CONESTOGA-ROVERS
& ASSOCIATES

285 Delaware Avenue, Suite 500, Buffalo, New York 14202
Telephone: 716-856-2142 Facsimile: 716-856-2160
www.CRAworld.com

August 31, 2012 Reference No. 017390

Mr. Glenn May, CPG
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
270 Michigan Avenue
Buffalo, New York 14203-2999

Dear Mr. May:

Re: GM Powertrain Group – Tonawanda, New York
Endoline Area Semi-Annual Groundwater Monitoring Report
Spill Number 9875474

Conestoga-Rovers & Associates (CRA) has prepared this Semi-Annual Groundwater Monitoring Report on behalf of the General Motors Company (GM) in accordance with the Enhanced Attenuation Work Plan for the Endoline Areas Chlorinated Solvent Plume dated February 22, 2011(Work Plan). The New York State Department of Environmental Conservation (NYSDEC) approved the Work Plan on March 14, 2011.

SEMI-ANNUAL GROUNDWATER MONITORING – SOLVENT PLUME

Baseline sampling was completed in April 2011. The soy-lactate and nutrient injection program was completed in September 2011 with 90-day performance monitoring completed in December 2011. An injection summary is provided as Attachment 1. Complete details of the injection well installation and nutrient injection program will be included in the final report and evaluation submitted after the two year sampling event scheduled for the fall of 2013.

The first round of semi-annual groundwater monitoring and 180-day performance monitoring was completed on March 26, 2012. All samples were sent to TestAmerica Laboratories of North Canton, Ohio for analysis. Groundwater samples were collected from perimeter monitoring wells MW-1, MW-101, MW-102, and MW-103 and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs) to monitor for potential plume migration. Groundwater samples collected from MW-2, MW-3, MW-9, MW-11, and MW-12 as well as three injection points (IP-2, IP-10, and IP-13) were analyzed for TCL VOCs and the following natural attenuation parameters:

Wet Chemistry
Aerobic 1,1,1-TCA specific microbial population
Ammonia
Alkalinity, total (as CaCO3)
Anaerobic 1,1,1-TCA specific microbial population
Biochemical oxygen demand (BOD)
Chemical oxygen demand (COD)
Nitrate (as N)
Nitrite (as N)
Orthophosphate

Dissolved Gases
Ethane
Methane

Field Parameters
Conductivity
Dissolved oxygen (DO)
Oxidation reduction potential (ORP)
pH

Phosphate, total
Sulfate
Sulfite
Total microbial population - aerobic
Total microbial population - anaerobic
Total organic carbon (TOC)

Temperature, field
Turbidity

Monitoring and injection well locations are shown on Figure 1. Figure 2 presents total chlorinated VOC (CVOC) and solvent contours. Analytical results for the chlorinated solvent plume enhanced attenuation program are summarized on Table 1. As requested, attenuation plots are provided as Attachment 2.

The data was validated by CRA. Application of quality assurance criteria was consistent with "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," EPA-540/R-99/008, October 1999. The data were found to exhibit acceptable levels of accuracy and precision with the qualifiers noted on the tables.

The data from the 90-day performance monitoring and round one of the semi-annual events (180-day performance monitoring) were reviewed to evaluate the enhanced biodegradation treatment at the Endoline Area. The results suggest the injections of soy-lactate and nutrients have not reached the monitoring wells. Groundwater flow through the soil matrix is slow due to the clay soils. CVOC data shows that biodegradation has increased at well MW-2 as a result of the injections. Biodegradation rates will likely continue to increase at this well as more of the injected material migrates into the area. The biodegradation observed at well MW-2 suggests that that reductive dechlorination will increase at all the wells when the anaerobic conditions have had time to migrate from the injection wells to the areas of the monitoring wells. Data from the injection points support the conclusion that reductive dechlorination will increase when the anaerobic conditions reach the other wells and also confirm that enhanced biodegradation is occurring in areas where the organic substrate is present.

The three injection wells sampled during the first round of semi-annual monitoring will be sampled again at the next event to monitor the migration of the organic substrate out of the injection well area and confirm that enhanced biodegradation is occurring in the injection well area. Round 2 of the semiannual sampling will be conducted in September 2012.

No conclusions are being made at this time. As stated in the approved Work Plan, CRA will evaluate the effectiveness of the enhanced attenuation program after two years (four rounds) of semiannual sampling. An evaluation report will be prepared and submitted to the NYSDEC with recommendations for future sampling or additional remedial actions if necessary.

ENDOLINE AREA SUMP

A sump was located in June 2011 during the installation of the injection wells for the Endoline Area Enhanced Attenuation program. The sump was approximately 4 feet in diameter by 10 feet in depth with an approximate volume of 1,000 gallons, and was filled with water. Floating solids were visible at the surface and a layer of sludge was present at the bottom. CRA submitted a Work Plan to NYSDEC to Address the Endoline Area Sump dated June 27, 2011. Per the Work Plan, the sump was emptied, with

the floating solids and bottom sludge being segregated and drummed for disposal as hazardous waste. The water was disposed of as non-hazardous waste.

The sump was inspected and only one inlet was observed coming in from the southeast. The line was cleaned and a video camera was used to inspect the line. The line was blocked off approximately 45 feet from the sump and no other connections were observed. The sump was filled with stone/crushed concrete and the top one foot was capped with hydraulic cement. The manhole cover was replaced.

ANNUAL GROUNDWATER MONITORING – PETROLEUM PLUME

Groundwater samples were collected from monitoring wells MW-2, MW-3, MW-4, and MW-5 and analyzed for the NYSDEC Spill Technology and Remediation Series (STARS) Memo #1 list of petroleum-related VOCs to monitor the conditions in the Endoline area related to residual petroleum impacts. The data is summarized in Table 2.

No significant changes in concentration have been observed since 2008. These wells will be sampled again for the STARS list of petroleum-related VOCs in Spring 2013.

Please contact Jim Hartnett at 315-463-2391 (GM) or Katherine Galanti at 716-856-2142 (CRA) if you should have any questions or comments.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

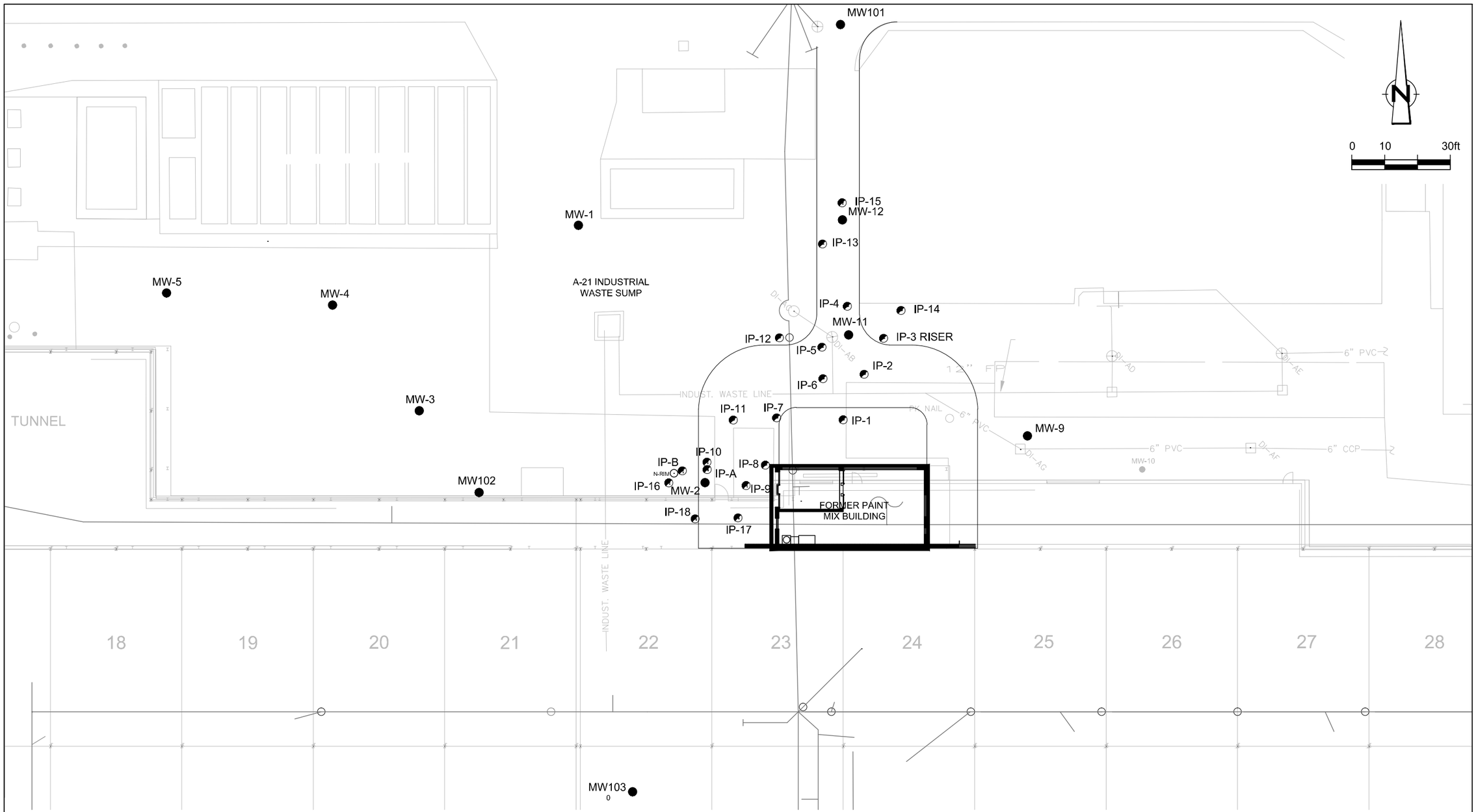
Katherine B. Galanti
Project Manager

KBG/CMB/ck/017390-May-006

Encl.

c.c.: M. Antonetti – GM
J. Hartnett – GM

FIGURES



LEGEND

MW-1 ● MONITORING WELL LOCATION

IP-11 ◐ INJECTION WELL LOCATION

figure 1

WELL LOCATIONS
ENHANCED ATTENUATION AT THE ENDOLINE AREA CHLORINATED SOLVENT PLUME
GENERAL MOTORS COMPANY TONAWANDA ENGINE PLANT
Tonawanda, New York

17390-00(MAY006)GN-BU001 AUG 30/2012

MW101
ND
<1

N

0 10 30ft

MW-1
<1

MW-12
80.2

IP-13
243.4

A-21 INDUSTRIAL
WASTE SUMP

MW-5
ND
<1

MW-4
ND
<1

MW-11
5106

IP-2
244.6

TUNNEL

MW-3
ND
<10

INDUST. WASTE LINE

MW-9
1.7

IP-10
5057

MW102
2.7

MW-2
3529

10000

1000

100

10

2

FORMER PAINT
MIX BUILDING

INDUST. WASTE LINE

18 19 20 21 22 23 24 25 26 27 28

MW103
ND
<1

LEGEND

MW-1 ● MONITORING WELL LOCATION

IP-11 ◐ INJECTION WELL LOCATIONS

CVOC SOLVENT CONCENTRATION

MW-1 <1 ● TOTAL CHLORINATED VOC AND SOLVENT CONCENTRATION IN GROUNDWATER (ppb)

CRA

figure 2

TOTAL CVOC SOLVENT CONTOURS - MARCH 2012
ENHANCED ATTENUATION AT THE ENDOLINE AREA CHLORINATED SOLVENT PLUME
GENERAL MOTORS COMPANY TONAWANDA ENGINE PLANT
Tonawanda, New York

