

**GROUNDWATER MONITORING
REPORT FOR THE
APRIL 2001 SAMPLING EVENT
GROUNDWATER INCIDENT NO. 10032**

**GIRMES SITE, FORMERLY SKF USA INC.
BUNCOMBE COUNTY, NORTH CAROLINA**

PREPARED BY RMT NORTH CAROLINA, INC.

May 2001

Robert P. Stevens, P.E.



Certification

The hydrogeology work for the Girmes Site, formerly SKF USA Inc., in Buncombe County, North Carolina, was performed by an RMT, Inc. consulting hydrogeologist in support of RMT North Carolina, Inc.

Dan O. Madison, Jr., P.G.
RMT, Inc.



Table of Contents

1.	Introduction.....	1
2.	Groundwater Elevations.....	2
3.	Groundwater and Surface Water Quality	5
3.1	Standard Monitoring Program.....	5
3.2	Tetrachloroethene	6
4.	Recovery System Performance	16

List of Tables

Table 1	Summary of Groundwater Elevations	3
Table 2	Groundwater and Surface Water Samples Collected April 10, 2001 through April 20, 2001	9
Table 3	Historical Trichloroethene Concentrations Detected in Groundwater	10
Table 4	Historical 1,2-Dichloroethene Concentrations Detected in Groundwater	13
Table 5	Operations Summary.....	17

List of Figures

Figure 1	Location of Data Points	8
----------	-------------------------------	---

List of Appendices

Appendix A	Hydrographs for Bedrock Wells
Appendix B	Laboratory Analytical Reports

List of Plates

Plate 1	Configuration of Water Table April 9, 2001
---------	--



Section 1

Introduction

The J.L. deBall Girmes of America (Girmes) site is a former textile plant located on Old Highway 74 East in Asheville, North Carolina. The site was formerly occupied by SKF USA Inc. (SKF) from approximately 1960 to 1973. The North Carolina Department of Environment and Natural Resources (NC DENR) issued SKF a Notice of Violation (NOV) on April 2, 1993 (Groundwater Incident Number 10032). In response to the NOV and associated correspondence, SKF conducted a Comprehensive Site Assessment (CSA) in 1993 and 1994. Volatile organic compounds (VOCs), in particular trichloroethene, 1,2-dichloroethene, and vinyl chloride, were found in groundwater at the site. The results of the CSA were submitted to NC DENR in November 1994. Following the CSA, a Corrective Action Plan (CAP) to address groundwater with dissolved VOCs was prepared and submitted to NC DENR in October 1996.

The CAP for the Girmes site is being implemented by RMT North Carolina, Inc. (RMT). A groundwater recovery system consisting of three groundwater recovery wells and an air stripper unit were installed in 1997 and early 1998. The system began operation on March 4, 1998.

The CAP specified that groundwater elevations are to be measured in all wells on a quarterly basis. Water samples are to be collected from all 29 monitoring wells, three recovery wells, and four surface water stations, on a semiannual basis. Thirteen of these monitoring wells, along with the three recovery wells, are also to be sampled quarterly. The CAP specifies that the samples are to be analyzed for trichloroethene, 1,2-dichloroethene, and vinyl chloride.

On December 11, 2000, NC DENR approved reducing the monitoring frequency from quarterly to semiannually. Beginning in 2001, the 29 monitoring wells, three recovery wells, and four surface water stations are sampled on a semiannual basis. Groundwater elevations are also measured on a semiannual basis. Water samples and elevations are now collected in April and October of each year.

This report presents results of the April 2001 sampling event.



Section 2

Groundwater Elevations

On April 9, 2001, groundwater levels were measured in all monitoring wells and recovery wells at the Girmes site. Water levels are summarized in Table 1 along with pre-startup elevations measured in January 1998, and historical water levels measured since system startup.

Water levels were used to construct the water table configuration shown on Plate 1. As specified in the CAP, hydrographs were also prepared for bedrock wells MW-4, MW-5, MW-14, MW-17, MW-18, MW-19, MW-21, MW-22, MW-23, MW-24, MW-27, and MW-28A. These hydrographs are presented in Appendix A. The hydrographs include water levels measured in 1997 to identify groundwater trends prior to system startup. Several wells exhibited significant drawdown after system startup. For these wells, an inferred data point based on the last actually measured water level prior to startup was plotted on the hydrograph for March 4, 1998, the date of system startup. The purpose of the inferred data point is to better illustrate drawdown since system startup.

The water table configuration and hydrographs for wells MW-14, MW-18, MW-19, MW-21, MW-22, MW-23, MW-24, and MW-27 continue to show a cone of depression around the recovery wells since system startup.

On the southwest side of the facility, wells MW-14, MW-18, MW-21, and MW-22 are dry. The remaining wells all exhibited increases in water levels since measured in October 2000. The amount of increase was 0.25 to 0.4 feet at wells MW-28 and MW-28A (located 600 feet northwest of the recovery well system) and was much greater, 0.93 to 4.39 feet, in wells closer to the recovery system. The water level in the three recovery wells increased 17 to 37 feet. The cone of depression continues to extend over 1,100 feet laterally in a northwest/southeast direction, parallel with Gashes Creek. The cone also continues to reach beneath Gashes Creek and encompasses well MW-23.

On the northeast side of the facility, water levels have generally increased 0.14 feet in well MW-16 to 7.86 feet in well MW-12. Four monitoring wells (MW-1, MW-5, MW-6, and MW-11) exhibited a decrease in water level. Monitoring wells MW-1, MW-5, and MW-6, located near the east corner of the Girmes facility, have continued to exhibit an overall decreasing trend in groundwater elevations since the startup of the remediation system. The remaining wells on this side of the facility appear to exhibit seasonal fluctuations. The overall water level trend in monitoring wells MW-1, MW-5, and MW-6 indicate that these wells are being affected by pumping of the groundwater recovery system on the southwest side of the facility.

Table 1
Summary of Groundwater Elevations

Page 1 of 2

Table 1
Summary of Groundwater Elevations

Page 2 of 2



Section 3

Groundwater and Surface Water Quality

Groundwater samples were collected from 24 monitoring wells and from recovery wells RW-1, RW-3, and RW-4 on April 10 through April 20, 2001. Surface water samples were also collected from the four surface water stations, SW-1, SW-2, SW-3, and SW-4. Sampling locations are shown on Figure 1 and Plate 1. Wells MW-14, MW-18, MW-21, and MW-22 were dry at that time due to drawdown and could not be sampled. Monitoring well MW-2 also was not sampled as the well was temporarily inaccessible. Well MW-2 will be sampled during the next sampling event in October 2001. Groundwater samples were analyzed for trichloroethene, 1,2-dichloroethene, and vinyl chloride. In addition, six monitoring wells and recovery wells RW-1, RW-3, and RW-4 were analyzed for tetrachloroethene. Analytical results are summarized in Table 2. Laboratory analytical reports are presented in Appendix B. Table 3 and Table 4 present summaries of historical concentrations of trichloroethene and 1,2-dichloroethene.

3.1 Standard Monitoring Program

During the April 2001 sampling event, 17 monitoring wells were sampled on the northeast side of the Girmes facility (Plate 1). Trichloroethene was detected in samples collected from ten wells, with the concentrations exceeding the NC 2L standard of 0.0028 mg/L in five of the wells. Trichloroethene concentrations decreased in eight monitoring wells – MW-4, MW-5, MW-7, MW-9, MW-10, MW-11, MW-17, and MW-20. Two wells, MW-8 and MW-15A had increases in trichloroethene concentrations. 1,2-Dichloroethene was detected in samples collected from five monitoring wells. The detected concentrations exceeded the NC 2L standard of 0.07 mg/L in only three wells – MW-4, MW-5, and MW-10. 1,2-Dichloroethene concentrations increased in only one well, MW-4. While the concentration in well MW-5 remained generally unchanged, the 1,2-dichloroethene concentration decreased in wells MW-9, MW-10, and MW-20. Neither trichloroethene nor 1,2-dichloroethene was detected in monitoring well MW-13.

Vinyl chloride was detected in samples collected from wells MW-4, MW-10, and MW-13, on the northeast side of the Girmes facility, at concentrations that exceeded the NC 2L standard of 0.000015 mg/L. Vinyl chloride was not detected in MW-4 or MW-10 during the October 2000 sampling event. The vinyl chloride concentrations in well MW-13 have decreased since the last sampling event in October 2000.

On the southwest side of the Girmes facility, seven monitoring wells – MW-19, MW-23, MW-24, MW-26R, MW-27, MW-28, and MW-28A – and three recovery wells – RW-1, RW-3, and RW-4 –

were sampled. Monitoring wells MW-14, MW-18, MW-21, and MW-22 were dry and could not be sampled. Trichloroethene was detected in groundwater samples from five monitoring wells (MW-19, MW-23, MW-24, MW-26R, and MW-28A) and all three recovery wells. With the exception of well MW-26R, detected concentrations in all of the wells exceeded NC 2L standards. 1,2-Dichloroethene was detected in groundwater samples from four of the monitoring wells (MW-19, MW-23, MW-26R, and MW-28A) and in all three recovery wells. None of the detected concentrations of 1,2-dichloroethene exceeded the NC 2L standard.

Trichloroethene concentrations decreased in monitoring wells MW-19 and MW-28A and in recovery wells RW-1 and RW-3 since last sampled in October 2000. The trichloroethene concentration increased in monitoring wells MW-23 and MW-26R and recovery well RW-4. Trichloroethene concentrations remained generally the same in monitoring wells MW-24. Concentrations of 1,2-dichloroethene continue to decreased in monitoring wells MW-19 and MW-28A and recovery well RW-1, and have increased slightly in monitoring wells MW-23 and MW-26R and recovery well RW-4. The 1,2-dichloroethene concentration in the recovery well RW-3 was generally unchanged.

Vinyl chloride was detected in only one monitoring well (MW-26R) on the southwest side of the Girmes facility. This well is located on Dotson's property on the southwest side of Gashes Creek. The detected concentration in MW-26R, 0.0035 mg/L, is a slight increase from the previous sampling event but remains above the NC 2L standard.

Surface water samples were collected from four surface water stations during the April 2001 sampling event, SW-1, SW-2, SW-3, and SW-4. None of the surface water samples collected had detections of trichloroethene, 1,2-dichloroethene, or vinyl chloride.

3.2 Tetrachloroethene

Since shortly after startup of the groundwater recovery system, tetrachloroethene has been found in the influent to the treatment system. Select monitoring wells sampled during the January 1999 monitoring event were analyzed for tetrachloroethene in addition to the standard analytical parameters. The January 1999 analytical results, along with historical groundwater analytical data collected at the site during the CSA, led SKF to conclude that the tetrachloroethene and other VOCs found on the southwest side of Gashes Creek have no relationship to the affected groundwater found on the Girmes facility.

In the groundwater monitoring report for the January 1999 sampling event, SKF modified the groundwater monitoring program to continue monitoring all of the wells specified in the CAP according to the specified schedule. In addition to trichloroethene, 1,2-dichloroethene, and

vinyl chloride, recovery wells RW-1, RW-3, and RW-4 and select monitoring wells would also be sampled for tetrachloroethene.

During the April 2001 sampling event, monitoring wells MW-19, MW-23, MW-24, MW-26R, MW-28, and MW-28A and the three recovery wells were analyzed for tetrachloroethene. Analytical results are included in Table 2. Tetrachloroethene was detected in samples collected from monitoring wells MW-23 and MW-28A located on the southwest side of Gashes Creek. Tetrachloroethene was also detected in samples collected from two of the recovery wells, RW-1 and RW-3. These wells recover groundwater from the southwest side of Gashes Creek as indicated by the water table map on Plate 1. All four wells had tetrachloroethene concentrations exceeding the NC 2L standard. Tetrachloroethene has consistently been found in these wells since analyses for trichloroethene began in January 1999.

