAL
Y Variable: Synchronous Scan Intensity
File Source: g:\hydrochem\harmony\spring\080509\harmony\spring\water\080509-080522\labw510

Fitted Parameters

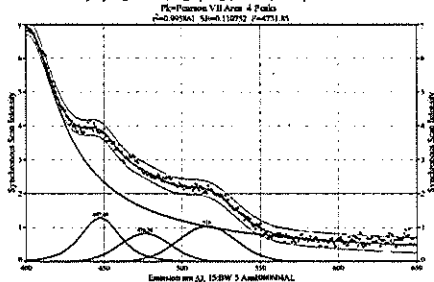
Peak	Type	Amplitude	Center	FWHM	Asym0	FW Base	Asym10
1	Peak	2848.15462	356.413527	61.9736060	0.53962373		
2	Peak	106.722786	451.279196	67.2346042	2.7874933		
3	Peak	116.489504	507.255122	21.5772303	3.27835926		
4	Peak	18.9405403	642.893289	76.5422126	167.454737		

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym0	FW Base	Asym10
1	Peak	5.6109770	356.413527	61.9736060	0.0000000	0.0000000	0.0000000
2	Peak	1.6789175	451.279196	67.2346042	1.0000000	136.95584	1.0000001
3	Peak	4.6843245	507.255122	21.5772303	1.0000000	49.915807	1.0000000
4	Peak	0.7211837	642.893289	76.5422126	1.0000000	153.56575	1.0000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

Scanning Spectrofluorophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Inputs
Harmony Spring, Water, Big Spring (23-A24), Sampled:080514 1303



Description: Harmony Spring, Water, Big Spring (23-A24), Sampled:080514 1303
X Variable: Emission nm Δ : 15.00W 5 Ams:080514AAL
Y Variable: Synchronous Scan Intensity
File Source: g:\hydrochem\harmony\spring\080514\harmony\spring\water\080514-080522\labw514

Fitted Parameters

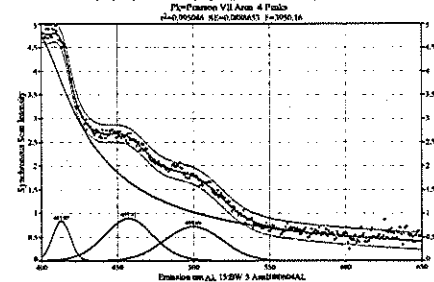
Peak	Type	Amplitude	Center	FWHM	Asym0	FW Base	Asym10
1	Peak	10753.5064	400.148317	62.8412407	0.51200520		
2	Peak	44.954254	447.484413	29.4614440	2.7857533		
3	Peak	23.3265932	476.243321	37.9401082	167.920113		
4	Peak	47.9453871	515.999784	43.0260738	48.753488		

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym0	FW Base	Asym10
1	Peak	6.93279419	400.148317	62.8412408	1.0000000	0.0000000	0.0000000
2	Peak	1.27641567	447.484413	29.4614440	0.9999997	71.9514443	0.9999998
3	Peak	0.82320528	476.243321	37.9401082	1.0000000	76.1335470	1.0000000
4	Peak	1.64237970	515.999784	43.0260738	1.0000000	86.8777583	1.0000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

Scanning Spectrofluorophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Inputs
Harmony Spring, Water, Big Spring (23-A24), Sampled:080522 1426



Description: Harmony Spring, Water, Big Spring (23-A24), Sampled:080522 1426
X Variable: Emission nm Δ : 15.00W 5 Ams:080522AAL
Y Variable: Synchronous Scan Intensity
File Source: g:\hydrochem\harmony\spring\080522\harmony\spring\water\080522-080522\labw522

Fitted Parameters

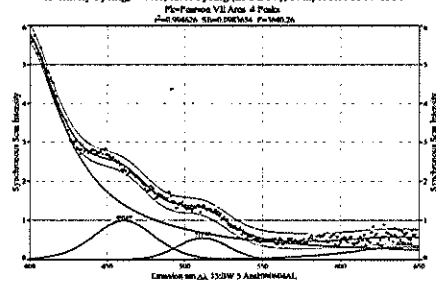
Peak	Type	Amplitude	Center	FWHM	Asym0	FW Base	Asym10
1	Peak	5771.83336	393.565565	30.7606069	0.51222977		
2	Peak	12.3818035	413.019771	13.7000980	167.876756		
3	Peak	36.2825279	457.412863	37.5377922	8.3602193		
4	Peak	34.1502951	499.872323	44.3427341	46.4097779		

