Genesee River Phase V Water and Sediment Sampling Results

CSXT Derailment and Chemical Spill at Charlotte, New York

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November 27, 2002

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November 27, 2002

Janet Scagnelli Esq.
2001 Market Street
26th Floor
Philadelphia, PA 19103

RE: GENESEE RIVER PHASE V REPORT

Dear Ms. Scagnelli:

Enclosed for your review and comment is the draft report: ***Genesee River Phase V Water and Sediment Sampling Results.*** Please contact me via telephone at 732-469-5599, ext. 317 or e-mail Mike.Murray@shawgrp.com with any questions or comments.

Sincerely,

Mike Murray
Senior Environmental Scientist

MM:dlt

cc w/enclosure:

P. Kurzanski
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T. Ahrens

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Genesee River Phase V Water and Sediment Sampling Results

Introduction

On October 24 and 25, Phase V Genesee River sampling was conducted. The sampling included sediment coring using vibratory coring techniques, and collection of bottom water samples. The data are presented in this report, which also includes a discussion of the data and a comparison to data collected earlier.

Sampling Locations:

Phase V sediment samples were collected at 12 locations in the area adjacent to the spill. All Phase V sediment-sampling locations were judged to be in the spill affected area. Samples of bottom water were collected at six of these locations, and at three downstream locations. Six previously sampled locations were re-sampled in Phase V: SS-5A, SS-11A, SS-15A, SS-19A, SS-24A and SS-45. Six previously un-sampled locations were added for Phase V. These sampling stations are designated SS-59 through SS-64. The sampling station locations were selected to delineate the remaining area of river bottom containing elevated methylene chloride concentrations. The location coordinates for these stations are given in the table below.

Phase V Sampling Locations

STATION	SAMPLE TYPE	STATE PLANE NAD83 NY WEST	
SS-5A	Sediment/Water	N1186350.9848	E1407683.3885
SS-11A	Sediment/Water	N1186320.5219	E1407670.3009
SS-15A	Sediment	N1186320.5258	E1407670.2080
SS-19A	Sediment/Water	N1186302.4734	E1407683.8853
SS-24A	Sediment/Water	N1186321.1537	E1407741.4456
SS-45	Sediment/Water	N1186250.9133	E1407719.0339
SS-59	Sediment	N1186282.2358	E1407655.9983
SS-60	Sediment	N1186264.8064	E1407690.4037
SS-61	Sediment/Water	N1186298.0146	E1407716.5058
SS-62	Sediment	N1186209.1888	E1407699.3721
SS-63	Sediment	N1186287.4051	E1407737.4490
SS-64	Sediment	N1186229.1226	E1407742.8894
WS-1	Water	N1186492.5188	E1407863.7890
WS-2	Water	N1188208.6836	E1409105.4559
WS-3	Water	N1190444.1315	E1410522.0005

Stations SS-5A through SS-64 are shown on **Figure 1.** Stations WS-1, WS-2 and WS-3 are shown on **Figure 2.**

Sediment and water samples were submitted for volatiles analysis. Split samples of sediment were requested by and provided to the NYSDEC for locations SS-5A, SS-15A and SS-45.

Sediment Sampling:

Samples were collected with a vibratory corer with a 4-inch barrel using flexible plastic liners. One core sample was collected from each of the sampling stations described previously to refusal. The core lengths ranged from four to seven feet. The cores were divided into three sections of approximately equal length, and sediment samples were collected from each interval.

Water Sampling:

Bottom water samples were collected at the nine locations previously described and were analyzed for methylene chloride and acetone. Samples were collected with a horizontal water sampler. Samples were collected from approximately one foot above the sediments.

Results and Discussion

Sediment: The Phase V sediment data are presented in **Table 1.** Methylene chloride was detected at all locations at all three depths. Concentrations in surface samples ranged from 170 ppb at SS-15A to 1,100,000 ppb at SS-19A. Concentrations at a sediment depth of 3 feet ranged from 56 ppb at SS-45 to 6,600,000 at SS-63. Deeper sediment concentrations from the bottom third of the cores ranged from 46 ppb at SS-45 to 2,900,000 ppb at SS-19A. At most locations, the highest methylene chloride concentrations were present at the three-foot depth.

For reasons that are unclear at this writing, methylene chloride concentrations found in Phase V were higher than found in Phase IV. For this data review, to evaluate if methylene chloride sediment concentrations are continuing to decrease, Phase V methylene chloride concentrations were compared to collocated Phase III data.

Figures 3 through 7 are log scale plots of the collocated Phase III and V data for locations SS-5A, SS-11A, SS-15A, SS-19A, and SS-24A respectively.

Figure 3 shows that at SS-5A the concentrations have decreased significantly at all depths, with concentrations in the surface and three foot depth decreasing to less than one percent of the Phase III concentration.

Figure 4 indicates that at location SS-11A, the surface concentrations of methylene chloride have decreased markedly, but concentrations at three feet and 4-5 feet have increased.

Figure 5 shows that at location SS-15A methylene chloride concentrations at the surface and 3 foot depth have decreased significantly from Phase III concentrations, and concentrations in deeper sediments (5 ft) were relatively low in Phase III and have decreased slightly.

Figure 6 presents the comparison for SS-19A. At this location the pattern is similar to 11A, with the methylene chloride concentration decreasing on the surface, but increasing at sediment depths of three and five feet.