The analytical results for tetrachloroethene confirm the results obtained in January, April, July, and October 1999 and January, April, July, and October 2000. The tetrachloroethene found in these wells appears to be the result of a release on the southwest side of Gashes Creek and does not appear to be related to groundwater quality on the Girmes facility. However, for the time being, SKF will continue analyzing groundwater samples from wells MW-19, MW-23, MW-24, MW-26R, MW-28, MW-28A, RW-1, RW-3, and RW-4 for tetrachloroethene in order to monitor concentration trends and their effects on the groundwater recovery system.

Figure 1 Location of Data Points

Table 2
Groundwater and Surface Water Samples
Collected April 10, 2001 through April 20, 2001

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 1 of 3

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 2 of 3

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 3 of 3

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 1 of 3

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 2 of 3

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 3 of 3



Section 4

Recovery System Performance

The groundwater recovery system uses three recovery wells to capture affected groundwater. Water from these wells is pumped to an air stripper, where VOCs are removed, and treated water is discharged into Gashes Creek. Influent and effluent to the stripper is sampled on a monthly basis. Effluent flow is recorded continuously. The analytical results for the influent and effluent are used along with the flow data to estimate the amount of trichloroethene removed each month. Monthly volumes of treated groundwater and the estimated amount of trichloroethene removed since system startup in March 1998 through April 2001 are summarized in Table 5. The estimated amount of groundwater that was recovered and treated during November 2000 through April 2001 is 5.99 million gallons. It is estimated that over 35 pounds of trichloroethene were removed during November 2000 through April 2001.

The pumping rates in all three recovery wells will continue to be adjusted periodically until water level equilibrium near the bottom of the wells can be reached.

**Table 5
Operations Summary**

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
02/98	0	0	0	Not operational
03/98	28	1.58	N/C ⁽¹⁾	Startup 3/4/98
04/98	30	1.62	39.1	Normal operation
05/98	31	1.64	35.6	Normal operation
06/98	30	1.58	17.1	Normal operation
07/98	31	1.53	17.9	Normal operation. Adjusted pump rate for RW-4
08/98	31	1.42	14.2	RMT coordinating maintenance of pump controllers
09/98	30	1.47	13.5	Normal operation, pump controllers repaired/calibrated
10/98	31	1.40	11.7	Removed pump from RW-3. Pump will be cleaned and repaired, as needed.
11/98	30	1.30	11.9	RW-3 pump replaced
12/98	31	1.28	6.7	Normal operation
01/99	31	1.31	7.5	Auto dialer was reprogrammed. System inspected.
02/99	28	1.33	7.42	Normal operation
03/99	31	1.33	3.27	Normal operation. Calibrated flow meter and updated flow meter software.
04/99	30	1.35	1.90	Normal operation. System inspected during groundwater sampling.
05/99	31	1.46	10.7	Normal operation
06/99	30	1.39	7.06	Normal operation
07/99	31	1.46	7.05	Normal operation
08/99	31	1.42	7.1	Normal operation
09/99	30	1.33	6.6	Normal operation

**Table 5
Operations Summary**

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
10/99	31	1.35	4.5	Normal operation. System inspected during groundwater sampling.
11/99	30	1.31	6.1	Normal operation
12/99	31	1.29	6.0	Normal operation
01/00	31	1.19	5.2	Normal operation
02/00	29	1.17	5.8	Normal operation
03/00	31	1.25	6.6	Normal operation
04/00	30	1.08	6.3	Normal operation
05/00	31	0.661	1.05	Flow from RW-4 has declined. Field technician will adjust flow
06/00	30	0.693	1.9	Maintenance issues identified during site visit. Flow remains lower than normal
07/00	31	0.624 ⁽²⁾	3.02	Pumps functional at a reduced rate. Meters are marginally functional.
08/00	31	0.725	4.6	Replacement equipment purchased, operation and maintenance (O&M) trip scheduled.
09/00	30	1.274	11.7	Repairs made on September 6 and 7. Flow restored to approximately 45,000 gpd.
10/00	31	1.27 ⁽²⁾	12.7	Normal operation
11/00	30	1.10	17.4	Effluent flow meter calibrated, normal operation
12/00	31	1.03	5.5	Normal operation
1/01	31	1.02	3.9	Normal operation
2/01	28	0.97	2.7	Normal operation
3/01	31	0.85	2.8 ⁽²⁾	Normal operation
4/01	30	1.02	3.2	Flow rates adjusted and yield increased
Total since system startup	1,156	47.073	337.27	For period beginning March 4, 1998, and ending October April 30, 2001.

⁽¹⁾ Excluding March 1998.

⁽²⁾ Estimated, flow data not yet available



Appendix A

Hydrographs for Bedrock Wells



Appendix B

Laboratory Analytical Reports

**GROUNDWATER MONITORING
REPORT FOR THE
OCTOBER 2001 SAMPLING EVENT
GROUNDWATER INCIDENT NO. 10032**

**GIRMES SITE, FORMERLY SKF USA INC.
BUNCOMBE COUNTY, NORTH CAROLINA**

PREPARED BY RMT NORTH CAROLINA, INC.

December 2001



Certification

The hydrogeology work for the Girmes Site, formerly SKF USA Inc., in Buncombe County, North Carolina, was performed by an RMT, Inc. consulting hydrogeologist in support of RMT North Carolina, Inc.

Dan O. Madison, Jr., P.G.
RMT, Inc.



Table of Contents

1.	Introduction.....	1
2.	Groundwater Elevations.....	2
3.	Groundwater and Surface Water Quality	5
3.1	Standard Monitoring Program.....	5
3.2	Tetrachloroethene	6
4.	Recovery System Performance	18

List of Tables

Table 1	Summary of Groundwater Elevations	3
Table 2	Analytical Results for Groundwater and Surface Water Samples Collected October 3 through October 5, 2001	9
Table 3	Historical Trichloroethene Concentrations Detected in Groundwater	10
Table 4	Historical 1,2-Dichloroethene Concentrations Detected in Groundwater	14
Table 5	Operations Summary.....	19

List of Figures

Figure 1	Location of Data Points	8
----------	-------------------------------	---

List of Appendices

Appendix A	Hydrographs for Bedrock Wells
Appendix B	Laboratory Analytical Reports

List of Plates

Plate 1	Configuration of Water Table October 3, 2001
---------	--



Section 1

Introduction

The J.L. deBall Girmes of America (Girmes) site is a former textile plant located on Old Highway 74 East in Asheville, North Carolina. Girmes owned the site from 1973 until 2001 when it was purchased by LMC, LLC. The site was formerly occupied by SKF USA Inc. (SKF) from approximately 1960 to 1973. The North Carolina Department of Environment and Natural Resources (NC DENR) issued SKF a Notice of Violation (NOV) on April 2, 1993 (Groundwater Incident Number 10032). In response to the NOV and associated correspondence, SKF conducted a Comprehensive Site Assessment (CSA) in 1993 and 1994. Volatile organic compounds (VOCs), in particular trichloroethene, 1,2-dichloroethene, and vinyl chloride, were found in groundwater at the site. The results of the CSA were submitted to NC DENR in November 1994. Following the CSA, a Corrective Action Plan (CAP) to address groundwater with dissolved VOCs was prepared and submitted to NC DENR in October 1996.

The CAP for the Girmes site is being implemented by RMT North Carolina, Inc. (RMT). A groundwater recovery system consisting of three groundwater recovery wells and an air stripper unit were installed in 1997 and early 1998. The system began operation on March 4, 1998.

The CAP specified that groundwater elevations are to be measured in all wells on a quarterly basis. Water samples are to be collected from all 29 monitoring wells, three recovery wells, and four surface water stations, on a semiannual basis. Thirteen of these monitoring wells, along with the three recovery wells, are also to be sampled quarterly. The CAP specifies that the samples are to be analyzed for trichloroethene, 1,2-dichloroethene, and vinyl chloride.

On December 11, 2000, NC DENR approved reducing the monitoring frequency from quarterly to semiannually. Beginning in 2001, the 29 monitoring wells, three recovery wells, and four surface water stations are sampled on a semiannual basis. Groundwater elevations are also measured on a semiannual basis. Water samples and elevations are now collected in April and October of each year.

This report presents results of the October 2001 sampling event.



Section 2

Groundwater Elevations

On October 3, 2001, groundwater levels were measured in monitoring wells and recovery wells at the Girmes site. Water levels are summarized in Table 1 along with pre-startup elevations measured in January 1998, and historical water levels measured since system startup.

Water levels were used to construct the water table map shown on Plate 1. As specified in the CAP, hydrographs were also prepared for bedrock wells MW-4, MW-5, MW-14, MW-17, MW-18, MW-19, MW-21, MW-22, MW-23, MW-24, MW-27, and MW-28A. These hydrographs are presented in Appendix A. The hydrographs include water levels measured in 1997 to identify groundwater trends prior to system startup. Several wells exhibited significant drawdown after system startup. For these wells, an inferred data point based on the last actually measured water level prior to startup was plotted on the hydrograph for March 4, 1998, the date of system startup. The purpose of the inferred data point is to better illustrate drawdown since system startup.

The water table configuration and hydrographs for wells MW-14, MW-18, MW-19, MW-21, MW-22, MW-23, MW-24, and MW-27 continue to show a cone of depression around the recovery wells since system startup.

On the southwest side of the facility, wells MW-14, MW-18, MW-21, and MW-22 continue to be dry. The remaining monitoring wells all exhibited decreases in water levels since measured in April 2001. The amount of decrease was 0.23 to 0.52 feet at wells MW-28 and MW-28A (located 600 feet northwest of the recovery well system) and was much greater, 1.16 to 4.82 feet, in wells closer to the recovery system. The water level in the three recovery wells decreased 26.54 to 35.74 feet. The cone of depression continues to extend over 1,100 feet laterally in a northwest/southeast direction, parallel with Gashes Creek. The cone also continues to reach beneath Gashes Creek and encompasses well MW-23.

On the northeast side of the facility, water levels in most of the monitoring wells have decreased 0.07 feet in well MW-4 to 6.95 feet in well MW-12. The water level in monitoring well MW-5 has remained relatively unchanged. Monitoring wells MW-1 and MW-6, located near the east corner of the Girmes facility, have continued to exhibit an overall decreasing trend in groundwater elevations since the startup of the remediation system. The remaining wells on this side of the facility appear to exhibit seasonal fluctuations. The overall water level trend in monitoring wells MW-1, MW-5, and MW-6 indicate that these wells are being affected by pumping of the groundwater recovery system on the southwest side of the facility.

Table 1
Summary of Groundwater Elevations

Page 1 of 2

Table 1
Summary of Groundwater Elevations

Page 2 of 2



Section 3

Groundwater and Surface Water Quality

Groundwater samples were collected from 25 monitoring wells and from recovery wells RW-1, RW-3, and RW-4 on October 3 through October 5, 2001. Surface water samples were also collected from the four surface water stations, SW-1, SW-2, SW-3, and SW-4. Sampling locations are shown on Figure 1 and Plate 1. Wells MW-14, MW-18, MW-21, and MW-22 were dry at that time due to drawdown and could not be sampled. Groundwater samples were analyzed for trichloroethene, 1,2-dichloroethene, and vinyl chloride. In addition, six monitoring wells and recovery wells RW-1, RW-3, and RW-4 were analyzed for tetrachloroethene. Analytical results are summarized in Table 2. Laboratory analytical reports are presented in Appendix B. Table 3 and Table 4 present summaries of historical concentrations of trichloroethene and 1,2-dichloroethene.

