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ANNUAL MONITORING REPORT FOR 1989

REILLY TAR & CHEMICAL CORP.
N.P.L. SITE
ST. LOUIS PARK, MINNESOTA

SUBMITTED MARCH 15, 1990

CITY

ENSR — RMAL

(INCLUDES APPENDICES A-D)

ANNUAL MONITORING REPORT

FOR 1989

SUBMITTED TO THE

REGIONAL ADMINISTRATOR
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

EXECUTIVE DIRECTOR
MINNESOTA POLLUTION CONTROL AGENCY

BY

THE CITY OF ST. LOUIS PARK, MINNESOTA

PURSUANT TO
CONSENT DECREE-REMEDIAL ACTION PLAN
SECTION 3.4

UNITED STATES OF AMERICA, ET AL.

vs.

REILLY TAR AND CHEMICAL CORPORATION, ET AL.

UNITED STATES DISTRICT COURT
DISTRICT OF MINNESOTA
CIVIL NO. 4-80-469

MARCH 15, 1990

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1.0 INTRODUCTION

Pursuant to Section 3.4 of the Consent Decree - Remedial Action Plan (CD-RAP) in the case of the United States of America, et al. vs. Reilly Tar & Chemical Corporation, et al., this report presents the results of all chemical analyses and water level measurements for 1989 that are not presented in previous reports.

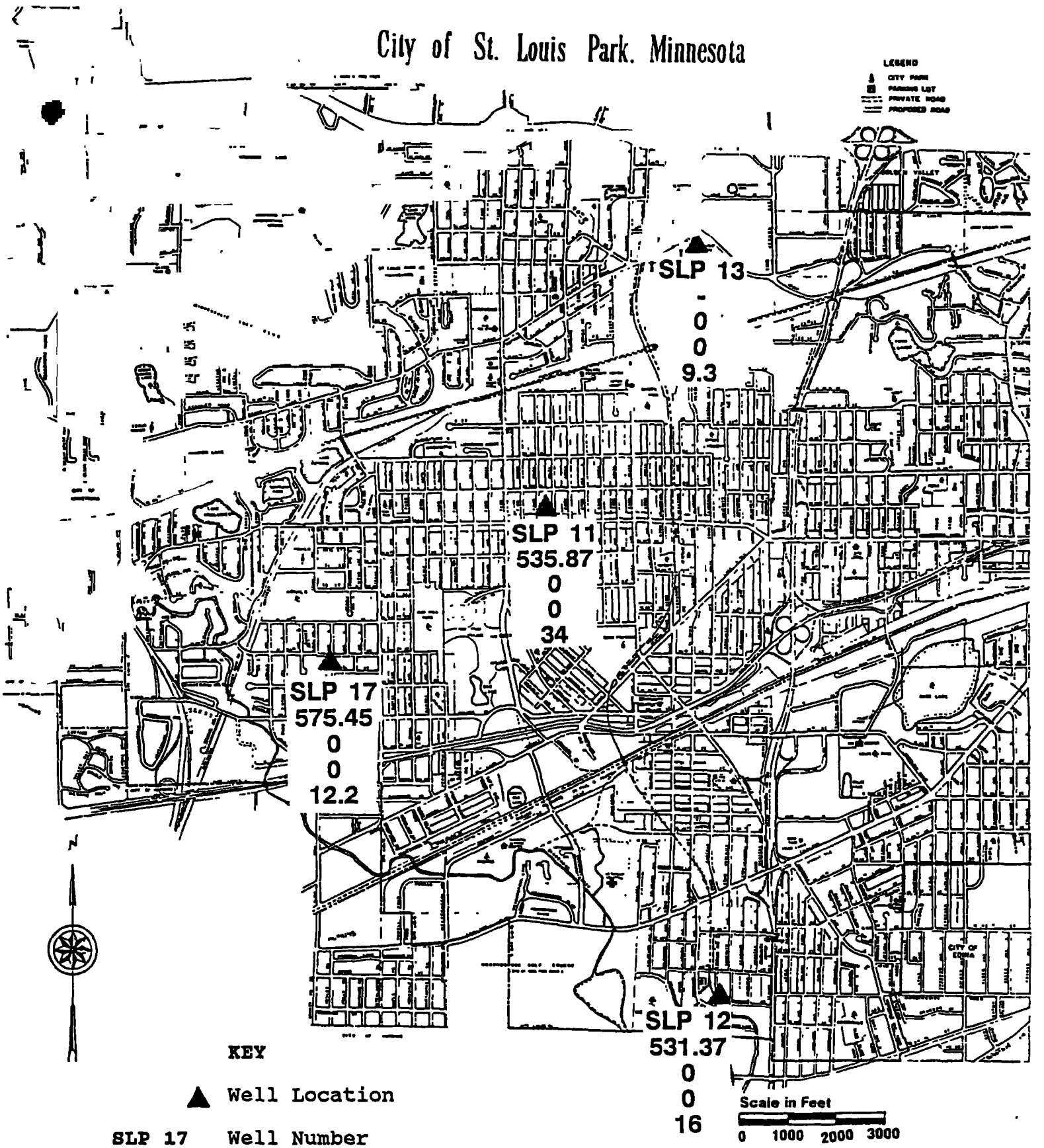
The ground water monitoring conducted in 1989 was performed in accordance with the Sampling Plan submitted in October, 1989. This report contains the results of ground water monitoring that took place from June 6, 1989 to December 31, 1989. The City of St. Louis Park has overall responsibility for conducting the ground water monitoring required by the CD-RAP. In accordance with the Sampling Plan, the City was assisted in 1989 by ENSR Consulting and Engineering (formerly ERT) who collected ground water samples from monitoring wells, and by Rocky Mountain Analytical Laboratory (RMAL) who performed the analyses for PAH and phenolics.

The 1989 monitoring data are presented separately for each aquifer that was monitored, starting with the Mt. Simon-Hinckley Aquifer, which is the deepest below the ground surface, and ending with the Drift-Platteville Aquifer, which is the uppermost aquifer monitored. A series of maps has been prepared to help present the monitoring data. Maps for the Prairie du Chien-Jordan, St. Peter, and Drift-Platteville Aquifers are contained in the pockets of this report.

2.0 MT. SIMON-HINCKLEY AQUIFER

In accordance with the RAP Section 5.1, the four wells in the Mt. Simon-Hinckley Aquifer were sampled once in 1989. A summary of the analytical data and the water level elevations at each well are shown on Figure 2-1. The laboratory reports of the analytical data are included as Appendix A.

The sums of the concentrations of benzo(a)pyrene and dibenz(a,h)anthracene PAH, carcinogenic PAH, and Other PAH in each well are below the drinking water criteria for these compounds. These results are consistent with historical water quality for the aquifer. It appears that the Mt. Simon-Hinckley Aquifer has not been significantly affected by contaminants originating from the former Reilly Tar & Chemical Corporation (Reilly) site.



KEY

▲ Well Location

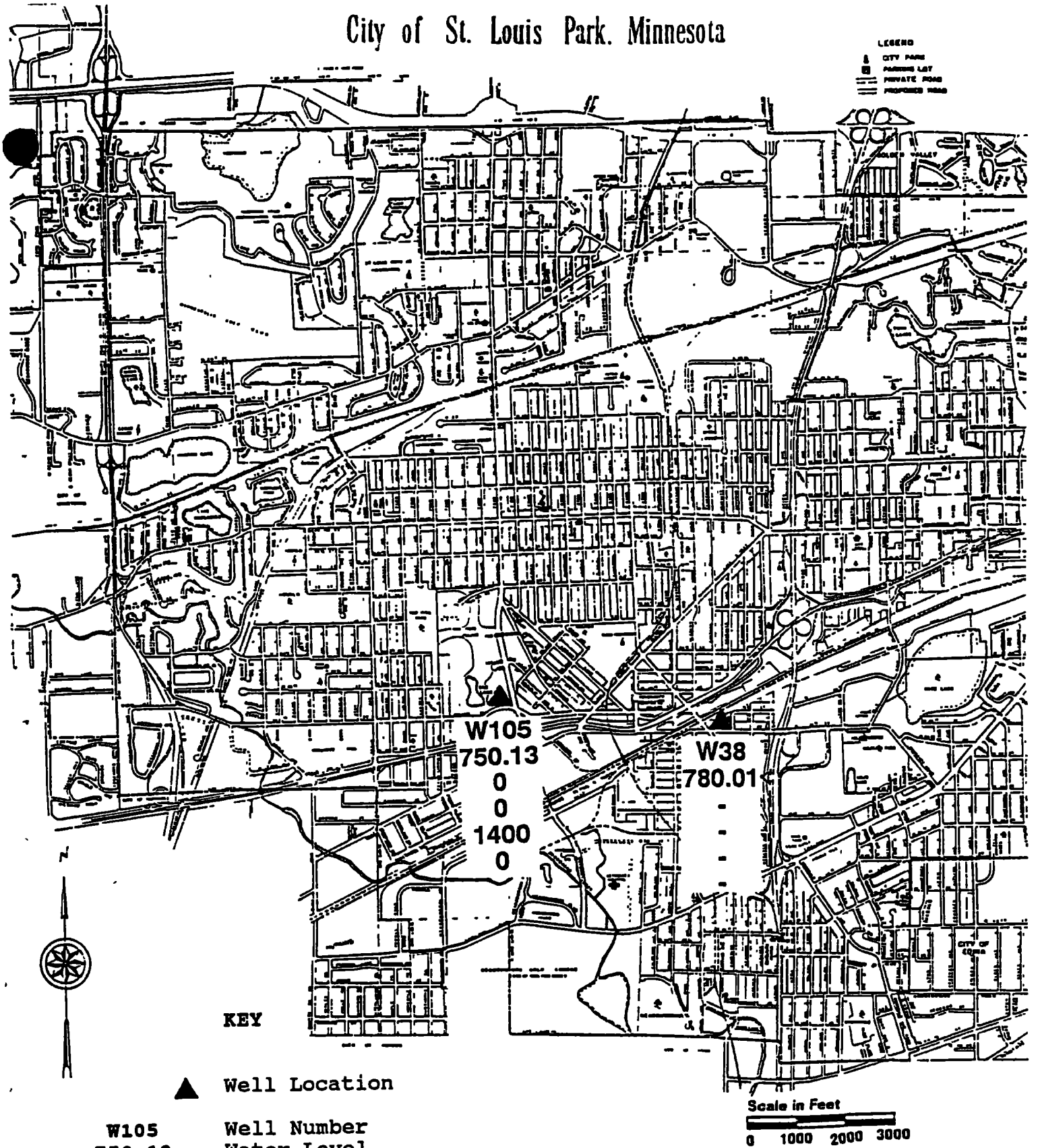
SLP 17	Well Number
541.45	Water Level
0	Sum of benzo(a)pyrene and dibenz(a,h)anthracene
0	Total Carcinogenic PAH
12.3	Total Other PAH (parts per trillion)

FIGURE 2-1 Summary of Ground Water Monitoring Data for the Mt. Simon-Hinckley Aquifer: 1989

3.0 IRONTON-GALESVILLE AQUIFER

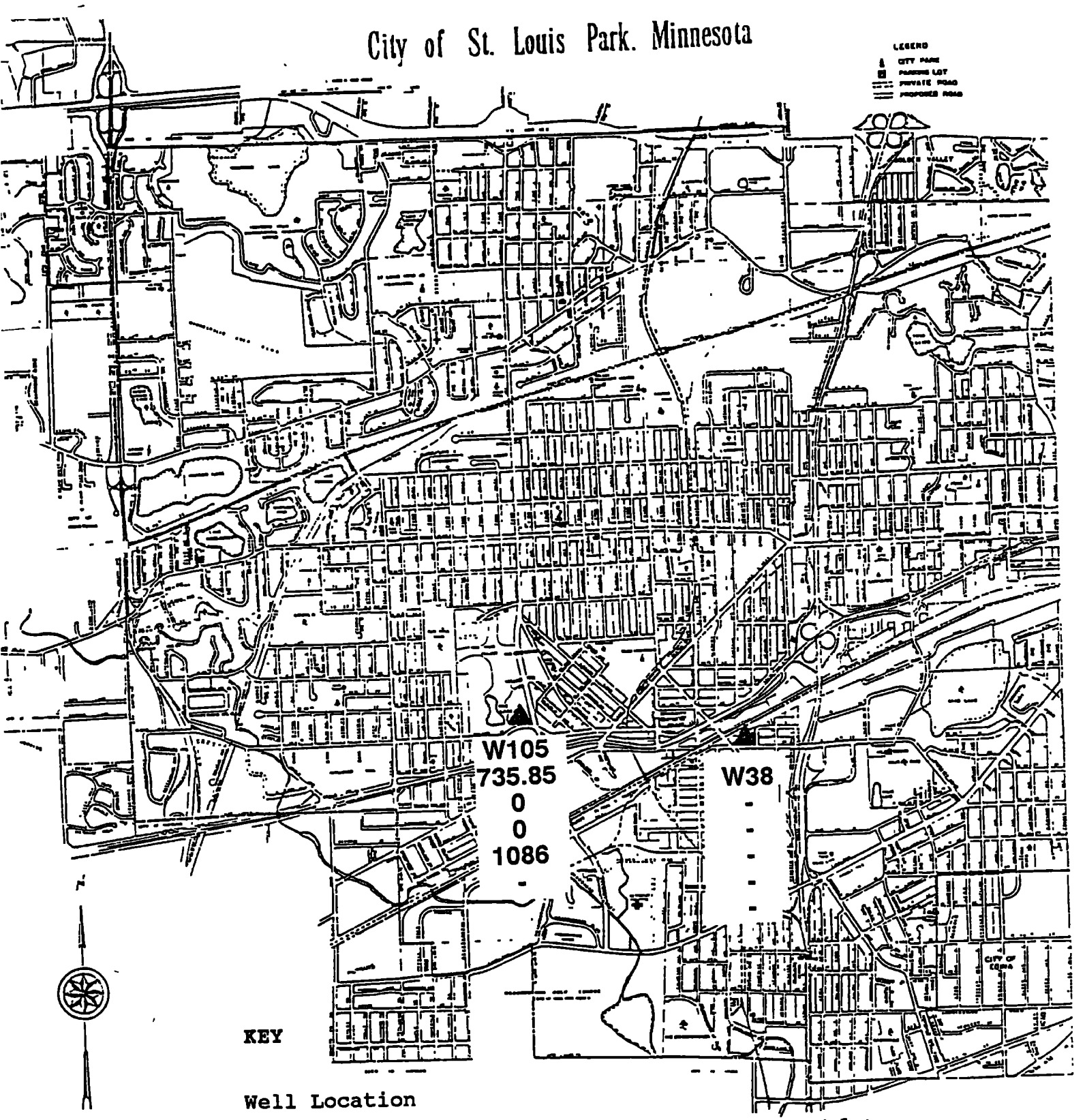
In accordance with the RAP Section 6.1.4, one Ironton-Galesville Aquifer well (W105) was sampled twice in 1989. The data indicate a decrease in the concentration of PAH throughout the year. This trend is consistent with the monitoring results since pumping began in well W105 in November, 1987. The samples were analyzed using the part per trillion method (selected ion monitoring gas chromatography mass spectrometry).

A summary of the analytical data and the ground water elevations of the sampling rounds in the first and second halves of 1989 are presented in Figure 3-1 and Figure 3-2. The laboratory reports of the analytical data are presented as Appendix B. As shown in Figure 3-1 and Figure 3-2, no carcinogenic PAH were detected during the sampling rounds. The concentration of total PAH decreased during 1989 as a result of pumping at well W105. The water quality in well W105 currently meets the criteria for discontinuing the 25 gallons per minute pumpage of the well.



W105	Well Number
750.13	Water Level
0	Sum of benzo(a)pyrene and dibenz(a,h)anthracene
0	Total Carcinogenic PAH
1400	Total Other PAH (parts per trillion)
0	Total Phenolics (parts per billion)

FIGURE 3-1 Summary of Ground Water Monitoring Data for the Ironton-Galesville Aquifer: First Half of 1989



KEY

Well Location

W105	Well Number
750.13	Water Level
0	Sum of benzo(a)pyrene and dibenz(a,h)anthracene
0	Total Carcinogenic PAH
1400	Total Other PAH (parts per trillion)
0	Total Phenolics (parts per billion)

FIGURE 3-2 Summary of Ground Water Monitoring Data for the Ironton-Galesville Aquifer: Second Half of 1989

4.0 PRAIRIE DU CHIEN-JORDAN AQUIFER

In accordance with RAP Section 7.3, Prairie du Chien-Jordan Aquifer wells were monitored in 1989 at the frequency identified in the 1989 Sampling Plan. In addition to water quality monitoring, ground water elevations were measured at the Prairie du Chien-Jordan Aquifer wells during each sampling round. Wells W48, SLP 6, and SLP 7 were not available for sampling during the first quarter because of repairs or no access. These wells were sampled in the remaining quarters of 1989. W23 was sampled three times in 1989.

Summaries of analytical data and ground water elevations for the sampling rounds are shown in Figures 4-1, 4-2, 4-3 and 4-4 (in pockets). The figures show that ground water flow in the aquifer is highly variable, depending on which combination of wells are pumping as measurements are made. The laboratory reports of the analytical data are presented in Appendix C. Table 4-1 presents a summary of 1988 and 1989 analytical results for Prairie du Chien-Jordan Aquifer wells. In 1989, Other PAH were detected in concentrations ranging from 6.1 ppt (well E13) to 120,100 ppt (well W23). The eight wells exceeding the drinking water criterion for Other PAH (W23, W48, H3, SLP15, W403, W29, W40, and W70) define a contaminant plume consistent with historical data for the Prairie du Chien-Jordan Aquifer.

In the second quarter, carcinogenic PAH were detected in wells SLP6, W403, W29, and W70. The levels detected range from 2.8 to 39.7 ppt. Carcinogenic PAH had not been detected before this time in Prairie du Chien-Jordan Aquifer monitoring wells, and have not been detected since. No particular significance is attributed to the second-round carcinogenic PAH data, due to lack of a trend or pattern in the data.

The pumping of source control well W23 in 1989 has lowered the concentration of PAH in samples from the well by approximately 10% throughout the year (Table 4-1).

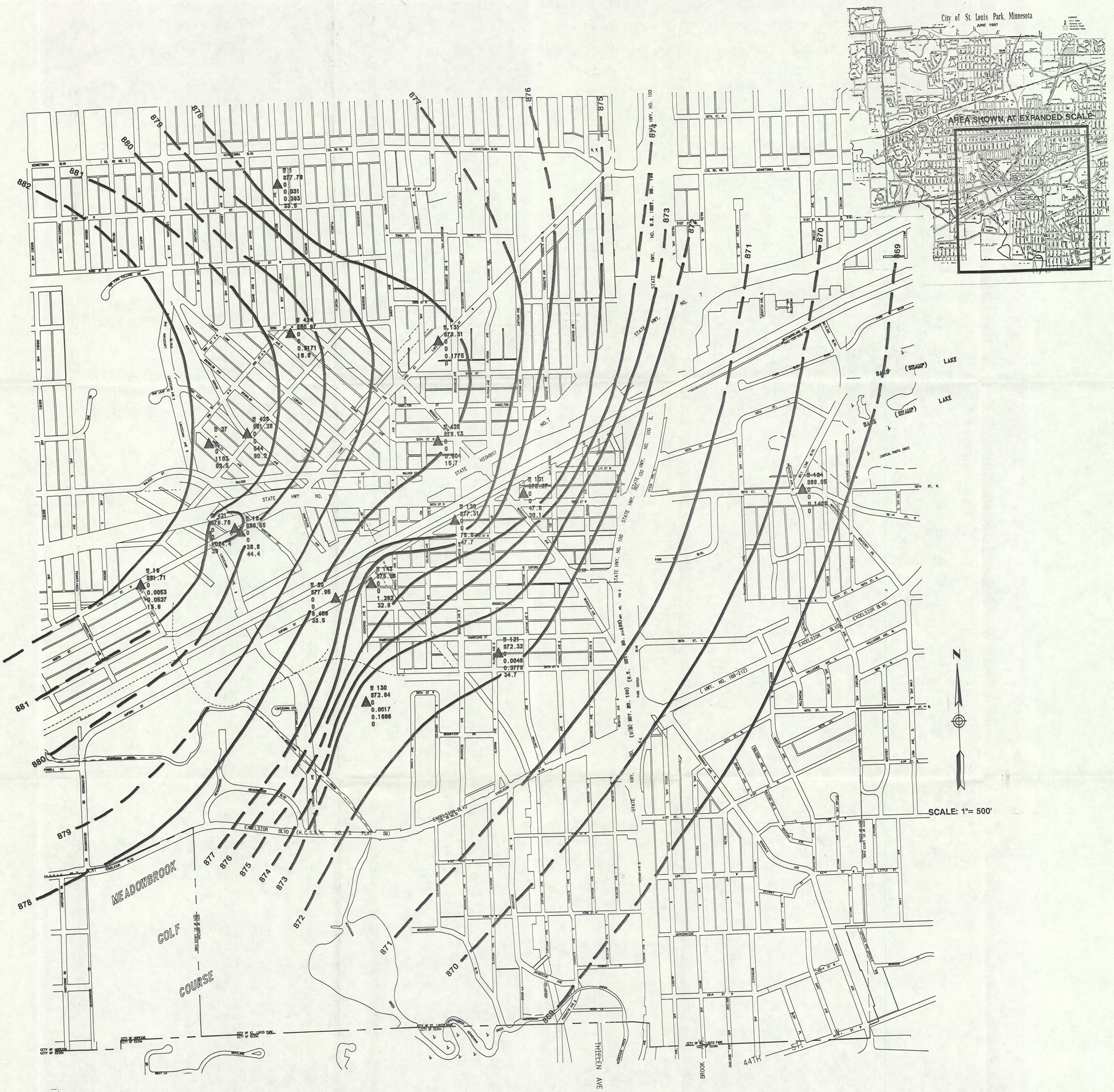


FIGURE 6 - 2 SUMMARY OF GROUND WATER MONITORING RESULTS FOR THE PLATTEVILLE AQUIFER: 1989

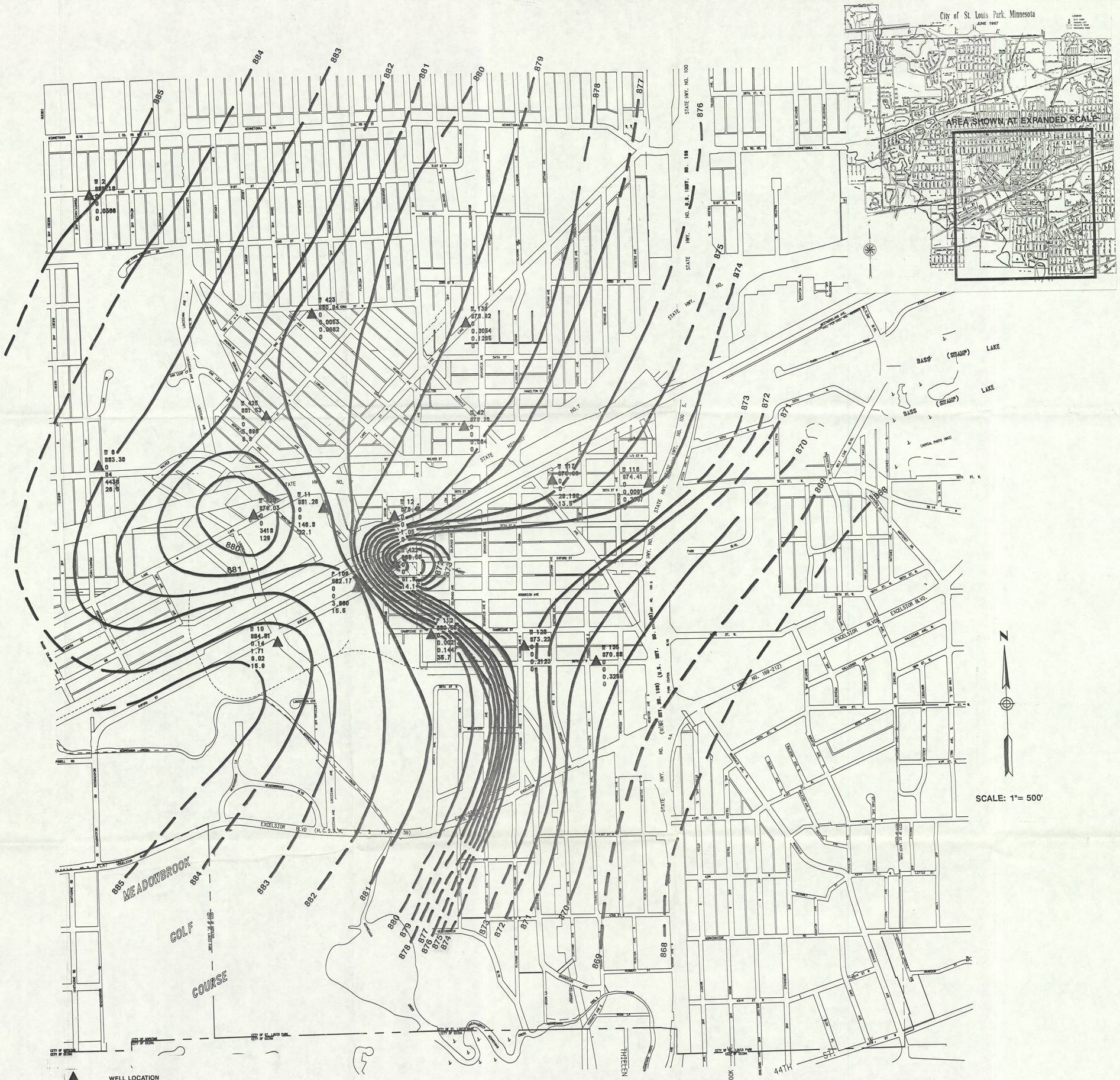


FIGURE 6 - 1 SUMMARY OF GROUND WATER MONITORING RESULTS FOR THE DRIFT AQUIFER: 1989

6.0 DRIFT-PLATTEVILLE AQUIFER

The ground water monitoring for the 30 Drift-Platteville Aquifer monitoring wells in 1989 consisted of one round of sample collection and analysis for PAH and phenolics, and water level measurements. Also, quarterly PAH and phenolics monitoring of wells W420, W421, and W422, the Drift-Platteville Aquifer source and gradient control wells, has been conducted since those wells became operational in 1987. The monitoring data are presented on Figure 6-1 and Figure 6-2, and Rocky Mountain Analytical Laboratory (RMAL) data summary reports are included in Appendix E.

Figure 6-1 shows the results from the monitoring round for the Drift Aquifer, and Figure 6-2 presents Platteville Aquifer results. The maps show each well location and a tabulation of the water level elevation in feet above mean sea level, the sum of the concentrations of benzo(a)pyrene and dibenz(a,h)anthracene in units of micrograms per liter (parts per billion), the sum of all carcinogenic PAH in units of micrograms per liter, the sum of Other PAH in units of micrograms per liter, and the concentration of phenolics in units of micrograms per liter.

In addition to these data, Figures 6-1 and 6-2 show water level contours. The reason the data for the Drift Aquifer is presented separately from the Platteville Aquifer is that at several locations where Drift Aquifer and Platteville Aquifer monitoring wells exist side by side, water levels in the Drift Aquifer are typically one to two feet higher than in the Platteville Aquifer (e.g., see wells P109 or W117 in Figure 6-1 and compare with wells W20 or W101 in Figure 6-2). Table 6-1 presents all of the water level data for the Drift-Platteville Aquifer in 1989. The water level difference between the Drift

TABLE 5-2
SUMMARY OF TOTAL PAH ANALYTICAL RESULTS FOR ST. PETER AQUIFER WELLS IN 1988 AND 1989

Well	First Round 7/88	Second Round 10/88	First Round 6/89	Second Round 10/89
SLP3	8	10	9.6	15
W14	152	438	--	--
W24	3,309	3,622	--	--
W33	16,430	12,455	--	--
W122	163	2,246	990	133
W129	88	290	601	40
W133	52,370	29,830	37,870	21,370
W408	153	34	150	110
W409	2,351	890	630	830
W410	1,228	1,435	425	360
W411	1,274	1,161	208	460
W412	1,317	209	226	130
P116	204	3,770	83	43

All concentrations in ppt (ng/l)
-- Not Sampled

TABLE 5-1
SUMMARY OF ST. PETER AQUIFER WATER LEVEL ELEVATIO

Wells	June 1989 Water Level Elevation	Oct. 1989 Water Level Elevation
SLP 3	-	854.86
W408	870.11	856.25
W409	869.96	863.78
W410	866.25	862.50
W411	868.34	866.20
W412	864.69	861.41
W129	866.96	865.77
W122	852.45	851.58
P116	862.27	860.19
W133	866.17	861.93

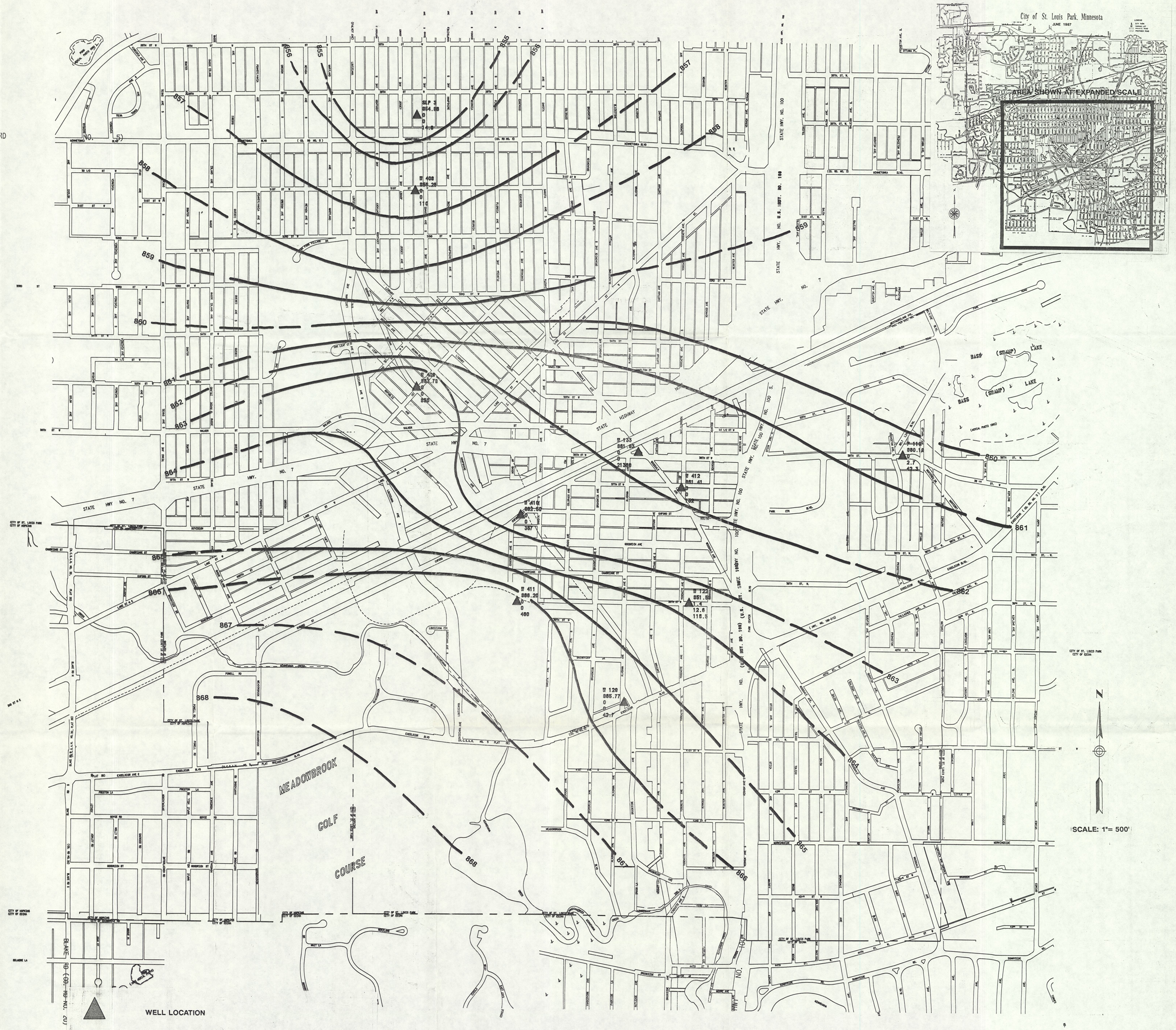


FIGURE 5 - 2 SUMMARY OF GROUND WATER MONITORING RESULTS FOR THE ST. PETER AQUIFER: SECOND ROUND, 1989

FIGURE 5 - 1 SUMMARY OF GROUND WATER MONITORING RESULTS FOR THE ST. PETER AQUIFER: FIRST ROUND, 1989

5.0 ST. PETER AQUIFER

In accordance with the results of the St. Peter Aquifer Remedial Investigation, and subsequent communications regarding a Feasibility Study (see letter from the City of St. Louis Park to United States EPA, Minnesota Pollution Control Agency, and Reilly Industries dated October 16, 1989), St. Peter Aquifer wells were monitored twice in 1989. In addition to water quality monitoring, ground water elevations were measured in the St. Peter Aquifer wells during each monitorng round. Summaries of analytical data and ground water elevations for monitoring rounds 1 and 2 are shown in Figures 5-1 and 5-2. Ground water level elevations for the monitoring rounds are shown in Table 5-1. A comparision of Figures 5-1 and 5-2 shows that flow in the aquifer is influenced by pumping at well SLP3.

A summary of total PAH results for 1988 and 1989 is presented in Table 5-2. The laboratory reports of the 1989 analytical data are presented in Appendix D. A pump test at well W410 was conducted from September 13, 1989 to September 15, 1989. The purpose of the pump test was to determine the feasibility of using W410 as a St. Peter Aquifer Gradient Control well. The data from that test was reported in ENSR's Report on the Pumping of the St. Peter Aquifer at Well Location W410 in St. Louis Park, Minnesota, November 15, 1989.

The 1989 data are beginning to identify PAH levels in the St. Peter Aquifer monitoring wells on a more reliable basis, compared to the judgments that were made based on only the 1988 data. For example, well W122 still shows a wide range of total PAH concentrations in 1989 (133 to 990 ppt); however, the second quarter 1988 result is much higher than the other data for the well. The 1989 data confirms that the total PAH concentration in well W122 is in the range of hundreds, not thousands, of parts per trillion. A similar "comfort level" for total PAH concentrations in wells W409, W412, and P116 is indicated by the 1989 data.

TABLE 4-1
SUMMARY OF TOTAL PAH ANALYTICAL RESULTS
FOR PRAIRIE DU CHIEN-JORDAN AQUIFER WELLS
IN 1988 AND 1989[a]

Well	1988		1989			
	Q3	Q4	Q1	Q2	Q3	Q4
W23	111,100	123,100	120,200	117,600	106,300	--
W48	2,420	--	--	1,640	1,850	1,130
SLP6	33	55	--	58	36	40
SLP7	78	51	--	61	25	25
W406[b]	29	--	--	36	--	26
E2	14	--	--	21	8	--
E13	4	--	--	20	6	--
H3	378	--	--	93	370	--
SLP15	--	--	--	4,030	--	--
SLP10	8,200	--	--	--	--	5,120
SLP14	112	--	--	134	84	--
SLP16	48	--	--	28	24	--
W402	--	--	--	--	--	151
W403	57	--	--	1,020	177	--
W119	3	--	--	18	11	--
SLP5	61	--	--	94	--	--
H6	19	--	--	16	--	--
E3	15	--	--	15	--	--
E15	11	--	--	16	--	--
MTKA6	4	--	--	12	--	--
W29	495	--	--	341	--	--
W40	1,062	--	--	540	--	--
W70	481	--	--	431	280	--
W401	12	--	--	15	--	--
SLP4	244	--	--	--	--	232

a. Results presented are the sum of carcinogenic and Other PAH in parts per trillion (ng/l).
b. 1988 results are for the American Hardware Mutual (AHM) well.

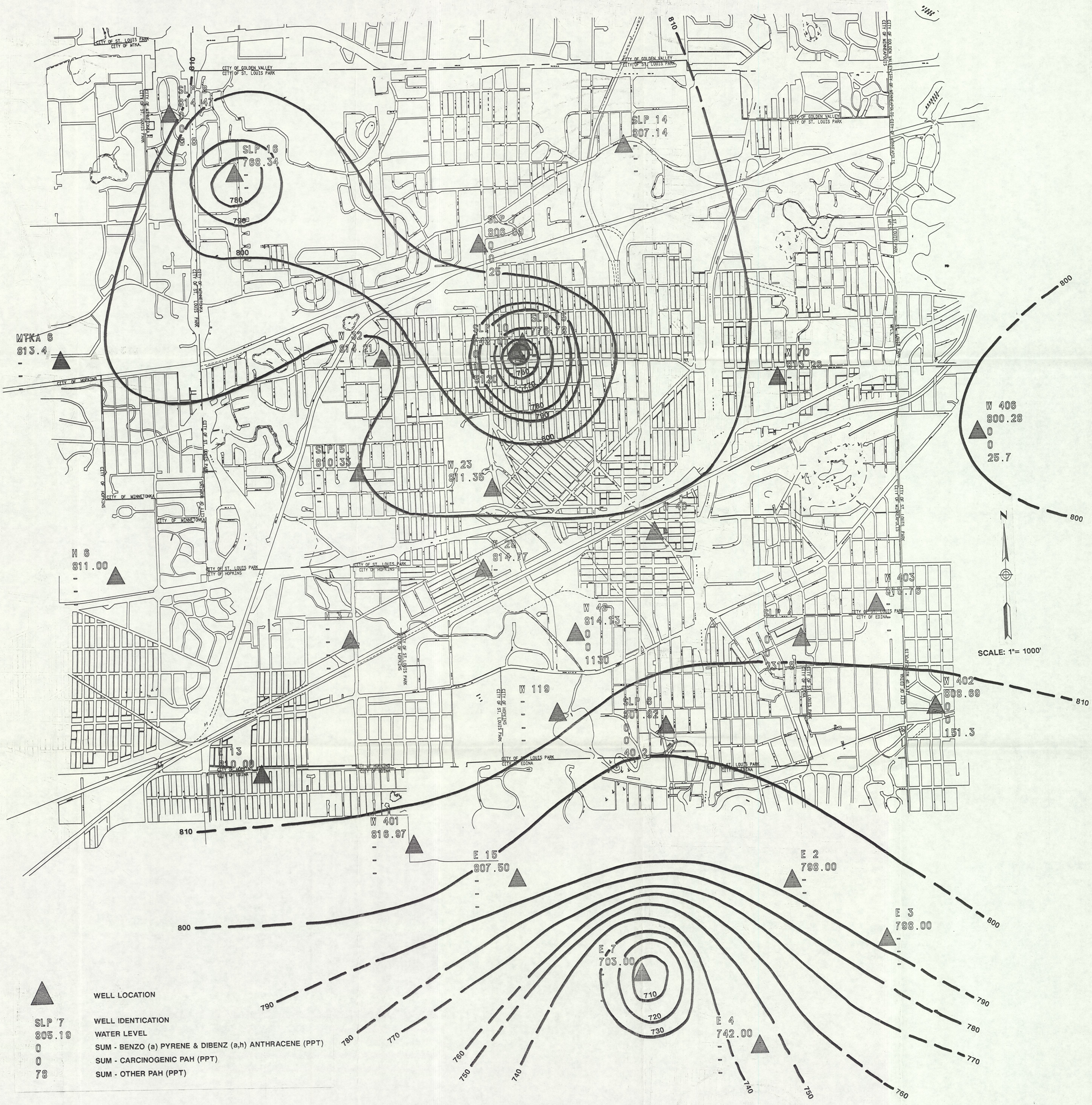


FIGURE 4 - 4 SUMMARY OF GROUND WATER MONITORING RESULTS FOR THE PRAIRIE DU CHIEN - JORDAN AQUIFER: FOURTH QUARTER, 1989

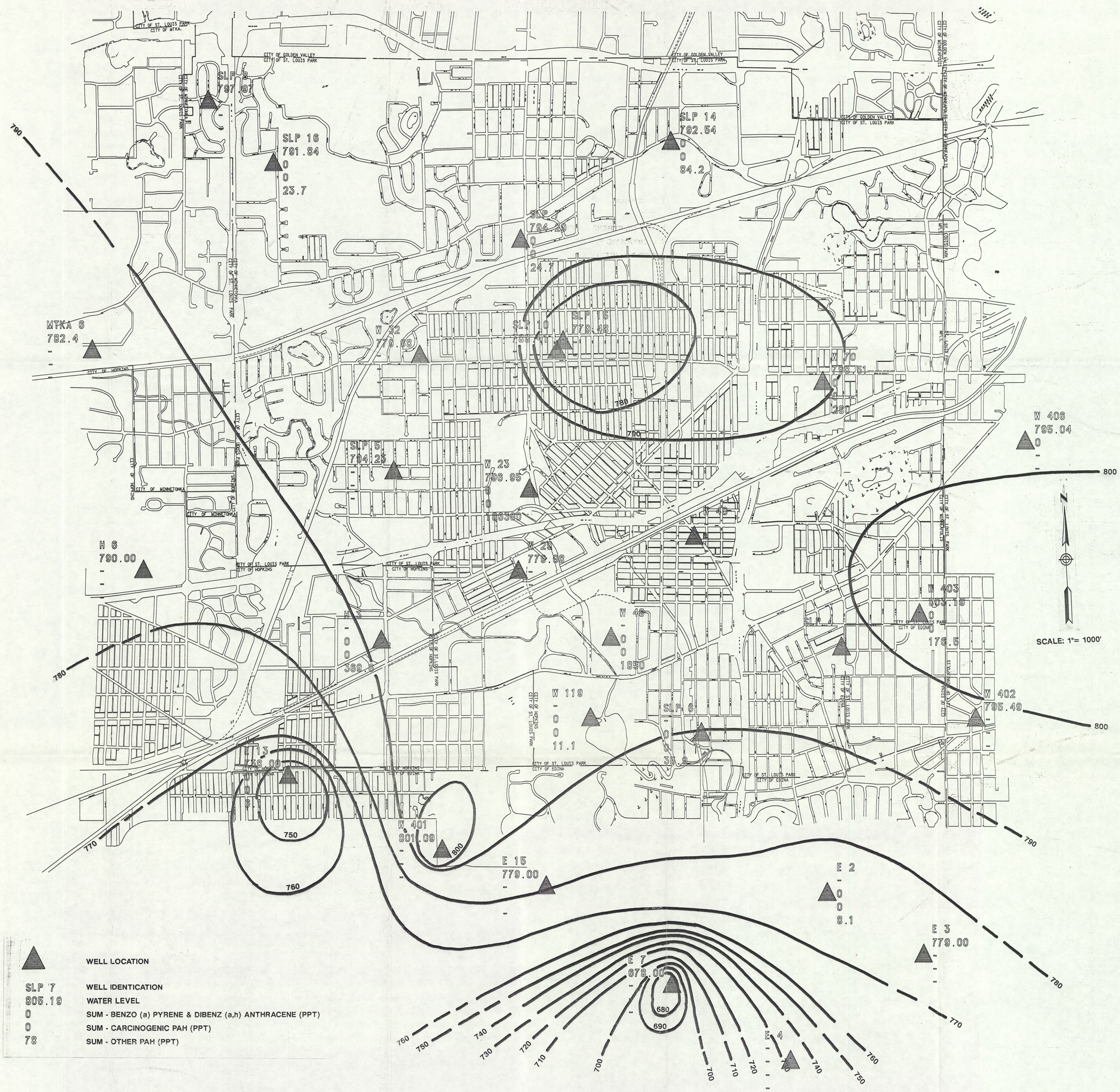


FIGURE 4 - 3 SUMMARY OF GROUND WATER MONITORING RESULTS FOR THE PRAIRIE DU CHIEN - JORDAN AQUIFER: THIRD QUARTER, 1989

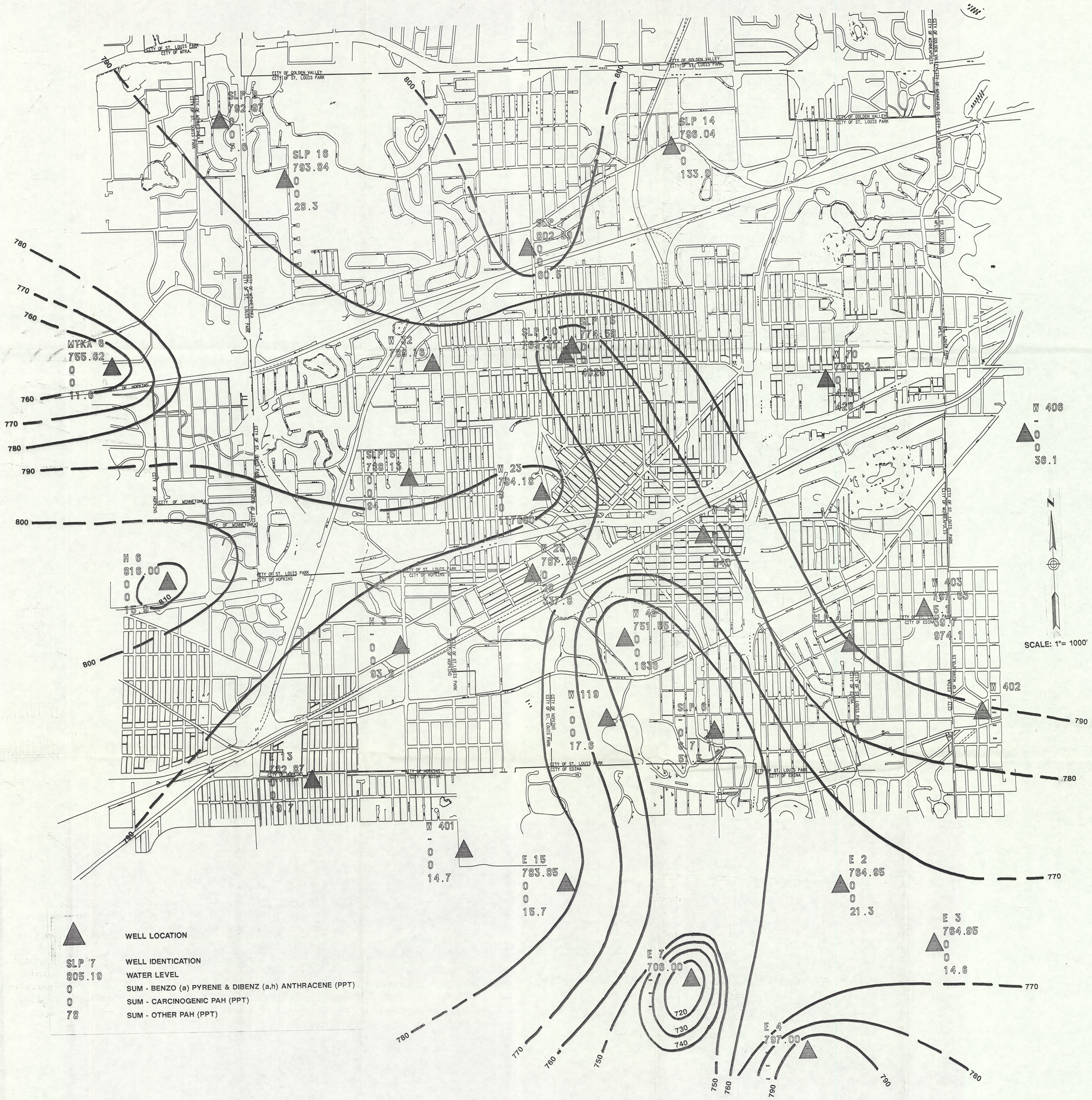


FIGURE 4 - 2 SUMMARY OF GROUND WATER MONITORING RESULTS FOR THE PRAIRIE DU CHIEN - JORDAN AQUIFER: SECOND QUARTER, 1989

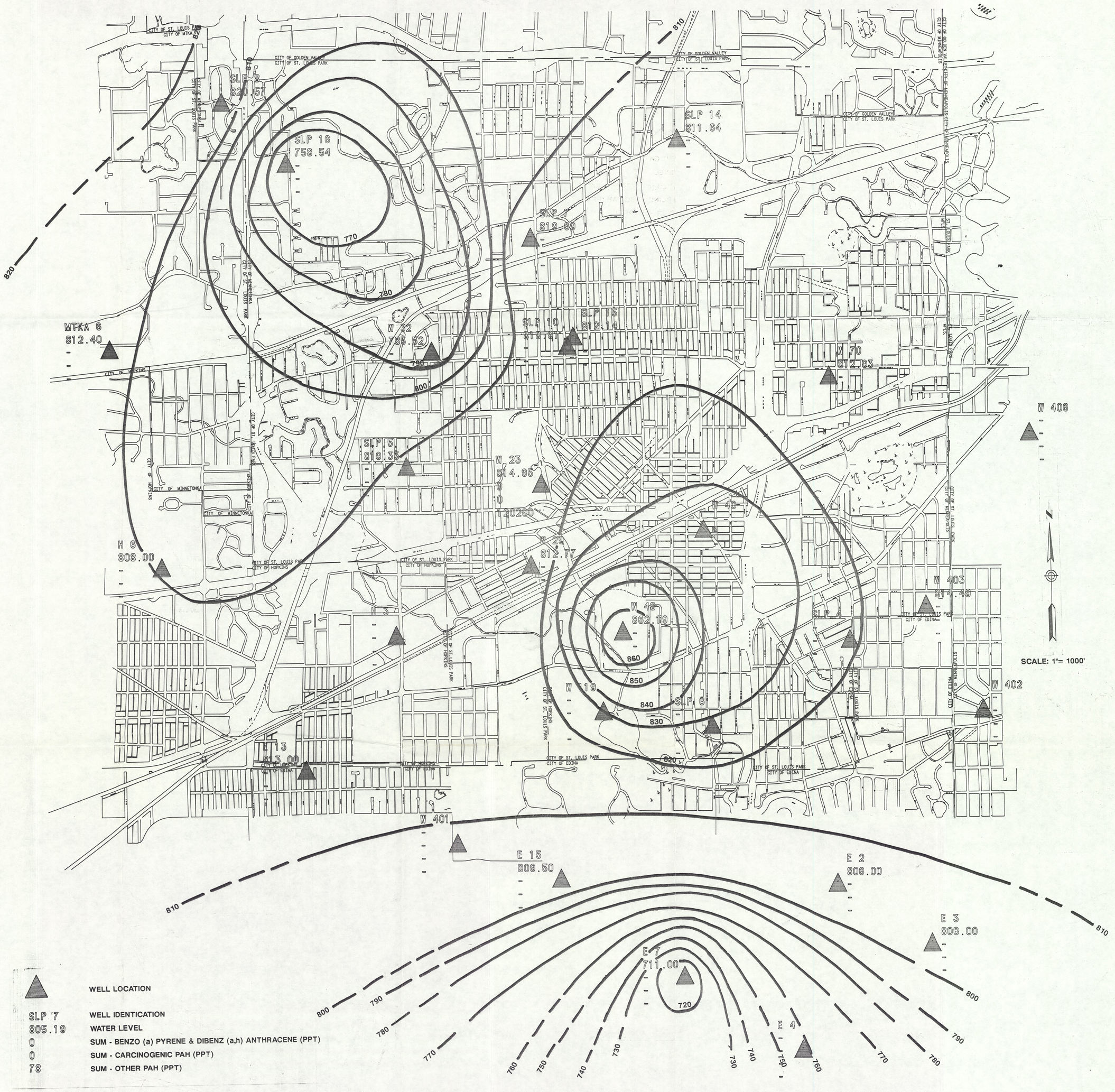


FIGURE 4 - 1 SUMMARY OF GROUND WATER MONITORING RESULTS FOR THE PRAIRIE DU CHIEN - JORDAN AQUIFER: FIRST QUARTER, 1989

TABLE 6-1
SUMMARY OF DRIFT-PLATTEVILLE AQUIFER WATER LEVEL ELEVATIONS

June 1989

Drift Aquifer Wells	Measuring Point Elevation	Water Level Elevation	Platteville Aquifer Wells	Measuring Point Elevation	Water Level Elevation
P 109	895.11	882.17	W 1	922.78	877.78
P 112	903.8	880.56	W 18	893.27	880.55
W 2	897.96	885.18	W 19	894.49	881.71
W 6	894.24	883.38	W 20	895.83	877.95
W 10	892.03	884.51	W 27	910.47	(a)
W 11	897.21	881.26	W 101	918.03	875.27
W 12	919.29	878.4	W 120	919.9	877.31
W 116	909.54	874.41	W 121	922.85	872.28
W 117	917.75	876.06	W 124	887.65	869.65
W 128	922.89	873.26	W 130	894.83	872.64
W 135	918.78	870.88	W 131	919.27	878.31
W 136	919.17	878.85	W 143	905.31	875.96
W 420	895.84	879.03	W 421	895.82	879.78
W 422	908.14	868.66	W 424	917.57	880.97
W 423	917.51	880.64	W 426	923.91	881.28
W 425	923.76	881.53	W 428	919.4	878.13
W 427	919.4	878.28			

(a)- No Data

Aquifer and the Platteville Aquifer at any location monitored ranges from zero to approximately five feet, with the Drift Aquifer water level elevations being consistently higher.