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym0	FW Base	Asym10
1	Peak	4.92613722	393.565565	30.7606132	0.97967465	0.0000000	0.0000000
2	Peak	0.63317494	413.019772	13.7000980	0.99999993	27.6722953	0.99999974
3	Peak	0.88962916	457.412863	37.5377922	1.00000000	78.6870109	1.00000000
4	Peak	0.72128949	499.872323	44.3427341	1.00000000	89.5641945	1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

Scanning Spectrofluorophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Inputs
Harmony Spring, Water, Hart Spring (23-A358), Sampled:080506 1550



Description: Harmony Spring, Water, Hart Spring (23-A358), Sampled:080506 1550
X Variable: Emission nm Δ : 15.00W 5 Ams:080506AAL
Y Variable: Synchronous Scan Intensity
File Source: g:\hydrochem\harmony\spring\080506\harmony\spring\water\080506-080522\labw506

Fitted Parameters

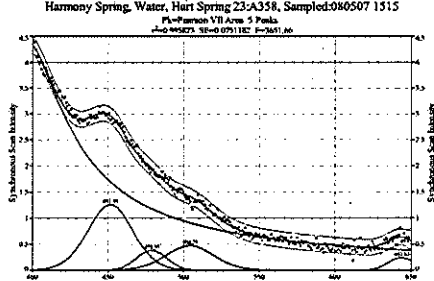
Peak	Type	Amplitude	Center	FWHM	Asym0	FW Base	Asym10
1	Peak	1025.20615	396.250712	62.9005338	0.67223717		
2	Peak	50.6697280	460.893129	66.3232347	5.96834448		
3	Peak	23.7318787	511.416784	34.2601008	167.818213		
4	Peak	33.9565944	640.964386	86.1774700	2.07355637		

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym0	FW Base	Asym10
1	Peak	5.8424073	396.250712	62.9111538	0.90755084	0.00000000	0.00000000
2	Peak	0.98033966	460.893129	66.3232347	1.00000000	99.7549007	1.00000000
3	Peak	0.53748583	511.416785	34.2601008	0.99999995	76.7756748	0.99999997
4	Peak	0.32551732	640.964386	86.1774700	1.00000000	215.526424	1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

Scanning Spectrofluorophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Inputs
Harmony Spring, Water, Hart Spring (23-A358), Sampled:080507 1515



Description: Harmony Spring, Water, Hart Spring (23-A358), Sampled:080507 1515
X Variable: Emission nm Δ : 15.00W 5 Ams:080507AAL
Y Variable: Synchronous Scan Intensity
File Source: g:\hydrochem\harmony\spring\080507\harmony\spring\water\080507-080522\labw507.p

Fitted Parameters

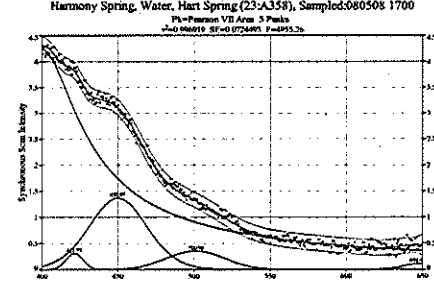
Peak	Type	Amplitude	Center	FWHM	Asym0	FW Base	Asym10
1	Peak	4802.89137	394.360319	61.8614294	0.52221054		
2	Peak	47.9649319	451.577406	34.8021836	8.52332307		
3	Peak	9.75466301	478.927408	23.8987445	26.3034654		
4	Peak	19.5124654	504.297237	37.2602070	5.86445022		
5	Peak	5.1962958	643.825136	20.2745321	167.614460		

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym0	FW Base	Asym10
1	Peak	4.46050295	394.360319	61.8614294	1.00000000	0.00000000	0.00000000
2	Peak	1.20523150	451.577406	34.8021836	1.00000000	77.2450270	1.00000001
3	Peak	0.33009035	478.927410	23.8887445	0.99999997	48.533165	0.99999998
4	Peak	0.47193020	504.297237	37.2602070	1.00000000	80.7602076	1.00000000
5	Peak	0.24057999	643.825134	20.2745321	1.00000000	46.8464662	1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