17390-00(MAY006)GN-BU002 AUG 30/2012

TABLES

TABLE 1

ANALYTICAL RESULTS SUMMARY
SOLVENT PLUME MONITORING, 2011-2012
GENERAL MOTORS COMPANY
TONAWANDA, NEW YORK

Location ID:			*IP-2*	*IP-10*	*IP-13*	*MW-1*	*MW-1*	*MW-2*	*MW-2*	*MW-2*	*MW-2*
Sample Name:			*WG-17390-032812-KL-16*	*WG-17390-032812-KL-17*	*WG-17390-032812-KL-15*	*GW-17390-042511-KL-02*	*WG-17390-032712-KL-11*	*GW-17390-042611-KL-04*	*WG-17390-121911-KL-01*	*WG-17390-032612-KL-01*	*WG-17390-032612-KL-02*
Sample Date:			*3/28/2012*	*3/28/2012*	*3/28/2012*	*4/25/2011*	*3/27/2012*	*4/26/2011*	*12/19/2011*	*3/26/2012*	*3/26/2012*
		NYSDEC TOGs Groundwater [1]									*Duplicate*
Parameters	*Units*	*Guidance Value*	*Standard*								
Volatile Organic Compounds											
1,1,1-Trichloroethane	ug/L		5	3.3 U	130 U	6.7 U	1.0 U	1.0 U	12000	24000	7400	7500
1,1,2,2-Tetrachloroethane	ug/L		5	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
1,1,2-Trichloroethane	ug/L		1	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
1,1-Dichloroethane	ug/L		5	4.5	290	3.4 J	1.0 U	1.0 U	4700	23000	24000	22000
1,1-Dichloroethene	ug/L		5	3.3 U	130 U	6.7 U	1.0 U	1.0 U	140 J	1100	190 J	170 J
1,2,4-Trichlorobenzene	ug/L		5	3.3 U	130 U	6.7 U	-	1.0 U	-	710 U	830 U	630 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L		0.04	6.7 U	250 U	13 U	-	2.0 U	-	1400 U	1700 U	1300 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L		0.0006	3.3 U	130 U	6.7 U	-	1.0 U	-	710 U	830 U	630 U
1,2-Dichlorobenzene	ug/L		3	3.3 U	130 U	6.7 U	-	1.0 U	-	710 U	830 U	630 U
1,2-Dichloroethane	ug/L		0.6	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
1,2-Dichloroethene (total)	ug/L	5		-	-	-	2.0 U	-	670 U	-	-	-
1,2-Dichloropropane	ug/L		1	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
1,3-Dichlorobenzene	ug/L		3	3.3 U	130 U	6.7 U	-	1.0 U	-	710 U	830 U	630 U
1,4-Dichlorobenzene	ug/L		3	3.3 U	130 U	6.7 U	-	1.0 U	-	710 U	830 U	630 U
1,4-Dioxane	ug/L			170 U	6300 U	330 U	50 U	50 U	17000 U	-	42000 U	31000 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	50		32 J	79 J	130	10 U	10 U	3300 U	7100 U	8300 U	6300 U
2-Hexanone	ug/L	50		1.6 J	1300 U	67 U	10 U	10 U	3300 U	7100 U	8300 U	6300 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L			1.5 J	1300 U	67 U	10 U	10 U	3300 U	7100 U	8300 U	6300 U
Acetone	ug/L	50		190	150 J	100	10 U	10 U	3300 U	7100 U	1200 J	980 J
Benzene	ug/L		1	3.3 U	31 J	6.7 U	1.0 U	1.0 U	330 U	200 J	270 J	260 J
Bromodichloromethane	ug/L	50		3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Bromoform	ug/L	50		3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Bromomethane (Methyl bromide)	ug/L		5	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Carbon disulfide	ug/L	60	60	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Carbon tetrachloride	ug/L		5	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Chlorobenzene	ug/L		5	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Chloroethane	ug/L		5	15	4500	10	1.0 U	1.0 U	740	3700	4200 J	2400 J
Chloroform (Trichloromethane)	ug/L		7	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Chloromethane (Methyl chloride)	ug/L		5	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
cis-1,2-Dichloroethene	ug/L		5	3.3 U	130 U	6.7 U	-	1.0 U	-	710 U	830 U	630 U
cis-1,3-Dichloropropene	ug/L			3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Cyclohexane	ug/L			3.3 U	130 U	6.7 U	-	1.0 U	-	710 U	830 U	630 U
Dibromochloromethane	ug/L	50		3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Dichlorodifluoromethane (CFC-12)	ug/L		5	3.3 U	130 U	6.7 U	-	1.0 U	-	710 U	830 U	630 U
Ethylbenzene	ug/L		5	3.3 U	130 U	6.7 U	1.0 U	1.0 U	80 J	120 J	160 J	140 J
Isopropyl benzene	ug/L		5	3.3 U	130 U	6.7 U	-	1.0 U	-	710 U	830 U	630 U
Methyl acetate	ug/L			33 U	1300 U	67 U	-	10 U	-	7100 U	8300 U	6300 U
Methyl cyclohexane	ug/L			3.3 U	130 U	6.7 U	-	1.0 U	-	99 J	830 U	630 U
Methyl tert butyl ether (MTBE)	ug/L	10		17 U	630 U	33 U	-	1.1 J	-	3600 U	4200 U	3100 U
Methylene chloride	ug/L		5	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	320 J	230 J
Styrene	ug/L		5	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Tetrachloroethene	ug/L		5	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Toluene	ug/L		5	3.3 U	130 U	6.7 U	1.0 U	1.0 U	68 J	190 J	180 J	170 J
trans-1,2-Dichloroethene	ug/L		5	3.3 U	130 U	6.7 U	-	1.0 U	-	710 U	830 U	630 U
trans-1,3-Dichloropropene	ug/L			3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Trichloroethene	ug/L		5	3.3 U	130 U	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Trichlorofluoromethane (CFC-11)	ug/L		5	3.3 U	130 U	6.7 U	-	1.0 U	-	710 U	830 U	630 U
Trifluorotrichloroethane (Freon 113)	ug/L		5	3.3 U	130 U	6.7 U	-	1.0 U	-	710 U	830 U	630 U
Vinyl chloride	ug/L		2	3.3 U	38 J	6.7 U	1.0 U	1.0 U	330 U	710 U	830 U	630 U
Xylenes (total)	ug/L			6.7 U	250 U	13 U	2.0 U	2.0 U	380 J	590 J	680 J	600 J

TABLE 1

ANALYTICAL RESULTS SUMMARY
SOLVENT PLUME MONITORING, 2011-2012
GENERAL MOTORS COMPANY
TONAWANDA, NEW YORK

Location ID:			*IP-2*	*IP-10*	*IP-13*	*MW-1*	*MW-1*	*MW-2*	*MW-2*	*MW-2*	*MW-2*
Sample Name:			*WG-17390-032812-KL-16*	*WG-17390-032812-KL-17*	*WG-17390-032812-KL-15*	*GW-17390-042511-KL-02*	*WG-17390-032712-KL-11*	*GW-17390-042611-KL-04*	*WG-17390-121911-KL-01*	*WG-17390-032612-KL-01*	*WG-17390-032612-KL-02*
Sample Date:			*3/28/2012*	*3/28/2012*	*3/28/2012*	*4/25/2011*	*3/27/2012*	*4/26/2011*	*12/19/2011*	*3/26/2012*	*3/26/2012*
		NYSDEC TOGs Groundwater [1]									*Duplicate*
Parameters	***Units***	***Guidance Value*** ***Standard***									
Dissolved Gases											
Ethane	ug/L		11 U	15	0.50	0.50 U	-	19	25	11	18
Methane	ug/L		7600	5600	2800	8.7	-	5800	3700	2700	3300
Wet Chemistry											
Alkalinity, total (as CaCO3)	ug/L		1400000	610000	1300000	324000 J	-	209000	240000	260000 J	280000
Ammonia	ug/L	2000	**6400**	2000 U	2000 U	2000 U	-	**3000**	**4200**	**3600**	**3600**
Anaerobic 1,1,1-TCA specific microbial population	cfu/mL		100	40	480	-	-	1260	1470	10900	-
Biochemical oxygen demand (BOD)	ug/L		480000	220000 U	46000	2000 U	-	12000	43000 J	94000	98000
Chemical oxygen demand (COD)	ug/L		950000	290000	290000	16000	-	35000	200000	190000 J	180000
Dehalobacter spp.	unknown		present	present	present	-	-	absent	present	present	-
Dehalococcoides spp.	unknown		present	present	absent	-	-	present	present	present	-
Nitrate (as N)	ug/L	10000	500 U	100 U	100 U	100 U	-	100 U	100 U	100 U	100 U
Nitrite (as N)	ug/L	1000	5000 U	100 U	100 U	500 U	-	100 U	100 U	100 U	100 U
Orthophosphate	ug/L		100 U	100 U	100 U	-	-	-	-	61 J	54 J
Phosphorus	ug/L		-	-	-	57 J	-	200	130	-	-
Sulfate	ug/L	250000	5000 U	6900	**1100000**	**809000**	-	6000	1000	460 J	400 J
Sulfide	ug/L	50	1000 U	1000 U	1000 U	1000 U	-	**1400**	**2400**	**1100**	**960 J**
TOC averages	ug/L		260000	110000	39000	-	-	-	-	46000	43000
Total microbial population - aerobic	cfu/mL		2930	8800	2090	-	-	56640	1770	15200	-
Total microbial population - anaerobic	cfu/mL		32000	5980	6120	-	-	11880	3520	13900	-
Total organic carbon (TOC)	ug/L		-	-	-	9000	-	10000	65000	-	-
Field Parameters											
Conductivity	mS/cm		22.5	2.91	4.81	-	3.92	-	1.289	1.47	-
Dissolved oxygen (DO)	ug/L		16740	650	760	-	20	-	280	2800	-
Oxidation reduction potential (ORP)	millivolts		-130	-183	-255	-	-20	-	-209.2	-119	-
pH	s.u.		8.56	6.92	6.88	-	7.05	-	6.82	7.11	-
Temperature, field	Deg C		11.3	12.8	12.9	-	11.7	-	-	6.1	-
Temperature, field	Deg F		-	-	-	-	-	-	8.4	-	-
Turbidity	NTU		-	4.5	22.2	-	0	-	1	5.8	-

Notes:

[1] NYSDEC TOGs Groundwater Standards and Guidance - NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values, dated June 1998 and addenda.

220 Value exceeds criteria.

U Not present at or above the associated value.

J Estimated.

ug/L Micrograms per liter.

- Not analyzed.

TABLE 1

ANALYTICAL RESULTS SUMMARY
SOLVENT PLUME MONITORING, 2011-2012
GENERAL MOTORS COMPANY
TONAWANDA, NEW YORK

Location ID:		*MW-3*	*MW-3*	*MW-9*	*MW-9*	*MW-9*	*MW-101*	*MW-101*	*MW-102*	*MW-102*
Sample Name:		*GW-17390-042711-KL-08*	*WG-17390-032712-KL-08*	*GW-17390-042711-KL-10*	*GW-17390-042711-KL-11*	*WG-17390-032712-KL-05*	*GW-17390-042611-KL-05*	*WG-17390-032812-KL-14*	*GW-17390-042511-KL-01*	*WG-17390-032712-KL-09*
Sample Date:		*4/27/2011*	*3/27/2012*	*4/28/2011*	*4/28/2011*	*3/27/2012*	*4/26/2011*	*3/28/2012*	*4/25/2011*	*3/27/2012*
					Duplicate					
Parameters	***Units***									
Volatile Organic Compounds										
1,1,1-Trichloroethane	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
1,1,2,2-Tetrachloroethane	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
1,1,2-Trichloroethane	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
1,1-Dichloroethane	ug/L	11 U	10 U	1.3	1.3	1.7	1.0 U	1.0 U	2.6	2.7
1,1-Dichloroethene	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
1,2,4-Trichlorobenzene	ug/L	-	10 U	-	-	1.0 U	-	1.0 U	-	1.7 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	-	20 U	-	-	2.0 U	-	2.0 U	-	3.3 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	-	10 U	-	-	1.0 U	-	1.0 U	-	1.7 U
1,2-Dichlorobenzene	ug/L	-	10 U	-	-	1.0 U	-	1.0 U	-	1.7 U
1,2-Dichloroethane	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
1,2-Dichloroethene (total)	ug/L	22 U	-	2.0 U	2.0 U	-	2.0 U	-	2.0 U	-
1,2-Dichloropropane	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
1,3-Dichlorobenzene	ug/L	-	10 U	-	-	1.0 U	-	1.0 U	-	1.7 U
1,4-Dichlorobenzene	ug/L	-	10 U	-	-	1.0 U	-	1.0 U	-	1.7 U
1,4-Dioxane	ug/L	560 U	500 U	50 U	50 U	50 U	50 U	-	50 U	84 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	110 U	100 U	10 U	10 U	10 U	0.98 J	10 U	10 U	17 U
2-Hexanone	ug/L	110 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	110 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Acetone	ug/L	110 U	100 U	10 U	10 U	10 U	3.9 J	10 U	10 U	17 U
Benzene	ug/L	**15**	**6.1 J**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Bromodichloromethane	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Bromoform	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Bromomethane (Methyl bromide)	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Carbon disulfide	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Carbon tetrachloride	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Chlorobenzene	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Chloroethane	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Chloroform (Trichloromethane)	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Chloromethane (Methyl chloride)	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
cis-1,2-Dichloroethene	ug/L	-	10 U	-	-	1.0 U	-	1.0 U	-	1.7 U
cis-1,3-Dichloropropene	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Cyclohexane	ug/L	-	10 U	-	-	1.0 U	-	1.0 U	-	1.7 U
Dibromochloromethane	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Dichlorodifluoromethane (CFC-12)	ug/L	-	10 U	-	-	1.0 U	-	1.0 U	-	1.7 U
Ethylbenzene	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Isopropyl benzene	ug/L	-	10 U	-	-	1.0 U	-	1.0 U	-	1.7 U
Methyl acetate	ug/L	-	100 U	-	-	10 U	-	10 U	-	17 U
Methyl cyclohexane	ug/L	-	10 U	-	-	1.0 U	-	1.0 U	-	1.7 U
Methyl tert butyl ether (MTBE)	ug/L	-	**300**	-	-	5.0 U	-	5.0 U	-	**41**
Methylene chloride	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Styrene	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Tetrachloroethene	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Toluene	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
trans-1,2-Dichloroethene	ug/L	-	10 U	-	-	1.0 U	-	1.0 U	-	1.7 U
trans-1,3-Dichloropropene	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Trichloroethene	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Trichlorofluoromethane (CFC-11)	ug/L	-	10 U	-	-	1.0 U	-	1.0 U	-	1.7 U
Trifluorotrichloroethane (Freon 113)	ug/L	-	10 U	-	-	1.0 U	-	1.0 U	-	1.7 U
Vinyl chloride	ug/L	11 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7 U
Xylenes (total)	ug/L	22 U	20 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	3.3 U