The water level contours show the influence of the Drift-Platteville Aquifer source and gradient control wells on the regional east-southeast ground water flow direction. Figure 6-1 shows water level contours in the "bog area" (defined by the CD-RAP as the area beneath Walker Street on the north, Temporary Louisiana Avenue on the east, Lake Street and South Frontage Street Extension on the south, and a north-south line extending from the intersection of Walker Street and West 37th Street on the west) that support the interpretation that the Drift Aquifer source control well (W420) is effective in controlling the flow of ground water in an area at least the size of the bog.

Figure 6-1 also shows a significant degree of control exerted on the ground water in the vicinity of the Drift-Platteville Aquifer gradient control well (W422). Well W422 currently is being pumped at a rate of 50 gallons per minute, in accordance with the CD-RAP, and appears to be effective in controlling ground water over a large portion of the Drift-Platteville Aquifer.

Figure 6-2 shows water level contours in the Platteville Aquifer monitoring wells that also reflect the influence of the Platteville Aquifer source control well (W421). Well W421 is currently being pumped at a rate of 25 gallons per minute, in accordance with the CD-RAP, and appears to be effective in controlling ground water in an area at least the size of the bog between Walker and Lake Streets. The water level contours shown in Figure 6-2 support the interpretation that well W421 is an effective source control well.

From July to November, 1989 the pumping rate at both wells W420 and W421 was increased to approximately 47 gallons per minute. These increases were to evaluate if these wells could be used as gradient control wells for the Northern Area of the Drift-Platteville Aquifer. This work is further described in the Drift-

Platteville Aquifer (Northern Area) Remedial Investigation Report and in subsequent correspondence dated June 30, 1989; September 13, 1989; October 16, 1989; and November 15, 1989. Figures 6-3 and 6-4 graphically present the average monthly pumping rates for wells W420 and W421.

The water quality data shown on Figure 6-1 and 6-2 indicate a pattern of contamination in the Drift-Platteville Aquifer that is consistent with historical observations. During 1989 it appears that the Drift-Platteville Aquifer source and gradient control wells remained effective in controlling the spread of contamination in the vicinity of the Reilly Site. Figure 6-5 presents the inferred area of contamination based on the 1989 data, and on historical water quality data for the aquifer.

The levels of PAH and phenolics remain the highest in the immediate vicinity of the Reilly site and bog area. Wells W420, W421, and W422 have been monitored quarterly since they began pumping in 1987. The PAH data are summarized in Table 6-2, while the phenolic data are summarized in Table 6-3. Table 6-2 shows that near the source of contamination, PAH concentrations in ground water are consistently in the range of several hundred micrograms per liter to low milligrams per liter. The trends of these data suggests that while contaminant levels have fluctuated approximately 10% in the past two years, the overall levels can be described as stable.

Monitoring wells in the area near 36th Street and Wooddale Avenue continue to exhibit levels of contaminants that are higher than may be expected given the lower levels exhibited in wells closer to the Reilly Site. For example, wells W101 and W117 contained levels of Other PAH in the range of 28 to 48 micrograms per liter. Monitoring well W12 is between the Reilly Site and W101 and W117, and contains levels of Other PAH in the range of less than two micrograms per liter. This pattern of contamination is the same as historical water quality patterns. The reason for elevated levels of contaminants in the vicinity of 36th Street and Wooddale is unknown.

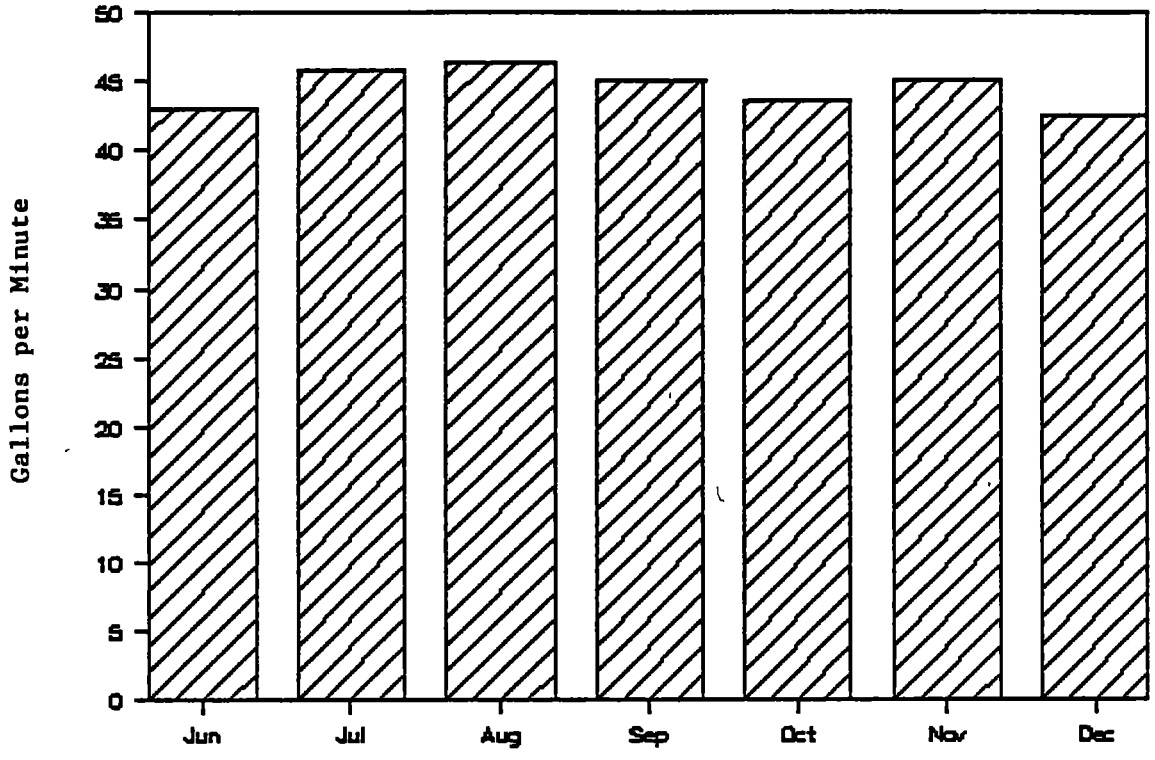
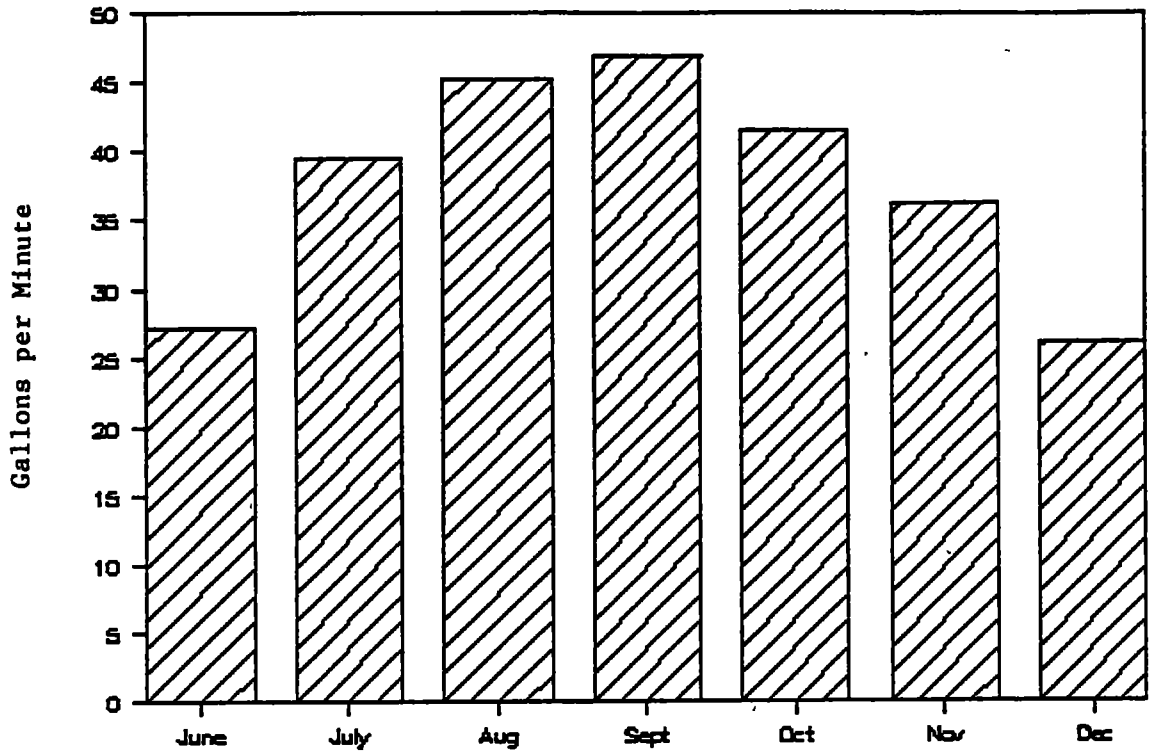
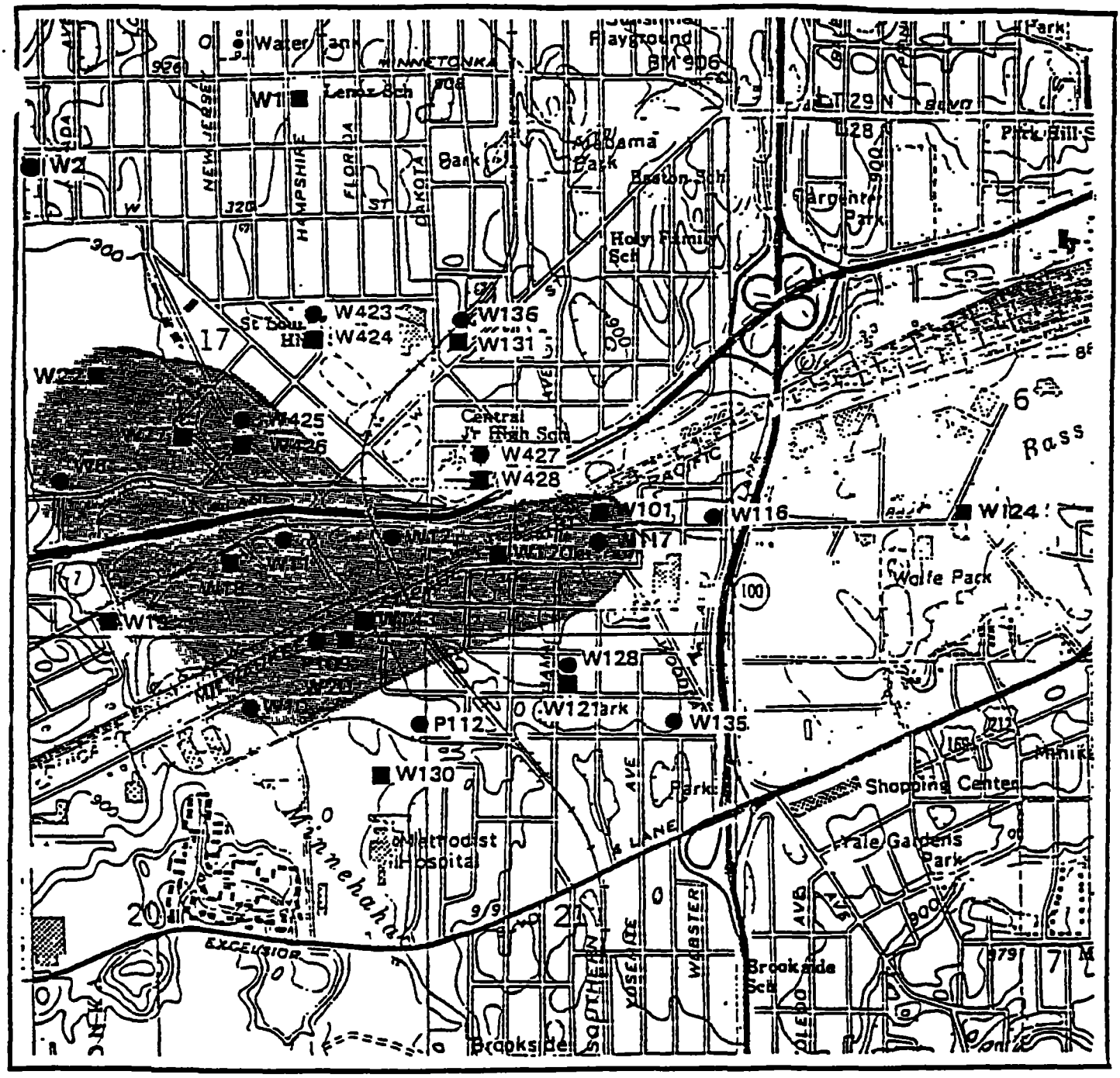


FIGURE 6-3
SUMMARY OF MONTHLY PUMPING
WELL W420 JUNE TO DECEMBER 1989



June to December 1989

FIGURE 6-4
SUMMARY OF MONTHLY PUMPING
WELL W421 JUNE TO DECEMBER 1989



SCALE

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EXPLANATION

● DRIFT WELLS

■ PLATTEVILLE WELLS

INFERRED AREA OF CONTAMINATION

Figure 6-5 Inferred Area of Contaimination in the Drift-Platteville Aquifer: 1989

TABLE 6-2
SUMMARY OF TOTAL PAH ANALYTICAL RESULTS FOR WELLS W420, W421, W422 IN 1988 AND 1989[a]

Well	1988				1989			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
W420	3242	3420	2477	1148	2400	3400	3400	3400
W421	566	821	764	1107	878	1000	1000	730
W422	27	57.1	76.7	49.7	50	50	60	50

(a) All concentrations in ppb (ug/l).

TABLE 6-3
SUMMARY OF PHENOL ANALYTICAL RESULTS FOR WELLS W420, W421, W422 IN 1988 AND 1989[a]

Well	1988				1989			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
W420	440	330	220	44.3	120	129	220	110
W421	33	0	29.7	34.7	29	26	33	27
W422	11	0	24	84.1	11	14	20	13

(a) Concentrations in ppb (ug/l)

7.0 REFERENCES

City of St. Louis Park. 1989a. St. Peter Aquifer Remedial Investigation Report for the Reilly Tar & Chemical Corporation N.P.L. Site, St. Louis Park, Minnesota. Prepared for the City of St. Louis Park by ENSR Consulting and Engineering.

City of St. Louis Park. 1989b. Annual Monitoring Report for 1988. March 15, 1989.

City of St. Louis Park. 1989c. Drift-Platteville Aquifer (Northern Area) Remedial Investigation Report for the Reilly Tar & Chemical Corporation N.P.L. Site, St. Louis Park, Minnesota. Prepared for the City of St. Louis Park by ENSR Consulting and Engineering.

City of St. Louis Park. 1989d. Sampling Plan for Reilly Tar & Chemical Corporation N.P.L. Site, St. Louis Park, Minnesota. Prepared for the City of St. Louis Park by ENSR Consulting and Engineering.

APPENDIX A

LABORATORY DATA SUMMARY PACKAGE: MT. SIMON-HINCKLEY AQUIFER

QUALITY CON L SUMMARY
MT. SIMON-HINCKLEY AQUIFER

Well No.	Sample Date	Method Blank	Field Duplicate	Matrix Spike	Field Blank
SLP11	06/05/89	5238-BLK01	MSH-SLP13D-060589	MSH-SLP13MS-060589	MSH-SLP13FB-060589
SLP12	06/29/89	5262-BLK01	MSH-SLP12DD-062989	MSH-SLP12MS-060589	GAC-SLP15FB-062989
SLP13	06/05/89	5238-BLK01	MSH-SLP13D-060589	MSH-SLP13MS-060589	MSH-SLP13FBV-060589
SLP17	06/05/89	5238-BLK01	MSH-SLP13D-060589	MSH-SLP13MS-060589	MSH-SLP13FBV-060589

Enseco

CASE NARRATIVE

FOR

City of St. Louis Park

July 31, 1989

Enseco - RMAL Project Number 005238

Introduction

Nine aqueous samples (includes MS) were received at Enseco Rocky Mountain Analytical Laboratory on June 6, 1989. The samples were logged in under RMAL project number 005238. Sample MSH-SLP13FBD-060589 (RMA # 005238-06) was inadvertently analyzed and is included in the data package, however, you will not be billed for the analysis. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Internal Quality Control Processes, Corrective Actions, and Resolution

All quality control and/or analytical problems encountered in processing the samples and corrective actions taken have been summarized below as per the 1989 QAPP.

PPT PAH

Samples 5238-01, 03, 03MS, 04, 05, 06, and 07 show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: Tracy Giberson **Date:** 7/31/89
Tracy Giberson
Data Control Supervisor

Approved by: Jean Zimmerman **Date:** July 31, 1989
Jean Zimmerman
Program Administrator

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005238-0001-SA	PCJ-SLP8-060589	AQUEOUS	05 JUN 89	09:30	06 JUN 89
005238-0002-SA	MSH-SLP11-060589	AQUEOUS	05 JUN 89	09:30	06 JUN 89
005238-0003-SA	MSH-SLP13-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0003-MS	MSH-SLP13MS-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0004-SA	MSH-SLP13D-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0005-SA	MSH-SLP13FB-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0006-SA	MSH-SLP13FBD-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0007-SA	PCJ-SLP16-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0008-SA	MSH-SLP17-060589	AQUEOUS	05 JUN 89		06 JUN 89

Enseco - Rocky Mountain Analytical
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No. 15005

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: M. Higgins

SAMPLE SAFE™ CONDITIONS

1. Packed by: M. Higgins Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: Yes No
8. Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
6/5/89	0930	MSH-SLP11-060589	Amber Liter	6	PPT-PAH	02
〃	〃	PCJ-SLP8-060589	〃	〃	〃	01
		MSH-SLP17-060589				08

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by: (signed)	Received by: (signed)	Date	Time
1				
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: M.H.

Method of Shipment: Fed X Airbill # 2865075765

Received for Lab: MA Signed: [signature] Date/Time 0830 6/6/89

Enseco Project No. _____

White and Pink Copies to Lab Yellow to Sampler

SS-001

2

Enseco - Rocky Mountain Analytical

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Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No. 1_ _06

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: M. Higgins

SAMPLE SAFE™ CONDITIONS

1. Packed by: MH Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: Yes No
8. Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
6/5/89		MSH-SLP13-060589	Liter Amber	6	PPT-PAH	03
"		PCJ-SLP16-060589	"	"	"	07

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by: (signed)	Date	Time
1				
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: MH

Method of Shipment: Fed X Airbill # 2865 0 7 5765

Received for Lab: [illegible] Signed: [illegible] Date/Time 0830 6/6/89

Enseco Project No. _____

White and Pink Copies to Lab Yellow to Sampler

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3

Enseco - Rocky Mountain Analytical

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303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No. 15007

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: M. Higgins

SAMPLE SAFE™ CONDITIONS

1. Packed by: MH Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory. Yes No
8. Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
		MSH-SLP13D - 060589	Liter Amber	6	PPT-PAH	04
		MSH-SLP13MS - 060589				03 MS

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by: (signed)	Received by: (signed)	Date	Time
1				
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: MH

Method of Shipment: Fed X Airbill # 2865075765

Received for Lab: [illegible] Signed: [illegible] Date/Time 0830 6/6/89

Enseco Project No. _____

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Enseco - Rocky Mountain Analytical

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303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No. 13008

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: M. Higgins

SAMPLE SAFE™ CONDITIONS

1. Packed by: MH Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: Yes No
8. Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
6/5/89		MSH SLP13FB - 060589	Liter Amber	6	PPT-PAH	05
"		MSH - SLP13FBD - 060589	"	"	"	06

CUSTODY TRANSFERS PRIOR TO SHIPPING

Relinquished by: (signed)	Received by: (signed)	Date	Time
1			
2			
3			

SHIPPING DETAILS

Delivered to Shipper by: MH

Method of Shipment: Fed X Airbill # 2865075765

Received for Lab: QMA Signed: [signature] Date/Time 0830 6/6/89

Enseco Project No. _____

White and Pink Copies to Lab Yellow to Sampler

SS-001

SUMMARY

DATA

PACKAGE

FOR

City of St. Louis Park

RMA QC# 5238

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5238-01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5238-01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5238X944

Level: (low/med) LOW Date Received: 06/06/89

% Moisture: not dec. dec. Date Extracted: 06/09/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/05/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	U
95-13-6	1H-Indene	1.6	
91-20-3	Naphthalene	2.1	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	1.8	B *
90-12-0	1-Methylnaphthalene	1.0	J
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.1	J
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
57-97-6	7,12-Dimethylbenzanthracene	2.8	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
56-49-5	3-Methylcholanthrene	3.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U
215-58-7	Dibenz(A,C)Anthracene	1.6	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5238-02

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5238-02

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5238X945

Level: (low/med) LOW Date Received: 06/06/89

% Moisture: not dec. dec. Date Extracted: 06/09/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/05/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	2.3	
95-13-6	1H-Indene	3.8	
91-20-3	Naphthalene	19.	B
4565-32-6	Benzo(B)Thiophene	1.0	
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	2.7	B
90-12-0	1-Methylnaphthalene	2.7	
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.4	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.1	J
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
57-97-6	7,12-Dimethylbenzanthracene	2.8	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
56-49-5	3-Methylcholanthrene	3.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U
215-58-7	Dibenz(A,C)Anthracene	1.6	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5238-03

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5238-03

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5238X946

Level: (low/med) LOW Date Received: 06/06/89

% Moisture: not dec. dec. Date Extracted: 06/09/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/05/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	U
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	1.9	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	1.8	B
90-12-0	1-Methylnaphthalene	1.1	J
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.4	*
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	3.1	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
57-97-6	7,12-Dimethylbenzanthracene	2.8	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
56-49-5	3-Methylcholanthrene	3.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U
215-58-7	Dibenz(A,C)Anthracene	1.6	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5238-04

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5238-04

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5238X948

Level: (low/med) LOW Date Received: 06/06/89

% Moisture: not dec. dec. Date Extracted: 06/09/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/05/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	U
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	1.7	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	1.7	B *
90-12-0	1-Methylnaphthalene	1.1	J
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.2	J
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
57-97-6	7,12-Dimethylbenzanthracene	2.8	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
56-49-5	3-Methylcholanthrene	3.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U
215-58-7	Dibenz(A,C)Anthracene	1.6	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5238-05

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5238-05

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5238X949

Level: (low/med) LOW Date Received: 06/06/89

% Moisture: not dec. dec. Date Extracted: 06/09/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/05/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	U
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	2.3	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	1.8	B
90-12-0	1-Methylnaphthalene	1.1	J
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	2.2	*
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	2.9	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
57-97-6	7,12-Dimethylbenzanthracene	2.8	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
56-49-5	3-Methylcholanthrene	3.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U
215-58-7	Dibenz(A,C)Anthracene	1.6	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5238-06

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5238-06

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5238X950

Level: (low/med) LOW Date Received: 06/06/89

% Moisture: not dec. dec. Date Extracted: 06/09/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/05/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	U
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	2.6	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	2.2	B
90-12-0	1-Methylnaphthalene	1.2	J
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.1	J *
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.2	*
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	2.1	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
57-97-6	7,12-Dimethylbenzanthracene	2.8	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
56-49-5	3-Methylcholanthrene	3.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U
215-58-7	Dibenz(A,C)Anthracene	1.6	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5238-07

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5238-07

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5238X951

Level: (low/med) LOW Date Received: 06/06/89

% Moisture: not dec. dec. Date Extracted: 06/09/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/05/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	5.2	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	2.4	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	2.5	B *
90-12-0	1-Methylnaphthalene	1.5	J
92-52-4	Biphenyl	1.7	J
208-96-8	Acenaphthylene	2.9	
83-32-9	Acenaphthene	8.0	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	4.1	
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.1	J *
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
57-97-6	7,12-Dimethylbenzanthracene	2.8	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
56-49-5	3-Methylcholanthrene	3.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U
215-58-7	Dibenz(A,C)Anthracene	1.6	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5238-08

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5238-08

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5238X952

Level: (low/med) LOW Date Received: 06/06/89

% Moisture: not dec. dec. Date Extracted: 06/09/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/05/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.0	J
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	3.2	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.1	B
90-12-0	1-Methylnaphthalene	2.0	
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.6	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
57-97-6	7,12-Dimethylbenzanthracene	2.8	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
56-49-5	3-Methylcholanthrene	3.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U
215-58-7	Dibenz(A,C)Anthracene	1.6	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5238-03MS

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5238-03MS

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5238X947

Level: (low/med) LOW Date Received: 06/06/89

% Moisture: not dec. dec. Date Extracted: 06/09/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/05/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	U
95-13-6	1H-Indene	5.1	SP
91-20-3	Naphthalene	5.7	B SP
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	9.4	*SP
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	6.3	B*SP
90-12-0	1-Methylnaphthalene	1.6	U
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	7.4	SP
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	6.1	SP
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
57-97-6	7,12-Dimethylbenzanthracene	2.8	U
192-97-2	Benzo(E)Pyrene	2.3	SP
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
56-49-5	3-Methylcholanthrene	3.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U
215-58-7	Dibenz(A,C)Anthracene	1.6	U

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	5238-01	74	75	64
2	5238-02	69	79	56
3	5238-03	64	77	58
4	5238-04	56	60	51
5	5238-05	80	83	81
6	5238-06	80	80	84
7	5238-07	57	71	64
8	5238-08	66	72	51
9	5238-03MS	52	60	50
10	BLK01	68	84	58

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

FORM II SV-1 1/87 Rev.

3C

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Matrix Spike - EPA Sample No.: 5238-03

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC
1H-Indene	10	ND	5.1	51
Naphthalene	10	1.9	5.7	38
Quinoline	10	ND	9.4	94
2-Methylnaphthalene	10	1.8	6.3	45
Fluorene	10	ND	7.4	74
Chrysene	10	ND	6.1	61
Benzo(E)Pyrene	10	ND	2.3	23

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Lab File ID: S5238X953 Lab Sample ID: BLK01

Date Extracted: 06/09/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 07/05/89 Time Analyzed: 18:55

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: 4500-X

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	5238-01	5238-01	S5238X944	07/05/89
2	5238-02	5238-02	S5238X945	07/05/89
3	5238-03	5238-03	S5238X946	07/05/89
4	5238-04	5238-04	S5238X948	07/05/89
5	5238-05	5238-05	S5238X949	07/05/89
6	5238-06	5238-06	S5238X950	07/05/89
7	5238-07	5238-07	S5238X951	07/05/89
8	5238-08	5238-08	S5238X952	07/05/89
9	5238-03MS	5238-03MS	S5238X947	07/05/89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5238X953

Level: (low/med) LOW Date Received: 06/06/89

% Moisture: not dec. dec. Date Extracted: 06/09/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/05/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	5.1	U	
496-11-7	2,3-Dihydroindene	1.4	U	
95-13-6	1H-Indene	0.9	U	
91-20-3	Naphthalene	1.1	J	
4565-32-6	Benzo(B)Thiophene	0.9	U	
91-22-5	Quinoline	1.4	U	
120-72-9	1H-Indole	2.5	U	
91-57-6	2-Methylnaphthalene	1.1		*
90-12-0	1-Methylnaphthalene	1.6	U	
92-52-4	Biphenyl	4.3	U	
208-96-8	Acenaphthylene	1.4	U	
83-32-9	Acenaphthene	1.3	U	
132-64-9	Dibenzofuran	1.0	U	
86-73-7	Fluorene	1.0	U	
132-65-0	Dibenzothiophene	1.1	U	
85-01-8	Phenanthrene	1.3	U	
120-12-7	Anthracene	1.1	U	
260-94-6	Acridine	2.9	U	
86-74-8	Carbazole	1.9	U	
206-44-0	Fluoranthene	1.4	U	
129-00-0	Pyrene	1.4	U	
56-55-3	Benzo(A)Anthracene	2.5	U	
218-01-9	Chrysene	2.8	U	
205-99-2	Benzo(B)Fluoranthene	2.5	U	
207-08-9	Benzo(K)Fluoranthene	2.3	U	
57-97-6	7,12-Dimethylbenzanthracene	2.8	U	
192-97-2	Benzo(E)Pyrene	1.9	U	
50-32-8	Benzo(A)Pyrene	2.3	U	
198-55-0	Perylene	2.5	U	
56-49-5	3-Methylcholanthrene	3.5	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U	
53-70-3	Dibenz(A,H)Anthracene	1.6	U	
191-24-2	Benzo(G,H,I)Perylene	2.8	U	
215-58-7	Dibenz(A,C)Anthracene	1.6	U	

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No: N/A

Lab Code: ENSECO Case No: 5238 SAS No: N/A SDG No: N/A

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDX942	07/05/89	08:12
5238-01	S5238X944	07/05/89	11:02
5238-02	S5238X945	07/05/89	11:54
5238-03	S5238X946	07/05/89	12:48
5238-03MS	S5238X947	07/05/89	13:41
5238-04	S5238X948	07/05/89	14:33
5238-05	S5238X949	07/05/89	15:26
5238-06	S5238X950	07/05/89	16:19
5238-07	S5238X951	07/05/89	17:11
5238-08	S5238X952	07/05/89	18:02
BLK01	S5238X953	07/05/89	18:55

INITIAL CALIBRATION DATA
PAH COMPOUNDS

b Name: RMAL Lab Code: Enseco Case No: 5238

Instrument ID: 4500-X Calibration Date(s): 04/13/89

Minimum RRF is 0.050 Maximum % RSD is 35%

Lab File ID: RRF = STDX986 RRF = STDX984
RRF = STDX987 RRF = STDX985 RRF = STDX983

COMPOUND	20 PPT RRF	40 PPT RRF	240PPT RRF	1200PPT RRF	4800PPT RRF	AVE RRF	%RSD
D8-Naphthalene	2.648	2.513	2.437	2.666	2.301	2.513	6.0
D10-Flourene	1.360	1.278	1.306	1.368	1.525	1.367	7.0
D12-Chrysene	1.806	1.706	1.525	1.683	1.696	1.683	6.0
2,3-Benzofuran	1.487	1.438	1.347	1.488	1.513	1.455	4.5
2,3-Dihydroindene	1.481	1.456	1.392	1.541	1.586	1.491	5.0
1H-Indene	1.789	1.797	1.695	1.928	1.885	1.819	5.0
Naphthalene	3.034	2.882	2.745	3.077	2.515	2.851	8.0
Benzo(B)Thiophene	2.359	2.243	2.161	2.410	2.161	2.267	5.0
Quinoline	1.161	1.079	1.173	1.371	1.571	1.271	15.7
1H-Indole	1.641	1.623	1.591	1.803	1.912	1.714	8.0
2-Methylnaphthalene	1.533	1.457	1.414	1.568	1.663	1.527	6.4
.-Methylnaphthalene	1.584	1.508	1.462	1.621	1.693	1.574	5.8
Biphenyl	2.453	2.028	1.954	2.084	2.033	2.110	9.3
Acenaphthylene	1.701	1.683	1.695	2.001	2.111	1.838	11.0
Acenaphthene	1.472	1.310	1.301	1.418	1.539	1.408	7.3
Dibenzofuran	2.268	2.143	2.086	2.222	2.198	2.183	3.2
Flourene	1.608	1.460	1.504	1.619	1.823	1.603	8.8
Dibenzothiophene	1.305	1.218	1.163	1.085	1.329	1.220	8.3
Phenanthrene	1.362	1.263	1.219	1.127	1.355	1.265	7.8
Anthracene	1.089	1.042	1.063	1.035	1.346	1.115	11.7
Acridine	0.805	0.727	0.881	0.883	1.236	0.906	21.5
Carbazole	1.177	1.121	1.091	0.994	1.285	1.134	9.5
Fluoranthene	1.435	1.264	1.276	1.139	1.422	1.307	9.4
Pyrene	1.777	1.361	1.262	1.105	1.394	1.380	18.0
Benzo(A)Anthracene	1.832	1.786	1.580	1.851	1.933	1.796	7.4
Chrysene	1.851	1.896	1.611	1.802	1.843	1.801	6.2
Benzo(B)Fluoranthene	1.938	1.924	1.614	1.911	1.878	1.853	7.3
Benzo(K)Fluoranthene	2.230	1.991	1.602	1.897	2.114	1.967	12.2
Benzo(E)Pyrene	1.780	1.827	1.678	1.867	1.872	1.805	4.4
Benzo(A)Pyrene	1.412	1.437	1.356	1.562	1.750	1.503	10.5
Perylene	1.514	1.429	1.361	1.589	1.813	1.541	11.3
Indeno(1,2,3-CD)Pyrene	1.477	1.466	1.417	1.628	1.646	1.527	6.8
Dibenz(A,H)Anthracene	1.167	1.273	1.199	1.355	1.362	1.271	7.0
Benzo(G,H,I)Perylene	1.480	1.316	1.253	1.434	1.357	1.368	6.6

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

b Name: RMAL | Lab Code: Enseco | Case No: 5238

Instrument ID: 4500-X | Calibration Date(s): 07/05/89 Time: 08:12

Lab ID: STDX942 | Initial Calibration Date : 04/13/89

Minimum RRF is 0.050 Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPT RRF	%D
D8-Naphthalene	2.513	2.050	18.4
D10-Fluorene	1.367	1.219	10.8
D12-Chrysene	1.683	1.604	4.7
2,3-Benzofuran	1.455	1.050	27.8
2,3-Dihydroindene	1.491	1.377	7.6
1H-Indene	1.819	1.438	20.9
Naphthalene	2.851	2.887	-1.3
Benzo(B)Thiophene	2.267	1.875	17.3
Quinoline	1.271	0.865	31.9
1H-Indole	1.714	1.181	31.1
2-Methylnaphthalene	1.527	1.364	10.7
1-Methylnaphthalene	1.574	1.452	7.8
Biphenyl	2.110	1.813	14.1
Acenaphthylene	1.838	1.749	4.8
Acenaphthene	1.408	1.307	7.2
Dibenzofuran	2.183	1.818	16.7
Flourene	1.603	1.406	12.3
Dibenzothiophene	1.220	1.196	2.0
Phenanthrene	1.265	1.262	0.2
Anthracene	1.115	1.020	8.5
Acridine	0.906	0.689	24.0
Carbazole	1.134	0.931	17.9
Fluoranthene	1.307	1.224	6.4
Pyrene	1.380	1.212	12.2
Benzo(A)Anthracene	1.796	1.865	-3.8
Chrysene	1.801	1.865	-3.6
Benzo(B)Fluoranthene	1.853	1.475	20.4
Benzo(K)Fluoranthene	1.967	1.802	8.4
Benzo(E)Pyrene	1.805	1.806	-0.1
Benzo(A)Pyrene	1.503	1.371	8.8
Perylene	1.541	1.332	13.6
Indeno(1,2,3-CD)Pyrene	1.527	1.296	15.1
Dibenz(A,H)Anthracene	1.271	1.029	19.0
Benzo(G,H,I)Perylene	1.368	1.247	8.8

FORM VII

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: Enseco Case No: 5238 SAS No.: N/A SDG No: N/A

Lab File ID (Standard): STDX942 Date Analyzed: 07/05/89

Instrument ID: 4500-X Time Analyzed: 08:12

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	151000	229500	101900
UPPER LIMIT	302000	459000	203800
LOWER LIMIT	75500	114800	51000
SAMPLE NO.			
5238-01	169800	263500	142200
5238-02	173900	294000	159600
5238-03	158900	270400	166000
5238-04	166200	274800	161900
5238-05	175800	301200	164700
5238-06	164300	275200	143300
5238-07	164800	282200	156200
5238-08	161700	271400	151700
5238-03MS	187000	329900	187700
BLK01	161500	274000	142000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

Enseco

CASE NARRATIVE

FOR

City of St. Louis Park

August 22, 1989

Enseco - RMAL Project Number 005562

Introduction

Five aqueous samples (includes MS) were received at Enseco Rocky Mountain Analytical Laboratory on June 30, 1989. The samples were logged in under RMAL project number 005562. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Samples 5568-01, 02, 03, 04 and the associated blank show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

The 1989 QAPP sets forth specific requirements for the measurement of benzo(j)fluoranthene. Results have not been provided previously for this compound, however, the special procedure in the QAPP will be implemented on all future projects.

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: Tracy Giberson **Date:** 8/22/89
Tracy Giberson
Data Control Supervisor

Approved by: Debbie Fazio **Date:** 8/22/89
Debbie Fazio
Program Administrator

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for

City of St. Louis Park

RMAL QC# 5562

PAH

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6. Matrix Spike Duplicate Data.....N/A

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005562-0001-SA	PCJ-W70-062989	AQUEOUS	29 JUN 89		30 JUN 89
005562-0002-SA	PCJ-W407-062989	AQUEOUS	29 JUN 89		30 JUN 89
005562-0003-SA	MSH-SLP12-062989	AQUEOUS	29 JUN 89		30 JUN 89
005562-0003-MS	MSH-SLP12MS-062989	AQUEOUS	29 JUN 89		30 JUN 89
005562-0004-SA	MSH-SLP12D-062989	AQUEOUS	29 JUN 89		30 JUN 89

Ens - Rocky Mountain Analytical

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Arvada, Colorado 80002
303/421-6611 Facsimile. 303/431-7171

CHAIN OF CUSTODY

No. 41

Attn:

Enseco Client: St. Louis Park

Project:

Sampling Co.: ENSR

Sampling Site:

Team Leader: S Anderson

SAMPLE SAFE™ CONDITIONS

1. Packed by: SA Seal #
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents:
4. Sealed for Shipping by:
5. Initial Contents Temp : °C Seal #
6. Sampling Status: Done Continuing Until
7. Seal Intact Upon Receipt by Laboratory: Yes ✓ No
8. Contents Temperature Upon Receipt by Lab: 14.3 °C
9. Condition of Contents: ~~1 broken bottle~~ OK

RMA#	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
01	6/29/89		PCJ-W70 - 062989	Amber	6	PPT-PAH	
02			PCJ-W407 - 062989	Amber	6	PPT-PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by (signed)	Received by (signed)	Date	Time
1	[signature]		6/29/89	1400
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA.

Method of Shipment: Fed X Airbill # 2865075861

Received for Lab: RMA Signed: [signature] Date/Time 6-30-89 08:30

Enseco Project No. 5562

White and Pink Copies to Lab Yellow to Sampler

SS-001

Enseco - Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No. 5540

Attn: _____

Enseco Client: St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: SAnderson

SAMPLE SAFE™ CONDITIONS

1. Packed by: SA Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: (Yes) No
8. Contents Temperature Upon Receipt by Lab: 14.3 °C
9. Condition of Contents: OK

RMA#

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
03	6/29/89		MSH - SLP12 - 062989	Amber	6	PPT - PAH	
04			MSH - SLP12D - 062989	Amber	6	PPT - PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by (signed)	Received by. (signed)	Date	Time
1	S. Anderson		6/29/89	1400
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA

Method of Shipment: Fed X Airbill # 2865075861

Received for Lab: RMA Signed: [illegible] Date/Time 6-30-89 08:30

Enseco Project No. 5562

White and Pink Copies to Lab Yellow to Sampler

SS-001

Ens. . - Rocky Mountain Analytical
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile 303/431-7171

CHAIN OF CUSTODY

No. . .42

Attn: _____

Enseco Client: St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: S. Andersen

SAMPLE SAFE™ CONDITIONS

1. Packed by: SA Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: (Yes) No
8. Contents Temperature Upon Receipt by Lab. 14.3 °C
9. Condition of Contents: ok

RMA #

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
05 6/29/89		GAC-SLP15FBD-062989	Amber	6	PPT-PAH	
06 5562-03MS		MSH-SLP12MS-062989	Amber	6	PPT-PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by (signed)	Received by. (signed)	Date	Time
1	[signature]		6/29/89	1400
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA

Method of Shipment: Fed X Airbill # 2865075841

Received for Lab: RMA Signed. [signature] Date/Time 6-29-89 08:30

Enseco Project No. 5562

White and Pink Copies to Lab Yellow to Sampler

SS-001

SUMMARY

DATA

PACKAGE

FOR

City of St. Louis Park

RMA QC# 5562

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5562-01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5562 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5562-01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5562Z637

Level: (low/med) LOW Date Received: 06/30/89

% Moisture: not dec. dec. Date Extracted: 07/03/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/02/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	1.3	J *
496-11-7	2,3-Dihydroindene	16.	B
95-13-6	1H-Indene	3.2	
91-20-3	Naphthalene	10.	B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	8.4	B
90-12-0	1-Methylnaphthalene	4.5	*
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	26.	
83-32-9	Acenaphthene	250.	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	23.	
132-65-0	Dibenzothiophene	10.	
85-01-8	Phenanthrene	3.4	
120-12-7	Anthracene	4.2	
260-94-6	Acridine	1.5	J *
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	3.9	
129-00-0	Pyrene	61.	B
56-55-3	Benzo(A)Anthracene	2.6	
218-01-9	Chrysene	2.0	J *
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5562-02

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5562 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5562-02

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5562Z638

Level: (low/med) LOW Date Received: 06/30/89

% Moisture: not dec. dec. Date Extracted: 07/03/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/03/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	5.1	U	
496-11-7	2,3-Dihydroindene	2.5		B
95-13-6	1H-Indene	1.1		
91-20-3	Naphthalene	4.8	J	B
4565-32-6	Benzo(B)Thiophene	0.9	U	
91-22-5	Quinoline	1.4	U	
120-72-9	1H-Indole	2.5	U	
91-57-6	2-Methylnaphthalene	2.8		B *
90-12-0	1-Methylnaphthalene	1.7		*
92-52-4	Biphenyl	4.3	U	
208-96-8	Acenaphthylene	1.4	U	
83-32-9	Acenaphthene	2.4		
132-64-9	Dibenzofuran	1.0	U	
86-73-7	Fluorene	1.0	U	
132-65-0	Dibenzothiophene	1.1	U	
85-01-8	Phenanthrene	1.8		*
120-12-7	Anthracene	1.1	U	
260-94-6	Acridine	2.9	U	
86-74-8	Carbazole	1.9	U	
206-44-0	Fluoranthene	1.4	U	
129-00-0	Pyrene	19.		B
56-55-3	Benzo(A)Anthracene	2.5	U	
218-01-9	Chrysene	2.8	U	
205-99-2	Benzo(B)Fluoranthene	2.5	U	
207-08-9	Benzo(K)Fluoranthene	2.3	U	
192-97-2	Benzo(E)Pyrene	1.9	U	
50-32-8	Benzo(A)Pyrene	2.3	U	
198-55-0	Perylene	2.5	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U	
53-70-3	Dibenz(A,H)Anthracene	1.6	U	
191-24-2	Benzo(G,H,I)Perylene	2.8	U	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5562-03

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5562 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5562-03

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5562Z639

Level: (low/med) LOW Date Received: 06/30/89

% Moisture: not dec. dec. Date Extracted: 07/03/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/03/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	2.9	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	5.0	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	1.1	J
91-57-6	2-Methylnaphthalene	2.3	B
90-12-0	1-Methylnaphthalene	1.5	J *
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5562-04

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5562 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5562-04

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5562Z641

Level: (low/med) LOW Date Received: 06/30/89

% Moisture: not dec. dec. Date Extracted: 07/03/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/03/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	3.6	B
95-13-6	1H-Indene	1.2	
91-20-3	Naphthalene	5.8	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	1.3	J *
91-57-6	2-Methylnaphthalene	2.4	B
90-12-0	1-Methylnaphthalene	1.7	*
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5562-03MS

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5562 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5562-03MS

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5562Z640

Level: (low/med) LOW Date Received: 06/30/89

% Moisture: not dec. dec. Date Extracted: 07/03/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/03/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.7	B
95-13-6	1H-Indene	8.2	SP
91-20-3	Naphthalene	12.	B SP
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	11.	SP
120-72-9	1H-Indole	1.2	J
91-57-6	2-Methylnaphthalene	11.	B SP
90-12-0	1-Methylnaphthalene	1.6	U
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	9.3	SP
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	8.3	SP
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	3.3	SP
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

2C

WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5562 SAS No.: N/A SDG No.: N/A

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	5562-01	62	58	62
2	5562-02	66	63	70
3	5562-03	64	61	53
4	5562-04	72	67	65
5	5562-03MS	67	66	60
6	BLK01	58	59	71

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3C

WATER SEMIVOLATILE MATRIX SPIKE RECOVERY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5562 SAS No.: N/A SDG No.: N/A

Matrix Spike - EPA Sample No.: 5562-03

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC
1H-Indene	10	ND	8.2	82
Naphthalene	10	5.0	12.	70
Quinoline	10	ND	11.	110
2-Methylnaphthalene	10	2.3	11.	87
Fluorene	10	ND	9.3	93
Chrysene	10	ND	8.3	83
Benzo(E)Pyrene	10	ND	3.3	33

COMMENTS:

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5562 SAS No.: N/A SDG No.: N/A

Lab File ID: S5562Z636 Lab Sample ID: BLK01

Date Extracted: 07/03/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 08/02/89 Time Analyzed: 22:56

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: 4500-Z

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	5562-01	5562-01	S5562Z637	08/02/89
2	5562-02	5562-02	S5562Z638	08/03/89
3	5562-03	5562-03	S5562Z639	08/03/89
4	5562-04	5562-04	S5562Z641	08/03/89
5	5562-03MS	5562-03MS	S5562Z640	08/03/89

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5562 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5562Z636

Level: (low/med) LOW Date Received: 06/30/89

% Moisture: not dec. dec. Date Extracted: 07/03/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/02/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	5.1	U	
496-11-7	2,3-Dihydroindene	1.6		
95-13-6	1H-Indene	0.9	U	
91-20-3	Naphthalene	2.8	J	*
4565-32-6	Benzo(B)Thiophene	0.9	U	
91-22-5	Quinoline	1.4	U	
120-72-9	1H-Indole	2.5	U	
91-57-6	2-Methylnaphthalene	1.3		
90-12-0	1-Methylnaphthalene	1.6	U	
92-52-4	Biphenyl	4.3	U	
208-96-8	Acenaphthylene	1.4	U	
83-32-9	Acenaphthene	1.3	U	
132-64-9	Dibenzofuran	1.0	U	
86-73-7	Fluorene	1.0	U	
132-65-0	Dibenzothiophene	1.1	U	
85-01-8	Phenanthrene	1.3	U	
120-12-7	Anthracene	1.1	U	
260-94-6	Acridine	2.9	U	
86-74-8	Carbazole	1.9	U	
206-44-0	Fluoranthene	1.4	U	
129-00-0	Pyrene	1.1	J	
56-55-3	Benzo(A)Anthracene	2.5	U	
218-01-9	Chrysene	2.8	U	
205-99-2	Benzo(B)Fluoranthene	2.5	U	
207-08-9	Benzo(K)Fluoranthene	2.3	U	
192-97-2	Benzo(E)Pyrene	1.9	U	
50-32-8	Benzo(A)Pyrene	2.3	U	
198-55-0	Perylene	2.5	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U	
53-70-3	Dibenz(A,H)Anthracene	1.6	U	
191-24-2	Benzo(G,H,I)Perylene	2.8	U	

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No: N/A

Lab Code: ENSECO Case No: 5562 SAS No: N/A SDG No: N/A

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDZ635	08/02/89	21:30
BLK01	S5562Z636	08/02/89	22:56
5562-01	S5562Z637	08/02/89	23:58
5562-02	S5562Z638	08/03/89	00:59
5562-03	S5562Z639	08/03/89	02:02
5562-03MS	S5562Z640	08/03/89	03:03
5562-04	S5562Z641	08/03/89	04:04