3.1 Standard Monitoring Program

During the October 2001 sampling event, 18 monitoring wells were sampled on the northeast side of the Girmes facility (Plate 1). Trichloroethene was detected in samples collected from eleven wells, with the concentrations exceeding the NC 2L standard of 0.0028 mg/L in eight of the wells. Trichloroethene concentrations increased in seven monitoring wells – MW-4, MW-5, MW-9, MW-11, MW-13, MW-16A, and MW-17. Two wells, MW-2 and MW-7, had decreases in trichloroethene concentrations. Trichloroethene concentrations remained generally unchanged in wells MW-8 and MW-10. 1,2-Dichloroethene was detected in samples collected from five monitoring wells. The detected concentrations exceeded the NC 2L standard of 0.07 mg/L in only three wells – MW-4, MW-5, and MW-10. 1,2-Dichloroethene concentrations increased in only two wells, MW-4 and MW-9. While the concentration in well MW-5 remained generally unchanged, the 1,2-dichloroethene concentration decreased in wells MW-2 and MW-10.

Vinyl chloride was detected in samples collected from only one well, MW-13, on the northeast side of the Girmes facility, at concentrations that exceeded the NC 2L standard of 0.000015 mg/L. The vinyl chloride concentrations in well MW-13 have decreased since the last sampling event in April 2001.

On the southwest side of the Girmes facility, seven monitoring wells – MW-19, MW-23, MW-24, MW-26R, MW-27, MW-28, and MW-28A – and three recovery wells – RW-1, RW-3, and RW-4 – were sampled. Monitoring wells MW-14, MW-18, MW-21, and MW-22 were dry and could not be sampled. Trichloroethene was detected in groundwater samples from five monitoring wells (MW-19, MW-23, MW-24, MW-26R, and MW-28A) and all three recovery wells. Detected

concentrations exceeded NC 2L standards. 1,2-Dichloroethene was detected in groundwater samples from four of the monitoring wells (MW-19, MW-23, MW-26R, and MW-28A) and in all three recovery wells. Only MW-26R had concentrations of 1,2-dichloroethene exceeding the NC 2L standard.

Trichloroethene concentrations decreased in monitoring wells MW-23, MW-24, and MW-28A and in recovery wells RW-1 and RW-4 since last sampled in April 2001. The trichloroethene concentrations increased in monitoring wells MW-19 and MW-26R and recovery well RW-3. Concentrations of 1,2-dichloroethene decreased in monitoring well MW-23 and recovery wells RW-1 and RW-4, while concentrations have increased slightly in monitoring wells MW-19 and MW-26R. The 1,2-dichloroethene concentration in monitoring well MW-28A and recovery well RW-3 were generally unchanged.

Vinyl chloride was detected in one monitoring well (MW-26R) on the southwest side of the Girmes facility. This well is located on Dotson's property on the southwest side of Gashes Creek. The detected concentration in MW-26R, 0.066 mg/L, is a slight increase from the previous sampling event and remains above the NC 2L standard.

Surface water samples were collected from four surface water stations during the October 2001 sampling event, SW-1, SW-2, SW-3, and SW-4. None of the surface water samples collected had detections of trichloroethene, 1,2-dichloroethene, or vinyl chloride.

3.2 Tetrachloroethene

Since shortly after startup of the groundwater recovery system, tetrachloroethene has been found in the influent to the treatment system. Select monitoring wells sampled during the January 1999 monitoring event were analyzed for tetrachloroethene in addition to the standard analytical parameters. The January 1999 analytical results, along with historical groundwater analytical data collected at the site during the CSA, led SKF to conclude that the tetrachloroethene and other VOCs found on the southwest side of Gashes Creek have no relationship to the affected groundwater found on the Girmes facility.

In the groundwater monitoring report for the January 1999 sampling event, SKF modified the groundwater monitoring program to continue monitoring all of the wells specified in the CAP according to the specified schedule. In addition to trichloroethene, 1,2-dichloroethene, and vinyl chloride, recovery wells RW-1, RW-3, and RW-4 and select monitoring wells would also be sampled for tetrachloroethene.

During the October 2001 sampling event, monitoring wells MW-19, MW-23, MW-24, MW-26R, MW-28, and MW-28A and the three recovery wells were analyzed for tetrachloroethene. A

blind duplicate sample for monitoring well MW-16 was also analyzed for tetrachloroethene. Analytical results are included in Table 2. Tetrachloroethene was detected in samples collected from monitoring wells MW-23 and MW-28A located on the southwest side of Gashes Creek. Tetrachloroethene was also detected in samples collected from two of the recovery wells, RW-1 and RW-3. These wells recover groundwater from the southwest side of Gashes Creek as indicated by the water table map on Plate 1. All four wells had tetrachloroethene concentrations exceeding the NC 2L standard. Tetrachloroethene has consistently been found in these wells since analyses for tetrachloroethene began in January 1999. Tetrachloroethene was also found in the blind duplicate sample for well MW-16. The detected concentration in this well was below the NC 2L standard.

The analytical results for tetrachloroethene confirm the results obtained in January, April, July, and October 1999, January, April, July, and October 2000, and April 2001. The tetrachloroethene found in these wells appears to be the result of a release on the southwest side of Gashes Creek and does not appear to be related to groundwater quality on the Girmes facility. However, for the time being, SKF will continue analyzing groundwater samples from wells MW-19, MW-23, MW-24, MW-26R, MW-28, MW-28A, RW-1, RW-3, and RW-4 for tetrachloroethene in order to monitor concentration trends and their effects on the groundwater recovery system.

Figure 1 Location of Data Points

Table 2
Analytical Results for Groundwater and Surface Water Samples
Collected October 3 through October 5, 2001

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 1 of 4

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 2 of 4

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 3 of 4

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 4 of 4

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 1 of 4

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 2 of 4

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 3 of 4

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 4 of 4



Section 4

Recovery System Performance

The groundwater recovery system uses three recovery wells to capture affected groundwater. Water from these wells is pumped to an air stripper, where VOCs are removed, and treated water is discharged into Gashes Creek. Influent and effluent to the stripper is sampled on a monthly basis. Effluent flow is recorded continuously. The analytical results for the influent and effluent are used along with the flow data to estimate the amount of trichloroethene removed each month. Monthly volumes of treated groundwater and the estimated amount of trichloroethene removed since system startup in March 1998 through October 2001 are summarized in Table 5. The estimated amount of groundwater that was recovered and treated during May 2001 through October 2001 is 6.56 million gallons. It is estimated that over 24 pounds of trichloroethene were removed during May 2001 through October 2001.

The pumping rates in all three recovery wells will continue to be adjusted periodically until water level equilibrium near the bottom of the wells can be reached.

**Table 5
Operations Summary**

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
02/98	0	0	0	Not operational
03/98	28	1.58	N/C	Startup 3/4/98
04/98	30	1.62	39.1	Normal operation
05/98	31	1.64	35.6	Normal operation
06/98	30	1.58	17.1	Normal operation
07/98	31	1.53	17.9	Normal operation. Adjusted pump rate for RW-4
08/98	31	1.42	14.2	RMT coordinating maintenance of pump controllers
09/98	30	1.47	13.5	Normal operation, pump controllers repaired/calibrated
10/98	31	1.40	11.7	Removed pump from RW-3. Pump will be cleaned and repaired, as needed.
11/98	30	1.30	11.9	RW-3 pump replaced
12/98	31	1.28	6.7	Normal operation
01/99	31	1.31	7.5	Auto dialer was reprogrammed. System inspected.
02/99	28	1.33	7.42	Normal operation
03/99	31	1.33	3.27	Normal operation. Calibrated flow meter and updated flow meter software.
04/99	30	1.35	1.90	Normal operation. System inspected during groundwater sampling.
05/99	31	1.46	10.7	Normal operation
06/99	30	1.39	7.06	Normal operation
07/99	31	1.46	7.05	Normal operation
08/99	31	1.42	7.1	Normal operation
09/99	30	1.33	6.6	Normal operation

**Table 5
Operations Summary**

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
10/99	31	1.35	4.5	Normal operation. System inspected during groundwater sampling.
11/99	30	1.31	6.1	Normal operation
12/99	31	1.29	6.0	Normal operation
01/00	31	1.19	5.2	Normal operation
02/00	29	1.17	5.8	Normal operation
03/00	31	1.25	6.6	Normal operation
04/00	30	1.08	6.3	Normal operation
05/00	31	0.661	1.05	Flow from RW-4 has declined. Field technician will adjust flow
06/00	30	0.693	1.9	Maintenance issues identified during site visit. Flow remains lower than normal
07/00	31	0.624 ⁽²⁾	3.02	Pumps functional at a reduced rate. Meters are marginally functional.
08/00	31	0.725	4.6	Replacement equipment purchased, operation and maintenance (O&M) trip scheduled.
09/00	30	1.274	11.7	Repairs made on September 6 and 7. Flow restored to approximately 45,000 gpd.
10/00	31	1.27 ⁽²⁾	12.7	Normal operation
11/00	30	1.10	17.4	Effluent flow meter calibrated, normal operation
12/00	31	1.03	5.5	Normal operation
1/01	31	1.02	3.9	Normal operation
2/01	28	0.97	2.7	Normal operation
3/01	31	0.85	2.8 ⁽²⁾	Normal operation
4/01	30	1.02	3.2	Flow rates adjusted and yield increased
5/01	31	1.05	5.2	Normal operation
6/01	30	1.11	4.4	Normal operation
7/01	31	1.14	3.8	Normal operation
8/01	31	1.14	3.6	Normal operation

**Table 5
Operations Summary**

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
9/01	30	1.06	3.9	Normal operation
10/01	31	1.06 ⁽¹⁾	3.9 ⁽²⁾	Normal operation
Total since system startup	1,340	53.633	362.07	For period beginning March 4, 1998, and ending October 31, 2001.

⁽¹⁾ Not calculated, no influent sample collected

⁽²⁾ Estimated, flow data not yet available



Appendix A

Hydrographs for Bedrock Wells



Appendix B

Laboratory Analytical Reports

100 Verdae Boulevard (29607-3825)
PO Box 16778 (29606-6778)
Greenville, South Carolina
Telephone (864) 281-0030
Fax (864) 281-0288

Groundwater Monitoring Report for the April 2002 Sampling Event Groundwater Incident No. 10032

Girmes Site, Formerly SKF USA Inc.

Bumcombe County, North Carolina

June 2002

Michael B. Parker, P.E.
Senior Client Service Manager

Certification

The hydrogeology work for the Girmes Site, formerly SKF USA Inc., in Buncombe County, North Carolina, was performed by an RMT, Inc. consulting hydrogeologist in support of RMT North Carolina, Inc.

Dan O. Madison, Jr., P.G.
RMT, Inc.

Table of Contents

Certification	ii
1. Introduction.....	1
2. Groundwater Elevations.....	2
3. Groundwater and Surface Water Quality	5
3.1 Standard Monitoring Program.....	5
3.2 Tetrachloroethene	6
4. Recovery System Performance	18

List of Tables

Table 1	Summary of Groundwater Elevations	3
Table 2	Analytical Results for Groundwater and Surface Water Samples Collected April 2 through April 3, 2002.....	9
Table 3	Historical Trichloroethene Concentrations Detected in Groundwater	10
Table 4	Historical 1,2-Dichloroethene Concentrations Detected in Groundwater.....	14
Table 5	Operations Summary for Period Beginning March 4, 1998, and Ending April 30, 2002	19

List of Figures

Figure 1	Location of Data Points	8
----------	-------------------------------	---

List of Appendices

Appendix A	Hydrographs for Bedrock Wells
Appendix B	Laboratory Analytical Reports

List of Plates

Plate 1	Configuration of Water Table April 1, 2002
---------	--

Section 1

Introduction

The J.L. deBall Girmes of America (Girmes) site is a former textile plant located on Old Highway 74 East in Asheville, North Carolina. Girmes owned the site from 1973 until 2001 when it was purchased by LMC, LLC. The site was formerly occupied by SKF USA Inc. (SKF) from approximately 1960 to 1973. The North Carolina Department of Environment and Natural Resources (NC DENR) issued SKF a Notice of Violation (NOV) on April 2, 1993 (Groundwater Incident Number 10032). In response to the NOV and associated correspondence, SKF conducted a comprehensive site assessment (CSA) in 1993 and 1994. Volatile organic compounds (VOCs), in particular trichloroethene (TCE), 1,2-dichloroethene (1,2-DCE), and vinyl chloride, were found in groundwater at the site. The results of the CSA were submitted to NC DENR in November 1994. Following the CSA, a corrective action plan (CAP) to address groundwater with dissolved VOCs was prepared and submitted to NC DENR in October 1996.