Scanning Spectrofluorophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
Harmony Spring Trace 6 May 2008 Inputs
Harmony Spring, Water, Hart Spring (23-A358), Sampled:080506 1700



Description: Harmony Spring, Water, Hart Spring (23-A358), Sampled:080506 1700
X Variable: Emission nm Δ : 15.00W 5 Ams:080506AAL
Y Variable: Synchronous Scan Intensity
File Source: g:\hydrochem\harmony\spring\080506\harmony\spring\water\080506-080522\labw508.p

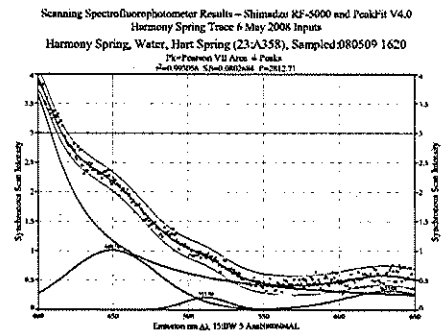
Fitted Parameters

Peak	Type	Amplitude	Center	FWHM	Asym0	FW Base	Asym10
1	Peak	425.48468	393.393808	79.3979025	0.52406574		
2	Peak	4.87509283	421.545701	13.5376069	33.0401045		
3	Peak	66.310512	450.867478	44.5706037	8.74187575		
4	Peak	17.3650788	500.862076	43.2663933	167.907479		
5	Peak	3.26791222	649.389239	29.1221831	49.8372534		

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym0	FW Base	Asym10
1	Peak	4.25530263	393.393809	79.3979025	0.99999994	0.00000000	0.00000000
2	Peak	0.38624537	421.545701	13.5376069	1.00000000	27.443964	1.00000000
3	Peak	1.36378787	450.867478	44.5706037	1.00000005	93.046262	1.00000008
4	Peak	0.33248809	500.862076	43.2663933	1.00000000	90.8750822	1.00000000
5	Peak	0.18640014	649.389099	29.1801170	1.1452611	56.8001223	1.37940946

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu



Description: Harmony Spring, Water, Hart Spring (23-A358), Sampled:080509 1620
X Variable: Emission mμ (Δλ 15.00 nm) S/N=0.000000
Y Variable: Synchronous Scan Intensity
File Source: g:\hydrochem\harmony\spring\080509\080509-080522\080509

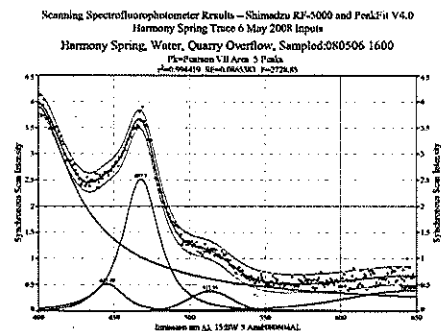
Fitted Parameters

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	2957.52279	301.545382	63.161787	0.9297830		
2	Peak	78.3143809	449.743803	71.829688	1.0498473		
3	Peak	7.86071118	511.082942	55.660124	1.07490725		
4	Peak	24.9446241	633.180330	70.330330	3.3909225		

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	3.0077450	301.54538	63.161787	0.9297830	0.0000000	0.0000000
2	Peak	1.0075400	449.74384	71.829688	1.0000000	1.0000000	1.0000000
3	Peak	0.2074140	511.08294	55.660124	1.0000000	1.0000000	1.0000000
4	Peak	0.13107793	633.00380	70.330330	1.0000000	152.60373	1.0000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alexu017@umn.edu



Description: Harmony Spring, Water, Quarry Overflow, Sampled:080509 1600
X Variable: Emission mμ (Δλ 15.00 nm) S/N=0.000000
Y Variable: Synchronous Scan Intensity
File Source: g:\hydrochem\harmony\spring\080509\080509-080522\080509

