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REPORTS

DATE:

2005

IRO248

ARCADIS
Infrastructure, environment, facilities

ARCADIS G&M, Inc.
5100 E Skelly Drive
Suite 1000
Tulsa
Oklahoma 74135
Tel 918 664 9900
Fax 918 664 9925

ENVIRONMENTAL

Mr. Wayne Price
New Mexico Energy, Mineral and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Tulsa, Oklahoma
06 April 2006

Contact:
Michael M. Gates

Contact Number:
(918) 664-9900

Subject:
2005 Annual Groundwater Sampling and Reporting and Request for Site Closure;
Lea Crude Oil Station, Lea County, New Mexico

Dear Mr. Price:

Sunoco, Inc. has been conducting annual groundwater sampling at their former Lea Crude Oil Station near Eunice in Lea County, New Mexico in response to a suspected former crude oil release. Six years of annual groundwater monitoring has demonstrated that groundwater quality conditions are stable and natural attenuation has completed the remediation of residual impacts from the suspected release. Therefore, Sunoco is requesting a site closure and No Further Action Status for this release.

Groundwater Sampling Activities

ARCADIS conducted the 2005 annual groundwater sampling at the former Sunoco Crude Oil Station in Lea County, New Mexico. The sampling event was conducted to comply with requirements outlined by the New Mexico Oil Conservation Division (OCD) in a letter dated July 5, 2001.

Specifically, the OCD scope of work requires Sunoco to (1) sample and analyze groundwater from each monitor well on an annual basis for concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX); total dissolved solids; and major cations and anions using USEPA approved methods and quality assurance/quality control (QA/QC) procedures; and (2) submit an annual report to the OCD each year that includes the following:

a) A description of the sampling activities, which occurred during the past calendar year.
b) A water-table map showing the location of the station, excavated areas, monitor wells, and any other pertinent site features as well as the direction and magnitude of the hydraulic gradient created using the water-table elevation from each monitor well.

c) Summary tables of all groundwater quality sampling results and copies of all recent laboratory analytical data sheets and associated QA/QC data.
d) The disposition of all wastes generated.

This letter report summarizes the 2005 annual sampling event and provides the information required for annual reporting to the OCD.

On December 19, 2005, ARCADIS collected groundwater samples from the three monitor wells located at the former Crude Oil Station (SE1/4, NW1/4 Section 28, Township 20 South, Range 37 East). A site map showing the location of the monitor wells and other pertinent site features is attached as Figure 1. Prior to sampling, the water level in each well was measured using an electronic interface probe. Liquid hydrocarbons were not present in any site monitor well and the depth to groundwater averaged 28.89 feet below the top of casing. The groundwater elevation and general groundwater flow direction are shown on Figure 1. The gauging data are provided in Table 3. The general groundwater flow direction remains to the east and is consistent with past measurements.

Prior to collecting groundwater samples each monitor well was purged of three well volumes of water. Purging and sampling was conducted with disposable bailers dedicated for each well. Groundwater samples were collected in approved laboratory containers, labeled and preserved on ice and shipped to Severn Trent Laboratory in Corpus Christi, Texas under appropriate chain of custody.

Groundwater Sample Results

All groundwater samples were submitted to Severn Trent Laboratory in Corpus Christi, Texas for analysis of BTEX, total dissolved solids, and major cations and anions. The BTEX results are summarized in the attached Table 1. BTEX concentrations were not detected except for traces of ethylbenzene in MW99-3, which are well below New Mexico Water Quality Control Commission groundwater standards.

The results of the general water chemistry are summarized in the attached Table 2. The analyses include major cations and anions, and total dissolved solids. The results for this sampling event are consistent with historical water quality data and no significant deviations or trends have been established.

Conclusions

Since groundwater monitoring began in December 2000, BTEX concentrations have remained at non-detectable to trace amounts below New Mexico Water Quality Control Commission groundwater standards. The general water quality has been stable over this monitoring time period with no significant trends observed. Chloride levels in all monitoring wells, including the upgradient well, remain elevated above New Mexico Water Quality Control Commission groundwater standards but have shown no increasing or decreasing trends over the years. This pattern suggests that elevated chlorides are a regional issue.

Based on six years of annual groundwater monitoring, it has been demonstrated that groundwater quality conditions are stable and natural attenuation has eliminated impacts resulting from the former crude oil release. Therefore, Sunoco is requesting a site closure and No Further Action Status for this release.

Please call me at 918-664-9900 if you have any questions concerning this report or our annual sampling. Thank you for you assistance.

Sincerely,

ARCADIS G&M, Inc.

Michael M. Gates
Project Advisor

cc: Brad Fish Sunoco

G:\Aproject\SUNPIPE\OK1351001\2004 Ltr Rpt.rtf

Table 1. Groundwater Analytical Results, Sunoco, Inc., Lea Truck Station.

Sample Number	Date Collected	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)
MW99-1	12/19/05	<2.0	<2.0	<2.0	<6.0
	12/9/04	<2.0	<2.0	<2.0	<6.0
	11/13/03	<2.0	<2.0	<2.0	<6.0
	12/9/02	<1.0	<1.0	<1.0	<3.0
	12/12/01	<1.0	<1.0	<1.0	<3.0
	12/5/00	<1.0	<1.0	<1.0	<3.0
MW99-2	12/19/05	<2.0	<2.0	<2.0	<6.0
	12/9/04	<2.0	<2.0	5.0	<6.0
	11/13/03	<2.0	<2.0	3.0	<6.0
	12/9/02	<1.0	<1.0	<1.0	<3.0
	12/12/01	1.3	<1.0	2.2	<3.0
	12/5/00	2.6	1.5	3.7	<3.0
MW99-3	12/19/05	<2.0	<2.0	3.0	<6.0
	12/9/04	<2.0	<2.0	3.0	<6.0
	11/13/03	<2.0	<2.0	12.0	<6.0
	12/9/02	<1.0	<1.0	37.0	4.0
	12/12/01	<1.0	<1.0	6.0	<3.0
	12/5/00	<1.0	<1.0	22.0	<3.0

(µg/L) micrograms per liter.
< less than.

G:\Aproject\SUNPIPE\OK1351001\[TBL1.XLS]BTEX

Table 2. General Chemistry and Total Metals, Sunoco, Inc., Lea Truck Station.

Sample Number	Date Collected	Bicarbonate Alkalinity (mg/l)	Bromide (mg/l)	Carbonate Alkalinity (mg/l)	Chloride (mg/l)	Fluoride (mg/l)	Nitrate (mg/l)	Sulfate (mg/l)	Total Dissolved Solids (mg/l)	Calcium (mg/l)	Iron (mg/l)	Potassium (mg/l)	Magnesium (mg/l)	Sodium (mg/l)
MW99-1	12/19/05	329	3	ND	350	4.4	ND	200	1,400	74.4	ND	13.8	60.4	259
	12/10/04	379	3	ND	350	5	ND	200	1,400	86	<4.1	<101	69	314
	11/13/03	352	3	ND	380	5.4	0.4	250	1,350	73.3	0.28	14.8	59.7	341
	12/9/02	336	6.1	ND	359	6	ND	237	1,390	81	0.86	17.9	66.2	305
	12/12/01	332	3.1	ND	387	5.5	ND	244	1,360	102	17.2	21.3	80.6	ND
	12/5/00	185	3.4	ND	344	4.6	46.4	237	1,530	80.5	2.79	14.2	65.5	285
MW99-2	12/19/05	394	3	ND	410	5.0	0.6	500	1,870	85.9	ND	19.1	86.9	391
	12/9/04	370	3	ND	360	1.2	ND	300	1,550	87	<4.0	<100	69	314
	11/13/03	344	3	ND	370	5.9	0.4	251	1,380	69.6	<0.25	14.9	55.8	32.2
	12/9/02	341	7.1	ND	361	6.2	ND	238	1,720	82.7	0.82	19.1	65.3	327
	12/12/01	352	3.0	ND	364	5.9	ND	237	1,300	91.7	56.8	21.8	71.9	280
	12/5/00	227	3.2	ND	344	5.1	48.6	245	1,580	93.8	13.1	17.9	72.5	295
MW99-3	12/19/05	637	10	ND	1,520	9.5	2.6	600	3,880	324	ND	74.6	376	321
	12/9/04	610	9	ND	1,720	10	3.5	800	4,760	404	0.53	83.4	458	202
	11/13/03	532	9	ND	1,250	6.7	1.2	500	3,310	231	0.47	49.4	240	578
	12/9/02	640	17.8	ND	1,480	10.5	ND	513	3,760	285	0.99	70.4	336	509
	12/12/01	525	7.7	ND	1,120	7.7	ND	366	2,790	208	19.2	68	220	495
	12/5/00	445	9.9	ND	1,210	3.6	45.6	367	3,460	288	52.6	70	301	550