The CAP for the Girmes site is being implemented by RMT North Carolina, Inc. (RMT). A groundwater recovery system consisting of three groundwater recovery wells and an air stripper unit were installed in 1997 and early 1998. The system began operation on March 4, 1998.

The CAP specified that groundwater elevations are to be measured in all wells on a quarterly basis. Water samples are to be collected from all 29 monitoring wells, three recovery wells, and four surface water stations, on a semiannual basis. Thirteen of these monitoring wells, along with the three recovery wells, are also to be sampled quarterly. The CAP specifies that the samples are to be analyzed for TCE, 1,2-DCE, and vinyl chloride.

On December 11, 2000, NC DENR approved reducing the monitoring frequency from quarterly to semiannually. Beginning in 2001, the 29 monitoring wells, three recovery wells, and four surface water stations are sampled on a semiannual basis. Groundwater elevations are also measured on a semiannual basis. Water samples and elevations are now collected in April and October of each year.

This report presents results of the April 2002 sampling event.

Section 2

Groundwater Elevations

On April 1, 2002, groundwater levels were measured in monitoring wells and recovery wells at the Girmes site. Water levels are summarized in Table 1 along with pre-startup elevations measured in January 1998, and historical water levels measured since system startup.

Water levels were used to construct the water table map shown on Plate 1. As specified in the CAP, hydrographs were also prepared for bedrock wells MW-4, MW-5, MW-14, MW-17, MW-18, MW-19, MW-21, MW-22, MW-23, MW-24, MW-27, and MW-28A. These hydrographs are presented in Appendix A. The hydrographs include water levels measured in 1997 to identify groundwater trends prior to system startup. Several wells exhibited significant drawdown after system startup. For these wells, an inferred data point based on the last actually measured water level prior to startup was plotted on the hydrograph for March 4, 1998, the date of system startup. The purpose of the inferred data point is to better illustrate drawdown since system startup.

The water table configuration and hydrographs for wells MW-14, MW-18, MW-19, MW-21, MW-22, MW-23, MW-24, and MW-27 have continued to show a cone of depression around the recovery wells since system startup.

On the southwest side of the facility, wells MW-14, MW-18, MW-21, and MW-22 continue to be dry. With the exception of MW-26R, the remaining monitoring wells all exhibited increases in water levels since measured in October 2001. The amount of increase was 1.16 to 0.76 feet at wells MW-28 and MW-28A (located 600 feet northwest of the recovery well system) and was similar, 0.89 to 1.36 feet, in wells closer to the recovery system. The water level in the three recovery wells increased 4.61 to 54.09 feet. Although recovery well RW-3 was not operational during the April 2002 sampling event, the cone of depression continues to extend over 1,100 feet laterally in a northwest/southeast direction, parallel with Gashes Creek. The cone also continues to reach beneath Gashes Creek and encompasses well MW-23.

On the northeast side of the facility, water levels in most of the monitoring wells have increased 0.02 feet in well MW-16 to 5.32 feet in well MW-12. Monitoring wells MW-1, MW-5, and MW-6, located near the east corner of the Girmes facility, have continued to exhibit an overall decreasing trend in groundwater elevations since the startup of the remediation system. The overall water level trend in monitoring wells MW-1, MW-5, and MW-6 indicate that these wells are being affected by pumping of the groundwater recovery system on the southwest side of the facility.

Table 1
Summary of Groundwater Elevations

Page 1 of 2

Table 1
Summary of Groundwater Elevations

Page 2 of 2

Section 3

Groundwater and Surface Water Quality

Groundwater samples were collected from 25 monitoring wells and from recovery wells RW-1, RW-3, and RW-4 on April 2 through April 3, 2002. Surface water samples were also collected from the four surface water stations, SW-1, SW-2, SW-3, and SW-4. Sampling locations are shown on Figure 1 and Plate 1. Wells MW-14, MW-18, MW-21, and MW-22 were dry at that time due to drawdown and could not be sampled. Groundwater samples were analyzed for TCE, 1,2-DCE, and vinyl chloride. In addition, six monitoring wells and recovery wells RW-1, RW-3, and RW-4 were analyzed for tetrachloroethene (PCE). Analytical results are summarized in Table 2. Laboratory analytical reports are presented in Appendix B. Table 3 and Table 4 present summaries of historical concentrations of TCE and 1,2-DCE.

3.1 Standard Monitoring Program

During the April 2002 sampling event, 18 monitoring wells were sampled on the northeast side of the Girmes facility (Plate 1). TCE was detected in samples collected from nine wells, with the concentrations exceeding the North Carolina (NC) 2L standard of 0.0028 mg/L in seven of the wells. TCE concentrations decreased in five monitoring wells—MW-4, MW-5, MW-9, MW-10, and MW-11. Two wells, MW-2 and MW-17, had increases in TCE concentrations. TCE concentrations remained generally unchanged in samples collected from wells MW-8 and MW-20. While TCE was detected in samples collected from MW-13 and MW-16A at concentrations just above the detection limit during the October 2001 sampling event, TCE was not detected in these wells during the April 2002 sampling event.

1,2-DCE was detected in samples collected from seven monitoring wells. The detected concentrations exceeded the NC 2L standard of 0.07 mg/L in only two wells—MW-4 and MW-5. 1,2-DCE concentrations increased in three wells, MW-5, MW-17, and MW-20. While the concentrations in samples collected from wells MW-2 and MW-9 remained generally unchanged, the 1,2-DCE concentration decreased in samples collected from wells MW-4 and MW-10.

Vinyl chloride was detected in samples collected from only two wells, MW-10 and MW-20, on the northeast side of the Girmes facility, at concentrations that exceeded the NC 2L standard of 0.000015 mg/L.

On the southwest side of the Girmes facility, seven monitoring wells – MW-19, MW-23, MW-24, MW-26R, MW-27, MW-28, and MW-28A – and two recovery wells – RW-1 and RW-4 – were sampled. Monitoring wells MW-14, MW-18, MW-21, and MW-22 were dry and could not be sampled. Samples could not be collected from recovery well RW-3 because the pump was not operating during the April 2002 sampling event. TCE was detected in groundwater samples from four monitoring wells (MW-19, MW-23, MW-24, and MW-28A) and both recovery wells. Detected concentrations exceeded NC 2L standards. 1,2-DCE was detected in groundwater samples from three of the monitoring wells (MW-19, MW-23, and MW-26R) and in only one recovery well (RW-1). Only MW-26R had concentrations of 1,2-DCE exceeding the NC 2L standard.

TCE concentrations decreased in samples collected from monitoring wells MW-19, MW-24, MW-26R, and in samples collected from recovery wells RW-1 and RW-4 since last sampled in October 2001. TCE detected in samples collected from MW-28A have remained relatively unchanged since last sampled. The TCE concentrations increased in samples collected from monitoring well MW-23.

Concentrations of 1,2-DCE decreased in samples collected from monitoring wells MW-19 and MW-28A and samples collected from recovery well RW-4, while concentrations have increased slightly in samples collected from monitoring well MW-23. The 1,2-DCE concentration detected in samples collected from monitoring well MW-26R and recovery well RW-1 were generally unchanged.

Vinyl chloride was detected in samples collected from one monitoring well (MW-26R) on the southwest side of the Girmes facility. This well is located on Dotson's property on the southwest side of Gashes Creek. The detected concentration in MW-26R, 0.073 mg/L, has increased from the previous sampling event and remains above the NC 2L standard.

Surface water samples were collected from four surface water stations during the April 2002 sampling event, SW-1, SW-2, SW-3, and SW-4. None of the surface water samples collected had detections of TCE, 1,2-DCE, or vinyl chloride.

3.2 Tetrachloroethene

Since shortly after startup of the groundwater recovery system, PCE was found in the influent to the treatment system. Select monitoring wells sampled during the January 1999 monitoring event were analyzed for PCE in addition to the standard analytical parameters. The January 1999 analytical results, along with historical groundwater analytical data collected at the site during the CSA, led SKF to conclude that the PCE and other VOCs found on the southwest side of Gashes Creek have no relationship to the affected groundwater found on the Girmes facility.

In the groundwater monitoring report for the January 1999 sampling event, SKF modified the groundwater monitoring program to continue monitoring all of the wells specified in the CAP according to the specified schedule. In addition to TCE, 1,2-DCE, and vinyl chloride, recovery wells RW-1, RW-3, and RW-4 and select monitoring wells would also be sampled for PCE.

During the April 2002 sampling event, monitoring wells MW-19, MW-23, MW-24, MW-26R, MW-28, and MW-28A and the two operating recovery wells were analyzed for PCE. Analytical results are included in Table 2. PCE continues to be detected in samples collected from monitoring wells MW-23 and MW-28A located on the southwest side of Gashes Creek. Concentrations of PCE have increased in samples collected from well MW-23 since last sampled in October 2001. PCE was also detected in samples collected from the two recovery wells, RW-1 and RW-4. The tetrachloroethene concentrations detected in samples collected from both recovery wells have increased since last sampled in October 2001. These wells recover groundwater from the southwest side of Gashes Creek as indicated by the water table map on Plate 1. Three of the four wells had PCE concentrations exceeding the NC 2L standard. PCE has consistently been found in these wells since analyses for PCE began in January 1999. The PCE detected in samples collected from well MW-28A did not exceed the NC 2L standard.

The analytical results for PCE confirm the results from previous sampling events since January 1999. The PCE found in these wells appears to be the result of a release on the southwest side of Gashes Creek and does not appear to be related to groundwater quality on the Girmes facility. However, for the time being, SKF will continue analyzing groundwater samples from wells MW-19, MW-23, MW-24, MW-26R, MW-28, MW-28A, RW-1, RW-3, and RW-4 for PCE in order to monitor concentration trends and their effects on the groundwater recovery system.