INITIAL CALIBRATION DATA
PAH COMPOUNDS

ıb Name: RMAL Lab Code: Enseco Case No: 5562

Instrument ID: 4500-Z Calibration Date(s): 07/11/89

Minimum $\overline{RRF}$ is 0.050 Maximum % RSD is 35%

Lab File ID: RRF 40.= STDZ338 RRF 1200.= STDZ337
RRF 20.= STDZ335 RRF 240.= STDZ334 RRF 4800.= STDZ332

COMPOUND	20 PPT RRF	40 PPT RRF	240 PPT RRF	1200PPT RRF	4800PPT RRF	AVE RRF	%RSD
D8-Naphthalene	1.931	2.037	2.441	2.318	1.722	2.090	13.9
D10-Flourene	2.201	1.340	1.625	1.444	1.286	1.579	23.5
D12-Chrysene	1.356	1.460	1.519	1.461	1.152	1.390	10.4
2,3-Benzofuran	1.061	1.104	1.285	1.165	0.992	1.121	9.9
2,3-Dihydroindene	1.047	1.126	1.301	1.176	1.011	1.132	10.1
1H-Indene	1.367	1.474	1.714	1.537	1.287	1.476	11.1
Naphthalene	2.165	2.305	2.680	2.508	1.855	2.303	13.8
Benzo(B)Thiophene	1.873	1.936	2.223	2.057	1.665	1.951	10.7
Quinoline	0.783	0.938	1.280	1.289	1.213	1.101	20.7
1H-Indole	1.249	1.357	1.673	1.634	1.427	1.468	12.4
2-Methylnaphthalene	1.127	1.150	1.349	1.289	1.125	1.208	8.6
1-Methylnaphthalene	1.158	1.304	1.470	1.381	1.188	1.300	10.0
Biphenyl	1.834	1.802	2.315	2.029	1.664	1.929	13.1
Acenaphthylene	1.963	2.112	2.485	2.352	1.870	2.156	12.0
Acenaphthene	1.385	1.403	1.711	1.458	1.263	1.444	11.5
Dibenzofuran	1.974	1.970	2.465	2.219	1.740	2.074	13.3
Flourene	1.599	1.674	1.869	1.707	1.436	1.657	9.5
Dibenzothiophene	1.206	1.338	1.488	1.476	1.061	1.314	13.9
Phenanthrene	1.537	1.477	1.554	1.475	1.099	1.428	13.1
Anthracene	1.296	1.318	1.503	1.433	1.066	1.323	12.6
Acridine	0.967	0.953	1.223	1.229	1.017	1.078	12.7
Carbazole	1.096	1.121	1.353	1.355	1.077	1.200	11.8
Fluoranthene	1.621	1.563	1.762	1.717	1.237	1.580	13.1
Pyrene	1.430	1.441	1.782	1.639	1.148	1.488	16.1
Benzo(A)Anthracene	1.410	1.647	1.726	1.873	1.434	1.618	12.2
Chrysene	1.504	1.736	1.696	1.721	1.366	1.605	10.2
Benzo(B)Fluoranthene	1.315	1.653	1.941	1.777	1.476	1.632	15.1
Benzo(K)Fluoranthene	1.677	1.912	1.743	2.015	1.404	1.750	13.4
Benzo(E)Pyrene	1.450	1.667	1.802	1.882	1.304	1.621	14.9
Benzo(A)Pyrene	1.382	1.403	1.574	1.659	1.349	1.473	9.2
Perylene	1.363	1.425	1.630	1.734	1.372	1.505	11.1
Indeno(1,2,3-CD)Pyrene	1.350	1.543	1.745	1.934	1.622	1.639	13.3
Dibenz(A,H)Anthracene	1.087	1.202	1.418	1.549	1.279	1.307	13.9
Benzo(G,H,I)Perylene	1.216	1.452	0.561	1.493	1.385	1.221	31.4

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

ab Name: RMAL_ Lab Code: Enseco Case No: 5562

Instrument ID: 4500-Z Calibration Date(s): 08/02/89 Time: 21:30

Lab ID: STDZ635 Initial Calibration Date : 07/11/89

Minimum RRF is 0.050 Maximum %D is 35%

COMPOUND	$\overline{RRF}$	40 PPT RRF	%D
D8-Naphthalene	2.090	2.017	3.5
D10-Fluorene	1.579	1.337	15.3
D12-Chrysene	1.390	1.284	7.6
2,3-Benzofuran	1.121	1.109	1.1
2,3-Dihydroindene	1.132	1.169	-3.3
1H-Indene	1.476	1.551	-5.1
Naphthalene	2.303	2.210	4.0
Benzo(B)Thiophene	1.951	1.799	7.8
Quinoline	1.101	1.038	5.7
1H-Indole	1.468	1.265	13.8
2-Methylnaphthalene	1.208	1.141	5.5
1-Methylnaphthalene	1.300	1.200	7.7
Biphenyl	1.929	1.898	1.6
Acenaphthylene	2.156	2.051	4.9
Acenaphthene	1.444	1.311	9.2
Dibenzofuran	2.074	2.032	2.0
Flourene	1.657	1.545	6.8
Dibenzothiophene	1.314	1.184	9.9
Phenanthrene	1.428	1.355	5.1
Anthracene	1.323	1.283	3.0
Acridine	1.078	1.027	4.7
Carbazole	1.200	1.182	1.5
Fluoranthene	1.580	1.479	6.4
Pyrene	1.488	1.535	-3.2
Benzo(A)Anthracene	1.618	1.501	7.2
Chrysene	1.605	1.483	7.6
Benzo(B)Fluoranthene	1.632	1.365	16.4
Benzo(K)Fluoranthene	1.750	1.549	11.5
Benzo(E)Pyrene	1.621	1.469	9.4
Benzo(A)Pyrene	1.473	1.280	13.1
Perylene	1.505	1.344	10.7
Indeno(1,2,3-CD)Pyrene	1.639	1.343	18.1
Dibenz(A,H)Anthracene	1.307	1.091	16.5
Benzo(G,H,I)Perylene	1.221	1.191	2.5

FORM VII

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: Enseco Case No: 5562 SAS No.: N/A SDG No: N/A

Lab File ID (Standard): STDZ635 Date Analyzed: 08/02/89

Instrument ID: 4500-Z Time Analyzed: 21:30

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	277200	477100	360500
UPPER LIMIT	554400	954200	721000
LOWER LIMIT	138600	238600	180200
SAMPLE NO.			
5562-01	245700	411800	302200
5562-02	248400	403600	296400
5562-03	223900	383400	265700
5562-04	250600	433500	313400
5562-03MS	244200	423800	306800
BLK01	216100	338900	234200

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

Enseco

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005568-0001-SA	GAC-SLP15T-062989	AQUEOUS	29 JUN 89		30 JUN 89
005568-0001-MS	GAC-SLP15TMS-062989	AQUEOUS	29 JUN 89		30 JUN 89
005568-0002-SA	GAC-SLP15TD-062989	AQUEOUS	29 JUN 89		30 JUN 89
005568-0003-SA	GAC-SLP15FBD-062989	AQUEOUS	29 JUN 89		30 JUN 89
005568-0004-SA	GAC-SLP15FB-062989	AQUEOUS	29 JUN 89		30 JUN 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5568-04

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5568 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5568-04

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5568Z572

Level: (low/med) LOW Date Received: 06/30/89

% Moisture: not dec. dec. Date Extracted: 07/03/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/28/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	1.1	J
496-11-7	2,3-Dihydroindene	12.	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	5.7	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	2.1	B
90-12-0	1-Methylnaphthalene	1.2	J B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.0	J B
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.2	J B
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

APPENDIX B

LABORATORY DATA SUMMARY PACKAGE: IRONTON-GALESVILLE AQUIFER

QUALITY CONT. . SUMMARY PAH
IRONTON-GALESVILLE AQUIFER

Well No.	Sample Date	Method Blank	Field Duplicate	Matrix Spike	Field Blank
W105	--	--	--	--	--
W105	06/09/89	5294-BLK01	PCJ-SLP14D-060989	PCJ-SLP6MS-060789	PCJ-SLP14FB-060989
W105	--	--	--	--	--
W105	12/20/89	7930-BLK01	PCJ-SLP10D-122089	PCJ-SLP10MS-122089	PCJ-SLP10FB-122089

PHENOLICS

W105	03/29/89	Water	DPV-W422DTP-032989	DPV-W422MSTP-032989	DPV-W422TPFB-032989

PAH MONITORING

1ST HALF - 1989

Rocky Mountain
Analytical Laboratory

Enseco Incorporated

Enseco

CASE NARRATIVE

FOR

City of St. Louis Park

August 10, 1989

Enseco - RMAL Project Number 005294

Introduction

Four aqueous samples were received at Enseco Rocky Mountain Analytical Laboratory on June 10, 1989. The samples were logged in under RMAL project number 005294. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for medium level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Sample 005294-02 shows target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

The 1989 QAPP sets forth specific requirements for the measurement of benzo(j)fluoranthene. Results have not yet been provided previously for this compound due to the lack of an internal standard. The special procedure in the QAPP will be implemented on all future projects.

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: Tracy Giberson Date: 8/10/89
Tracy Giberson
Data Control Supervisor

Approved by: Jeanne B Howbert for Date: 8/10/89
Jean Zimmerman
Program Administrator

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005294-0001-SA	PCJ-SLP5-060989	AQUEOUS	09 JUN 89		10 JUN 89
005294-0002-SA	PCJ-SLP15-060989	AQUEOUS	09 JUN 89		10 JUN 89
005294-0003-SA	IGV-W105-060989	AQUEOUS	09 JUN 89		10 JUN 89
005294-0004-SA	PCJ-W40-060989	AQUEOUS	09 JUN 89		10 JUN 89

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for

City of St. Louis Park

RMAL QC# 5294

PAH

1. QC Summary Package.....001
2. Sample Data Package.....006
3. Standards Data Package.....187
4. Blank Raw Data.....510
5. Matrix Spike Data.....N/A
6. Matrix Spike Duplicate Data.....N/A

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5294-03

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5294 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5294-03

Sample wt/vol: 500 (g/ml) ML Lab File ID: S5294Z343

Level: (low/med) MED Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/12/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	280.	
95-13-6	1H-Indene	190.	
91-20-3	Naphthalene	210.	J
4565-32-6	Benzo(B)Thiophene	98.	
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	170.	
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	120.	
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	130.	
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	82.	J
129-00-0	Pyrene	120.	
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

PAH MONITORING

2ND HALF - 1989

Enseco

CASE NARRATIVE

FOR

City of St. Louis Park

February 9, 1990

Enseco - RMAL Project Number 007930

Introduction

Six aqueous samples (includes MS and DU) were received at Enseco Rocky Mountain Analytical Laboratory on December 21, 1989. The samples were logged in under RMAL project number 007930. Sample PCJ-SLP10FBD-122089 (RMA # 007930-04) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low and medium level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Sample 007930-02 shows target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

The 1989 QAPP sets forth specific requirements for the measurement of benzo(j)fluoranthene. Results have not been provided previously for this compound. The special procedure in the QAPP will be implemented on all future projects.

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: Tracy Giberson Date: 2-9-90
Tracy Giberson
Data Control Supervisor

Approved by: Debbie Fazio Date: 2-9-90
Debbie Fazio
Program Administrator

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
007930-0001-SA	PCJ-SLP10-122089	AQUEOUS	20 DEC 89	13:00	21 DEC 89
007930-0001-MS	PCJ-SLP10MS-122089	AQUEOUS	20 DEC 89	13:00	21 DEC 89
007930-0001-DU	PCJ-SLP10D-122089	AQUEOUS	20 DEC 89	13:00	21 DEC 89
007930-0002-SA	IGV-W105-122089	AQUEOUS	20 DEC 89	13:00	21 DEC 89
007930-0003-SA	PCJ-SLP10FB-122089	AQUEOUS	20 DEC 89	13:00	21 DEC 89
007930-0004-SA	PCJ-SLP10FBD-122089	AQUEOUS	20 DEC 89	13:00	21 DEC 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

7930-02

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 7930 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 7930-02

Sample wt/vol: 500 (g/ml) ML Lab File ID: X0879

Level: (low/med) MED Date Received: 12/21/89

% Moisture: not dec. dec. Date Extracted: 12/26/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 01/19/90

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	300.	
95-13-6	1H-Indene	180.	
91-20-3	Naphthalene	87.	J *
4565-32-6	Benzo(B)Thiophene	95.	
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	210.	
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	130.	
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	84.	J
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	110.	U
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

PHENOLICS MONITORING

1ST HALF - 1989

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ROCKY MOUNTAIN ANALYTICAL Project No. 0000001

SOW No: 7/87

Sample Numbers

CLIENT ID NO	RMA SAMPLE NO
IGV-W105TP	59946-01
DPV-W420TP	59946-02
DPV-W421TP	59946-03
DPV-W422TP	59946-04
DPV-W422DTP	59946-04D
DPV-W422MSTP	59946-04S
DPV-W422FBTP	59946-05

PARAMETERS	METHOD NO.	DETECTION LIMIT	SOURCE
PHENOL	420.1	0.005 MG/L	1

Comments:

FIVE WATER SAMPLES FOR PPB PHENOL ANALYSIS.

RMA QC#59946

SOURCE:
1="Methods for Chemical Analysis of Water and Wastes", USEPA-EMSL, Cincinnati.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Lab Manager: Anne Long

Date: 4/3/89

RMA SAMPLE NO
59946-01
0000004
CLIENT ID NO
IGV-W105TP

INORGANIC ANALYSIS DATA SHEET

Lab Name: ROCKY MOUNTAIN ANALYTICAL

Project No:

Matrix (soil/water) WATER

Date Received: 03/30/89

Level (low/med):

% Solids: 0.0

Analyte	Concentration	C	Q	Concentration Units
PHENOL	0.005	U		MG/L

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: Clarity After: Artifacts:

COMMENTS:

APPENDIX C

LABORATORY DATA SUMMARY PACKAGE: PRAIRIE DU CHIEN-JORDAN AQUIFER

PRAIRIE DU CHI. JORDAN AQUIFER
QUALITY CONTROL SUMMARY

Well No.	Sample Date	Method Blank	Field Duplicate	Matrix Spike	Field Blank
W23	03/29/89	4100-BLK01	DPV-W422D-032989	DPV-W422MS-032989	DPV-W422FB-032989
W23	06/29/89	5560-BLK01	DPV-W422D-032989	DPV-W422MS-032989	DPV-W422FB-032989
W23	09/27/89	6764-BLK01	DPV-W422D-032989	DPV-W422MS-032989	DPV-W422FB-032989
W48	NOT APPLICABLE				
SLP6	NOT APPLICABLE				
SLP719	NOT APPLICABLE				
W48	06/07/89	5254-BLK01	PCJ-SLP6D-060789	PCJ-SLP6MS-060789	PCJ-SLP6FB-060789
SLP6	06/07/89	5254-BLK01	PCJ-SLP6D-060789	PCJ-SLP6MS-060789	PCJ-SLP6FB-060789
SLP7	06/09/89	5292-BLK01	PCJ-SLP6D-060789	PCJ-SLP6MS-060789	PCJ-SLP6FB-060789
W48	09/05/89	6425-BLK01	PCJ-W403D-090589	PCJ-W402MS-090589	PCJ-W402FB-090589
SLP6	09/28/89	6798-BLK01	PCJ-W403D-092889	PCJ-W402MS-092889	PCJ-W402FB-092889
SLP7	09/28/89	6798-BLK01	PCJ-W403D-092889	PCJ-W402MS-092889	PCJ-W402FB-092889
W48	10/11/89	6965-BLK01	PCJ-W129D-101289	STP-SLP3MS-101089	PCJ-W129FB-101289
SLP6	10/12/89	6965-BLK01	PCJ-W129D-101289	STP-SLP3MS-101089	PCJ-W129FB-101289
SLP7	10/12/89	6965-BLK01	PCJ-W129D-101289	STP-SLP3MS-101089	PCJ-W129FB-101289

Well No.	Sample Date	Method Blank	Field Duplicate	Matrix Spike	Field Blank
W406	06/29/89	5562-BLK01	MSH-SLP12D-062989	MSH-SLP12MS-062989	GAC-SLP15FB-062989
E2	06/07/89	5254-BLK01	PCJ-SLP6D-060789	PCJ-SLP6MS-060789	PCJ-SLP6FB-060789
E13	06/07/89	5254-BLK01	PCJ-SLP6D-060789	PCJ-SLP6MS-060789	PCJ-SLP6FB-060789
H3	06/07/89	5254-BLK01	PCJ-SLP6D-060789	PCJ-SLP6MS-060789	PCJ-SLP6FB-060789
SLP15	06/09/89	5294-BLK01	PCJ-SLP14D-060989	PCJ-SLP6MS-060789	PCJ-SLP14FB-060989
SLP14	06/09/89	5292-BLK01	PCJ-SLP14D-060989	PCJ-SLP6MS-060789	PCJ-SLP14FB-060989
SLP16	06/09/89	5238-BLK01	MSH-SLP13D-060989	MSH-SLP6MS-060789	MSH-SLP13FB-060589
W402	NOT APPLICABLE				
W403	06/09/89	5292-BLK01	PCJ-SLP14D-060989	PCJ-SLP6MS-060789	PCJ-SLP14FB-060989
W119	06/09/89	5292-BLK01	PCJ-SLP14D-060989	PCJ-SLP6MS-060789	PCJ-SLP14FB-060989
W406	10/12/89	6992-BLK01	STP-W129D-101189	STP-SLP3MS-101089	STP-W129FB-101189
E2	09/28/89	6798-BLK01	PCJ-SLP6D-092889	PCJ-SLP6MS-092889	PCJ-SLP6FB-092889
E13	09/28/89	6798-BLK01	PCJ-SLP6D-092889	PCJ-SLP6MS-092889	PCJ-SLP6FB-092889
H3	09/28/89	6798-BLK01	PCJ-SLP6D-092989	PCJ-SLP6MS-092889	PCJ-SLP6FB-092889
SLP10	09/28/89	7930-BLK01	PCJ-SLP10D-120889	PCJ-SLP6MS-092889	PCJ-SLP6FB-092889
SLP14	09/28/89	6798-BLK01	PCJ-SLP6D-092989	PCJ-SLP6MS-092889	PCJ-SLP6FB-092889
SLP16	09/28/89	6798-BLK01	PCJ-SLP6D-092989	PCJ-SLP6MS-092889	PCJ-SLP6FB-092889
W402	09/11/89	6965-BLK01	STP-W1296D-101189	STP-SLP3MS-101089	STP-W129FB-101189

Well No.	Sample Date	Method Blank	Field Duplicate	Matrix Spike	Field Blank
W403	09/05/89	6425-BLK01	PCJ-W403D-090589	PCJ-W402MS-090589	PCJ-W402FB-090589
W119	09/28/89	6978-BLK01	PCJ-SLP6D-092889	PCJ-SLP6MS-092889	PCJ-SLP6FB-092889
SLP5	06/09/89	5294-BLK01	PCJ-SLP14D-060989	PCJ-SLP6MS-060789	PCJ-SLP14FB-060989
H6	06/07/89	5254-BLK01	PCJ-SLP6D-060789	PCJ-SLP6MS-060789	PCJ-SLP14FB-060789
E3	06/07/89	5254-BLK01	PCJ-SLP6D-060789	PCJ-SLP6MS-060789	PCJ-SLP14FB-060789
E15	06/07/89	5254-BLK01	PCJ-SLP14D-060789	PCJ-SLP6MS-060789	PCJ-SLP14FB-060789
MTK6	06/07/89	5254-BLK01	PCJ-SLP6D-060789	PCJ-SLP6MS-060789	PCJ-SLP14FB-060789
W29	06/07/89	5254-BLK01	PCJ-SLP6D-060789	PCJ-SLP6MS-060789	PCJ-SLP14FB-060789
W40	06/29/89	5294-BLK01	PCJ-SLP14D-060989	PCJ-SLP6MS-060789	PCJ-SLP14FB-060789
W70	06/07/89	5562-BLK01	MSH-SLP12D-062989	MSH-SLP12MS-062989	GAC-SLP15FB-062989
W401	06/09/89	5254-BLK01	PCJ-SLP6D-060789	PCJ-SLP6MS-060789	PCJ-SLP14FB-060789
SLP8	06/05/89	5238-BLK01	MSH-SLP13D-060589	MSH-SLP13MS-060589	MSH-SLP13FB-060589
SLP8	10/12/89	6992-BLK01	PCJ-SLP6D-101289	STP-SLP3MS-101089	PCJ-SLP6FB-101289
W70	09/28/89	6798-BLK01	PCJ-SLP6D-092889	PCJ-SLP6MS-092889	PCJ-SLP6FB-092889
SLP4	10/12/89	6992-BLK01	PCJ-SLP6D-101289	STP-SLP3MS-101089	PCJ-SLP6FB-101289

RAP SECTION 7.3. (B) MONITORING

1ST QUARTER - 1989

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
004100-0001-SA	PCJ-W23-032989	AQUEOUS	29 MAR 89		30 MAR 89
004100-0002-SA	DPV-W420-032989	AQUEOUS	29 MAR 89		30 MAR 89
004100-0003-SA	DPV-W421-032989	AQUEOUS	29 MAR 89		30 MAR 89
004100-0004-SA	DPV-W422-032989	AQUEOUS	29 MAR 89		30 MAR 89
004100-0004-DU	DPV-W422D-032989	AQUEOUS	29 MAR 89		30 MAR 89
004100-0004-MS	DPV-W422MS-032989	AQUEOUS	29 MAR 89		30 MAR 89
004100-0005-SA	DPV-W422FB-032989	AQUEOUS	29 MAR 89		30 MAR 89
004100-0005-DU	DPV-W422FBD-032989	AQUEOUS	29 MAR 89		30 MAR 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

4100-01

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 4100 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 4100-01

Sample wt/vol: 1060 (g/mL) ML Lab File ID: S4100R928

Level: (low/med) LOW Date Received: 03/30/89

% Moisture: not dec. dec. Date Extracted: 03/31/89

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/12/89

GPC Cleanup: (Y/N) pH: 6.0 Dilution Factor: 0.943

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
271-89-6	2,3-Benzofuran	9.4	U
496-11-7	2,3-Dihydroindene	16.	
95-13-6	1H-Indene	3.1	J
91-20-3	Naphthalene	25.	
4565-32-6	Benzo(B)Thiophene	4.0	J
91-22-5	Quinoline	9.4	U
120-72-9	1H-Indole	9.4	U
91-57-6	2-Methylnaphthalene	3.5	J
90-12-0	1-Methylnaphthalene	8.3	J
92-52-4	Biphenyl	2.9	J
208-96-8	Acenaphthylene	2.3	J
83-32-9	Acenaphthene	14.	
132-64-9	Dibenzofuran	5.3	J
86-73-7	Fluorene	11.	
132-65-0	Dibenzothiophene	1.3	J
85-01-8	Phenanthrene	11.	
120-12-7	Anthracene	1.4	J
260-94-6	Acridine	9.4	U
86-74-8	Carbazole	2.1	J
206-44-0	Fluoranthene	4.8	J
129-00-0	Pyrene	4.2	J
56-55-3	Benzo(A)Anthracene	9.4	U
218-01-9	Chrysene	9.4	U
205-99-2	Benzo(B)Fluoranthene	9.4	U
207-08-9	Benzo(K)Fluoranthene	9.4	U
192-97-2	Benzo(E)Pyrene	9.4	U
50-32-8	Benzo(A)Pyrene	9.4	U
198-55-0	Perylene	9.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	9.4	U
53-70-3	Dibenz(A,H)Anthracene	9.4	U
191-24-2	Benzo(G,H,I)Perylene	9.4	U

RAP SECTION 7.3. (B) MONITORING

2ND QUARTER - 1989

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005560-0001-SA	PCJ-W23-062989	AQUEOUS	29 JUN 89		30 JUN 89
005560-0002-SA	DPV-W420-062989	AQUEOUS	29 JUN 89		30 JUN 89
005560-0003-SA	DPV-W421-062989	AQUEOUS	29 JUN 89		30 JUN 89
005560-0004-SA	DPV-W422-062989	AQUEOUS	29 JUN 89		30 JUN 89
005560-0004-MS	DPV-W422MS-062989	AQUEOUS	29 JUN 89		30 JUN 89
005560-0005-SA	DPV-W422D-062989	AQUEOUS	29 JUN 89		30 JUN 89
005560-0006-SA	DPV-W422FB-062989	AQUEOUS	29 JUN 89		30 JUN 89
005560-0007-SA	DPV-W422FBD-062989	AQUEOUS	29 JUN 89		30 JUN 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5560-01

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 5560 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 5560-01

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S5560R409

Level: (low/med) LOW Date Received: 06/30/89

% Moisture: not dec. dec. Date Extracted: 07/03/89

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 08/07/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
271-89-6	2,3-Benzofuran	10.	U
496-11-7	2,3-Dihydroindene	14.	
95-13-6	1H-Indene	3.2	J
91-20-3	Naphthalene	25.	
4565-32-6	Benzo(B)Thiophene	4.3	J
91-22-5	Quinoline	10.	U
120-72-9	1H-Indole	10.	U
91-57-6	2-Methylnaphthalene	3.6	J
90-12-0	1-Methylnaphthalene	8.2	J
92-52-4	Biphenyl	2.7	J
208-96-8	Acenaphthylene	2.6	J
83-32-9	Acenaphthene	13.	
132-64-9	Dibenzofuran	5.1	J
86-73-7	Fluorene	11.	
132-65-0	Dibenzothiophene	1.2	J
85-01-8	Phenanthrene	11.	
120-12-7	Anthracene	1.5	J
260-94-6	Acridine	10.	U
86-74-8	Carbazole	2.1	J
206-44-0	Fluoranthene	4.9	J
129-00-0	Pyrene	4.2	J
56-55-3	Benzo(A)Anthracene	10.	U
218-01-9	Chrysene	10.	U
205-99-2	Benzo(B)Fluoranthene	10.	U
207-08-9	Benzo(K)Fluoranthene	10.	U
192-97-2	Benzo(E)Pyrene	10.	U
50-32-8	Benzo(A)Pyrene	10.	U
198-55-0	Perylene	10.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	10.	U
53-70-3	Dibenz(A,H)Anthracene	10.	U
191-24-2	Benzo(G,H,I)Perylene	10.	U

RAP SECTION 7.3. (B) MONITORING

3RD QUARTER - 1989

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006764-0001-SA	PCJ-W23-092789	AQUEOUS	27 SEP 89	10:30	28 SEP 89
006764-0002-SA	DPV-W420-092789	AQUEOUS	27 SEP 89	10:30	28 SEP 89
006764-0003-SA	DPV-W421-092789	AQUEOUS	27 SEP 89	10:30	28 SEP 89
006764-0004-SA	DPV-W422-092789	AQUEOUS	27 SEP 89	10:30	28 SEP 89
006764-0004-MS	DPV-W422MS-092789	AQUEOUS	27 SEP 89	10:30	28 SEP 89
006764-0005-SA	DPV-W422D-092789	AQUEOUS	27 SEP 89	10:30	28 SEP 89
006764-0006-SA	DPV-W422FB-092789	AQUEOUS	27 SEP 89	10:30	28 SEP 89
006764-0007-SA	DPV-W422FBD-092789	AQUEOUS	27 SEP 89	10:30	28 SEP 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6764-01

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 6764 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6764-01

Sample wt/vol: 1050 (g/mL) ML Lab File ID: S6764R358

Level: (low/med) LOW Date Received: 09/28/89

% Moisture: not dec. dec. Date Extracted: 10/01/89

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/18/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.952

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
271-89-6	2,3-Benzofuran	9.5	U
496-11-7	2,3-Dihydroindene	12.	
95-13-6	1H-Indene	2.7	J
91-20-3	Naphthalene	22.	
4565-32-6	Benzo(B)Thiophene	3.5	J
91-22-5	Quinoline	9.5	U
120-72-9	1H-Indole	9.5	U
91-57-6	2-Methylnaphthalene	3.4	J
90-12-0	1-Methylnaphthalene	7.2	J
92-52-4	Biphenyl	2.4	J
208-96-8	Acenaphthylene	2.2	J
83-32-9	Acenaphthene	12.	
132-64-9	Dibenzofuran	4.9	J
86-73-7	Fluorene	9.9	
132-65-0	Dibenzothiophene	1.1	J
85-01-8	Phenanthrene	11.	
120-12-7	Anthracene	1.3	J
260-94-6	Acridine	9.5	U
86-74-8	Carbazole	1.8	J
206-44-0	Fluoranthene	4.7	J
129-00-0	Pyrene	4.2	J
56-55-3	Benzo(A)Anthracene	9.5	U
218-01-9	Chrysene	9.5	U
205-99-2	Benzo(B)Fluoranthene	9.5	U
207-08-9	Benzo(K)Fluoranthene	9.5	U
192-97-2	Benzo(E)Pyrene	9.5	U
50-32-8	Benzo(A)Pyrene	9.5	U
198-55-0	Perylene	9.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	9.5	U
53-70-3	Dibenz(A,H)Anthracene	9.5	U
191-24-2	Benzo(G,H,I)Perylene	9.5	U

RAP SECTION 7.3. (B) MONITORING

4TH QUARTER - 1989

NO MONITORING REQUIRED

RAP SECTION 7.3. (C) MONITORING

1ST QUARTER - 1989

NO MONITORING COMPLETED

CITY OF SAINT LOUIS PARK

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

April 5, 1989

Regional Administrator
United States Environmental
Protection Agency, Region 5
ATTN: Hazardous Waste Enforcement
Branch
230 South Dearborn Street
Chicago, Illinois 60604

Director, Solid and Hazardous
Waste Division
Minnesota Pollution Control Agency
ATTN: Site Response Section
520 Lafayette Road North
St. Paul, Minnesota 55155

President
Reilly Industries, Inc.
1510 Market Square Center
151 North Delaware
Indianapolis, Indiana 46204

RE: United States of America, et al. vs. Reilly Tar &
Chemical Corporation, et al.
File No. Civ. 4-80-469

Gentlemen:

Pursuant to the provisions of Part O of the Consent Decree in the referenced case, the City hereby informs the parties that it was unable to retrieve groundwater samples from Prairie du Chien-Jordan Aquifer wells SLP7/SLP9 and W48 during the first quarter of 1989 as specified in Section 7.3. of the Remedial Action Plan in said case. The reason for the City's inability to retrieve the samples is that wells SLP7 and SLP9 are currently being reconditioned and there is no method by which samples can be collected at this time. Regarding W48, the well pump system remains "winterized" at this time. As the City Project Leader noted in a conversation with the Minnesota Pollution Control Agency Alternate Project Leader, it is the City's intent to retrieve the samples as soon as possible in the second quarter of 1989.

Sincerely,

James N. Grube

James N. Grube
Director of Public Works

JNG/cmr

5005 minnetonka boulevard • st. louis park, minnesota 55416-2290 • phone (612) 924-2500

RAP SECTION 7.3. (C) MONITORING

2ND QUARTER - 1989

Rocky Mountain
Analytical Laboratory

Enseco Incorporated

Enseco

CASE NARRATIVE

FOR

City of St. Louis Park

August 7, 1989

Enseco - RMAL Project Number 005254

Introduction

Fourteen aqueous samples (includes MS) were received at Enseco Rocky Mountain Analytical Laboratory on June 8, 1989. The samples were logged in under RMAL project number 005254. Sample PCJ-SLP6FBD-060789 (RMA # 005254-13) was inadvertently analyzed and is included in the data package, however, you will not be billed for the analysis. As per client request on June 7, 1989, sample PCJ-W48-060789 (RMAL # 005254-09) was extracted and analyzed as medium level. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

The analyte list in this report is the list shown in Table 8-1 of the 1989 QAPP. This list does not contain results for the compounds which are required to be monitored under the "extended analysis" requirements in the Remedial Action Plan. The data sheets from previous projects contained results for three compounds on the extended monitoring list, 7,12-dimethylbenzanthracene, 3-methylchloanthrene and dibenz(a,c)anthracene. Analyses were not performed for these compounds and the reported results (ND) should be disregarded.

The 1989 QAPP sets forth specific requirements for the measurement of benzo(j)fluoranthene. Results have not been provided previously for this compound due to the lack of an internal standard. The special procedure in the QAPP will be implemented on all future projects.

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile 303/431-7171

PPT PAH Con't)

Samples 5254-02, 03, 04, 05, 07, 10 and 10MS show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

The secondary ion was used to measure the surrogate recovery for D10-fluorene in samples 005254-04 and 005254-10.

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: Tracy Giberson — Date: Aug. 7, 1989
Tracy Giberson
Data Control Supervisor

Approved by: Jean Zimmerman — Date: Aug 7 1989
Jean Zimmerman
Program Administrator

Qualifier Codes and their Usage

U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.

J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarly invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.

E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.

D = This flag identifies all compounds identified during a re-analysis of a diluted sample.

Additional Qualifiers for TIC data only:

I = Isomer The unknown may be this specific isomer or an isomer with the same molecular formula.

C = Class The unknown compound contains ions characteristic of a particular class of compounds.

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005254-0001-SA	PCJ-E13-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0002-SA	PCJ-E3-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0003-SA	PCJ-E2-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0004-SA	PCJ-H6-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0005-SA	PCJ-H3-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0006-SA	PCJ-MTK6-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0007-SA	PCJ-W29-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0008-SA	PCJ-W401-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0009-SA	PCJ-W48-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0010-SA	PCJ-SLP6-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0010-MS	PCJ-SLP6MS-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0011-SA	PCJ-SLP6D-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0012-SA	PCJ-SLP6FB-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0013-SA	PCJ-SLP6FBD-060789	AQUEOUS	07 JUN 89		08 JUN 89

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for

City of St. Louis Park

RMAL QC# 5254

PAH

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3. Standards Data Package.....0597
4. Blank Raw Data.....0966
5. Matrix Spike Data.....1057
6. Matrix Spike Duplicate Data.....N/A

1)

Enseco - Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No. 10654

Attn: _____

Enseco Client: St. Louis Park

Project: _____

Sampling Co.: ENSR

Sampling Site: _____

Team Leader: S. Anderson

SAMPLE SAFE™ CONDITIONS

1. Packed by: SA Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: (Yes) No
8. Contents Temperature Upon Receipt by Lab. _____ °C
9. Condition of Contents: _____

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
6/7/89		PCJ-E13-060789	Amber	6	PPT-PAH	RMA# 01
		PCJ-E3-060789				02
		PCJ-E2-060789				03

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by: (signed)	Received by. (signed)	Date	Time
1				
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA

Method of Shipment: Fed X Airbill # 2865075721

Received for Lab. RMA Signed: [illegible] Date/Time 6/8/89 0815

Enseco Project No. _____

White and Pink Copies to Lab Yellow to Sampler

SS-001

Enseco - Rocky Mountain Analytical
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No. 1355

Attn: _____

Enseco Client: St. Louis Park

Project: _____

Sampling Co.: ENSR

Sampling Site: _____

Team Leader: S. Anderson

SAMPLE SAFE™ CONDITIONS

1. Packed by: SA Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: (Yes) No
8. Contents Temperature Upon Receipt by Lab. _____ °C
9. Condition of Contents _____

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
6/7/89		PCJ-H6-060789	LT Amber	6	PPT-PAH	04
〃		PCJ-H3-060789	〃	〃	〃	05
〃		PCJ-[redacted] MTK 6-060789	〃	〃	〃	06

CUSTODY TRANSFERS PRIOR TO SHIPPING

Relinquished by: (signed)	Received by. (signed)	Date	Time
1			
2			
3			

SHIPPING DETAILS

Delivered to Shipper by: SA

Method of Shipment: FedX Airbill # 2865075721

Received for Lab: RMA Signed: [illegible] Date/Time 6/8/89

Enseco Project No. 0815

White and Pink Copies to Lab Yellow to Sampler

SS-001

Enseco - Rocky Mountain Analytical
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No. 10850

Attn: _____

Enseco Client: St. Louis Park

Project: _____

Sampling Co.: ENSR

Sampling Site: _____

Team Leader: S. Anderson

SAMPLE SAFE™ CONDITIONS

1. Packed by. _____ Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by. _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status. Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: (Yes) No
8. Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
6/7/89		PCJ-W29-060789	Amber	6	PPT-PAH	07
		PCJ-W401-060789	?	?	?	08
		PCJ-W48-060789				09

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by. (signed)	Date	Time
1				
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA

Method of Shipment: Fed K Airbill # 2865075721

Received for Lab: RMA Signed: [signature] Date/Time 6/8/89 0815

Enseco Project No. _____

White and Pink Copies to Lab Yellow to Sampler

SS-001

Enseco - Rocky Mountain Analytical

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Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No. 8_ _2

Attn: _____

Enseco Client: St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: Scott Anderson

SAMPLE SAFE™ CONDITIONS

1. Packed by: SA Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: (Yes) No
8. Contents Temperature Upon Receipt by Lab. _____ °C
9. Condition of Contents: _____

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
~~[illegible]~~		~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	
6/7/89		PCJ- SLP 6 - 060789	Liter Amber	6	PPC, PAH	10
		PCJ- SLP 6D - 060789	"	6	"	11

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by (signed)	Received by: (signed)	Date	Time
1				
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA

Method of Shipment: FedEx Airbill # 2865075721

Received for Lab: RMA Signed: [signature] Date/Time 6/8/89

Enseco Project No. 0865

White and Pink Copies to Lab Yellow to Sampler

SS-001

Enseco - Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No. 8017

Attn: _____

Enseco Client: St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: Scott Anderson

SAMPLE SAFE™ CONDITIONS

1. Packed by: SA Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: (Yes) No
8. Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
6/7/89		PCJ-SLP6FB-060789	Liter Amber	6	PPL-PAH	12
〃		PCJ-SLP6FBD-060789	〃	〃	〃	13
〃		PCJ-SLP6MS-060789	〃	〃	〃	10 MS

CUSTODY TRANSFERS PRIOR TO SHIPPING

Relinquished by: (signed)	Received by: (signed)	Date	Time
1			
2			
3			

SHIPPING DETAILS

Delivered to Shipper by: SA

Method of Shipment: Fed Ex Airbill # 2865075721

Received for Lab: RMA Signed: [illegible] Date/Time 6/8/89 0815

Enseco Project No. _____

White and Pink Copies to Lab Yellow to Sampler

SS-001

SUMMARY

DATA

PACKAGE

FOR

City of St. Louis Park

RMA QC# 5254

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z354

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/12/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.9	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	7.7	B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	5.2	B
90-12-0	1-Methylnaphthalene	2.8	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	2.1	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-02

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-02

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z355

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/12/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.5	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.0	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	4.0	B *
90-12-0	1-Methylnaphthalene	2.3	B *
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.5	B
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-03

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-03

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z356

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/12/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	6.0	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.5	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	4.6	B *
90-12-0	1-Methylnaphthalene	2.8	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.5	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.9	B
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-04

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-04

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z357

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.6	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.5	J B *
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	4.5	B
90-12-0	1-Methylnaphthalene	2.5	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.4	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	B
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-05

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-05

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z358

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	15.	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.5	J B
4565-32-6	Benzo(B)Thiophene	1.2	
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.6	B
90-12-0	1-Methylnaphthalene	1.9	B *
92-52-4	Biphenyl	4.1	J
208-96-8	Acenaphthylene	5.9	
83-32-9	Acenaphthene	19.	
132-64-9	Dibenzofuran	1.4	
86-73-7	Fluorene	15.	
132-65-0	Dibenzothiophene	3.0	
85-01-8	Phenanthrene	3.0	
120-12-7	Anthracene	2.8	
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	6.7	
129-00-0	Pyrene	6.1	B
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-06

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-06

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z359

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.3	J
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.0	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.6	B
90-12-0	1-Methylnaphthalene	1.6	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.1	J
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-07

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-07

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z360

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	130.	
95-13-6	1H-Indene	2.3	
91-20-3	Naphthalene	2.6	J B
4565-32-6	Benzo(B)Thiophene	3.9	*
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	2.1	B *
90-12-0	1-Methylnaphthalene	1.6	B
92-52-4	Biphenyl	9.9	
208-96-8	Acenaphthylene	12.	
83-32-9	Acenaphthene	55.	
132-64-9	Dibenzofuran	1.7	
86-73-7	Fluorene	45.	
132-65-0	Dibenzothiophene	6.4	
85-01-8	Phenanthrene	4.4	
120-12-7	Anthracene	2.9	
260-94-6	Acridine	2.0	J *
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	37.	
129-00-0	Pyrene	19.	B
56-55-3	Benzo(A)Anthracene	2.8	*
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-08

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-08

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z361

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.8	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.7	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	1.1	J
91-57-6	2-Methylnaphthalene	4.5	B
90-12-0	1-Methylnaphthalene	2.6	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-09

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-09

Sample wt/vol: 500 (g/ml) ML Lab File ID: S5254Z340

Level: (low/med) MED Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/12/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	700.	
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	88.	J
83-32-9	Acenaphthene	410.	
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	240.	
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	88.	J
129-00-0	Pyrene	110.	
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-10

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-10

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z362

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	24.	
95-13-6	1H-Indene	1.3	
91-20-3	Naphthalene	4.8	J B
4565-32-6	Benzo(B)Thiophene	1.9	
91-22-5	Quinoline	6.7	*
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	4.4	B *
90-12-0	1-Methylnaphthalene	2.5	B
92-52-4	Biphenyl	1.4	J
208-96-8	Acenaphthylene	1.8	
83-32-9	Acenaphthene	6.8	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.5	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.1	J B
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-11

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-11

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z365

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	26.	
95-13-6	1H-Indene	1.5	
91-20-3	Naphthalene	8.8	B
4565-32-6	Benzo(B)Thiophene	2.4	
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	6.9	B
90-12-0	1-Methylnaphthalene	2.9	B
92-52-4	Biphenyl	1.7	J
208-96-8	Acenaphthylene	1.8	
83-32-9	Acenaphthene	6.8	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.7	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-12

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-12

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z364

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	U
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	5.2	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.6	B
90-12-0	1-Methylnaphthalene	1.6	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.1	J
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-13

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-13

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z368

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.7	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	6.0	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.7	B
90-12-0	1-Methylnaphthalene	1.7	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-10MS

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-10MS

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z367

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	17.	
95-13-6	1H-Indene	6.4	SP
91-20-3	Naphthalene	9.4	B SP
4565-32-6	Benzo(B)Thiophene	1.4	
91-22-5	Quinoline	7.6	SP
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	9.1	B SP
90-12-0	1-Methylnaphthalene	1.4	J B *
92-52-4	Biphenyl	1.0	J *
208-96-8	Acenaphthylene	1.1	J
83-32-9	Acenaphthene	4.5	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	6.9	SP
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.2	J
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.2	J B
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	7.8	SP
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	3.5	SP
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Level : LOW

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	5254-01	73	145	57
2	5254-02	76	102	63
3	5254-03	74	128	58
4	5254-04	74	81	58
5	5254-05	74	107	57
6	5254-06	68	89	55
7	5254-07	55	141	51
8	5254-08	61	82	53
9	5254-10	76	86	64
10	5254-11	79	107	79
11	5254-12	69	91	63
12	5254-13	69	93	86
13	5254-10MS	53	84	69
14	BLK01	52	59	61

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Level : MED

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	5254-09	65	64	56
2	BLK01	61	63	61

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3C

WATER SEMIVOLATILE MATRIX SPIKE RECOVERY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix Spike - EPA Sample No.: 5254-10

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC
1H-Indene	10	1.3	6.4	51
Naphthalene	10	4.8	9.4	46
Quinoline	10	6.7	7.6	9
2-Methylnaphthalene	10	4.4	9.1	47
Fluorene	10	ND	6.9	69
Chrysene	10	ND	7.8	78
Benzo(E)Pyrene	10	ND	3.5	35

COMMENTS:

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Lab File ID: S5254Z366 Lab Sample ID: BLK01

Date Extracted: 06/11/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 07/13/89 Time Analyzed: 11:03

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: 4500-Z

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	5254-01	5254-01	S5254Z354	07/12/89
2	5254-02	5254-02	S5254Z355	07/12/89
3	5254-03	5254-03	S5254Z356	07/12/89
4	5254-04	5254-04	S5254Z357	07/13/89
5	5254-05	5254-05	S5254Z358	07/13/89
6	5254-06	5254-06	S5254Z359	07/13/89
7	5254-07	5254-07	S5254Z360	07/13/89
8	5254-08	5254-08	S5254Z361	07/13/89
9	5254-10	5254-10	S5254Z362	07/13/89
10	5254-11	5254-11	S5254Z365	07/13/89
11	5254-12	5254-12	S5254Z364	07/13/89
12	5254-13	5254-13	S5254Z368	07/13/89
13	5254-10MS	5254-10MS	S5254Z367	07/13/89

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z366

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	U
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.2	J
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.6	
90-12-0	1-Methylnaphthalene	1.5	J
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.0	J
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Lab File ID: S5254Z348 Lab Sample ID: BLK01

Date Extracted: 06/12/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 07/12/89 Time Analyzed: 08:09

Matrix: (soil/water) WATER Level: (low/med) MED

Instrument ID: 4500-Z

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	5254-09	5254-09	S5254Z340	07/12/89

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 500 (g/ml) ML Lab File ID: S5254Z348

Level: (low/med) MED Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/12/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	110.	U
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	100.	U
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	110.	U
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No: N/A

Lab Code: ENSECO Case No: 5254 SAS No: N/A SDG No: N/A

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDZ338	07/11/89	23:40
5254-09	S5254Z340	07/12/89	01:01
BLK01	S5254Z348	07/12/89	08:09

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No: N/A

Lab Code: ENSECO Case No: 5254 SAS No: N/A SDG No: N/A

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDZ351	07/12/89	17:39
5254-01	S5254Z354	07/12/89	21:46
5254-02	S5254Z355	07/12/89	22:40
5254-03	S5254Z356	07/12/89	23:33
5254-04	S5254Z357	07/13/89	00:27
5254-05	S5254Z358	07/13/89	01:21
5254-06	S5254Z359	07/13/89	02:14
5254-07	S5254Z360	07/13/89	03:08
5254-08	S5254Z361	07/13/89	04:00
5254-10	S5254Z362	07/13/89	04:54

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No: N/A

Lab Code: ENSECO Case No: 5254 SAS No: N/A SDG No: N/A

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDZ363	07/13/89	07:35
5254-12	S5254Z364	07/13/89	09:18
5254-11	S5254Z365	07/13/89	10:11
BLK01	S5254Z366	07/13/89	11:03
5254-10MS	S5254Z367	07/13/89	11:55
5254-13	S5254Z368	07/13/89	12:47

INITIAL CALIBRATION DATA
PAH COMPOUNDS

ɔ Name: RMAL Lab Code: Enseco Case No: 5254

Instrument ID: 4500-Z Calibration Date(s): 07/11/89

Minimum RRF is 0.050 Maximum % RSD is 35%

Lab File ID: RRF 40.= STDZ338 RRF 1200.= STDZ337
RRF 20.= STDZ335 RRF 240.= STDZ334 RRF 4800.= STDZ332

COMPOUND	20 PPT RRF	40 PPT RRF	240 PPT RRF	1200PPT RRF	4800PPT RRF	AVE RRF	%RSD
D8-Naphthalene	1.931	2.037	2.441	2.318	1.722	2.090	13.9
D10-Flourene	2.201	1.340	1.625	1.444	1.286	1.579	23.5
D12-Chrysene	1.356	1.460	1.519	1.461	1.152	1.390	10.4
2,3-Benzofuran	1.061	1.104	1.285	1.165	0.992	1.121	9.9
2,3-Dihydroindene	1.047	1.126	1.301	1.176	1.011	1.132	10.1
1H-Indene	1.367	1.474	1.714	1.537	1.287	1.476	11.1
Naphthalene	2.165	2.305	2.680	2.508	1.855	2.303	13.8
Benzo(B)Thiophene	1.873	1.936	2.223	2.057	1.665	1.951	10.7
Quinoline	0.783	0.938	1.280	1.289	1.213	1.101	20.7
1H-Indole	1.249	1.357	1.673	1.634	1.427	1.468	12.4
2-Methylnaphthalene	1.127	1.150	1.349	1.289	1.125	1.208	8.6
-Methylnaphthalene	1.158	1.304	1.470	1.381	1.188	1.300	10.0
Biphenyl	1.834	1.802	2.315	2.029	1.664	1.929	13.1
Acenaphthylene	1.963	2.112	2.485	2.352	1.870	2.156	12.0
Acenaphthene	1.385	1.403	1.711	1.458	1.263	1.444	11.5
Dibenzofuran	1.974	1.970	2.465	2.219	1.740	2.074	13.3
Flourene	1.599	1.674	1.869	1.707	1.436	1.657	9.5
Dibenzothiophene	1.206	1.338	1.488	1.476	1.061	1.314	13.9
Phenanthrene	1.537	1.477	1.554	1.475	1.099	1.428	13.1
Anthracene	1.296	1.318	1.503	1.433	1.066	1.323	12.6
Acridine	0.967	0.953	1.223	1.229	1.017	1.078	12.7
Carbazole	1.096	1.121	1.353	1.355	1.077	1.200	11.8
Fluoranthene	1.621	1.563	1.762	1.717	1.237	1.580	13.1
Pyrene	1.430	1.441	1.782	1.639	1.148	1.488	16.1
Benzo(A)Anthracene	1.410	1.647	1.726	1.873	1.434	1.618	12.2
Chrysene	1.504	1.736	1.696	1.721	1.366	1.605	10.2
Benzo(B)Fluoranthene	1.315	1.653	1.941	1.777	1.476	1.632	15.1
Benzo(K)Fluoranthene	1.677	1.912	1.743	2.015	1.404	1.750	13.4
Benzo(E)Pyrene	1.450	1.667	1.802	1.882	1.304	1.621	14.9
Benzo(A)Pyrene	1.382	1.403	1.574	1.659	1.349	1.473	9.2
Perylene	1.363	1.425	1.630	1.734	1.372	1.505	11.1
Indeno(1,2,3-CD)Pyrene	1.350	1.543	1.745	1.934	1.622	1.639	13.3
Dibenz(A,H)Anthracene	1.087	1.202	1.418	1.549	1.279	1.307	13.9
Benzo(G,H,I)Perylene	1.216	1.452	0.561	1.493	1.385	1.221	31.4

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

ɔ Name: RMAL Lab Code: Enseco Case No: 5254

Instrument ID: 4500-Z Calibration Date(s): 07/11/89 Time: 23:40

Lab ID: STDZ338 Initial Calibration Date : 07/11/89

Minimum RRF is 0.050 Maximum %D is 35%

COMPOUND	$\overline{RRF}$	40 PPT RRF	%D
D8-Naphthalene	2.090	2.037	2.5
D10-Fluorene	1.579	1.340	15.1
D12-Chrysene	1.390	1.460	-5.0
2,3-Benzofuran	1.121	1.104	1.5
2,3-Dihydroindene	1.132	1.126	0.5
1H-Indene	1.476	1.474	0.1
Naphthalene	2.303	2.305	-0.1
Benzo(B)Thiophene	1.951	1.936	0.8
Quinoline	1.101	0.938	14.8
1H-Indole	1.468	1.357	7.6
2-Methylnaphthalene	1.208	1.150	4.8
1-Methylnaphthalene	1.300	1.304	-0.3
Biphenyl	1.929	1.802	6.6
Acenaphthylene	2.156	2.112	2.0
Acenaphthene	1.444	1.403	2.8
Dibenzofuran	2.074	1.970	5.0
Flourene	1.657	1.674	-1.0
Dibenzothiophene	1.314	1.338	-1.8
Phenanthrene	1.428	1.477	-3.4
Anthracene	1.323	1.318	0.4
Acridine	1.078	0.953	11.6
Carbazole	1.200	1.121	6.6
Fluoranthene	1.580	1.563	1.1
Pyrene	1.488	1.441	3.2
Benzo(A)Anthracene	1.618	1.647	-1.8
Chrysene	1.605	1.736	-8.2
Benzo(B)Fluoranthene	1.632	1.653	-1.3
Benzo(K)Fluoranthene	1.750	1.912	-9.3
Benzo(E)Pyrene	1.621	1.667	-2.8
Benzo(A)Pyrene	1.473	1.403	4.8
Perylene	1.505	1.425	5.3
Indeno(1,2,3-CD)Pyrene	1.639	1.543	5.9
Dibenz(A,H)Anthracene	1.307	1.202	8.0
Benzo(G,H,I)Perylene	1.221	1.452	-18.9