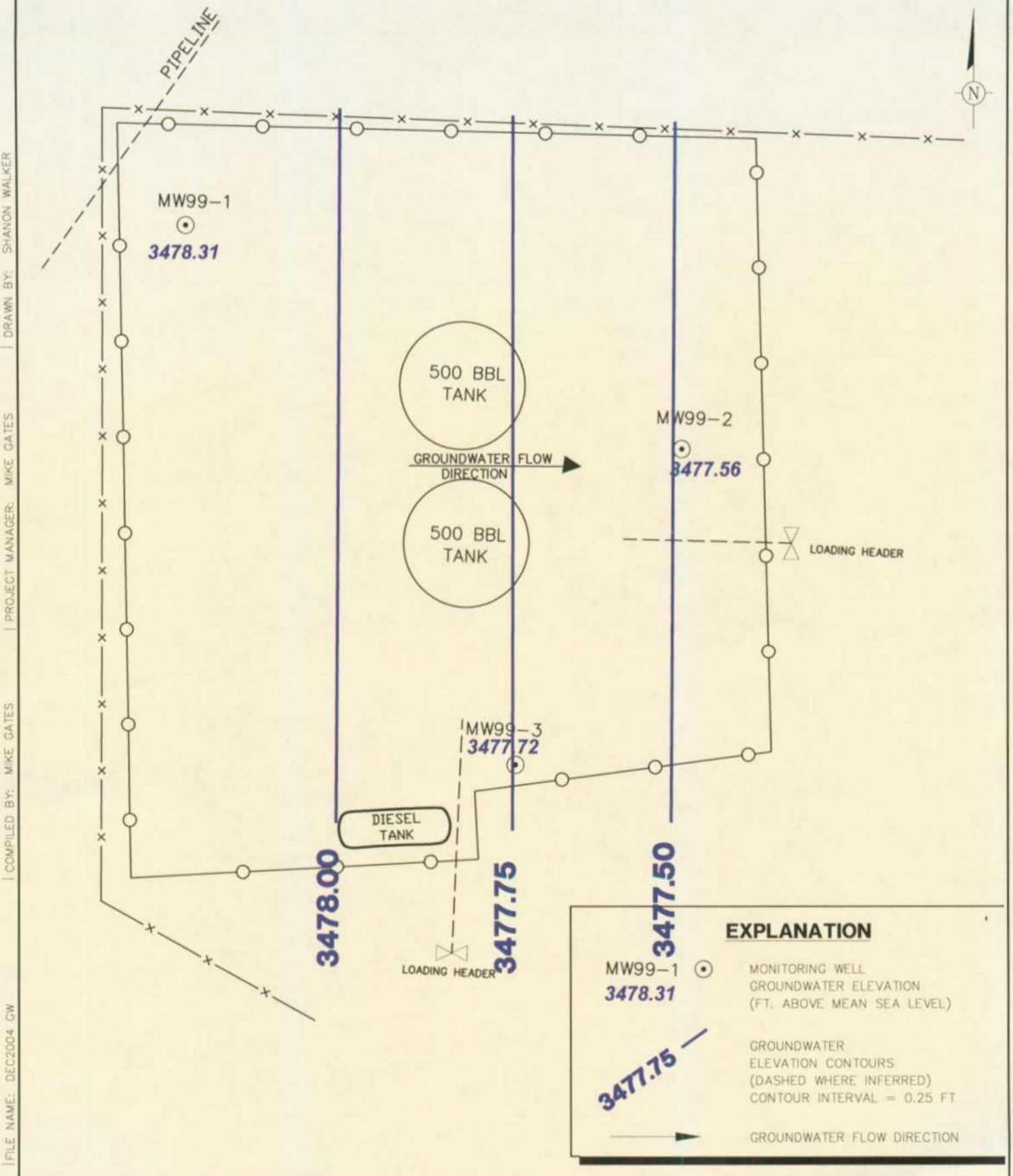
ND Non detect.
mg/L Milligrams per liter.

Table 3. Summary of Fluid Level Measurements, Sunoco, Inc., Lea Truck Station.

Well Number	Date Measured	Measuring Point Elevation (i.e. TOC) (ft)	Depth to Water (ft bTOC)	Water Level Elevation (ft)	Depth to Product (ft bTOC)	Product Level Elevation (ft)	Product Thickness (ft)	Corrected Water Level Elevation (ft)
MW99-1	12/19/05	3507.15	28.84	3478.31	--	--	--	3478.31
	12/9/04		30.06	3477.09	--	--	--	3477.09
	11/13/03		33.51	3473.64	--	--	--	3473.64
	12/9/02		32.06	3475.09	--	--	--	3475.09
	12/12/01		33.1	3474.05	--	--	--	3474.05
MW99-2	12/19/05	3506.51	28.95	3477.56	--	--	--	3477.56
	12/9/04		30.14	3476.37	--	--	--	3476.37
	11/13/03		33.63	3472.88	--	--	--	3472.88
	12/9/02		32.21	3474.30	--	--	--	3474.30
	12/12/01		32.94	3473.57	--	--	--	3473.57
MW99-3	12/19/05	3506.59	28.87	3477.72	--	--	--	3477.72
	12/9/04		29.94	3476.65	--	--	--	3476.65
	11/13/03		33.56	3473.03	--	--	--	3473.03
	12/9/02		32.14	3474.45	--	--	--	3474.45
	12/12/01		33.06	3473.53	--	--	--	3473.53

TOC Top of Casing.
ft bTOC Feet below top of casing.

G:\Aproject\SUNPIPE\OK1351001\CADD\DEC2005 GW.dwg, 3/28/2006 10:48:15 AM



DATE: | FILE NAME: DEC2004 GW | COMPILED BY: MIKE GATES | PROJECT MANAGER: MIKE GATES | DRAWN BY: SHANON WALKER

ARCADIS G&M
5100 EAST SKELLY DRIVE SUITE 1000
TULSA, OKLAHOMA 74135
Tel: (918) 664-9900 Fax: (918) 664-9925

NOT TO SCALE

GROUNDWATER ELEVATION CONTOURS DECEMBER 2005

SUN PIPE LINE COMPANY
LEA CRUDE OIL STATION
LEA CO. NEW MEXICO

PROJECT NUMBER
OK001351.0001

FIGURE NUMBER
1

ATTACHMENT 1

SEVERN TRENT STL

ANALYTICAL REPORT

JOB NUMBER: 233229

Prepared For:

ARCADIS / G&M
5100 East Skelly Drive
Suite 1000
Tulsa, OK 74135

Attention: Mike Gates

Date: 01/12/2006

Signature

Name: Chip Meador

Title: Laboratory Director

E-Mail: cmeador@stl-inc.com

1/13/06
Date

Severn Trent Laboratories
1733 N. Padre Island Drive
Corpus Christi, TX 78408

PHONE: 361/289-2673
FAX..: 361/289-2471

TOTAL # OF PAGES 24

SEVERN TRENT STL

CASE NARRATIVE

Job Number 233229

January 12, 2006

Sample Receipt and Login

During the sample receipt and login process it was noted that sample 233229-4 (trip blank) was dated 032/27/2003 and was received with headspace. Data generated form VOAs containing headspace should be flagged accordingly and used at the client's discretion.

Total Metals Digestion and Analysis

Sample 233229-1 was analyzed for total metals using EPA Methods 3010A/6010B. Due to limited sample volume, no matrix spike and matrix spike duplicate were analyzed with this metals digestion and analytical batch, however, a spiked blank and spiked blank duplicate were analyzed. The data are therefore reported.

Please call if you have any questions regarding this report or if we can be of further assistance.