TABLE 1

ANALYTICAL RESULTS SUMMARY
SOLVENT PLUME MONITORING, 2011-2012
GENERAL MOTORS COMPANY
TONAWANDA, NEW YORK

Location ID:		*MW-3*	*MW-3*	*MW-9*	*MW-9*	*MW-9*	*MW-101*	*MW-101*	*MW-102*	*MW-102*
Sample Name:		*GW-17390-042711-KL-08*	*WG-17390-032712-KL-08*	*GW-17390-042711-KL-10*	*GW-17390-042711-KL-11*	*WG-17390-032712-KL-05*	*GW-17390-042611-KL-05*	*WG-17390-032812-KL-14*	*GW-17390-042511-KL-01*	*WG-17390-032712-KL-09*
Sample Date:		*4/27/2011*	*3/27/2012*	*4/28/2011*	*4/28/2011*	*3/27/2012*	*4/26/2011*	*3/28/2012*	*4/25/2011*	*3/27/2012*
					Duplicate					
Parameters	***Units***									
Dissolved Gases										
Ethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	-	0.50 U	-
Methane	ug/L	1300	1600	0.71	0.68	0.15 J	14	-	61	-
Wet Chemistry										
Alkalinity, total (as CaCO3)	ug/L	612000 J	650000	317000	321000	360000	311000	-	395000 J	-
Ammonia	ug/L	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U	-	2000 U	-
Anaerobic 1,1,1-TCA specific microbial population	cfu/mL	-	-	-	-	-	-	-	-	-
Biochemical oxygen demand (BOD)	ug/L	9000	8000	2000 U	2000 U	2000 U	3000	-	2000 U	-
Chemical oxygen demand (COD)	ug/L	48000	62000	11000	16000	16000 J	790000	-	16000	-
Dehalobacter spp.	unknown	-	-	-	-	-	-	-	-	-
Dehalococcoides spp.	unknown	-	-	-	-	-	-	-	-	-
Nitrate (as N)	ug/L	41 J	100 U	83 J	76 J	120	1900	-	110	-
Nitrite (as N)	ug/L	500 U	100 U	500 UJ	500 UJ	100 U	20000 UJ	-	100 U	-
Orthophosphate	ug/L	-	100 U	-	-	100 U	-	-	-	-
Phosphorus	ug/L	67 J	-	33 J	100 U	-	35 J	-	72 J	-
Sulfate	ug/L	278000	280000	758000	711000	580000	805000	-	239000	-
Sulfide	ug/L	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U	-	1000 U	-
TOC averages	ug/L	-	11000	-	-	5100	-	-	-	-
Total microbial population - aerobic	cfu/mL	-	-	-	-	-	-	-	-	-
Total microbial population - anaerobic	cfu/mL	-	-	-	-	-	-	-	-	-
Total organic carbon (TOC)	ug/L	12000	-	6000	6000	-	4000	-	9000	-
Field Parameters										
Conductivity	mS/cm	-	2.13	-	-	2.61	-	26.7	-	1.6
Dissolved oxygen (DO)	ug/L	-	160	-	-	3870	-	2160	-	210
Oxidation reduction potential (ORP)	millivolts	-	-88	-	-	93	-	70	-	-100
pH	s.u.	-	9.41	-	-	7.35	-	7.16	-	7.24
Temperature, field	Deg C	-	10.2	-	-	4.9	-	11.2	-	10.1
Temperature, field	Deg F	-	-	-	-	-	-	-	-	-
Turbidity	NTU	-	-	-	-	0	-	0.4	-	0

s:

NYSDEC TOGs Groundwater Standards and Guidance - NYSDEC Di
Operational Guidance Series (1.1.1) Ambient Water Quality Standard
June 1998 and addenda.

Value exceeds criteria.

Not present at or above the associated value.

Estimated.

Micrograms per liter.

Not analyzed.

TABLE 1

ANALYTICAL RESULTS SUMMARY
SOLVENT PLUME MONITORING, 2011-2012
GENERAL MOTORS COMPANY
TONAWANDA, NEW YORK

Location ID:		*MW-103*	*MW-103*	*MW-11*	*MW-11*	*MW-11*	*MW-11*	*MW-12*	*MW-12*	*MW-12*
Sample Name:		*GW-17390-042711-KL-09*	*WG-17390-032812-KL-13*	*GW-17390-042611-KL-07*	*WG-17390-121911-KL-02*	*WG-17390-121911-KL-03*	*WG-17390-032612-KL-03*	*GW-17390-042611-KL-06*	*WG-17390-121911-KL-04*	*WG-17390-032712-KL-04*
Sample Date:		*4/28/2011*	*3/28/2012*	*4/26/2011*	*12/19/2011*	*12/19/2011*	*3/26/2012*	*4/26/2011*	*12/19/2011*	*3/27/2012*
						Duplicate				
Parameters	***Units***									
Volatile Organic Compounds										
1,1,1-Trichloroethane	ug/L	1.0 U	1.0 U	730	760	730	550	2.0 U	3.3 U	3.3 U
1,1,2,2-Tetrachloroethane	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
1,1,2-Trichloroethane	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
1,1-Dichloroethane	ug/L	1.0 U	1.0 U	2400	2600	2500	2500	68	83	72
1,1-Dichloroethene	ug/L	1.0 U	1.0 U	1800	2100	2100	1800	2.0 U	3.3 U	3.3 U
1,2,4-Trichlorobenzene	ug/L	-	1.0 U	-	130 U	130 U	83 U	-	3.3 U	3.3 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	-	2.0 U	-	250 U	250 U	170 U	-	6.7 U	6.7 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	-	1.0 U	-	130 U	130 U	83 U	-	3.3 U	3.3 U
1,2-Dichlorobenzene	ug/L	-	1.0 U	-	130 U	130 U	83 U	-	3.3 U	3.3 U
1,2-Dichloroethane	ug/L	1.0 U	1.0 U	16 J	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
1,2-Dichloroethene (total)	ug/L	2.0 U	-	98 J	-	-	-	4.0 U	-	-
1,2-Dichloropropane	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
1,3-Dichlorobenzene	ug/L	-	1.0 U	-	130 U	130 U	83 U	-	3.3 U	3.3 U
1,4-Dichlorobenzene	ug/L	-	1.0 U	-	130 U	130 U	83 U	-	3.3 U	3.3 U
1,4-Dioxane	ug/L	50 U	-	3600 U	-	-	4200 U	100 U	-	170 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	10 U	10 U	710 U	1300 U	1300 U	830 U	20 U	33 U	33 U
2-Hexanone	ug/L	10 U	10 U	710 U	1300 U	1300 U	830 U	20 U	33 U	33 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	10 U	10 U	710 U	1300 U	1300 U	830 U	20 U	33 U	33 U
Acetone	ug/L	10 U	10 U	710 U	1300 U	1300 U	130 J	20 U	33 U	33 U
Benzene	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Bromodichloromethane	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Bromoform	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Bromomethane (Methyl bromide)	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Carbon disulfide	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Carbon tetrachloride	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Chlorobenzene	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Chloroethane	ug/L	1.0 U	1.0 U	22 J	130 U	36 J	83 U	2.0 U	3.3 U	3.3 U
Chloroform (Trichloromethane)	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Chloromethane (Methyl chloride)	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
cis-1,2-Dichloroethene	ug/L	-	1.0 U	-	110 J	110 J	110	-	3.3 U	3.3 U
cis-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Cyclohexane	ug/L	-	1.0 U	-	130 U	130 U	83 U	-	3.3 U	3.3 U
Dibromochloromethane	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Dichlorodifluoromethane (CFC-12)	ug/L	-	1.0 U	-	130 U	130 U	83 U	-	8.6	8.2
Ethylbenzene	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Isopropyl benzene	ug/L	-	1.0 U	-	130 U	130 U	83 U	-	3.3 U	3.3 U
Methyl acetate	ug/L	-	10 U	-	1300 U	1300 U	830 U	-	33 U	33 U
Methyl cyclohexane	ug/L	-	1.0 U	-	130 U	130 U	83 U	-	3.3 U	3.3 U
Methyl tert butyl ether (MTBE)	ug/L	-	5.0 U	-	630 U	630 U	420 U	-	17 U	17 U
Methylene chloride	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Styrene	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Tetrachloroethene	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Toluene	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
trans-1,2-Dichloroethene	ug/L	-	1.0 U	-	130 U	130 U	83 U	-	3.3 U	3.3 U
trans-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Trichloroethene	ug/L	1.0 U	1.0 U	71 U	130 U	130 U	16 J	2.0 U	3.3 U	3.3 U
Trichlorofluoromethane (CFC-11)	ug/L	-	1.0 U	-	130 U	130 U	83 U	-	3.3 U	3.3 U
Trifluorotrichloroethane (Freon 113)	ug/L	-	1.0 U	-	130 U	130 U	83 U	-	3.3 U	3.3 U
Vinyl chloride	ug/L	1.0 U	1.0 U	31 J	130 U	130 U	83 U	2.0 U	3.3 U	3.3 U
Xylenes (total)	ug/L	2.0 U	2.0 U	140 U	250 U	250 U	170 U	4.0 U	6.7 U	6.7 U