FORM VII

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

b Name: RMAL Lab Code: Enseco Case No: 5254

Instrument ID: 4500-Z Calibration Date(s): 07/12/89 Time: 17:39

Lab ID: STDZ351 Initial Calibration Date : 07/11/89

Minimum RRF is 0.050 Maximum %D is 35%

COMPOUND	RRF	40 PPT RRF	%D
D8-Naphthalene	2.090	1.971	5.7
D10-Fluorene	1.579	1.275	19.3
D12-Chrysene	1.390	1.436	-3.3
2,3-Benzofuran	1.121	1.054	6.0
2,3-Dihydroindene	1.132	1.041	8.0
1H-Indene	1.476	1.343	9.0
Naphthalene	2.303	2.395	-4.0
Benzo(B)Thiophene	1.951	1.948	0.2
Quinoline	1.101	0.975	11.4
1H-Indole	1.468	1.300	11.4
2-Methylnaphthalene	1.208	1.199	0.7
1-Methylnaphthalene	1.300	1.226	5.7
Biphenyl	1.929	1.747	9.4
Acenaphthylene	2.156	1.895	12.1
Acenaphthene	1.444	1.240	14.1
Dibenzofuran	2.074	1.937	6.6
Flourene	1.657	1.446	12.7
Dibenzothiophene	1.314	1.322	-0.6
Phenanthrene	1.428	1.449	-1.5
Anthracene	1.323	1.288	2.6
Acridine	1.078	0.975	9.6
Carbazole	1.200	1.134	5.5
Fluoranthene	1.580	1.551	1.8
Pyrene	1.488	1.523	-2.4
Benzo(A)Anthracene	1.618	1.605	0.8
Chrysene	1.605	1.719	-7.1
Benzo(B)Fluoranthene	1.632	1.563	4.2
Benzo(K)Fluoranthene	1.750	1.867	-6.7
Benzo(E)Pyrene	1.621	1.449	10.6
Benzo(A)Pyrene	1.473	1.391	5.6
Perylene	1.505	1.381	8.2
Indeno(1,2,3-CD)Pyrene	1.639	1.452	11.4
Dibenz(A,H)Anthracene	1.307	1.186	9.3
Benzo(G,H,I)Perylene	1.221	1.376	-12.7

FORM VII

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

b Name: RMAL Lab Code: Enseco Case No: 5254

Instrument ID: 4500-Z Calibration Date(s): 07/13/89 Time: 07:35

Lab ID: STDZ363 Initial Calibration Date : 07/11/89

Minimum RRF is 0.050 Maximum %D is 35%

COMPOUND	RRF	40 PPT RRF	%D
D8-Naphthalene	2.090	2.014	3.6
D10-Fluorene	1.579	1.345	14.8
D12-Chrysene	1.390	1.208	13.1
2,3-Benzofuran	1.121	1.081	3.6
2,3-Dihydroindene	1.132	1.056	6.7
1H-Indene	1.476	1.364	7.6
Naphthalene	2.303	2.142	7.0
Benzo(B)Thiophene	1.951	1.754	10.1
Quinoline	1.101	0.843	23.4
1H-Indole	1.468	1.219	17.0
2-Methylnaphthalene	1.208	1.104	8.6
1-Methylnaphthalene	1.300	1.254	3.5
Biphenyl	1.929	1.710	11.4
Acenaphthylene	2.156	2.059	4.5
Acenaphthene	1.444	1.379	4.5
Dibenzofuran	2.074	1.981	4.5
Flourene	1.657	1.505	9.2
Dibenzothiophene	1.314	1.280	2.6
Phenanthrene	1.428	1.384	3.1
Anthracene	1.323	1.296	2.0
Acridine	1.078	0.966	10.4
Carbazole	1.200	1.053	12.3
Fluoranthene	1.580	1.474	6.7
Pyrene	1.488	1.588	-6.7
Benzo(A)Anthracene	1.618	1.337	17.4
Chrysene	1.605	1.380	14.0
Benzo(B)Fluoranthene	1.632	1.253	23.2
Benzo(K)Fluoranthene	1.750	1.626	7.1
Benzo(E)Pyrene	1.621	1.457	10.1
Benzo(A)Pyrene	1.473	1.269	13.8
Perylene	1.505	1.103	26.7
Indeno(1,2,3-CD)Pyrene	1.639	1.270	22.5
Dibenz(A,H)Anthracene	1.307	1.028	21.3
Benzo(G,H,I)Perylene	1.221	1.087	11.0

FORM VII

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: Enseco Case No: 5254 SAS No.: N/A SDG No: N/A

Lab File ID (Standard): STDZ338 Date Analyzed: 07/11/89

Instrument ID: 4500-Z Time Analyzed: 23:40

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	121200	201700	130100
UPPER LIMIT	242400	403400	260200
LOWER LIMIT	60600	100800	65000
SAMPLE NO.			
5254-09	155500	270700	185000
BLK01	234500	381400	279700 *

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: Enseco Case No: 5254 SAS No.: N/A SDG No: N/A

Lab File ID (Standard): STDZ351 Date Analyzed: 07/12/89

Instrument ID: 4500-Z Time Analyzed: 17:39

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	206900	321100	211400
UPPER LIMIT	413800	642200	422800
LOWER LIMIT	103400	160600	105700
SAMPLE NO.			
5254-01	181000	305300	224300
5254-02	185600	317800	198800
5254-03	214200	325900	219300
5254-04	201300	328700	254100
5254-05	197000	332400	234800
5254-06	215100	357600	281900
5254-07	232200	393000	288900
5254-08	240700	403300	300100
5254-10	235700	401000	293000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

FORM VIII SV-2

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: Enseco Case No: 5254 SAS No.: N/A SDG No: N/A

Lab File ID (Standard): STDZ363 Date Analyzed: 07/13/89

Instrument ID: 4500-Z Time Analyzed: 07:35

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	145500	245500	202000
UPPER LIMIT	291000	491000	404000
LOWER LIMIT	72800	122800	101000
SAMPLE NO.			
5254-11	169900	290400	222600
5254-12	169500	289400	237000
5254-13	192900	358200	225300
5254-10MS	160300	261800	199100
BLK01	147700	235300	182000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005292-0001-SA	PCJ-SLP7-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0002-SA	PCJ-SLP14-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0003-SA	PCJ-SLP14D-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0004-SA	PCJ-W403-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0005-SA	PCJ-E15-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0006-SA	PCJ-W119-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0007-SA	PCJ-SLP14FB-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0008-SA	PCJ-SLP14FBD-060989	AQUEOUS	09 JUN 89		10 JUN 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5292-01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5292 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5292-01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5292Z370

Level: (low/med) LOW Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/14/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	16.	B
95-13-6	1H-Indene	1.5	
91-20-3	Naphthalene	5.8	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.9	B
90-12-0	1-Methylnaphthalene	2.4	B
92-52-4	Biphenyl	2.0	J
208-96-8	Acenaphthylene	6.6	
83-32-9	Acenaphthene	13.	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	3.2	
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.8	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	4.3	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

RAP SECTION 7.3. (C) MONITORING

3RD QUARTER - 1989

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006425-0001-SA	PCJW48090589	AQUEOUS	05 SEP 89	15:30	06 SEP 89
006425-0002-SA	PCJW403090589	AQUEOUS	05 SEP 89	12:30	06 SEP 89
006425-0003-SA	PCJW402FB090589	AQUEOUS	05 SEP 89	13:30	06 SEP 89
006425-0004-SA	PCJW402FBD090589	AQUEOUS	05 SEP 89	13:30	06 SEP 89
006425-0006-SA	PCJW402090589	AQUEOUS	05 SEP 89	13:30	06 SEP 89
006425-0006-MS	PCJW402MS090589	AQUEOUS	05 SEP 89	13:30	06 SEP 89
006425-0007-SA	PCJW403D090589	AQUEOUS	05 SEP 89	14:20	06 SEP 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6425-01

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6425 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6425-01

Sample wt/vol: 500 (g/ml) ML Lab File ID: S6425X021

Level: (low/med) MED Date Received: 09/06/89

% Moisture: not dec. dec. Date Extracted: 09/07/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/06/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	730.	
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	120.	
83-32-9	Acenaphthene	470.	
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	290.	
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	
129-00-0	Pyrene	130.	
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

Enseco

CASE NARRATIVE

FOR

City of St. Louis Park

November 10, 1989

Enseco - RMAL Project Number 006798

Introduction

Fourteen aqueous samples (includes MS/MSD) were received at Enseco Rocky Mountain Analytical Laboratory on September 29, 1989. The samples were logged in under RMAL project number 006798. Sample PCJ-SLP6FBD-092889 (RMA # 006798-09) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low and medium level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Sample PCJ-SLP6D (RMA # 006798-10MSD) was inadvertently extracted and analyzed as a matrix spike duplicate rather than a sample duplicate and is reported as such.

Samples 006798-01, 02, 03, 04, 05, 07, 10MS and 10MSD show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

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4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

The 1989 QAPP sets forth specific requirements for the measurement of benzo(j)fluoranthene. Results have not been provided previously for this compound. The special procedure in the QAPP will be implemented on all future projects.

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: Tracy Giberson — **Date:** 11/10/89
Tracy Giberson
Data Control Supervisor

Approved by: Debbie Fazio for — **Date:** 11/10/89
Debbie Fazio
Program Administrator

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006798-0001-SA	PCJ-E13-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0002-SA	PCJ-E2-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0003-SA	PCJ-SLP-7-092889	AQUEOUS	28 SEP 89	10:00	29 SEP 89
006798-0004-SA	PCJ-SLP-16-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0005-SA	PCJ-SLP-14-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0006-SA	PCJ-SLP-10-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0007-SA	PCJ-H3-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0008-SA	PCJ-SLP6FB-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0009-SA	PCJ-SLP6FBD-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0010-SA	PCJ-SLP6-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0010-SD	PCJ-SLP6D-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0010-MS	PCJ-SLP6MS-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0011-SA	PCJ-W119-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0012-SA	PCJ-W70-092889	AQUEOUS	28 SEP 89		29 SEP 89

TABLE OF CONTENTS

for

City of St. Louis Park

RMAL QC# 6798

PAH

1. QC Summary Package.....001
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6. Matrix Spike Duplicate Data.....974

Qualifier Codes and their Usage

U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.

J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarly invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.

E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.

D = This flag identifies all compounds identified during a re-analysis of a diluted sample.

Additional Qualifiers for TIC data only:

I = Isomer The unknown may be this specific isomer or an isomer with the same molecular formula.

C = Class The unknown compound contains ions characteristic of a particular class of compounds.

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CHAIN OF CUSTODY

No.

Attn: _____

Enseco Client: St. Louis Park

Project: _____

Sampling Co.: ENSR

Sampling Site: _____

Team Leader: Wm Gregg

SAMPLE SAFE™ CONDITIONS

1. Packed by: MH Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: Yes No
8. Contents Temperature Upon Receipt by Lab. _____ °C
9. Condition of Contents: _____

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
01	9/28/89		PCJ-E13-092889	L Amber	6	ppt-PAH	Low ppt-PAH
02	9/28/89		PCJ-E2-092889	L Amber	6	ppt-PAH	Low ppt-PAH

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by· (signed)	Date	Time
1				
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: MH

Method of Shipment: FEDX Airbill # 2865 07 5920

Received for Lab: Rmax Signed: B Magin Date/Time 9/29/89 0800

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Sampling Co.: _____

Sampling Site: _____

Team Leader: M. Higgins

SAMPLE SAFE™ CONDITIONS

1. Packed by: MH Seal # _____
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3. Condition of Contents: _____
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5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: Yes No
8. Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
03	9/28/89	1000	PCJ- SLP 7 - 092889	L Amber	6	ppt- PAH	Low ppt-PAH
04	9/28/89		PCJ- SLP 16 - 092889	L Amber	6	ppt- PAH	Low ppt-PAH
05	9/28/89		PCJ- SLP 14- 092889	L Amber	6	ppt- PAH	Low ppt-PAH

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by: (signed)	Received by. (signed)	Date	Time
1	[illegible]			
2				
3				

SHIPPING DETAILS

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Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: M. Higgins

SAMPLE SAFE™ CONDITIONS

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2. Seal Intact Upon Receipt by Sampling Co.. Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status. Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory. Yes No
8. Contents Temperature Upon Receipt by Lab _____ °C
9. Condition of Contents. _____

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
06	9/28/89		PCJ-SLP10 - 092889	L Amber	6	ppt PAH	Med ppt PAH
07	9/28/89		PCJ-H3 - 092889	L Amber	6	ppt PAH	Low ppt-PAH

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by (signed)	Date	Time
1				
2				
3				

SHIPPING DETAILS

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No.

Attn: _____

Enseco Client: St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: M. Higgins

SAMPLE SAFE™ CONDITIONS

1. Packed by: MH Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: Yes No
8. Contents Temperature Upon Receipt by Lab. _____ °C
9. Condition of Contents. _____

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
08	9/28/89	0900	PCJ-SLP6FB -092889	L Amber	6	ppt-PAH	Low ppt-PAH
09	9/28/89		PCJ-SLP6FBD- 092889	L. Amber	6	ppt-PAH	Low ppt-PAH

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by: (signed)	Received by: (signed)	Date	Time
1	MH			
2				
3				

SHIPPING DETAILS

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CHAIN CUSTODY No.

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Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: M. Higgins

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2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: Yes No
8. Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
1C	9/28/89	0900	PCJ-SLP6 - 092889	L Amber	6	ppt-PAH	Low ppt-PAH
1DUP	9/28/89		PCJ-SLP6D - 092889	L Amber	6	ppt-PAH	Low ppt-PAH
1DMS	9/28/89		PCJ-SLP6MS - 092889	L Amber	6	ppt-PAH	Low ppt-PAH

CUSTODY TRANSFERS PRIOR TO SHIPPING

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1	[illegible]			
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Enseco Client: St. Louis Park

Project: _____

Sampling Co.: ENSR

Sampling Site: _____

Team Leader: Wm Gregg

SAMPLE SAFE™ CONDITIONS

1. Packed by: MH. Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: Yes No
8. Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
11	9/28/89		PCJ-W119-092889	L Amber	6	ppt-PAH	Low ppt PAH
12	9/28/89		PCJ-W70-092889	L Amber	6	ppt-PAH	Med ppt PAH

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by: (signed)	Received by: (signed)	Date	Time
1	SEC			
2				
3				

SHIPPING DETAILS

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Method of Shipment: Fed X Airbill # 2865075920

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Enseco Project No. 6798

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SUMMARY

DATA

PACKAGE

FOR

City of St. Louis Park

RMT QC# 6798

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-01

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-01

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X027

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	1.1	J B *
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	2.2	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.2	B
90-12-0	1-Methylnaphthalene	1.5	U
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.3	U
83-32-9	Acenaphthene	1.2	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.6	
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-02

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-02

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X028

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	4.9	U	
496-11-7	2,3-Dihydroindene	3.9		B
95-13-6	1H-Indene	0.9	U	
91-20-3	Naphthalene	2.0	J	B
4565-32-6	Benzo(B)Thiophene	0.9	U	
91-22-5	Quinoline	1.3	U	
120-72-9	1H-Indole	2.4	U	
91-57-6	2-Methylnaphthalene	1.2		B
90-12-0	1-Methylnaphthalene	1.5	U	
92-52-4	Biphenyl	4.1	U	
208-96-8	Acenaphthylene	1.3	U	
83-32-9	Acenaphthene	1.2	U	
132-64-9	Dibenzofuran	1.0	U	
86-73-7	Fluorene	1.0	U	
132-65-0	Dibenzothiophene	1.0	U	
85-01-8	Phenanthrene	1.2	U	
120-12-7	Anthracene	1.0	U	
260-94-6	Acridine	2.8	U	
86-74-8	Carbazole	1.8	U	
206-44-0	Fluoranthene	1.3	U	
129-00-0	Pyrene	1.0	J	*
56-55-3	Benzo(A)Anthracene	2.4	U	
218-01-9	Chrysene	2.7	U	
205-99-2	Benzo(B)Fluoranthene	2.4	U	
207-08-9	Benzo(K)Fluoranthene	2.2	U	
192-97-2	Benzo(E)Pyrene	1.8	U	
50-32-8	Benzo(A)Pyrene	2.2	U	
198-55-0	Perylene	2.4	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U	
53-70-3	Dibenz(A,H)Anthracene	1.5	U	
191-24-2	Benzo(G,H,I)Perylene	2.7	U	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-03

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-03

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X029

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	7.8	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	1.4	J B *
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.0	B *
90-12-0	1-Methylnaphthalene	1.5	U
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	3.7	
83-32-9	Acenaphthene	7.2	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.2	*
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	2.4	
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-04

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-04

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X030

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	6.8	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	1.7	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.1	B *
90-12-0	1-Methylnaphthalene	1.5	U
92-52-4	Biphenyl	1.4	J
208-96-8	Acenaphthylene	2.2	
83-32-9	Acenaphthene	7.9	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	2.6	
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.3	U
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-05

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-05

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X031

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	4.9	U	
496-11-7	2,3-Dihydroindene	24.		B
95-13-6	1H-Indene	1.5		
91-20-3	Naphthalene	1.7	J	B
4565-32-6	Benzo(B)Thiophene	2.5		
91-22-5	Quinoline	1.3	U	
120-72-9	1H-Indole	1.1	J	*
91-57-6	2-Methylnaphthalene	0.9	U	
90-12-0	1-Methylnaphthalene	1.5	U	
92-52-4	Biphenyl	2.4	J	
208-96-8	Acenaphthylene	13.		
83-32-9	Acenaphthene	31.		
132-64-9	Dibenzofuran	1.0	U	
86-73-7	Fluorene	1.6		*
132-65-0	Dibenzothiophene	1.0	U	
85-01-8	Phenanthrene	1.6		
120-12-7	Anthracene	1.4		*
260-94-6	Acridine	2.8	U	
86-74-8	Carbazole	1.8	U	
206-44-0	Fluoranthene	1.3	U	
129-00-0	Pyrene	2.4		
56-55-3	Benzo(A)Anthracene	2.4	U	
218-01-9	Chrysene	2.7	U	
205-99-2	Benzo(B)Fluoranthene	2.4	U	
207-08-9	Benzo(K)Fluoranthene	2.2	U	
192-97-2	Benzo(E)Pyrene	1.8	U	
50-32-8	Benzo(A)Pyrene	2.2	U	
198-55-0	Perylene	2.4	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U	
53-70-3	Dibenz(A,H)Anthracene	1.5	U	
191-24-2	Benzo(G,H,I)Perylene	2.7	U	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-06

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-06

Sample wt/vol: 500 (g/ml) ML Lab File ID: S6798X024

Level: (low/med) MED Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/08/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	80.	J
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	180.	
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	110.	U
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-07

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-07

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X032

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	90.	B
95-13-6	1H-Indene	7.0	
91-20-3	Naphthalene	2.1	J B
4565-32-6	Benzo(B)Thiophene	2.9	
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.1	B
90-12-0	1-Methylnaphthalene	1.0	J *
92-52-4	Biphenyl	13.	
208-96-8	Acenaphthylene	36.	
83-32-9	Acenaphthene	100.	
132-64-9	Dibenzofuran	1.5	
86-73-7	Fluorene	62.	
132-65-0	Dibenzothiophene	10.	
85-01-8	Phenanthrene	2.2	
120-12-7	Anthracene	2.8	
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.0	J
206-44-0	Fluoranthene	20.	
129-00-0	Pyrene	17.	
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-08

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-08

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X033

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	1.6	B
95-13-6	1H-Indene	3.2	
91-20-3	Naphthalene	2.7	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.4	B
90-12-0	1-Methylnaphthalene	1.5	U
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.3	U
83-32-9	Acenaphthene	1.2	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.3	U
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-10

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-10

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X035

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	21.	B
95-13-6	1H-Indene	3.4	
91-20-3	Naphthalene	2.5	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.3	B
90-12-0	1-Methylnaphthalene	1.5	U
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.3	
83-32-9	Acenaphthene	6.4	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.3	U
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-11

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-11

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X043

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	1.5	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	3.5	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	3.2	B
90-12-0	1-Methylnaphthalene	1.8	
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.3	U
83-32-9	Acenaphthene	1.2	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.1	J
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-12

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-12

Sample wt/vol: 500 (g/ml) ML Lab File ID: S6798X025

Level: (low/med) MED Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/08/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	110.	U
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	280.	
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	110.	U
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-10MS

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-10MS

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X041

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	15.	B
95-13-6	1H-Indene	4.7	SP
91-20-3	Naphthalene	6.9	B SP
4565-32-6	Benzo(B)Thiophene	1.1	
91-22-5	Quinoline	5.7	SP
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	5.8	B SP
90-12-0	1-Methylnaphthalene	1.5	U
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.0	J *
83-32-9	Acenaphthene	4.8	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	5.2	SP
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.1	J
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	5.1	SP
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.0	J SP
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-10MSD

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-10MSD

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X042

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	17.	B
95-13-6	1H-Indene	5.3	SP
91-20-3	Naphthalene	8.2	B SP
4565-32-6	Benzo(B)Thiophene	1.3	
91-22-5	Quinoline	6.3	SP
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	6.6	B SP
90-12-0	1-Methylnaphthalene	1.1	J
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.1	J *
83-32-9	Acenaphthene	5.8	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	5.6	SP
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.1	J
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	5.9	SP
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.5	J SP
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	6798-01	40	58	61
2	6798-02	36	52	55
3	6798-03	29	46	44
4	6798-04	39	49	60
5	6798-05	38	54	53
6	6798-06	51	66	68
7	6798-07	32	48	59
8	6798-08	38	56	71
9	6798-10	41	54	55
10	6798-11	57	81	60
11	6798-12	40	58	72
12	6798-10MS	38	47	50
13	6798-10MSD	43	58	57
14	BLK01-LOW	46	63	65
15	BLK01-MED	37	54	70

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3C

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix Spike - EPA Sample No.: 6798-10 LEVEL: LOW

Compound	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC
1H-Indene	4.76	3.35	4.69	28
Naphthalene	4.76	2.49	6.86	92
Quinoline	4.76	ND	5.68	119
2-Methylnaphthalene	4.76	1.31	5.76	93
Flourene	4.76	ND	5.19	109
Chrysene	4.76	ND	5.06	106
Benzo(E)Pyrene	4.76	ND	1.03	22

Compound	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD
1H-Indene	4.76	5.31	41	-38
Naphthalene	4.76	8.20	120	-26
Quinoline	4.76	6.27	132	-10
2-Methylnaphthalene	4.76	6.64	112	-19
Flourene	4.76	5.59	117	-7
Chrysene	4.76	5.91	124	-16
Benzo(E)Pyrene	4.76	1.46	31	-34

Comments:

3C

WATER SEMIVOLATILE DUPLICATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

EPA Sample No.: 6798-10

COMPOUND	6798-10 SAMPLE CONCENTRATION (ng/L)	6798-10MSD DUPLICATE CONCENTRATION (ng/L)	% RPD
2,3-Dihydroindene	21.	17.	21
Benzo(B)Thiophene	ND	1.3	NC
1-Methylnaphthalene	ND	1.1	NC
Acenaphthylene	1.3	1.1	17
Acenaphthene	6.4	5.8	10

ND = Not found
NC = Not calculated

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Lab File ID: S6798X044 Lab Sample ID: BLK01

Date Extracted: 10/02/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 10/09/89 Time Analyzed: 23:55

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: 4500-X

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	6798-01	6798-01	S6798X027	10/09/89
2	6798-02	6798-02	S6798X028	10/09/89
3	6798-03	6798-03	S6798X029	10/09/89
4	6798-04	6798-04	S6798X030	10/09/89
5	6798-05	6798-05	S6798X031	10/09/89
6	6798-07	6798-07	S6798X032	10/09/89
7	6798-08	6798-08	S6798X033	10/09/89
8	6798-10	6798-10	S6798X035	10/09/89
9	6798-11	6798-11	S6798X043	10/09/89
10	6798-10MS	6798-10MS	S6798X041	10/09/89
11	6798-10MSD	6798-10MSD	S6798X042	10/09/89

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6798X044

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.1	J
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	2.1	J
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	1.2	
90-12-0	1-Methylnaphthalene	1.6	U
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Lab File ID: S6798X026 Lab Sample ID: BLK01

Date Extracted: 10/02/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 10/08/89 Time Analyzed: 23:37

Matrix: (soil/water) WATER Level: (low/med) MED

Instrument ID: 4500-X

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	6798-06	6798-06	S6798X024	10/08/89
2	6798-12	6798-12	S6798X025	10/08/89

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 500 (g/ml) ML Lab File ID: S6798X026

Level: (low/med) MED Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/08/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	110.	U
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	100.	U
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	110.	U
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6798 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
4800_PPT_PAH_STD	STDX791	09/21/89	11:40
20_PPT_PAH_STD	STDX792	09/21/89	13:37
240_PPT_PAH_STD	STDX793	09/21/89	14:46
40_PPT_PAH_STD	STDX794	09/21/89	16:01
1200_PPT_PAH_STD	STDX795	09/21/89	16:54

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6798 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PPT_PAH_STD	STDX023	10/08/89	20:36
6798-06	S6798X024	10/08/89	21:54
6798-12	S6798X025	10/08/89	22:46
BLK01-MED	S6798X026	10/08/89	23:37
6798-01	S6798X027	10/09/89	00:30
6798-02	S6798X028	10/09/89	01:22
6798-03	S6798X029	10/09/89	02:15
6798-04	S6798X030	10/09/89	03:08
6798-05	S6798X031	10/09/89	04:00
6798-07	S6798X032	10/09/89	04:52
6798-08	S6798X033	10/09/89	05:45
6798-10	S6798X035	10/09/89	06:37

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6798 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PPT_PAH_STD	STDX040	10/09/89	19:17
6798-10MS	S6798X041	10/09/89	21:17
6798-10MSD	S6798X042	10/09/89	22:10
6798-11	S6798X043	10/09/89	23:03
BLK01-LOW	S6798X044	10/09/89	23:55

INITIAL CALIBRATION DATA
PAH COMPOUNDS

Lab Name: RMAL Lab Code: ENSECO Case No: 6798

Instrument ID: 4500-X Calibration Date(s): 09/21/89

Maximum % RSD is 35%

Lab File ID: RRF 20= STDX792 RRF 40= STDX794
RRF 240= STDX793 RRF 1200= STDX795 RRF 4800= STDX791

COMPOUND	20 PPT RRF	40 PPT RRF	240PPT RRF	1200PPT RRF	4800PPT RRF	AVE RRF	%RSD
D8-Naphthalene	2.331	2.503	2.450	2.535	2.400	2.444	3.3
D10-Flourene	1.524	1.553	1.512	1.504	1.544	1.527	1.4
D12-Chrysene	1.485	1.317	1.430	1.608	1.243	1.417	10.1
2,3-Benzofuran	1.363	1.377	1.355	1.345	1.255	1.339	3.6
2,3-Dihydroindene	1.371	1.429	1.383	1.365	1.253	1.360	4.8
1H-Indene	1.720	1.760	1.817	1.796	1.677	1.754	3.2
Naphthalene	2.314	2.852	2.747	2.877	2.503	2.659	9.1
Benzo(B)Thiophene	1.795	2.008	1.843	1.965	2.144	1.951	7.1
Quinoline	1.228	1.054	1.186	1.314	1.380	1.232	10.1
1H-Indole	1.471	1.498	1.591	1.726	1.811	1.619	9.0
2-Methylnaphthalene	1.310	1.397	1.392	1.432	1.400	1.386	3.3
1-Methylnaphthalene	1.218	1.271	1.101	1.512	1.451	1.311	12.9
Biphenyl	2.069	2.179	2.170	2.304	2.166	2.178	3.8
Acenaphthylene	2.576	2.665	2.581	2.569	2.524	2.583	2.0
Acenaphthene	1.659	1.687	1.644	1.620	1.591	1.640	2.2
Dibenzofuran	2.416	2.280	2.295	2.337	2.410	2.348	2.7
Flourene	1.763	1.825	1.817	1.817	1.851	1.815	1.8
Dibenzothiophene	1.507	1.475	1.526	1.424	1.379	1.462	4.1
Phenanthrene	1.539	1.405	1.485	1.446	1.427	1.460	3.6
Anthracene	1.352	1.291	1.407	1.474	1.454	1.396	5.4
Acridine	1.183	1.085	1.306	1.262	1.338	1.235	8.3
Carbazole	1.334	1.197	1.463	1.320	1.422	1.347	7.7
Fluoranthene	1.786	1.643	1.655	1.493	1.536	1.623	7.1
Pyrene	1.849	1.675	1.626	1.413	1.510	1.615	10.3
Benzo(A)Anthracene	1.478	1.514	1.563	1.704	1.514	1.555	5.7
Chrysene	1.268	1.459	1.505	1.627	1.322	1.436	10.0
Benzo(B)Fluoranthene	1.707	1.537	1.543	1.732	1.472	1.598	7.2
Benzo(K)Fluoranthene	1.716	1.838	1.768	1.700	1.508	1.706	7.2
Benzo(E)Pyrene	1.715	1.711	1.681	1.765	1.400	1.654	8.8
Benzo(A)Pyrene	1.559	1.449	1.512	1.544	1.380	1.489	5.0
Perylene	1.662	1.531	1.491	1.545	1.358	1.517	7.2
Indeno(1,2,3-CD)Pyrene	1.605	1.864	1.803	1.897	1.440	1.722	11.3
Dibenz(A,H)Anthracene	1.238	1.461	1.378	1.532	1.172	1.356	11.1
Benzo(G,H,I)Perylene	1.430	1.763	1.528	1.636	1.170	1.505	14.9

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Lab Name: RMAL Lab Code: ENSECO Case No: 6798

Instrument ID: 4500-X Calibration Date(s): 10/08/89 Time: 20:36

Lab ID: STDX023 Initial Calibration Date: 09/21/89

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPT RRF	%D
D8-Naphthalene	2.444	2.299	5.9
D10-Flourene	1.527	1.590	-4.1
D12-Chrysene	1.417	1.476	-4.2
2,3-Benzofuran	1.339	1.315	1.8
2,3-Dihydroindene	1.360	1.322	2.8
1H-Indene	1.754	1.493	14.9
Naphthalene	2.659	2.667	-0.3
Benzo(B)Thiophene	1.951	2.990	-2.0
Quinoline	1.232	1.032	16.2
1H-Indole	1.619	1.472	9.1
2-Methylnaphthalene	1.386	1.392	-0.4
1-Methylnaphthalene	1.311	1.511	-15.3
Biphenyl	2.178	2.270	-4.2
Acenaphthylene	2.583	2.482	3.9
Acenaphthene	1.640	1.633	0.4
Dibenzofuran	2.348	2.435	-3.7
Flourene	1.815	1.808	0.4
Dibenzothiophene	1.462	1.491	-2.0
Phenanthrene	1.460	1.561	-6.9
Anthracene	1.396	1.532	-9.7
Acridine	1.235	1.298	-5.1
Carbazole	1.347	1.443	-7.1
Fluoranthene	1.623	1.673	-3.1
Pyrene	1.615	1.739	-7.7
Benzo(A)Anthracene	1.555	1.586	-2.0
Chrysene	1.436	1.559	-8.6
Benzo(B)Fluoranthene	1.598	1.384	13.4
Benzo(K)Fluoranthene	1.706	1.767	-3.6
Benzo(E)Pyrene	1.654	1.547	6.5
Benzo(A)Pyrene	1.489	1.434	3.7
Perylene	1.517	1.430	5.7
Indeno(1,2,3-CD)Pyrene	1.722	1.497	13.1
Dibenz(A,H)Anthracene	1.356	1.220	10.0
Benzo(G,H,I)Perylene	1.505	1.237	17.8

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Lab Name: RMAL Lab Code: ENSECO Case No: 6798

Instrument ID: 4500-X Calibration Date(s): 10/09/89 Time: 19:17

Lab ID: STDX040 Initial Calibration Date: 09/21/89

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPT RRF	%D
D8-Naphthalene	2.444	2.700	-10.5
D10-Flourene	1.527	1.528	-0.1
D12-Chrysene	1.417	1.709	-20.6
2,3-Benzofuran	1.339	1.398	-4.4
2,3-Dihydroindene	1.360	1.552	-14.1
1H-Indene	1.754	1.832	-4.4
Naphthalene	2.659	2.919	-9.8
Benzo(B)Thiophene	1.951	2.354	-20.7
Quinoline	1.232	1.207	2.0
1H-Indole	1.619	1.642	-1.4
2-Methylnaphthalene	1.386	1.491	-7.6
1-Methylnaphthalene	1.311	1.619	-23.5
Biphenyl	2.178	2.061	5.4
Acenaphthylene	2.583	2.534	1.9
Acenaphthene	1.640	1.537	6.3
Dibenzofuran	2.348	2.208	6.0
Flourene	1.815	1.690	6.9
Dibenzothiophene	1.462	1.454	0.5
Phenanthrene	1.460	1.530	-4.8
Anthracene	1.396	1.431	-2.5
Acridine	1.235	1.074	13.0
Carbazole	1.347	1.325	1.6
Fluoranthene	1.623	1.639	-1.0
Pyrene	1.615	1.277	20.9
Benzo(A)Anthracene	1.555	1.820	-17.0
Chrysene	1.436	1.646	-14.6
Benzo(B)Fluoranthene	1.598	1.715	-7.3
Benzo(K)Fluoranthene	1.706	2.010	-17.8
Benzo(E)Pyrene	1.654	1.919	-16.0
Benzo(A)Pyrene	1.489	1.646	-10.5
Perylene	1.517	1.684	-11.0
Indeno(1,2,3-CD)Pyrene	1.722	1.727	-0.3
Dibenz(A,H)Anthracene	1.356	1.215	10.4
Benzo(G,H,I)Perylene	1.505	1.480	1.7

8C
SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 6798 SAS No.: SDG No:

Lab File ID (Standard): STDX023 Date Analyzed: 10/08/89

Instrument ID: 4500-X Time Analyzed: 20:36

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	132000	212000	182000
UPPER LIMIT	264000	424000	364000
LOWER LIMIT	66000	106000	91000
SAMPLE NO.			
6798-01	154000	228000	207000
6798-02	151000	241000	222000
6798-03	151000	212000	212000
6798-04	146000	207000	199000
6798-05	145000	226000	206000
6798-06	136000	201000	183000
6798-07	169000	246000	217000
6798-08	140000	211000	194000
6798-10	141000	193000	203000
6798-12	142000	199000	160000
BLK01-MED	144000	205000	172000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100%
of internal standard area
LOWER LIMIT = - 50%
of internal standard area

Column used to flag internal standard area values with an asterisk

FORM VIII SV-2

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 6798 SAS No.: SDG No:

Lab File ID (Standard): STDX040 Date Analyzed: 10/09/89

Instrument ID: 4500-X Time Analyzed: 19:17

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	70700	110000	63300
UPPER LIMIT	141000	220000	127000
LOWER LIMIT	35400	55000	31600
SAMPLE NO.			
6798-11	101000	178000	106000
6640-10MS	95700	148000	92300
6640-10MSD	99000	162000	95100
BLK01-LOW	89600	133000	84600

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100%
of internal standard area
LOWER LIMIT = - 50%
of internal standard area

Column used to flag internal standard area values with an asterisk

RAP SECTION 7.3. (C) MONITORING

4TH QUARTER - 1989

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006965-0001-SA	STP-W129-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0001-DU	STP-W129D-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0002-SA	STP-W129FB-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0003-SA	STP-W129FBD-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0004-SA	PCJ-W402-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0005-SA	STP-W122-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0006-SA	STP-P116-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0007-SA	PCJ-W48-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0008-SA	STP-W133-101189	AQUEOUS	11 OCT 89		12 OCT 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6965-07

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6965-07

Sample wt/vol: 500 (g/ml) ML Lab File ID: S6965X477

Level: (low/med) MED Date Received: 10/12/89

% Moisture: not dec. dec. Date Extracted: 10/16/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/17/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	600.	
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	250.	
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	160.	
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	120.	
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

Rocky Mountain
Analytical Laboratory

Enseco

CASE NARRATIVE

FOR

City of St. Louis Park

November 30, 1989

Enseco - RMAL Project Number 006992

Introduction

Eight aqueous samples were received at Enseco Rocky Mountain Analytical Laboratory on October 13, 1989. The samples were logged in under RMAL project number 006992. Sample PCJ-SLP6FBD-101289 (RMA # 006992-03) was extracted and help as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Samples 006992-01, 01Dup, 04, 05, and 06 show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax. 303/431-7171

The 1989 QAPP sets forth specific requirements for the measurement of benzo(j)fluoranthene. Results have not yet been provided previously for this compound due to the lack of an internal standard. The special procedure in the QAPP will be implemented on all future projects.

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: Tracy Giberson **Date:** 11/30/89
Tracy Giberson
Data Control Supervisor

Approved by: Debbie Fazio **Date:** 11/30/89
Debbie Fazio
Program Administrator

TABLE OF CONTENTS

for

City of St. Louis Park

RMAL QC# 6992

PAH

1. QC Summary Package.....001
2. Sample Data Package.....009
3. Standards Data Package.....321
4. Blank Raw Data.....698
5. Matrix Spike Data.....N/A
6. Matrix Spike Duplicate Data.....N/A

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006992-0001-SA	PCJ-SLP6-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0001-DU	PCJ-SLP6D-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0002-SA	PCJ-SLP6FB-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0003-SA	PCJ-SLP6FBD-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0004-SA	PCJ-SLP7-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0005-SA	PCJ-SLP8-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0006-SA	PCJ-SLP4-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0007-SA	PCJ-W407-101289	AQUEOUS	12 OCT 89		13 OCT 89

Ense **Rocky Mountain Analytical**

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No.

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: M. Higgins

SAMPLE SAFE™ CONDITIONS

1 Packed by: MA Seal #: _____
2 Seal Intact Upon Receipt by Sampling Co. Yes No
3 Condition of Contents: _____
4 Sealed for Shipping by: _____
5 Initial Contents Temp.: _____ °C Seal #: _____
6. Sampling Status Done Continuing Until: _____
7. Seal Intact Upon Receipt by Laboratory Yes No
8 Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
1	10/12/89		PCJ-SLP6 - 101289	l	6	ppt-PAH	Low ppt-PAH
D			PCJ-SLP6D - 101289	l	6	ppt-PAH	Low ppt-PAH
			~~PCJ-SLP6 - 101289~~	~~l~~	~~6~~	~~ppt-PAH~~	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by (signed)	Date	Time
1	[signature]			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: MA
Method of Shipment: Fed Ex Airbill #: 2865075953
Received for Lab: CMAL Signed: [signature] Date/Time: 10/13 0800
Enseco Project No: 6992

White and Pink Copies to Yellow to Sampler

SS-001

Ense Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

CHAIN O STODY

No.

Attn:

Enseco Client St. Louis Park

Project

Sampling Co.

Sampling Site

Team Leader MHiggins

SAMPLE SAFE™ CONDITIONS

1 Packed by. MH Seal #

2 Seal Intact Upon Receipt by Sampling Co. Yes No

3 Condition of Contents:

4 Sealed for Shipping by:

5 Initial Contents Temp °C Seal #

6 Sampling Status Done Continuing Until

7. Seal Intact Upon Receipt by Laboratory Yes No

8 Contents Temperature Upon Receipt by Lab: °C

9. Condition of Contents:

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
3 10/12/89		PCJ- SLP 6FBD - 101289	l	6	ppt- PAH	Low ppt PAH
3		PCJ- SLP 6FB - 101289	l	6	ppt- PAH	Low ppt PAH

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by: (signed)	Date	Time
1	[signature]			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by. MH

Method of Shipment FED - EX Airbill # 2865075953

Received for Lab RMAL Signed Bret W. Holt Date/Time 10/13 0800

Enseco Project No 6992 8

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SS-001

Enseco Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile 303/431-7171

CHAIN OF CUSTODY

No.

Attn: _____

Enseco Client: St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: M Higgins

SAMPLE SAFE™ CONDITIONS

1 Packed by: MH Seal #: _____
2 Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5 Initial Contents Temp.: _____ °C Seal #: _____
6 Sampling Status: Done Continuing Until: _____
7 Seal Intact Upon Receipt by Laboratory. Yes No
8 Contents Temperature Upon Receipt by Lab: _____ °C
9 Condition of Contents: _____

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
10/12/89		~~PCJ-SLP1 - 101289~~	~~l~~	~~6~~	~~ppt-PAH~~	
4		PCJ-SLP 7 - 101289	l	6	ppt-PAH	Low ppt-PAH
05		PCJ-SLP 8 - 101289	l	6	ppt-PAH	Low ppt-PAH

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by: (signed)	Received by (signed)	Date	Time
1	[signature]			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: MH
Method of Shipment: FED EX Airbill #: 2865075953
Received for Lab: RMAL Signed: [signature] Date/Time: 10/13
Enseco Project No: 6992 0800

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Ense **Rocky Mountain Analytical**

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No.

Attn:

Enseco Client: City St Louis Park

Project:

Sampling Co.: ENSR

Sampling Site:

Team Leader: MH & MJ

SAMPLE SAFE™ CONDITIONS

1. Packed by: SH Seal #:
2. Seal Intact Upon Receipt by Sampling Co.. Yes No
3. Condition of Contents:
4. Sealed for Shipping by.
5. Initial Contents Temp.: °C Seal #:
6. Sampling Status Done Continuing Until
7. Seal Intact Upon Receipt by Laboratory Yes No
8. Contents Temperature Upon Receipt by Lab: °C
9. Condition of Contents:

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
06	10/12/89		PCJ-SLP4 -101289	l	6	ppt-PAH	Low ppt-PAH
7	10/12/89		PCJ-W407 -101289	l	6	ppt-PAH	Low ppt-PAH

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by. (signed)	Date	Time
1	[signature]			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: MH

Method of Shipment: FED EX Airbill #: 2845075953

Received for Lab: RMAL Signed: [signature] Date/Time: 10/13

Enseco Project No: 6992 0800

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SS-001

Qualifier Codes and their Usage

U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.

J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarly invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.

E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.

D = This flag identifies all compounds identified during a re-analysis of a diluted sample.

Additional Qualifiers for TIC data only:

I = Isomer The unknown may be this specific isomer or an isomer with the same molecular formula.

C = Class The unknown compound contains ions characteristic of a particular class of compounds.

SUMMARY

DATA

PACKAGE

FOR

City of St. Louis Park

RMA QC# 6992

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6992-01

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6992-01

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6992X480

Level: (low/med) LOW Date Received: 10/13/89

% Moisture: not dec. dec. Date Extracted: 10/17/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/17/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	20	
95-13-6	1H-Indene	1.1	
91-20-3	Naphthalene	2.4	J B
4565-32-6	Benzo(B)Thiophene	1.5	
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.5	B
90-12-0	1-Methylnaphthalene	1.5	U
92-52-4	Biphenyl	1.1	J
208-96-8	Acenaphthylene	1.4	*
83-32-9	Acenaphthene	6.3	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.1	J
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6992-01DUP

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6992-01DUP

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6992X481

Level: (low/med) LOW Date Received: 10/13/89

% Moisture: not dec. dec. Date Extracted: 10/17/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/17/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	23	
95-13-6	1H-Indene	1.1	
91-20-3	Naphthalene	2.6	J B
4565-32-6	Benzo(B)Thiophene	1.7	*
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.7	B
90-12-0	1-Methylnaphthalene	1.5	U
92-52-4	Biphenyl	1.3	J
208-96-8	Acenaphthylene	1.7	*
83-32-9	Acenaphthene	7.1	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.3	U
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6992-02

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6992-02

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6992X482

Level: (low/med) LOW Date Received: 10/13/89

% Moisture: not dec. dec. Date Extracted: 10/17/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/17/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	1.3	U
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	2.3	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	1.2	J
91-57-6	2-Methylnaphthalene	1.4	B
90-12-0	1-Methylnaphthalene	1.5	U
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.3	U
83-32-9	Acenaphthene	1.2	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.0	J
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6992-04

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6992-04

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6992X506

Level: (low/med) LOW Date Received: 10/13/89

% Moisture: not dec. dec. Date Extracted: 10/17/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/21/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	7.2	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	2.3	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.4	B
90-12-0	1-Methylnaphthalene	1.5	U
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	3.7	*
83-32-9	Acenaphthene	6.9	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.5	
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	2.0	
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6992-05

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6992-05

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6992X493

Level: (low/med) LOW Date Received: 10/13/89

% Moisture: not dec. dec. Date Extracted: 10/17/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/20/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	1.7	*
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	3.6	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	2.2	B
90-12-0	1-Methylnaphthalene	1.3	J
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.3	U
83-32-9	Acenaphthene	1.2	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.2	J
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6992-06

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6992-06

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6992X494

Level: (low/med) LOW Date Received: 10/13/89

% Moisture: not dec. dec. Date Extracted: 10/17/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/20/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	1.5	J
496-11-7	2,3-Dihydroindene	89	
95-13-6	1H-Indene	8.6	
91-20-3	Naphthalene	3.2	J B
4565-32-6	Benzo(B)Thiophene	18	
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.7	B
90-12-0	1-Methylnaphthalene	1.1	J *
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.6	
83-32-9	Acenaphthene	76	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	2.1	
120-12-7	Anthracene	1.4	
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	23	
206-44-0	Fluoranthene	1.6	
129-00-0	Pyrene	3.0	
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6992-07

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6992-07

Sample wt/vol: 3990 (g/ml) ML Lab File ID: S6992X495

Level: (low/med) LOW Date Received: 10/13/89

% Moisture: not dec. dec. Date Extracted: 10/17/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/20/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.1	J
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	2.6	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	1.4	B
90-12-0	1-Methylnaphthalene	1.6	U
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	3.6	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	17	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	6992-01	45	68	89
2	6992-01DUP	50	74	83
3	6992-02	40	62	84
4	6992-04	44	60	53
5	6992-05	51	66	56
6	6992-06	42	58	59
7	6992-07	40	58	60
8	BLK-01	47	65	73

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3C
WATER SEMIVOLATILE DUPLICATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

EPA Sample No.: 6992-01

COMPOUND	SAMPLE CONCENTRATION (ng/L)	DUPLICATE CONCENTRATION (ng/L)	% RPD
2,3-Dihydroindene	20	23	-14
1H-Indene	1.1	1.1	0
Naphthalene	2.4	2.6	-8
Benzo(B)Thiophene	1.5	1.7	-12
2-Methylnaphthalene	1.5	1.7	-12
Biphenyl	1.1	1.3	-17
Acenaphthylene	1.4	1.7	-19
Acenaphthene	6.3	7.1	-12
Pyrene	1.1	ND	NC

COMMENTS:

ND = Not found
NC = Not calculated

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

Lab File ID: S6992X496 Lab Sample ID: BLK01

Date Extracted: 10/17/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 11/20/89 Time Analyzed: 17:50

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: 4500-X

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	6992-01	6992-01	S6992X480	11/17/89
2	6992-01DUP	6992-01DUP	S6992X481	11/17/89
3	6992-02	6992-02	S6992X482	11/17/89
4	6992-04	6992-04	S6992X506	11/21/89
5	6992-05	6992-05	S6992X493	11/20/89
6	6992-06	6992-06	S6992X494	11/20/89
7	6992-07	6992-07	S6992X495	11/20/89

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6992X496

Level: (low/med) LOW Date Received: 10/13/89

% Moisture: not dec. dec. Date Extracted: 10/17/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/20/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	U
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	1.9	J
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	1.2	
90-12-0	1-Methylnaphthalene	1.6	U
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6992 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
4800_PPT_PAH_STD	STDX791	09/21/89	11:40
20_PPT_PAH_STD	STDX792	09/21/89	13:37
240_PPT_PAH_STD	STDX793	09/21/89	14:46
40_PPT_PAH_STD	STDX794	09/21/89	16:01
1200_PPT_PAH_STD	STDX795	09/21/89	16:54

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6992 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PPT_PAH_STD	STDX472	11/17/89	08:42
6992-01	S6992X480	11/17/89	17:07
6992-01DUP	S6992X481	11/17/89	18:01
6992-02	S6992X482	11/17/89	18:55

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6992 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PPT_PAH_STD	STDX491	11/20/89	12:45
6992-05	S6992X493	11/20/89	15:12
6992-06	S6992X494	11/20/89	16:06
6992-07	S6992X495	11/20/89	16:58
BLK01	S6992X496	11/20/89	17:50

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6992 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PPT_PAH_STD	STDX505	11/21/89	10:00
6992-04	S6992X506	11/21/89	11:12