Figure 7 shows that at location SS-24A methylene chloride has decreased to below 1000 ppb at all depths.

The comparisons of the Phase V and Phase III data show that methylene chloride sediment concentrations have decreased significantly at three of five collocated sample stations. At two of the stations, the methylene chloride concentrations have decreased in surface sediments only, and show an increase in deeper sediments. The data for the six new locations sampled in Phase V show that at two of the locations (SS-59 and SS-62), methylene chloride concentrations are relatively low, but were elevated at the remaining four new locations. Therefore, it appears that the anticipated natural attenuation of methylene chloride is occurring more rapidly at some locations within the affected area than at others. This may be due to several factors, including specific sediment characteristics and the initial methylene chloride concentrations.

Water: The Phase V bottom water data are presented in **Table 2**. The concentrations ranged from 0.67 ppb to 5.4 ppb in the affected area, and from 0.65 ppb to 1.6 ppb at downstream locations. These concentrations are quite low, and indicate that spill related methylene chloride remaining in sediments is not resulting in river water concentrations that would negatively affect downstream or lake drinking water sources.

Conclusions and Recommendations

The results of the Phase V sediment and bottom water sampling indicate that methylene chloride concentrations have decreased significantly through natural attenuation in portions of the spill affected area, and have decreased substantially in surface sediments throughout the affected area. Concentrations remain elevated in deeper sediments in some portions of the affected area. Concentrations of methylene chloride in Genesee River bottom waters were low. Therefore, release of methlyene chloride from sediments to the water column is not a concern for drinking water intakes.

Natural attenuation of methylene chloride and acetone through biodegradation and other mechanisms is expected to continue, although the contaminant reduction rate is likely to decrease during the cold-weather months. A laboratory test of methylene chloride biodegradation in Genesee River sediments is ongoing at the Shaw E&I Environmental Technology Laboratory in Knoxville, TN. Preliminary results indicate that sediments collected from the spill area during Phase V sampling have a healthy population of aerobic bacteria capable of degrading methylene chloride. The results of the tests will determine the biodegradation rate of methylene chloride in the laboratory and provide information for an estimation of the biodegradation rate in the affected area.

Because the results of the Phase V sampling event appear to be inconsistent with the Phase IV results, an additional round of sampling using vibratory coring is planned for early December 2002. Additional monitoring of bottom water will also be performed at that time in accordance with the previously submitted and approved Monitoring Plan.

Table 1
Genesee River Phase V Sediment Data

Sample ID	Lab Sample ID	Lab	Sample Date	Acetone (ppb)		Methylene Chloride (ppb)		Core Length (ft)	Depth to Bottom (ft)
SS-5A 1'	A2A63801	STL	10/24/2002	91		3,800		6'	10'
SS-5A 3'	A2A62701	STL	10/24/2002	35		1,100			
SS-5A 6'	A2A62702	STL	10/24/2002	29		590			
SS-11A 1'	A2A62802	STL	10/24/2002	65		1,800		5.5'	23'
SS-11A 3'	A2A62703	STL	10/24/2002	30,000	U	2,400,000			
SS-11A 4'	A2A62704	STL	10/24/2002	14,000	U	1,700,000			
SS-15 1'	A2A62803	STL	10/24/2002	32		170		5	11'
SS-15 3'	A2A62705	STL	10/24/2002	33		3,300			
SS-15 5'	A2A62706	STL	10/24/2002	27		2,000			
SS-19A 1'	A2A62804	STL	10/24/2002	3,300	U	1,100,000		5	
SS-19A 2.5'	A2A62707	STL	10/24/2002	33,000	U	5,000,000			
SS-19A 5'	A2A62805	STL	10/24/2002	2,700	U	2,900,000			
SS-24A 1'	A2A62807	STL	10/25/2002	67		320		4.5	24'
SS-24A 2.5'	A2A62717	STL	10/25/2002	32		76	J		
SS-24A 4.5'	A2A62718	STL	10/25/2002	39		700			
SS-45 1'	A2A62708	STL	10/24/2002	30		220		5	
SS-45 3'	A2A62709	STL	10/24/2002	58		56	J		
SS-45 5'	A2A62710	STL	10/24/2002	50		46	J		
SS-59 1'	A2A62806	STL	10/25/2002	76		420		7	24'
SS-59 4'	A2A62715	STL	10/25/2002	100		7,300			
SS-59 7'	A2A62716	STL	10/25/2002	56		290			
SS-60 1'	A2A62808	STL	10/25/2002	100		620		4	23'
SS-60 2.5'	A2A62719	STL	10/25/2002	2,500	U	1,000,000			
SS-60 4'	A2A62720	STL	10/25/2002	2,900	U	350,000			
SS-61 1'	A2A62809	STL	10/25/2002	3,200	U	390,000		4	24'
SS-61 2.5'	A2A62721	STL	10/25/2002	2,900	U	2,000,000			
SS-61 4'	A2A62722	STL	10/25/2002	32		12,000			
SS-62 1'	A2A62810	STL	10/25/2002	130		950		5	25.5'
SS-62 3'	A2A62723	STL	10/25/2002	96		1,400			
SS-62 5'	A2A62724	STL	10/25/2002	41		730			
SS-63 1'	A2A62811	STL	10/25/2002	3,200	U	280,000		4	25'
SS-63 2.5'	A2A62725	STL	10/25/2002	2,800	U	6,600,000			
SS-63 4'	A2A62726	STL	10/25/2002	2,800	U	2,700,000			
SS-64 1'	A2A62812	STL	10/25/2002	3,200	U	370,000		4	24'
SS-64 2.5'	A2A62727	STL	10/25/2002	3000	U	2,300,000			
SS-64 4'	A2A62728	STL	10/25/2002	170		100,000			