TABLE 1

ANALYTICAL RESULTS SUMMARY
SOLVENT PLUME MONITORING, 2011-2012
GENERAL MOTORS COMPANY
TONAWANDA, NEW YORK

Location ID:		*MW-103*	*MW-103*	*MW-11*	*MW-11*	*MW-11*	*MW-11*	*MW-12*	*MW-12*	*MW-12*
Sample Name:		*GW-17390-042711-KL-09*	*WG-17390-032812-KL-13*	*GW-17390-042611-KL-07*	*WG-17390-121911-KL-02*	*WG-17390-121911-KL-03*	*WG-17390-032612-KL-03*	*GW-17390-042611-KL-06*	*WG-17390-121911-KL-04*	*WG-17390-032712-KL-04*
Sample Date:		*4/28/2011*	*3/28/2012*	*4/26/2011*	*12/19/2011*	*12/19/2011*	*3/26/2012*	*4/26/2011*	*12/19/2011*	*3/27/2012*
						Duplicate				
Parameters	***Units***									
Dissolved Gases										
Ethane	ug/L	0.50 U	-	4.0	5.9	6.2	0.65	0.50 U	0.50 U	0.50 U
Methane	ug/L	1.1	-	860	1200	1200	93	0.50	8.1	1.1
Wet Chemistry										
Alkalinity, total (as CaCO3)	ug/L	-	-	422000	450000	460000	440000 J	484000	510000	500000
Ammonia	ug/L	-	-	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U
Anaerobic 1,1,1-TCA specific microbial population	cfu/mL	-	-	3360	115	-	200	490	0	10
Biochemical oxygen demand (BOD)	ug/L	-	-	2000 U	2000 UJ	2000 UJ	2000 U	2000 U	2000 UJ	2000 U
Chemical oxygen demand (COD)	ug/L	-	-	180000	190000	160000	100000 J	56000	72000	45000
Dehalobacter spp.	unknown	-	-	present	present	-	present	present	present	present
Dehalococcoides spp.	unknown	-	-	absent	absent	-	absent	absent	absent	absent
Nitrate (as N)	ug/L	-	-	100 U	500 U	500 U	100 U	53 J	500 U	100 U
Nitrite (as N)	ug/L	-	-	5000 U	500 U	5000 U	2500 U	1000 U	500 U	2000 U
Orthophosphate	ug/L	-	-	-	-	-	100 U	-	-	100 U
Phosphorus	ug/L	-	-	40 J	100 U	100 U	-	40 J	100 U	-
Sulfate	ug/L	-	-	**1960000**	**2000000**	**2000000**	**3100000**	**1020000**	130000	**1100000**
Sulfide	ug/L	-	-	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U
TOC averages	ug/L	-	-	-	-	-	3100	-	-	5500
Total microbial population - aerobic	cfu/mL	-	-	40800	1670	-	555	3440	10	80
Total microbial population - anaerobic	cfu/mL	-	-	6080	1450	-	215	42400	10	10
Total organic carbon (TOC)	ug/L	14000	-	5000	6500	6900	-	7000	8400	-
Field Parameters										
Conductivity	mS/cm	-	3.62	-	14.67	-	16.3	-	5.775	5.03
Dissolved oxygen (DO)	ug/L	-	640	-	230	-	-	-	1610	3700
Oxidation reduction potential (ORP)	millivolts	-	-65	-	-12.7	-	97	-	43.8	79
pH	s.u.	-	7.78	-	6.12	-	6.27	-	6.52	6.99
Temperature, field	Deg C	-	16.8	-	-	-	10.1	-	-	8.5
Temperature, field	Deg F	-	-	-	10.04	-	-	-	10	-
Turbidity	NTU	-	-	-	5.2	-	-	-	0.2	140

s:
NYSDEC TOGs Groundwater Standards and Guidance - NYSDEC Di
Operational Guidance Series (1.1.1) Ambient Water Quality Standard
June 1998 and addenda.
Value exceeds criteria.
Not present at or above the associated value.
Estimated.
Micrograms per liter.
Not analyzed.

TABLE 2

ANALYTICAL RESULTS SUMMARY
PETROLEUM IMPACTS MONITORING, 2008-2012
GENERAL MOTORS COMPANY
TONAWANDA, NEW YORK

Location ID:				*MW-2*	*MW-2*	*MW-2*
Sample Name:				*WG-30264-103108-DJT-006*	*WG-017390-101909-002*	*WG-17390-032612-KL-01*
Sample Date:				*10/31/2008*	*10/19/2009*	*3/26/2012*
		NYSDEC TOGs Groundwater [1]				
Parameters	*Units*	*Guidance Value*	*Standard*			
Volatile Organic Compounds						
1,2,4-Trimethylbenzene	ug/L		5	2500 U	**19 J**	830 U
1,3,5-Trimethylbenzene	ug/L		5	2500 U	420 U	830 U
2-Phenylbutane (sec-Butylbenzene)	ug/L		5	2500 U	420 U	830 U
Benzene	ug/L		1	**190 J**	**220**	**270 J**
Cymene (p-Isopropyltoluene)	ug/L		5	2500 U	420 U	830 U
Ethylbenzene	ug/L		5	**93 J**	**86 J**	**160 J**
Isopropyl benzene	ug/L		5	2500 U	420 U	830 U
Methyl tert butyl ether (MTBE)	ug/L	10		5000 U	830 U	4200 U
Naphthalene	ug/L	10		5000 U	830 U	830 U
N-Butylbenzene	ug/L		5	2500 U	420 U	830 U
N-Propylbenzene	ug/L		5	2500 U	420 U	830 U
tert-Butylbenzene	ug/L		5	2500 U	420 U	830 U
Toluene	ug/L		5	**120 J**	**120 J**	**180 J**
Xylenes (total)	ug/L			600 J	620	680 J

Notes:

[1] NYSDEC TOGs Groundwater Standards and Guidance - NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values, dated June 1998 and addenda.

220 Value exceeds criteria.

U Not present at or above the associated value.

J Estimated.

ug/L Micrograms per liter.

ANALYTICAL RESULTS SUMMARY
PETROLEUM IMPACTS MONITORING, 2008-2012
GENERAL MOTORS COMPANY
TONAWANDA, NEW YORK

Location ID:				*MW-3*	*MW-3*	*MW-3*
Sample Name:				*WG-30264-103108-DJT-003*	*WG-017390-101909-005*	*WG-17390-032712-KL-08*
Sample Date:				*10/31/2008*	*10/19/2009*	*3/27/2012*
		NYSDEC TOGs Groundwater [1]				
Parameters	*Units*	*Guidance Value*	*Standard*			
Volatile Organic Compounds						
1,2,4-Trimethylbenzene	ug/L		5	20 U	5.0 U	10 U
1,3,5-Trimethylbenzene	ug/L		5	20 U	5.0 U	10 U
2-Phenylbutane (sec-Butylbenzene)	ug/L		5	20 U	5.0 U	10 U
Benzene	ug/L		1	**12**	**3.9**	**6.1 J**
Cymene (p-Isopropyltoluene)	ug/L		5	20 U	5.0 U	10 U
Ethylbenzene	ug/L		5	20 U	5.0 U	10 U
Isopropyl benzene	ug/L		5	20 U	0.21 J	10 U
Methyl tert butyl ether (MTBE)	ug/L	10		**130**	**160**	**300**
Naphthalene	ug/L	10		40 U	10 U	10 U
N-Butylbenzene	ug/L		5	20 U	5.0 U	10 U
N-Propylbenzene	ug/L		5	20 U	5.0 U	10 U
tert-Butylbenzene	ug/L		5	20 U	5.0 U	10 U
Toluene	ug/L		5	20 U	5.0 U	10 U
Xylenes (total)	ug/L			20 U	5.0 U	20 U

NYSDEC TOGs Groundwater Standards and Guidance - NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values, dated June 1998 and addenda.

Value exceeds criteria.

Not present at or above the associated value.

Estimated.

Micrograms per liter.

TABLE 2

ANALYTICAL RESULTS SUMMARY
PETROLEUM IMPACTS MONITORING, 2008-2012
GENERAL MOTORS COMPANY
TONAWANDA, NEW YORK

Location ID:				*MW-4*	*MW-4*	*MW-4*
Sample Name:				*WG-30264-103108-DJT-002*	*WG-017390-101909-006*	*WG-17390-032712-KL-10*
Sample Date:				*10/31/2008*	*10/19/2009*	*3/27/2012*
		NYSDEC TOGs Groundwater [1]				
Parameters	*Units*	*Guidance Value*	*Standard*			
Volatile Organic Compounds						
1,2,4-Trimethylbenzene	ug/L		5	5.0 U	5.0 U	1.0 U
1,3,5-Trimethylbenzene	ug/L		5	5.0 U	5.0 U	1.0 U
2-Phenylbutane (sec-Butylbenzene)	ug/L		5	5.0 U	5.0 U	1.0 U
Benzene	ug/L		1	1.0 U	1.0 U	1.0 U
Cymene (p-Isopropyltoluene)	ug/L		5	5.0 U	5.0 U	1.0 U
Ethylbenzene	ug/L		5	5.0 U	5.0 U	1.0 U
Isopropyl benzene	ug/L		5	5.0 U	5.0 U	1.0 U
Methyl tert butyl ether (MTBE)	ug/L	10		8.9 J	**12**	**18**
Naphthalene	ug/L	10		10 U	10 U	1.0 U
N-Butylbenzene	ug/L		5	5.0 U	5.0 U	1.0 U
N-Propylbenzene	ug/L		5	5.0 U	5.0 U	1.0 U
tert-Butylbenzene	ug/L		5	5.0 U	5.0 U	1.0 U
Toluene	ug/L		5	5.0 U	5.0 U	1.0 U
Xylenes (total)	ug/L			5.0 U	5.0 U	2.0 U

NYSDEC TOGs Groundwater Standards and Guidance - NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values, dated June 1998 and addenda.
Value exceeds criteria.
Not present at or above the associated value.
Estimated.
Micrograms per liter.

ANALYTICAL RESULTS SUMMARY
PETROLEUM IMPACTS MONITORING, 2008-2012
GENERAL MOTORS COMPANY
TONAWANDA, NEW YORK

Location ID:				*MW-5*	*MW-5*	*MW-5*
Sample Name:				*WG-30264-103108-DJT-001*	*WG-017390-101909-007*	*WG-17390-032712-KL-12*
Sample Date:				*10/31/2008*	*10/19/2009*	*3/27/2012*
		NYSDEC TOGs Groundwater [1]				
Parameters	*Units*	*Guidance Value*	*Standard*			
Volatile Organic Compounds						
1,2,4-Trimethylbenzene	ug/L		5	5.0 U	5.0 U	1.0 U
1,3,5-Trimethylbenzene	ug/L		5	5.0 U	5.0 U	1.0 U
2-Phenylbutane (sec-Butylbenzene)	ug/L		5	5.0 U	5.0 U	1.0 U
Benzene	ug/L		1	1.0 U	1.0 U	0.38 J
Cymene (p-Isopropyltoluene)	ug/L		5	5.0 U	5.0 U	1.0 U
Ethylbenzene	ug/L		5	5.0 U	5.0 U	1.0 U
Isopropyl benzene	ug/L		5	5.0 U	5.0 U	1.0 U
Methyl tert butyl ether (MTBE)	ug/L	10		8.8 J	7.3 J	4.3 J
Naphthalene	ug/L	10		10 U	10 U	1.0 U
N-Butylbenzene	ug/L		5	5.0 U	5.0 U	1.0 U
N-Propylbenzene	ug/L		5	5.0 U	5.0 U	1.0 U
tert-Butylbenzene	ug/L		5	5.0 U	5.0 U	1.0 U
Toluene	ug/L		5	5.0 U	5.0 U	1.9
Xylenes (total)	ug/L			5.0 U	5.0 U	0.93 J

:

NYSDEC TOGs Groundwater Standards and Guidance - NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values, dated June 1998 and addenda.

Value exceeds criteria.

Not present at or above the associated value.

Estimated.

Micrograms per liter.

ATTACHMENT 1

ATTATCHMENT 1

Ref. No. 017390

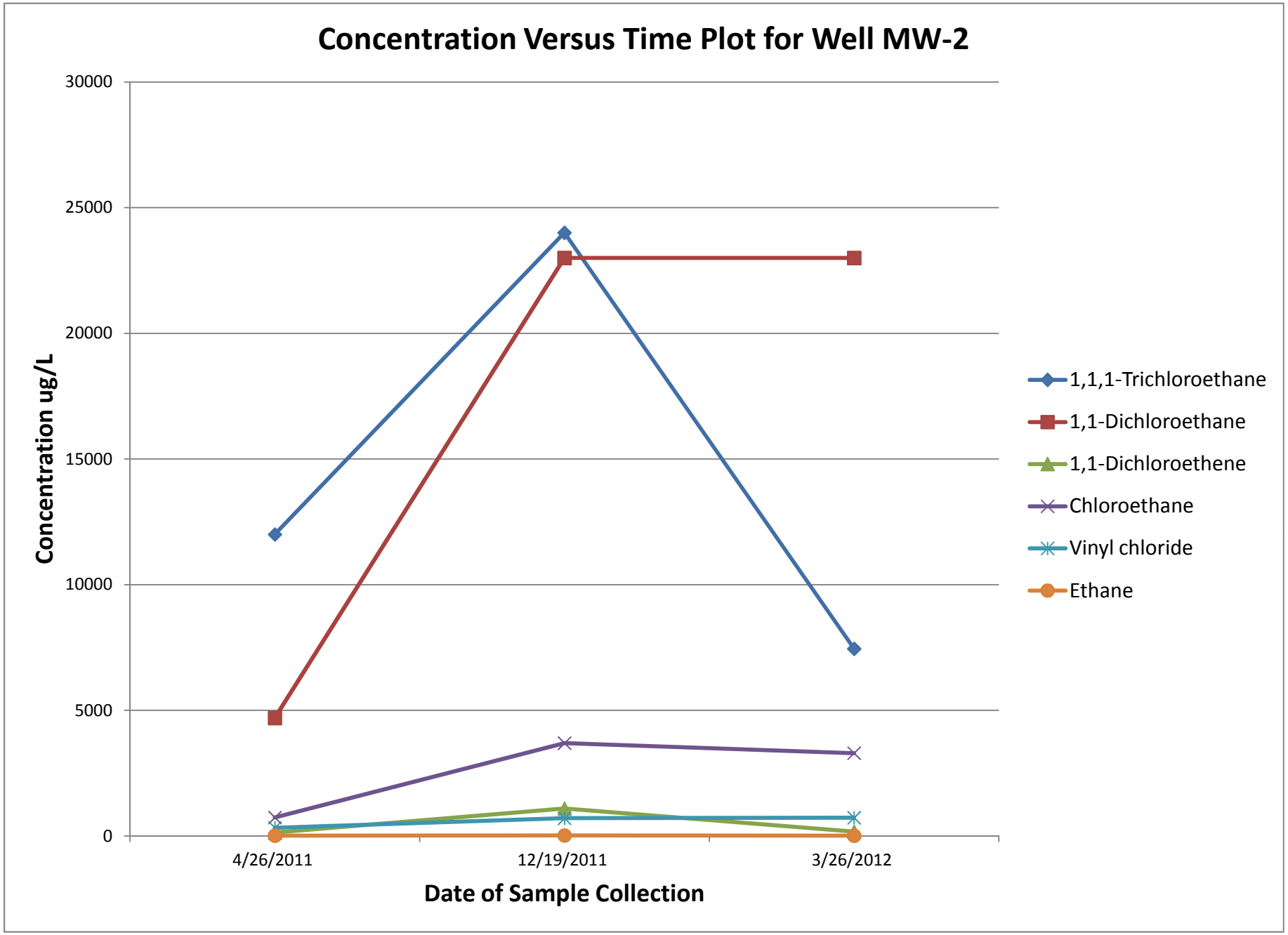
INJECTION SUMMARY
ENDOLINE AREA ENHANCED ATTENUATION
GENERAL MOTORS COMPANY
TONAWANDA, NEW YORK