INITIAL CALIBRATION DATA
PAH COMPOUNDS

Lab Name: RMAL Lab Code: ENSECO Case No: 6992

Instrument ID: 4500-X Calibration Date(s): 09/21/89

Maximum % RSD is 35%

Lab File ID: RRF 20= STDX792 RRF 40= STDX794
RRF 240= STDX793 RRF 1200= STDX795 RRF 4800= STDX791

COMPOUND	20 PPT RRF	40 PPT RRF	240PPT RRF	1200PPT RRF	4800PPT RRF	AVE RRF	%RSD
D8-Naphthalene	2.331	2.503	2.450	2.535	2.400	2.444	3.3
D10-Flourene	1.524	1.553	1.512	1.504	1.544	1.527	1.4
D12-Chrysene	1.485	1.317	1.430	1.608	1.243	1.417	10.1
2,3-Benzofuran	1.363	1.377	1.355	1.345	1.255	1.339	3.6
2,3-Dihydroindene	1.371	1.429	1.383	1.365	1.253	1.360	4.8
1H-Indene	1.720	1.760	1.817	1.796	1.677	1.754	3.2
Naphthalene	2.314	2.852	2.747	2.877	2.503	2.659	9.1
Benzo(B)Thiophene	1.795	2.008	1.843	1.965	2.144	1.951	7.1
Quinoline	1.228	1.054	1.186	1.314	1.380	1.232	10.1
1H-Indole	1.471	1.498	1.591	1.726	1.811	1.619	9.0
2-Methylnaphthalene	1.310	1.397	1.392	1.432	1.400	1.386	3.3
1-Methylnaphthalene	1.218	1.271	1.101	1.512	1.451	1.311	12.9
Biphenyl	2.069	2.179	2.170	2.304	2.166	2.178	3.8
Acenaphthylene	2.576	2.665	2.581	2.569	2.524	2.583	2.0
Acenaphthene	1.659	1.687	1.644	1.620	1.591	1.640	2.2
Dibenzofuran	2.416	2.280	2.295	2.337	2.410	2.348	2.7
Flourene	1.763	1.825	1.817	1.817	1.851	1.815	1.8
Dibenzothiophene	1.507	1.475	1.526	1.424	1.379	1.462	4.1
Phenanthrene	1.539	1.405	1.485	1.446	1.427	1.460	3.6
Anthracene	1.352	1.291	1.407	1.474	1.454	1.396	5.4
Acridine	1.183	1.085	1.306	1.262	1.338	1.235	8.3
Carbazole	1.334	1.197	1.463	1.320	1.422	1.347	7.7
Fluoranthene	1.786	1.643	1.655	1.493	1.536	1.623	7.1
Pyrene	1.849	1.675	1.626	1.413	1.510	1.615	10.3
Benzo(A)Anthracene	1.478	1.514	1.563	1.704	1.514	1.555	5.7
Chrysene	1.268	1.459	1.505	1.627	1.322	1.436	10.0
Benzo(B)Fluoranthene	1.707	1.537	1.543	1.732	1.472	1.598	7.2
Benzo(K)Fluoranthene	1.716	1.838	1.768	1.700	1.508	1.706	7.2
Benzo(E)Pyrene	1.715	1.711	1.681	1.765	1.400	1.654	8.8
Benzo(A)Pyrene	1.559	1.449	1.512	1.544	1.380	1.489	5.0
Perylene	1.662	1.531	1.491	1.545	1.358	1.517	7.2
Indeno(1,2,3-CD)Pyrene	1.605	1.864	1.803	1.897	1.440	1.722	11.3
Dibenz(A,H)Anthracene	1.238	1.461	1.378	1.532	1.172	1.356	11.1
Benzo(G,H,I)Perylene	1.430	1.763	1.528	1.636	1.170	1.505	14.9

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Lab Name: RMAL Lab Code: ENSECO Case No: 6992

Instrument ID: 4500-X Calibration Date(s): 11/17/89 Time: 08:42

Lab ID: STDX472 Initial Calibration Date: 09/21/89

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPT RRF	%D
D8-Naphthalene	2.444	2.688	-10.0
D10-Flourene	1.527	1.525	0.1
D12-Chrysene	1.417	1.300	8.3
2,3-Benzofuran	1.339	1.469	-9.7
2,3-Dihydroindene	1.360	1.524	-12.1
1H-Indene	1.754	1.965	-12.0
Naphthalene	2.659	3.223	-21.2
Benzo(B)Thiophene	1.951	2.346	-20.2
Quinoline	1.232	1.526	-23.9
1H-Indole	1.619	1.626	-0.4
2-Methylnaphthalene	1.386	1.505	-8.6
1-Methylnaphthalene	1.311	1.562	-19.1
Biphenyl	2.178	2.161	0.8
Acenaphthylene	2.583	2.140	17.2
Acenaphthene	1.640	1.496	8.8
Dibenzofuran	2.348	2.251	4.1
Flourene	1.815	1.638	9.8
Dibenzothiophene	1.462	1.368	6.4
Phenanthrene	1.460	1.517	-3.9
Anthracene	1.396	1.384	0.9
Acridine	1.235	1.213	1.8
Carbazole	1.347	1.315	2.4
Fluoranthene	1.623	1.695	-4.4
Pyrene	1.615	1.768	-9.5
Benzo(A)Anthracene	1.555	1.332	14.3
Chrysene	1.436	1.297	9.7
Benzo(B)Fluoranthene	1.598	1.529	4.3
Benzo(K)Fluoranthene	1.706	1.479	13.3
Benzo(E)Pyrene	1.654	1.457	11.9
Benzo(A)Pyrene	1.489	1.356	8.9
Perylene	1.517	1.359	10.4
Indeno(1,2,3-CD)Pyrene	1.722	1.890	-9.8
Dibenz(A,H)Anthracene	1.356	1.471	-8.5
Benzo(G,H,I)Perylene	1.505	1.647	-9.4

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Lab Name: RMAL Lab Code: ENSECO Case No: 6992

Instrument ID: 4500-X Calibration Date(s): 11/20/89 Time: 12:45

Lab ID: STDX491 Initial Calibration Date: 09/21/89

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPT RRF	%D
D8-Naphthalene	2.444	2.715	-11.1
D10-Flourene	1.527	1.661	-8.8
D12-Chrysene	1.417	1.822	-28.6
2,3-Benzofuran	1.339	1.473	-10.0
2,3-Dihydroindene	1.360	1.516	-11.5
1H-Indene	1.754	1.942	-10.7
Naphthalene	2.659	2.975	-11.9
Benzo(B)Thiophene	1.951	2.328	-19.3
Quinoline	1.232	1.483	-20.4
1H-Indole	1.619	1.764	-9.0
2-Methylnaphthalene	1.386	1.532	-10.5
1-Methylnaphthalene	1.311	1.519	-15.9
Biphenyl	2.178	2.256	-3.6
Acenaphthylene	2.583	2.327	9.9
Acenaphthene	1.640	1.531	6.6
Dibenzofuran	2.348	2.512	-7.0
Flourene	1.815	1.792	1.3
Dibenzothiophene	1.462	1.346	7.9
Phenanthrene	1.460	1.474	-1.0
Anthracene	1.396	1.404	-0.6
Acridine	1.235	1.198	3.0
Carbazole	1.347	1.305	3.1
Fluoranthene	1.623	1.589	2.1
Pyrene	1.615	1.584	1.9
Benzo(A)Anthracene	1.555	1.867	-20.1
Chrysene	1.436	1.883	-31.1
Benzo(B)Fluoranthene	1.598	2.033	-27.2
Benzo(K)Fluoranthene	1.706	1.732	-1.5
Benzo(E)Pyrene	1.654	1.819	-10.0
Benzo(A)Pyrene	1.489	1.480	0.6
Perylene	1.517	1.353	10.8
Indeno(1,2,3-CD)Pyrene	1.722	1.545	10.3
Dibenz(A,H)Anthracene	1.356	1.215	10.4
Benzo(G,H,I)Perylene	1.505	1.313	12.8

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

ab Name: RMAL Lab Code: ENSECO Case No: 6992

Instrument ID: 4500-X Calibration Date(s): 11/21/89 Time: 10:00

Lab ID: STDX505 Initial Calibration Date: 09/21/89

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPT RRF	%D
D8-Naphthalene	2.444	2.668	-9.2
D10-Flourene	1.527	1.508	1.2
D12-Chrysene	1.417	1.624	-14.6
2,3-Benzofuran	1.339	1.630	-21.7
2,3-Dihydroindene	1.360	1.620	-19.1
1H-Indene	1.754	1.992	-13.6
Naphthalene	2.659	3.171	-19.3
Benzo(B)Thiophene	1.951	2.380	-22.0
Quinoline	1.232	1.432	-16.2
1H-Indole	1.619	1.691	-4.4
2-Methylnaphthalene	1.386	1.575	-13.6
1-Methylnaphthalene	1.311	1.554	-18.5
Biphenyl	2.178	2.150	1.3
Acenaphthylene	2.583	2.068	19.9
Acenaphthene	1.640	1.496	8.8
Dibenzofuran	2.348	2.300	2.0
Flourene	1.815	1.659	8.6
Dibenzothiophene	1.462	1.321	9.6
Phenanthrene	1.460	1.491	-2.1
Anthracene	1.396	1.312	6.0
Acridine	1.235	1.100	10.9
Carbazole	1.347	1.289	4.3
Fluoranthene	1.623	1.583	2.5
Pyrene	1.615	1.753	-8.5
Benzo(A)Anthracene	1.555	1.572	-1.1
Chrysene	1.436	1.546	-7.7
Benzo(B)Fluoranthene	1.598	1.844	-15.4
Benzo(K)Fluoranthene	1.706	1.703	0.2
Benzo(E)Pyrene	1.654	1.748	-5.7
Benzo(A)Pyrene	1.489	1.495	-0.4
Perylene	1.517	1.465	3.4
Indeno(1,2,3-CD)Pyrene	1.722	1.384	19.6
Dibenz(A,H)Anthracene	1.356	1.127	16.9
Benzo(G,H,I)Perylene	1.505	1.156	23.2

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 6992 SAS No.: SDG No:

Lab File ID (Standard): STDX472 Date Analyzed: 11/17/89

Instrument ID: 4500-X Time Analyzed: 08:42

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	168000	250000	264000
UPPER LIMIT	336000	500000	528000
LOWER LIMIT	84000	125000	132000
SAMPLE NO.			
6992-01	232000	373000	317000
6992-01DUP	261000	468000	400000
6992-02	154000	265000	225000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 6992 SAS No.: SDG No:

Lab File ID (Standard): STDX491 Date Analyzed: 11/20/89

Instrument ID: 4500-X Time Analyzed: 12:45

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	172000	296000	204000
UPPER LIMIT	344000	592000	408000
LOWER LIMIT	86000	148000	102000
SAMPLE NO.			
6992-05	147000	237000	203000
6992-06	216000	330000	237000
6992-07	211000	376000	258000
BLK01	235000	395000	268000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

FORM VIII SV-2

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 6992 SAS No.: SDG No:

Lab File ID (Standard): STDX505 Date Analyzed: 11/21/89

Instrument ID: 4500-X Time Analyzed: 10:00

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	181000	276000	247000
UPPER LIMIT	362000	552000	494000
LOWER LIMIT	90500	138000	124000
SAMPLE NO.			
6992-04	178000	280000	270000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

RAP SECTION 7.3. (D) MONITORING

1ST HALF - 1989

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005562-0001-SA	PCJ-W70-062989	AQUEOUS	29 JUN 89		30 JUN 89
005562-0002-SA	PCJ-~~W407~~-062989 W406	AQUEOUS	29 JUN 89		30 JUN 89
005562-0003-SA	MSH-SLP12-062989	AQUEOUS	29 JUN 89		30 JUN 89
005562-0003-MS	MSH-SLP12MS-062989	AQUEOUS	29 JUN 89		30 JUN 89
005562-0004-SA	MSH-SLP12D-062989	AQUEOUS	29 JUN 89		30 JUN 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5562-02

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5562 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5562-02

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5562Z638

Level: (low/med) LOW Date Received: 06/30/89

% Moisture: not dec. dec. Date Extracted: 07/03/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/03/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	5.1	U	
496-11-7	2,3-Dihydroindene	2.5		B
95-13-6	1H-Indene	1.1		
91-20-3	Naphthalene	4.8	J	B
4565-32-6	Benzo(B)Thiophene	0.9	U	
91-22-5	Quinoline	1.4	U	
120-72-9	1H-Indole	2.5	U	
91-57-6	2-Methylnaphthalene	2.8		B *
90-12-0	1-Methylnaphthalene	1.7		*
92-52-4	Biphenyl	4.3	U	
208-96-8	Acenaphthylene	1.4	U	
83-32-9	Acenaphthene	2.4		
132-64-9	Dibenzofuran	1.0	U	
86-73-7	Fluorene	1.0	U	
132-65-0	Dibenzothiophene	1.1	U	
85-01-8	Phenanthrene	1.8		*
120-12-7	Anthracene	1.1	U	
260-94-6	Acridine	2.9	U	
86-74-8	Carbazole	1.9	U	
206-44-0	Fluoranthene	1.4	U	
129-00-0	Pyrene	19.		B
56-55-3	Benzo(A)Anthracene	2.5	U	
218-01-9	Chrysene	2.8	U	
205-99-2	Benzo(B)Fluoranthene	2.5	U	
207-08-9	Benzo(K)Fluoranthene	2.3	U	
192-97-2	Benzo(E)Pyrene	1.9	U	
50-32-8	Benzo(A)Pyrene	2.3	U	
198-55-0	Perylene	2.5	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U	
53-70-3	Dibenz(A,H)Anthracene	1.6	U	
191-24-2	Benzo(G,H,I)Perylene	2.8	U	

Enseco

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005254-0001-SA	PCJ-E13-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0002-SA	PCJ-E3-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0003-SA	PCJ-E2-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0004-SA	PCJ-H6-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0005-SA	PCJ-H3-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0006-SA	PCJ-MTK6-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0007-SA	PCJ-W29-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0008-SA	PCJ-W401-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0009-SA	PCJ-W48-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0010-SA	PCJ-SLP6-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0010-MS	PCJ-SLP6MS-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0011-SA	PCJ-SLP6D-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0012-SA	PCJ-SLP6FB-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0013-SA	PCJ-SLP6FBD-060789	AQUEOUS	07 JUN 89		08 JUN 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-03

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-03

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z356

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. — dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/12/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	6.0	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.5	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	4.6	B *
90-12-0	1-Methylnaphthalene	2.8	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.5	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.9	B
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z354

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/12/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.9	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	7.7	B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	5.2	B
90-12-0	1-Methylnaphthalene	2.8	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	2.1	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-05

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-05

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z358

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	15.	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.5	J B
4565-32-6	Benzo(B)Thiophene	1.2	
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.6	B
90-12-0	1-Methylnaphthalene	1.9	B *
92-52-4	Biphenyl	4.1	J
208-96-8	Acenaphthylene	5.9	
83-32-9	Acenaphthene	19.	
132-64-9	Dibenzofuran	1.4	
86-73-7	Fluorene	15.	
132-65-0	Dibenzothiophene	3.0	
85-01-8	Phenanthrene	3.0	
120-12-7	Anthracene	2.8	
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	6.7	
129-00-0	Pyrene	6.1	B
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005294-0001-SA	PCJ-SLP5-060989	AQUEOUS	09 JUN 89		10 JUN 89
005294-0002-SA	PCJ-SLP15-060989	AQUEOUS	09 JUN 89		10 JUN 89
005294-0003-SA	IGV-W105-060989	AQUEOUS	09 JUN 89		10 JUN 89
005294-0004-SA	PCJ-W40-060989	AQUEOUS	09 JUN 89		10 JUN 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5294-02

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5294 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5294-02

Sample wt/vol: 500 (g/ml) ML Lab File ID: S5294Z342

Level: (low/med) MED Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/12/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	410.	U	
496-11-7	2,3-Dihydroindene	940.		
95-13-6	1H-Indene	72.	U	
91-20-3	Naphthalene	520.	U	
4565-32-6	Benzo(B)Thiophene	250.		
91-22-5	Quinoline	110.	U	
120-72-9	1H-Indole	200.	U	
91-57-6	2-Methylnaphthalene	72.	U	
90-12-0	1-Methylnaphthalene	130.	U	
92-52-4	Biphenyl	200.	J	
208-96-8	Acenaphthylene	430.		
83-32-9	Acenaphthene	830.		
132-64-9	Dibenzofuran	280.		*
86-73-7	Fluorene	600.		
132-65-0	Dibenzothiophene	88.	U	
85-01-8	Phenanthrene	86.	J	
120-12-7	Anthracene	88.	U	
260-94-6	Acridine	230.	U	
86-74-8	Carbazole	150.	U	
206-44-0	Fluoranthene	160.		
129-00-0	Pyrene	250.		
56-55-3	Benzo(A)Anthracene	200.	U	
218-01-9	Chrysene	220.	U	
205-99-2	Benzo(B)Fluoranthene	200.	U	
207-08-9	Benzo(K)Fluoranthene	180.	U	
192-97-2	Benzo(E)Pyrene	150.	U	
50-32-8	Benzo(A)Pyrene	180.	U	
198-55-0	Perylene	200.	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U	
53-70-3	Dibenz(A,H)Anthracene	130.	U	
191-24-2	Benzo(G,H,I)Perylene	220.	U	

Rocky Mountain
Analytical Laboratory

Enseco Incorporated

Enseco

CASE NARRATIVE

FOR

City of St. Louis Park

August 9, 1989

Enseco - RMAL Project Number 005292

Introduction

Eight aqueous samples were received at Enseco Rocky Mountain Analytical Laboratory on June 10, 1989. The samples were logged in under RMAL project number 005292. Sample PCJ-SLP14FBD-060989 (RMA # 005292-08) was extracted and help as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Samples 005292-02, 04, 04DL and 07 show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

The secondary ion was used to measure the surrogate recovery for D10-fluorene in samples 005292-01, 02, 03 and D8-napthalene in sample 005292-04.

Sample 005292-04 was reanalyzed at a dilution due to napthalene which was saturated in the original analysis. Results for both analyses are reported however, only the napthalene value was used from the dilution analysis.

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile 303/431-7171

PPT PAH Con't

In sample 005292-04,the surrogate recovery for D10-fluorene has exceeded thu upper control limit. All instrument calibration, surrogate standard concentration, ettc. are in control. It has been concluded that an interference specific to the surrogate was present thst resulted in the high recovery and this interference would not affect the quantitation of other target compounds. The presence of this interference has been confirmed by evaluating chromatographic peak shapes and ion intensities of the surrogate.

Surrogate recoveries for 005292-04DL could not be measured due to the dilution performed.

The 1989 QAPP sets forth specific requirements for the measurement of benzo(j)fluoranthene. Results have not yet been provided previously for this compound due to the lack of an internal standard. The special procedure in the QAPP will be implemented on all future projects.

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: _____ **Date:** _____
Tracy Giberson
Data Control Supervisor

Approved by: _____ **Date:** _____
Jean Zimmerman
Program Administrator

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005292-0001-SA	PCJ-SLP7-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0002-SA	PCJ-SLP14-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0003-SA	PCJ-SLP14D-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0004-SA	PCJ-W403-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0005-SA	PCJ-E15-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0006-SA	PCJ-W119-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0007-SA	PCJ-SLP14FB-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0008-SA	PCJ-SLP14FBD-060989	AQUEOUS	09 JUN 89		10 JUN 89

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for

City of St. Louis Park

RMAL QC# 5292

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5. Matrix Spike Data.....N/A
6. Matrix Spike Duplicate Data.....N/A

SUMMARY

DATA

PACKAGE

FOR

City of St. Louis Park

RMA QC# 5292

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5292-01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5292 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5292-01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5292Z370

Level: (low/med) LOW Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/14/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	16.	B
95-13-6	1H-Indene	1.5	
91-20-3	Naphthalene	5.8	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.9	B
90-12-0	1-Methylnaphthalene	2.4	B
92-52-4	Biphenyl	2.0	J
208-96-8	Acenaphthylene	6.6	
83-32-9	Acenaphthene	13.	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	3.2	
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.8	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	4.3	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5292-02

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5292 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5292-02

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5292Z371

Level: (low/med) LOW Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/14/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	34.	B
95-13-6	1H-Indene	2.3	
91-20-3	Naphthalene	5.7	J B
4565-32-6	Benzo(B)Thiophene	4.9	
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.3	B
90-12-0	1-Methylnaphthalene	1.8	B
92-52-4	Biphenyl	4.7	
208-96-8	Acenaphthylene	19.	
83-32-9	Acenaphthene	43.	
132-64-9	Dibenzofuran	1.9	*
86-73-7	Fluorene	3.4	
132-65-0	Dibenzothiophene	1.3	*
85-01-8	Phenanthrene	3.2	
120-12-7	Anthracene	1.9	*
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	3.5	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5292-03

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5292 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5292-03

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5292Z372

Level: (low/med) LOW Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/14/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	31.	B
95-13-6	1H-Indene	2.3	
91-20-3	Naphthalene	6.5	B
4565-32-6	Benzo(B)Thiophene	4.5	
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.8	B
90-12-0	1-Methylnaphthalene	2.4	B
92-52-4	Biphenyl	4.1	
208-96-8	Acenaphthylene	16.	
83-32-9	Acenaphthene	37.	
132-64-9	Dibenzofuran	1.8	
86-73-7	Fluorene	2.5	
132-65-0	Dibenzothiophene	1.1	
85-01-8	Phenanthrene	2.8	
120-12-7	Anthracene	1.7	
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	3.4	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5292-04

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5292 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5292-04

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5292Z373

Level: (low/med) LOW Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/14/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	130.	B
95-13-6	1H-Indene	42.	
91-20-3	Naphthalene	270.	B *#
4565-32-6	Benzo(B)Thiophene	48.	
91-22-5	Quinoline	5.7	*
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	330.	B
90-12-0	1-Methylnaphthalene	180.	B
92-52-4	Biphenyl	17.	
208-96-8	Acenaphthylene	8.1	*
83-32-9	Acenaphthene	10.	
132-64-9	Dibenzofuran	6.3	
86-73-7	Fluorene	6.5	
132-65-0	Dibenzothiophene	3.0	*
85-01-8	Phenanthrene	18.	
120-12-7	Anthracene	1.6	
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	7.9	
206-44-0	Fluoranthene	16.	
129-00-0	Pyrene	12.	
56-55-3	Benzo(A)Anthracene	4.7	
218-01-9	Chrysene	5.6	
205-99-2	Benzo(B)Fluoranthene	6.4	*
207-08-9	Benzo(K)Fluoranthene	3.0	*
192-97-2	Benzo(E)Pyrene	3.3	
50-32-8	Benzo(A)Pyrene	4.3	
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	3.5	
53-70-3	Dibenz(A,H)Anthracene	1.2	J
191-24-2	Benzo(G,H,I)Perylene	5.1	

Naphthalene value reported is saturated. See 25% diluted run.

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5292-04DL

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5292 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5292-04DL

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5292Z393

Level: (low/med) LOW Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/14/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.500

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	20.4	U	
496-11-7	2,3-Dihydroindene	110.	B	
95-13-6	1H-Indene	37.		
91-20-3	Naphthalene	300.	B	#
4565-32-6	Benzo(B)Thiophene	41.		
91-22-5	Quinoline	4.5	J	
120-72-9	1H-Indole	10.	U	
91-57-6	2-Methylnaphthalene	250.	B	
90-12-0	1-Methylnaphthalene	150.	B	
92-52-4	Biphenyl	14.	J	
208-96-8	Acenaphthylene	6.6		
83-32-9	Acenaphthene	8.6		
132-64-9	Dibenzofuran	5.4		
86-73-7	Fluorene	5.9		
132-65-0	Dibenzothiophene	4.4	U	
85-01-8	Phenanthrene	13.		*
120-12-7	Anthracene	4.4	U	
260-94-6	Acridine	11.6	U	
86-74-8	Carbazole	7.6	U	
206-44-0	Fluoranthene	9.2		*
129-00-0	Pyrene	14.		
56-55-3	Benzo(A)Anthracene	10.0	U	
218-01-9	Chrysene	19.		
205-99-2	Benzo(B)Fluoranthene	5.7	J	
207-08-9	Benzo(K)Fluoranthene	5.4	J	
192-97-2	Benzo(E)Pyrene	4.0	J	*
50-32-8	Benzo(A)Pyrene	5.1	J	
198-55-0	Perylene	10.0	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	8.4	U	
53-70-3	Dibenz(A,H)Anthracene	6.4	U	
191-24-2	Benzo(G,H,I)Perylene	11.2	U	

This diluted run is for Napthalene only.

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5292-05

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5292 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5292-05

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5292Z378

Level: (low/med) LOW Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/14/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.8	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.6	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.8	B
90-12-0	1-Methylnaphthalene	1.7	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	2.7	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.1	J
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5292-06

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5292 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5292-06

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5292Z379

Level: (low/med) LOW Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/14/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.5	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.3	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	6.0	B
90-12-0	1-Methylnaphthalene	3.5	B
92-52-4	Biphenyl	1.2	J
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.1	J
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5292-07

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5292 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5292-07

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5292Z389

Level: (low/med) LOW Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/14/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	2.3	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	6.4	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.4	B
90-12-0	1-Methylnaphthalene	1.8	B *
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5292 SAS No.: N/A SDG No.: N/A

	EPA SAMPLE NO.	S1 (NAP)	#	S2 (FLU)	#	S3 (CHR)	#
1	5292-01	94		92		79	
2	5292-02	85		94		82	
3	5292-03	76		78		69	
4	5292-04	41		229	*	51	
5	5292-04DL		D		D		D
6	5292-05	84		148		79	
7	5292-06	79		108		82	
8	5292-07	70		99		87	
9	BLK01	79		94		68	

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5292 SAS No.: N/A SDG No.: N/A

Lab File ID: S5292Z369 Lab Sample ID: BLK01

Date Extracted: 06/14/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 07/13/89 Time Analyzed: 13:39

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: 4500-Z

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	5292-01	5292-01	S5292Z370	07/13/89
2	5292-02	5292-02	S5292Z371	07/13/89
3	5292-03	5292-03	S5292Z372	07/13/89
4	5292-04	5292-04	S5292Z373	07/13/89
5	5292-04DL	5292-04DL	S5292Z393	07/14/89
6	5292-05	5292-05	S5292Z378	07/14/89
7	5292-06	5292-06	S5292Z379	07/14/89
8	5292-07	5292-07	S5292Z389	07/14/89

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5292 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5292Z369

Level: (low/med) LOW Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/14/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.6	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.0	J
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	2.5	
90-12-0	1-Methylnaphthalene	1.2	J
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No: N/A

Lab Code: ENSECO Case No: 5292 SAS No: N/A SDG No: N/A

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDZ363	07/13/89	07:35
BLK01	S5292Z369	07/13/89	13:39
5292-01	S5292Z370	07/13/89	14:32
5292-02	S5292Z371	07/13/89	15:25
5292-03	S5292Z372	07/13/89	16:17
5292-04	S5292Z373	07/13/89	17:12

SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No: N/A

Lab Code: ENSECO Case No: 5292 SAS No: N/A SDG No: N/A

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDZ377	07/13/89	23:22
5292-05	S5292Z378	07/14/89	00:16
5292-06	S5292Z379	07/14/89	01:10
5292-07	S5292Z389	07/14/89	10:39

SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No: N/A

Lab Code: ENSECO Case No: 5292 SAS No: N/A SDG No: N/A

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDZ291	07/14/89	14:41
5292-04DL	S5292Z393	07/14/89	16:45

INITIAL CALIBRATION DATA
PAH COMPOUNDS

ab Name: RMAL Lab Code: Enseco Case No: 5292

Instrument ID: 4500-Z Calibration Date(s): 07/11/89

Minimum RRF is 0.050 Maximum % RSD is 35%

Lab File ID: RRF 40.= STDZ338 RRF 1200.= STDZ337
RRF 20.= STDZ335 RRF 240.= STDZ334 RRF 4800.= STDZ332

COMPOUND	20 PPT RRF	40 PPT RRF	240 PPT RRF	1200PPT RRF	4800PPT RRF	AVE RRF	%RSD
D8-Naphthalene	1.931	2.037	2.441	2.318	1.722	2.090	13.9
D10-Flourene	2.201	1.340	1.625	1.444	1.286	1.579	23.5
D12-Chrysene	1.356	1.460	1.519	1.461	1.152	1.390	10.4
2,3-Benzofuran	1.061	1.104	1.285	1.165	0.992	1.121	9.9
2,3-Dihydroindene	1.047	1.126	1.301	1.176	1.011	1.132	10.1
1H-Indene	1.367	1.474	1.714	1.537	1.287	1.476	11.1
Naphthalene	2.165	2.305	2.680	2.508	1.855	2.303	13.8
Benzo(B)Thiophene	1.873	1.936	2.223	2.057	1.665	1.951	10.7
Quinoline	0.783	0.938	1.280	1.289	1.213	1.101	20.7
1H-Indole	1.249	1.357	1.673	1.634	1.427	1.468	12.4
2-Methylnaphthalene	1.127	1.150	1.349	1.289	1.125	1.208	8.6
1-Methylnaphthalene	1.158	1.304	1.470	1.381	1.188	1.300	10.0
Biphenyl	1.834	1.802	2.315	2.029	1.664	1.929	13.1
Acenaphthylene	1.963	2.112	2.485	2.352	1.870	2.156	12.0
Acenaphthene	1.385	1.403	1.711	1.458	1.263	1.444	11.5
Dibenzofuran	1.974	1.970	2.465	2.219	1.740	2.074	13.3
Flourene	1.599	1.674	1.869	1.707	1.436	1.657	9.5
Dibenzothiophene	1.206	1.338	1.488	1.476	1.061	1.314	13.9
Phenanthrene	1.537	1.477	1.554	1.475	1.099	1.428	13.1
Anthracene	1.296	1.318	1.503	1.433	1.066	1.323	12.6
Acridine	0.967	0.953	1.223	1.229	1.017	1.078	12.7
Carbazole	1.096	1.121	1.353	1.355	1.077	1.200	11.8
Fluoranthene	1.621	1.563	1.762	1.717	1.237	1.580	13.1
Pyrene	1.430	1.441	1.782	1.639	1.148	1.488	16.1
Benzo(A)Anthracene	1.410	1.647	1.726	1.873	1.434	1.618	12.2
Chrysene	1.504	1.736	1.696	1.721	1.366	1.605	10.2
Benzo(B)Fluoranthene	1.315	1.653	1.941	1.777	1.476	1.632	15.1
Benzo(K)Fluoranthene	1.677	1.912	1.743	2.015	1.404	1.750	13.4
Benzo(E)Pyrene	1.450	1.667	1.802	1.882	1.304	1.621	14.9
Benzo(A)Pyrene	1.382	1.403	1.574	1.659	1.349	1.473	9.2
Perylene	1.363	1.425	1.630	1.734	1.372	1.505	11.1
Indeno(1,2,3-CD)Pyrene	1.350	1.543	1.745	1.934	1.622	1.639	13.3
Dibenz(A,H)Anthracene	1.087	1.202	1.418	1.549	1.279	1.307	13.9
Benzo(G,H,I)Perylene	1.216	1.452	0.561	1.493	1.385	1.221	31.4

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Lab Name: RMAL Lab Code: Enseco Case No: 5292

Instrument ID: 4500-Z Calibration Date(s): 07/13/89 Time: 07:35

Lab ID: STDZ363 Initial Calibration Date : 07/11/89

Minimum RRF is 0.050 Maximum %D is 35%

COMPOUND	RRF	40 PPT RRF	%D
D8-Naphthalene	2.090	2.014	3.6
D10-Fluorene	1.579	1.345	14.8
D12-Chrysene	1.390	1.208	13.1
2,3-Benzofuran	1.121	1.081	3.6
2,3-Dihydroindene	1.132	1.056	6.7
1H-Indene	1.476	1.364	7.6
Naphthalene	2.303	2.142	7.0
Benzo(B)Thiophene	1.951	1.754	10.1
Quinoline	1.101	0.843	23.4
1H-Indole	1.468	1.219	17.0
2-Methylnaphthalene	1.208	1.104	8.6
1-Methylnaphthalene	1.300	1.254	3.5
Biphenyl	1.929	1.710	11.4
Acenaphthylene	2.156	2.059	4.5
Acenaphthene	1.444	1.379	4.5
Dibenzofuran	2.074	1.981	4.5
Flourene	1.657	1.505	9.2
Dibenzothiophene	1.314	1.280	2.6
Phenanthrene	1.428	1.384	3.1
Anthracene	1.323	1.296	2.0
Acridine	1.078	0.966	10.4
Carbazole	1.200	1.053	12.3
Fluoranthene	1.580	1.474	6.7
Pyrene	1.488	1.588	-6.7
Benzo(A)Anthracene	1.618	1.337	17.4
Chrysene	1.605	1.380	14.0
Benzo(B)Fluoranthene	1.632	1.253	23.2
Benzo(K)Fluoranthene	1.750	1.626	7.1
Benzo(E)Pyrene	1.621	1.457	10.1
Benzo(A)Pyrene	1.473	1.269	13.8
Perylene	1.505	1.103	26.7
Indeno(1,2,3-CD)Pyrene	1.639	1.270	22.5
Dibenz(A,H)Anthracene	1.307	1.028	21.3
Benzo(G,H,I)Perylene	1.221	1.087	11.0

FORM VII

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Lab Name: RMAL Lab Code: Enseco Case No: 5292

Instrument ID: 4500-Z Calibration Date(s): 07/13/89 Time: 23:22

Lab ID: STDZ377 Initial Calibration Date : 07/11/89

Minimum RRF is 0.050 Maximum %D is 35%

COMPOUND	RRF	40 PPT RRF	%D
D8-Naphthalene	2.090	2.048	2.0
D10-Fluorene	1.579	1.375	12.9
D12-Chrysene	1.390	1.336	3.9
2,3-Benzofuran	1.121	1.062	5.3
2,3-Dihydroindene	1.132	1.293	-14.2
1H-Indene	1.476	1.424	3.5
Naphthalene	2.303	2.773	-20.4
Benzo(B)Thiophene	1.951	1.845	5.4
Quinoline	1.101	0.923	16.2
1H-Indole	1.468	1.253	14.6
2-Methylnaphthalene	1.208	1.385	-14.7
1-Methylnaphthalene	1.300	1.432	-10.2
Biphenyl	1.929	1.807	6.3
Acenaphthylene	2.156	2.123	1.5
Acenaphthene	1.444	1.383	4.2
Dibenzofuran	2.074	2.063	0.5
Flourene	1.657	1.597	3.6
Dibenzothiophene	1.314	1.335	-1.6
Phenanthrene	1.428	1.415	0.9
Anthracene	1.323	1.359	-2.7
Acridine	1.078	1.048	2.8
Carbazole	1.200	1.162	3.2
Fluoranthene	1.580	1.538	2.7
Pyrene	1.488	1.675	-12.6
Benzo(A)Anthracene	1.618	1.570	3.0
Chrysene	1.605	1.521	5.2
Benzo(B)Fluoranthene	1.632	1.714	-5.0
Benzo(K)Fluoranthene	1.750	1.485	15.1
Benzo(E)Pyrene	1.621	1.619	0.1
Benzo(A)Pyrene	1.473	1.395	5.3
Perylene	1.505	1.310	13.0
Indeno(1,2,3-CD)Pyrene	1.639	1.498	8.6
Dibenz(A,H)Anthracene	1.307	1.161	11.2
Benzo(G,H,I)Perylene	1.221	1.326	8.6

FORM VII

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Lab Name: RMAL Lab Code: Enseco Case No: 5292

Instrument ID: 4500-Z Calibration Date(s): 07/14/89 Time: 14:41

Lab ID: STDZ291 Initial Calibration Date : 07/11/89

Minimum RRF is 0.050 Maximum %D is 35%

COMPOUND	RRF	40 PPT RRF	%D
D8-Naphthalene	2.090	1.963	6.1
D10-Fluorene	1.579	1.316	16.7
D12-Chrysene	1.390	1.261	9.3
2,3-Benzofuran	1.121	1.043	7.0
2,3-Dihydroindene	1.132	1.122	0.9
1H-Indene	1.476	1.398	5.3
Naphthalene	2.303	2.925	-27.0
Benzo(B)Thiophene	1.951	1.831	6.2
Quinoline	1.101	0.962	12.6
1H-Indole	1.468	1.379	6.1
2-Methylnaphthalene	1.208	1.303	-7.9
1-Methylnaphthalene	1.300	1.298	0.2
Biphenyl	1.929	1.935	-0.3
Acenaphthylene	2.156	2.117	1.8
Acenaphthene	1.444	1.324	8.3
Dibenzofuran	2.074	2.033	2.0
Flourene	1.657	1.605	3.1
Dibenzothiophene	1.314	1.231	6.3
Phenanthrene	1.428	1.320	7.6
Anthracene	1.323	1.251	5.4
Acridine	1.078	1.022	5.2
Carbazole	1.200	1.154	3.8
Fluoranthene	1.580	1.465	7.3
Pyrene	1.488	0.970	34.8
Benzo(A)Anthracene	1.618	1.521	6.0
Chrysene	1.605	1.484	7.5
Benzo(B)Fluoranthene	1.632	1.515	7.2
Benzo(K)Fluoranthene	1.750	1.403	19.8
Benzo(E)Pyrene	1.621	1.452	10.4
Benzo(A)Pyrene	1.473	1.368	7.1
Perylene	1.505	1.400	7.0
Indeno(1,2,3-CD)Pyrene	1.639	1.390	15.2
Dibenz(A,H)Anthracene	1.307	1.079	17.4
Benzo(G,H,I)Perylene	1.221	1.190	2.5

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: Enseco Case No: 5292 SAS No.: N/A SDG No: N/A

Lab File ID (Standard): STDZ363 Date Analyzed: 07/13/89

Instrument ID: 4500-Z Time Analyzed: 07:35

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	145500	245500	202000
UPPER LIMIT	291000	491000	404000
LOWER LIMIT	72800	122800	101000
SAMPLE NO.			
BLK01	178500	302200	224800
5292-01	136900	223500	201100
5292-02	199700	332000	260100
5292-03	178400	302100	232600
5292-04	246900	330000	361700

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: Enseco Case No: 5292 SAS No.: N/A SDG No: N/A

Lab File ID (Standard): STDZ377 Date Analyzed: 07/13/89

Instrument ID: 4500-Z Time Analyzed: 23:22

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	148000	249800	189000
UPPER LIMIT	296000	499600	378000
LOWER LIMIT	74000	124900	94500
SAMPLE NO.			
5292-05	184000	299300	244800
5292-06	185600	299000	212800
5292-07	145400	248400	179600

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: Enseco Case No: 5292 SAS No.: N/A SDG No: N/A

Lab File ID (Standard): STDZ291 Date Analyzed: 07/14/89

Instrument ID: 4500-Z Time Analyzed: 14:41

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	184800	329200	232300
UPPER LIMIT	369600	658400	464600
LOWER LIMIT	92400	164600	116200
SAMPLE NO.			
5292-04DL	210800	483700	197800

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005238-0001-SA	PCJ-SLP8-060589	AQUEOUS	05 JUN 89	09:30	06 JUN 89
005238-0002-SA	MSH-SLP11-060589	AQUEOUS	05 JUN 89	09:30	06 JUN 89
005238-0003-SA	MSH-SLP13-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0003-MS	MSH-SLP13MS-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0004-SA	MSH-SLP13D-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0005-SA	MSH-SLP13FB-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0006-SA	MSH-SLP13FBD-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0007-SA	PCJ-SLP16-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0008-SA	MSH-SLP17-060589	AQUEOUS	05 JUN 89		06 JUN 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5238-07

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5238-07

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5238X951

Level: (low/med) LOW Date Received: 06/06/89

% Moisture: not dec. dec. Date Extracted: 06/09/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/05/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	5.2	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	2.4	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	2.5	B *
90-12-0	1-Methylnaphthalene	1.5	J
92-52-4	Biphenyl	1.7	J
208-96-8	Acenaphthylene	2.9	
83-32-9	Acenaphthene	8.0	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	4.1	
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.1	J *
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
57-97-6	7,12-Dimethylbenzanthracene	2.8	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
56-49-5	3-Methylcholanthrene	3.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U
215-58-7	Dibenz(A,C)Anthracene	1.6	U

RAP SECTION 7.3. (D) MONITORING

2ND HALF

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006992-0001-SA	PCJ-SLP6-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0001-DU	PCJ-SLP6D-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0002-SA	PCJ-SLP6FB-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0003-SA	PCJ-SLP6FBD-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0004-SA	PCJ-SLP7-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0005-SA	PCJ-SLP8-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0006-SA	PCJ-SLP4-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0007-SA	PCJ-~~W407~~-101289 W406	AQUEOUS	12 OCT 89		13 OCT 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6992-07

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6992-07

Sample wt/vol: 3990 (g/ml) ML Lab File ID: S6992X495

Level: (low/med) LOW Date Received: 10/13/89

% Moisture: not dec. dec. Date Extracted: 10/17/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/20/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.1	J
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	2.6	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	1.4	B
90-12-0	1-Methylnaphthalene	1.6	U
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	3.6	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	17	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006798-0001-SA	PCJ-E13-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0002-SA	PCJ-E2-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0003-SA	PCJ-SLP-7-092889	AQUEOUS	28 SEP 89	10:00	29 SEP 89
006798-0004-SA	PCJ-SLP-16-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0005-SA	PCJ-SLP-14-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0006-SA	PCJ-SLP-10-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0007-SA	PCJ-H3-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0008-SA	PCJ-SLP6FB-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0009-SA	PCJ-SLP6FBD-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0010-SA	PCJ-SLP6-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0010-SD	PCJ-SLP6D-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0010-MS	PCJ-SLP6MS-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0011-SA	PCJ-W119-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0012-SA	PCJ-W70-092889	AQUEOUS	28 SEP 89		29 SEP 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-02

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-02

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X028

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	4.9	U	
496-11-7	2,3-Dihydroindene	3.9		B
95-13-6	1H-Indene	0.9	U	
91-20-3	Naphthalene	2.0	J	B
4565-32-6	Benzo(B)Thiophene	0.9	U	
91-22-5	Quinoline	1.3	U	
120-72-9	1H-Indole	2.4	U	
91-57-6	2-Methylnaphthalene	1.2		B
90-12-0	1-Methylnaphthalene	1.5	U	
92-52-4	Biphenyl	4.1	U	
208-96-8	Acenaphthylene	1.3	U	
83-32-9	Acenaphthene	1.2	U	
132-64-9	Dibenzofuran	1.0	U	
86-73-7	Fluorene	1.0	U	
132-65-0	Dibenzothiophene	1.0	U	
85-01-8	Phenanthrene	1.2	U	
120-12-7	Anthracene	1.0	U	
260-94-6	Acridine	2.8	U	
86-74-8	Carbazole	1.8	U	
206-44-0	Fluoranthene	1.3	U	
129-00-0	Pyrene	1.0	J	*
56-55-3	Benzo(A)Anthracene	2.4	U	
218-01-9	Chrysene	2.7	U	
205-99-2	Benzo(B)Fluoranthene	2.4	U	
207-08-9	Benzo(K)Fluoranthene	2.2	U	
192-97-2	Benzo(E)Pyrene	1.8	U	
50-32-8	Benzo(A)Pyrene	2.2	U	
198-55-0	Perylene	2.4	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U	
53-70-3	Dibenz(A,H)Anthracene	1.5	U	
191-24-2	Benzo(G,H,I)Perylene	2.7	U	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-01

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-01

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X027

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	1.1	J B *
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	2.2	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.2	B
90-12-0	1-Methylnaphthalene	1.5	U
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.3	U
83-32-9	Acenaphthene	1.2	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.6	
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-07

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-07

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X032

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	90.	B
95-13-6	1H-Indene	7.0	
91-20-3	Naphthalene	2.1	J B
4565-32-6	Benzo(B)Thiophene	2.9	
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.1	B
90-12-0	1-Methylnaphthalene	1.0	J *
92-52-4	Biphenyl	13.	
208-96-8	Acenaphthylene	36.	
83-32-9	Acenaphthene	100.	
132-64-9	Dibenzofuran	1.5	
86-73-7	Fluorene	62.	
132-65-0	Dibenzothiophene	10.	
85-01-8	Phenanthrene	2.2	
120-12-7	Anthracene	2.8	
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.0	J
206-44-0	Fluoranthene	20.	
129-00-0	Pyrene	17.	
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-05

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-05

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X031

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	4.9	U	
496-11-7	2,3-Dihydroindene	24.	B	
95-13-6	1H-Indene	1.5		
91-20-3	Naphthalene	1.7	J B	
4565-32-6	Benzo(B)Thiophene	2.5		
91-22-5	Quinoline	1.3	U	
120-72-9	1H-Indole	1.1	J	*
91-57-6	2-Methylnaphthalene	0.9	U	
90-12-0	1-Methylnaphthalene	1.5	U	
92-52-4	Biphenyl	2.4	J	
208-96-8	Acenaphthylene	13.		
83-32-9	Acenaphthene	31.		
132-64-9	Dibenzofuran	1.0	U	
86-73-7	Fluorene	1.6		*
132-65-0	Dibenzothiophene	1.0	U	
85-01-8	Phenanthrene	1.6		
120-12-7	Anthracene	1.4		*
260-94-6	Acridine	2.8	U	
86-74-8	Carbazole	1.8	U	
206-44-0	Fluoranthene	1.3	U	
129-00-0	Pyrene	2.4		
56-55-3	Benzo(A)Anthracene	2.4	U	
218-01-9	Chrysene	2.7	U	
205-99-2	Benzo(B)Fluoranthene	2.4	U	
207-08-9	Benzo(K)Fluoranthene	2.2	U	
192-97-2	Benzo(E)Pyrene	1.8	U	
50-32-8	Benzo(A)Pyrene	2.2	U	
198-55-0	Perylene	2.4	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U	
53-70-3	Dibenz(A,H)Anthracene	1.5	U	
191-24-2	Benzo(G,H,I)Perylene	2.7	U	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-04

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-04

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X030

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	6.8	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	1.7	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.1	B *
90-12-0	1-Methylnaphthalene	1.5	U
92-52-4	Biphenyl	1.4	J
208-96-8	Acenaphthylene	2.2	
83-32-9	Acenaphthene	7.9	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	2.6	
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.3	U
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-11

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-11

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6798X043

Level: (low/med) LOW Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/09/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	1.5	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	3.5	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	3.2	B
90-12-0	1-Methylnaphthalene	1.8	
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.3	U
83-32-9	Acenaphthene	1.2	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.1	J
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

Enseco

CASE NARRATIVE

FOR

City of St. Louis Park

February 9, 1990

Enseco - RMAL Project Number 007930

Introduction

Six aqueous samples (includes MS and DU) were received at Enseco Rocky Mountain Analytical Laboratory on December 21, 1989. The samples were logged in under RMAL project number 007930. Sample PCJ-SLP10FBD-122089 (RMA # 007930-04) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low and medium level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Sample 007930-02 shows target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax. 303/431-7171

The 1989 QAPP sets forth specific requirements for the measurement of benzo(j)fluoranthene. Results have not been provided previously for this compound. The special procedure in the QAPP will be implemented on all future projects.

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: Tracy Giberson **Date:** 2-9-90
Tracy Giberson
Data Control Supervisor

Approved by: Debbie Fazio **Date:** 2-9-90
Debbie Fazio
Program Administrator

Enseco
A CORNING Company

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
007930-0001-SA	PCJ-SLP10-122089	AQUEOUS	20 DEC 89	13:00	21 DEC 89
007930-0001-MS	PCJ-SLP10MS-122089	AQUEOUS	20 DEC 89	13:00	21 DEC 89
007930-0001-DU	PCJ-SLP10D-122089	AQUEOUS	20 DEC 89	13:00	21 DEC 89
007930-0002-SA	IGV-W105-122089	AQUEOUS	20 DEC 89	13:00	21 DEC 89
007930-0003-SA	PCJ-SLP10FB-122089	AQUEOUS	20 DEC 89	13:00	21 DEC 89
007930-0004-SA	PCJ-SLP10FBD-122089	AQUEOUS	20 DEC 89	13:00	21 DEC 89

Ense[illegible] - Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile. 303/431-7171

CHAIN O. USTODY

No.

Attn: _____

Enseco Client: St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: McHiggins

SAMPLE SAFE™ CONDITIONS

1. Packed by: MH Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: Yes No
8. Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

7930

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
01 DUP	12/20/89	1300	PCJ-SLP10D - 122089	l	6	ppt-PAH	REFER TO PROJECT 5294-02 (ppt-PAH)
01 ~~02~~ MS	12/20/89	1300	PCJ-SLP10MS - 122089	l	6	ppt-PAH	REFER TO PROJECT 5294-02 (ppt-PAH)

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by (signed)	Received by. (signed)	Date	Time
1	[signature]			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: MH

Method of Shipment: Fed X Airbill # 2865075986

Received for Lab: RMAL Signed: L Dalla Date/Time 12/21 - 09:40

Enseco Project No. _____

White and Pink Copies to Lab Yellow to Sampler

SS-001

Ens - Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile 303/431-7171

CHAIN O. USTODY No.

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: MHiggins

SAMPLE SAFE" CONDITIONS

1. Packed by: MH Seal #: _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal #: _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory Yes No
8. Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
12/20/89	1300	IGV-W105-122089	l	6	PPT-PAH	REFER TO PROJECT 5294-03 (ppt-PAH)
12/20/89	1300	PIJ-SLP10-122089	l	6	ppt-PAH	REFER TO PROJECT 5294-02 (ppt-PAH)

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by (signed)	Received by (signed)	Date	Time
1	[signature]			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: MH

Method of Shipment: Fed X Airbill #: 2865075986

Received for Lab.: CHAL Signed: L Dalle Date/Time: 12/21 09:40

Enseco Project No.: 7930

White and Pink Copies to Lab Yellow to Sampler SS-001

Ens - Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile 303/431-7171

CHAIN O JSTODY

No.