Julie Darrow
QA Assistant

SEVERN TRENT STL

SAMPLE INFORMATION
Date: 01/12/2006

Job Number.: 233229
Customer...: ARCADIS / G&M
Attn.....: Mike Gates

Project Number.....: 98000084
Customer Project ID....: SUNOCO OK001351
Project Description....: Project - OVM

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
233229-1	MW99-3	Liquid	12/19/2005	14:05	12/20/2005	09:54
233229-2	MW99-2	Liquid	12/19/2005	14:25	12/20/2005	09:54
233229-3	MW99-1	Liquid	12/19/2005	14:50	12/20/2005	09:54
233229-4	TRIP BLANK	Water	12/19/2005	00:00	12/20/2005	09:54

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SEVERN TRENT STL

LABORATORY TEST RESULTS

Job Number: 233229 Date: 01/12/2006

CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

Customer Sample ID: MW99-3
Date Sampled.....: 12/19/2005
Time Sampled.....: 14:05
Sample Matrix.....: Liquid

Laboratory Sample ID: 233229-1
Date Received.....: 12/20/2005
Time Received.....: 09:54

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 160.1	Solids, Total Dissolved (TDS)	3880	10	mg/L	12/21/05	ijn
SM 2320 B	Bicarbonate (HCO3)	637	5.0	mg/L CaCO3	12/22/05	cgb
SM 2320 B	Carbonate (CO3)	<5.0	5.0	mg/L CaCO3	12/22/05	cgb
EPA 300.0	Bromide (Br)	10	2	mg/L	01/05/06	ijn
EPA 300.0	Chloride	1520	50	mg/L	12/28/05	ijn
EPA 300.0	Nitrogen, Nitrate as N (NO3-N)	2.6	0.2	mg/L	12/21/05	ijn
EPA 300.0	Sulfate (SO4)	600	100	mg/L	12/28/05	ijn
EPA 340.2	Fluoride (F)	9.5	0.5	mg/L	12/28/05	ijn
SW-846 6010B	Calcium (Ca)	324	1.0	mg/L	12/23/05	jem
SW-846 6010B	Iron (Fe)	<0.40	0.40	mg/L	12/23/05	jem
SW-846 6010B	Magnesium (Mg)	376	1.0	mg/L	12/23/05	jem
SW-846 6010B	Potassium (K)	74.6	10.0	mg/L	12/23/05	jem
SW-846 6010B	Sodium (Na)	321	1.0	mg/L	12/23/05	jem
SW-846 3010A	Acid Digestion, Total Metals	Complete			12/23/05	mkm
SW-846 8021B	Volatile Organics - Aromatics					
	Benzene	ND	2	ug/L	12/22/05	mal
	Ethylbenzene	3	2	ug/L	12/22/05	mal
	Toluene	ND	2	ug/L	12/22/05	mal
	Xylenes (total)	ND	6	ug/L	12/22/05	mal

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SEVERN TRENT STL

LABORATORY TEST RESULTS

Job Number: 233229 Date: 01/12/2006

CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

Customer Sample ID: MW99-2
Date Sampled.....: 12/19/2005
Time Sampled.....: 14:25
Sample Matrix.....: Liquid

Laboratory Sample ID: 233229-2
Date Received.....: 12/20/2005
Time Received.....: 09:54

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 160.1	Solids, Total Dissolved (TDS)	1870	10	mg/L	12/21/05	ijn
SM 2320 B	Bicarbonate (HCO3)	394	5.0	mg/L CaCO3	12/22/05	cgb
SM 2320 B	Carbonate (CO3)	<5.0	5.0	mg/L CaCO3	12/22/05	cgb
EPA 300.0	Bromide (Br)	3	2	mg/L	01/06/06	ijn
EPA 300.0	Chloride	410	50	mg/L	12/28/05	ijn
EPA 300.0	Nitrogen, Nitrate as N (NO3-N)	0.6	0.2	mg/L	12/21/05	ijn
EPA 300.0	Sulfate (SO4)	500	100	mg/L	12/28/05	ijn
EPA 340.2	Fluoride (F)	5.0	0.5	mg/L	12/28/05	ijn
SW-846 6010B	Calcium (Ca)	85.9	1.0	mg/L	12/23/05	jem
SW-846 6010B	Iron (Fe)	<0.40	0.40	mg/L	12/23/05	jem
SW-846 6010B	Magnesium (Mg)	86.9	1.0	mg/L	12/23/05	jem
SW-846 6010B	Potassium (K)	19.1	10.0	mg/L	12/23/05	jem
SW-846 6010B	Sodium (Na)	391	1.0	mg/L	12/23/05	jem
SW-846 3010A	Acid Digestion, Total Metals	Complete			12/23/05	mkm
SW-846 8021B	Volatile Organics - Aromatics					
	Benzene	ND	2	ug/L	12/22/05	mal
	Ethylbenzene	ND	2	ug/L	12/22/05	mal
	Toluene	ND	2	ug/L	12/22/05	mal
	Xylenes (total)	ND	6	ug/L	12/22/05	mal

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SEVERN TRENT STL

LABORATORY TEST RESULTS

Job Number: 233229 Date: 01/12/2006

CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

Customer Sample ID: MW99-1
Date Sampled.....: 12/19/2005
Time Sampled.....: 14:50
Sample Matrix.....: Liquid

Laboratory Sample ID: 233229-3
Date Received.....: 12/20/2005
Time Received.....: 09:54

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 160.1	Solids, Total Dissolved (TDS)	1400	10	mg/L	12/21/05	ijn
SM 2320 B	Bicarbonate (HCO3)	329	5.0	mg/L CaCO3	12/22/05	cgb
SM 2320 B	Carbonate (CO3)	<5.0	5.0	mg/L CaCO3	12/22/05	cgb
EPA 300.0	Bromide (Br)	3	2	mg/L	01/06/06	ijn
EPA 300.0	Chloride	350	50	mg/L	12/28/05	ijn
EPA 300.0	Nitrogen, Nitrate as N (NO3-N)	<0.2	0.2	mg/L	12/21/05	ijn
EPA 300.0	Sulfate (SO4)	200	100	mg/L	12/28/05	ijn
EPA 340.2	Fluoride (F)	4.4	0.5	mg/L	12/28/05	ijn
SW-846 6010B	Calcium (Ca)	74.4	1.0	mg/L	12/23/05	jem
SW-846 6010B	Iron (Fe)	<0.40	0.40	mg/L	12/23/05	jem
SW-846 6010B	Magnesium (Mg)	60.4	1.0	mg/L	12/23/05	jem
SW-846 6010B	Potassium (K)	13.8	10.0	mg/L	12/23/05	jem
SW-846 6010B	Sodium (Na)	259	1.0	mg/L	12/23/05	jem
SW-846 3010A	Acid Digestion, Total Metals	Complete			12/23/05	mkm
SW-846 8021B	Volatile Organics - Aromatics					
	Benzene	ND	2	ug/L	12/22/05	mal
	Ethylbenzene	ND	2	ug/L	12/22/05	mal
	Toluene	ND	2	ug/L	12/22/05	mal
	Xylenes (total)	ND	6	ug/L	12/22/05	mal

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SEVERN TRENT STL

LABORATORY TEST RESULTS

Job Number: 233229 Date: 01/12/2006

CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

Customer Sample ID: TRIP BLANK
Date Sampled.....: 12/19/2005
Time Sampled.....: 00:00
Sample Matrix.....: Water

Laboratory Sample ID: 233229-4
Date Received.....: 12/20/2005
Time Received.....: 09:54

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 8021B	Volatile Organics - Aromatics					
	Benzene	ND	2	ug/L	12/27/05	den
	Ethylbenzene	ND	2	ug/L	12/27/05	den
	Toluene	ND	2	ug/L	12/27/05	den
	Xylenes (total)	ND	6	ug/L	12/27/05	den

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SEVERN TRENT STL

QUALITY CONTROL RESULTS

Job Number.: 233229 Report Date.: 01/12/2006

CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

Test Method.....: SM 2320 B Batch.....: 113759 Analyst...: cgb
Method Description.: Carbonate/Bicarbonate/Hydroxide Units.....: mg/L CaCO3 Test Code.: HCO3
Parameter.....: Bicarbonate (HCO3)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
LCS		ALK051222L	88.2		100.0					12/22/2005	0900
MS	233229-1	ALK051222S	735.392		100.0	637.392	98.0	%	75-125	12/22/2005	0930
MSD	233229-1	ALK051222S	732.452	735.392	100.0	637.392	95.1	%	75-125	12/22/2005	0935
							0.4	R	20		
LCS		ALK051222L	94.472		100.0					12/22/2005	0955

Test Method.....: EPA 300.0 Batch.....: 114186 Analyst...: ijn
Method Description.: Ion Chromatography Analysis Units.....: mg/L Test Code.: BR
Parameter.....: Bromide (Br)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
ICV		BR060105I	4.9794		5.000		99.6	%	90-110	01/05/2006	2300
ICB		010506	0.0							01/05/2006	2315
MB		010506	0.0							01/05/2006	2329
LCS		BR060105L	9.9272		10.00		99.3	%	85-115	01/05/2006	2344
MS	233229-1	BR060105S	21.0520		10.00	9.6253	114.3	%	75-125	01/06/2006	0013
MSD	233229-1	BR060105S	21.1232	21.0520	10.00	9.6253	115.0	%	75-125	01/06/2006	0028
							0.3	R	20		
CCV		BR060105V	20.0311		20.00		100.2	%	80-120	01/06/2006	0111
CCB		010506	0.0							01/06/2006	0126