Figure 1 Location of Data Points

Table 2
Analytical Results for Groundwater and Surface Water Samples
Collected April 2 through April 3, 2002

LOCATION	DATE	TCE	1,2-DCE, TOTAL	VINYL CHLORIDE	PCE
NC 2L Standard		0.0028	0.07	0.000015	0.0007
MW-01	04/02/02	<0.001	<0.002	<0.002	NA
MW-02	04/02/02	0.031	0.0017 J	<0.002	NA
MW-04	04/03/02	0.33	0.44	<0.01	NA
MW-05	04/03/02	11 D	0.34	<0.05	NA
MW-06	04/02/02	<0.001	<0.002	<0.002	NA
MW-07	04/02/02	<0.001	<0.002	<0.002	NA
MW-08	04/02/02	0.0014	<0.002	<0.002	NA
MW-09	04/02/02	0.41	0.012	<0.01	NA
MW-10	04/02/02	0.0011	0.021	0.00029 J	NA
MW-11	04/03/02	0.0029	<0.002	<0.002	NA
MW-12	04/03/02	<0.001	<0.002	<0.002	NA
MW-13	04/03/02	<0.001	<0.002	<0.002	NA
MW-15	04/02/02	<0.001	<0.002	<0.002	NA
MW-15A	04/02/02	<0.001	<0.002	<0.002	NA
MW-16	04/02/02	<0.001	<0.002	<0.002	NA
MW-16A	04/02/02	<0.001	<0.002	<0.002	NA
MW-17	04/02/02	0.0044	0.00084 J	<0.002	NA
MW-19	04/03/02	0.064	0.0023	<0.002	<0.001
MW-20	04/03/02	0.012	0.0055	0.00019 J	NA
MW-23	04/03/02	0.027	0.0036	<0.002	0.12
MW-24	04/03/02	0.0047	<0.002	<0.002	<0.001
MW-26R	04/03/02	<0.002	0.17	0.073	<0.002
MW-27	04/03/02	<0.001	<0.002	<0.002	NA
MW-28	04/03/02	<0.001	<0.002	<0.002	<0.001
MW-28 (DU-02101)	04/03/02	<0.001	<0.002	<0.002	<0.001
MW-28A	04/03/02	0.0058	<0.002	<0.002	0.00066 J
RW-01	04/03/02	0.16	0.015	<0.004	0.11
RW-04	04/03/02	0.034	<0.002	<0.002	0.00085 J
RW-04 (DU-02102)	04/03/02	0.034	<0.002	<0.002	0.00085 J
SW-1	04/03/02	<0.002	<0.001	<0.001	NA
SW-2	04/03/02	<0.002	<0.001	<0.001	NA
SW-3	04/03/02	<0.002	<0.001	<0.001	NA
SW-4	04/03/02	<0.002	<0.001	<0.001	NA

(1) Analytical results are reported in milligrams per liter (mg/L) unless otherwise noted.
J Qualitative mass spectral evidence of analyte present; concentration is less than reporting limit.
< Concentration less than the Quantitation Limit.
NA Not analyzed.
Shaded value indicates exceedance of NC 2L Standard

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 1 of 4

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 2 of 4

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 3 of 4

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 4 of 4

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 1 of 4

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 2 of 4

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 3 of 4

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 4 of 4

Section 4

Recovery System Performance

The groundwater recovery system uses three recovery wells to capture affected groundwater. Water from these wells is pumped to an air stripper, where VOCs are removed, and treated water is discharged into Gashes Creek. Influent and effluent to the stripper is sampled on a monthly basis. Effluent flow is recorded continuously. The analytical results for the influent and effluent are used along with the flow data to estimate the amount of trichloroethene removed each month. Monthly volumes of treated groundwater and the estimated amount of TCE removed since system startup in March 1998 through April 2002 are summarized in Table 5. The estimated amount of groundwater that was recovered and treated during November 2001 through April 2002 is 6.22 million gallons. It is estimated that over 20 pounds of TCE were removed during November 2001 through April 2002.

During the April 2002 sampling event it was discovered that the pump in well RW-3 was not operating. Attempts to restart the pump were unsuccessful. Well RW-3 has a yield of about ½ gallon per minute. Such a low flow in combination with the amount of vertical head between the pump and the land surface results in stress on the pump and its electrical system. This, in turn, results in increased maintenance. The remaining two wells (RW-1 and RW-4) recover about 15 and 7 gallons per minute, respectively, and account for nearly all of the yield from the groundwater recovery system. It is recommended that well RW-3 remain offline and groundwater recovery include only wells RW-1 and RW-4.

Table 5
Operations Summary for Period Beginning March 4, 1998, and Ending April 30, 2002

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
02/98	0	0	0	Not operational
03/98	28	1.58	N/C	Startup 03/04/98
04/98	30	1.62	39.1	Normal operation
05/98	31	1.64	35.6	Normal operation
06/98	30	1.58	17.1	Normal operation
07/98	31	1.53	17.9	Normal operation. Adjusted pump rate for RW-4
08/98	31	1.42	14.2	RMT coordinating maintenance of pump controllers
09/98	30	1.47	13.5	Normal operation, pump controllers repaired/calibrated
10/98	31	1.40	11.7	Removed pump from RW-3. Pump will be cleaned and repaired, as needed.
11/98	30	1.30	11.9	RW-3 pump replaced
12/98	31	1.28	6.7	Normal operation
01/99	31	1.31	7.5	Auto dialer was reprogrammed. System inspected.
02/99	28	1.33	7.42	Normal operation
03/99	31	1.33	3.27	Normal operation. Calibrated flow meter and updated flow meter software.
04/99	30	1.35	1.90	Normal operation. System inspected during groundwater sampling.
05/99	31	1.46	10.7	Normal operation
06/99	30	1.39	7.06	Normal operation
07/99	31	1.46	7.05	Normal operation
08/99	31	1.42	7.1	Normal operation
09/99	30	1.33	6.6	Normal operation
10/99	31	1.35	4.5	Normal operation. System inspected during groundwater sampling.
11/99	30	1.31	6.1	Normal operation
12/99	31	1.29	6.0	Normal operation

⁽¹⁾ Not calculated, no influent sample collected

⁽²⁾ Estimated, flow data not yet available

Table 5
Operations Summary for Period Beginning March 4, 1998, and Ending April 30, 2002

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
01/00	31	1.19	5.2	Normal operation
02/00	29	1.17	5.8	Normal operation
03/00	31	1.25	6.6	Normal operation
04/00	30	1.08	6.3	Normal operation
05/00	31	0.661	1.05	Flow from RW-4 has declined. Field technician will adjust flow
06/00	30	0.693	1.9	Maintenance issues identified during site visit. Flow remains lower than normal
07/00	31	0.624 ⁽²⁾	3.02	Pumps functional at a reduced rate. Meters are marginally functional.
08/00	31	0.725	4.6	Replacement equipment purchased, operation and maintenance (O&M) trip scheduled.
09/00	30	1.274	11.7	Repairs made on September 6 and 7. Flow restored to approximately 45,000 gpd.
10/00	31	1.27 ⁽²⁾	12.7	Normal operation
11/00	30	1.10	17.4	Effluent flow meter calibrated, normal operation
12/00	31	1.03	5.5	Normal operation
1/01	31	1.02	3.9	Normal operation
2/01	28	0.97	2.7	Normal operation
3/01	31	0.85	2.8 ⁽²⁾	Normal operation
4/01	30	1.02	3.2	Flow rates adjusted and yield increased
5/01	31	1.05	5.2	Normal operation
6/01	30	1.11	4.4	Normal operation
7/01	31	1.14	3.8	Normal operation
8/01	31	1.14	3.6	Normal operation
9/01	30	1.06	3.9	Normal operation
10/01	31	1.06 ⁽¹⁾	3.9 ⁽²⁾	Normal operation
11/01	30	1.03	3.8	Normal operation
12/01	31	1.08	3.9	Normal operation

⁽¹⁾ Not calculated, no influent sample collected

⁽²⁾ Estimated, flow data not yet available

Table 5
Operations Summary for Period Beginning March 4, 1998, and Ending April 30, 2002

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
01/02	31	1.06	3.0	Normal operation,
02/02	28	0.95	2.6	Normal operation
03/02	31	1.07	3.5	Normal operation
04/02	30	1.03 ⁽²⁾	3.5 ⁽²⁾	Well RW-3 not operating
	1,521	58.998	382.37	Total since system startup

⁽¹⁾ Not calculated, no influent sample collected

⁽²⁾ Estimated, flow data not yet available

Appendix A

Hydrographs for Bedrock Wells

Appendix B

Laboratory Analytical Reports

100 Verdae Boulevard (29607-3825)
PO Box 16778 (29606-6778)
Greenville, South Carolina
Telephone (864) 281-0030
Fax (864) 281-0288

Groundwater Monitoring Report for the October 2002 Sampling Event Groundwater Incident No. 10032

Girmes Site, Formerly SKF USA Inc.

Buncombe County, North Carolina

December 2002

Michael B. Parker, P.E.
Senior Client Service Manager

Certification

The hydrogeology work for the Girmes Site, formerly SKF USA Inc., in Buncombe County, North Carolina, was performed by an RMT, Inc. consulting hydrogeologist in support of RMT North Carolina, Inc.

Dan O. Madison, Jr., P.G.
RMT, Inc.

Table of Contents

Certification	ii
1. Introduction.....	1
2. Groundwater Elevations.....	2
3. Groundwater and Surface Water Quality	6
3.1 Standard Monitoring Program.....	6
3.2 Tetrachloroethene	7
4. Recovery System Performance	20

List of Tables

Table 1	Summary of Groundwater Elevations	4
Table 2	Analytical Results for Groundwater and Surface Water Samples Collected October 22 through October 24, 2002.....	10
Table 3	Historical Trichloroethene Concentrations Detected in Groundwater	12
Table 4	Historical 1,2-Dichloroethene Concentrations Detected in Groundwater.....	16
Table 5	Operations Summary for Period Beginning March 4, 1998, and Ending October 31, 2002.....	21

List of Figures

Figure 1	Location of Data Points	9
----------	-------------------------------	---

List of Appendices

Appendix A	Hydrographs for Bedrock Wells
Appendix B	Laboratory Analytical Reports

List of Plates

Plate 1	Configuration of Water Table October 21, 2002
---------	---

Section 1

Introduction

The J.L. deBall Girmes of America (Girmes) site is a former textile plant located on Old Highway 74 East in Asheville, North Carolina. Girmes owned the site from 1973 until 2001 when it was purchased by LMC, LLC. The site was formerly occupied by SKF USA Inc. (SKF) from approximately 1960 to 1973. The North Carolina Department of Environment and Natural Resources (NC DENR) issued SKF a Notice of Violation (NOV) on April 2, 1993 (Groundwater Incident Number 10032). In response to the NOV and associated correspondence, SKF conducted comprehensive site assessment (CSA) activities in 1993 and 1994. Volatile organic compounds (VOCs), in particular trichloroethene (TCE), 1,2-dichloroethene (1,2-DCE), and vinyl chloride, were found in groundwater at the site. The results of the CSA were submitted to NC DENR in November 1994. Following the CSA, a corrective action plan (CAP) to address the VOC-impacted groundwater was prepared and submitted to NC DENR in October 1996.

The CAP for the Girmes site was then implemented by RMT North Carolina, Inc. (RMT). A groundwater recovery system consisting of three groundwater recovery wells and an air stripper unit was installed in 1997 and early 1998. The system began operation on March 4, 1998.

The CAP specified that groundwater elevations were to be measured in all wells on a quarterly basis. Water samples were to be collected from all 29 monitoring wells, three recovery wells, and four surface water stations, on a semiannual basis. Thirteen of these monitoring wells, along with the three recovery wells, were also to be sampled quarterly. The CAP specified that the samples were to be analyzed for TCE, 1,2-DCE, and vinyl chloride.

On December 11, 2000, NC DENR approved reducing the monitoring frequency from quarterly to semiannually. Beginning in 2001, the 29 monitoring wells, three recovery wells, and four surface water stations were sampled on a semiannual basis. Groundwater elevations were also measured on a semiannual basis. Water samples and elevations are now collected in April and October of each year.

This report presents results of the October 2002 sampling event.

Section 2

Groundwater Elevations

On October 21, 2002, groundwater levels were measured in monitoring wells and recovery wells at the Girmes site. Water levels are summarized in Table 1 along with pre-startup elevations measured in January 1998, and historical water levels measured since system startup.

Water levels were used to construct the water table map shown on Plate 1. As specified in the CAP, hydrographs were also prepared for bedrock wells MW-4, MW-5, MW-14, MW-17, MW-18, MW-19, MW-21, MW-22, MW-23, MW-24, MW-27, and MW-28A. These hydrographs are presented in Appendix A. The hydrographs include water levels measured in 1997 to identify groundwater trends prior to system startup. Several wells exhibited significant drawdown after system startup. For these wells, an inferred data point based on the last actually measured water level prior to startup was plotted on the hydrograph for March 4, 1998, which was the date of system startup. The purpose of the inferred data point is to better illustrate drawdown since system startup.

The water table configuration and hydrographs for wells MW-14, MW-18, MW-19, MW-21, MW-22, MW-23, MW-24, and MW-27 have continued to show a cone of depression around the recovery wells since system startup.