Attn: _____

Enseco Client: St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: M. Higgins

SAMPLE SAFE™ CONDITIONS

1. Packed by: MH Seal # _____
2. Seal Intact Upon Receipt by Sampling Co Yes No
3. Condition of Contents _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp. _____ °C Seal # _____
6. Sampling Status. Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: Yes No
8. Contents Temperature Upon Receipt by Lab _____ °C
9. Condition of Contents: _____

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
03	12/20/89	1300	PCJ- SLP10FB - 122089	l	6	ppt PAH	Low PPT-PAH
04	12/20/89	1300	PCJ- SLP 10FBD- 122089	l	6	ppt- PAH	Low PPT-PAH

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by (signed)	Received by (signed)	Date	Time
1	[signature]			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: MH

Method of Shipment: FED X Airbill # 2865075986

Received for Lab: RMAL Signed: L Delle Date/Time: 12/21 09:40

Enseco Project No. _____

White and Pink Copies to Lab Yellow to Sampler

SS-001

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for

City of St. Louis Park

RMAL QC# 7930

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SUMMARY

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PACKAGE

FOR

City of St. Louis Park

RMA CC#7930

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

7930-01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 7930 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 7930-01

Sample wt/vol: 500 (g/ml) ML Lab File ID: X0876

Level: (low/med) MED Date Received: 12/21/89

% Moisture: not dec. dec. Date Extracted: 12/26/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 01/19/90

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	1200.	
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	330.	
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	92.	J
92-52-4	Biphenyl	290.	J
208-96-8	Acenaphthylene	540.	
83-32-9	Acenaphthene	1100.	
132-64-9	Dibenzofuran	330.	
86-73-7	Fluorene	860.	
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	190.	
129-00-0	Pyrene	190.	
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

7930-01DUP

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 7930 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 7930-01DUP

Sample wt/vol: 500 (g/ml) ML Lab File ID: X0877

Level: (low/med) MED Date Received: 12/21/89

% Moisture: not dec. dec. Date Extracted: 12/26/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 01/19/90

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	1200.	
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	320.	
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	86.	J
92-52-4	Biphenyl	280.	J
208-96-8	Acenaphthylene	530.	
83-32-9	Acenaphthene	1100.	
132-64-9	Dibenzofuran	330.	
86-73-7	Fluorene	840.	
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	57.	J
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	190.	
129-00-0	Pyrene	190.	
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

7930-02

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 7930 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 7930-02

Sample wt/vol: 500 (g/ml) ML Lab File ID: X0879

Level: (low/med) MED Date Received: 12/21/89

% Moisture: not dec. dec. Date Extracted: 12/26/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 01/19/90

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	300.	
95-13-6	1H-Indene	180.	
91-20-3	Naphthalene	87.	J *
4565-32-6	Benzo(B)Thiophene	95.	
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	210.	
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	130.	
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	84.	J
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	110.	U
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

7930-03

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 7930 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 7930-03

Sample wt/vol: 4000 (g/ml) ML Lab File ID: X0880

Level: (low/med) LOW Date Received: 12/21/89

% Moisture: not dec. dec. Date Extracted: 12/26/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 01/19/90

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	2.7	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	3.1	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	1.5	
90-12-0	1-Methylnaphthalene	1.6	U
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

7930-01MS

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 7930 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 7930-01MS

Sample wt/vol: 500 (g/ml) ML Lab File ID: X0878

Level: (low/med) MED Date Received: 12/21/89

% Moisture: not dec. dec. Date Extracted: 12/26/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 01/19/90

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	1300.	
95-13-6	1H-Indene	2400.	SP
91-20-3	Naphthalene	2900.	SP
4565-32-6	Benzo(B)Thiophene	330.	
91-22-5	Quinoline	2600.	SP
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	2600.	SP
90-12-0	1-Methylnaphthalene	140.	
92-52-4	Biphenyl	300.	J
208-96-8	Acenaphthylene	540.	
83-32-9	Acenaphthene	1200.	
132-64-9	Dibenzofuran	350.	
86-73-7	Fluorene	3800.	SP
132-65-0	Dibenzothiophene	82.	J
85-01-8	Phenanthrene	60.	J
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	200.	
129-00-0	Pyrene	200.	
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	2800.	SP
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	2100.	SP
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract: Level: Low

Lab Code: ENSECO Case No.: 7930 SAS No.: SDG No.:

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	7930-03	46	56	51
2	BLK01	50	63	62

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract: Level. MED

Lab Code: ENSECO Case No.: 7930 SAS No.: SDG No.:

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	7930-01	59	75	67
2	7930-01DUP	58	75	66
3	7930-02	55	70	63
4	7930-01MS	59	75	70
5	BLK01	54	71	60

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3C
WATER SEMIVOLATILE DUPLICATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 7930 SAS No.: SDG No.:

EPA Sample No.: 7930-01

COMPOUND	SAMPLE CONCENTRATION (ng/L)	DUPLICATE CONCENTRATION (ng/L)	% RPD
2,3-Dihydroindene	1200.	1200.	0
Benzo(B)Thiophene	330.	320.	3
1-Methylnaphthalene	92.	86.	7
Biphenyl	290.	280.	4
Acenaphthylene	540.	530.	4
Acenaphthene	1100.	1100.	0
Dibenzofuran	330.	330.	0
Fluorene	860.	840.	1
Phenanthrene	ND	57.	NC
Fluoranthene	190.	190.	0
Pyrene	190.	190.	0

COMMENTS:

ND = Not found
NC = Not calculated

3C
WATER SEMIVOLATILE MATRIX SPIKE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 7930 SAS No.: SDG No.:

Matrix Spike - EPA Sample No.: 7930-01

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC
1H-Indene	4000.	ND	2400.	60
Naphthalene	4000.	ND	2900.	72
Quinolene	4000.	ND	2600.	65
2-Methylnaphthalene	4000.	ND	2600.	65
Fluorene	4000.	860	3800.	74
Chrysene	4000.	ND	2800.	70
Benzo(E)Pyrene	4000.	ND	2100.	52

COMMENTS:

ND = Not found
NC = Not calculated

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 7930 SAS No.: SDG No.:

Lab File ID: X0875 Lab Sample ID: BLK01

Date Extracted: 12/26/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 01/19/90 Time Analyzed: 1223

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: 4500-X

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	7930-03	7930-03	X0880	01/19/90

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 7930 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: X0875

Level: (low/med) LOW Date Received: 12/21/89

% Moisture: not dec. dec. Date Extracted: 12/26/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 01/19/90

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	U
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	1.7	J
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	0.9	U
90-12-0	1-Methylnaphthalene	1.6	U
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 7930 SAS No.: SDG No.:

Lab File ID: X0874 Lab Sample ID: BLK01

Date Extracted: 12/26/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 01/19/90 Time Analyzed: 1129

Matrix: (soil/water) WATER Level: (low/med) MED

Instrument ID: 4500-X

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	7930-01	7930-01	X0876	01/19/90
2	7930-01DUP	7930-01DUP	X0877	01/19/90
3	7930-02	7930-02	X0879	01/19/90
4	7930-01MS	7930-01MS	X0878	01/19/90

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 7930 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 500 (g/ml) ML Lab File ID: X0874

Level: (low/med) MED Date Received: 12/21/89

% Moisture: not dec. dec. Date Extracted: 12/26/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 01/19/90

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	110.	U
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	100.	U
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	110.	U
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 7930 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
4800_PPT_PAH_STD	PAHQX863	01/18/90	1332
20_PPT_PAH_STD	PAHQX864	01/18/90	1428
40_PPT_PAH_STD	PAHQX866	01/18/90	1705
240_PPT_PAH_STD	PAHQX867	01/18/90	1758
1200_PPT_PAH_STD	PAHQX868	01/18/90	1853

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 7930 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	X0873	01/19/90	0915
BLK01	X0874	01/19/90	1129
BLK01	X0875	01/19/90	1223
7930-01	X0876	01/19/90	1317
7930-01DUP	X0877	01/19/90	1411
7930-01MS	X0878	01/19/90	1505
7930-02	X0879	01/19/90	1559
7930-03	X0880	01/19/90	1652

INITIAL CALIBRATION DATA
PAH COMPOUNDS

b Name: RMAL Lab Code: ENSECO Case No: 7930

Instrument ID: 4500-X Calibration Date(s): 01/18/90

Maximum % RSD is 35%

Lab File ID:
RRF 20 = PAHQX864
RRF 40 = PAHQX866
RRF 240 = PAHQX867
RRF 1200 = PAHQX868
RRF 4800 = PAHQX863

COMPOUND	20 PPT RRF	40 PPT RRF	240PPT RRF	1200PPT RRF	4800PPT RRF	AVE RRF	%RSD
D8-Naphthalene	3.434	3.294	2.965	3.071	2.410	3.035	13.0
D10-Flourene	1.478	1.553	1.416	1.477	1.553	1.495	3.9
D12-Chrysene	2.449	2.192	2.160	1.884	1.722	2.081	13.6
2,3-Benzofuran	2.108	2.028	1.847	1.901	1.910	1.959	5.4
2,3-Dihydroindene	2.083	2.056	1.847	1.894	1.893	1.955	5.5
1H-Indene	2.765	2.574	2.386	2.507	2.234	2.493	8.0
Naphthalene	3.809	3.637	3.373	3.468	2.490	3.355	15.2
Benzo(B)Thiophene	3.104	2.989	2.751	2.829	2.317	2.798	10.8
Quinoline	1.776	1.602	1.513	1.683	1.877	1.690	8.4
1H-Indole	2.407	2.289	2.149	2.358	2.221	2.285	4.5
2-Methylnaphthalene	1.806	1.775	1.686	1.701	1.733	1.740	2.9
1-Methylnaphthalene	1.877	1.850	1.694	1.755	1.800	1.795	4.1
Biphenyl	2.735	2.675	2.432	2.479	2.201	2.504	8.5
Acenaphthylene	2.196	2.014	1.996	2.328	2.380	2.183	8.1
Acenaphthene	1.683	1.696	1.591	1.659	1.763	1.678	3.7
Dibenzofuran	2.795	2.784	2.538	2.627	2.487	2.646	5.3
Flourene	1.818	1.866	1.745	1.858	1.950	1.847	4.0
Dibenzothiophene	1.633	1.525	1.263	1.418	1.492	1.466	9.4
Phenanthrene	1.686	1.591	1.341	1.510	1.554	1.536	8.3
Anthracene	1.234	1.200	1.119	1.416	1.531	1.300	13.0
Acridine	1.079	0.964	0.933	1.252	1.449	1.135	19.0
Carbazole	1.464	1.387	1.217	1.470	1.500	1.408	8.1
Fluoranthene	1.473	1.369	1.225	1.453	1.529	1.410	8.4
Pyrene	1.341	1.455	1.182	1.402	1.479	1.372	8.6
Benzo(A)Anthracene	2.253	2.131	2.119	2.178	2.103	2.157	2.8
Chrysene	2.527	2.470	2.425	2.076	1.910	2.282	11.9
Benzo(B)Fluoranthene	2.487	2.289	2.252	2.381	2.135	2.309	5.8
Benzo(K)Fluoranthene	2.024	2.319	2.085	1.887	2.031	2.069	7.6
Benzo(E)Pyrene	2.519	2.292	2.220	2.102	2.008	2.228	8.8
Benzo(A)Pyrene	1.609	1.678	1.705	1.812	1.835	1.728	5.5
Perylene	1.707	1.555	1.702	1.820	1.847	1.726	6.7
Indeno(1,2,3-CD)Pyrene	2.069	1.961	1.909	1.994	2.069	2.000	3.5
Dibenz(A,H)Anthracene	1.566	1.689	1.656	1.660	1.680	1.650	3.0
Benzo(G,H,I)Perylene	2.110	1.722	1.675	1.642	1.683	1.766	11.0

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

b Name: RMAL | Lab Code: ENSECO | Case No: 7930

Instrument ID: 4500-X | Calibration Date(s): 01/19/90 Time: 09:15

Lab ID: X0873 | Initial Calibration Date: 01/18/90

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPT RRF	%D
D8-Naphthalene	3.035	2.885	4.9
D10-Flourene	1.495	1.509	-0.9
D12-Chrysene	2.081	2.218	-6.6
2,3-Benzofuran	1.959	1.791	8.6
2,3-Dihydroindene	1.955	1.745	10.7
1H-Indene	2.493	2.227	10.7
Naphthalene	3.355	3.330	0.7
Benzo(B)Thiophene	2.798	2.563	8.4
Quinoline	1.690	1.448	14.3
1H-Indole	2.285	1.885	17.5
2-Methylnaphthalene	1.740	1.593	8.4
1-Methylnaphthalene	1.795	1.579	12.0
Biphenyl	2.504	2.521	-0.7
Acenaphthylene	2.183	1.781	18.4
Acenaphthene	1.678	1.594	5.0
Dibenzofuran	2.646	2.394	9.5
Flourene	1.847	1.707	7.6
Dibenzothiophene	1.466	1.514	-3.3
Phenanthrene	1.536	1.646	-7.2
Anthracene	1.300	1.246	4.2
Acridine	1.135	1.026	9.6
Carbazole	1.408	1.362	3.3
Fluoranthene	1.410	1.583	-12.3
Pyrene	1.372	1.659	-20.9
Benzo(A)Anthracene	2.157	1.857	13.9
Chrysene	2.282	2.166	5.1
Benzo(B)Fluoranthene	2.309	2.238	3.1
Benzo(K)Fluoranthene	2.069	1.880	9.1
Benzo(E)Pyrene	2.228	1.900	14.7
Benzo(A)Pyrene	1.728	1.482	14.2
Perylene	1.726	1.423	17.6
Indeno(1,2,3-CD)Pyrene	2.000	1.743	12.9
Dibenz(A,H)Anthracene	1.650	1.504	8.8
Benzo(G,H,I)Perylene	1.766	1.639	7.2

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 7930 SAS No.: SDG No:

Lab File ID (Standard): X0873 Date Analyzed: 01/19/90

Instrument ID: 4500-X Time Analyzed: 0915

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	180000	266000	173000
UPPER LIMIT	360000	532000	346000
LOWER LIMIT	90000	133000	86500
SAMPLE NO.			
7930-01	194000	308000	170000
7930-01DUP	181000	278000	151000
7930-02	187000	299000	158000
7930-03	190000	287000	190000
7930-01MS	180000	274000	149000
BLK01	197000	293000	198000
BLK01	188000	300000	180000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006965-0001-SA	STP-W129-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0001-DU	STP-W129D-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0002-SA	STP-W129FB-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0003-SA	STP-W129FBD-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0004-SA	PCJ-W402-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0005-SA	STP-W122-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0006-SA	STP-P116-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0007-SA	PCJ-W48-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0008-SA	STP-W133-101189	AQUEOUS	11 OCT 89		12 OCT 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6965-04

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6965-04

Sample wt/vol: 4120 (g/ml) ML Lab File ID: S6965X467

Level: (low/med) LOW Date Received: 10/12/89

% Moisture: not dec. dec. Date Extracted: 10/16/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/16/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.121

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	1.4	U
95-13-6	1H-Indene	7.0	
91-20-3	Naphthalene	15.	B *
4565-32-6	Benzo(B)Thiophene	1.1	*
91-22-5	Quinoline	6.9	
120-72-9	1H-Indole	24.	*
91-57-6	2-Methylnaphthalene	14.	B
90-12-0	1-Methylnaphthalene	8.4	*
92-52-4	Biphenyl	2.8	
208-96-8	Acenaphthylene	1.4	*
83-32-9	Acenaphthene	1.1	J *
132-64-9	Dibenzofuran	1.9	*
86-73-7	Fluorene	2.2	
132-65-0	Dibenzothiophene	19.	*
85-01-8	Phenanthrene	21.	*
120-12-7	Anthracene	1.8	*
260-94-6	Acridine	1.1	J *
86-74-8	Carbazole	6.1	*
206-44-0	Fluoranthene	11.	
129-00-0	Pyrene	11.	
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.4	J
50-32-8	Benzo(A)Pyrene	1.8	J *
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006425-0001-SA	PCJW48090589	AQUEOUS	05 SEP 89	15:30	06 SEP 89
006425-0002-SA	PCJW403090589	AQUEOUS	05 SEP 89	12:30	06 SEP 89
006425-0003-SA	PCJW402FB090589	AQUEOUS	05 SEP 89	13:30	06 SEP 89
006425-0004-SA	PCJW402FBD090589	AQUEOUS	05 SEP 89	13:30	06 SEP 89
006425-0006-SA	PCJW402090589	AQUEOUS	05 SEP 89	13:30	06 SEP 89
006425-0006-MS	PCJW402MS090589	AQUEOUS	05 SEP 89	13:30	06 SEP 89
006425-0007-SA	PCJW403D090589	AQUEOUS	05 SEP 89	14:20	06 SEP 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6425-02

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6425 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6425-02

Sample wt/vol: 500 (g/ml) ML Lab File ID: S6425X001

Level: (low/med) MED Date Received: 09/06/89

% Moisture: not dec. dec. Date Extracted: 09/07/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/05/89

GPC Cleanup: (Y/N) N pH: 8.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	110.	U
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	100.	U
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	110.	U
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

RAP SECTION 7.3. (E) MONITORING

ANNUAL ONLY, INCLUDING MISCELLANEOUS

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005294-0001-SA	PCJ-SLP5-060989	AQUEOUS	09 JUN 89		10 JUN 89
005294-0002-SA	PCJ-SLP15-060989	AQUEOUS	09 JUN 89		10 JUN 89
005294-0003-SA	IGV-W105-060989	AQUEOUS	09 JUN 89		10 JUN 89
005294-0004-SA	PCJ-W40-060989	AQUEOUS	09 JUN 89		10 JUN 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5294-01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5294 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5294-01

Sample wt/vol: 500 (g/ml) ML Lab File ID: S5294Z341

Level: (low/med) MED Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/12/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	110.	U
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	100.	U
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	94.	J
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5294-04

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5294 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5294-04

Sample wt/vol: 500 (g/ml) ML Lab File ID: S5294Z344

Level: (low/med) MED Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/12/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	110.	
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	310.	
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	120.	
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005254-0001-SA	PCJ-E13-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0002-SA	✓PCJ-E3-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0003-SA	PCJ-E2-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0004-SA	✓PCJ-H6-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0005-SA	PCJ-H3-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0006-SA	✓PCJ-MTK6-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0007-SA	✓PCJ-W29-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0008-SA	PCJ-W401-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0009-SA	PCJ-W48-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0010-SA	PCJ-SLP6-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0010-MS	PCJ-SLP6MS-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0011-SA	PCJ-SLP6D-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0012-SA	PCJ-SLP6FB-060789	AQUEOUS	07 JUN 89		08 JUN 89
005254-0013-SA	PCJ-SLP6FBD-060789	AQUEOUS	07 JUN 89		08 JUN 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-02

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-02

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z355

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/12/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.5	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.0	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	4.0	B *
90-12-0	1-Methylnaphthalene	2.3	B *
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.5	B
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-04

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-04

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z357

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.6	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.5	J B *
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	4.5	B
90-12-0	1-Methylnaphthalene	2.5	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.4	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	B
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-06

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-06

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z359

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.3	J
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.0	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.6	B
90-12-0	1-Methylnaphthalene	1.6	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.1	J
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-07

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-07

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z360

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	130.	
95-13-6	1H-Indene	2.3	
91-20-3	Naphthalene	2.6	J B
4565-32-6	Benzo(B)Thiophene	3.9	*
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	2.1	B *
90-12-0	1-Methylnaphthalene	1.6	B
92-52-4	Biphenyl	9.9	
208-96-8	Acenaphthylene	12.	
83-32-9	Acenaphthene	55.	
132-64-9	Dibenzofuran	1.7	
86-73-7	Fluorene	45.	
132-65-0	Dibenzothiophene	6.4	
85-01-8	Phenanthrene	4.4	
120-12-7	Anthracene	2.9	
260-94-6	Acridine	2.0	J *
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	37.	
129-00-0	Pyrene	19.	B
56-55-3	Benzo(A)Anthracene	2.8	*
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5254-08

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5254 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5254-08

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5254Z361

Level: (low/med) LOW Date Received: 06/08/89

% Moisture: not dec. dec. Date Extracted: 06/11/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.8	
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.7	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	1.1	J
91-57-6	2-Methylnaphthalene	4.5	B
90-12-0	1-Methylnaphthalene	2.6	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005292-0001-SA	PCJ-SLP7-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0002-SA	PCJ-SLP14-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0003-SA	PCJ-SLP14D-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0004-SA	PCJ-W403-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0005-SA	PCJ-E15-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0006-SA	PCJ-W119-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0007-SA	PCJ-SLP14FB-060989	AQUEOUS	09 JUN 89		10 JUN 89
005292-0008-SA	PCJ-SLP14FBD-060989	AQUEOUS	09 JUN 89		10 JUN 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5292-05

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5292 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5292-05

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5292Z378

Level: (low/med) LOW Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/14/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.8	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	4.6	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.8	B
90-12-0	1-Methylnaphthalene	1.7	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	2.7	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.1	J
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005294-0001-SA	PCJ-SLP5-060989	AQUEOUS	09 JUN 89		10 JUN 89
005294-0002-SA	PCJ-SLP15-060989	AQUEOUS	09 JUN 89		10 JUN 89
005294-0003-SA	IGV-W105-060989	AQUEOUS	09 JUN 89		10 JUN 89
005294-0004-SA	PCJ-W40-060989	AQUEOUS	09 JUN 89		10 JUN 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5294-04

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5294 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5294-04

Sample wt/vol: 500 (g/ml) ML Lab File ID: S5294Z344

Level: (low/med) MED Date Received: 06/10/89

% Moisture: not dec. dec. Date Extracted: 06/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/12/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	110.	
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	310.	
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	120.	
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005562-0001-SA	PCJ-W70-062989	AQUEOUS	29 JUN 89		30 JUN 89
005562-0002-SA	PCJ-W407-062989	AQUEOUS	29 JUN 89		30 JUN 89
005562-0003-SA	MSH-SLP12-062989	AQUEOUS	29 JUN 89		30 JUN 89
005562-0003-MS	MSH-SLP12MS-062989	AQUEOUS	29 JUN 89		30 JUN 89
005562-0004-SA	MSH-SLP12D-062989	AQUEOUS	29 JUN 89		30 JUN 89

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5562-01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5562 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5562-01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5562Z637

Level: (low/med) LOW Date Received: 06/30/89

% Moisture: not dec. dec. Date Extracted: 07/03/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/02/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	1.3	J *
496-11-7	2,3-Dihydroindene	16.	B
95-13-6	1H-Indene	3.2	
91-20-3	Naphthalene	10.	B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	8.4	B
90-12-0	1-Methylnaphthalene	4.5	*
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	26.	
83-32-9	Acenaphthene	250.	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	23.	
132-65-0	Dibenzothiophene	10.	
85-01-8	Phenanthrene	3.4	
120-12-7	Anthracene	4.2	
260-94-6	Acridine	1.5	J *
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	3.9	
129-00-0	Pyrene	61.	B
56-55-3	Benzo(A)Anthracene	2.6	
218-01-9	Chrysene	2.0	J *
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005238-0001-SA	PCJ-SLP8-060589	AQUEOUS	05 JUN 89	09:30	06 JUN 89
005238-0002-SA	MSH-SLP11-060589	AQUEOUS	05 JUN 89	09:30	06 JUN 89
005238-0003-SA	MSH-SLP13-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0003-MS	MSH-SLP13MS-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0004-SA	MSH-SLP13D-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0005-SA	MSH-SLP13FB-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0006-SA	MSH-SLP13FBD-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0007-SA	PCJ-SLP16-060589	AQUEOUS	05 JUN 89		06 JUN 89
005238-0008-SA	MSH-SLP17-060589	AQUEOUS	05 JUN 89		06 JUN 89

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5238-01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5238 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5238-01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5238X944

Level: (low/med) LOW Date Received: 06/06/89

% Moisture: not dec. dec. Date Extracted: 06/09/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/05/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	U
95-13-6	1H-Indene	1.6	
91-20-3	Naphthalene	2.1	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	1.8	B *
90-12-0	1-Methylnaphthalene	1.0	J
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.1	J
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
57-97-6	7,12-Dimethylbenzanthracene	2.8	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
56-49-5	3-Methylcholanthrene	3.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U
215-58-7	Dibenz(A,C)Anthracene	1.6	U

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006992-0001-SA	PCJ-SLP6-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0001-DU	PCJ-SLP6D-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0002-SA	PCJ-SLP6FB-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0003-SA	PCJ-SLP6FBD-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0004-SA	PCJ-SLP7-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0005-SA	PCJ-SLP8-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0006-SA	PCJ-SLP4-101289	AQUEOUS	12 OCT 89		13 OCT 89
006992-0007-SA	PCJ-W407-101289	AQUEOUS	12 OCT 89		13 OCT 89

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6992-05

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6992-05

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6992X493

Level: (low/med) LOW Date Received: 10/13/89

% Moisture: not dec. dec. Date Extracted: 10/17/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/20/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	1.7	*
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	3.6	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	2.2	B
90-12-0	1-Methylnaphthalene	1.3	J
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.3	U
83-32-9	Acenaphthene	1.2	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.3	U
129-00-0	Pyrene	1.2	J
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6992-06

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6992 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6992-06

Sample wt/vol: 4200 (g/ml) ML Lab File ID: S6992X494

Level: (low/med) LOW Date Received: 10/13/89

% Moisture: not dec. dec. Date Extracted: 10/17/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/20/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	1.5	J
496-11-7	2,3-Dihydroindene	89	
95-13-6	1H-Indene	8.6	
91-20-3	Naphthalene	3.2	J B
4565-32-6	Benzo(B)Thiophene	18	
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	1.7	B
90-12-0	1-Methylnaphthalene	1.1	J *
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.6	
83-32-9	Acenaphthene	76	
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	2.1	
120-12-7	Anthracene	1.4	
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	23	
206-44-0	Fluoranthene	1.6	
129-00-0	Pyrene	3.0	
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006798-0001-SA	PCJ-E13-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0002-SA	PCJ-E2-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0003-SA	PCJ-SLP-7-092889	AQUEOUS	28 SEP 89	10:00	29 SEP 89
006798-0004-SA	PCJ-SLP-16-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0005-SA	PCJ-SLP-14-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0006-SA	PCJ-SLP-10-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0007-SA	PCJ-H3-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0008-SA	PCJ-SLP6FB-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0009-SA	PCJ-SLP6FBD-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0010-SA	PCJ-SLP6-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0010-SD	PCJ-SLP6D-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0010-MS	PCJ-SLP6MS-092889	AQUEOUS	28 SEP 89	09:00	29 SEP 89
006798-0011-SA	PCJ-W119-092889	AQUEOUS	28 SEP 89		29 SEP 89
006798-0012-SA	PCJ-W70-092889	AQUEOUS	28 SEP 89		29 SEP 89

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6798-12

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6798 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6798-12

Sample wt/vol: 500 (g/ml) ML Lab File ID: S6798X025

Level: (low/med) MED Date Received: 09/29/89

% Moisture: not dec. dec. Date Extracted: 10/02/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 10/08/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	110.	U
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	280.	
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	110.	U
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

APPENDIX D

LABORATORY DATA SUMMARY PACKAGE:

ST. PETER AQUIFER

ST. PETER AQUIFER
QUALITY CONTROL SUMMARY

Well No.	Sample Date	Method Blank	Field Duplicate	Matrix Spike	Field Blank
SLP3	06/13/89	5315-BLK01	STP-SLP3D-061389	STP-SLP3MS-061389	STP-SLP3FB-061389
W408	06/13/89	5315-BLK01	STP-SLP3D-061389	STP-SLP3MS-061389	STP-SLP3FB-061389
W409	06/13/89	5315-BLK01	STP-SLP3D-061389	STP-SLP3MS-061389	STP-SLP3FB-061389
W410	06/13/89	5315-BLK01	STP-SLP3D-061389	STP-SLP3MS-061389	STP-SLP3FB-061389
W411	06/13/89	5315-BLK01	STP-SLP3D-061389	STP-SLP3MS-061389	STP-SLP3FB-061389
W412	06/13/89	5315-BLK01	STP-SLP3D-061389	STP-SLP3MS-061389	STP-SLP3FB-061389
W129	06/15/89	5354-BLK01	STP-W129D-061589	STP-SLP3MS-061389	STP-W129FB-061589
W122	06/15/89	5354-BLK01	STP-W129D-061589	STP-SLP3MS-061389	STP-W129FB-061589
P116	06/15/89	5354-BLK01	STP-W129D-061589	STP-SLP3MS-061389	STP-W129FB-061589
W133	06/15/89	5354-BLK01	STP-W129D-061589	STP-SLP3MS-061389	STP-W129FB-061589
SLP3	10/10/89	6951-BLK01	STP-SLP3D-101089	STP-SLP3MS-101089	STP-SLP3FB-101089
W408	10/10/89	6951-BLK01	STP-SLP3D-101089	STP-SLP3MS-101089	STP-SLP3FB-101089
W409	10/10/89	6951-BLK01	STP-SLP3D-101089	STP-SLP3MS-101089	STP-SLP3FB-101089
W410	10/10/89	6951-BLK01	STP-SLP3D-101089	STP-SLP3MS-101089	STP-SLP3FB-101089
W411	10/10/89	6951-BLK01	STP-SLP3D-101089	STP-SLP3MS-101089	STP-SLP3FB-101089
W412	10/10/89	6951-BLK01	STP-SLP3D-101089	STP-SLP3MS-101089	STP-SLP3FB-101089

Well No.	Sample Date	Method Blank	Field Duplicate	Matrix Spike	Field Blank
W129	10/11/89	6965-BLK01	STP-W129D-101189	STP-SLP3MS-101089	STP-W129FB-101189
W122	10/11/89	6965-BLK01	STP-W129D-101189	STP-SLP3MS-101089	STP-W129FB-101189
P116	10/11/89	6965-BLK01	STP-W129D-101189	STP-SLP3MS-101089	STP-W129FB-101189
W133	10/11/89	6965-BLK01	STP-W129D-101189	STP-SLP3MS-101089	STP-W129FB-101189

1ST HALF - 1989

Enseco

CASE NARRATIVE

FOR

City of St. Louis Park

August 14, 1989

Enseco - RMAL Project Number 005315

Introduction

Ten aqueous samples (includes MS) were received at Enseco Rocky Mountain Analytical Laboratory on June 14, 1989. The samples were logged in under RMAL project number 005315. Sample STP-SLP3FBD-061389 (RMA # 005315-04) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Samples 5315-05, 06, 07, 08, 09 and 01MS show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

The secondary ion was used to measure the surrogate recovery for D10-fluorene in all samples due to an interference with the primary ion.

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

The 1989 QAPP sets forth specific requirements for the measurement of benzo(j)fluoranthene. Results have not been provided previously for this compound due to the lack of an internal standard. The special procedure in the QAPP will be implemented on all future projects.

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: _____ **Date:** _____
Tracy Giberson
Data Control Supervisor

Approved by: _____ **Date:** 8/14/89
Jean Zimmerman
Program Administrator

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005315-0001-SA	STP-SLP3-061389	AQUEOUS	13 JUN 89		14 JUN 89
005315-0001-MS	STP-SLP3MS-061389	AQUEOUS	13 JUN 89		14 JUN 89
005315-0002-SA	STP-SLP3D-061389	AQUEOUS	13 JUN 89		14 JUN 89
005315-0003-SA	STP-SLP3FB-061389	AQUEOUS	13 JUN 89		14 JUN 89
005315-0004-SA	STP-SLP3FBD-061389	AQUEOUS	13 JUN 89		14 JUN 89
005315-0005-SA	STP-W408-061389	AQUEOUS	13 JUN 89		14 JUN 89
005315-0006-SA	STP-W409-061389	AQUEOUS	13 JUN 89		14 JUN 89
005315-0007-SA	STP-W410-061389	AQUEOUS	13 JUN 89		14 JUN 89
005315-0008-SA	STP-W411-061389	AQUEOUS	13 JUN 89		14 JUN 89
005315-0009-SA	STP-W412-061389	AQUEOUS	13 JUN 89		14 JUN 89

TABLE OF CONTENTS

for

City of St. Louis Park

RMAL QC# 5315

PAH

1. QC Summary Package.....001
2. Sample Data Package.....007
3. Standards Data Package.....383
4. Blank Raw Data.....699
5. Matrix Spike Data.....745
6. Matrix Spike Duplicate Data.....N/A

TABLE OF CONTENTS

for

City of St. Louis Park

RMAL QC# 5315

PAH

1. QC Summary Package.....001
2. Sample Data Package.....007
3. Standards Data Package.....383
4. Blank Raw Data.....699
5. Matrix Spike Data.....745
6. Matrix Spike Duplicate Data.....N/A

Ens · Rocky Mountain Analytical
4955 Y. Street
Arvada, Colorado 80002
303/421-6611 Facsimile 303/431-7171

CHAIN OF CUSTODY

No. 10700

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: Scott Anderson

SAMPLE SAFE™ CONDITIONS

1 Packed by: SA Seal #: _____
2 Seal Intact Upon Receipt by Sampling Co Yes No
3 Condition of Contents: _____
4 Sealed for Shipping by: _____
5 Initial Contents Temp: _____ °C Seal #: _____
6 Sampling Status Done Continuing Until: _____
7 Seal Intact Upon Receipt by Laboratory (Yes) No
8 Contents Temperature Upon Receipt by Lab: 11.4 °C
9 Condition of Contents: OK

RM #	Date	Time	Sample ID/Description	Sample Type	No Containers	Analysis Parameters	Remarks
03	6/13/89		STP-SLP3FB - 061389	Amber	6	PPT-PAH	
04	6/13/89		STP-SLP3FBD - 061389	Amber	5	PPT-PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by (signed)	Received by. (signed)	Date	Time
1				
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA
Method of Shipment: F-P-X Airbill #: _____
Received for Lab: RMA Signed: [illegible] Date/Time: 6/14/89
Enseco Project No: 0820

White and Pink Copies to Lab Yellow to Sampler

SS-001

Enseco - Rocky Mountain Analytical

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Arvada, Colorado 80002
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CHAIN OF CUSTODY

No. 1u098

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: ENSR

Sampling Site: _____

Team Leader: Scott Anderson

SAMPLE SAFE™ CONDITIONS

1 Packed by: SA Seal #: _____
2 Seal Intact Upon Receipt by Sampling Co Yes No
3 Condition of Contents: _____
4 Sealed for Shipping by: _____
5 Initial Contents Temp: _____ °C Seal #: _____
6 Sampling Status Done Continuing Until: _____
7 Seal Intact Upon Receipt by Laboratory (Yes) No
8 Contents Temperature Upon Receipt by Lab: 13.2 °C
9 Condition of Contents: OK

#	Date	Time	Sample ID/Description	Sample Type	No Containers	Analysis Parameters	Remarks
RMA 05	6/13/89		STP - W468 - 061389	Amber	6	PPT - PAH	
06	6/13/89		STP - W409 - 061389	Amber	6	PPT - PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by (signed)	Received by (signed)	Date	Time
1				
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA
Method of Shipment: Fed-X Airbill #: _____
Received for Lab: RMA Signed: [illegible] Date/Time: 6/14/89
Enseco Project No: 0820

White and Pink Copies to Lab Yellow to Sampler

SS-001

Enseco - Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No. 10697

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: ENSR

Sampling Site: _____

Team Leader: S. Andersen

SAMPLE SAFE™ CONDITIONS

1 Packed by: SA Seal #: _____
2. Seal Intact Upon Receipt by Sampling Co Yes No
3. Condition of Contents: _____
4 Sealed for Shipping by: _____
5 Initial Contents Temp _____ °C Seal # _____
6 Sampling Status Done Continuing Until _____
7 Seal Intact Upon Receipt by Laboratory (Yes) No
8 Contents Temperature Upon Receipt by Lab. 13.1 °C
9 Condition of Contents. OK

RMA #	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
07	6/13/89		STP-W 410 - 061389	Amber	6	PPT-PAH	
08	6/13/89		STP-W 411 - 061389	Amber	6	PPT-PAH	
09	6/13/89		STP-W 412 - 061389	Amber	6	PPT-PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

Relinquished by. (signed)	Received by (signed)	Date	Time
1			
2			
3			

SHIPPING DETAILS

Delivered to Shipper by: SA
Method of Shipment: Fed-X Airbill #: _____
Received for Lab: RMA Signed: [illegible] Date/Time: 6/14/89 0820
Enseco Project No: _____

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SS-001

Enseco - Rocky Mountain Analytical

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303/421-6611 Facsimile 303/431-7171

CHAIN OF CUSTODY

No. 10099

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: Scott Anderson

SAMPLE SAFE™ CONDITIONS

1 Packed by: SA Seal # _____
2 Seal Intact Upon Receipt by Sampling Co. Yes No
3 Condition of Contents _____
4. Sealed for Shipping by _____
5 Initial Contents Temp _____ °C Seal # _____
6 Sampling Status Done Continuing Until _____
7 Seal Intact Upon Receipt by Laboratory (Yes) No
8 Contents Temperature Upon Receipt by Lab 15 °C
9 Condition of Contents OK

RMA #	Date	Time	Sample ID/Description	Sample Type	No Containers	Analysis Parameters	Remarks
01	6/13/89		STP - SLP3 - 061389	Amber	6	PPT - PAH	
02	6/13/89		STP - SLP3D - 061389	Amber	6	PPT - PAH	
01MS	6/13/89		STP - SLP3MS - 061389	Amber	6	PPT - PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by (signed)	Date	Time
1				
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: Sit

Method of Shipment: Fed X Airbill # _____

Received for Lab: RMA Signed: [signature] Date/Time: 6/14/89 0820

Enseco Project No _____

White and Pink Copies to Lab Yellow to Sampler

SS-001

SUMMARY

DATA

PACKAGE

FOR

City of St. Louis Park

RMA QC# 5315

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5315-01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5315 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5315-01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5315Z381

Level: (low/med) LOW Date Received: 06/14/89

% Moisture: not dec. dec. Date Extracted: 06/18/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	3.5	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	2.4	B
90-12-0	1-Methylnaphthalene	1.3	J B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.0	J
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5315-02

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5315 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5315-02

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5315Z383

Level: (low/med) LOW Date Received: 06/14/89

% Moisture: not dec. dec. Date Extracted: 06/18/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.5	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	3.6	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	2.4	B
90-12-0	1-Methylnaphthalene	1.2	J B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5315-03

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5315 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5315-03

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5315Z384

Level: (low/med) LOW Date Received: 06/14/89

% Moisture: not dec. dec. Date Extracted: 06/18/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	3.5	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	2.6	B
90-12-0	1-Methylnaphthalene	1.3	J B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.0	J
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5315-05

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5315 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5315-05

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5315Z385

Level: (low/med) LOW Date Received: 06/14/89

% Moisture: not dec. dec. Date Extracted: 06/18/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	19.	B
95-13-6	1H-Indene	8.7	
91-20-3	Naphthalene	19.	B
4565-32-6	Benzo(B)Thiophene	5.2	
91-22-5	Quinoline	2.9	
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	38.	B
90-12-0	1-Methylnaphthalene	28.	B
92-52-4	Biphenyl	5.0	
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	2.5	
132-64-9	Dibenzofuran	2.1	*
86-73-7	Fluorene	3.0	
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	6.0	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	4.4	
129-00-0	Pyrene	4.2	
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	1.8	J
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5315-06

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5315 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5315-06

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5315Z386

Level: (low/med) LOW Date Received: 06/14/89

% Moisture: not dec. dec. Date Extracted: 06/18/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	5.1	U	
496-11-7	2,3-Dihydroindene	27.	B	
95-13-6	1H-Indene	21.		
91-20-3	Naphthalene	79.	B	
4565-32-6	Benzo(B)Thiophene	10.		
91-22-5	Quinoline	12.		
120-72-9	1H-Indole	2.5	U	
91-57-6	2-Methylnaphthalene	81.	B	
90-12-0	1-Methylnaphthalene	51.	B	
92-52-4	Biphenyl	12.		
208-96-8	Acenaphthylene	1.4	U	
83-32-9	Acenaphthene	18.		
132-64-9	Dibenzofuran	13.		*
86-73-7	Fluorene	45.		
132-65-0	Dibenzothiophene	61.		
85-01-8	Phenanthrene	97.		
120-12-7	Anthracene	1.1	U	
260-94-6	Acridine	2.9	U	
86-74-8	Carbazole	1.9	U	
206-44-0	Fluoranthene	23.		*
129-00-0	Pyrene	33.		*
56-55-3	Benzo(A)Anthracene	4.1		*
218-01-9	Chrysene	17.		
205-99-2	Benzo(B)Fluoranthene	4.6		
207-08-9	Benzo(K)Fluoranthene	4.1		*
192-97-2	Benzo(E)Pyrene	4.2		
50-32-8	Benzo(A)Pyrene	4.8		
198-55-0	Perylene	2.5	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	1.7	J	
53-70-3	Dibenz(A,H)Anthracene	1.6	U	
191-24-2	Benzo(G,H,I)Perylene	2.8	U	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5315-07

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5315 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5315-07

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5315Z387

Level: (low/med) LOW Date Received: 06/14/89

% Moisture: not dec. dec. Date Extracted: 06/18/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	5.1	U	
496-11-7	2,3-Dihydroindene	130.	B	
95-13-6	1H-Indene	21.		
91-20-3	Naphthalene	47.	B	
4565-32-6	Benzo(B)Thiophene	27.		
91-22-5	Quinoline	3.5		
120-72-9	1H-Indole	2.5	U	
91-57-6	2-Methylnaphthalene	34.	B	
90-12-0	1-Methylnaphthalene	22.	B	
92-52-4	Biphenyl	4.5		
208-96-8	Acenaphthylene	1.4	U	
83-32-9	Acenaphthene	6.3		
132-64-9	Dibenzofuran	1.0	U	
86-73-7	Fluorene	3.2		
132-65-0	Dibenzothiophene	1.1	U	
85-01-8	Phenanthrene	12.		
120-12-7	Anthracene	1.1	U	
260-94-6	Acridine	88.		
86-74-8	Carbazole	14.		
206-44-0	Fluoranthene	4.8		
129-00-0	Pyrene	9.8		
56-55-3	Benzo(A)Anthracene	2.5	U	
218-01-9	Chrysene	1.3	J	*
205-99-2	Benzo(B)Fluoranthene	2.5	U	
207-08-9	Benzo(K)Fluoranthene	2.3	U	
192-97-2	Benzo(E)Pyrene	1.9	U	
50-32-8	Benzo(A)Pyrene	2.3	U	
198-55-0	Perylene	2.5	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U	
53-70-3	Dibenz(A,H)Anthracene	1.6	U	
191-24-2	Benzo(G,H,I)Perylene	2.8	U	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5315-08

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5315 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5315-08

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5315Z388

Level: (low/med) LOW Date Received: 06/14/89

% Moisture: not dec. dec. Date Extracted: 06/18/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	6.7	B
95-13-6	1H-Indene	4.2	
91-20-3	Naphthalene	6.6	B *
4565-32-6	Benzo(B)Thiophene	3.2	*
91-22-5	Quinoline	2.2	
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	9.1	B *
90-12-0	1-Methylnaphthalene	6.2	B *
92-52-4	Biphenyl	3.4	J
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	4.2	*
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	13.	
132-65-0	Dibenzothiophene	11.	
85-01-8	Phenanthrene	14.	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	94.	
86-74-8	Carbazole	6.8	
206-44-0	Fluoranthene	7.8	
129-00-0	Pyrene	10.	*
56-55-3	Benzo(A)Anthracene	1.5	J
218-01-9	Chrysene	4.4	
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5315-09

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5315 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5315-09

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5315Z392

Level: (low/med) LOW Date Received: 06/14/89

% Moisture: not dec. dec. Date Extracted: 06/18/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	5.1	U	
496-11-7	2,3-Dihydroindene	6.1	B	
95-13-6	1H-Indene	5.8		
91-20-3	Naphthalene	7.8	B	
4565-32-6	Benzo(B)Thiophene	0.9	U	
91-22-5	Quinoline	2.2		
120-72-9	1H-Indole	3.1		
91-57-6	2-Methylnaphthalene	11.	B	*
90-12-0	1-Methylnaphthalene	6.3	B	
92-52-4	Biphenyl	7.4		
208-96-8	Acenaphthylene	1.4	U	
83-32-9	Acenaphthene	5.8		*
132-64-9	Dibenzofuran	5.2		*
86-73-7	Fluorene	19.		
132-65-0	Dibenzothiophene	28.		
85-01-8	Phenanthrene	43.		
120-12-7	Anthracene	9.2		*
260-94-6	Acridine	12.		*
86-74-8	Carbazole	11.		*
206-44-0	Fluoranthene	11.		*
129-00-0	Pyrene	19.		*
56-55-3	Benzo(A)Anthracene	1.6	J	*
218-01-9	Chrysene	7.5		*
205-99-2	Benzo(B)Fluoranthene	3.3		
207-08-9	Benzo(K)Fluoranthene	2.3	U	
192-97-2	Benzo(E)Pyrene	1.8	J	
50-32-8	Benzo(A)Pyrene	1.8	J	*
198-55-0	Perylene	2.5	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U	
53-70-3	Dibenz(A,H)Anthracene	1.6	U	
191-24-2	Benzo(G,H,I)Perylene	2.8	U	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5315-01MS

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5315 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5315-01MS

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5315Z382

Level: (low/med) LOW Date Received: 06/14/89

% Moisture: not dec. dec. Date Extracted: 06/18/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.5	B
95-13-6	1H-Indene	7.0	SP
91-20-3	Naphthalene	9.2	B SP
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	8.6	SP
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	8.8	B SP
90-12-0	1-Methylnaphthalene	1.4	J B *
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	7.6	SP
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	7.8	SP
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	2.6	SP
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

2C

WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5315 SAS No.: N/A SDG No.: N/A

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	5315-01	56	61	60
2	5315-02	52	57	58
3	5315-03	56	58	63
4	5315-05	35	108	39
5	5315-06	71	59	63
6	5315-07	30	70	38
7	5315-08	40	58	54
8	5315-09	41	43	15
9	5315-01MS	54	59	60
10	BLK01	55	55	41

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3C

WATER SEMIVOLATILE MATRIX SPIKE RECOVERY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5315 SAS No.: N/A SDG No.: N/A

Matrix Spike - EPA Sample No.: 5315-01

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC
1H-Indene	10	ND	7.0	70
Naphthalene	10	3.5	9.2	57
Quinoline	10	ND	8.6	86
2-Methylnaphthalene	10	2.4	8.8	64
Fluorene	10	ND	7.6	76
Chrysene	10	ND	7.8	78
Benzo(E)Pyrene	10	ND	2.6	26

COMMENTS:

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5315 SAS No.: N/A SDG No.: N/A

Lab File ID: S5315Z380 Lab Sample ID: BLK01

Date Extracted: 06/18/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 07/14/89 Time Analyzed: 02:04

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: 4500-Z

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	5315-01	5315-01	S5315Z381	07/14/89
2	5315-02	5315-02	S5315Z383	07/14/89
3	5315-03	5315-03	S5315Z384	07/14/89
4	5315-05	5315-05	S5315Z385	07/14/89
5	5315-06	5315-06	S5315Z386	07/14/89
6	5315-07	5315-07	S5315Z387	07/14/89
7	5315-08	5315-08	S5315Z388	07/14/89
8	5315-09	5315-09	S5315Z392	07/14/89
9	5315-01MS	5315-01MS	S5315Z382	07/14/89

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5315 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5315Z380

Level: (low/med) LOW Date Received: 06/14/89

% Moisture: not dec. dec. Date Extracted: 06/18/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	5.1	U	
496-11-7	2,3-Dihydroindene	1.4		
95-13-6	1H-Indene	0.9	U	
91-20-3	Naphthalene	3.4	J	
4565-32-6	Benzo(B)Thiophene	0.9	U	
91-22-5	Quinoline	1.4	U	
120-72-9	1H-Indole	2.5	U	
91-57-6	2-Methylnaphthalene	2.6		*
90-12-0	1-Methylnaphthalene	1.4	J	*
92-52-4	Biphenyl	4.3	U	
208-96-8	Acenaphthylene	1.4	U	
83-32-9	Acenaphthene	1.3	U	
132-64-9	Dibenzofuran	1.0	U	
86-73-7	Fluorene	1.0	U	
132-65-0	Dibenzothiophene	1.1	U	
85-01-8	Phenanthrene	1.3	U	
120-12-7	Anthracene	1.1	U	
260-94-6	Acridine	2.9	U	
86-74-8	Carbazole	1.9	U	
206-44-0	Fluoranthene	1.4	U	
129-00-0	Pyrene	1.4	U	
56-55-3	Benzo(A)Anthracene	2.5	U	
218-01-9	Chrysene	2.8	U	
205-99-2	Benzo(B)Fluoranthene	2.5	U	
207-08-9	Benzo(K)Fluoranthene	2.3	U	
192-97-2	Benzo(E)Pyrene	1.9	U	
50-32-8	Benzo(A)Pyrene	2.3	U	
198-55-0	Perylene	2.5	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U	
53-70-3	Dibenz(A,H)Anthracene	1.6	U	
191-24-2	Benzo(G,H,I)Perylene	2.8	U	

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No: N/A

Lab Code: ENSECO Case No: 5315 SAS No: N/A SDG No: N/A

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDZ377	07/13/89	23:22
BLK01	S5315Z380	07/14/89	02:04
5315-01	S5315Z381	07/14/89	02:57
5315-01MS	S5315Z382	07/14/89	03:51
5315-02	S5315Z383	07/14/89	04:45
5315-03	S5315Z384	07/14/89	05:38
5315-05	S5315Z385	07/14/89	06:32
5315-06	S5315Z386	07/14/89	07:24
5315-07	S5315Z387	07/14/89	08:18
5315-08	S5315Z388	07/14/89	09:44

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No: N/A

Lab Code: ENSECO Case No: 5315 SAS No: N/A SDG No: N/A

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDZ291	07/14/89	14:41
5315-09	S5315Z392	07/14/89	15:52

INITIAL CALIBRATION DATA
PAH COMPOUNDS

Lab Name: RMAL Lab Code: Enseco Case No: 5315

Instrument ID: 4500-Z Calibration Date(s): 07/11/89

Minimum $\overline{RRF}$ is 0.050 Maximum % RSD is 35%

Lab File ID: RRF 40.= STDZ338 RRF 1200.= STDZ337
RRF 20.= STDZ335 RRF 240.= STDZ334 RRF 4800.= STDZ332

COMPOUND	20 PPT RRF	40 PPT RRF	240 PPT RRF	1200PPT RRF	4800PPT RRF	AVE RRF	%RSD
D8-Naphthalene	1.931	2.037	2.441	2.318	1.722	2.090	13.9
D10-Flourene	2.201	1.340	1.625	1.444	1.286	1.579	23.5
D12-Chrysene	1.356	1.460	1.519	1.461	1.152	1.390	10.4
2,3-Benzofuran	1.061	1.104	1.285	1.165	0.992	1.121	9.9
2,3-Dihydroindene	1.047	1.126	1.301	1.176	1.011	1.132	10.1
1H-Indene	1.367	1.474	1.714	1.537	1.287	1.476	11.1
Naphthalene	2.165	2.305	2.680	2.508	1.855	2.303	13.8
Benzo(B)Thiophene	1.873	1.936	2.223	2.057	1.665	1.951	10.7
Quinoline	0.783	0.938	1.280	1.289	1.213	1.101	20.7
1H-Indole	1.249	1.357	1.673	1.634	1.427	1.468	12.4
2-Methylnaphthalene	1.127	1.150	1.349	1.289	1.125	1.208	8.6
1-Methylnaphthalene	1.158	1.304	1.470	1.381	1.188	1.300	10.0
Biphenyl	1.834	1.802	2.315	2.029	1.664	1.929	13.1
Acenaphthylene	1.963	2.112	2.485	2.352	1.870	2.156	12.0
Acenaphthene	1.385	1.403	1.711	1.458	1.263	1.444	11.5
Dibenzofuran	1.974	1.970	2.465	2.219	1.740	2.074	13.3
Flourene	1.599	1.674	1.869	1.707	1.436	1.657	9.5
Dibenzothiophene	1.206	1.338	1.488	1.476	1.061	1.314	13.9
Phenanthrene	1.537	1.477	1.554	1.475	1.099	1.428	13.1
Anthracene	1.296	1.318	1.503	1.433	1.066	1.323	12.6
Acridine	0.967	0.953	1.223	1.229	1.017	1.078	12.7
Carbazole	1.096	1.121	1.353	1.355	1.077	1.200	11.8
Fluoranthene	1.621	1.563	1.762	1.717	1.237	1.580	13.1
Pyrene	1.430	1.441	1.782	1.639	1.148	1.488	16.1
Benzo(A)Anthracene	1.410	1.647	1.726	1.873	1.434	1.618	12.2
Chrysene	1.504	1.736	1.696	1.721	1.366	1.605	10.2
Benzo(B)Fluoranthene	1.315	1.653	1.941	1.777	1.476	1.632	15.1
Benzo(K)Fluoranthene	1.677	1.912	1.743	2.015	1.404	1.750	13.4
Benzo(E)Pyrene	1.450	1.667	1.802	1.882	1.304	1.621	14.9
Benzo(A)Pyrene	1.382	1.403	1.574	1.659	1.349	1.473	9.2
Perylene	1.363	1.425	1.630	1.734	1.372	1.505	11.1
Indeno(1,2,3-CD)Pyrene	1.350	1.543	1.745	1.934	1.622	1.639	13.3
Dibenz(A,H)Anthracene	1.087	1.202	1.418	1.549	1.279	1.307	13.9
Benzo(G,H,I)Perylene	1.216	1.452	0.561	1.493	1.385	1.221	31.4

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Lab Name: RMAL Lab Code: Enseco Case No: 5315

Instrument ID: 4500-Z Calibration Date(s): 07/13/89 Time: 23:22

Lab ID: STDZ377 Initial Calibration Date : 07/11/89

Minimum RRF is 0.050 Maximum %D is 35%

COMPOUND	RRF	40 PPT RRF	%D
D8-Naphthalene	2.090	2.048	2.0
D10-Fluorene	1.579	1.375	12.9
D12-Chrysene	1.390	1.336	3.9
2,3-Benzofuran	1.121	1.062	5.3
2,3-Dihydroindene	1.132	1.293	-14.2
1H-Indene	1.476	1.424	3.5
Naphthalene	2.303	2.773	-20.4
Benzo(B)Thiophene	1.951	1.845	5.4
Quinoline	1.101	0.923	16.2
1H-Indole	1.468	1.253	14.6
2-Methylnaphthalene	1.208	1.385	-14.7
1-Methylnaphthalene	1.300	1.432	-10.2
Biphenyl	1.929	1.807	6.3
Acenaphthylene	2.156	2.123	1.5
Acenaphthene	1.444	1.383	4.2
Dibenzofuran	2.074	2.063	0.5
Flourene	1.657	1.597	3.6
Dibenzothiophene	1.314	1.335	-1.6
Phenanthrene	1.428	1.415	0.9
Anthracene	1.323	1.359	-2.7
Acridine	1.078	1.048	2.8
Carbazole	1.200	1.162	3.2
Fluoranthene	1.580	1.538	2.7
Pyrene	1.488	1.675	-12.6
Benzo(A)Anthracene	1.618	1.570	3.0
Chrysene	1.605	1.521	5.2
Benzo(B)Fluoranthene	1.632	1.714	-5.0
Benzo(K)Fluoranthene	1.750	1.485	15.1
Benzo(E)Pyrene	1.621	1.619	0.1
Benzo(A)Pyrene	1.473	1.395	5.3
Perylene	1.505	1.310	13.0
Indeno(1,2,3-CD)Pyrene	1.639	1.498	8.6
Dibenz(A,H)Anthracene	1.307	1.161	11.2
Benzo(G,H,I)Perylene	1.221	1.326	8.6

FORM VII

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Lab Name: RMAL Lab Code: Enseco Case No: 5315

Instrument ID: 4500-Z Calibration Date(s): 07/14/89 Time: 14:41

Lab ID: STDZ291 Initial Calibration Date : 07/11/89

Minimum RRF is 0.050 Maximum %D is 35%

COMPOUND	RRF	40 PPT RRF	%D
D8-Naphthalene	2.090	1.963	6.1
D10-Fluorene	1.579	1.316	16.7
D12-Chrysene	1.390	1.261	9.3
2,3-Benzofuran	1.121	1.043	7.0
2,3-Dihydroindene	1.132	1.122	0.9
1H-Indene	1.476	1.398	5.3
Naphthalene	2.303	2.925	-27.0
Benzo(B)Thiophene	1.951	1.831	6.2
Quinoline	1.101	0.962	12.6
1H-Indole	1.468	1.379	6.1
2-Methylnaphthalene	1.208	1.303	-7.9
1-Methylnaphthalene	1.300	1.298	0.2
Biphenyl	1.929	1.935	-0.3
Acenaphthylene	2.156	2.117	1.8
Acenaphthene	1.444	1.324	8.3
Dibenzofuran	2.074	2.033	2.0
Flourene	1.657	1.605	3.1
Dibenzothiophene	1.314	1.231	6.3
Phenanthrene	1.428	1.320	7.6
Anthracene	1.323	1.251	5.4
Acridine	1.078	1.022	5.2
Carbazole	1.200	1.154	3.8
Fluoranthene	1.580	1.465	7.3
Pyrene	1.488	0.970	34.8
Benzo(A)Anthracene	1.618	1.521	6.0
Chrysene	1.605	1.484	7.5
Benzo(B)Fluoranthene	1.632	1.515	7.2
Benzo(K)Fluoranthene	1.750	1.403	19.8
Benzo(E)Pyrene	1.621	1.452	10.4
Benzo(A)Pyrene	1.473	1.368	7.1
Perylene	1.505	1.400	7.0
Indeno(1,2,3-CD)Pyrene	1.639	1.390	15.2
Dibenz(A,H)Anthracene	1.307	1.079	17.4
Benzo(G,H,I)Perylene	1.221	1.190	2.5

FORM VII

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: Enseco Case No: 5315 SAS No.: N/A SDG No: N/A

Lab File ID (Standard): STDZ377 Date Analyzed: 07/13/89

Instrument ID: 4500-Z Time Analyzed: 23:22

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	148000	249800	189000
UPPER LIMIT	296000	499600	378000
LOWER LIMIT	74000	124900	94500
SAMPLE NO.			
5315-01	179400	313900	242300
5315-02	194300	340800	253400
5315-03	172800	296900	216200
5315-05	222000	345400	330600
5315-06	198100	330000	200100
5315-07	256600	327800	279200
5315-08	160900	250500	182500
5315-01MS	173500	296400	215200
BLK01	196100	337800	271100

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: Enseco Case No: 5315 SAS No.: N/A SDG No: N/A

Lab File ID (Standard): STDZ291 Date Analyzed: 07/14/89

Instrument ID: 4500-Z Time Analyzed: 14:41

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	184800	329200	232300
UPPER LIMIT	369600	658400	464600
LOWER LIMIT	92400	164600	116200
SAMPLE NO.			
5315-09	219000	444000	190500

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

1/87 Rev.