Notes:
B=Analyte found in blank
D=Dilution
E= Analyte exceeded the calibration range
J= Estimated Result

Table 2
Genesee River Phase V Bottom Water Data

IT Sample ID	Lab Sample ID	Lab	Sample Date	Acetone (ppb)		Methylene Chloride (ppb)	
SS-5Aw	A2A62711	STL	10/24/2002	3.7		5.4	
SS-11Aw	A2A62712	STL	10/24/2002	2.4		2.5	
SS-19Aw	A2A62713	STL	10/24/2002	2.3		0.67	J
SS-24Aw	A2A62732	STL	10/25/2002	1.8		1.1	
SS-45w	A2A62714	STL	10/24/2002	3.8		2.5	
SS-61w	A2A62723	STL	10/25/2002	2.7		0.6	J
WS-1	A2A6729	STL	10/25/2002	1.6		1.6	
WS-2	A2A6730	STL	10/25/2002	1.8		0.65	J
WS-3	A2A6731	STL	10/25/2002	1.9		0.88	J

Notes:
J = Estimated Result

IMAGE	X-REF	OFFICE	DRAWING NUMBER
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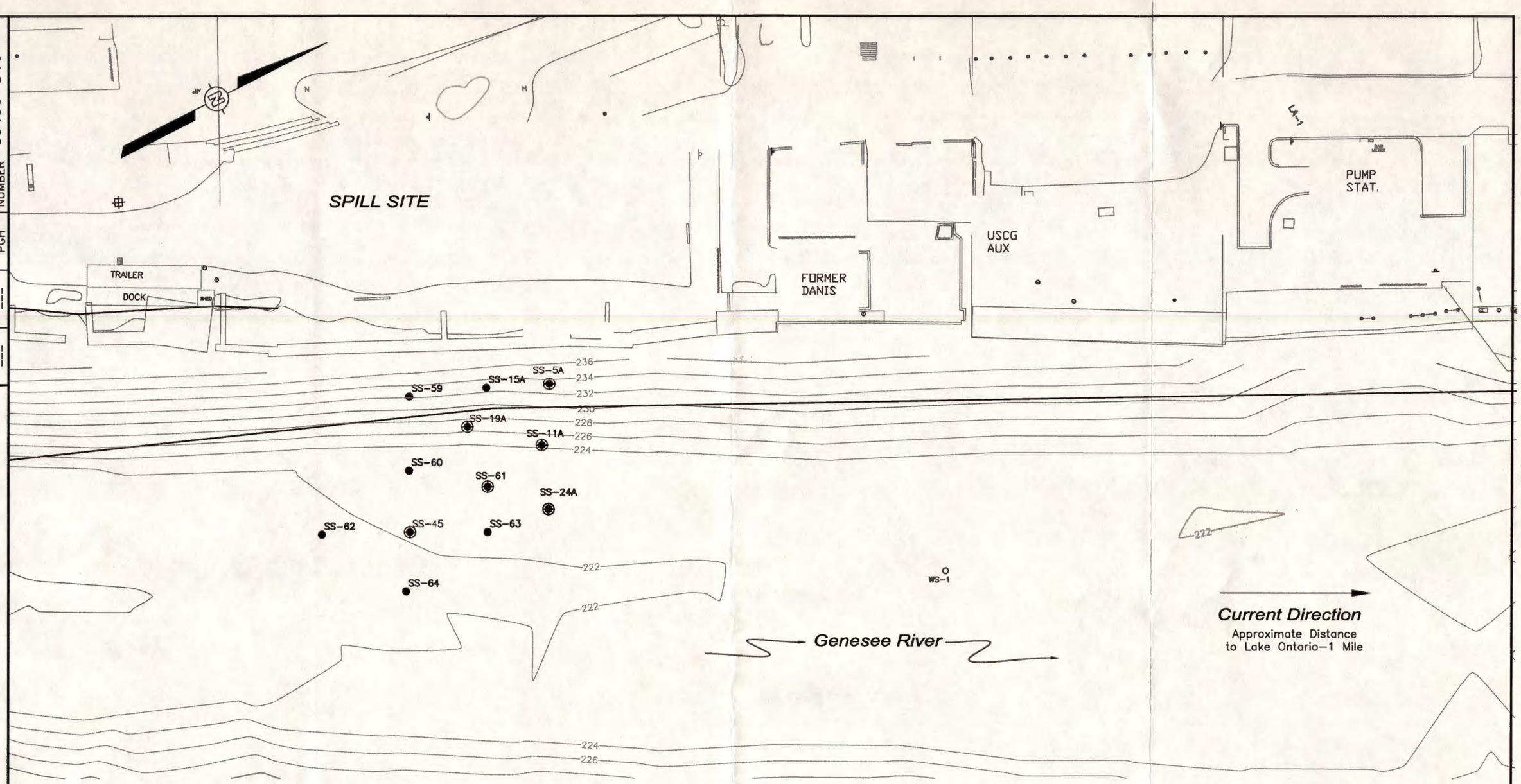

LEGEND:

- WS-1 — WATER SAMPLING LOCATION
- SS-59 — SEDIMENT SAMPLING LOCATION
- SS-45 — SEDIMENT AND WATER SAMPLING LOCATION
- NAVIGATION CHANEL BOUNDARY
- 224 — BATHOMETRIC CONTOUR LINE IN FT

NOTE:
SEE FIG. B-2 FOR SAMPLE WS-2 AND WS-3 LOCATIONS

STATION	STATE PLANE NAD83 NY WEST	
SS-5A	N1186350.9848	E1407683.3885
SS-11A	N1186320.5219	E1407670.3009
SS-15A	N1186320.5258	E1407670.2080
SS-19A	N1186302.4734	E1407683.8853
SS-24A	N1186321.1537	E1407741.4456
SS-59	N1186282.2358	E1407655.9983
SS-60	N1186264.8064	E1407690.4037
SS-61	N1186298.0146	E1407716.5058
SS-62	N1186209.1888	E1407699.3721
SS-63	N1186287.4051	E1407737.4490
SS-64	N1186229.1226	E1407742.8894
WS-1	N1186492.5188	E1407863.789

SCALE
0 50 100 FEET

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

FIGURE 1

Shaw
Shaw E & I, Inc.

CSX TRANSPORTATION
JACKSONVILLE, FL

PHASE V RIVER
SAMPLING LOCATIONS
CSXT RIVER ST. DERAILMENT
480 RIVER ST. ROCHESTER, NY

DESIGNED BY			CHECKED BY	
DRAWN BY	A. Yanavicius	10/08/02	APPROVED BY	

SCALE:	DRAWING NO.	SHEET NO.	REVISION NO.
AS SHOWN	834540D16		

IMAGE	X-REF	OFFICE	DRAWING NUMBER
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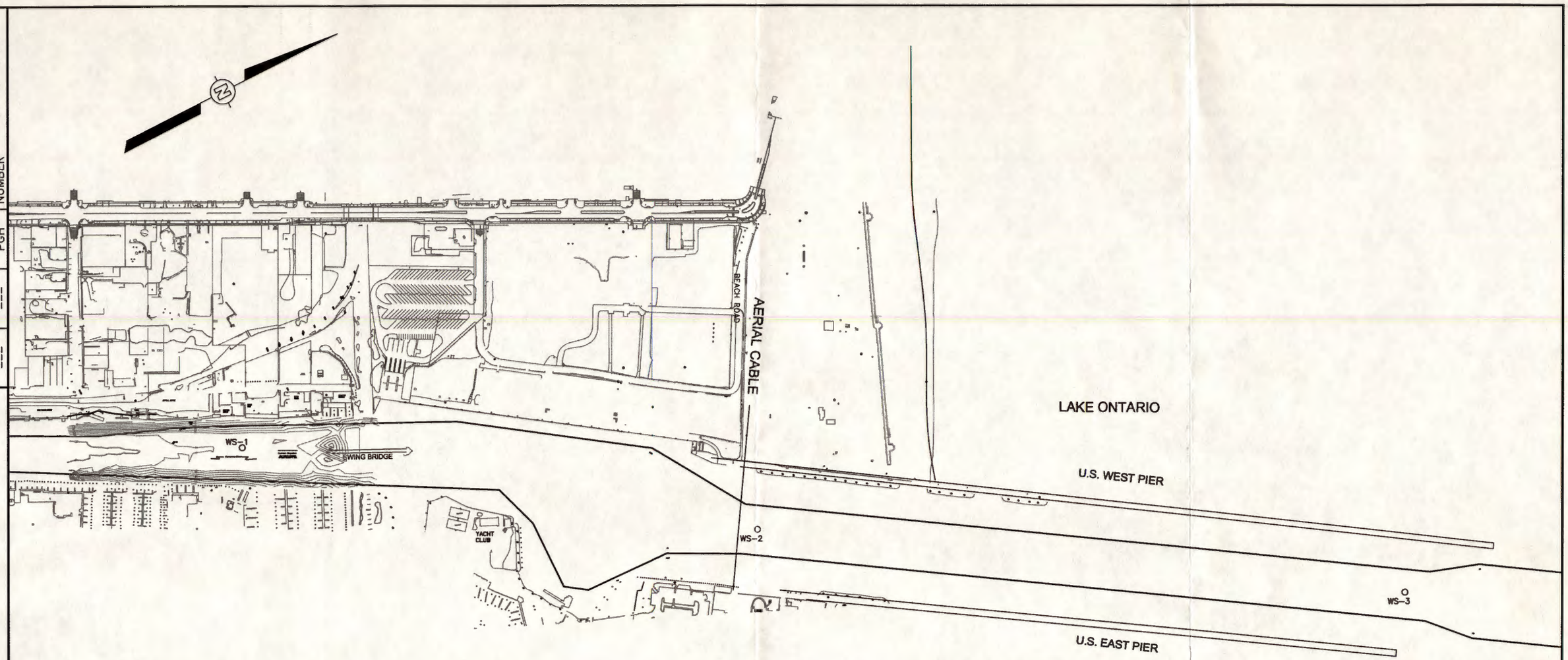

LEGEND:

SS-45 — SEDIMENT AND WATER MONITORING LOCATION

WS-1 — WATER MONITORING LOCATION

——— NAVIGATION CHANEL BOUNDARY

STATION	STATE PLANE NAD83 NY WEST	
SS-5A	N1186350.9848	E1407683.3885
SS-19A	N1186302.4734	E1407683.8853
SS-45	N1186250.9133	E1407719.0339

SCALE

0 400 800 FEET

FIGURE 2

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

Shaw
Shaw E & I, Inc.