Test Method.....: SM 2320 B Batch.....: 113759 Analyst...: cgb
Method Description.: Carbonate/Bicarbonate/Hydroxide Units.....: mg/L CaCO3 Test Code.: CO3
Parameter.....: Carbonate (CO3)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
LCS		ALK051222L	0		100.0					12/22/2005	0900
LCS		ALK051222L	0		100.0					12/22/2005	0955

Test Method.....: EPA 300.0 Batch.....: 113908 Analyst...: ijn
Method Description.: Ion Chromatography Analysis Units.....: mg/L Test Code.: CHL
Parameter.....: Chloride

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
ICV		IC051228I	6.0431		6.25		96.7	%	90-110	12/28/2005	0928
ICB		122805	0.1656							12/28/2005	0943
MB		122805	0.1209							12/28/2005	0958
LCS		IC051228L	9.7464		10.00		97.5	%	85-115	12/28/2005	1013
CCV		IC051228V	12.5954		12.50		100.8	%	80-120	12/28/2005	1158
CCB		122805	0.1185							12/28/2005	1213
MS	233250-1	IC051228S	17.5741		10.00	8.3693	92.0	%	75-125	12/28/2005	1244
MSD	233250-1	IC051228S	17.7623	17.5741	10.00	8.3693	93.9	%	75-125	12/28/2005	1259
							1.1	R	20		
CCV		IC051228V	12.6547		12.50		101.2	%	80-120	12/28/2005	1444
CCB		122805	0.1514							12/28/2005	1459

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

Test Method.....: EPA 340.2 Batch.....: 113907 Analyst...: ijn
Method Description.: Fluoride (ISE) Units.....: mg/L Test Code.: FL
Parameter.....: Fluoride (F)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
ICB		122805	0.0114							12/28/2005	1455
ICV		FL051228H	0.486		0.5000		97.2	%	90-110	12/28/2005	1504
MB		122805	0.0114							12/28/2005	1513
LCS		FL051228J	0.792		0.8000		99.0	%	85-115	12/28/2005	1522
MS	233250-1	FL051228K	1.65		0.5000	1.15	100.0	%	75-125	12/28/2005	1607
MSD	233250-1	FL051228K	1.65	1.65	0.5000	1.15	100.0	%	75-125	12/28/2005	1616
							0.0	R	20		
CCB		122805	0.0114							12/28/2005	1701
CCV		FL051228I	0.989		1.000		98.9	%	90-110	12/28/2005	1710

Test Method.....: EPA 300.0 Batch.....: 113689 Analyst...: ijn
Method Description.: Ion Chromatography Analysis Units.....: mg/L Test Code.: NO3
Parameter.....: Nitrogen, Nitrate as N (NO3-N)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
ICV		IC051221I	2.4199		2.50		96.8	%	90-110	12/21/2005	0920
ICB		122105	0.0301							12/21/2005	0934
MB		122105	0.0							12/21/2005	0948
LCS		IC051221L	6.2973		6.0000		105.0	%	85-115	12/21/2005	1002
MS	233229-1	IC051221SS	7.8524		5.0000	2.6159	104.7	%	75-125	12/21/2005	1030
MSD	233229-1	IC051221SS	7.1697	7.8524	5.0000	2.6159	91.1	%	75-125	12/21/2005	1044
							9.1	R	20		
CCV		IC051221V	5.2785		5.0		105.6	%	80-120	12/21/2005	1126
CCB		122105	0.0753							12/21/2005	1140
CCV		IC051221V	5.3193		5.0		106.4	%	80-120	12/21/2005	1443
CCB		122105	0.0521							12/21/2005	1457
CCV		IC051221V	5.3449		5.0		106.9	%	80-120	12/21/2005	1703
CCB		122105	0.0571							12/21/2005	1717

Test Method.....: EPA 160.1 Batch.....: 113757 Analyst...: ijn
Method Description.: Solids, Total Dissolved (TDS) Units.....: mg/L Test Code.: TDS
Parameter.....: Solids, Total Dissolved (TDS)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
MB		122105	3.0							12/21/2005	1540
LCS		TDS051208L	2352.0		2250		104.5	%	85-115	12/21/2005	1543
LCS		TDS051208L	2268.0		2250		100.8	%	85-115	12/21/2005	1546
MS	233229-2	TDS051208S	4253.3		2250	1870.0	105.9	%	75-125	12/21/2005	1555
MSD	233229-2	TDS051208S	4310.0	4253.3	2250	1870.0	108.4	%	75-125	12/21/2005	1558
							1.3	R	20		

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CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

Test Method.....: EPA 300.0 Batch.....: 113908 Analyst...: ijn
Method Description.: Ion Chromatography Analysis Units.....: mg/L Test Code.: SO4
Parameter.....: Sulfate (SO4)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
ICV		IC051228I	24.3548		25.0		97.4	%	90-110	12/28/2005	0928
ICB		122805	0.0							12/28/2005	0943
MB		122805	0.0							12/28/2005	0958
LCS		IC051228L	40.5006		40.000		101.3	%	85-115	12/28/2005	1013
CCV		IC051228V	51.5141		50.00		103.0	%	80-120	12/28/2005	1158
MS	233250-1	IC051228S	41.8086		40.0032	3.2702	96.3	%	75-125	12/28/2005	1244
MSD	233250-1	IC051228S	41.7921	41.8086	40.0032	3.2702	96.3	%	75-125	12/28/2005	1259
							0.0	R	20		
CCV		IC051228V	51.5208		50.00		103.0	%	80-120	12/28/2005	1444
CCB		122805	0.0							12/28/2005	1459

Test Method.....: SW-846 6010B Batch.....: 113814 Analyst...: jem
Method Description.: Metals Analysis (ICAP) Units.....: mg/L Test Code.: CA
Parameter.....: Calcium (Ca)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
RS		M417	49.9392		50.0		99.9	%	90-110	12/23/2005	1525
ICV		M0419	1.0811		1.00		108.1	%	90-110	12/23/2005	1548
ICB			-0.0114							12/23/2005	1608
CCV		M418	24.0628		25.0		96.3	%	90-110	12/23/2005	1628
CCB			-0.0111							12/23/2005	1631
MB		3010	0.0734							12/23/2005	1639
LCS		M355	2.6653		2.50		106.6	%	80-120	12/23/2005	1642
PDS	233160-7	M355D	12.0000		10.0	0.1619	118.4	%	75-125	12/23/2005	1714
PSD	233160-7	M355D	12.1200	12.0000	10.0	0.1619	119.6	%	75-125	12/23/2005	1716
							1.0	R	20		
MB		3010	0.0844							12/23/2005	1719
LCS		M355	2.6174		2.50		104.7	%	80-120	12/23/2005	1721
CCV		M418	23.4603		25.0		93.8	%	90-110	12/23/2005	1741
CCB			-0.0019							12/23/2005	1746

Test Method.....: SW-846 6010B Batch.....: 113814 Analyst...: jem
Method Description.: Metals Analysis (ICAP) Units.....: mg/L Test Code.: FE
Parameter.....: Iron (Fe)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
RS		M417	20.4395		20.0		102.2	%	90-110	12/23/2005	1525
ICB			0.0051							12/23/2005	1608
ICV		M0391B	63.7639		62.50		102.0	%	90-110	12/23/2005	1611
CCV		M418	9.9900		10.0		99.9	%	90-110	12/23/2005	1628
CCB			-0.0013							12/23/2005	1631
MB		3010	0.0269							12/23/2005	1639
LCS		M355	1.0984		1.00		109.8	%	80-120	12/23/2005	1642
PDS	233160-7	M355D	3.7754		4.00	0.0180	93.9	%	75-125	12/23/2005	1714
PSD	233160-7	M355D	3.7918	3.7754	4.00	0.0180	94.3	%	75-125	12/23/2005	1716
							0.4	R	20		
MB		3010	0.0232							12/23/2005	1719
LCS		M355	1.0853		1.00		108.5	%	80-120	12/23/2005	1721
CCV		M418	9.6402		10.0		96.4	%	90-110	12/23/2005	1741

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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Test Method.....: SW-846 6010B Batch.....: 113814 Analyst...: jem
Method Description.: Metals Analysis (ICAP) Units.....: mg/L Test Code.: FE
Parameter.....: Iron (Fe)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CCB			0.0016							12/23/2005	1746