FORM VIII SV-2

Enseco

CASE NARRATIVE

FOR

City of St. Louis Park

August 17, 1989

Enseco - RMAL Project Number 005354

Introduction

Seven aqueous samples were received at Enseco Rocky Mountain Analytical Laboratory on June 16, 1989. The samples were logged in under RMAL project number 005354. Sample STP-W129FBD-061589 (RMA # 005354-02) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Samples 005354-05 and 07 contained high amounts of target conmpounds and hydrocarbons and were therefore diluted. Surrogates could not be measured due to the dilutions performed.

All samples and the associated blank show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

The secondary ion was used to measure the surrogate recoveries for D10-fluorene and D12-chrysene in samples 5354-01, 04 and the associated blank. This is due to an interference with the primary ion.

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

The 1989 QAPP sets forth specific requirements for the measurement of benzo(j)fluoranthene. Results have not been provided previously for this compound due to the lack of an internal standard. The special procedure in the QAPP will be implemented on all future projects.

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: _____ **Date:** 8/17/89
Tracy Giberson
Data Control Supervisor

Approved by: _____ **Date:** 8/17/89
Debbie Fazio
Program Administrator

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
005354-0001-SA	STP-W129FB-061589	AQUEOUS	15 JUN 89		16 JUN 89
005354-0002-SA	STP-W129FBD-061589	AQUEOUS	15 JUN 89		16 JUN 89
005354-0003-SA	STP-W122-061589	AQUEOUS	15 JUN 89		16 JUN 89
005354-0004-SA	STP-P116-061589	AQUEOUS	15 JUN 89		16 JUN 89
005354-0005-SA	STP-W133-061589	AQUEOUS	15 JUN 89		16 JUN 89
005354-0006-SA	STP-W129-061589	AQUEOUS	15 JUN 89		16 JUN 89
005354-0007-SA	STP-W129D-061589	AQUEOUS	15 JUN 89		16 JUN 89

TABLE OF CONTENTS

for

City of St. Louis Park

RMAL QC# 5354

PAH

1. QC Summary Package.....001
2. Sample Data Package.....007
3. Standards Data Package.....291
4. Blank Raw Data.....673
5. Matrix Spike Data.....N/A
6. Matrix Spike Duplicate Data.....N/A

Ens. . - Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile 303/431-7171

CHAIN OF CUSTODY

No. 13

Attn: _____

Enseco Client: St. Louis Park

Project: _____

Sampling Co: ENSR

Sampling Site: _____

Team Leader: S. Anderson

SAMPLE SAFE™ CONDITIONS

1 Packed by: SA Seal #: _____
2. Seal Intact Upon Receipt by Sampling Co.. Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5 Initial Contents Temp: _____ °C Seal #: _____
6. Sampling Status Done Continuing Until: _____
7. Seal Intact Upon Receipt by Laboratory. (Yes) No
8. Contents Temperature Upon Receipt by Lab. 14.7/19.5 °C
9 Condition of Contents. ok

Date	Time	Sample ID/Description	RMA #	Sample Type	No Containers	Analysis Parameters	Remarks
6/15/89		STP-W129FB- 061589	01	Amber	6	PPT-PAH	
6/15/89		STP-W129FBD- 061589	02	Amber	6	PPT-PAH	
6/15/89		STP+W122- 061589	03	Amber	6	PPT-PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by (signed)	Received by. (signed)	Date	Time
1	S. Anderson		6/15/89	
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA
Method of Shipment: Fed X Airbill #: _____
Received for Lab. RMA Signed: [illegible] Date/Time 6/16/89 0830
Enseco Project No: 5354

White and Pink Copies to Lab Yellow to Sampler

SS-001

Ens . - Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile. 303/431-7171

Attn: _____

CHAIN OF CUSTODY

No. 30

SAMPLE SAFE™ CONDITIONS

1. Packed by SA Seal # _____
2. Seal Intact Upon Receipt by Sampling Co. Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status. Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory (Yes) No
8. Contents Temperature Upon Receipt by Lab: 14.3 °C
9. Condition of Contents: ok/one bottle's cap broken, sample leaked.

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: ENSR

Sampling Site: _____

Team Leader: S. Anderson

Date	Time	Sample ID/Description	RMA #	Sample Type	No. Containers	Analysis Parameters	Remarks
6/15/89		STP-P116 - 061589	04	Amber	6	ppt-PAH	
6/15/89		STP-W133 - 061589	05	Amber	6	ppt-PAH	
[redacted]		[redacted]		[redacted]	[redacted]	[redacted]	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by. (signed)	Date	Time
1	S. Anderson		6/15/89	
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA

Method of Shipment: Fed X Airbill #: _____

Received for Lab: RMA Signed: [signature] Date/Time 6/16/89 08:30

Enseco Project No. 5354

White and Pink Copies to Lab Yellow to Sampler

SS-001

Enseco - Rocky Mountain Analytical
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile 303/431-7171

CHAIN OF CUSTODY

No. [illegible]31

Attn: _____

Enseco Client: Cory St. Louis Park

Project: _____

Sampling Co.: ENSR

Sampling Site: _____

Team Leader: S. Anderson

SAMPLE SAFE™ CONDITIONS

1. Packed by: SA Seal #: _____
2. Seal Intact Upon Receipt by Sampling Co. Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal #: _____
6. Sampling Status Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory. (Yes) No
8. Contents Temperature Upon Receipt by Lab: 13.6 °C
9. Condition of Contents: ok

Date	Time	Sample ID/Description	Rm#	Sample Type	No. Containers	Analysis Parameters	Remarks
6/15/89		STP-W129-061589	06	Amber	6	ppt-PAH	
6/15/89		STP-W129D-061589	07	Amber	6	ppt-PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by (signed)	Received by (signed)	Date	Time
1	S. Anderson		6/15/89	
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: _____

Method of Shipment: _____ Airbill #: _____

Received for Lab: RMA Signed: [illegible] Date/Time: 6/16/89 0830

Enseco Project No.: 5354

White and Pink Copies to Lab Yellow to Sampler

SS-001

SUMMARY

DATA

PACKAGE

FOR

City of St. Louis Park

RMA QC# 5354

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5354-01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5354 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5354-01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5354Z408

Level: (low/med) LOW Date Received: 06/16/89

% Moisture: not dec. dec. Date Extracted: 06/19/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/17/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	4.1	B
95-13-6	1H-Indene	1.9	
91-20-3	Naphthalene	8.6	B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	7.2	B
90-12-0	1-Methylnaphthalene	3.6	B *
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.4	B
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5354-03

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5354 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5354-03

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5354Z567

Level: (low/med) LOW Date Received: 06/16/89

% Moisture: not dec. dec. Date Extracted: 06/19/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/28/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	11.	*
496-11-7	2,3-Dihydroindene	99.	B
95-13-6	1H-Indene	67.	
91-20-3	Naphthalene	240.	B *
4565-32-6	Benzo(B)Thiophene	29.	
91-22-5	Quinoline	4.7	*
120-72-9	1H-Indole	1.8	J *
91-57-6	2-Methylnaphthalene	250.	B
90-12-0	1-Methylnaphthalene	150.	B
92-52-4	Biphenyl	21.	
208-96-8	Acenaphthylene	22.	*
83-32-9	Acenaphthene	9.7	
132-64-9	Dibenzofuran	7.9	
86-73-7	Fluorene	8.8	
132-65-0	Dibenzothiophene	3.7	*
85-01-8	Phenanthrene	21.	B
120-12-7	Anthracene	2.2	
260-94-6	Acridine	2.3	J *
86-74-8	Carbazole	3.9	
206-44-0	Fluoranthene	9.1	B
129-00-0	Pyrene	5.9	B
56-55-3	Benzo(A)Anthracene	1.6	J
218-01-9	Chrysene	3.0	
205-99-2	Benzo(B)Fluoranthene	1.9	J
207-08-9	Benzo(K)Fluoranthene	1.5	J
192-97-2	Benzo(E)Pyrene	2.0	*
50-32-8	Benzo(A)Pyrene	4.0	*
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	1.6	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5354-04

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5354 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5354-04

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5354Z410

Level: (low/med) LOW Date Received: 06/16/89

% Moisture: not dec. dec. Date Extracted: 06/19/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/17/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	5.6	B
95-13-6	1H-Indene	1.4	
91-20-3	Naphthalene	17.	B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	1.7	J
91-57-6	2-Methylnaphthalene	22.	B
90-12-0	1-Methylnaphthalene	11.	B
92-52-4	Biphenyl	1.5	J
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	2.3	
132-65-0	Dibenzothiophene	6.9	
85-01-8	Phenanthrene	8.5	B
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.9	B
129-00-0	Pyrene	2.5	B
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	1.0	J *
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5354-05

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5354 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5354-05

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5354Z583

Level: (low/med) LOW Date Received: 06/16/89

% Moisture: not dec. dec. Date Extracted: 06/19/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/30/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 12.5

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	510.	U
496-11-7	2,3-Dihydroindene	19000.	B
95-13-6	1H-Indene	9700.	
91-20-3	Naphthalene	1800.	B
4565-32-6	Benzo(B)Thiophene	7000.	
91-22-5	Quinoline	140.	U
120-72-9	1H-Indole	250.	U
91-57-6	2-Methylnaphthalene	90.	U
90-12-0	1-Methylnaphthalene	230.	B *
92-52-4	Biphenyl	430.	U
208-96-8	Acenaphthylene	140.	U
83-32-9	Acenaphthene	130.	U
132-64-9	Dibenzofuran	100.	U
86-73-7	Fluorene	100.	U
132-65-0	Dibenzothiophene	110.	U
85-01-8	Phenanthrene	130.	U
120-12-7	Anthracene	110.	U
260-94-6	Acridine	140.	J
86-74-8	Carbazole	190.	U
206-44-0	Fluoranthene	140.	U
129-00-0	Pyrene	140.	U
56-55-3	Benzo(A)Anthracene	250.	U
218-01-9	Chrysene	280.	U
205-99-2	Benzo(B)Fluoranthene	250.	U
207-08-9	Benzo(K)Fluoranthene	230.	U
192-97-2	Benzo(E)Pyrene	190.	U
50-32-8	Benzo(A)Pyrene	230.	U
198-55-0	Perylene	250.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	210.	U
53-70-3	Dibenz(A,H)Anthracene	160.	U
191-24-2	Benzo(G,H,I)Perylene	280.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5354-06

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5354 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5354-06

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5354Z568

Level: (low/med) LOW Date Received: 06/16/89

% Moisture: not dec. dec. Date Extracted: 06/19/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/28/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	2.4	J	
496-11-7	2,3-Dihydroindene	34.		B
95-13-6	1H-Indene	6.7		
91-20-3	Naphthalene	58.		B
4565-32-6	Benzo(B)Thiophene	4.4		
91-22-5	Quinoline	1.4	U	
120-72-9	1H-Indole	2.2	J	*
91-57-6	2-Methylnaphthalene	96.		B
90-12-0	1-Methylnaphthalene	60.		B
92-52-4	Biphenyl	9.5		
208-96-8	Acenaphthylene	1.4	U	
83-32-9	Acenaphthene	8.0		
132-64-9	Dibenzofuran	5.8		
86-73-7	Fluorene	11.		
132-65-0	Dibenzothiophene	7.2		
85-01-8	Phenanthrene	31.		B
120-12-7	Anthracene	5.0		*
260-94-6	Acridine	1.6	J	*
86-74-8	Carbazole	5.3		*
206-44-0	Fluoranthene	20.		B
129-00-0	Pyrene	15.		B
56-55-3	Benzo(A)Anthracene	2.5	U	
218-01-9	Chrysene	2.8	U	
205-99-2	Benzo(B)Fluoranthene	2.5	U	
207-08-9	Benzo(K)Fluoranthene	2.3	U	
192-97-2	Benzo(E)Pyrene	1.9	U	
50-32-8	Benzo(A)Pyrene	2.3	U	
198-55-0	Perylene	5.0		*
193-39-5	Indeno(1,2,3-CD)Pyrene	1.2	J	*
53-70-3	Dibenz(A,H)Anthracene	1.6	U	
191-24-2	Benzo(G,H,I)Perylene	2.8	U	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

5354-07

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5354 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: 5354-07

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5354Z584

Level: (low/med) LOW Date Received: 06/16/89

% Moisture: not dec. dec. Date Extracted: 06/19/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/30/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 12.5

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	510.	U
496-11-7	2,3-Dihydroindene	140.	U
95-13-6	1H-Indene	90.	U
91-20-3	Naphthalene	130.	J B *
4565-32-6	Benzo(B)Thiophene	90.	U
91-22-5	Quinoline	140.	U
120-72-9	1H-Indole	250.	U
91-57-6	2-Methylnaphthalene	210.	B
90-12-0	1-Methylnaphthalene	150.	J B
92-52-4	Biphenyl	430.	U
208-96-8	Acenaphthylene	140.	U
83-32-9	Acenaphthene	130.	U
132-64-9	Dibenzofuran	100.	U
86-73-7	Fluorene	100.	U
132-65-0	Dibenzothiophene	110.	U
85-01-8	Phenanthrene	110.	J B
120-12-7	Anthracene	110.	U
260-94-6	Acridine	290.	U
86-74-8	Carbazole	190.	U
206-44-0	Fluoranthene	140.	U
129-00-0	Pyrene	140.	U
56-55-3	Benzo(A)Anthracene	250.	U
218-01-9	Chrysene	280.	U
205-99-2	Benzo(B)Fluoranthene	250.	U
207-08-9	Benzo(K)Fluoranthene	230.	U
192-97-2	Benzo(E)Pyrene	190.	U
50-32-8	Benzo(A)Pyrene	230.	U
198-55-0	Perylene	250.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	210.	U
53-70-3	Dibenz(A,H)Anthracene	160.	U
191-24-2	Benzo(G,H,I)Perylene	280.	U

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5354 SAS No.: N/A SDG No.: N/A

	EPA SAMPLE NO.	S1 (NAP)	#	S2 (FLU)	#	S3 (CHR)	#
1	5354-01	66		75		64	
2	5354-03	42		55		43	
3	5354-04	66		89		61	
4	5354-05		D		D		D
5	5354-06	55		62		59	
6	5354-07		D		D		D
7	BLK01	64		69		60	

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: ENSECO Case No.: 5354 SAS No.: N/A SDG No.: N/A

Lab File ID: S5354Z407 Lab Sample ID: BLK01

Date Extracted: 06/19/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 07/17/89 Time Analyzed: 00:55

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: 4500-Z

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	5354-01	5354-01	S5354Z408	07/17/89
2	5354-03	5354-03	S5354Z567	07/28/89
3	5354-04	5354-04	S5354Z410	07/17/89
4	5354-05	5354-05	S5354Z583	07/30/89
5	5354-06	5354-06	S5354Z568	07/28/89
6	5354-07	5354-07	S5354Z584	07/30/89

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.: N/A

Lab Code: ENSECO Case No.: 5354 SAS No.: N/A SDG No.: N/A

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S5354Z407

Level: (low/med) LOW Date Received: 06/16/89

% Moisture: not dec. dec. Date Extracted: 06/19/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 07/17/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	5.1	U	
496-11-7	2,3-Dihydroindene	1.3	J	
95-13-6	1H-Indene	0.9	U	
91-20-3	Naphthalene	3.4	J	
4565-32-6	Benzo(B)Thiophene	0.9	U	
91-22-5	Quinoline	1.4	U	
120-72-9	1H-Indole	2.5	U	
91-57-6	2-Methylnaphthalene	2.3		
90-12-0	1-Methylnaphthalene	1.2	J	*
92-52-4	Biphenyl	4.3	U	
208-96-8	Acenaphthylene	1.4	U	
83-32-9	Acenaphthene	1.3	U	
132-64-9	Dibenzofuran	1.0	U	
86-73-7	Fluorene	1.0	U	
132-65-0	Dibenzothiophene	1.1	U	
85-01-8	Phenanthrene	1.2	J	
120-12-7	Anthracene	1.1	U	
260-94-6	Acridine	2.9	U	
86-74-8	Carbazole	1.9	U	
206-44-0	Fluoranthene	2.2		
129-00-0	Pyrene	3.8		
56-55-3	Benzo(A)Anthracene	2.5	U	
218-01-9	Chrysene	2.8	U	
205-99-2	Benzo(B)Fluoranthene	2.5	U	
207-08-9	Benzo(K)Fluoranthene	2.3	U	
192-97-2	Benzo(E)Pyrene	1.9	U	
50-32-8	Benzo(A)Pyrene	2.3	U	
198-55-0	Perylene	2.5	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U	
53-70-3	Dibenz(A,H)Anthracene	1.6	U	
191-24-2	Benzo(G,H,I)Perylene	2.8	U	

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No: N/A

Lab Code: ENSECO Case No: 5354 SAS No: N/A SDG No: N/A

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDZ404	07/16/89	21:34
BLK01	S5354Z407	07/17/89	00:55
5354-01	S5354Z408	07/17/89	01:49
5354-04	S5354Z410	07/17/89	03:36

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No: N/A

Lab Code: ENSECO Case No: 5354 SAS No: N/A SDG No: N/A

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDZ565	07/27/89	22:12
5354-03	S5354Z567	07/28/89	00:57
5354-06	S5354Z568	07/28/89	01:48

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No: N/A

Lab Code: ENSECO Case No: 5354 SAS No: N/A SDG No: N/A

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDZ580	07/30/89	18:16
5354-05	S5354Z583	07/30/89	20:53
5354-07	S5354Z584	07/30/89	21:45

INITIAL CALIBRATION DATA
PAH COMPOUNDS

) Name: RMAL Lab Code: Enseco Case No: 5354

Instrument ID: 4500-Z Calibration Date(s): 07/11/89

Minimum RRF is 0.050 Maximum % RSD is 35%

Lab File ID: RRF 40.= STDZ338 RRF 1200.= STDZ337
RRF 20.= STDZ335 RRF 240.= STDZ334 RRF 4800.= STDZ332

COMPOUND	20 PPT RRF	40 PPT RRF	240 PPT RRF	1200PPT RRF	4800PPT RRF	AVE RRF	%RSD
D8-Naphthalene	1.931	2.037	2.441	2.318	1.722	2.090	13.9
D10-Flourene	2.201	1.340	1.625	1.444	1.286	1.579	23.5
D12-Chrysene	1.356	1.460	1.519	1.461	1.152	1.390	10.4
2,3-Benzofuran	1.061	1.104	1.285	1.165	0.992	1.121	9.9
2,3-Dihydroindene	1.047	1.126	1.301	1.176	1.011	1.132	10.1
1H-Indene	1.367	1.474	1.714	1.537	1.287	1.476	11.1
Naphthalene	2.165	2.305	2.680	2.508	1.855	2.303	13.8
Benzo(B)Thiophene	1.873	1.936	2.223	2.057	1.665	1.951	10.7
Quinoline	0.783	0.938	1.280	1.289	1.213	1.101	20.7
1H-Indole	1.249	1.357	1.673	1.634	1.427	1.468	12.4
2-Methylnaphthalene	1.127	1.150	1.349	1.289	1.125	1.208	8.6
1-Methylnaphthalene	1.158	1.304	1.470	1.381	1.188	1.300	10.0
Biphenyl	1.834	1.802	2.315	2.029	1.664	1.929	13.1
Acenaphthylene	1.963	2.112	2.485	2.352	1.870	2.156	12.0
Acenaphthene	1.385	1.403	1.711	1.458	1.263	1.444	11.5
Dibenzofuran	1.974	1.970	2.465	2.219	1.740	2.074	13.3
Flourene	1.599	1.674	1.869	1.707	1.436	1.657	9.5
Dibenzothiophene	1.206	1.338	1.488	1.476	1.061	1.314	13.9
Phenanthrene	1.537	1.477	1.554	1.475	1.099	1.428	13.1
Anthracene	1.296	1.318	1.503	1.433	1.066	1.323	12.6
Acridine	0.967	0.953	1.223	1.229	1.017	1.078	12.7
Carbazole	1.096	1.121	1.353	1.355	1.077	1.200	11.8
Fluoranthene	1.621	1.563	1.762	1.717	1.237	1.580	13.1
Pyrene	1.430	1.441	1.782	1.639	1.148	1.488	16.1
Benzo(A)Anthracene	1.410	1.647	1.726	1.873	1.434	1.618	12.2
Chrysene	1.504	1.736	1.696	1.721	1.366	1.605	10.2
Benzo(B)Fluoranthene	1.315	1.653	1.941	1.777	1.476	1.632	15.1
Benzo(K)Fluoranthene	1.677	1.912	1.743	2.015	1.404	1.750	13.4
Benzo(E)Pyrene	1.450	1.667	1.802	1.882	1.304	1.621	14.9
Benzo(A)Pyrene	1.382	1.403	1.574	1.659	1.349	1.473	9.2
Perylene	1.363	1.425	1.630	1.734	1.372	1.505	11.1
Indeno(1,2,3-CD)Pyrene	1.350	1.543	1.745	1.934	1.622	1.639	13.3
Dibenz(A,H)Anthracene	1.087	1.202	1.418	1.549	1.279	1.307	13.9
Benzo(G,H,I)Perylene	1.216	1.452	0.561	1.493	1.385	1.221	31.4

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

) Name: RMAL Lab Code: Enseco Case No: 5354

Instrument ID: 4500-Z Calibration Date(s): 07/16/89 Time: 21:34

Lab ID: STDZ404 Initial Calibration Date : 07/11/89

Minimum RRF is 0.050 Maximum %D is 35%

COMPOUND	$\overline{RRF}$	40 PPT RRF	%D
D8-Naphthalene	2.090	1.899	9.1
D10-Fluorene	1.579	1.235	21.8
D12-Chrysene	1.390	1.365	1.8
2,3-Benzofuran	1.121	1.020	9.0
2,3-Dihydroindene	1.132	0.966	14.7
1H-Indene	1.476	1.321	10.5
Naphthalene	2.303	2.171	5.7
Benzo(B)Thiophene	1.951	1.715	12.1
Quinoline	1.101	0.919	16.5
1H-Indole	1.468	1.232	16.1
2-Methylnaphthalene	1.208	1.172	3.0
1-Methylnaphthalene	1.300	1.237	4.8
Biphenyl	1.929	1.750	9.3
Acenaphthylene	2.156	2.032	5.8
Acenaphthene	1.444	1.288	10.8
Dibenzofuran	2.074	2.072	0.1
Flourene	1.657	1.522	8.1
Dibenzothiophene	1.314	1.213	7.7
Phenanthrene	1.428	1.451	-1.6
Anthracene	1.323	1.228	7.2
Acridine	1.078	0.999	7.3
Carbazole	1.200	1.212	-1.0
Fluoranthene	1.580	1.506	4.7
Pyrene	1.488	1.850	-24.3
Benzo(A)Anthracene	1.618	1.617	0.1
Chrysene	1.605	1.586	1.2
Benzo(B)Fluoranthene	1.632	1.513	7.3
Benzo(K)Fluoranthene	1.750	1.696	3.1
Benzo(E)Pyrene	1.621	1.589	2.0
Benzo(A)Pyrene	1.473	1.348	8.5
Perylene	1.505	1.421	5.6
Indeno(1,2,3-CD)Pyrene	1.639	1.252	23.6
Dibenz(A,H)Anthracene	1.307	0.877	32.9
Benzo(G,H,I)Perylene	1.221	1.113	8.8

FORM VII

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Name: RMAL | Lab Code: Enseco | Case No: 5354

Instrument ID: 4500-Z | Calibration Date(s): 07/27/89 Time: 22:12

Lab ID: STDZ565 | Initial Calibration Date : 07/11/89

Minimum RRF is 0.050 Maximum %D is 35%

COMPOUND	$\overline{RRF}$	40 PPT RRF	%D
D8-Naphthalene	2.090	2.021	3.3
D10-Fluorene	1.579	1.305	17.4
D12-Chrysene	1.390	1.415	-1.8
2,3-Benzofuran	1.121	1.001	10.7
2,3-Dihydroindene	1.132	1.040	8.1
1H-Indene	1.476	1.351	8.5
Naphthalene	2.303	2.455	-6.6
Benzo(B)Thiophene	1.951	1.811	7.2
Quinoline	1.101	1.086	1.4
1H-Indole	1.468	1.392	5.2
2-Methylnaphthalene	1.208	1.220	-1.0
1-Methylnaphthalene	1.300	1.238	4.8
Biphenyl	1.929	1.845	4.4
Acenaphthylene	2.156	2.041	5.3
Acenaphthene	1.444	1.404	2.8
Dibenzofuran	2.074	1.944	6.3
Flourene	1.657	1.513	8.7
Dibenzothiophene	1.314	1.285	2.2
Phenanthrene	1.428	1.395	2.3
Anthracene	1.323	1.302	1.6
Acridine	1.078	1.190	-10.4
Carbazole	1.200	1.311	-9.3
Fluoranthene	1.580	1.508	4.6
Pyrene	1.488	1.756	-18.0
Benzo(A)Anthracene	1.618	1.796	-11.0
Chrysene	1.605	1.642	-2.3
Benzo(B)Fluoranthene	1.632	1.705	-4.5
Benzo(K)Fluoranthene	1.750	1.528	12.7
Benzo(E)Pyrene	1.621	1.624	-0.2
Benzo(A)Pyrene	1.473	1.434	2.6
Perylene	1.505	1.596	-6.0
Indeno(1,2,3-CD)Pyrene	1.639	1.502	8.4
Dibenz(A,H)Anthracene	1.307	1.263	3.4
Benzo(G,H,I)Perylene	1.221	1.338	-9.6

FORM VII

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Name: RMAL | Lab Code: Enseco | Case No: 5354

Instrument ID: 4500-Z | Calibration Date(s): 07/30/89 Time: 18:16

Lab ID: STDZ580 | Initial Calibration Date : 07/11/89

Minimum RRF is 0.050 Maximum %D is 35%

COMPOUND	RRF	40 PPT RRF	%D
D8-Naphthalene	2.090	1.926	7.8
D10-Fluorene	1.579	1.391	11.9
D12-Chrysene	1.390	1.397	-0.5
2,3-Benzofuran	1.121	1.133	-1.1
2,3-Dihydroindene	1.132	1.146	-1.2
1H-Indene	1.476	1.438	2.6
Naphthalene	2.303	2.268	1.5
Benzo(B)Thiophene	1.951	1.820	6.7
Quinoline	1.101	1.125	-2.2
1H-Indole	1.468	1.473	-0.3
2-Methylnaphthalene	1.208	1.291	-6.9
1-Methylnaphthalene	1.300	1.244	4.3
Biphenyl	1.929	1.922	0.4
Acenaphthylene	2.156	2.049	5.0
Acenaphthene	1.444	1.294	10.4
Dibenzofuran	2.074	2.157	-4.0
Flourene	1.657	1.599	3.5
Dibenzothiophene	1.314	1.067	18.8
Phenanthrene	1.428	1.427	0.1
Anthracene	1.323	1.294	2.2
Acridine	1.078	1.034	4.1
Carbazole	1.200	1.189	0.9
Fluoranthene	1.580	1.496	5.3
Pyrene	1.488	1.439	3.3
Benzo(A)Anthracene	1.618	1.719	-6.2
Chrysene	1.605	1.576	1.8
Benzo(B)Fluoranthene	1.632	1.649	-1.0
Benzo(K)Fluoranthene	1.750	1.619	7.5
Benzo(E)Pyrene	1.621	1.260	22.3
Benzo(A)Pyrene	1.473	1.377	6.5
Perylene	1.505	1.414	6.0
Indeno(1,2,3-CD)Pyrene	1.639	1.274	22.3
Dibenz(A,H)Anthracene	1.307	1.088	16.8
Benzo(G,H,I)Perylene	1.221	1.116	8.6

FORM VII

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: Enseco Case No: 5354 SAS No.: N/A SDG No: N/A

Lab File ID (Standard): STDZ404 Date Analyzed: 07/16/89

Instrument ID: 4500-Z Time Analyzed: 21:34

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	138700	243300	151900
UPPER LIMIT	277400	486600	303800
LOWER LIMIT	69400	121600	76000
SAMPLE NO.			
BLK01	185300	306500	200800
5354-01	157700	261800	192500
5354-04	195600	341500	245200

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: Enseco Case No: 5354 SAS No.: N/A SDG No: N/A

Lab File ID (Standard): STDZ565 Date Analyzed: 07/27/89

Instrument ID: 4500-Z Time Analyzed: 22:12

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	167500	261500	172900
UPPER LIMIT	335000	523000	345800
LOWER LIMIT	83800	130800	86400
SAMPLE NO.			
5354-03	267700	473700	349300 *
5354-06	181700	283300	178300

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

FORM VIII SV-2

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract: N/A

Lab Code: Enseco Case No: 5354 SAS No.: N/A SDG No: N/A

Lab File ID (Standard): STDZ580 Date Analyzed: 07/30/89

Instrument ID: 4500-Z Time Analyzed: 18:16

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	158800	297000	213300
UPPER LIMIT	317600	594000	426600
LOWER LIMIT	79400	148500	106600
SAMPLE NO.			
5354-05	121500	242200	328200
5354-07	91700	174100	158700

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

2ND HALF - 1989

Enseco

CASE NARRATIVE

FOR

City of St. Louis Park

December 5, 1989

Enseco - RMAL Project Number 006951

Introduction

Ten aqueous samples were received at Enseco Rocky Mountain Analytical Laboratory on October 11, 1989. The samples were logged in under RMAL project number 006951. Sample STP-SLP3FBD-101089 (RMA # 006951-03) was extracted and help as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Samples 06951-04, 05, 06, 07 and 08 were analyzed and reported at dilutions due to high concentrations of target or non-target compounds present. Due to the dilutions performed, surrogates could not be measured in the samples.

Samples 006951-06 and 07 show internal standard areas outside advisory limits (high). Some target compounds were quantitated against this internal standard hence results may be slightly biased low.

Samples 006951-02, 04, 05, 06, and 08 show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

The 1989 QAPP sets forth specific requirements for the measurement of benzo(j)fluoranthene. Results have not yet been provided previously for this compound due to the lack of an internal standard. The special procedure in the QAPP will be implemented on all future projects.

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: Tracy Giberson **Date:** 12-5-89
Tracy Giberson
Data Control Supervisor

Approved by: Debbie Fazio **Date:** 12-5-89
Debbie Fazio
Program Administrator

Qualifier Codes and their Usage

U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.

J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarly invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.

E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.

D = This flag identifies all compounds identified during a re-analysis of a diluted sample.

Additional Qualifiers for TIC data only:

I = Isomer The unknown may be this specific isomer or an isomer with the same molecular formula.

C = Class The unknown compound contains ions characteristic of a particular class of compounds.

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006951-0001-SA	STP-SLP3-101089	AQUEOUS	10 OCT 89	13:00	11 OCT 89
006951-0001-DU	STP-SLP3D-10/10/89	AQUEOUS	10 OCT 89	13:00	11 OCT 89
006951-0001-MS	STP-SLP3MS-10/10/89	AQUEOUS	10 OCT 89	13:00	11 OCT 89
006951-0002-SA	STP-SLP3FB-10/10/89	AQUEOUS	10 OCT 89	13:00	11 OCT 89
006951-0003-SA	STP-SLP3FBD-10/10/89	AQUEOUS	10 OCT 89	13:00	11 OCT 89
006951-0004-SA	STP-W408-10/10/89	AQUEOUS	10 OCT 89		11 OCT 89
006951-0005-SA	STP-W410-10/10/89	AQUEOUS	10 OCT 89		11 OCT 89
006951-0006-SA	STP-W412-10/10/89	AQUEOUS	10 OCT 89		11 OCT 89
006951-0007-SA	STP-W409-10/10/89	AQUEOUS	10 OCT 89		11 OCT 89
006951-0008-SA	STP-W411-10/10/89	AQUEOUS	10 OCT 89		11 OCT 89

TABLE OF CONTENTS

for

City of St. Louis Park

RMAL QC# 6951

PAH

1. QC Summary Package.....001
2. Sample Data Package.....010
3. Standards Data Package..... 328
4. Blank Raw Data..... 703
5. Matrix Spike Data.....750
6. Duplicate Data.....797

Enseco - Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile: 303/431-7171

CHAIN OF CUSTODY

No.

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: M. Higgins

SAMPLE SAFE™ CONDITIONS

1. Packed by: DA. Seal #: _____
2. Seal Intact Upon Receipt by Sampling Co.. Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.. _____ °C Seal #: _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory. Yes No
8. Contents Temperature Upon Receipt by Lab. _____ °C
9. Condition of Contents: _____

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
01	10/10/89	1300	STP-SLP3 - 101089	l	6	ppt- PAH	
01D	10/10/89		STP-SLP3D - 101089	l	6	ppt- PAH	
01MS	10/10/89		STP-SLP3MS - 101089	l	6	ppt- PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by (signed)	Date	Time
1	[illegible]			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: _____

Method of Shipment: FED EX Airbill #: 2865075931

Received for Lab: RMAL Signed: Bruce W. Holt Date/Time: 10/11 0800

Enseco Project No.: 6951

Yellow to Sampler

SS-001

Enseco - Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile 303/431-7171

CHAIN OF CUSTODY

No.

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: _____

Sampling Site: _____

Team Leader: M. Higgins

SAMPLE SAFE™ CONDITIONS

1. Packed by: SA Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: Yes No
8. Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
02	10/10/89	1300	STP-SLP3FB-101089	l	6	ppt-PAH	
03	10/10/89	)	STP-SLP3FBD-101089	l	6	ppt-PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by (signed)	Date	Time
1	[signature]			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA

Method of Shipment: FED EX Airbill # 2865075931

Received for Lab: RMAL Signed: Brett W. Hall Date/Time: 10/11 0800

Enseco Project No: 6951

SS-001

Enseco - Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile. 303/431-7171

CHAIN OF CUSTODY

No.

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: ENSR

Sampling Site: _____

Team Leader: M. Higgins

SAMPLE SAFE™ CONDITIONS

1. Packed by: SA Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.. Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status: Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory: Yes No
8. Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
04	10/10/89		STP-W 408 -101089	l	6	ppt-PAH	
05	10/10/89		STP-W 410 -101089	l	6	ppt-PAH	
06	10/10/89		STP-W 412 101089	l	6	ppt-PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by (signed)	Date	Time
1	[signature]			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA

Method of Shipment: FED EX Airbill # 2865075931

Received for Lab.: RMAL Signed: [signature] Date/Time 10/11 0800

Enseco Project No: 6951

SS-001

Enseco - Rocky Mountain Analytical

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Facsimile. 303/431-7171

CHAIN OF CUSTODY

No.

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: ENSR

Sampling Site: _____

Team Leader: M. Higgins

SAMPLE SAFE™ CONDITIONS

1 Packed by: SA Seal #: _____
2 Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents: _____
4. Sealed for Shipping by: _____
5. Initial Contents Temp: _____ °C Seal #: _____
6. Sampling Status. Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory Yes No
8 Contents Temperature Upon Receipt by Lab _____ °C
9. Condition of Contents _____

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
07 10/10/89		STP - W 409 - 101089	l	6	ppt- PAH	
08 10/10/89		STP - W 411 - 101089	l	6	ppt- PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by: (signed)	Date	Time
1	S. Lundeen			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA
Method of Shipment: FED EX Airbill #: 2865075931
Received for Lab.: RMAL Signed: Butch Hoff Date/Time: 10/11 0900
Enseco Project No.: 6951

SUMMARY

DATA

PACKAGE

FOR

City of St. Louis Park

RMA QC# 6951

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6951-01

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6951-01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6951X439

Level: (low/med) LOW Date Received: 10/11/89

% Moisture: not dec. dec. Date Extracted: 10/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/14/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	2.3	B
95-13-6	1H-Indene	1.5	B
91-20-3	Naphthalene	5.7	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.5	B
90-12-0	1-Methylnaphthalene	1.8	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6951-02

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6951-02

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6951X431

Level: (low/med) LOW Date Received: 10/11/89

% Moisture: not dec. dec. Date Extracted: 10/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/13/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	3.3	B
95-13-6	1H-Indene	2.2	B
91-20-3	Naphthalene	7.6	B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	5.0	B *
90-12-0	1-Methylnaphthalene	2.4	B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6951-04

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6951-04

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6951X560

Level: (low/med) LOW Date Received: 10/11/89

% Moisture: not dec. dec. Date Extracted: 10/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/16/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.25

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	51.	U
496-11-7	2,3-Dihydroindene	14.	U
95-13-6	1H-Indene	9.	U
91-20-3	Naphthalene	65.	U
4565-32-6	Benzo(B)Thiophene	9.	U
91-22-5	Quinoline	14.	U
120-72-9	1H-Indole	25.	U
91-57-6	2-Methylnaphthalene	27.	B *
90-12-0	1-Methylnaphthalene	26.	B *
92-52-4	Biphenyl	43.	U
208-96-8	Acenaphthylene	14.	U
83-32-9	Acenaphthene	13.	U
132-64-9	Dibenzofuran	10.	U
86-73-7	Fluorene	10.	U
132-65-0	Dibenzothiophene	11.	U
85-01-8	Phenanthrene	14.	
120-12-7	Anthracene	11.	U
260-94-6	Acridine	29.	U
86-74-8	Carbazole	19.	U
206-44-0	Fluoranthene	21.	
129-00-0	Pyrene	22.	
56-55-3	Benzo(A)Anthracene	25.	U
218-01-9	Chrysene	12.	J *
205-99-2	Benzo(B)Fluoranthene	25.	U
207-08-9	Benzo(K)Fluoranthene	23.	U
192-97-2	Benzo(E)Pyrene	19.	U
50-32-8	Benzo(A)Pyrene	23.	U
198-55-0	Perylene	25.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	21.	U
53-70-3	Dibenz(A,H)Anthracene	16.	U
191-24-2	Benzo(G,H,I)Perylene	28.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6951-05

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6951-05

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6951X448

Level: (low/med) LOW Date Received: 10/11/89

% Moisture: not dec. dec. Date Extracted: 10/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/15/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 2.50

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	100.	U
496-11-7	2,3-Dihydroindene	130.	B *
95-13-6	1H-Indene	22.	B
91-20-3	Naphthalene	45.	J B *
4565-32-6	Benzo(B)Thiophene	25.	
91-22-5	Quinoline	28.	U
120-72-9	1H-Indole	50.	U
91-57-6	2-Methylnaphthalene	42.	B *
90-12-0	1-Methylnaphthalene	25.	J B *
92-52-4	Biphenyl	86.	U
208-96-8	Acenaphthylene	28.	U
83-32-9	Acenaphthene	26.	U
132-64-9	Dibenzofuran	20.	U
86-73-7	Fluorene	20.	U
132-65-0	Dibenzothiophene	22.	U
85-01-8	Phenanthrene	23.	J *
120-12-7	Anthracene	22.	U
260-94-6	Acridine	25.	J *
86-74-8	Carbazole	38.	U
206-44-0	Fluoranthene	28.	U
129-00-0	Pyrene	20.	J
56-55-3	Benzo(A)Anthracene	50.	U
218-01-9	Chrysene	56.	U
205-99-2	Benzo(B)Fluoranthene	50.	U
207-08-9	Benzo(K)Fluoranthene	46.	U
192-97-2	Benzo(E)Pyrene	38.	U
50-32-8	Benzo(A)Pyrene	46.	U
198-55-0	Perylene	50.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	42.	U
53-70-3	Dibenz(A,H)Anthracene	32.	U
191-24-2	Benzo(G,H,I)Perylene	56.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6951-06

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6951-06

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6951X461

Level: (low/med) LOW Date Received: 10/11/89

% Moisture: not dec. dec. Date Extracted: 10/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/16/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 2.50

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	100.	U
496-11-7	2,3-Dihydroindene	28.	U
95-13-6	1H-Indene	18.	U
91-20-3	Naphthalene	20.	J B *
4565-32-6	Benzo(B)Thiophene	18.	U
91-22-5	Quinoline	28.	U
120-72-9	1H-Indole	50.	U
91-57-6	2-Methylnaphthalene	24.	B *
90-12-0	1-Methylnaphthalene	32.	U
92-52-4	Biphenyl	86.	U
208-96-8	Acenaphthylene	28.	U
83-32-9	Acenaphthene	26.	U
132-64-9	Dibenzofuran	20.	U
86-73-7	Fluorene	20.	U
132-65-0	Dibenzothiophene	41.	*
85-01-8	Phenanthrene	47.	
120-12-7	Anthracene	22.	U
260-94-6	Acridine	58.	U
86-74-8	Carbazole	38.	U
206-44-0	Fluoranthene	28.	U
129-00-0	Pyrene	28.	U
56-55-3	Benzo(A)Anthracene	50.	U
218-01-9	Chrysene	56.	U
205-99-2	Benzo(B)Fluoranthene	50.	U
207-08-9	Benzo(K)Fluoranthene	46.	U
192-97-2	Benzo(E)Pyrene	38.	U
50-32-8	Benzo(A)Pyrene	46.	U
198-55-0	Perylene	50.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	42.	U
53-70-3	Dibenz(A,H)Anthracene	32.	U
191-24-2	Benzo(G,H,I)Perylene	56.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6951-07

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6951-07

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6951X450

Level: (low/med) LOW Date Received: 10/11/89

% Moisture: not dec. dec. Date Extracted: 10/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/16/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 12.5

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	510.	U
496-11-7	2,3-Dihydroindene	140.	U
95-13-6	1H-Indene	90.	U
91-20-3	Naphthalene	650.	U
4565-32-6	Benzo(B)Thiophene	90.	U
91-22-5	Quinoline	140.	U
120-72-9	1H-Indole	250.	U
91-57-6	2-Methylnaphthalene	90.	U
90-12-0	1-Methylnaphthalene	160.	U
92-52-4	Biphenyl	430.	U
208-96-8	Acenaphthylene	140.	U
83-32-9	Acenaphthene	130.	U
132-64-9	Dibenzofuran	100.	U
86-73-7	Fluorene	100.	U
132-65-0	Dibenzothiophene	110.	U
85-01-8	Phenanthrene	130.	U
120-12-7	Anthracene	110.	U
260-94-6	Acridine	290.	U
86-74-8	Carbazole	190.	U
206-44-0	Fluoranthene	480.	
129-00-0	Pyrene	350.	
56-55-3	Benzo(A)Anthracene	250.	U
218-01-9	Chrysene	280.	U
205-99-2	Benzo(B)Fluoranthene	250.	U
207-08-9	Benzo(K)Fluoranthene	230.	U
192-97-2	Benzo(E)Pyrene	190.	U
50-32-8	Benzo(A)Pyrene	230.	U
198-55-0	Perylene	250.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	210.	U
53-70-3	Dibenz(A,H)Anthracene	160.	U
191-24-2	Benzo(G,H,I)Perylene	280.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6951-08

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6951-08

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6951X463

Level: (low/med) LOW Date Received: 10/11/89

% Moisture: not dec. dec. Date Extracted: 10/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/16/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.25

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	51.	U
496-11-7	2,3-Dihydroindene	11.	J B
95-13-6	1H-Indene	12.	B
91-20-3	Naphthalene	49.	J B *
4565-32-6	Benzo(B)Thiophene	9.	U
91-22-5	Quinoline	14.	U
120-72-9	1H-Indole	25.	U
91-57-6	2-Methylnaphthalene	47.	B *
90-12-0	1-Methylnaphthalene	36.	B *
92-52-4	Biphenyl	43.	U
208-96-8	Acenaphthylene	14.	U
83-32-9	Acenaphthene	13.	U
132-64-9	Dibenzofuran	10.	*
86-73-7	Fluorene	35.	
132-65-0	Dibenzothiophene	40.	*
85-01-8	Phenanthrene	99.	
120-12-7	Anthracene	14.	*
260-94-6	Acridine	62.	*
86-74-8	Carbazole	11.	J
206-44-0	Fluoranthene	12.	J
129-00-0	Pyrene	22.	
56-55-3	Benzo(A)Anthracene	25.	U
218-01-9	Chrysene	28.	U
205-99-2	Benzo(B)Fluoranthene	25.	U
207-08-9	Benzo(K)Fluoranthene	23.	U
192-97-2	Benzo(E)Pyrene	19.	U
50-32-8	Benzo(A)Pyrene	23.	U
198-55-0	Perylene	25.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	21.	U
53-70-3	Dibenz(A,H)Anthracene	16.	U
191-24-2	Benzo(G,H,I)Perylene	28.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6951-01DUP

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6951-DUP

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6951X429

Level: (low/med) LOW Date Received: 10/11/89

% Moisture: not dec. dec. Date Extracted: 10/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.6	B
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	3.9	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	2.3	B
90-12-0	1-Methylnaphthalene	1.2	J B
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6951-01MS