CSX TRANSPORTATION
JACKSONVILLE, FL

PHASE V DOWNSTREAM WATER SAMPLING LOCATIONS
CSXT RIVER ST. DERAILMENT
480 RIVER ST. ROCHESTER, NY

DESIGNED BY			CHECKED BY		
DRAWN BY	A. Yanavicius	09/27/02	APPROVED BY		

SCALE:	DRAWING NO.	SHEET NO.	REVISION NO.
AS SHOWN	834540D16		

DATE: 10/10/02
FORMAT REVISION 10/8/02

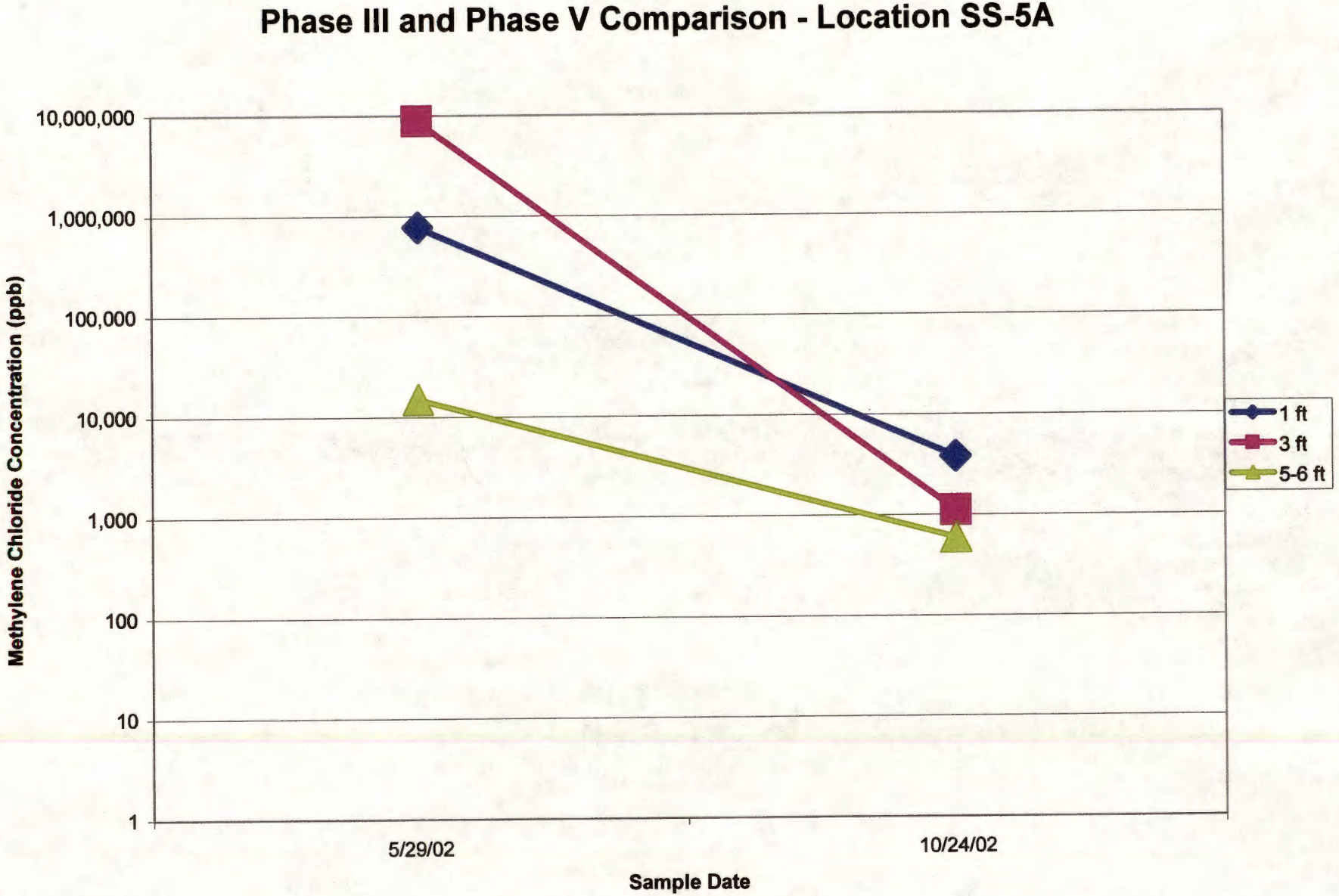
Phase III and Phase V Comparison - Location SS-5A
Methylene Chloride Concentration (ppb)
10,000,000
1,000,000
100,000
10,000
1,000
100
10
1
5/29/02
10/24/02
Sample Date
1 ft
3 ft
5-6 ft