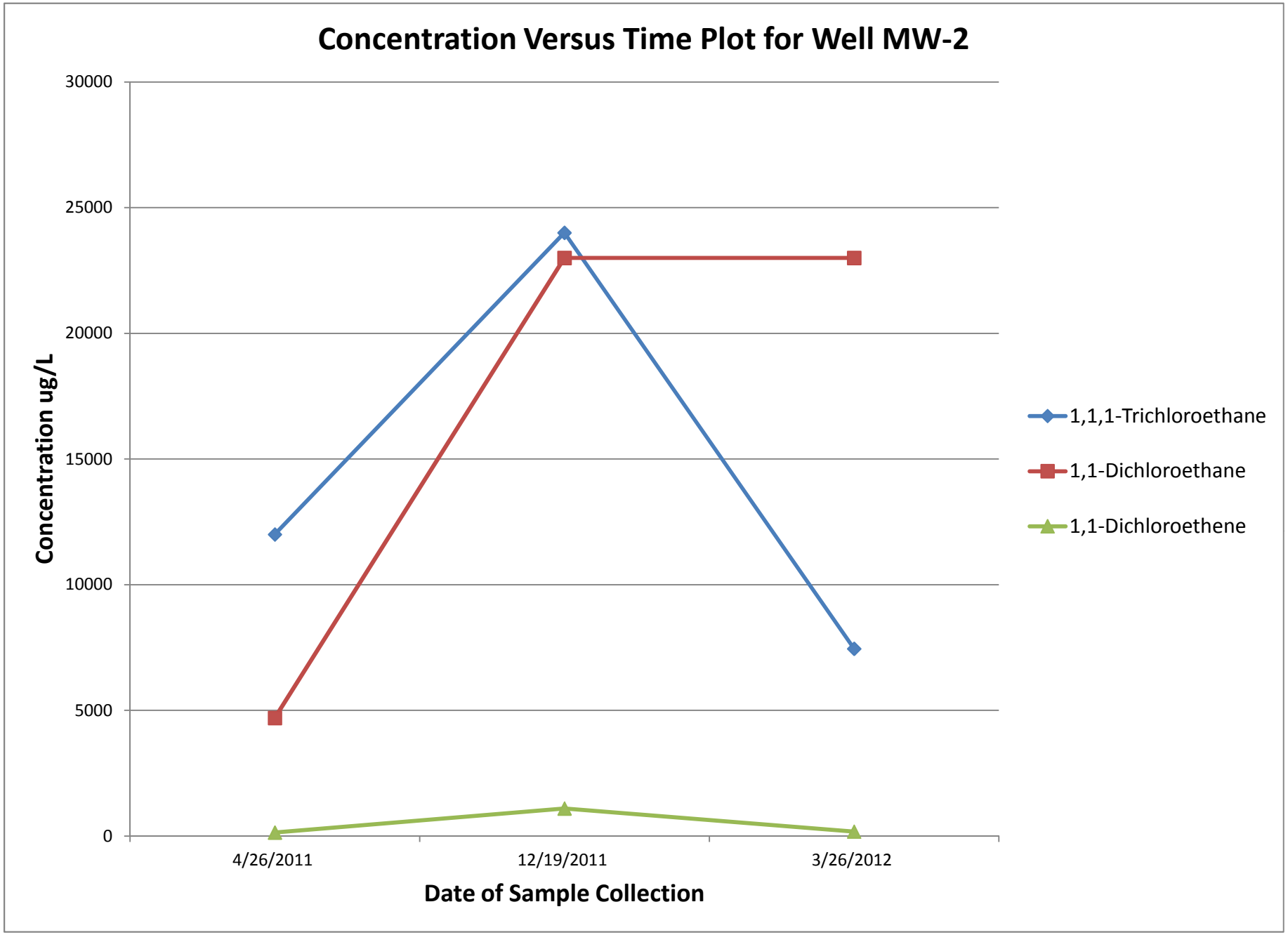
Round 1 Well	Well Head Pressure (PSI)	Gals. Pumped 09/13/11	09/14/11	09/15/11	Total into Well (Gals)	Flush water (Gals.) 09/15/11	9/16/2011
IP-14	5	163	177		340		70
IP-2	8	75	193		268		68
IP-3	10	13	0		13		6
IP-13	10	6	0		6		0.6
IP-12	2	360	163		523		116
IP-15	10	1	0		1		0
IP-4	0		47	34.3	81.3	24	
IP-5	15		2		2		0.9
IP-11	15		3.5		3.5		0.5
IP-10	15		10.8		10.8		0
IP-9	3		495		495		110
IP-8	15		1		1		0.5
IP-16	16		10.5	0.2	10.7		0
IP-7	15		1.3		1.3		0
IP-1	7		11.1	24.1	35.2	6	
IP-6	10		32.8	180	212.8	51	
IP-17	0			447.5	447.5	94	
IP-18	6			272	272	70	
IP-A (fill zone)	5			39	39	12	
IP-B (fill zone)	5			198.5	198.5	29	
Total Gals		618	1148	1195.6	2961.6	286	372.5
Drums used		1	2	2			
Drums remain		4	2	0			

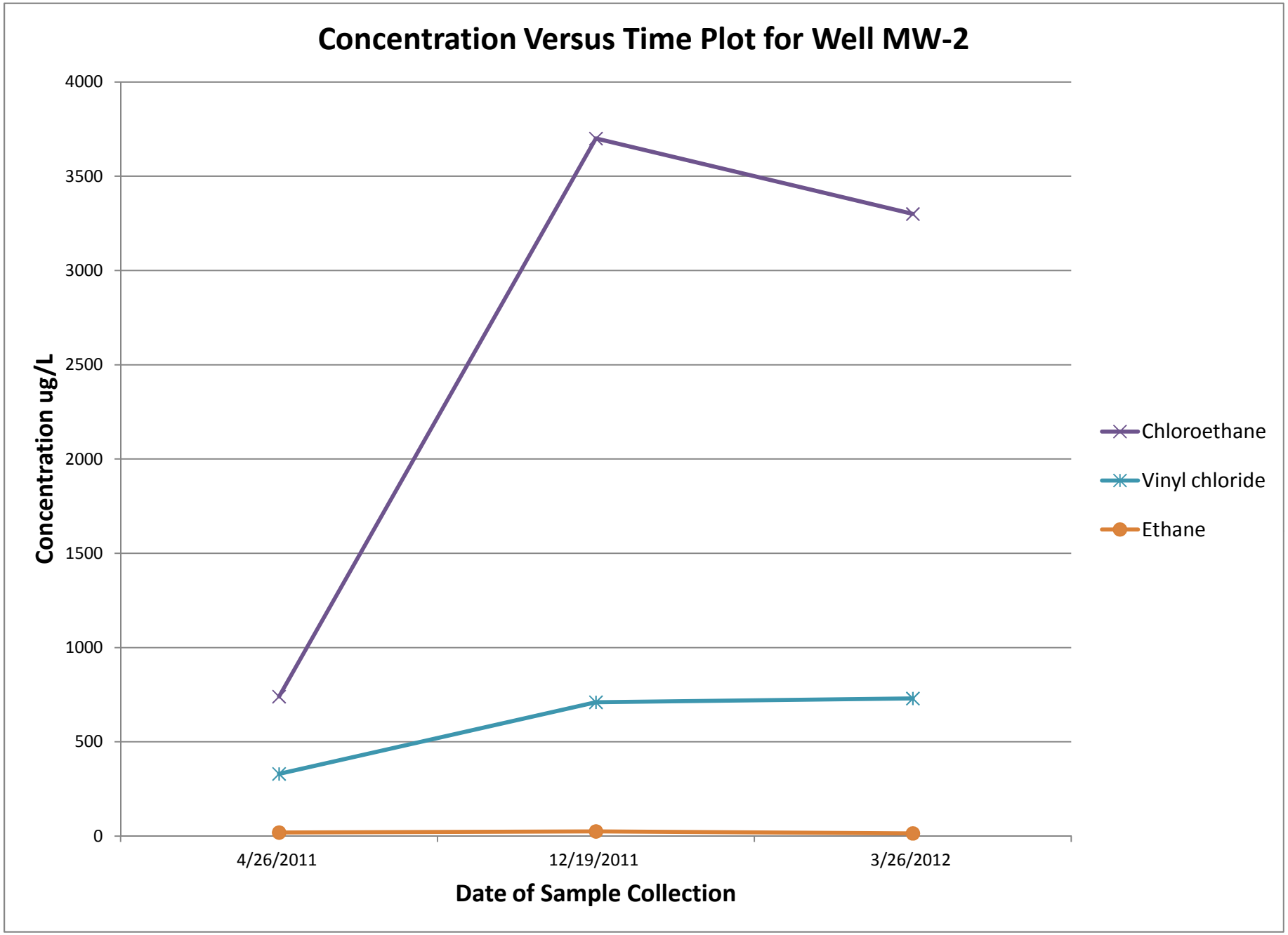
Round 2 Well	Gals. Pumped 09/21/11	09/22/11	09/23/11	Total into Well (Gals)	Flush water (Gals.) 09/23/11	09/27/11	Grand total Solution (Gals)	Total water Flush (Gals)
IP-14	160	133		293	21		633	91
IP-2	144	76		220	100		488	168
IP-3		0		0	2		13	8
IP-13		0		0	5		6	5.6
IP-12	192	260		452		193	975	309
IP-15		0		0	10		1	10
IP-4		0		0	0		81.3	24
IP-5		0		0	10		2	10.9
IP-11		104	76	180	130		183.5	130.5
IP-10		0		0		6	10.8	6
IP-9	175	140		315		100	810	210
IP-8		0		0		21	1	21.5
IP-16		0		0		20	10.7	20
IP-7		0		0		25	1.3	25
IP-1		29	57	86	125		121.2	131
IP-6	150	96		246	42		458.8	93
IP-17		217	268	485	330		932.5	424
IP-18		273	199	472	315		744	385
IP-A (fill zone)		0		0		20	39	32
IP-B (fill zone)	120	63	70	253	130		451.5	159
Total Gals	941	1391	670	3002	1220	385	5964	2264
Drums used	1.5	2.5	1					
Drums remain	3.5	1	0					