Test Method.....: SW-846 6010B Batch.....: 113814 Analyst...: jem
Method Description.: Metals Analysis (ICAP) Units.....: mg/L Test Code.: MG
Parameter.....: Magnesium (Mg)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
RS		M417	50.2680		50.0		100.5	%	90-110	12/23/2005	1525
ICV		M0419	1.0262		1.00		102.6	%	90-110	12/23/2005	1548
ICB			-0.0099							12/23/2005	1608
CCV		M418	24.1986		25.0		96.8	%	90-110	12/23/2005	1628
CCB			0.0075							12/23/2005	1631
MB		3010	0.0151							12/23/2005	1639
LCS		M355	2.5838		2.50		103.4	%	80-120	12/23/2005	1642
PDS	233160-7	M355D	9.1853		10.0	0.0060	91.8	%	75-125	12/23/2005	1714
PSD	233160-7	M355D	9.2340	9.1853	10.0	0.0060	92.3	%	75-125	12/23/2005	1716
							0.5	R	20		
MB		3010	0.0357							12/23/2005	1719
LCS		M355	2.5861		2.50		103.4	%	80-120	12/23/2005	1721
CCV		M418	23.5508		25.0		94.2	%	90-110	12/23/2005	1741
CCB			0.0304							12/23/2005	1746

Test Method.....: SW-846 6010B Batch.....: 113814 Analyst...: jem
Method Description.: Metals Analysis (ICAP) Units.....: mg/L Test Code.: K
Parameter.....: Potassium (K)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
RS		M417	48.4288		50.0		96.9	%	90-110	12/23/2005	1525
ICV		M0420	10.6561		10.00		106.6	%	90-110	12/23/2005	1554
ICB			-0.0430							12/23/2005	1608
CCV		M418	24.1933		25.0		96.8	%	90-110	12/23/2005	1628
CCB			-0.0523							12/23/2005	1631
MB		3010	0.7386							12/23/2005	1639
LCS		M355	2.3430		2.50		93.7	%	80-142	12/23/2005	1642
PDS	233160-7	M355D	9.8814		10.0	0.4059	94.8	%	75-125	12/23/2005	1714
PSD	233160-7	M355D	9.6216	9.8814	10.0	0.4059	92.2	%	75-125	12/23/2005	1716
							2.7	R	20		
MB		3010	0.9364							12/23/2005	1719
LCS		M355	2.6039		2.50		104.2	%	80-142	12/23/2005	1721
CCV		M418	24.2065		25.0		96.8	%	90-110	12/23/2005	1741
CCB			0.5249							12/23/2005	1746

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Test Method.....: SW-846 6010B Batch.....: 113814 Analyst...: jem
Method Description.: Metals Analysis (ICAP) Units.....: mg/L Test Code.: NA
Parameter.....: Sodium (Na)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
RS		M417	50.0677		50.0		100.1	%	90-110	12/23/2005	1525
ICV		M0420	0.9629		1.00		96.3	%	90-110	12/23/2005	1554
ICB			-0.0867							12/23/2005	1608
CCV		M418	23.8986		25.0		95.6	%	90-110	12/23/2005	1628
CCB			-0.0807							12/23/2005	1631
MB		3010	-0.0518							12/23/2005	1639
LCS		M355	2.5422		2.50		101.7	%	80-120	12/23/2005	1642
PDS	233160-7	M355D	8.9673		10.0	-0.0482	90.2	%	75-125	12/23/2005	1714
PSD	233160-7	M355D	9.0275	8.9673	10.0	-0.0482	90.8	%	75-125	12/23/2005	1716
							0.7	R	20		
MB		3010	-0.0337							12/23/2005	1719
LCS		M355	2.5356		2.50		101.4	%	80-120	12/23/2005	1721
CCV		M418	23.1517		25.0		92.6	%	90-110	12/23/2005	1741
CCB			-0.0752							12/23/2005	1746

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: SW-846 8021B Units.....: ug/L Analyst...: mal
Method Description.: Volatile Organics - Aromatics Batch.....: 113795

CCV	Continuing Calibration Verification	V120105CCC			12/22/2005	1001

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	103.958		100.000000		104.0	%	80-120
Ethylbenzene	100.305		100.000000		100.3	%	80-120
tert-Butyl Methyl Ether (MTBE)	102.935		100.000000		102.9	%	80-120
Toluene	88.982		100.000000		89.0	%	80-120
Xylenes (total)	298.106		300.000000		99.4	%	80-120
m&p-Xylenes	202.607		200.000000		101.3	%	80-120
o-Xylene	95.499		100.000000		95.5	%	80-120

CCV	Continuing Calibration Verification	V120105CCC			12/22/2005	1611

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	105.182		100.000000		105.2	%	80-120
Ethylbenzene	103.023		100.000000		103.0	%	80-120
tert-Butyl Methyl Ether (MTBE)	107.285		100.000000		107.3	%	80-120
Toluene	90.541		100.000000		90.5	%	80-120
Xylenes (total)	305.594		300.000000		101.9	%	80-120
m&p-Xylenes	207.517		200.000000		103.8	%	80-120
o-Xylene	98.077		100.000000		98.1	%	80-120

CCV	Continuing Calibration Verification	V120105CCC			12/22/2005	2208

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	103.191		100.000000		103.2	%	80-120
Ethylbenzene	100.948		100.000000		100.9	%	80-120
tert-Butyl Methyl Ether (MTBE)	105.149		100.000000		105.1	%	80-120
Toluene	89.004		100.000000		89.0	%	80-120
Xylenes (total)	298.742		300.000000		99.6	%	80-120
m&p-Xylenes	202.715		200.000000		101.4	%	80-120
o-Xylene	96.027		100.000000		96.0	%	80-120

MB	Method Blank	122205			12/22/2005	1103

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	0.000						
Ethylbenzene	0.000						
tert-Butyl Methyl Ether (MTBE)	0.000						
Toluene	0.000						
Xylenes (total)	0.000						
m&p-Xylenes	0.000						
o-Xylene	0.000						

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
MB	Method Blank	122205			12/22/2005	1637

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	0.065						
Ethylbenzene	0.134						
tert-Butyl Methyl Ether (MTBE)	0.000						
Toluene	0.068						
Xylenes (total)	0.476						
m&p-Xylenes	0.350						
o-Xylene	0.126						

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
MS	Matrix Spike	V120105SBW	233241-1		12/22/2005	2117

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	22.522		20.000000	2.935	97.9	%	50-147
Ethylbenzene	20.028		20.000000	0.690	96.7	%	35-147
tert-Butyl Methyl Ether (MTBE)	91.776		100.000000	0.320	91.5	%	48-150
Toluene	20.001		20.000000	3.692	81.5	%	40-143
Xylenes (total)	46.604		40.000000	8.567	95.1	%	43-149
m&p-Xylenes	24.840		20.000000	4.937	99.5	%	25-150
o-Xylene	21.764		20.000000	3.630	90.7	%	57-138

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
MSD	Matrix Spike Duplicate	V120105SBW	233241-1		12/22/2005	2142

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	21.795	22.522	20.000000	2.935	94.3	%	50-147
					3.3	R	20
Ethylbenzene	18.715	20.028	20.000000	0.690	90.1	%	35-147
					6.8	R	20
tert-Butyl Methyl Ether (MTBE)	87.675	91.776	100.000000	0.320	87.4	%	48-150
					4.6	R	20
Toluene	19.158	20.001	20.000000	3.692	77.3	%	40-143
					4.3	R	20
Xylenes (total)	44.573	46.604	40.000000	8.567	90.0	%	43-149
					4.5	R	20
m&p-Xylenes	23.688	24.840	20.000000	4.937	93.8	%	25-150
					4.7	R	20
o-Xylene	20.885	21.764	20.000000	3.630	86.3	%	57-138
					4.1	R	20

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
SB	Spiked Blank	V120105SBW			12/22/2005	1129

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	20.223		20.000000		101.1	%	78-121
Ethylbenzene	19.399		20.000000		97.0	%	72-120
tert-Butyl Methyl Ether (MTBE)	86.254		100.000000		86.3	%	79-132
Toluene	17.158		20.000000		85.8	%	72-120
Xylenes (total)	38.988		40.000000		97.5	%	81-127
m&p-Xylenes	20.596		20.000000		103.0	%	80-129
o-Xylene	18.392		20.000000		92.0	%	80-127

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: SW-846 8021B Units.....: ug/L Analyst...: den
Method Description.: Volatile Organics - Aromatics Batch.....: 113911

CCV	Continuing Calibration Verification	V120105CCC			12/27/2005	0837

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	103.199		100.000000		103.2	%	80-120
Ethylbenzene	104.756		100.000000		104.8	%	80-120
tert-Butyl Methyl Ether (MTBE)	109.178		100.000000		109.2	%	80-120
Toluene	103.379		100.000000		103.4	%	80-120
Xylenes (total)	321.979		300.000000		107.3	%	80-120
m&p-Xylenes	214.830		200.000000		107.4	%	80-120
o-Xylene	107.149		100.000000		107.1	%	80-120