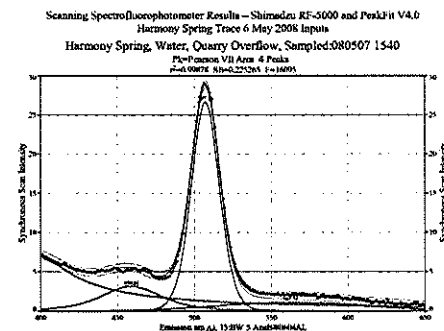
Fitted Parameters

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	2758.79468	308.979402	66.622662	0.9290197		
2	Peak	16.2679987	445.477309	25.0941024	1.09192407		
3	Peak	93.7615724	467.703238	27.9084742	1.99468131		
4	Peak	13.5902844	513.546528	34.2752064	1.07333775		
5	Peak	45.3048234	645.838078	101.431322	2.99405361		

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	3.91089993	308.979402	66.622662	0.9290197	0.0000000	0.0000000
2	Peak	0.51304279	445.477309	25.0941024	1.0000000	0.0000000	1.0000000
3	Peak	2.51810112	467.703238	27.9084742	1.0000000	79.0021427	1.0000000
4	Peak	0.37204276	513.546528	34.2752064	0.9999999	68.7793610	0.9999999
5	Peak	0.38051400	645.838077	101.431322	1.0000000	235.831032	1.0000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alexu017@umn.edu



Description: Harmony Spring, Water, Quarry Overflow, Sampled:080507 1540
X Variable: Emission mμ (Δλ 15.00 nm) S/N=0.000000
Y Variable: Synchronous Scan Intensity
File Source: g:\hydrochem\harmony\spring\080506\080522\080507

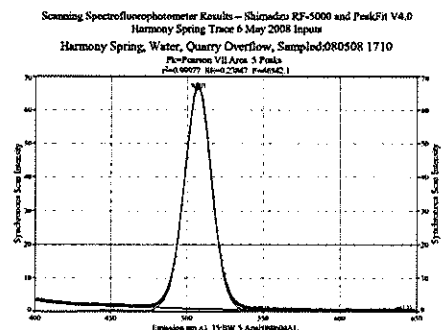
Fitted Parameters

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	542.620219	305.887392	75.118993	0.93101810		
2	Peak	180.745263	439.011446	46.8734162	1.89437869		
3	Peak	621.547150	507.138349	21.1412014	6.66790388		
4	Peak	134.148010	563.318137	113.527505	107.906075		

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	7.04901109	305.887390	75.118993	0.93101810	0.0000000	0.0000000
2	Peak	3.14103646	439.011446	46.8734162	1.0000000	119.554922	1.0000000
3	Peak	26.8237338	507.138349	21.1412014	1.0000000	45.4532487	1.0000000
4	Peak	1.10873829	562.318142	113.527505	0.9999999	227.813096	0.9999999

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alexu017@umn.edu



Description: Harmony Spring, Water, Quarry Overflow, Sampled:080508 1710
X Variable: Emission mμ (Δλ 15.00 nm) S/N=0.000000
Y Variable: Synchronous Scan Intensity
File Source: g:\hydrochem\harmony\spring\080506\080522\080508

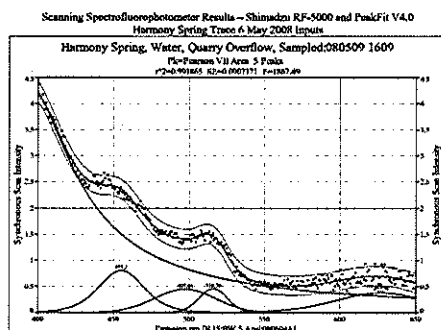
Fitted Parameters

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	4297.82123	379.602962	90.8910542	0.93100000		
2	Peak	20.5741876	453.770466	35.8910695	50.0796279		
3	Peak	1483.02036	507.111324	20.2638548	4.56794227		
4	Peak	14.9704688	549.106155	48.4273670	167.8952338		
5	Peak	5.12563526	642.248041	31.5005727	10.0000000		

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	4.61220941	379.602962	90.8910542	0.93100000	0.0000000	0.0000000
2	Peak	0.53743365	453.770466	35.8910695	72.465861	1.0000000	1.0000000
3	Peak	0.6237044	507.111324	20.2638548	1.0000000	42.409125	1.0000000
4	Peak	0.23810914	549.106155	48.4273678	1.0000000	90.9614336	1.0000000
5	Peak	0.14957073	642.248041	31.5005727	1.0000000	60.796876	1.0000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alexu017@umn.edu