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6951-01MS

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6951X430

Level: (low/med) LOW Date Received: 10/11/89

% Moisture: not dec. dec. Date Extracted: 10/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	5.1	U	
496-11-7	2,3-Dihydroindene	2.8	B	
95-13-6	1H-Indene	6.1	B	SP
91-20-3	Naphthalene	12.	B	SP
4565-32-6	Benzo(B)Thiophene	0.9	U	
91-22-5	Quinoline	7.2		SP
120-72-9	1H-Indole	2.5	U	
91-57-6	2-Methylnaphthalene	8.7	B	SP
90-12-0	1-Methylnaphthalene	2.0	B	
92-52-4	Biphenyl	4.3	U	
208-96-8	Acenaphthylene	1.4	U	
83-32-9	Acenaphthene	1.3	U	
132-64-9	Dibenzofuran	1.0	U	
86-73-7	Fluorene	5.9		SP
132-65-0	Dibenzothiophene	1.1	U	
85-01-8	Phenanthrene	1.3	U	
120-12-7	Anthracene	1.1	U	
260-94-6	Acridine	2.9	U	
86-74-8	Carbazole	1.9	U	
206-44-0	Fluoranthene	1.4	U	
129-00-0	Pyrene	1.4	U	
56-55-3	Benzo(A)Anthracene	2.5	U	
218-01-9	Chrysene	5.9		SP
205-99-2	Benzo(B)Fluoranthene	2.5	U	
207-08-9	Benzo(K)Fluoranthene	2.3	U	
192-97-2	Benzo(E)Pyrene	1.8	J	SP
50-32-8	Benzo(A)Pyrene	2.3	U	
198-55-0	Perylene	2.5	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U	
53-70-3	Dibenz(A,H)Anthracene	1.6	U	
191-24-2	Benzo(G,H,I)Perylene	2.8	U	

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	6951-01	46	56	110
2	6951-01DUP	47	64	88
3	6951-01MS	46	57	78
4	6951-02	54	64	76
5	6951-04	D	D	D
6	6951-05	D	D	D
7	6951-06	D	D	D
8	6951-07	D	D	D
9	6951-08	D	D	D
10	BLK01	46	66	60

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3C

WATER SEMIVOLATILE DUPLICATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

EPA Sample No.: 6951-01

COMPOUND	SAMPLE CONCENTRATION (ng/L)	DUPLICATE CONCENTRATION (ng/L)	% RPD
2,3-Dihydroindene	2.3	1.6	36
1H-Indene	1.5	ND	NC
Naphthalene	5.7	3.9	38
2-Methylnaphthalene	3.5	2.3	41
1-Methylnaphthalene	1.8	1.2	40

COMMENTS:

ND = Not found
NC = Not calculated

3C

WATER SEMIVOLATILE MATRIX SPIKE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

Matrix Spike - EPA Sample No.: 6951-01

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC
1H-Indene	5.0	1.5	6.1	92
Naphthalene	5.0	5.7	12.	126
Quinolene	5.0	ND	7.2	144
2-Methylnaphthalene	5.0	3.5	8.7	104
Fluorene	5.0	ND	5.9	118
Chrysene	5.0	ND	5.9	118
Benzo(E)Pyrene	5.0	ND	1.8	36

COMMENTS:

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

Lab File ID: S6951X438 Lab Sample ID: BLK01

Date Extracted: 10/12/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 11/13/89 Time Analyzed: 23:50

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: 4500-X

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	6951-01	6951-01	S6951X439	11/14/89
2	6951-01DUP	6951-01DUP	S6951X429	11/13/89
3	6951-01MS	6951-01MS	S6951X430	11/13/89
4	6951-02	6951-02	S6951X431	11/13/89
5	6951-04	6951-04	S6951X560	11/16/89
6	6951-05	6951-05	S6951X448	11/15/89
7	6951-06	6951-06	S6951X461	11/16/89
8	6951-07	6951-07	S6951X450	11/16/89
9	6951-08	6951-08	S6951X463	11/16/89

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6951 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6951X438

Level: (low/med) LOW Date Received: 10/11/89

% Moisture: not dec. dec. Date Extracted: 10/12/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/13/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	2.5	
95-13-6	1H-Indene	1.9	
91-20-3	Naphthalene	7.3	
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.7	
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	4.5	
90-12-0	1-Methylnaphthalene	2.2	
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6951 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
4800_PPT_PAH_STD	STDX791	09/21/89	11:40
20_PPT_PAH_STD	STDX792	09/21/89	13:37
240_PPT_PAH_STD	STDX793	09/21/89	14:46
40_PPT_PAH_STD	STDX794	09/21/89	16:01
1200_PPT_PAH_STD	STDX795	09/21/89	16:54

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6951 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDX427	11/13/89	13:07
6951-01DUP	S6951X429	11/13/89	15:53
6951-01MS	S6951X430	11/13/89	16:48
6951-02	S6951X431	11/13/89	17:42
BLK01	S6951X438	11/13/89	23:50
6951-01	S6951X439	11/14/89	00:43

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6951 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDX446	11/15/89	17:49
6951-05	S6951X448	11/15/89	22:15
6951-07	S6951X450	11/16/89	00:04

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6951 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPT PAH STD	STDX459	11/16/89	11:08
6951-04	S6951X560	11/16/89	12:55
6951-06	S6951X461	11/16/89	13:50
6951-08	S6951X463	11/16/89	15:39

INITIAL CALIBRATION DATA
PAH COMPOUNDS

ıb Name: RMAL Lab Code: ENSECO Case No: 6951

Instrument ID: 4500-X Calibration Date(s): 09/21/89

Maximum % RSD is 35%

Lab File ID: RRF 20= STDX792 RRF 40= STDX794
RRF 240= STDX793 RRF 1200= STDX795 RRF 4800= STDX791

COMPOUND	20 PPT RRF	40 PPT RRF	240PPT RRF	1200PPT RRF	4800PPT RRF	AVE RRF	%RSD
D8-Naphthalene	2.331	2.503	2.450	2.535	2.400	2.444	3.3
D10-Flourene	1.524	1.553	1.512	1.504	1.544	1.527	1.4
D12-Chrysene	1.485	1.317	1.430	1.608	1.243	1.417	10.1
2,3-Benzofuran	1.363	1.377	1.355	1.345	1.255	1.339	3.6
2,3-Dihydroindene	1.371	1.429	1.383	1.365	1.253	1.360	4.8
1H-Indene	1.720	1.760	1.817	1.796	1.677	1.754	3.2
Naphthalene	2.314	2.852	2.747	2.877	2.503	2.659	9.1
Benzo(B)Thiophene	1.795	2.008	1.843	1.965	2.144	1.951	7.1
Quinoline	1.228	1.054	1.186	1.314	1.380	1.232	10.1
1H-Indole	1.471	1.498	1.591	1.726	1.811	1.619	9.0
2-Methylnaphthalene	1.310	1.397	1.392	1.432	1.400	1.386	3.3
1-Methylnaphthalene	1.218	1.271	1.101	1.512	1.451	1.311	12.9
Biphenyl	2.069	2.179	2.170	2.304	2.166	2.178	3.8
Acenaphthylene	2.576	2.665	2.581	2.569	2.524	2.583	2.0
Acenaphthene	1.659	1.687	1.644	1.620	1.591	1.640	2.2
Dibenzofuran	2.416	2.280	2.295	2.337	2.410	2.348	2.7
Flourene	1.763	1.825	1.817	1.817	1.851	1.815	1.8
Dibenzothiophene	1.507	1.475	1.526	1.424	1.379	1.462	4.1
Phenanthrene	1.539	1.405	1.485	1.446	1.427	1.460	3.6
Anthracene	1.352	1.291	1.407	1.474	1.454	1.396	5.4
Acridine	1.183	1.085	1.306	1.262	1.338	1.235	8.3
Carbazole	1.334	1.197	1.463	1.320	1.422	1.347	7.7
Fluoranthene	1.786	1.643	1.655	1.493	1.536	1.623	7.1
Pyrene	1.849	1.675	1.626	1.413	1.510	1.615	10.3
Benzo(A)Anthracene	1.478	1.514	1.563	1.704	1.514	1.555	5.7
Chrysene	1.268	1.459	1.505	1.627	1.322	1.436	10.0
Benzo(B)Fluoranthene	1.707	1.537	1.543	1.732	1.472	1.598	7.2
Benzo(K)Fluoranthene	1.716	1.838	1.768	1.700	1.508	1.706	7.2
Benzo(E)Pyrene	1.715	1.711	1.681	1.765	1.400	1.654	8.8
Benzo(A)Pyrene	1.559	1.449	1.512	1.544	1.380	1.489	5.0
Perylene	1.662	1.531	1.491	1.545	1.358	1.517	7.2
Indeno(1,2,3-CD)Pyrene	1.605	1.864	1.803	1.897	1.440	1.722	11.3
Dibenz(A,H)Anthracene	1.238	1.461	1.378	1.532	1.172	1.356	11.1
Benzo(G,H,I)Perylene	1.430	1.763	1.528	1.636	1.170	1.505	14.9

FORM VI

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

ıb Name: RMAL Lab Code: ENSECO Case No: 6951

Instrument ID: 4500-X Calibration Date(s): 11/13/89 Time: 13:07

Lab ID: STDX427 Initial Calibration Date: 09/21/89

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPT RRF	%D
D8-Naphthalene	2.444	2.873	-17.6
D10-Flourene	1.527	1.574	-3.1
D12-Chrysene	1.417	1.718	-21.2
2,3-Benzofuran	1.339	1.638	-22.3
2,3-Dihydroindene	1.360	1.735	-27.6
1H-Indene	1.754	2.114	-20.5
Naphthalene	2.659	3.217	-21.0
Benzo(B)Thiophene	1.951	2.606	-33.6
Quinoline	1.232	1.477	-19.9
1H-Indole	1.619	1.815	-12.1
2-Methylnaphthalene	1.386	1.659	-19.7
1-Methylnaphthalene	1.311	1.693	-29.1
Biphenyl	2.178	2.349	-7.9
Acenaphthylene	2.583	2.515	2.6
Acenaphthene	1.640	1.601	2.4
Dibenzofuran	2.348	2.499	-6.4
Flourene	1.815	1.787	1.5
Dibenzothiophene	1.462	1.460	0.1
Phenanthrene	1.460	1.522	-4.2
Anthracene	1.396	1.507	-8.0
Acridine	1.235	1.270	-2.8
Carbazole	1.347	1.410	-4.7
Fluoranthene	1.623	1.705	-5.1
Pyrene	1.615	1.754	-8.6
Benzo(A)Anthracene	1.555	1.808	-16.3
Chrysene	1.436	1.784	-24.2
Benzo(B)Fluoranthene	1.598	1.787	-11.8
Benzo(K)Fluoranthene	1.706	1.744	-2.2
Benzo(E)Pyrene	1.654	1.864	-12.7
Benzo(A)Pyrene	1.489	1.587	-6.6
Perylene	1.517	1.629	-7.4
Indeno(1,2,3-CD)Pyrene	1.722	1.612	6.4
Dibenz(A,H)Anthracene	1.356	1.227	9.5
Benzo(G,H,I)Perylene	1.505	1.522	-1.1

FORM VII

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

ıb Name: RMAL Lab Code: ENSECO Case No: 6951

Instrument ID: 4500-X Calibration Date(s): 11/15/89 Time: 17:49

Lab ID: STDX446 Initial Calibration Date: 09/21/89

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPT RRF	%D
D8-Naphthalene	2.444	2.718	-11.2
D10-Flourene	1.527	1.636	-7.1
D12-Chrysene	1.417	1.565	-10.4
2,3-Benzofuran	1.339	1.510	-12.8
2,3-Dihydroindene	1.360	1.584	-16.5
1H-Indene	1.754	1.978	-12.8
Naphthalene	2.659	3.069	-15.4
Benzo(B)Thiophene	1.951	2.424	-24.2
Quinoline	1.232	1.471	-19.4
1H-Indole	1.619	1.742	-7.6
2-Methylnaphthalene	1.386	1.544	-11.4
1-Methylnaphthalene	1.311	1.562	-19.1
Biphenyl	2.178	2.214	-1.7
Acenaphthylene	2.583	2.328	9.9
Acenaphthene	1.640	1.539	6.2
Dibenzofuran	2.348	2.410	-2.6
Flourene	1.815	1.767	2.6
Dibenzothiophene	1.462	1.400	4.2
Phenanthrene	1.460	1.520	-4.1
Anthracene	1.396	1.358	2.7
Acridine	1.235	1.202	2.7
Carbazole	1.347	1.363	-1.2
Fluoranthene	1.623	1.617	0.4
Pyrene	1.615	1.703	-5.4
Benzo(A)Anthracene	1.555	1.631	-4.9
Chrysene	1.436	1.611	-12.2
Benzo(B)Fluoranthene	1.598	1.834	-14.8
Benzo(K)Fluoranthene	1.706	1.690	0.9
Benzo(E)Pyrene	1.654	1.140	31.1
Benzo(A)Pyrene	1.489	1.471	1.2
Perylene	1.517	1.495	1.5
Indeno(1,2,3-CD)Pyrene	1.722	1.673	2.8
Dibenz(A,H)Anthracene	1.356	1.262	6.9
Benzo(G,H,I)Perylene	1.505	1.519	-0.9

FORM VII

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

.b Name: RMAL Lab Code: ENSECO Case No: 6951

Instrument ID: 4500-X Calibration Date(s): 11/16/89 Time: 11:08

Lab ID: STDX459 Initial Calibration Date: 09/21/89

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPT RRF	%D
D8-Naphthalene	2.444	2.701	-10.5
D10-Flourene	1.527	1.610	-5.4
D12-Chrysene	1.417	1.579	-11.4
2,3-Benzofuran	1.339	1.520	-13.5
2,3-Dihydroindene	1.360	1.557	-14.5
1H-Indene	1.754	2.074	-18.2
Naphthalene	2.659	3.098	-16.5
Benzo(B)Thiophene	1.951	2.421	-24.1
Quinoline	1.232	1.516	-23.1
1H-Indole	1.619	1.750	-8.1
2-Methylnaphthalene	1.386	1.583	-14.2
1-Methylnaphthalene	1.311	1.560	-19.0
Biphenyl	2.178	2.353	-8.0
Acenaphthylene	2.583	2.201	14.8
Acenaphthene	1.640	1.664	-1.5
Dibenzofuran	2.348	2.384	-1.5
Flourene	1.815	1.713	5.6
Dibenzothiophene	1.462	1.373	6.1
Phenanthrene	1.460	1.481	-1.4
Anthracene	1.396	1.353	3.1
Acridine	1.235	1.136	8.0
Carbazole	1.347	1.248	7.3
Fluoranthene	1.623	1.610	0.8
Pyrene	1.615	1.657	-2.6
Benzo(A)Anthracene	1.555	1.475	5.1
Chrysene	1.436	1.425	0.8
Benzo(B)Fluoranthene	1.598	1.859	-16.3
Benzo(K)Fluoranthene	1.706	1.514	11.3
Benzo(E)Pyrene	1.654	1.758	-6.3
Benzo(A)Pyrene	1.489	1.454	2.4
Perylene	1.517	1.442	4.9
Indeno(1,2,3-CD)Pyrene	1.722	1.903	-10.5
Dibenz(A,H)Anthracene	1.356	1.509	-11.3
Benzo(G,H,I)Perylene	1.505	1.867	-24.1

FORM VII

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 6951 SAS No.: SDG No:

Lab File ID (Standard): STDX427 Date Analyzed: 11/13/89

Instrument ID: 4500-X Time Analyzed: 13:07

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	334000	537000	383000
UPPER LIMIT	668000	1070000	776000
LOWER LIMIT	167000	268000	192000
SAMPLE NO.			
6951-01	522000	1060000	652000
6951-01DUP	458000	811000	617000
6951-01MS	463000	817000	570000
6951-02	424000	754000	539000
BLK01	398000	701000	615000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 6951 SAS No.: SDG No:

Lab File ID (Standard): STDX446 Date Analyzed: 11/15/89

Instrument ID: 4500-X Time Analyzed: 17:49

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	88400	141000	102000
UPPER LIMIT	177000	282000	204000
LOWER LIMIT	44200	70500	51000
SAMPLE NO.			
6951-05	139000	226000	152000
6951-07	178000 *	330000 *	233000 *

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 6951 SAS No.: SDG No:

Lab File ID (Standard): STDX459 Date Analyzed: 11/16/89

Instrument ID: 4500-X Time Analyzed: 11:08

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	141000	227000	190000
UPPER LIMIT	282000	454000	380000
LOWER LIMIT	70500	114000	95000
SAMPLE NO.			
6951-04	186000	314000	261000
6951-06	364000 *	671000 *	598000 *
6951-08	211000	419000	301000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

Rocky Mountain
Analytical Laboratory

Enseco

CASE NARRATIVE

FOR

City of St. Louis Park

December 5, 1989

Enseco - RMAL Project Number 006965

Introduction

Nine aqueous samples were received at Enseco Rocky Mountain Analytical Laboratory on October 12, 1989. The samples were logged in under RMAL project number 006965. Sample STP-W129FBD-101189 (RMA # 006965-03) was extracted and help as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low and medium level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Samples 006965-04 and 05 show D10-fluorene recoveries below the lower control limit due to high background interferences. Corrective action consisting of re-extracting and reanalyzing the samples could not be taken due to limited sample and extract. Due to a large interference peak which is masking out D8-napthalene in sample 006965-04, the recovery has exceeded the upper control limit.

Samples 006965-01, 01Dup, 04 and 05 show internal standard areas outside advisory limits (high). Some target compounds were quantitated against this internal standard hence results may be slightly biased low.

Samples 006965-01, 01Dup, 02, 04, 05, 06 and 08 show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst.

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

PPT/PAH Con't

Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

The 1989 QAPP sets forth specific requirements for the measurement of benzo(j)fluoranthene. Results have not yet been provided previously for this compound due to the lack of an internal standard. The special procedure in the QAPP will be implemented on all future projects.

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: Tracy Giberson **Date:** 12/5/89
Tracy Giberson
Data Control Supervisor

Approved by: Debbie Fazio **Date:** 12/5/89
Debbie Fazio
Program Administrator

Qualifier Codes and their Usage

U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.

J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarly invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.

E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.

D = This flag identifies all compounds identified during a re-analysis of a diluted sample.

Additional Qualifiers for TIC data only:

I = Isomer The unknown may be this specific isomer or an isomer with the same molecular formula.

C = Class The unknown compound contains ions characteristic of a particular class of compounds.

TABLE OF CONTENTS

for

City of St. Louis Park

RMAL QC# 6965

PAH

1. QC Summary Package.....001
2. Sample Data Package.....011
3. Standards Data Package..... 330
4. Blank Raw Data..... 707
5. Matrix Spike Data.....N/A
6. Duplicate Data.....796

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006965-0001-SA	STP-W129-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0001-DU	STP-W129D-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0002-SA	STP-W129FB-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0003-SA	STP-W129FBD-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0004-SA	PCJ-W402-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0005-SA	STP-W122-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0006-SA	STP-P116-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0007-SA	PCJ-W48-101189	AQUEOUS	11 OCT 89		12 OCT 89
006965-0008-SA	STP-W133-101189	AQUEOUS	11 OCT 89		12 OCT 89

Ens - Rocky Mountain Analytical

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Arvada, Colorado 80002
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CHAIN OF CUSTODY

No.

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: ENSR

Sampling Site: _____

Team Leader: _____

SAMPLE SAFE™ CONDITIONS

1 Packed by: SA Seal # _____
2 Seal Intact Upon Receipt by Sampling Co.: Yes No
3. Condition of Contents. _____
4. Sealed for Shipping by. _____
5. Initial Contents Temp.: _____ °C Seal # _____
6. Sampling Status Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory Yes No
8 Contents Temperature Upon Receipt by Lab: _____ °C
9. Condition of Contents: _____

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
01	10/11/89		STP -W129- 101189	l	6	ppt- PAH	Low ppt-PAH
104	10/11/89		STP -W129D- 101189	l	6	ppt- PAH	Low ppt-PAH
	10/11/89		- ~~101189~~	~~l~~	6	~~ppt-PAH~~	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by (signed)	Date	Time
1	[signature]			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA
Method of Shipment: FED EX Airbill # 2865075942
Received for Lab. RMAL Signed: Brett W. Hart Date/Time 10/12 0800
Enseco Project No. 6965-8

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CHAIN OF CUSTODY

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Enseco Client: City St. Louis Park

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Sampling Co.: ENSR

Sampling Site: _____

Team Leader: MJ

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2. Seal Intact Upon Receipt by Sampling Co. Yes No
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4. Sealed for Shipping by: _____
5. Initial Contents Temp _____ °C Seal # _____
6. Sampling Status Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory Yes No
8. Contents Temperature Upon Receipt by Lab. _____ °C
9. Condition of Contents. _____

	Date	Time	Sample ID/Description	Sample Type	No Containers	Analysis Parameters	Remarks
02	10/11/89		STP - W129FB - 101189	l	6	ppt-PAH	Low ppt-PAH
03	10/11/89		STP - W129FBD - 101189	l	6	ppt-PAH	Low ppt-PAH
	10/11/89		- - 101189	l	6	ppt-PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING

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1	[signature]			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA

Method of Shipment: FED EX Airbill #: 2865075942

Received for Lab: RMAL Signed: Ruth W. Hall Date/Time: 10/12

Enseco Project No.: 6965 0800

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No.

Attn: _____

Enseco Client: City St. Louis Park

Project: _____

Sampling Co.: ENSR

Sampling Site: _____

Team Leader: _____

SAMPLE SAFE™ CONDITIONS

1 Packed by: SA Seal # _____
2. Seal Intact Upon Receipt by Sampling Co.. Yes No
3 Condition of Contents: _____
4 Sealed for Shipping by: _____
5 Initial Contents Temp _____ °C Seal # _____
6. Sampling Status. Done Continuing Until _____
7 Seal Intact Upon Receipt by Laboratory Yes No
8 Contents Temperature Upon Receipt by Lab. _____ °C
9 Condition of Contents. _____

	Date	Time	Sample ID/Description	Sample Type	No Containers	Analysis Parameters	Remarks
04	10/11/89		- W402 - 101189	l	6	ppt - PAH	Low PPT-PAH
05	10/11/89		- W122 - 101189	l	6	ppt - PAH	Prefer Low PPT-PAH May BE MED-PPT-PAH
06	10/11/89		- P116 - 101189	l	6	ppt - PAH	Low PPT-PAH

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by. (signed)	Received by. (signed)	Date	Time
1	[signature]			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA

Method of Shipment: FED EX Airbill # 2865075942

Received for Lab. RMAL Signed: Brett W. Holt Date/Time 10/12 0800

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Attn: _____

CHAIN OF CUSTODY

No.

Enseco Client: City St. Louis Park
Project: _____
Sampling Co.: ENSR
Sampling Site: _____
Team Leader: MJ

SAMPLE SAFE™ CONDITIONS

1 Packed by: SA Seal # _____
2 Seal Intact Upon Receipt by Sampling Co Yes No
3. Condition of Contents _____
4 Sealed for Shipping by _____
5 Initial Contents Temp _____ °C Seal # _____
6 Sampling Status Done Continuing Until _____
7. Seal Intact Upon Receipt by Laboratory Yes No
8 Contents Temperature Upon Receipt by Lab _____ °C
9. Condition of Contents: _____

	Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
07	10/11/89		PCJ - W48 - 101189	l	6	ppt- PAH	MED PPT-PAH
08	10/11/89		STP - W133 - 101189	l	6	ppt- PAH	MED PPT-PAH
	~~10/11/89~~		~~- 101189~~	~~l~~	~~6~~	~~ppt- PAH~~	

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by: (signed)	Received by: (signed)	Date	Time
1	S Elinden			
2				
3				

SHIPPING DETAILS

Delivered to Shipper by: SA
Method of Shipment: FED EX Airbill # 2865075942
Received for Lab: RMAL Signed: Brit W Holly Date/Time: 10/12
Enseco Project No: 6965 0800

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SUMMARY

DATA

PACKAGE

FOR

City of St. Louis Park

RMA QC#6965

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6965-01

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6965-01

Sample wt/vol: 4120 (g/ml) ML Lab File ID: S6965X453

Level: (low/med) LOW Date Received: 10/12/89

% Moisture: not dec. dec. Date Extracted: 10/16/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/16/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.121

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	4.9	U	
496-11-7	2,3-Dihydroindene	1.7	B	
95-13-6	1H-Indene	0.9	U	
91-20-3	Naphthalene	8.8	B	
4565-32-6	Benzo(B)Thiophene	0.9	U	
91-22-5	Quinoline	1.4	U	
120-72-9	1H-Indole	2.4	U	
91-57-6	2-Methylnaphthalene	9.1	B	
90-12-0	1-Methylnaphthalene	4.9		
92-52-4	Biphenyl	1.6	J	*
208-96-8	Acenaphthylene	1.4	U	
83-32-9	Acenaphthene	1.3	U	
132-64-9	Dibenzofuran	1.2		*
86-73-7	Fluorene	2.1		
132-65-0	Dibenzothiophene	1.9		*
85-01-8	Phenanthrene	6.3		
120-12-7	Anthracene	1.1	U	
260-94-6	Acridine	2.8	U	
86-74-8	Carbazole	1.8	U	
206-44-0	Fluoranthene	2.4		*
129-00-0	Pyrene	2.7		
56-55-3	Benzo(A)Anthracene	2.4	U	
218-01-9	Chrysene	2.7	U	
205-99-2	Benzo(B)Fluoranthene	2.4	U	
207-08-9	Benzo(K)Fluoranthene	2.2	U	
192-97-2	Benzo(E)Pyrene	1.8	U	
50-32-8	Benzo(A)Pyrene	2.2	U	
198-55-0	Perylene	2.4	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U	
53-70-3	Dibenz(A,H)Anthracene	1.5	U	
191-24-2	Benzo(G,H,I)Perylene	2.7	U	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6965-01DUP

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6965-01DUP

Sample wt/vol: 4120 (g/ml) ML Lab File ID: S6965X454

Level: (low/med) LOW Date Received: 10/12/89

% Moisture: not dec. dec. Date Extracted: 10/16/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/16/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.121

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	1.4	B *
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	7.2	B *
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	7.7	B
90-12-0	1-Methylnaphthalene	4.1	
92-52-4	Biphenyl	1.6	J
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.4	
132-65-0	Dibenzothiophene	1.5	*
85-01-8	Phenanthrene	5.1	
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	2.3	*
129-00-0	Pyrene	2.9	
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6965-02

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6965-02

Sample wt/vol: 4120 (g/ml) ML Lab File ID: S6965X455

Level: (low/med) LOW Date Received: 10/12/89

% Moisture: not dec. dec. Date Extracted: 10/16/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/16/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.121

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	1.5	B *
95-13-6	1H-Indene	1.3	
91-20-3	Naphthalene	5.1	J B
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	1.1	J
91-57-6	2-Methylnaphthalene	4.3	B *
90-12-0	1-Methylnaphthalene	2.1	
92-52-4	Biphenyl	4.2	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.0	J
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.2	J
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6965-04

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6965-04

Sample wt/vol: 4120 (g/ml) ML Lab File ID: S6965X467

Level: (low/med) LOW Date Received: 10/12/89

% Moisture: not dec. dec. Date Extracted: 10/16/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/16/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.121

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	4.9	U	
496-11-7	2,3-Dihydroindene	1.4	U	
95-13-6	1H-Indene	7.0		
91-20-3	Naphthalene	15.	B	*
4565-32-6	Benzo(B)Thiophene	1.1		*
91-22-5	Quinoline	6.9		
120-72-9	1H-Indole	24.		*
91-57-6	2-Methylnaphthalene	14.	B	
90-12-0	1-Methylnaphthalene	8.4		*
92-52-4	Biphenyl	2.8		
208-96-8	Acenaphthylene	1.4		*
83-32-9	Acenaphthene	1.1	J	*
132-64-9	Dibenzofuran	1.9		*
86-73-7	Fluorene	2.2		
132-65-0	Dibenzothiophene	19.		*
85-01-8	Phenanthrene	21.		*
120-12-7	Anthracene	1.8		*
260-94-6	Acridine	1.1	J	*
86-74-8	Carbazole	6.1		*
206-44-0	Fluoranthene	11.		
129-00-0	Pyrene	11.		
56-55-3	Benzo(A)Anthracene	2.4	U	
218-01-9	Chrysene	2.7	U	
205-99-2	Benzo(B)Fluoranthene	2.4	U	
207-08-9	Benzo(K)Fluoranthene	2.2	U	
192-97-2	Benzo(E)Pyrene	1.4	J	
50-32-8	Benzo(A)Pyrene	1.8	J	*
198-55-0	Perylene	2.4	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U	
53-70-3	Dibenz(A,H)Anthracene	1.5	U	
191-24-2	Benzo(G,H,I)Perylene	2.7	U	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6965-05

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6965-05

Sample wt/vol: 4090 (g/ml) ML Lab File ID: S6965X468

Level: (low/med) LOW Date Received: 10/12/89

% Moisture: not dec. dec. Date Extracted: 10/16/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/16/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.122

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	1.0	J	*
496-11-7	2,3-Dihydroindene	10.	B	
95-13-6	1H-Indene	4.7		
91-20-3	Naphthalene	26.	B	*
4565-32-6	Benzo(B)Thiophene	2.4		
91-22-5	Quinoline	1.4	U	
120-72-9	1H-Indole	2.4	U	
91-57-6	2-Methylnaphthalene	17.	B	
90-12-0	1-Methylnaphthalene	9.6		*
92-52-4	Biphenyl	6.0		*
208-96-8	Acenaphthylene	1.2	J	*
83-32-9	Acenaphthene	2.3		*
132-64-9	Dibenzofuran	1.1		*
86-73-7	Fluorene	1.7		*
132-65-0	Dibenzothiophene	1.1	U	
85-01-8	Phenanthrene	6.7		
120-12-7	Anthracene	1.3		*
260-94-6	Acridine	2.8	U	
86-74-8	Carbazole	2.7		*
206-44-0	Fluoranthene	11.		
129-00-0	Pyrene	9.5		
56-55-3	Benzo(A)Anthracene	1.5	J	
218-01-9	Chrysene	4.9		
205-99-2	Benzo(B)Fluoranthene	2.6		
207-08-9	Benzo(K)Fluoranthene	2.2		
192-97-2	Benzo(E)Pyrene	2.1		
50-32-8	Benzo(A)Pyrene	1.4	J	
198-55-0	Perylene	2.4	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U	
53-70-3	Dibenz(A,H)Anthracene	1.6	U	
191-24-2	Benzo(G,H,I)Perylene	2.7	U	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6965-06

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6965-06

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6965X475

Level: (low/med) LOW Date Received: 10/12/89

% Moisture: not dec. dec. Date Extracted: 10/16/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/17/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	5.1	U	
496-11-7	2,3-Dihydroindene	1.5	B	
95-13-6	1H-Indene	0.9	U	
91-20-3	Naphthalene	6.6	B	
4565-32-6	Benzo(B)Thiophene	0.9	U	
91-22-5	Quinoline	1.5		
120-72-9	1H-Indole	1.6	J	*
91-57-6	2-Methylnaphthalene	8.2	B	*
90-12-0	1-Methylnaphthalene	5.5		
92-52-4	Biphenyl	2.6	J	
208-96-8	Acenaphthylene	1.4	U	
83-32-9	Acenaphthene	1.2	J	*
132-64-9	Dibenzofuran	1.0	U	
86-73-7	Fluorene	1.5		*
132-65-0	Dibenzothiophene	4.0		
85-01-8	Phenanthrene	6.0		
120-12-7	Anthracene	1.1	U	
260-94-6	Acridine	2.9	U	
86-74-8	Carbazole	1.9	U	
206-44-0	Fluoranthene	1.5		*
129-00-0	Pyrene	2.1		
56-55-3	Benzo(A)Anthracene	2.5	U	
218-01-9	Chrysene	1.2	J	*
205-99-2	Benzo(B)Fluoranthene	2.5	U	
207-08-9	Benzo(K)Fluoranthene	2.3	U	
192-97-2	Benzo(E)Pyrene	1.9	U	
50-32-8	Benzo(A)Pyrene	2.3	U	
198-55-0	Perylene	2.5	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U	
53-70-3	Dibenz(A,H)Anthracene	1.6	U	
191-24-2	Benzo(G,H,I)Perylene	2.8	U	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6965-07

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6965-07

Sample wt/vol: 500 (g/ml) ML Lab File ID: S6965X477

Level: (low/med) MED Date Received: 10/12/89

% Moisture: not dec. dec. Date Extracted: 10/16/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/17/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	600.	
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	250.	
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	160.	
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	120.	
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

6965-08

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 6965-08

Sample wt/vol: 500 (g/ml) ML Lab File ID: S6965X478

Level: (low/med) MED Date Received: 10/12/89

% Moisture: not dec. dec. Date Extracted: 10/16/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/17/89

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q	
271-89-6	2,3-Benzofuran	410.	U	
496-11-7	2,3-Dihydroindene	12000.		
95-13-6	1H-Indene	5400.		
91-20-3	Naphthalene	270.	J	
4565-32-6	Benzo(B)Thiophene	3600.		
91-22-5	Quinoline	110.	U	
120-72-9	1H-Indole	200.	U	
91-57-6	2-Methylnaphthalene	72.	U	
90-12-0	1-Methylnaphthalene	99.	J	*
92-52-4	Biphenyl	340.	U	
208-96-8	Acenaphthylene	110.	U	
83-32-9	Acenaphthene	100.	U	
132-64-9	Dibenzofuran	80.	U	
86-73-7	Fluorene	80.	U	
132-65-0	Dibenzothiophene	88.	U	
85-01-8	Phenanthrene	100.	U	
120-12-7	Anthracene	88.	U	
260-94-6	Acridine	230.	U	
86-74-8	Carbazole	150.	U	
206-44-0	Fluoranthene	110.	U	
129-00-0	Pyrene	110.	U	
56-55-3	Benzo(A)Anthracene	200.	U	
218-01-9	Chrysene	220.	U	
205-99-2	Benzo(B)Fluoranthene	200.	U	
207-08-9	Benzo(K)Fluoranthene	180.	U	
192-97-2	Benzo(E)Pyrene	150.	U	
50-32-8	Benzo(A)Pyrene	180.	U	
198-55-0	Perylene	200.	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U	
53-70-3	Dibenz(A,H)Anthracene	130.	U	
191-24-2	Benzo(G,H,I)Perylene	220.	U	

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	6965-01	74	54	41
2	6965-01DUP	62	58	50
3	6965-02	46	51	54
4	6965-04	570 *	37 *	83
5	6965-05	40	26 *	51
6	6965-06	56	61	44
7	BLK01	43	50	64

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
5	6965-07	40	60	72
6	6965-08	40	65	70
7	BLK01	36	58	76

	QC LIMITS
S1 (NAP) = D8-NAPHTHALENE	(14-108)
S2 (FLU) = D10-FLUORENE	(41-162)
S3 (CHR) = D12-CHRYSENE	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3C
WATER SEMIVOLATILE DUPLICATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

EPA Sample No.: 6965-01

COMPOUND	SAMPLE CONCENTRATION (ng/L)	DUPLICATE CONCENTRATION (ng/L)	% RPD
2,3-Dihydroindene	1.7	1.4	19
Naphthalene	8.8	7.2	20
2-Methylnaphthalene	9.1	7.7	17
1-Methylnaphthalene	4.9	4.1	18
Biphenyl	1.6	1.6	0
Dibenzofuran	1.2	ND	NC
Fluorene	2.1	1.4	40
Dibenzothiophene	1.9	1.5	24
Phenanthrene	6.3	5.1	21
Fluoranthene	2.4	2.3	4
Pyrene	2.7	2.9	7

COMMENTS:

ND = Not found
NC = Not calculated

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Lab File ID: S6965X452 Lab Sample ID: BLK01

Date Extracted: 10/16/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 11/16/89 Time Analyzed: 01:52

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: 4500-X

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	6965-01	6965-01	S6965X453	11/16/89
2	6965-01DUP	6965-01DUP	S6965X454	11/16/89
3	6965-02	6965-02	S6965X455	11/16/89
4	6965-04	6965-04	S6965X467	11/16/89
5	6965-05	6965-05	S6965X468	11/16/89
6	6965-06	6965-06	S6965X475	11/17/89

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: S6965X452

Level: (low/med) LOW Date Received: 10/12/89

% Moisture: not dec. dec. Date Extracted: 10/16/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/16/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.0	J
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	2.8	J
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	1.6	
90-12-0	1-Methylnaphthalene	1.6	U
92-52-4	Biphenyl	4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.4	U
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	U
50-32-8	Benzo(A)Pyrene	2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Lab File ID: S6965X479 Lab Sample ID: BLK01

Date Extracted: 10/16/89 Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 11/17/89 Time Analyzed: 16:11

Matrix: (soil/water) WATER Level: (low/med) MED

Instrument ID: 4500-X

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	6965-07	6965-07	S6965X477	11/17/89
2	6965-08	6965-08	S6965X478	11/17/89

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: RMAL Contract No.:

Lab Code: ENSECO Case No.: 6965 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 500 (g/ml) ML Lab File ID: S6965X479

Level: (low/med) MED Date Received: 10/12/89

% Moisture: not dec. dec. Date Extracted: 10/16/89

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/17/89

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410.	U
496-11-7	2,3-Dihydroindene	110.	U
95-13-6	1H-Indene	72.	U
91-20-3	Naphthalene	520.	U
4565-32-6	Benzo(B)Thiophene	72.	U
91-22-5	Quinoline	110.	U
120-72-9	1H-Indole	200.	U
91-57-6	2-Methylnaphthalene	72.	U
90-12-0	1-Methylnaphthalene	130.	U
92-52-4	Biphenyl	340.	U
208-96-8	Acenaphthylene	110.	U
83-32-9	Acenaphthene	100.	U
132-64-9	Dibenzofuran	80.	U
86-73-7	Fluorene	80.	U
132-65-0	Dibenzothiophene	88.	U
85-01-8	Phenanthrene	100.	U
120-12-7	Anthracene	88.	U
260-94-6	Acridine	230.	U
86-74-8	Carbazole	150.	U
206-44-0	Fluoranthene	110.	U
129-00-0	Pyrene	110.	U
56-55-3	Benzo(A)Anthracene	200.	U
218-01-9	Chrysene	220.	U
205-99-2	Benzo(B)Fluoranthene	200.	U
207-08-9	Benzo(K)Fluoranthene	180.	U
192-97-2	Benzo(E)Pyrene	150.	U
50-32-8	Benzo(A)Pyrene	180.	U
198-55-0	Perylene	200.	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170.	U
53-70-3	Dibenz(A,H)Anthracene	130.	U
191-24-2	Benzo(G,H,I)Perylene	220.	U

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6965 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
4800_PPT_PAH_STD	STDX791	09/21/89	11:40
20_PPT_PAH_STD	STDX792	09/21/89	13:37
240_PPT_PAH_STD	STDX793	09/21/89	14:46
40_PPT_PAH_STD	STDX794	09/21/89	16:01
1200_PPT_PAH_STD	STDX795	09/21/89	16:54

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6965 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PPT_PAH_STD	STDX446	11/15/89	17:49
BLK01	S6965X452	11/16/89	01:52
6965-01	S6965X453	11/16/89	02:46
6965-01DUP	S6965X454	11/16/89	03:40
6965-02	S6965X455	11/16/89	04:34

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6965 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PPT_PAH_STD	STDX459	11/16/89	11:08
6965-04	S6965X467	11/16/89	19:27
6965-05	S6965X468	11/16/89	20:11

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 6965 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PPT_PAH_STD	STDX472	11/17/89	08:42
6965-06	S6965X475	11/17/89	12:34
6965-07	S6965X477	11/17/89	14:23
6965-08	S6965X478	11/17/89	15:18
BLK01	S6965X479	11/17/89	16:11

INITIAL CALIBRATION DATA
PAH COMPOUNDS

ab Name: RMAL Lab Code: ENSECO Case No: 6965

Instrument ID: 4500-X Calibration Date(s): 09/21/89

Maximum % RSD is 35%

Lab File ID: RRF 20= STDX792 RRF 40= STDX794
RRF 240= STDX793 RRF 1200= STDX795 RRF 4800= STDX791

COMPOUND	20 PPT RRF	40 PPT RRF	240PPT RRF	1200PPT RRF	4800PPT RRF	AVE RRF	%RSD
D8-Naphthalene	2.331	2.503	2.450	2.535	2.400	2.444	3.3
D10-Flourene	1.524	1.553	1.512	1.504	1.544	1.527	1.4
D12-Chrysene	1.485	1.317	1.430	1.608	1.243	1.417	10.1
2,3-Benzofuran	1.363	1.377	1.355	1.345	1.255	1.339	3.6
2,3-Dihydroindene	1.371	1.429	1.383	1.365	1.253	1.360	4.8
1H-Indene	1.720	1.760	1.817	1.796	1.677	1.754	3.2
Naphthalene	2.314	2.852	2.747	2.877	2.503	2.659	9.1
Benzo(B)Thiophene	1.795	2.008	1.843	1.965	2.144	1.951	7.1
Quinoline	1.228	1.054	1.186	1.314	1.380	1.232	10.1
1H-Indole	1.471	1.498	1.591	1.726	1.811	1.619	9.0
2-Methylnaphthalene	1.310	1.397	1.392	1.432	1.400	1.386	3.3
1-Methylnaphthalene	1.218	1.271	1.101	1.512	1.451	1.311	12.9
Biphenyl	2.069	2.179	2.170	2.304	2.166	2.178	3.8
Acenaphthylene	2.576	2.665	2.581	2.569	2.524	2.583	2.0
Acenaphthene	1.659	1.687	1.644	1.620	1.591	1.640	2.2
Dibenzofuran	2.416	2.280	2.295	2.337	2.410	2.348	2.7
Flourene	1.763	1.825	1.817	1.817	1.851	1.815	1.8
Dibenzothiophene	1.507	1.475	1.526	1.424	1.379	1.462	4.1
Phenanthrene	1.539	1.405	1.485	1.446	1.427	1.460	3.6
Anthracene	1.352	1.291	1.407	1.474	1.454	1.396	5.4
Acridine	1.183	1.085	1.306	1.262	1.338	1.235	8.3
Carbazole	1.334	1.197	1.463	1.320	1.422	1.347	7.7
Fluoranthene	1.786	1.643	1.655	1.493	1.536	1.623	7.1
Pyrene	1.849	1.675	1.626	1.413	1.510	1.615	10.3
Benzo(A)Anthracene	1.478	1.514	1.563	1.704	1.514	1.555	5.7
Chrysene	1.268	1.459	1.505	1.627	1.322	1.436	10.0
Benzo(B)Fluoranthene	1.707	1.537	1.543	1.732	1.472	1.598	7.2
Benzo(K)Fluoranthene	1.716	1.838	1.768	1.700	1.508	1.706	7.2
Benzo(E)Pyrene	1.715	1.711	1.681	1.765	1.400	1.654	8.8
Benzo(A)Pyrene	1.559	1.449	1.512	1.544	1.380	1.489	5.0
Perylene	1.662	1.531	1.491	1.545	1.358	1.517	7.2
Indeno(1,2,3-CD)Pyrene	1.605	1.864	1.803	1.897	1.440	1.722	11.3
Dibenz(A,H)Anthracene	1.238	1.461	1.378	1.532	1.172	1.356	11.1
Benzo(G,H,I)Perylene	1.430	1.763	1.528	1.636	1.170	1.505	14.9

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

ıb Name: RMAL Lab Code: ENSECO Case No: 6965

Instrument ID: 4500-X Calibration Date(s): 11/15/89 Time: 17:49

Lab ID: STDX446 Initial Calibration Date: 09/21/89

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPT RRF	%D
D8-Naphthalene	2.444	2.718	-11.2
D10-Flourene	1.527	1.636	-7.1
D12-Chrysene	1.417	1.565	-10.4
2,3-Benzofuran	1.339	1.510	-12.8
2,3-Dihydroindene	1.360	1.584	-16.5
1H-Indene	1.754	1.978	-12.8
Naphthalene	2.659	3.069	-15.4
Benzo(B)Thiophene	1.951	2.424	-24.2
Quinoline	1.232	1.471	-19.4
1H-Indole	1.619	1.742	-7.6
2-Methylnaphthalene	1.386	1.544	-11.4
1-Methylnaphthalene	1.311	1.562	-19.1
Biphenyl	2.178	2.214	-1.7
Acenaphthylene	2.583	2.328	9.9
Acenaphthene	1.640	1.539	6.2
Dibenzofuran	2.348	2.410	-2.6
Flourene	1.815	1.767	2.6
Dibenzothiophene	1.462	1.400	4.2
Phenanthrene	1.460	1.520	-4.1
Anthracene	1.396	1.358	2.7
Acridine	1.235	1.202	2.7
Carbazole	1.347	1.363	-1.2
Fluoranthene	1.623	1.617	0.4
Pyrene	1.615	1.703	-5.4
Benzo(A)Anthracene	1.555	1.631	-4.9
Chrysene	1.436	1.611	-12.2
Benzo(B)Fluoranthene	1.598	1.834	-14.8
Benzo(K)Fluoranthene	1.706	1.690	0.9
Benzo(E)Pyrene	1.654	1.140	31.1
Benzo(A)Pyrene	1.489	1.471	1.2
Perylene	1.517	1.495	1.5
Indeno(1,2,3-CD)Pyrene	1.722	1.673	2.8
Dibenz(A,H)Anthracene	1.356	1.262	6.9
Benzo(G,H,I)Perylene	1.505	1.519	-0.9

FORM VII

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

ıb Name: RMAL Lab Code: ENSECO Case No: 6965

Instrument ID: 4500-X Calibration Date(s): 11/16/89 Time: 11:08

Lab ID: STDX459 Initial Calibration Date: 09/21/89

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPT RRF	%D
D8-Naphthalene	2.444	2.701	-10.5
D10-Flourene	1.527	1.610	-5.4
D12-Chrysene	1.417	1.579	-11.4
2,3-Benzofuran	1.339	1.520	-13.5
2,3-Dihydroindene	1.360	1.557	-14.5
1H-Indene	1.754	2.074	-18.2
Naphthalene	2.659	3.098	-16.5
Benzo(B)Thiophene	1.951	2.421	-24.1
Quinoline	1.232	1.516	-23.1
1H-Indole	1.619	1.750	-8.1
2-Methylnaphthalene	1.386	1.583	-14.2
1-Methylnaphthalene	1.311	1.560	-19.0
Biphenyl	2.178	2.353	-8.0
Acenaphthylene	2.583	2.201	14.8
Acenaphthene	1.640	1.664	-1.5
Dibenzofuran	2.348	2.384	-1.5
Flourene	1.815	1.713	5.6
Dibenzothiophene	1.462	1.373	6.1
Phenanthrene	1.460	1.481	-1.4
Anthracene	1.396	1.353	3.1
Acridine	1.235	1.136	8.0
Carbazole	1.347	1.248	7.3
Fluoranthene	1.623	1.610	0.8
Pyrene	1.615	1.657	-2.6
Benzo(A)Anthracene	1.555	1.475	5.1
Chrysene	1.436	1.425	0.8
Benzo(B)Fluoranthene	1.598	1.859	-16.3
Benzo(K)Fluoranthene	1.706	1.514	11.3
Benzo(E)Pyrene	1.654	1.758	-6.3
Benzo(A)Pyrene	1.489	1.454	2.4
Perylene	1.517	1.442	4.9
Indeno(1,2,3-CD)Pyrene	1.722	1.903	-10.5
Dibenz(A,H)Anthracene	1.356	1.509	-11.3
Benzo(G,H,I)Perylene	1.505	1.867	-24.1

FORM VII

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

ıb Name: RMAL | Lab Code: ENSECO | Case No: 6965

Instrument ID: 4500-X | Calibration Date(s): 11/17/89 | Time: 08:42

Lab ID: STDX472 | Initial Calibration Date: 09/21/89

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPT RRF	%D
D8-Naphthalene	2.444	2.688	-10.0
D10-Flourene	1.527	1.525	0.1
D12-Chrysene	1.417	1.300	8.3
2,3-Benzofuran	1.339	1.469	-9.7
2,3-Dihydroindene	1.360	1.524	-12.1
1H-Indene	1.754	1.965	-12.0
Naphthalene	2.659	3.223	-21.2
Benzo(B)Thiophene	1.951	2.346	-20.2
Quinoline	1.232	1.526	-23.9
1H-Indole	1.619	1.626	-0.4
2-Methylnaphthalene	1.386	1.505	-8.6
1-Methylnaphthalene	1.311	1.562	-19.1
Biphenyl	2.178	2.161	0.8
Acenaphthylene	2.583	2.140	17.2
Acenaphthene	1.640	1.496	8.8
Dibenzofuran	2.348	2.251	4.1
Flourene	1.815	1.638	9.8
Dibenzothiophene	1.462	1.368	6.4
Phenanthrene	1.460	1.517	-3.9
Anthracene	1.396	1.384	0.9
Acridine	1.235	1.213	1.8
Carbazole	1.347	1.315	2.4
Fluoranthene	1.623	1.695	-4.4
Pyrene	1.615	1.768	-9.5
Benzo(A)Anthracene	1.555	1.332	14.3
Chrysene	1.436	1.297	9.7
Benzo(B)Fluoranthene	1.598	1.529	4.3
Benzo(K)Fluoranthene	1.706	1.479	13.3
Benzo(E)Pyrene	1.654	1.457	11.9
Benzo(A)Pyrene	1.489	1.356	8.9
Perylene	1.517	1.359	10.4
Indeno(1,2,3-CD)Pyrene	1.722	1.890	-9.8
Dibenz(A,H)Anthracene	1.356	1.471	-8.5
Benzo(G,H,I)Perylene	1.505	1.647	-9.4

FORM VII

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 6965 SAS No.: SDG No:

Lab File ID (Standard): STDX446 Date Analyzed: 11/15/89

Instrument ID: 4500-X Time Analyzed: 17:49

	IS#1 (ACN) AREA	#	IS#2 (PHN) AREA	#	IS#3 (BAP) AREA	#
12 HOUR STD	88400		141000		102000	
UPPER LIMIT	177000		282000		204000	
LOWER LIMIT	44200		70500		51000	
SAMPLE NO.						
6965-01	167000		290000	*	236000	*
6965-01DUP	147000		250000		220000	*
6965-02	89100		152000		119000	
BLK01	124000		200000		152000	

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 6965 SAS No.: SDG No:

Lab File ID (Standard): STDX459 Date Analyzed: 11/16/89

Instrument ID: 4500-X Time Analyzed: 11:08

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	141000	227000	190000
UPPER LIMIT	282000	454000	380000
LOWER LIMIT	70500	114000	95000
SAMPLE NO.			
6965-04	292000 *	408000	343000
6965-05	482000 *	413000	367000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100% of internal standard area
LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 6965 SAS No.: SDG No:

Lab File ID (Standard): STDX472 Date Analyzed: 11/17/89

Instrument ID: 4500-X Time Analyzed: 08:42

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	168000	250000	264000
UPPER LIMIT	336000	500000	528000
LOWER LIMIT	84000	125000	132000
SAMPLE NO.			
6965-06	246000	435000	432000
6965-07	180000	300000	268000
6965-08	210000	376000	318000
BLK01	186000	338000	268000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100%
of internal standard area
LOWER LIMIT = - 50%
of internal standard area

Column used to flag internal standard area values with an asterisk

1/87 Rev.

FORM VIII SV-2