On the southwest side of the facility, wells MW-14, MW-18, MW-21, and MW-22 continue to be dry. With the exception of MW-26R, the remaining monitoring wells all exhibited decreases in water levels since measured in April 2002. The amount of decrease was 0.71 to 1.10 feet at wells MW-28 and MW-28A (located 600 feet northwest of the recovery well system) and was similar, 0.06 to 0.96 feet, in wells closer to the recovery system. The water level in two of the three recovery wells decreased 0.51 to 8.64 feet, RW-3 and RW-1 respectively. The water level in recovery well RW-4 has increased 7.38 feet since April 2002. Although recovery well RW-3 was not operational during the October 2002 sampling event, the cone of depression continues to extend over 1,100 feet laterally in a northwest/southeast direction, parallel with Gashes Creek. The cone also continues to reach beneath Gashes Creek and encompasses well MW-23.

On the northeast side of the facility, water levels in most of the monitoring wells have decreased 0.12 feet in well MW-16 to 4.47 feet in well MW-12. Water levels increased in only one monitoring well, MW-6, since April 2002. Monitoring wells MW-1 and MW-5 located near the east corner of the Girmes facility, have continued to exhibit an overall decreasing trend in groundwater elevations since the startup of the remediation system. The overall water level

trend in monitoring wells MW-1 and MW-5 indicate that these wells are being affected by pumping of the groundwater recovery system on the southwest side of the facility.

Table 1
Summary of Groundwater Elevations

Page 1 of 2

Table 1
Summary of Groundwater Elevations

Page 2 of 2

Section 3

Groundwater and Surface Water Quality

Groundwater samples were collected from 25 monitoring wells and from recovery wells RW-1 and RW-4 on October 22 through October 24, 2002. As the pump was not operating during the October 2002 sampling event, groundwater samples were not collected from recovery well RW-3. Surface water samples were also collected from the four surface water stations, SW-1, SW-2, SW-3, and SW-4. Sampling locations are shown on Figure 1 and Plate 1. Wells MW-14, MW-18, MW-21, and MW-22 were dry at that time due to drawdown and could not be sampled. Groundwater samples were analyzed for TCE, 1,2-DCE, and vinyl chloride. In addition, six monitoring wells and recovery wells RW-1 and RW-4 were analyzed for tetrachloroethene (PCE). Analytical results are summarized in Table 2. Laboratory analytical reports are presented in Appendix B. Table 3 and Table 4 present summaries of historical concentrations of TCE and 1,2-DCE.

3.1 Standard Monitoring Program

During the October 2002 sampling event, 18 monitoring wells were sampled on the northeast side of the Girmes facility (Plate 1). TCE was detected in samples collected from nine wells, with the concentrations exceeding the North Carolina (NC) 2L standard of 0.0028 mg/L in seven of the wells. One well, MW-2, had a decrease in TCE concentrations since last sampled in April 2002. TCE concentrations increased in four monitoring wells – MW-4, MW-5, MW-9, and MW-17. TCE concentrations remained generally unchanged in samples collected from wells MW-8, MW-10, MW-11, and MW-20.

1,2-DCE was detected in samples collected from seven monitoring wells. The detected concentrations exceeded the NC 2L standard of 0.07 mg/L in only two wells – MW-4 and MW-5. 1,2-DCE concentrations increased in five wells MW-4, MW-5, MW-9, MW-10, and MW-17. Concentrations of 1,2-DCE decreased in samples collected from wells MW-2 and MW-20.

Vinyl chloride was detected in samples collected from only three wells, MW-10, MW-13, and MW-20, on the northeast side of the Girmes facility, at concentrations that exceeded the NC 2L standard of 0.000015 mg/L.

On the southwest side of the Girmes facility, seven monitoring wells—MW-19, MW-23, MW-24, MW-26R, MW-27, MW-28, and MW-28A—and two recovery wells—RW-1 and RW-4—were sampled. Monitoring wells MW-14, MW-18, MW-21, and MW-22 were dry and could not be sampled. Recovery well RW-3 was not operating during the October 2002 sampling event and therefore, was not sampled. TCE was detected in groundwater samples from four monitoring wells (MW-19, MW-23, MW-24, and MW-28A) and both recovery wells, at concentrations exceeding the NC 2L standards. TCE was also detected in samples collected from MW-26R at concentrations below the NC 2L standard. 1,2-DCE was detected in groundwater samples from four of the monitoring wells (MW-19, MW-23, MW-26R and MW-28A) and in both recovery wells (RW-1 and RW-4). Only MW-26R had concentrations of 1,2-DCE exceeding the NC 2L standard.

TCE concentrations increased in samples collected from monitoring wells MW-19, MW-24, MW-26R, MW-28A, and in samples collected from recovery wells RW-1 and RW-4 since last sampled in April 2002. TCE concentrations in samples collected from monitoring well MW-23 have remained relatively unchanged since last sampled.

Concentrations of 1,2-DCE have increased in samples collected from monitoring wells MW-19 and MW-28A and in samples collected from recovery well RW-4 since last sampled in April 2002. Concentrations have decreased slightly in samples collected from monitoring well MW-23. The 1,2-DCE concentration detected in samples collected from monitoring well MW-26R and recovery well RW-1 was generally unchanged.

Vinyl chloride was detected in samples collected from one monitoring well (MW-26R) on the southwest side of the Girmes facility. This well is located on Dotson's property on the southwest side of Gashes Creek. The detected concentration in MW-26R, 0.076 mg/L, has remained relatively unchanged from the previous sampling event and remains above the NC 2L standard.

Surface water samples were collected from four surface water stations during the April 2002 sampling event, SW-1, SW-2, SW-3, and SW-4. None of the surface water samples collected had detections of TCE, 1,2-DCE, or vinyl chloride.

3.2 Tetrachloroethene

Since shortly after startup of the groundwater recovery system, PCE was found in the influent to the treatment system. Select monitoring wells sampled during the January 1999 monitoring event were analyzed for PCE in addition to the standard analytical parameters. The January 1999 analytical results, along with historical groundwater analytical data collected at the site

during the CSA, led SKF to conclude that the PCE and other VOCs found on the southwest side of Gashes Creek have no relationship to the affected groundwater found on the Girmes facility.

In the groundwater monitoring report for the January 1999 sampling event, SKF modified the groundwater monitoring program to continue monitoring all of the wells specified in the CAP according to the specified schedule. In addition to TCE, 1,2-DCE, and vinyl chloride, recovery wells RW-1, RW-3, and RW-4 and select monitoring wells would also be sampled for PCE.

During the October 2002 sampling event, monitoring wells MW-19, MW-23, MW-24, MW-26R, MW-28, and MW-28A and the two operating recovery wells were analyzed for PCE. A duplicate sample to MW-16A was also analyzed for PCE. Analytical results are included in Table 2. PCE continues to be detected in samples collected from monitoring wells MW-23 and MW-28A located on the southwest side of Gashes Creek. Concentrations of PCE have decreased in samples collected from well MW-23 since last sampled in April 2002. While PCE also continues to be detected in samples collected from recovery well RW-1, PCE was not detected in samples collected from RW-4. The PCE concentrations detected in samples collected from RW-1 have decreased since last sampled in April 2002. Recovery wells RW-1 and RW-4 recover groundwater from the southwest side of Gashes Creek as indicated by the water table map on Plate 1. Two of the three wells (MW-23 and MW-28A) had PCE concentrations exceeding the NC 2L standard. PCE has consistently been found in these wells since analyses for PCE began in January 1999. The PCE detected in samples collected from well MW-28A did not exceed the NC 2L standard.

The analytical results for PCE confirm the results from previous sampling events since January 1999. The PCE found in these wells appears to be the result of a release on the southwest side of Gashes Creek and does not appear to be related to groundwater quality on the Girmes facility. However, for the time being, SKF will continue analyzing groundwater samples from wells MW-19, MW-23, MW-24, MW-26R, MW-28, MW-28A, RW-1, RW-3, and RW-4 for PCE in order to monitor concentration trends and their effects on the groundwater recovery system.

Figure 1 Location of Data Points

Table 2
Analytical Results for Groundwater and Surface Water Samples
Collected October 22 through October 24, 2002

LOCATION	DATE	TCE	1,2-DCE, TOTAL	VINYL CHLORIDE	PCE
NC 2L Standard		0.0028	0.07	0.000015	0.0007
MW-01	10/23/02	<0.001	<0.002	<0.001	NA
MW-02	10/23/02	0.026 k	0.0014 J	<0.001	NA
MW-04	10/24/02	0.41 k	0.63	<0.005	NA
MW-04 (DU-02302)	10/24/02	0.42 k	0.61	<0.005	<0.005
MW-05	10/24/02	14 k	0.46	<0.1	NA
MW-06	10/23/02	<0.001	<0.002	<0.001	NA
MW-07	10/23/02	<0.001	<0.002	<0.001	NA
MW-08	10/23/02	0.0013	<0.002	<0.001	NA
MW-09	10/23/02	0.96 k	0.024	<0.01	NA
MW-10	10/23/02	0.002	0.029	0.00055 J	NA
MW-11	10/22/02	0.0031	<0.002	<0.001	NA
MW-12	10/22/02	<0.001	<0.002	<0.001	NA
MW-13	10/22/02	<0.001	<0.002	0.00079 J	NA
MW-15	10/22/02	<0.001	<0.002	<0.001	NA
MW-15A	10/24/02	<0.001	<0.002	<0.001	NA
MW-16	10/22/02	<0.001	<0.002	<0.001	NA
MW-16A	10/22/02	<0.001 j	<0.002	<0.001	NA
MW-16A (DU-02301)	10/22/02	0.00072 Jj	<0.002	<0.001	<0.001
MW-17	10/22/02	0.01	0.0021	<0.001	NA
MW-19	10/22/02	0.18 k	0.006	<0.001	<0.001
MW-20	10/22/02	0.0091	0.0046	0.00015 J	NA
MW-23	10/22/02	0.028 k	0.0029	<0.001	0.096
MW-24	10/23/02	0.0062	<0.002	<0.001	<0.001
MW-26R	10/22/02	0.00076 J	0.13	0.076	<0.001
MW-27	10/23/02	<0.001	<0.002	<0.001	NA
MW-28	10/22/02	<0.001	<0.002	<0.001	<0.001

⁽¹⁾ Analytical results are reported in milligrams per liter (mg/L) unless otherwise noted.
J Qualitative mass spectral evidence of analyte present; concentration is less than reporting limit.
j Concentration considered an estimate based on data validation.
k Analyte present; reported value may be biased high.
N Spiked sample recovery not within control limits.
< Concentration less than the Quantitation Limit.
NA Not analyzed.
Shaded value indicates exceedance of NC 2L Standard

Table 2
Analytical Results for Groundwater and Surface Water Samples
Collected October 22 through October 24, 2002

LOCATION	DATE	TCE	1,2-DCE, TOTAL	VINYL CHLORIDE	PCE
MW-28A	10/22/02	0.0065	0.0016 J	<0.001	0.00068 J
RW-01	10/24/02	0.51 k	0.016	<0.005	0.073
RW-04	10/24/02	0.066 Nk	0.0012 J	<0.001	<0.001 N
SW-01	10/23/02	<0.001	<0.002	<0.001	NA
SW-02	10/23/02	<0.001	<0.002	<0.001	NA
SW-03	10/23/02	<0.001	<0.002	<0.001	NA
SW-04	10/23/02	<0.001	<0.002	<0.001	NA

- ⁽¹⁾ Analytical results are reported in milligrams per liter (mg/L) unless otherwise noted.
J Qualitative mass spectral evidence of analyte present; concentration is less than reporting limit.
j Concentration considered an estimate based on data validation.
k Analyte present; reported value may be biased high.
N Spiked sample recovery not within control limits.
< Concentration less than the Quantitation Limit.
NA Not analyzed.
Shaded value indicates exceedance of NC 2L Standard

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 1 of 4

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 2 of 4

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 3 of 4

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater

Page 4 of 4

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 1 of 4

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 2 of 4

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 3 of 4

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater

Page 4 of 4

Section 4

Recovery System Performance

The groundwater recovery system is designed to use three recovery wells to capture affected groundwater. Water from these wells is pumped to an air stripper, where VOCs are removed, and treated water is discharged into Gashes Creek. During the April 2002 sampling event it was discovered that the pump in well RW-3 was not operating. Attempts to restart the pump were unsuccessful. Well RW-3 has a yield of about ½ gallon per minute. Such a low flow in combination with the amount of vertical head between the pump and the land surface results in stress on the pump and its electrical system. This, in turn, results in increased maintenance. The remaining two wells (RW-1 and RW-4) recover approximately 15 and 7 gallons per minute, respectively, and account for nearly all of the yield from the groundwater recovery system. Since Recovery well RW-3 contributes very little to the overall yield of the groundwater recovery system, it has remained offline since April 2002 and groundwater recovery continues to include only wells RW-1 and RW-4.