CCV	Continuing Calibration Verification	V120105CCC			12/27/2005	1326

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	103.480		100.000000		103.5	%	80-120
Ethylbenzene	106.107		100.000000		106.1	%	80-120
tert-Butyl Methyl Ether (MTBE)	105.722		100.000000		105.7	%	80-120
Toluene	104.307		100.000000		104.3	%	80-120
Xylenes (total)	325.103		300.000000		108.4	%	80-120
m&p-Xylenes	217.266		200.000000		108.6	%	80-120
o-Xylene	107.837		100.000000		107.8	%	80-120

CCV	Continuing Calibration Verification	V120105CCC			12/27/2005	1903

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	98.497		100.000000		98.5	%	80-120
Ethylbenzene	98.951		100.000000		99.0	%	80-120
tert-Butyl Methyl Ether (MTBE)	107.131		100.000000		107.1	%	80-120
Toluene	97.946		100.000000		97.9	%	80-120
Xylenes (total)	303.556		300.000000		101.2	%	80-120
m&p-Xylenes	202.359		200.000000		101.2	%	80-120
o-Xylene	101.197		100.000000		101.2	%	80-120

MB	Method Blank	V120105S			12/27/2005	0925

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	ND						
Ethylbenzene	ND						
tert-Butyl Methyl Ether (MTBE)	ND						
Toluene	ND						
Xylenes (total)	ND						
m&p-Xylenes	ND						
o-Xylene	ND						

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 233229 Report Date.: 01/12/2006

CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
MB	Method Blank	V120105S			12/27/2005	1350

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	ND						
Ethylbenzene	ND						
tert-Butyl Methyl Ether (MTBE)	ND						
Toluene	ND						
Xylenes (total)	ND						
m&p-Xylenes	ND						
o-Xylene	ND						

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
MS	Matrix Spike	V120105SBW	233259-1		12/27/2005	1815

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	6.020		20.000000	ND	30.1	%	50-147
Ethylbenzene	5.746		20.000000	ND	28.7	%	35-147
tert-Butyl Methyl Ether (MTBE)	29.765		100.000000	ND	29.8	%	48-150
Toluene	5.796		20.000000	ND	29.0	%	40-143
Xylenes (total)	11.657		40.000000	ND	29.1	%	43-149
m&p-Xylenes	6.103		20.000000	ND	30.5	%	25-150
o-Xylene	5.554		20.000000	ND	27.8	%	57-138

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
MSD	Matrix Spike Duplicate	V120105SBW	233259-1		12/27/2005	1839

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	10.871	6.020	20.000000	ND	54.4	%	50-147
					57.4	R	20
Ethylbenzene	9.808	5.746	20.000000	ND	49.0	%	35-147
					52.2	R	20
tert-Butyl Methyl Ether (MTBE)	49.751	29.765	100.000000	ND	49.8	%	48-150
					50.3	R	20
Toluene	9.906	5.796	20.000000	ND	49.5	%	40-143
					52.4	R	20
Xylenes (total)	19.761	11.657	40.000000	ND	49.4	%	43-149
					51.6	R	20
m&p-Xylenes	10.009	6.103	20.000000	ND	50.0	%	25-150
					48.5	R	20
o-Xylene	9.752	5.554	20.000000	ND	48.8	%	57-138
					54.9	R	20

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
SB	Spiked Blank	V120105SBW			12/27/2005	0901

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Benzene	19.698		20.000000		98.5	%	78-121
Ethylbenzene	20.059		20.000000		100.3	%	72-120
tert-Butyl Methyl Ether (MTBE)	99.979		100.000000		100.0	%	79-132
Toluene	19.405		20.000000		97.0	%	72-120
Xylenes (total)	40.894		40.000000		102.2	%	81-127
m&p-Xylenes	20.905		20.000000		104.5	%	80-129
o-Xylene	19.989		20.000000		99.9	%	80-127

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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SURROGATE RECOVERIES REPORT

Job Number.: 233229 Report Date.: 01/12/2006

CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

Method.....: Volatile Organics - Aromatics Method Code.....: 8020
Batch.....: 113795 Analyst.....: mal Equipment Code: BTEX#1GC

Surrogate	Units
BFB (Surrogate)	ug/L

Lab ID	Matrix	QC Type	Dilution	Result	True Value	Percent Recovery	Limits	Flag	Date	Time
		CCV	1.00	17.253	20.000000	86.3	66-120		12/22/2005	1001
		MB	1.00	17.018	20.000000	85.1	66-120		12/22/2005	1103
		SB	1.00	18.006	20.000000	90.0	66-120		12/22/2005	1129
233229-1			1.00	18.881	20.000000	94.4	66-120		12/22/2005	1310
233229-2			1.00	17.114	20.000000	85.6	66-120		12/22/2005	1336
233229-3			1.00	17.208	20.000000	86.0	66-120		12/22/2005	1401
233241-1			1.00	18.631	20.000000	93.2	66-120		12/22/2005	1427
233241-2			1.00	17.903	20.000000	89.5	66-120		12/22/2005	1452
233241-3			1.00	18.992	20.000000	95.0	66-120		12/22/2005	1518
233241-4			1.00	16.539	20.000000	82.7	66-120		12/22/2005	1543
		CCV	1.00	19.753	20.000000	98.8	66-120		12/22/2005	1611
		MB	1.00	17.876	20.000000	89.4	66-120		12/22/2005	1637
233241-5			1.00	17.014	20.000000	85.1	66-120		12/22/2005	1702
233241-6			1.00	17.386	20.000000	86.9	66-120		12/22/2005	1728
233241-7			1.00	17.227	20.000000	86.1	66-120		12/22/2005	1753
233242-1			1.00	20.076	20.000000	100.4	66-120		12/22/2005	1819
233242-2			1.00	21.197	20.000000	106.0	66-120		12/22/2005	1844
233242-3			1.00	20.148	20.000000	100.7	66-120		12/22/2005	1910
233242-4			1.00	19.377	20.000000	96.9	66-120		12/22/2005	1935
233242-5			1.00	19.907	20.000000	99.5	66-120		12/22/2005	2001
233242-6			1.00	19.547	20.000000	97.7	66-120		12/22/2005	2026
233242-7			1.00	19.004	20.000000	95.0	66-120		12/22/2005	2052
233241-1		MS	1.00	19.178	20.000000	95.9	66-120		12/22/2005	2117
233241-1		MSD	1.00	19.286	20.000000	96.4	66-120		12/22/2005	2142
		CCV	1.00	19.249	20.000000	96.2	66-120		12/22/2005	2208

Surrogate	Units
Trifluorotoluene	ug/L

Lab ID	Matrix	QC Type	Dilution	Result	True Value	Percent Recovery	Limits	Flag	Date	Time
		CCV	1.00	18.525	20.000000	92.6	71-120		12/22/2005	1001
		MB	1.00	18.006	20.000000	90.0	71-120		12/22/2005	1103
		SB	1.00	18.467	20.000000	92.3	71-120		12/22/2005	1129
233229-1			1.00	16.776	20.000000	83.9	71-120		12/22/2005	1310
233229-2			1.00	17.982	20.000000	89.9	71-120		12/22/2005	1336
233229-3			1.00	18.147	20.000000	90.7	71-120		12/22/2005	1401
233241-1			1.00	18.115	20.000000	90.6	71-120		12/22/2005	1427
233241-2			1.00	18.241	20.000000	91.2	71-120		12/22/2005	1452
233241-3			1.00	18.348	20.000000	91.7	71-120		12/22/2005	1518
233241-4			1.00	18.209	20.000000	91.0	71-120		12/22/2005	1543
		CCV	1.00	18.854	20.000000	94.3	71-120		12/22/2005	1611
		MB	1.00	18.146	20.000000	90.7	71-120		12/22/2005	1637
233241-5			1.00	18.150	20.000000	90.8	71-120		12/22/2005	1702
233241-6			1.00	18.610	20.000000	93.0	71-120		12/22/2005	1728

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SURROGATE RECOVERIES REPORT

Job Number.: 233229 Report Date.: 01/12/2006

CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

Surrogate	Units
Trifluorotoluene	ug/L

Lab ID	Matrix	QC Type	Dilution	Result	True Value	Percent Recovery	Limits	Flag	Date	Time
233241-7			1.00	18.251	20.000000	91.3	71-120		12/22/2005	1753
233242-1			1.00	20.476	20.000000	102.4	71-120		12/22/2005	1819
233242-2			1.00	20.315	20.000000	101.6	71-120		12/22/2005	1844
233242-3			1.00	20.127	20.000000	100.6	71-120		12/22/2005	1910
233242-4			1.00	18.650	20.000000	93.2	71-120		12/22/2005	1935
233242-5			1.00	18.695	20.000000	93.5	71-120		12/22/2005	2001
233242-6			1.00	18.490	20.000000	92.5	71-120		12/22/2005	2026
233242-7			1.00	18.772	20.000000	93.9	71-120		12/22/2005	2052
233241-1		MS	1.00	18.608	20.000000	93.0	71-120		12/22/2005	2117
233241-1		MSD	1.00	18.459	20.000000	92.3	71-120		12/22/2005	2142
		CCV	1.00	18.816	20.000000	94.1	71-120		12/22/2005	2208