Figure 3

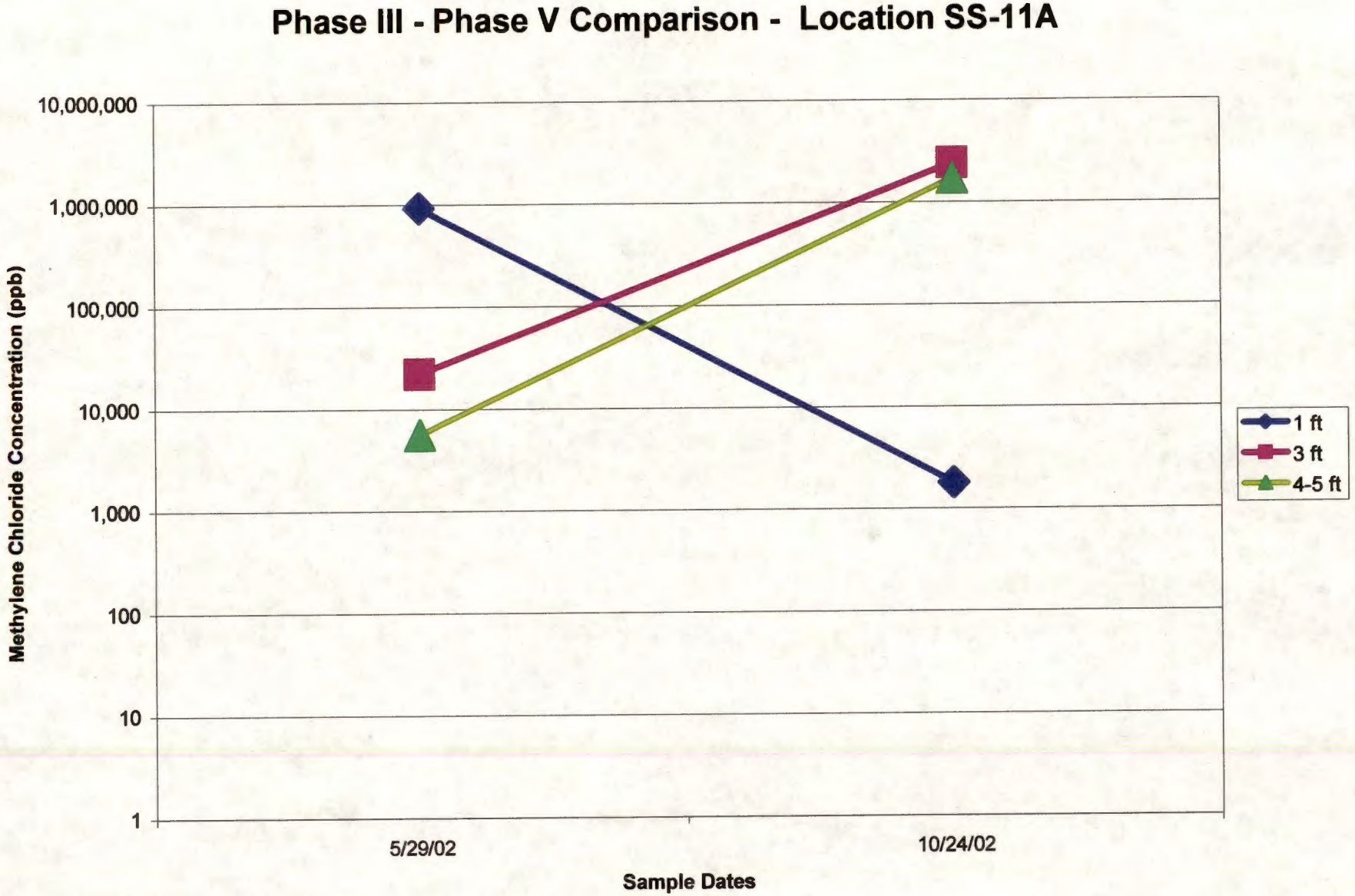
Phase III - Phase V Comparison - Location SS-11A
10,000,000
1,000,000
100,000
10,000
1,000
100
10
1
Methylene Chloride Concentration (ppb)
5/29/02
10/24/02
Sample Dates
1 ft
3 ft
4-5 ft