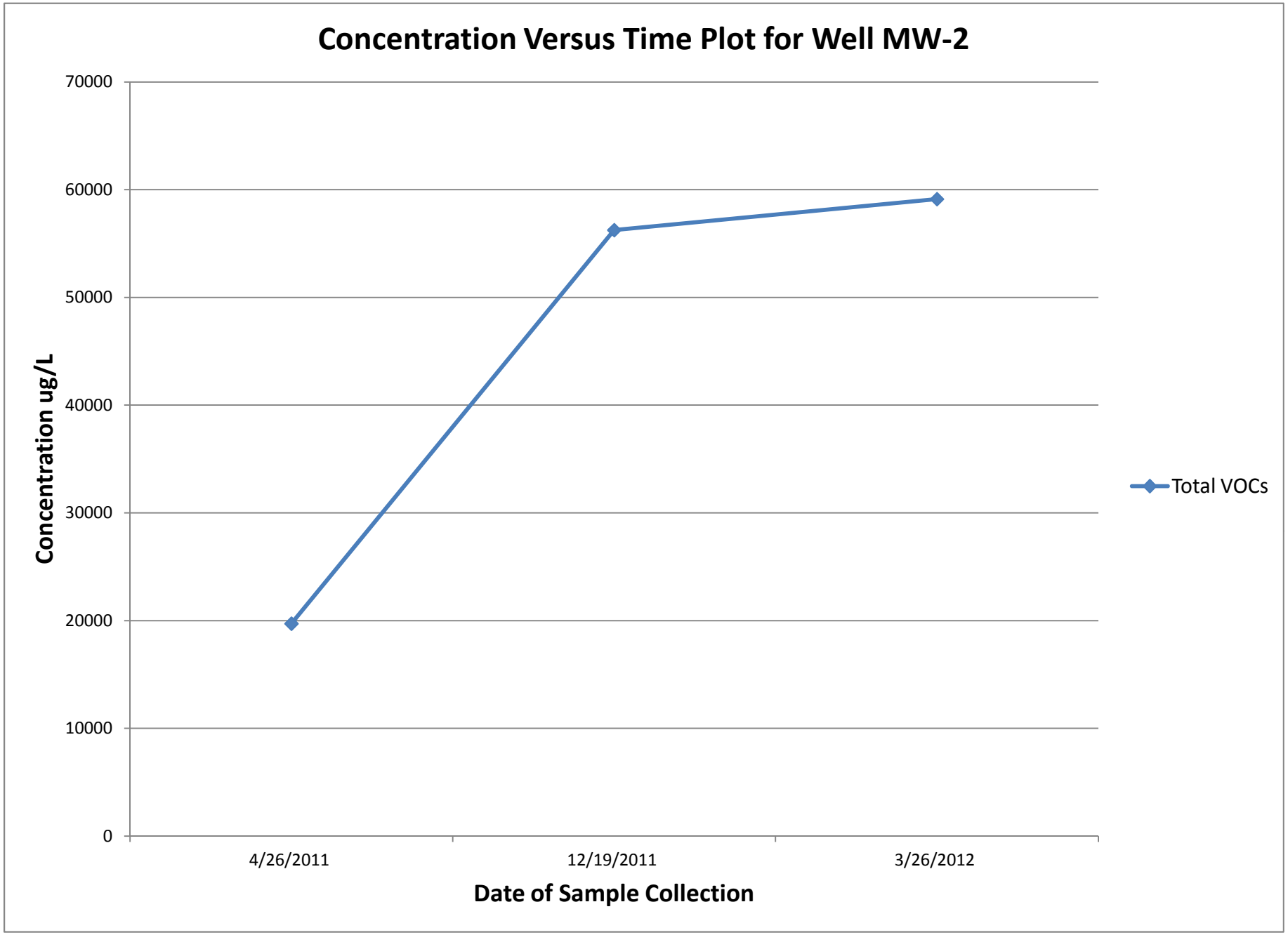
IP-11	leaks around roadbox rim into roadbox. No leakage to ground surface.
IP-9	leaks into trench drain near bldg. which drains to a pipe in SW corner of wastewater sump
IP-4 and IP-14	leakage was noted from around NE inlet about 1 foot above floor of catch basin therefore - pumping was shut down and moved away from this area.
IP-5 & IP-B	Riser loosened when removing well head
IP-A	Solution comes up around IP-10 very quickly - it may not be dispersing underground.
	For flushing, pumped out 1/2 of solution column in well and topped off well with clean water

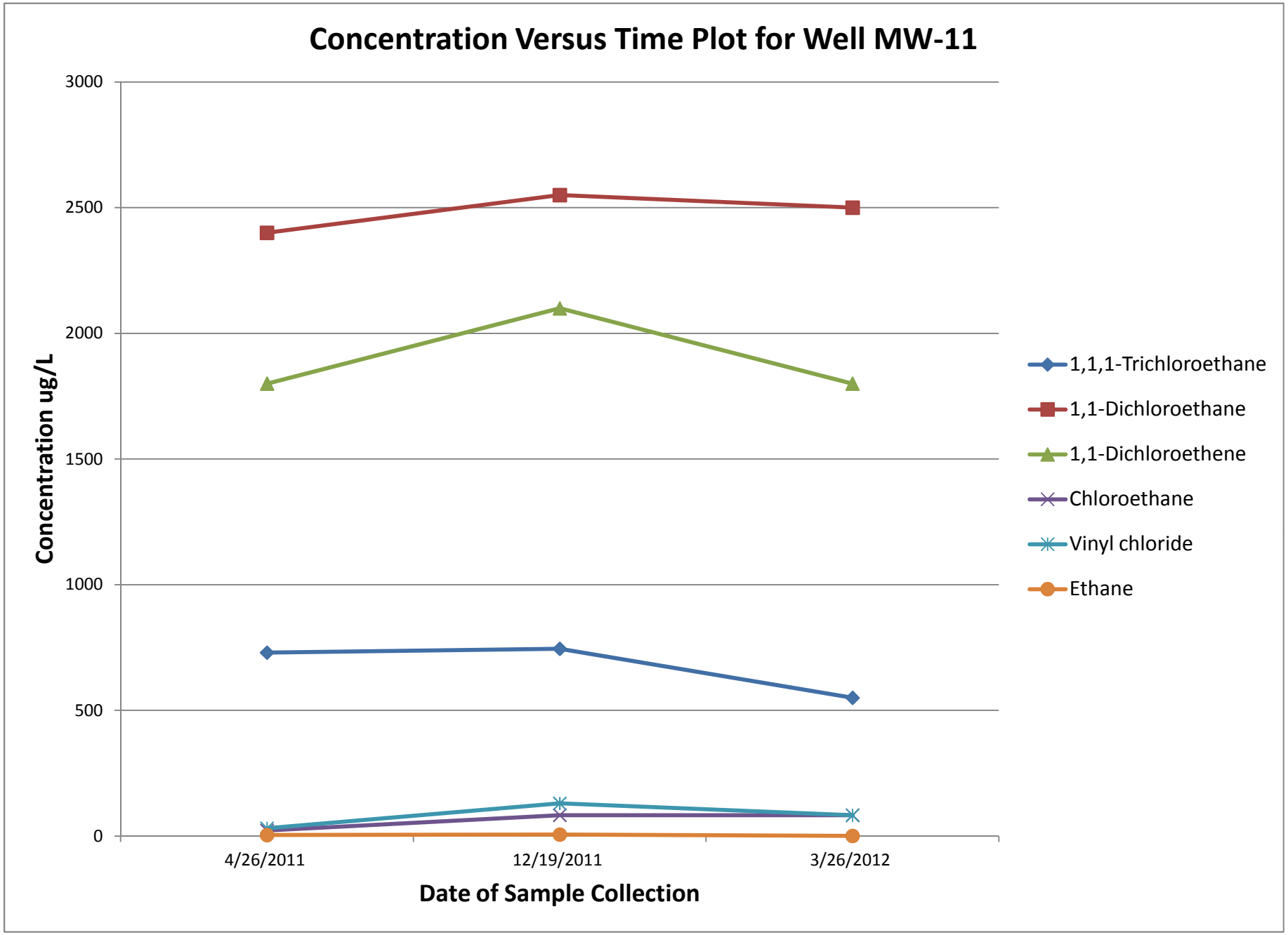
ATTACHMENT 2

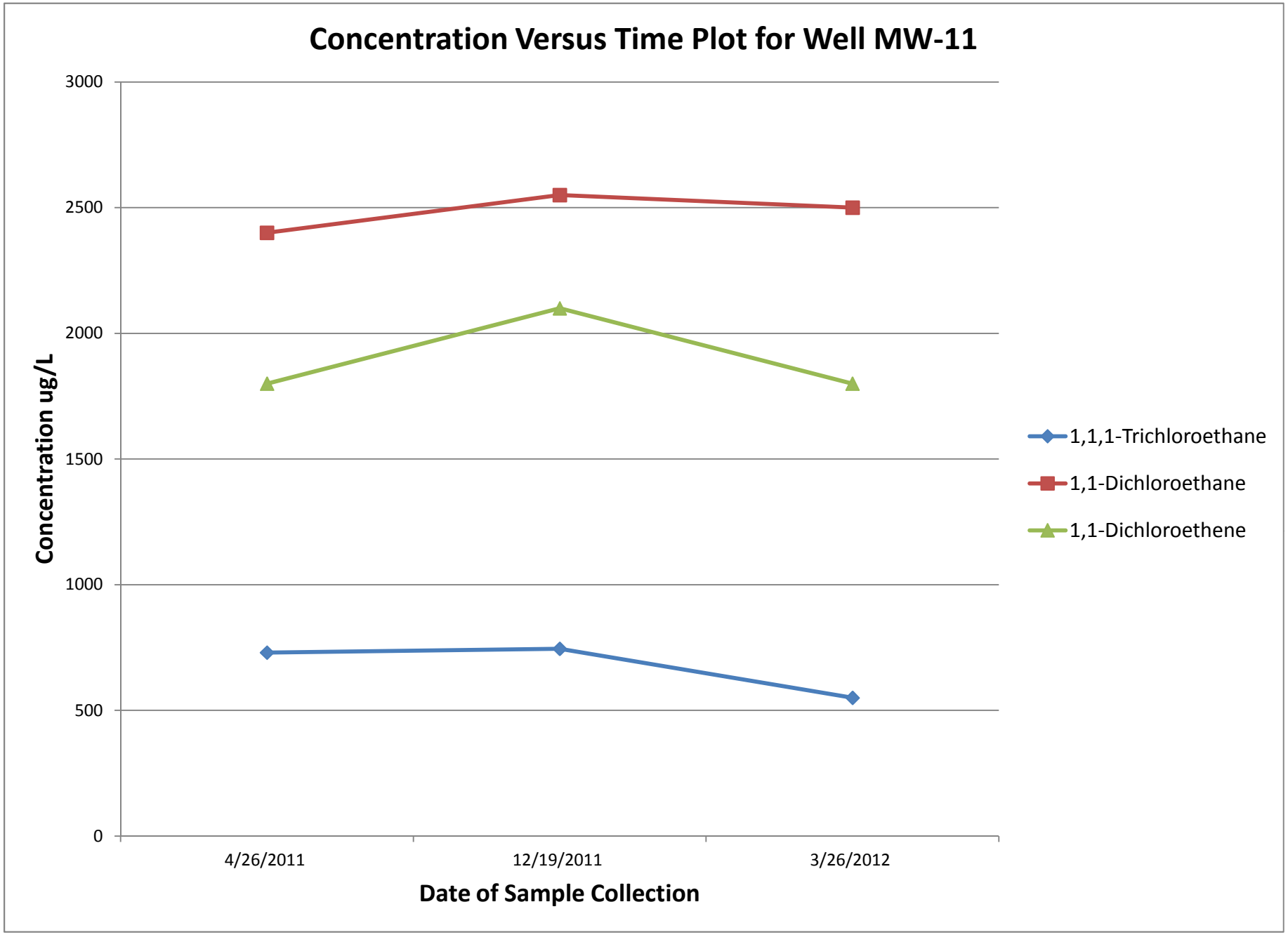

Concentration Versus Time Plot for Well MW-2
30000
25000
20000
15000
10000
5000
0
Concentration ug/L
4/26/2011
12/19/2011
3/26/2012
Date of Sample Collection
1,1,1-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
Chloroethane
Vinyl chloride
Ethane