Description: Harmony Spring, Water, Quarry Overflow, Sampled:080509 1600
X Variable: Emission mμ (Δλ 15.00 nm) S/N=0.000000
Y Variable: Synchronous Scan Intensity
File Source: g:\hydrochem\harmony\spring\080506\080522\080509

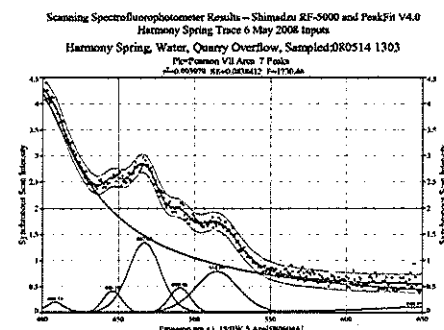
Fitted Parameters

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	1144.29375	302.094099	84.044670	0.93580564		
2	Peak	32.1173862	455.195152	35.281123	3.89016343		
3	Peak	22.7523302	497.457719	47.3610254	167.820541		
4	Peak	10.8273213	516.294440	22.2280916	112.611942		
5	Peak	29.0495339	627.362150	70.9772603	6.6912270		

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	4.39648232	302.094099	84.044670	0.93580564	0.0000000	0.0000000
2	Peak	0.88912906	455.195152	35.281123	1.0000000	79.1026217	1.0000000
3	Peak	0.65076560	497.457719	47.3610254	1.0000000	95.0346140	1.0000000
4	Peak	0.65808325	516.294440	22.2280916	1.0000000	64.6544167	1.0000000
5	Peak	0.38333897	627.362150	70.9772603	1.0000000	151.803679	1.0000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alexu017@umn.edu



Description: Harmony Spring, Water, Quarry Overflow, Sampled:080514 1303
X Variable: Emission mμ (Δλ 15.00 nm) S/N=0.000000
Y Variable: Synchronous Scan Intensity
File Source: g:\hydrochem\harmony\spring\080506\080522\080514

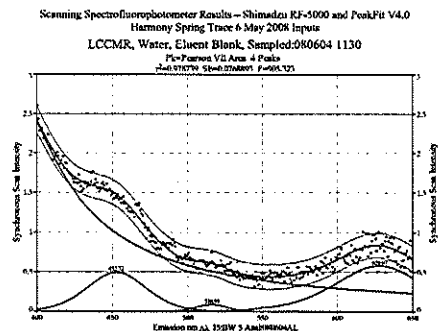
Fitted Parameters

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	7109.46148	389.669728	93.5175240	0.51812675		
2	Peak	3.67828230	488.428469	13.0072472	1.59946037		
3	Peak	6.4960222	486.138883	14.6800579	167.587765		
4	Peak	16.6131785	467.079703	24.8563282	7.14863533		
5	Peak	4.80169590	499.456533	16.261819	28.0022073		
6	Peak	29.3121576	514.892219	33.6838207	6.90004650		
7	Peak	61.5542516	644.954029	86.2341959	0.58867381		

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peak	4.50270763	389.669728	93.5175240	0.50960778	0.0000000	0.0000000
2	Peak	0.20038903	488.428469	13.0072472	1.0000000	28.255211	1.0000000
3	Peak	0.41448957	486.138883	14.6800579	1.0000000	29.450230	1.0000000
4	Peak	1.34000946	467.079703	24.8563282	0.9999999	32.7626765	0.9999999
5	Peak	0.47916774	499.456533	16.261819	1.0000000	33.5255590	1.0000000
6	Peak	0.70216006	514.892219	33.6838207	0.9999999	71.7226103	1.0000000
7	Peak	0.10303648	644.954029	86.2341959	1.0000000	0.0000000	0.0000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alexu017@umn.edu