Figure 4

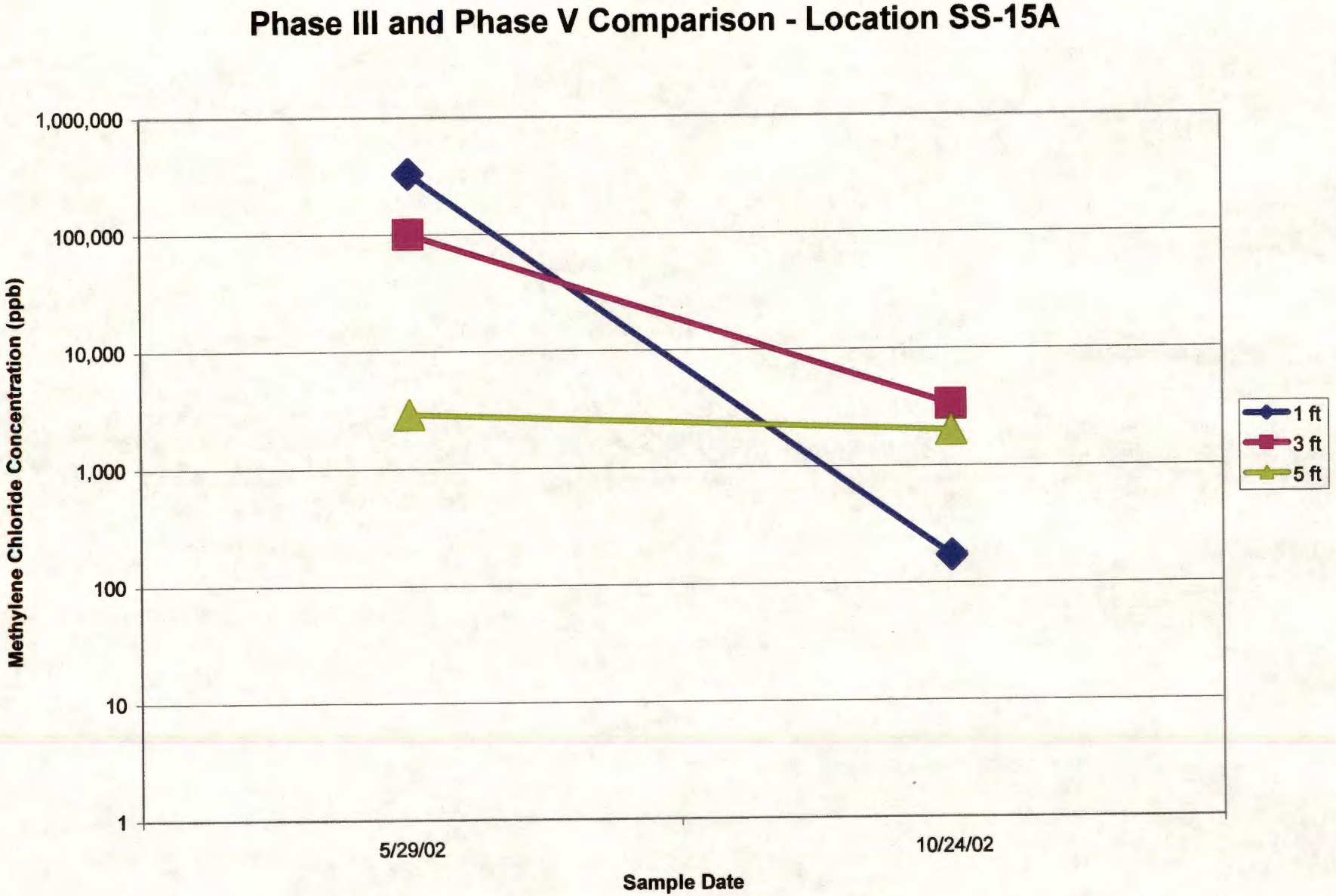
Phase III and Phase V Comparison - Location SS-15A
1,000,000
100,000
10,000
1,000
100
10
1
Methylene Chloride Concentration (ppb)
5/29/02
10/24/02
Sample Date
1 ft
3 ft
5 ft

Figure 5

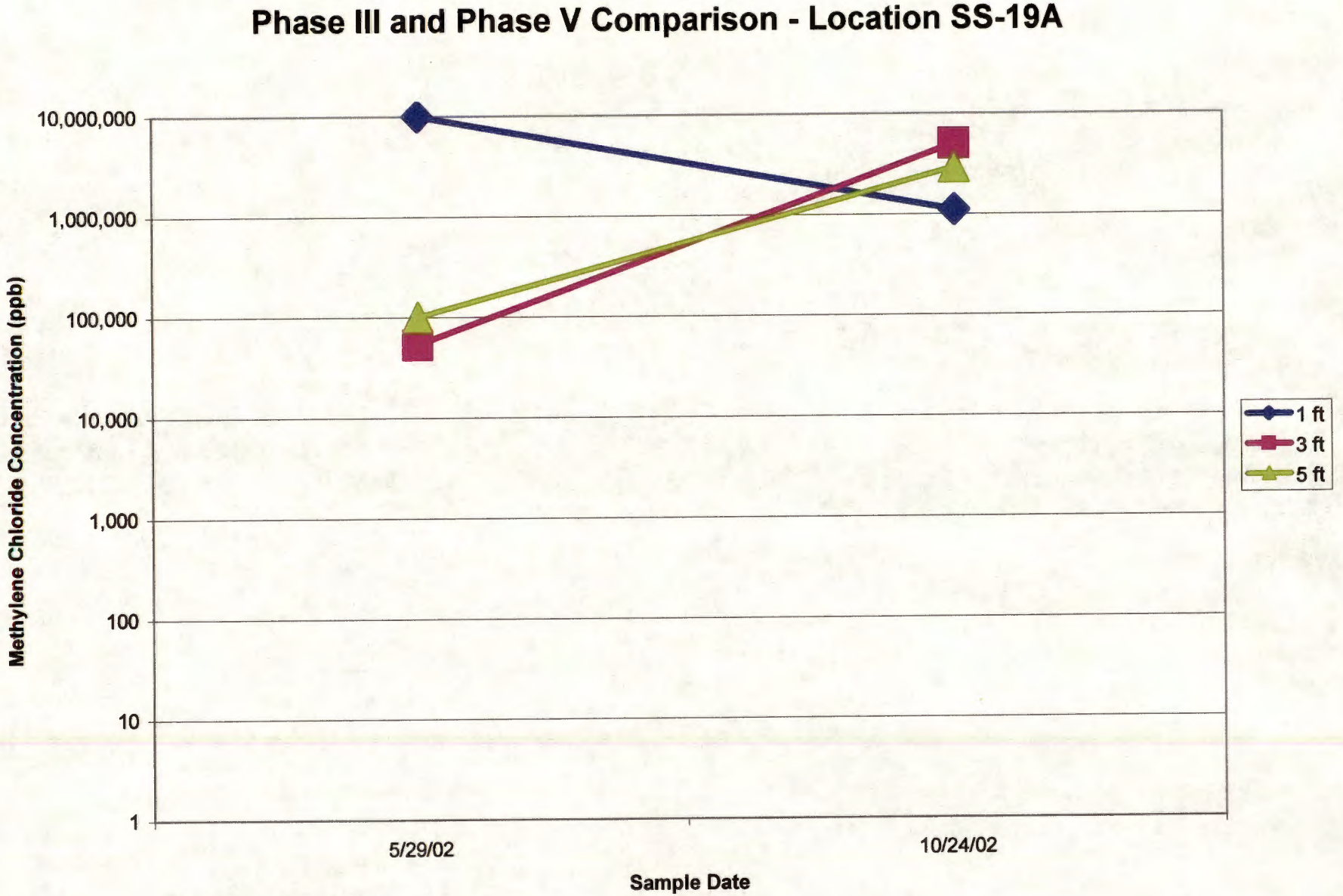
Phase III and Phase V Comparison - Location SS-19A
Methylene Chloride Concentration (ppb)
10,000,000
1,000,000
100,000
10,000
1,000
100
10
1
5/29/02
10/24/02
Sample Date
1 ft
3 ft
5 ft