Method.....: Volatile Organics - Aromatics Method Code.....: 8020
Batch.....: 113911 Analyst.....: den Equipment Code: BTEX#3

Surrogate	Units
BFB (Surrogate)	ug/L

Lab ID	Matrix	QC Type	Dilution	Result	True Value	Percent Recovery	Limits	Flag	Date	Time
		CCV	1.00	20.664	20.000000	103.3	66-120		12/27/2005	0837
		SB	1.00	17.701	20.000000	88.5	66-120		12/27/2005	0901
		MB	1.00	16.162	20.000000	80.8	66-120		12/27/2005	0925
233253-21			1.00	17.722	20.000000	88.6	66-120		12/27/2005	0949
233253-22			2.00	18.553	20.000000	92.8	66-120		12/27/2005	1013
233253-23			1.00	18.430	20.000000	92.2	66-120		12/27/2005	1037
233253-24			2.00	18.630	20.000000	93.2	66-120		12/27/2005	1101
233253-25			1.00	17.913	20.000000	89.6	66-120		12/27/2005	1126
233253-26			8.00	18.295	20.000000	91.5	66-120		12/27/2005	1150
233253-27			2.00	18.704	20.000000	93.5	66-120		12/27/2005	1214
233253-28			4.00	18.250	20.000000	91.2	66-120		12/27/2005	1238
233253-30			1.00	17.560	20.000000	87.8	66-120		12/27/2005	1302
		CCV	1.00	19.053	20.000000	95.3	66-120		12/27/2005	1326
		MB	1.00	16.580	20.000000	82.9	66-120		12/27/2005	1350
233259-1			1.00	16.551	20.000000	82.8	66-120		12/27/2005	1414
233259-2			1.00	16.398	20.000000	82.0	66-120		12/27/2005	1438
233259-3			1.00	16.145	20.000000	80.7	66-120		12/27/2005	1502
233259-4			1.00	16.191	20.000000	81.0	66-120		12/27/2005	1526
233259-5			1.00	16.342	20.000000	81.7	66-120		12/27/2005	1550
233259-6			1.00	16.202	20.000000	81.0	66-120		12/27/2005	1614
233259-7			1.00	16.241	20.000000	81.2	66-120		12/27/2005	1639
233229-4			1.00	16.093	20.000000	80.5	66-120		12/27/2005	1703
233267-4			1.00	16.125	20.000000	80.6	66-120		12/27/2005	1727
233253-29			2.00	18.348	20.000000	91.7	66-120		12/27/2005	1751
233259-1		MS	1.00	17.436	20.000000	87.2	66-120		12/27/2005	1815
233259-1		MSD	1.00	17.452	20.000000	87.3	66-120		12/27/2005	1839
		CCV	1.00	18.813	20.000000	94.1	66-120		12/27/2005	1903

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SEVERN TRENT STL

SURROGATE RECOVERIES REPORT

Job Number.: 233229 Report Date.: 01/12/2006

CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

Surrogate	Units
Trifluorotoluene	ug/L

Lab ID	Matrix	QC Type	Dilution	Result	True Value	Percent Recovery	Limits	Flag	Date	Time
		CCV	1.00	22.766	20.000000	113.8	71-120		12/27/2005	0837
		SB	1.00	20.588	20.000000	102.9	71-120		12/27/2005	0901
		MB	1.00	20.088	20.000000	100.4	71-120		12/27/2005	0925
233253-21			1.00	19.752	20.000000	98.8	71-120		12/27/2005	0949
233253-22			2.00	21.027	20.000000	105.1	71-120		12/27/2005	1013
233253-23			1.00	21.445	20.000000	107.2	71-120		12/27/2005	1037
233253-24			2.00	20.879	20.000000	104.4	71-120		12/27/2005	1101
233253-25			1.00	20.378	20.000000	101.9	71-120		12/27/2005	1126
233253-26			8.00	20.232	20.000000	101.2	71-120		12/27/2005	1150
233253-27			2.00	20.694	20.000000	103.5	71-120		12/27/2005	1214
233253-28			4.00	19.753	20.000000	98.8	71-120		12/27/2005	1238
233253-30			1.00	20.116	20.000000	100.6	71-120		12/27/2005	1302
		CCV	1.00	20.641	20.000000	103.2	71-120		12/27/2005	1326
		MB	1.00	20.465	20.000000	102.3	71-120		12/27/2005	1350
233259-1			1.00	20.422	20.000000	102.1	71-120		12/27/2005	1414
233259-2			1.00	20.734	20.000000	103.7	71-120		12/27/2005	1438
233259-3			1.00	20.419	20.000000	102.1	71-120		12/27/2005	1502
233259-4			1.00	20.739	20.000000	103.7	71-120		12/27/2005	1526
233259-5			1.00	20.301	20.000000	101.5	71-120		12/27/2005	1550
233259-6			1.00	20.743	20.000000	103.7	71-120		12/27/2005	1614
233259-7			1.00	20.360	20.000000	101.8	71-120		12/27/2005	1639
233229-4			1.00	20.409	20.000000	102.0	71-120		12/27/2005	1703
233267-4			1.00	20.173	20.000000	100.9	71-120		12/27/2005	1727
233253-29			2.00	20.495	20.000000	102.5	71-120		12/27/2005	1751
233259-1		MS	1.00	20.356	20.000000	101.8	71-120		12/27/2005	1815
233259-1		MSD	1.00	20.360	20.000000	101.8	71-120		12/27/2005	1839
		CCV	1.00	20.632	20.000000	103.2	71-120		12/27/2005	1903

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SEVERN TRENT STL

LABORATORY CHRONICLE

Job Number: 233229 Date: 01/12/2006

CUSTOMER: ARCADIS / G&M PROJECT: SUNOCO OK001351 ATTN: Mike Gates

Lab ID: 233229-1 Client ID: MW99-3 Date Recvd: 12/20/2005 Sample Date: 12/19/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
SW-846 3010A	Acid Digestion, Total Metals	1	113793		12/23/2005	1000	
SM 2320 B	Carbonate/Bicarbonate/Hydroxide	1	113759		12/22/2005	0925	
EPA 340.2	Fluoride (ISE)	1	113907		12/28/2005	1634	5
EPA 300.0	Ion Chromatography Analysis	1	113689		12/21/2005	1016	1
EPA 300.0	Ion Chromatography Analysis	1	113908		12/28/2005	1359	100
EPA 300.0	Ion Chromatography Analysis	1	114186		01/05/2006	2359	
SW-846 6010B	Metals Analysis (ICAP)	1	113814		12/23/2005	1725	
EPA 160.1	Solids, Total Dissolved (TDS)	1	113757		12/21/2005	1549	
SW-846 8021B	Volatile Organics - Aromatics	1	113795		12/22/2005	1310	1.00

Lab ID: 233229-2 Client ID: MW99-2 Date Recvd: 12/20/2005 Sample Date: 12/19/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
SW-846 3010A	Acid Digestion, Total Metals	1	113793		12/23/2005	1000	
SM 2320 B	Carbonate/Bicarbonate/Hydroxide	1	113759		12/22/2005	0940	
EPA 340.2	Fluoride (ISE)	1	113907		12/28/2005	1643	5
EPA 300.0	Ion Chromatography Analysis	1	113689		12/21/2005	1058	1
EPA 300.0	Ion Chromatography Analysis	1	113908		12/28/2005	1414	100
EPA 300.0	Ion Chromatography Analysis	1	114186		01/06/2006	0042	
SW-846 6010B	Metals Analysis (ICAP)	1	113814		12/23/2005	1732	
EPA 160.1	Solids, Total Dissolved (TDS)	1	113757		12/21/2005	1552	
SW-846 8021B	Volatile Organics - Aromatics	1	113795		12/22/2005	1336	1.00