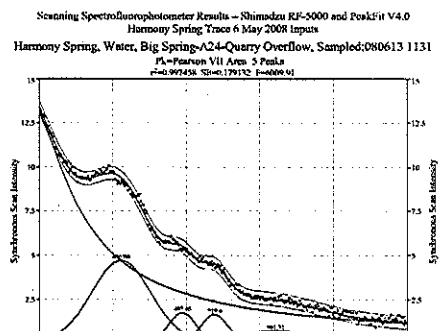


Description: LCCMR, Water, Eluent Blank, Sampled:080604 1130
X Variable: Emission Wavelength (nm) 15-BW 5 Anal:080604AL
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\lccmr\spring\080506\lccmr\spring\water\080604\080604L

Fitted Parameters
Coef Des DF Adj R² F1 Std Err F-value
0.9977950 0.9778161 605.122958
Peak Type m n a1 a2 a3 a4
1 Pearson VII Area 1251.77550 360.487020 91.5773739 0.37917607
2 Pearson VII Area 24.895811 452.719638 45.946403 8.52903148
3 Pearson VII Area 2.3561296 516.048460 28.1460371 167.629753
4 Pearson VII Area 49.074000 628.000026 69.6304677 3.31526519

Measured Values
Peak Type Amplitude Center FWHM Asym50 FWHM Asym10
1 Pearson VII Area 2.90621322 381.077962 92.6623498 0.97479485 0.00000000 0.00000000
2 Pearson VII Area 0.49212192 452.719638 45.946403 1.00000000 46.2675562 1.00000000
3 Pearson VII Area 0.08415019 516.048460 28.1460371 1.00000000 28.1460371 1.00000000
4 Pearson VII Area 0.57722013 628.000026 69.6304677 1.00000000 139.426472 1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

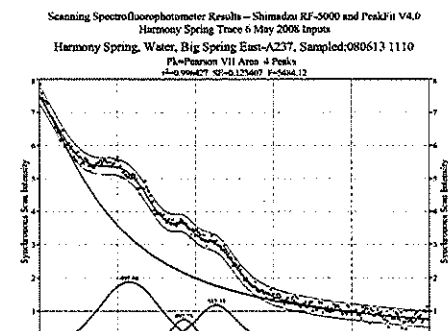


Description: Harmony Spring, Water, Big Spring-A24-Quarry Overflow, Sampled:080613 1131
X Variable: Emission Wavelength (nm) 15-BW 5 Anal:080613AL
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\lccmr\spring\080506\lccmr\spring\water\080613\080613L

Fitted Parameters
Coef Des DF Adj R² F1 Std Err F-value
0.9974586 0.99724275 6179.1175 6000.91470
Peak Type m n a1 a2 a3 a4 a5
1 Pearson VII Area 16777.9250 362.610183 80.1144075 0.52020221
2 Pearson VII Area 264.302208 456.050149 46.6166450 13.6031215
3 Pearson VII Area 41.3682009 497.654245 22.1627381 167.906223
4 Pearson VII Area 38.8372709 519.681271 21.5560758 9.8756874
5 Pearson VII Area 36.1331431 541.906691 71.2774897 7.27140326

Measured Values
Peak Type Amplitude Center FWHM Asym50 FWHM Asym10
1 Pearson VII Area 13.8061078 392.863297 86.1229644 0.9734447 0.00000000 0.00000000
2 Pearson VII Area 4.7099385 456.050149 46.6166450 1.00000000 46.2675562 1.00000000
3 Pearson VII Area 1.75142176 497.654245 22.1627381 0.99999993 44.4734700 0.99999999
4 Pearson VII Area 1.64798122 519.681272 21.5560758 0.99999988 45.0000000 0.99999994
5 Pearson VII Area 0.71793836 541.906691 71.2774897 1.00000000 151.155406 1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

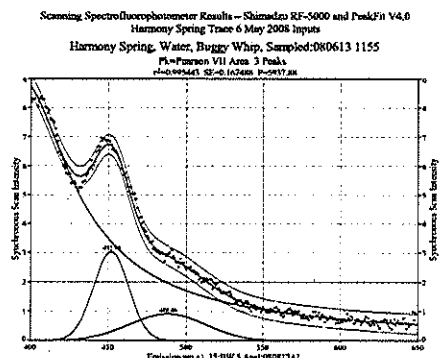


Description: Harmony Spring, Water, Big Spring-East-A237, Sampled:080613 1110
X Variable: Emission Wavelength (nm) 15-BW 5 Anal:080613AL
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\lccmr\spring\080506\lccmr\spring\water\080613\080613L