Influent and effluent to the stripper is sampled on a monthly basis. Effluent flow is recorded continuously. The analytical results for the influent and effluent are used along with the flow data to estimate the amount of trichloroethene removed each month. Monthly volumes of treated groundwater and the estimated amount of TCE removed since system startup in March 1998 through October 2002 are summarized in Table 5. The estimated amount of groundwater that was recovered and treated during May 2002 through October 2002 is 6.26 million gallons. It is estimated that over 18 pounds of TCE were removed during May 2002 through October 2002.

In August 2002, RMT proposed to switch the operation of the groundwater recovery system from continuous pumping to a pulsed pumping schedule. In October 2002, RMT proposed further modifications to the pumping cycle. Under the pulsed pumping schedule, the groundwater recovery system would operate one cycle per quarter. Each cycle will consist of 6 weeks of pumping followed by 6 weeks of no pumping. Kay Dechant of NC DENR approved the modified pulse pumping plan on October 14, 2002. The groundwater recovery system was shut off on November 11, 2002, and is scheduled to begin the next 6-week pumping phase on or about January 6, 2002.

Table 5
Operations Summary for Period Beginning March 4, 1998, and Ending October 31, 2002

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
02/98	0	0	0	Not operational
03/98	28	1.58	N/C	Startup 03/04/98
04/98	30	1.62	39.1	Normal operation
05/98	31	1.64	35.6	Normal operation
06/98	30	1.58	17.1	Normal operation
07/98	31	1.53	17.9	Normal operation. Adjusted pump rate for RW-4
08/98	31	1.42	14.2	RMT coordinating maintenance of pump controllers
09/98	30	1.47	13.5	Normal operation, pump controllers repaired/calibrated
10/98	31	1.40	11.7	Removed pump from RW-3. Pump will be cleaned and repaired, as needed.
11/98	30	1.30	11.9	RW-3 pump replaced
12/98	31	1.28	6.7	Normal operation
01/99	31	1.31	7.5	Auto dialer was reprogrammed. System inspected.
02/99	28	1.33	7.42	Normal operation
03/99	31	1.33	3.27	Normal operation. Calibrated flow meter and updated flow meter software.
04/99	30	1.35	1.90	Normal operation. System inspected during groundwater sampling.
05/99	31	1.46	10.7	Normal operation
06/99	30	1.39	7.06	Normal operation
07/99	31	1.46	7.05	Normal operation
08/99	31	1.42	7.1	Normal operation
09/99	30	1.33	6.6	Normal operation
10/99	31	1.35	4.5	Normal operation. System inspected during groundwater sampling.
11/99	30	1.31	6.1	Normal operation
12/99	31	1.29	6.0	Normal operation

⁽¹⁾ Not calculated, no influent sample collected

⁽²⁾ Estimated, flow data not yet available

Table 5
Operations Summary for Period Beginning March 4, 1998, and Ending October 31, 2002

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
01/00	31	1.19	5.2	Normal operation
02/00	29	1.17	5.8	Normal operation
03/00	31	1.25	6.6	Normal operation
04/00	30	1.08	6.3	Normal operation
05/00	31	0.661	1.05	Flow from RW-4 has declined. Field technician will adjust flow
06/00	30	0.693	1.9	Maintenance issues identified during site visit. Flow remains lower than normal
07/00	31	0.624 ⁽²⁾	3.02	Pumps functional at a reduced rate. Meters are marginally functional.
08/00	31	0.725	4.6	Replacement equipment purchased, operation and maintenance (O&M) trip scheduled.
09/00	30	1.274	11.7	Repairs made on September 6 and 7. Flow restored to approximately 45,000 gpd.
10/00	31	1.27 ⁽²⁾	12.7	Normal operation
11/00	30	1.10	17.4	Effluent flow meter calibrated, normal operation
12/00	31	1.03	5.5	Normal operation
1/01	31	1.02	3.9	Normal operation
2/01	28	0.97	2.7	Normal operation
3/01	31	0.85	2.8 ⁽²⁾	Normal operation
4/01	30	1.02	3.2	Flow rates adjusted and yield increased
5/01	31	1.05	5.2	Normal operation
6/01	30	1.11	4.4	Normal operation
7/01	31	1.14	3.8	Normal operation
8/01	31	1.14	3.6	Normal operation
9/01	30	1.06	3.9	Normal operation
10/01	31	1.06 ⁽¹⁾	3.9 ⁽²⁾	Normal operation
11/01	30	1.03	3.8	Normal operation
12/01	31	1.08	3.9	Normal operation

⁽¹⁾ Not calculated, no influent sample collected

⁽²⁾ Estimated, flow data not yet available

Table 5
Operations Summary for Period Beginning March 4, 1998, and Ending October 31, 2002

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
01/02	31	1.06	3.0	Normal operation
02/02	28	0.95	2.6	Normal operation
03/02	31	1.07	3.5	Normal operation
04/02	30	1.03 ⁽²⁾	3.5 ⁽²⁾	Well RW-3 not operating
05/02	31	1.09	3.3	The pump in well RW-3 not operating.
06/02	30	1.02	3.3	The pump in well RW-3 not operating.
07/02	31	1.02	3.3	The pump in well RW-3 not operating.
08/02	31	1.1	3.4	The pump in well RW-3 not operating.
09/02	30	1.01	2.4	The pump in well RW-3 not operating.
10/02	31	1.02 ⁽²⁾	2.4 ⁽²⁾	The pump in well RW-3 not operating.
	1,705	65.258	400.47	Total since system startup

⁽¹⁾ Not calculated, no influent sample collected

⁽²⁾ Estimated, flow data not yet available

Appendix A

Hydrographs for Bedrock Wells

Appendix B

Laboratory Analytical Reports



*Integrated
Environmental
Solutions*

100 Verdae Blvd. 29607-3825
P.O. Box 16778 29606-6778
Greenville, SC
Telephone: 864-281-0030
Fax: 864-281-0288

June 5, 2003

Ms. Laura Kay Dechant
Hydrogeologist
North Carolina Department of Environment
and Natural Resources
Division of Environmental Management
Groundwater Section
50 Woodfin Place
Asheville, North Carolina 28801

Subject: Groundwater Monitoring Report
Girmes Site, Formerly SKF USA Inc.
Ground Water Incident No. 10032
Buncombe County, North Carolina

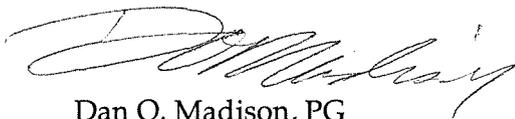
Dear Kay:

Enclosed is the Groundwater Monitoring Report for the April 2003 sampling event at the Girmes site (formerly SKF USA Inc.) in Asheville, North Carolina. We are scheduled to conduct the next groundwater sampling event in October 2003.

If you have questions, please call me at (864) 281-0030.

Sincerely,

RMT, Inc.



Dan O. Madison, PG

cc with enclosure: Mr. William McGlocklin
Mr. Billy Clarke
Ms. Leanne Campbell

100 Verdae Boulevard (29607-3825)
PO Box 16778 (29606-6778)
Greenville, South Carolina
Telephone (864) 281-0030
Fax (864) 281-0288



Groundwater Monitoring Report for the April 2003 Sampling Event Groundwater Incident No. 10032

Girmes Site, Formerly SKF USA Inc.

Buncombe County, North Carolina

June 2003

Michael B. Parker, P.E.
Senior Client Service Manager



Certification

The hydrogeology work for the Girmes Site, formerly SKF USA Inc., in Buncombe County, North Carolina, was performed by an RMT, Inc. consulting hydrogeologist in support of RMT North Carolina, Inc.



Dan O. Madison, Jr., P.G.
RMT, Inc.

Table of Contents

1.	Introduction.....	1
2.	Groundwater Elevations	3
3.	Groundwater and Surface Water Quality.....	8
3.1	Standard Monitoring Program.....	8
3.2	Tetrachloroethene	10
4.	Recovery System Performance	19

List of Tables

Table 1	Summary of Groundwater Elevations	5
Table 2	Analytical Results for Groundwater and Surface Water Samples Collected April 1, 2003 through April 3, 2003.....	12
Table 3	Historical Trichloroethene Concentrations Detected in Groundwater	13
Table 4	Historical 1,2-Dichloroethene Concentrations Detected in Groundwater.....	16
Table 5	Operations Summary for Period Beginning March 4, 1998, and Ending October 31, 2002	21

List of Figures

Figure 1	Location of Data Points	11
----------	-------------------------------	----

List of Appendices

Appendix A	Hydrographs for Bedrock Wells
Appendix B	Laboratory Analytical Reports

List of Plates

Plate 1	Configuration of Water Table March 31, 2003
---------	---

Section 1

Introduction

The J.L. deBall Girmes of America (Girmes) site is a former textile plant located on Old Highway 74 East in Asheville, North Carolina. Girmes owned the site from 1973 until 2001 when it was purchased by LMC, LLC. The site was formerly occupied by SKF USA Inc. (SKF) from approximately 1960 to 1973. The North Carolina Department of Environment and Natural Resources (NC DENR) issued SKF a Notice of Violation (NOV) on April 2, 1993 (Groundwater Incident Number 10032). In response to the NOV and associated correspondence, SKF conducted comprehensive site assessment (CSA) activities in 1993 and 1994. Volatile organic compounds (VOCs), in particular trichloroethene (TCE), 1,2-dichloroethene (1,2-DCE), and vinyl chloride, were found in groundwater at the site. The results of the CSA were submitted to NC DENR in November 1994. Following the CSA, a corrective action plan (CAP) to address the VOC-impacted groundwater was prepared and submitted to NC DENR in October 1996.

The CAP for the Girmes site was then implemented by RMT North Carolina, Inc. (RMT). A groundwater recovery system consisting of three groundwater recovery wells and an air stripper unit was installed in 1997 and early 1998. The system began operation on March 4, 1998.

The CAP specified that groundwater elevations were to be measured in all wells on a quarterly basis. Water samples were to be collected from all 29 monitoring wells, 3 recovery wells, and 4 surface water stations, on a semiannual basis. Thirteen of these monitoring wells, along with the three recovery wells, were also to be sampled quarterly. The CAP specified that the samples were to be analyzed for TCE, 1,2-DCE, and vinyl chloride.

On December 11, 2000, NC DENR approved reducing the monitoring frequency from quarterly to semiannually. Beginning in 2001, the 29 monitoring wells, 3 recovery wells, and 4 surface water stations were sampled on a semiannual basis. Groundwater elevations were also measured on a semiannual basis. Water samples and elevations are now collected in April and October of each year.

In August 2002, RMT proposed to switch the operation of the groundwater recovery system from continuous pumping to a pulsed pumping schedule. In October 2002, RMT proposed further modifications to the pumping cycle. Under the pulsed pumping schedule, the groundwater recovery system would operate one cycle per quarter. Each cycle consists of 6 weeks of pumping followed by 6 weeks of no pumping. Kay Dechant of NC DENR approved

the modified pulse pumping plan on October 14, 2002, and the first pumping cycle was initiated on November 11, 2002.