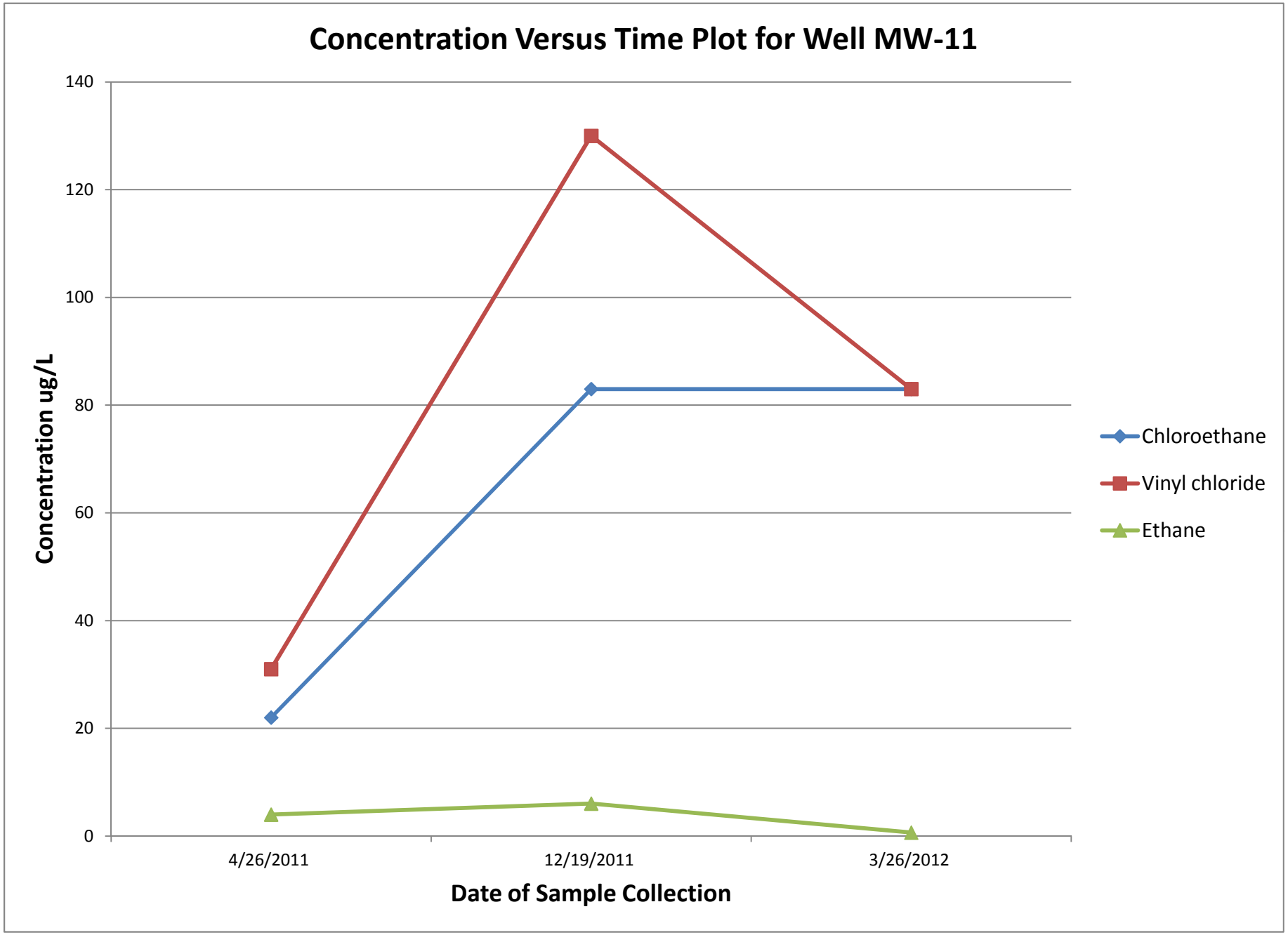

Concentration Versus Time Plot for Well MW-2
30000
25000
20000
15000
10000
5000
0
Concentration ug/L
4/26/2011
12/19/2011
3/26/2012
Date of Sample Collection
1,1,1-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene

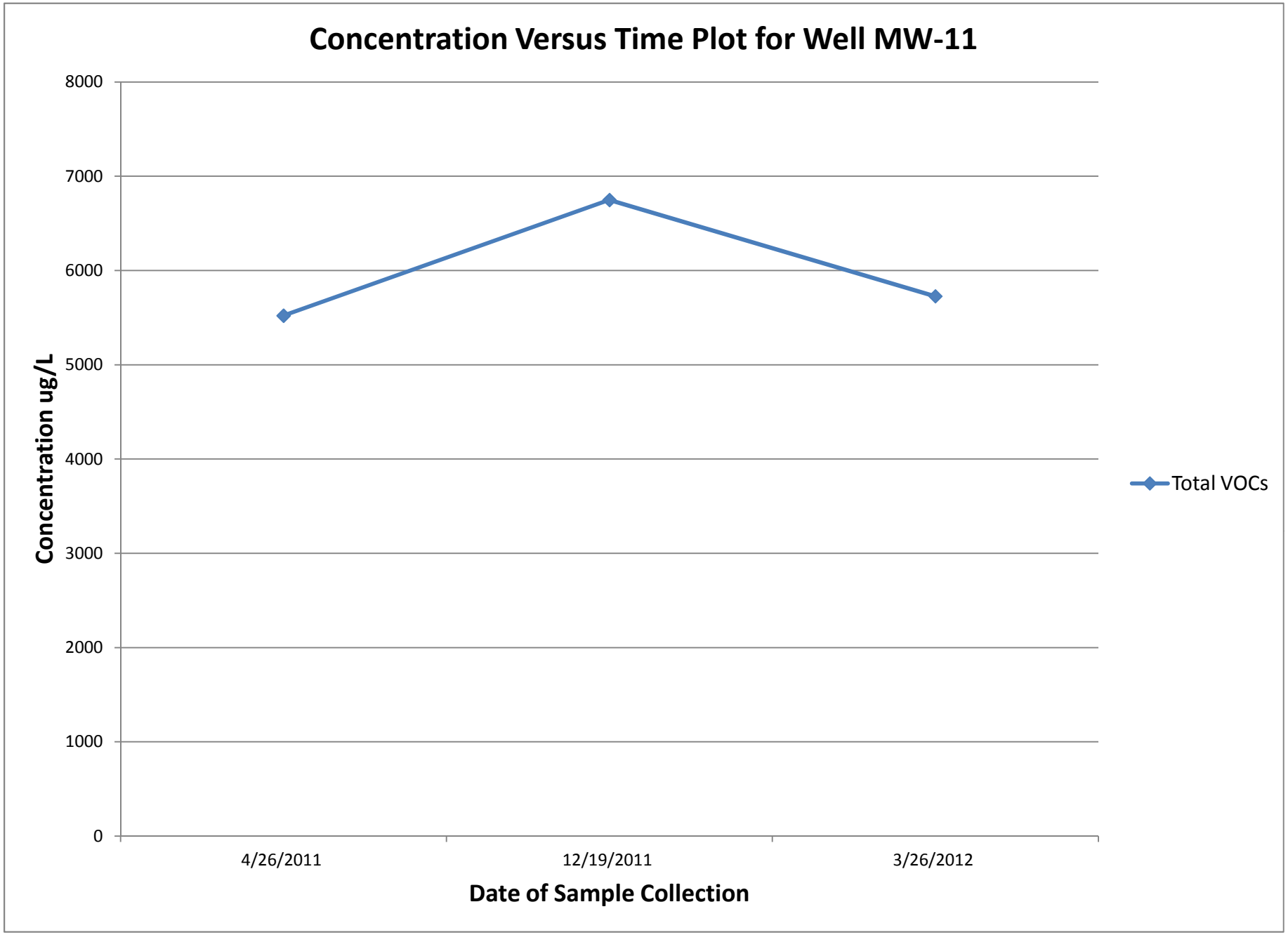

Concentration Versus Time Plot for Well MW-2
4000
3500
3000
2500
2000
1500
1000
500
0
Concentration ug/L
4/26/2011
12/19/2011
3/26/2012
Date of Sample Collection
Chloroethane
Vinyl chloride
Ethane

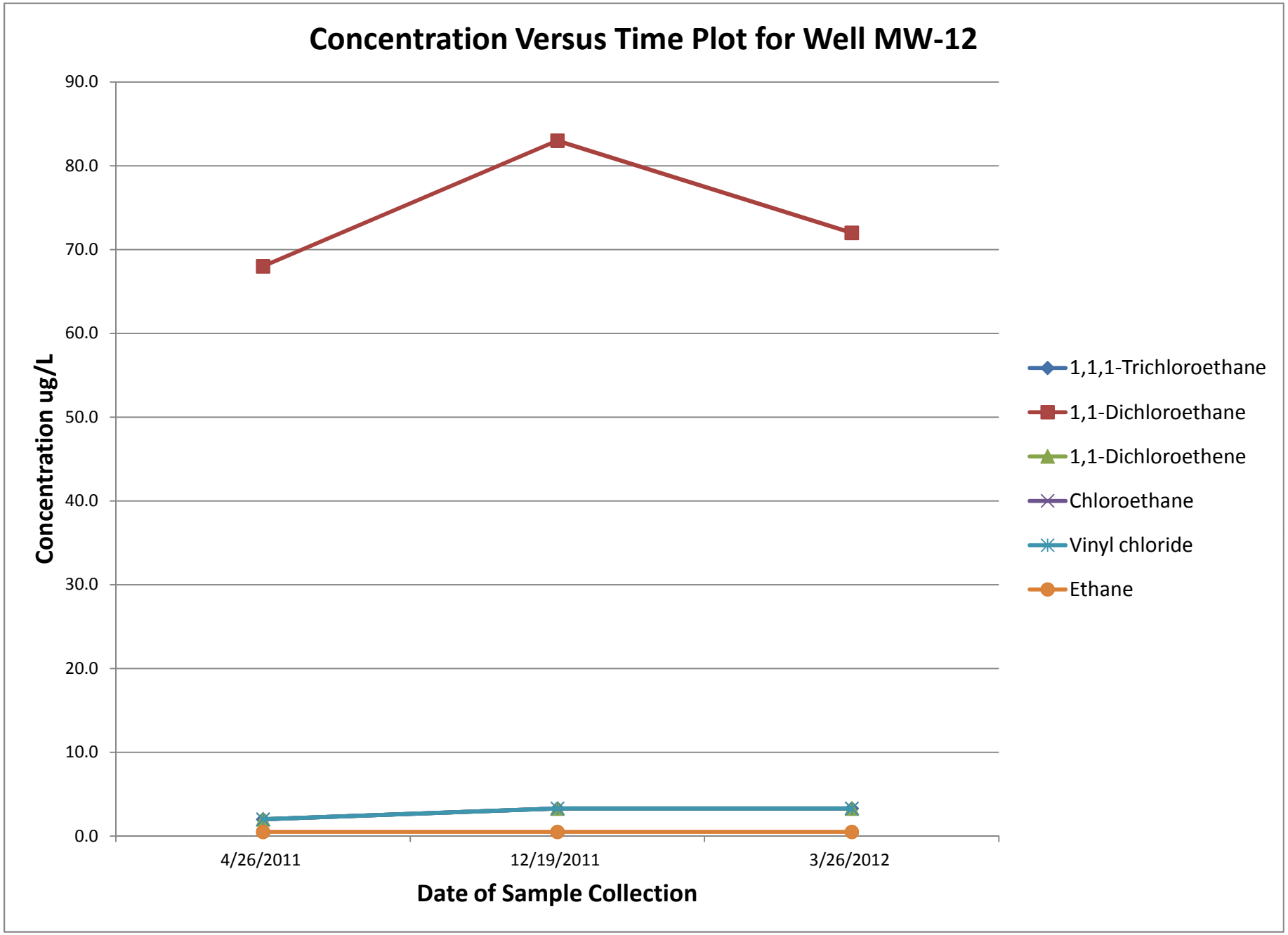

Concentration Versus Time Plot for Well MW-2
70000
60000
50000
40000
30000
20000
10000
0
Concentration ug/L
4/26/2011
12/19/2011
3/26/2012
Date of Sample Collection
Total VOCs