Fitted Parameters
Coef Des DF Adj R² F1 Std Err F-value
0.9964270 0.99627226 6124.09746 5484.1234
Peak Type m n a1 a2 a3 a4
1 Pearson VII Area 3075.54871 384.976436 111.52463 0.611821990
2 Pearson VII Area 89.1162077 457.80066 44.6914872 167.919028
3 Pearson VII Area 15.3259616 492.723607 18.6477529 4.16043610
4 Pearson VII Area 45.0433984 513.332107 31.2683540 1.97691842

Measured Values
Peak Type Amplitude Center FWHM Asym50 FWHM Asym10
1 Pearson VII Area 8.10978301 387.177534 111.524778 0.96195509 0.00000000 0.00000000
2 Pearson VII Area 1.87942508 457.80066 44.6914872 1.00000000 46.2675562 1.00000000
3 Pearson VII Area 0.75010394 492.723607 18.6477529 0.99999999 41.646111 0.99999999
4 Pearson VII Area 1.17769623 513.332107 31.2683540 1.00000000 79.196147 1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

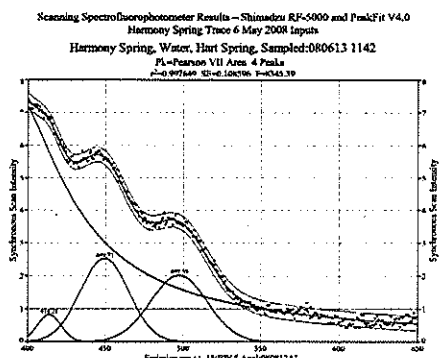


Description: Harmony Spring, Water, Buggy Whip, Sampled:080613 1155
X Variable: Emission Wavelength (nm) 15-BW 5 Anal:080613AL
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\lccmr\spring\080506\lccmr\spring\water\080613\080613L

Fitted Parameters
Coef Des DF Adj R² F1 Std Err F-value
0.9954457 0.9952967 5937.80300
Peak Type m n a1 a2 a3 a4 a5
1 Pearson VII Area 2149.12128 394.089557 85.5612790 0.65600126
2 Pearson VII Area 35.6022029 452.080451 26.437091 80.5460680
3 Pearson VII Area 55.8452296 488.458529 57.4554290 167.681120

Measured Values
Peak Type Amplitude Center FWHM Asym50 FWHM Asym10
1 Pearson VII Area 3.59616873 394.089557 85.5612790 1.00000000 0.00000000 0.00000000
2 Pearson VII Area 1.87202194 452.080451 26.437091 1.00000000 35.167517 1.00000001
3 Pearson VII Area 0.81221350 488.458529 57.4554290 1.00000000 115.294567 1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

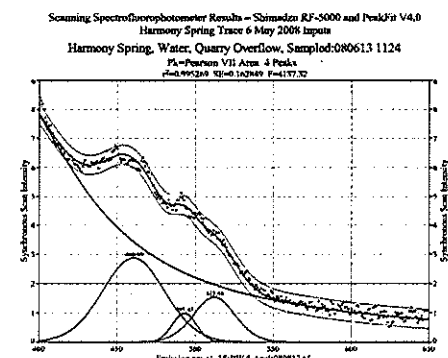


Description: Harmony Spring, Water, Hart Spring, Sampled:080613 1142
X Variable: Emission Wavelength (nm) 15-BW 5 Anal:080613AL
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\lccmr\spring\080506\lccmr\spring\water\080613\080613L

Fitted Parameters
Coef Des DF Adj R² F1 Std Err F-value
0.9976493 0.9975100 6186.34810
Peak Type m n a1 a2 a3 a4
1 Pearson VII Area 2176.26156 387.220478 93.7846260 0.44537025
2 Pearson VII Area 15.943254 414.207767 17.8455649 21.0883360
3 Pearson VII Area 96.3467817 449.708339 36.3821648 167.906228
4 Pearson VII Area 91.6967704 497.575558 42.7070421 119.757987