Lab ID: 233229-3 Client ID: MW99-1 Date Recvd: 12/20/2005 Sample Date: 12/19/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
SW-846 3010A	Acid Digestion, Total Metals	1	113793		12/23/2005	1000	
SM 2320 B	Carbonate/Bicarbonate/Hydroxide	1	113759		12/22/2005	0945	
EPA 340.2	Fluoride (ISE)	1	113907		12/28/2005	1652	5
EPA 300.0	Ion Chromatography Analysis	1	113689		12/21/2005	1112	1
EPA 300.0	Ion Chromatography Analysis	1	113908		12/28/2005	1429	100
EPA 300.0	Ion Chromatography Analysis	1	114186		01/06/2006	0057	
SW-846 6010B	Metals Analysis (ICAP)	1	113814		12/23/2005	1737	
EPA 160.1	Solids, Total Dissolved (TDS)	1	113757		12/21/2005	1601	
SW-846 8021B	Volatile Organics - Aromatics	1	113795		12/22/2005	1401	1.00

Lab ID: 233229-4 Client ID: TRIP BLANK Date Recvd: 12/20/2005 Sample Date: 12/19/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
SW-846 8021B	Volatile Organics - Aromatics	1	113911		12/27/2005	1703	1.00

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QUALITY ASSURANCE METHODS

REFERENCES AND NOTES

Report Date: 01/12/2006

(1) EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, March 1983
(2) EPA SW-846, Test Methods for Evaluating Solid Waste, Third Edition, September 1986, and Updates I, II, IIA, IIB, and III
(3) Standard Methods for the Examination of Water and Wastewater, 18th Edition, 1992
(4) Methods of Organic Chemical Analysis of Municipal and Industrial Wastewater, Federal Register, Vol. 49, No. 209, October 1984 and 40 CFR Part 136 amendments
(5) EPA 600/2-78-054, Field and Laboratory Methods Applicable to Overburdens and Minesoils
(6) Methods of Soil Analysis, American Society of Agronomy, Agronomy No. 9, 1965
(7) ASTM, Section 11 Water and Environmental Technology, Volume 11.01 Water (1), 1991
(8) American Society for Testing and Materials, Petroleum Products, Lubricants, and Fossil Fuels, Section 5, Volumes 05.01 - 05.05
(9) Hach Handbook of Water Analysis, 1979

Comments:

The test results in this report meet all NELAP requirements for parameters for which accreditation is held. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

According to 40CFR Part 136.3, pH, total residual chlorine, dissolved oxygen, sulfite, and temperature analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH, Client Provided), they were not analyzed immediately, but as soon as possible after laboratory receipt.

Data in the QC report may differ from final results due to digestion and/or dilution of sample into analytical ranges. The "Time Analyzed" may not be the actual time of analysis. The "Date Analyzed" is the actual date of analysis. Sludge samples are reported on a wet weight basis (i.e., not corrected for percent moisture) unless otherwise indicated.

Quality Control acceptance criteria are based either on limits specified in the referenced method or on actual laboratory performance.

All data is reported on sample "as received" unless noted.

Sample IDs with a "-00" at the end indicate a blank spike or blank spike duplicate associated with the numbered sample.

SAMPLE RESULT IDENTIFICATION

ND	= Not detected at a value greater than the reporting limit
TNTC	= Too numerous to count

BLANK QC SAMPLE IDENTIFICATION

MB	Method Blank
ICB	Initial Calibration Blank
CCB	Continuing Calibration Blank

SPIKE QC SAMPLE IDENTIFICATION

MS	Method (Matrix) Spike
MSD	Method (Matrix) Spike Duplicate
PDS	Post Digestion/Distillation Spike
SB	Spiked Blank
SBD	Spiked Blank Duplicate

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SEVERN TRENT STL

QUALITY ASSURANCE METHODS

REFERENCES AND NOTES

Report Date: 01/12/2006

REFERENCE STANDARD QC SAMPLE IDENTIFICATION

LCS	Laboratory Control Standard
RS	Reference Standard
ICV	Initial Calibration Verification Standard
CCV	Continuing Calibration Verification Standard
ISA/ISB	ICP Interference Check Sample
DSC	Distilled Standard Check

DUPLICATE QC SAMPLE IDENTIFICATION

MD	Method (Matrix) Duplicate
ED	Extraction Duplicate
DD	Digestion Duplicate
PDD	Post Digestion Duplicate
PSD	Post Digestion/Distillation Spike Duplicate

Analyses performed by a subcontract laboratory are indicated on the analytical and/or quality control reports under "technician" using the following codes:

SUBCONTRACT LABORATORIES

Severn Trent Laboratories:

Los Angeles, CA	*la	Houston, TX	*he	Lake Charles, LA	*lc
Aurora, CO	*au	North Canton, OH	*nc		
Tampa, FL	*ta	Valparaiso, IN	*vp		
Sacramento, CA	*sa	Chicago, IL	*ch		
Pensacola, FL	*pe	Tallahassee, FL	*tl		

Other:

Client provided data *cp Non-STL Subcontract Lab *xx

EXPLANATION OF QC FLAGS

B - This flag is used to indicate that an analyte is present in the method blank as well as in the sample. It indicates that the client should consider this when evaluating the results.

D - This flag indicates that surrogates were diluted out of calibration range and cannot be quantified.

E - Indicates that a sample result is an estimate because the concentration exceeded the calibration range of the instrument.

F - Indicated that a initial calibration verification or continuing calibration verification recovery is outside the specified quality control limits.

I - Used to indicate matrix interference.

X - Indicates that a surrogate recovery is outside the specified quality control limits.

Y - Used to identify a spike or spike duplicate recovery is outside the specified quality control limits.

Z - Used to indicate a relative percent difference (RPD) for a duplicate analysis is outside the specified quality control limits.

* - Indicates a relative percent difference for a duplicate analysis is outside the specified quality control limits.

' - Used to indicate that a standard is outside specified quality control limits.

EXPLANATION OF DATA QUALIFIERS

B - Indicates that a value for an inorganic analysis is an estimate. It is used when a compound is determined to be present but at a concentration less than the quantitation limit of the method.

J - Indicates that a value for an organic analysis is an estimate. It is used when a compound is determined to be present based on chromatographic pattern or mass spectral data, but at a concentration less than the quantitation limit of the method. This flag is also used when estimating the concentration of a tentatively identified compound.

U - Indicates that a value is less than the MDL or was not detected.

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ARCADIS

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name: OK001351.0001.00001

Project Location: Sunoco

Laboratory: STL - CC

Project Manager: Mike Gates

Sampler(s)/Affiliation: ARCADIS

210
233088

Sample ID/Location	Matrix	Date Sampled	Time	ANALYSIS / METHOD / SIZE: (3) 40 ml voa BTEX HCl	(1) 1 liter Neat HCO3, CO3, Br, Cl, Fl, NO3, SO4, TDS, Ca, Fe, K, Mg, Na					Remarks	Total
MW99-3	L	12-19-05	1405	3	1						4
MW99-2	L	12-19-05	1425	3	1						4
MW99-1	L	12-19-05	1450	3	1						4
Trip Blank	L			1							1
					IL						

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 13

Relinquished by: [signature]	Organization: ARCADIS	Date 12/19/05	Time 1800	Seal Intact?	
Received by: Fedex	Organization:	Date / /	Time	Yes	No N/A
Relinquished by: Fedex	Organization:	Date / /	Time	Seal Intact?	
Received by: [signature]	Organization: STL	Date 12/20/2005	Time 0954	Yes	No N/A

Special Instructions/Remarks:

Send Report to Mike Gates of questions call 918-664-8900

Delivery Method: ☐ In Person ☒ Common Carrier Fed-EX (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

rpjsckl | Job Sample Receipt Checklist Report | V2

Job Number.: 233229 Location.: 57203 Check List Number.: 1 Description.:
Customer Job ID.....: Job Check List Date.: 12/20/2005 Date of the Report..: 12/20/2005
Project Number.: 98000084 Project Description.: Project - OVM Project Manager.....: ovm
Customer.....: ARCADIS / G&M Contact.: Mike Gates

Questions ?	(Y/N)	Comments
How did samples arrive?.....		FED EX
Chain-of-Custody Present?.....	Y	
Custody seal on shipping container?.....	Y	
...If "yes", custody seal intact?.....	Y	
Custody seals on sample containers?.....	N	
...If "yes", custody seal intact?.....		
Samples chilled?.....	Y	
Temperature blank in cooler?.....	Y	
Temp of cooler acceptable? (0.05 to 6.00 deg C)	Y	2.0C
Samples received intact (good condition)?.....	Y	
Volatile samples acceptable? (no headspace).....	N	TRIP BLANK DATED 02/27/2003 RECEIVED WITH HEADSPACE
Correct containers used?.....	Y	
Adequate sample volume provided?.....	Y	
Samples preserved correctly?.....	Y	
Samples received within holding-time?.....	Y	
Agreement between COC and sample labels?.....	Y	
Additional.....		
Comments.....		
Sample Custodian Signature.....		V.MCDERMOTT 12/20/2005