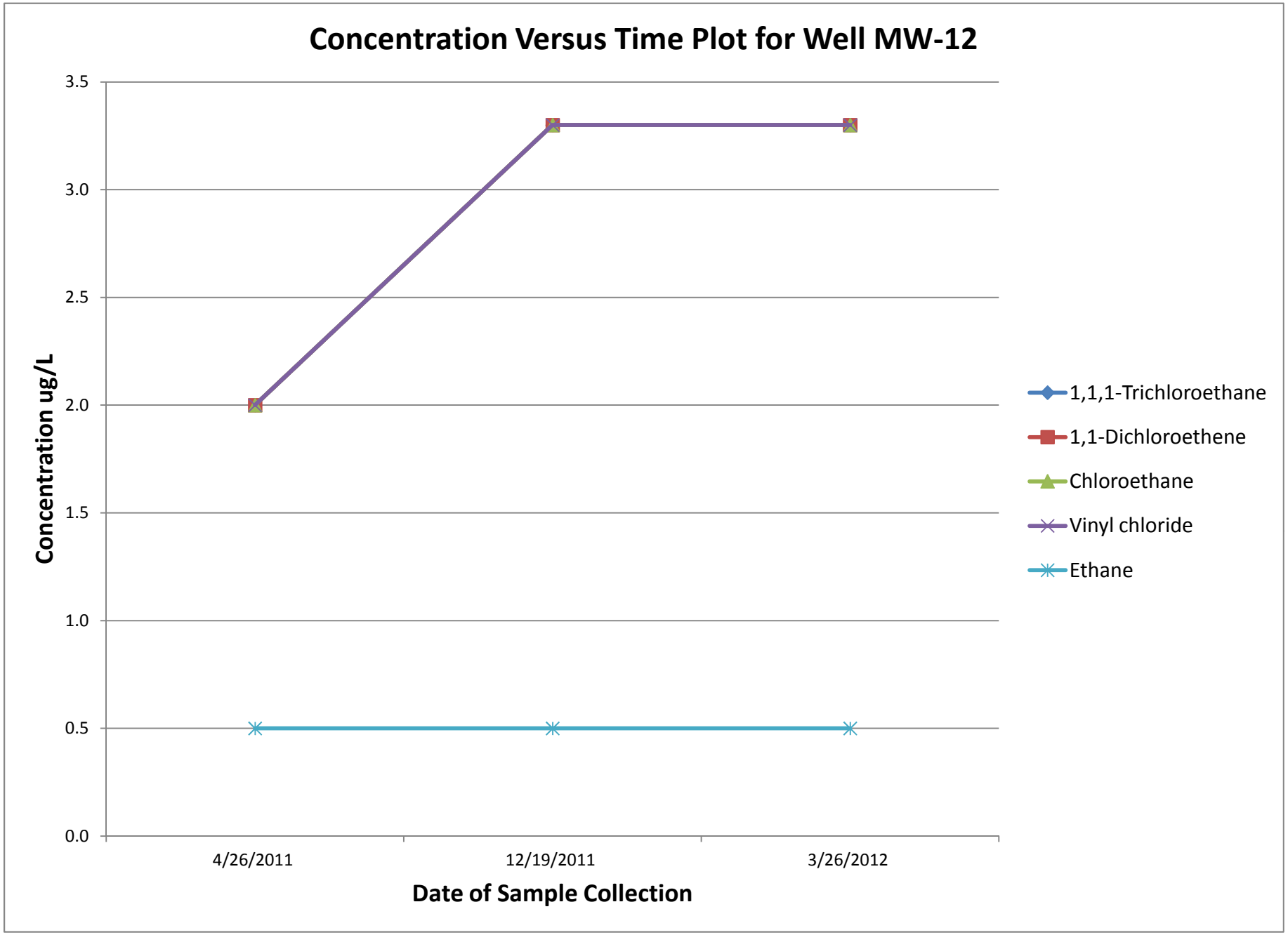

Concentration Versus Time Plot for Well MW-11
3000
2500
2000
1500
1000
500
0
Concentration ug/L
4/26/2011
12/19/2011
3/26/2012
Date of Sample Collection
1,1,1-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
Chloroethane
Vinyl chloride
Ethane

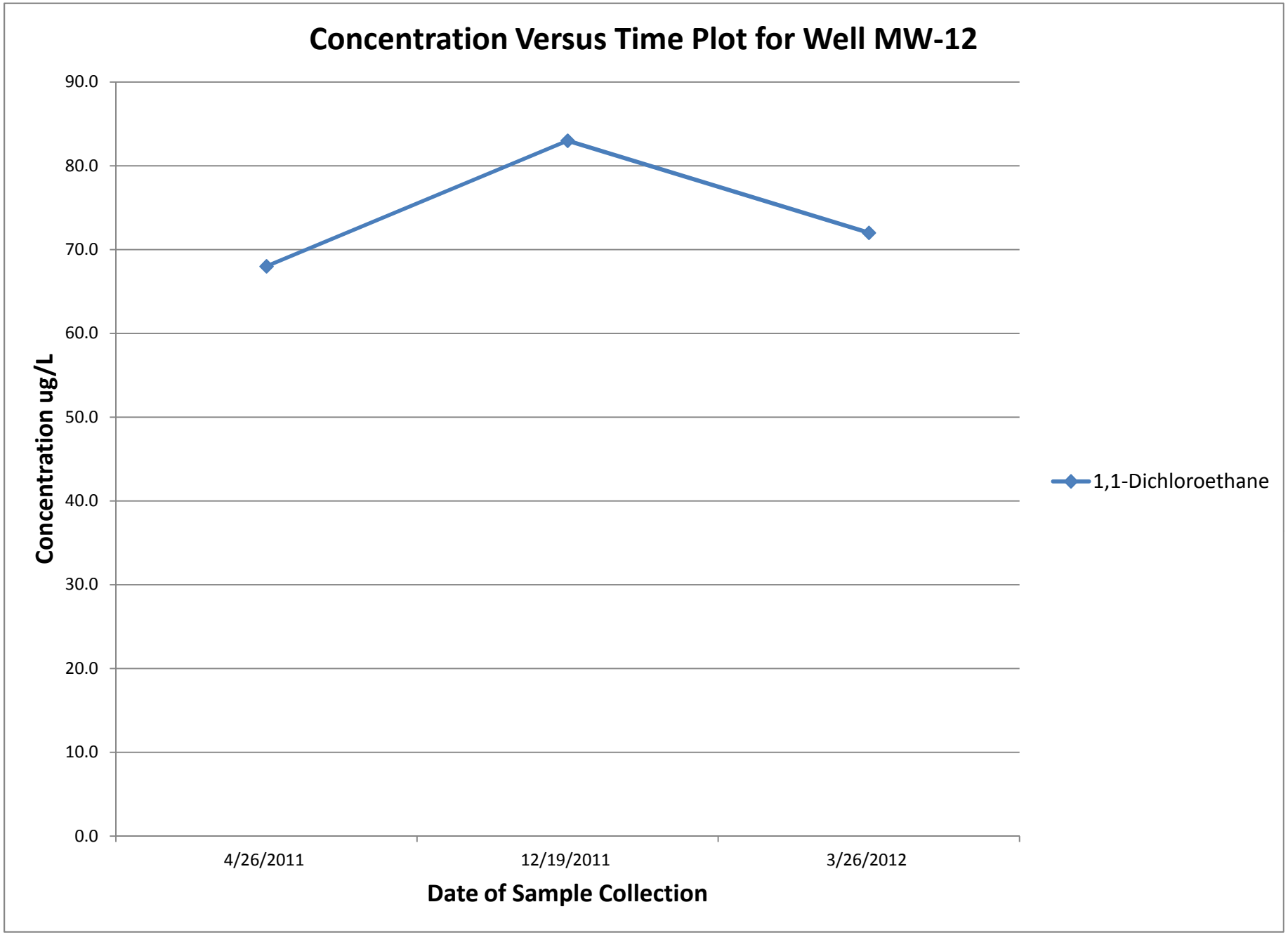

Concentration Versus Time Plot for Well MW-11
3000
2500
2000
1500
1000
500
0
Concentration ug/L
4/26/2011
12/19/2011
3/26/2012
Date of Sample Collection
1,1,1-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene

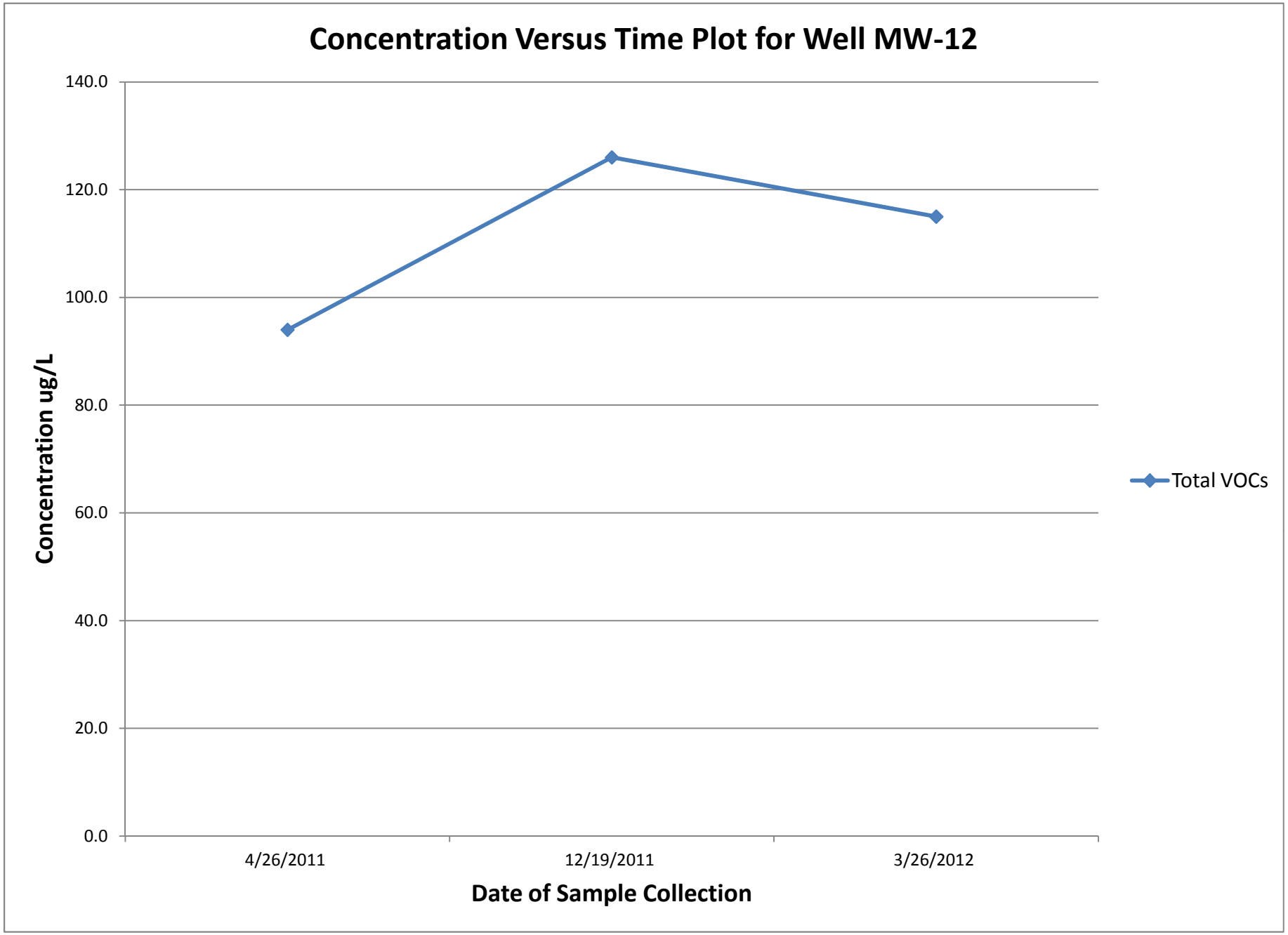

Concentration Versus Time Plot for Well MW-11
140
120
100
80
60
40
20
0
Concentration ug/L
4/26/2011
12/19/2011
3/26/2012
Date of Sample Collection
Chloroethane
Vinyl chloride
Ethane


Concentration Versus Time Plot for Well MW-11
8000
7000
6000
5000
4000
3000
2000
1000
0
Concentration ug/L
4/26/2011
12/19/2011
3/26/2012
Date of Sample Collection
Total VOCs


Concentration Versus Time Plot for Well MW-12
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Concentration ug/L
4/26/2011
12/19/2011
3/26/2012
Date of Sample Collection
1,1,1-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
Chloroethane
Vinyl chloride
Ethane


Concentration Versus Time Plot for Well MW-12
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Concentration ug/L
4/26/2011
12/19/2011
3/26/2012
Date of Sample Collection
1,1,1-Trichloroethane
1,1-Dichloroethene
Chloroethane
Vinyl chloride
Ethane


Concentration Versus Time Plot for Well MW-12
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Concentration ug/L
4/26/2011
12/19/2011
3/26/2012
Date of Sample Collection
1,1-Dichloroethane


Concentration Versus Time Plot for Well MW-12
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Concentration ug/L
4/26/2011
12/19/2011
3/26/2012
Date of Sample Collection
Total VOCs