Measured Values
Peak Type Amplitude Center FWHM Asym50 FWHM Asym10
1 Pearson VII Area 7.87781158 387.220478 93.7846260 0.99999999 0.00000000 0.00000000
2 Pearson VII Area 0.82383184 414.207767 17.8455649 0.99999999 36.3261773 0.99999999
3 Pearson VII Area 2.52226697 449.708339 36.3821648 1.00000000 71.4061509 1.00000000
4 Pearson VII Area 2.01366557 497.575558 42.7070421 1.00000000 85.7049109 1.00000000

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu



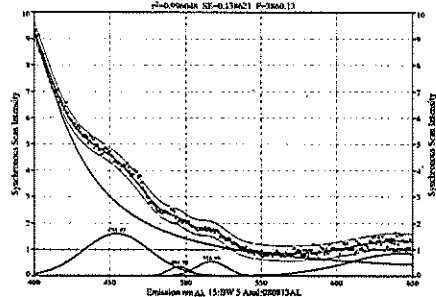
Description: Harmony Spring, Water, Quarry Overflow, Sampled:080613 1124
X Variable: Emission Wavelength (nm) 15-BW 5 Anal:080613AL
Y Variable: Synchronous Scan Intensity
File Source: g:\dynamics\lccmr\spring\080506\lccmr\spring\water\080613\080613L

Fitted Parameters
Coef Des DF Adj R² F1 Std Err F-value
0.9932491 0.99301134 4117.17035
Peak Type m n a1 a2 a3 a4
1 Pearson VII Area 2729.84626 378.001192 125.811677 0.69712997
2 Pearson VII Area 145.053763 460.388553 46.7964051 11.1964630
3 Pearson VII Area 19.1135095 493.427434 18.2874289 167.917967
4 Pearson VII Area 52.5102218 512.479925 31.1464206 6.94595896

Measured Values
Peak Type Amplitude Center FWHM Asym50 FWHM Asym10
1 Pearson VII Area 6.92745133 378.137562 125.811558 0.99021436 0.00000000 0.00000000
2 Pearson VII Area 2.8632831 460.388553 46.796461 0.99999999 96.7228204 0.99999999
3 Pearson VII Area 0.99806007 493.427434 18.2874289 0.99999999 36.6973595 0.99999999
4 Pearson VII Area 1.54499109 512.479925 31.1464206 0.99999999 66.3277042 0.99999999

Hydrogeochemistry Laboratory
Dept. of Geology & Geophysics, University of Minnesota
alex017@umn.edu

Scanning Spectrophotometer Results - Shimadzu RF-5000 and PeakFit V4.0
 Harmony Spring Trace 6 May 2008 Inputs
 LCCMR, Water, Tap Water Blank, Sampled:080613 1630
 PL=Peacoon VII Area 5 Peaks
 r²=0.999648 SE=0.136621 P=3300.13



Description: LCCMR, Water, Tap Water Blank, Sampled:080613 1630
 X Variable: Wavelength nm ΔL 15.00W 5 Area:080613AL
 Y Variable: Synchronous Scan Intensity
 File Source: g:\synchronizing\harmony\spring\080606\harmony\spring\water\080613\080613

Fit/Find Parameters

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peacoon VII Area	1814.34456	390.411393	72.5678952	0.88331110		
2	Peacoon VII Area	88.3345905	454.416022	51.6598052	41.1522870		
3	Peacoon VII Area	6.29409662	495.383077	16.7811280	167.836399		
4	Peacoon VII Area	14.1984508	516.861587	23.8094739	20.9210283		
5	Peacoon VII Area	77.2100347	542.419766	80.3487701	5.85411683		

Measured Values

Peak	Type	Amplitude	Center	FWHM	Asym50	FW Base	Asym10
1	Peacoon VII Area	0.98091183	390.342192	72.0700181	0.99076306	0.00000000	0.00000000
2	Peacoon VII Area	1.62302258	454.416022	51.6598052	1.00000000	106.664640	1.00000000
3	Peacoon VII Area	0.35141643	495.383077	16.7811280	1.00000000	53.6744090	1.00000000
4	Peacoon VII Area	0.52660991	516.861587	23.8094739	1.00000000	48.3097482	1.00000000
5	Peacoon VII Area	0.89807024	542.419766	80.3487701	1.00000000	175.167761	1.00000000

Hydrogeochemistry Laboratory
 Dept. of Geology & Geophysics, University of Minnesota
 alexa017@umn.edu