Figure 6

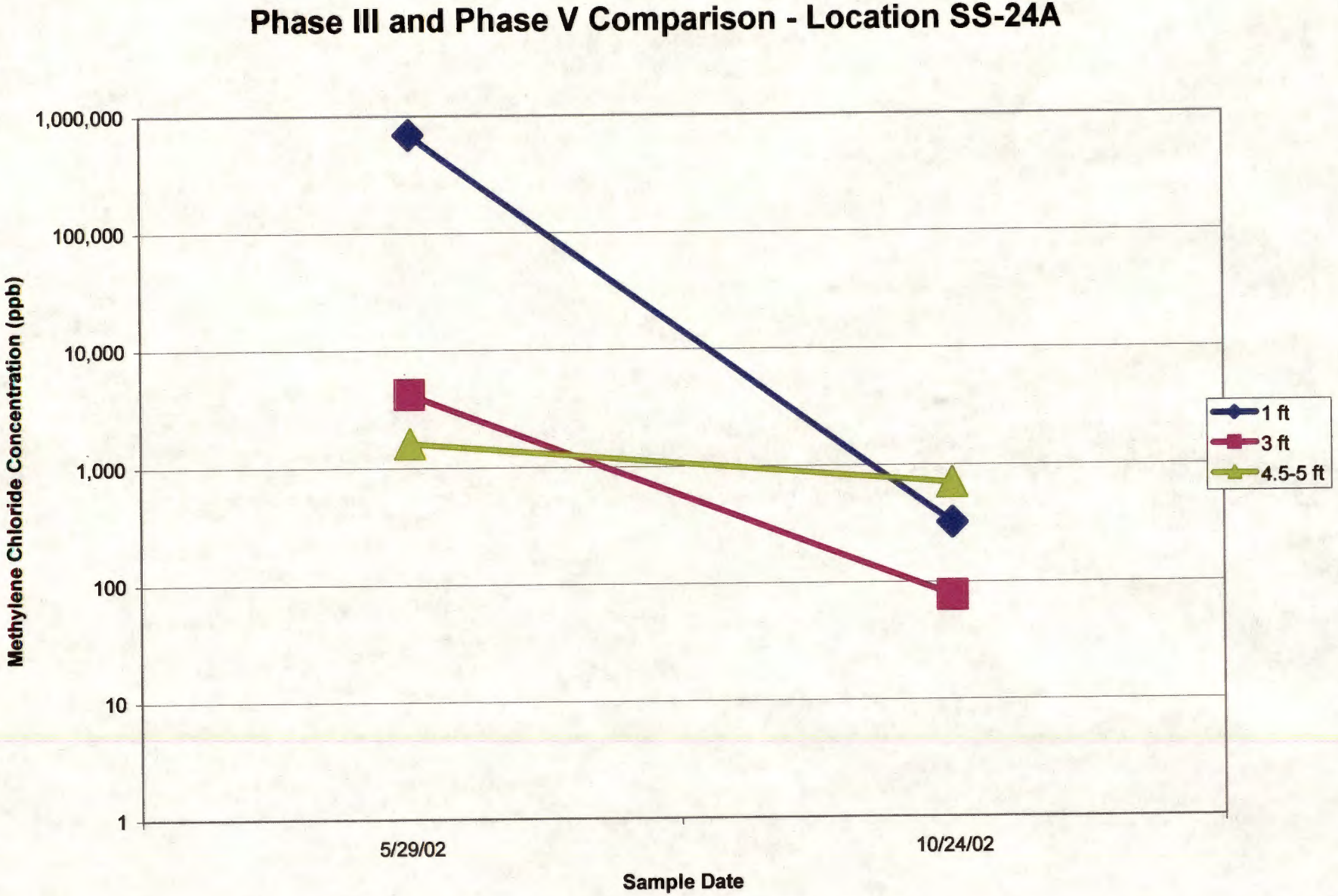
Phase III and Phase V Comparison - Location SS-24A
1,000,000
100,000
10,000
1,000
100
10
1
Methylene Chloride Concentration (ppb)
5/29/02
10/24/02
Sample Date
1 ft
3 ft
4.5-5 ft

Figure 7