This report presents results of the April 2003 sampling event.

Section 2

Groundwater Elevations

The recovery system has been operating on a pulsed pumping cycle since November 11, 2002. Groundwater levels have been measured in monitoring wells and recovery wells at the Girmes site at the end of each on and off pumping cycle since the pulsed pumping was initiated. Groundwater levels were measured on January 3, February 14, and March 31, 2003. Water levels are summarized in Table 1 along with pre-startup elevations measured in January 1998, and historical water levels measured since system startup. The following table summarizes the pumping cycles since November 2002.

Summary of Pulsed Pumping Cycles

RECOVERY SYSTEM SHUT DOWN	RECOVERY SYSTEM START UP
November 11, 2002	January 3, 2003 ⁽¹⁾
February 14, 2003 ⁽¹⁾	April 2, 2003

⁽¹⁾ Groundwater levels were measured prior to system startup or shut down on these days

Water levels measured on March 31, 2003, were used to construct the water table map shown on Plate 1. These water levels reflect water table conditions near the end of the second system-off cycle. As specified in the CAP, hydrographs were also prepared for bedrock wells MW-4, MW-5, MW-14, MW-17, MW-18, MW-19, MW-21, MW-22, MW-23, MW-24, MW-27, and MW-28A. These hydrographs are presented in Appendix A. The hydrographs include water levels measured in 1997 to identify groundwater trends prior to system startup. Several wells exhibited significant drawdown after system startup. For these wells, an inferred data point based on the last actually measured water level prior to startup was plotted on the hydrograph for March 4, 1998, which was the date of system startup. The purpose of the inferred data point is to better illustrate drawdown since system startup.

The water table configuration and hydrographs for wells MW-14, MW-18, MW-19, MW-21, MW-22, MW-23, MW-24, and MW-27 have shown a cone of depression around the recovery wells since system startup. As expected, the January and March 2003 (see Plate 1) water levels, measured before the recovery system was restarted following an "off" cycle, do not show this cone of depression around the recovery system. However, monitoring wells MW-14 and MW-22 on the southwest side of the facility have remained dry during the pulsed pumping cycles thus continuing to exhibit some influence of the drawdown resulting from the long-term pumping of the recovery wells.

The water level in monitoring wells on the southwest side of the facility exhibited fluctuations in response to the on and off cycles of the recovery system. Water level increases were observed on January 3, 2003, and March 31, 2003, at the end of the system-off cycles. On February 14, 2003, at the end of the first system-off cycle, the water levels had returned to normal drawdown levels observed prior to cycling of the system. Water level fluctuations ranged from about 13 to 70 feet in recovery wells RW-1, RW-3, and RW-4. Water levels in the surrounding monitoring wells fluctuated between approximately 3 feet at MW-26R to greater than 15 feet at MW-21. Monitoring wells MW-28 and MW-28A each exhibited about ½ foot of fluctuation; however, it is not clear if this is the result of cycling of the system or normal climatic conditions. On the northeast side of the facility, water levels in most of the monitoring wells increased since the October 2002 sampling event. Water levels fluctuated in many of these wells but exhibited an overall increase over the 6-month period. Water levels in the remaining wells rose steadily over the same period with the exception of well MW-1, which was dry at the end of the monitoring period. The overall increase in water levels is attributed to increased precipitation experienced over the monitoring period.

**Table 1
Summary of Groundwater Elevations**

LOCATION	TOP OF CASING ⁽¹⁾	WATER TABLE ELEVATION AND DATE OF MEASUREMENT						
		01/21/98*	07/29/98	10/15/98	01/05/99	04/20/99	04/20/99	07/01/99
MW-1	2123.16	2066.52	2070.69	2069.22	2065.99	57.85	2065.31	2064.71
MW-2	2074.52	2053.45	2053.59	2052.65	2052.87	21.58	2052.94	2053.45
MW-4	2122.38	2061.38	2062.27	2061.36	2060.89	60.63	2061.75	2061.39
MW-5	2121.44	2058.17	2059.24	2058.29	2057.45	64.33	2057.11	2056.94
MW-6	2102.22	2058.96	2060.80	2059.50	2058.56	43.91	2058.31	2057.82
MW-7	2071.17	2052.76	2052.82	2052.42	2052.34	18.73	2052.44	2052.36
MW-8	2075.22	2054.34	2054.60	2053.57	2053.26	21.33	2053.89	2054.10
MW-9	2072.29	2053.32	2054.37	2053.61	2053.15	17.79	2054.50	2053.45
MW-10	2076.30	2052.95	2033.79	2050.70	2051.08	23.05	2053.25	2051.79
MW-11	2109.60	2046.88	2044.25	2041.25	2039.26	70.15	2039.45	2038.37
MW-12	2040.65	2038.44	2032.49	2031.57	2033.09	9.28	2031.37	2033.56
MW-13	2044.67	2037.38	2033.76	2031.99	2031.49	11.25	2033.42	2032.25
MW-14	2119.88	<2040.20	<2040.20	<2040.20	<2040.20	DRY	<2040.20	<2040.20
MW-15	2058.15	2046.02	2046.09	2045.67	2045.25	12.40	2045.75	2045.25
MW-15A	2058.16	2047.38	2046.75	2046.11	2045.73	11.96	2046.20	2045.95
MW-16	2059.22	2052.79	2052.74	2052.75	2052.70	6.45	2052.77	2052.79
MW-16A	2059.33	2053.16	2053.04	2053.07	2053.15	6.25	2053.08	2052.96
MW-17	2056.71	2050.77	2046.05	2043.77	2043.96	9.61	2047.10	2045.47
MW-18	2036.36	2023.81	<2010.30	<2010.30	<2010.30	DRY	<2010.30	<2010.30
MW-19	2037.74	2018.32	2013.29	2012.86	2013.18	24.39	2013.35	2012.96
MW-20	2027.36	2013.59	2012.86	2012.30	2012.28	14.77	2012.59	2012.27
MW-21	2036.74	2022.53	<2006.90	<2006.90	<2006.90	DRY	<2006.90	<2006.90
MW-22	2082.12	2038.87	2037.80	2035.89	2027.47	DRY	<2025.90	<2025.90
MW-23	2027.54	2020.41	2010.26	2009.62	2010.42	17.20	2010.34	2010.49
MW-24	2035.05	2021.21	2010.71	2009.78	2010.80	24.23	2010.82	2010.72
MW-26R	2021.35	2015.12	2015.23	2014.08	2014.64	6.00	2015.35	2014.76
MW-27	2051.08	2025.26	2020.13	2019.38	2019.83	29.93	2021.15	2021.03
MW-28	2022.48	2012.11	2011.33	2011.37	2011.70	10.26	2012.22	2011.57
MW-28A	2022.69	2012.36	2011.22	2011.11	2011.52	11.39	2011.30	2011.33
RW-1	2031.70	NM	1955.30	1951.93	1968.90	70.57	1961.13	1967.09
RW-2	2071.70	NM	2051.09	2050.32	2049.72	21.18	2050.52	2050.15
RW-3	2033.40	NM	1991.13	1996.98	1935.75	82.15	1951.25	1935.88
RW-4	2032.10	NM	1982.98	1982.30	1986.74	46.26	1985.84	1984.70

Elevations are in feet above mean sea level.

⁽¹⁾ Top of casing measured in feet above mean sea level.

* Pre-startup

NM - Not Measured, well not accessible.

NOTE: System startup was March 4, 1998.

Water levels preceded with less than sign (<) indicates dry well.

**Table 1
Summary of Groundwater Elevations**

LOCATION	TOP OF CASING ⁽¹⁾	WATER TABLE ELEVATION AND DATE OF MEASUREMENT					
		10/25/99	01/25/00	04/18/00	08/04/00	10/23/00	04/09/01
MW-1	2123.16	2063.46	2064.29	2062.12	2062.11	2061.57	2060.56
MW-2	2074.52	2052.39	2052.28	2053.06	2052.65	2052.18	NM
MW-4	2122.38	2060.63	2060.43	2061.84	2060.73	2060.30	2060.67
MW-5	2121.44	2055.88	2055.78	2056.08	2056.01	2055.68	2055.34
MW-6	2102.22	2056.72	2056.37	2056.94	2056.42	2056.02	2055.79
MW-7	2071.17	2051.88	2051.97	2052.55	2052.35	2051.73	2052.15
MW-8	2075.22	2052.65	2052.46	2054.46	2053.82	2053.47	2053.96
MW-9	2072.29	2052.67	2052.98	2053.75	2053.39	2052.41	2053.29
MW-10	2076.30	2049.77	2052.32	2055.15	2052.30	2051.37	2053.76
MW-11	2109.60	2037.19	2036.91	2037.79	2038.05	2036.62	2035.70
MW-12	2040.65	2028.13	2030.41	2036.74	NM	2026.78	2034.46
MW-13	2044.67	2030.23	2030.32	2034.76	2032.18	2029.64	2032.54
MW-14	2119.88	<2040.20	<2040.20	<2040.20	2039.83	<2040.20	<2040.20
MW-15	2058.15	2044.59	2044.50	2047.26	NM	2044.33	2047.66
MW-15A	2058.16	2045.61	2045.55	2046.20	NM	2045.06	2045.81
MW-16	2059.22	2052.61	2052.77	2052.51	NM	2052.62	2052.76
MW-16A	2059.33	2052.89	2052.96	2052.84	NM	2052.81	2052.95
MW-17	2056.71	2042.74	2043.09	2048.16	NM	2041.97	2045.15
MW-18	2036.36	<2010.30	<2010.30	<2010.30	<2010.30	<2010.30	<2010.30
MW-19	2037.74	2013.09	2013.61	2014.85	2014.77	2012.66	2014.69
MW-20	2027.36	2011.89	2011.77	2012.61	2012.12	2011.57	2012.24
MW-21	2036.74	<2006.90	<2006.90	<2006.90	2007.11	<2006.90	<2006.90
MW-22	2082.12	<2025.90	<2025.90	<2025.90	<2025.90	<2025.90	<2025.90
MW-23	2027.54	2011.70	2011.25	2013.30	2016.40	2010.26	2014.60
MW-24	2035.05	2011.58	2011.17	2013.45	2015.90	2010.33	2014.72
MW-26R	2021.35	2014.25	2014.05	2015.84	2015.55	2014.78	2015.71
MW-27	2051.08	2019.80	2021.11	2021.81	2021.95	2019.20	2021.96
MW-28	2022.48	2011.64	2012.47	2011.97	2011.65	2011.55	2011.80
MW-28A	2022.69	2011.11	2011.54	2011.72	2011.44	2011.15	2011.55
RW-1	2031.70	1967.95	1950.66	1960.80	2005.76	1955.56	1989.42
RW-2	2071.70	NM	NM	2050.65	2049.83	2049.19	2050.18
RW-3	2033.40	1935.77	1991.85	1936.00	1961.15	1939.67	1976.97
RW-4	2032.10	1987.49	1976.54	1987.07	1994.01	1977.30	1994.98

Elevations are in feet above mean sea level.

⁽¹⁾ Top of casing measured in feet above mean sea level.

* Pre-startup

NM - Not Measured, well not accessible.

NOTE: System startup was March 4, 1998.

Water levels preceded with less than sign (<) indicates dry well.

**Table 1
Summary of Groundwater Elevations**

LOCATION	TOP OF CASING ⁽¹⁾	WATER TABLE ELEVATION AND DATE OF MEASUREMENT					
		10/03/01	04/01/02	10/21/02	01/03/03	02/14/03	03/31/03
MW-1	2123.16	2059.85	2059.20	2058.11	2058.43	2058.17	<2056.03
MW-2	2074.52	2052.32	2052.43	2051.96	2052.42	2052.13	2052.56
MW-4	2122.38	2060.60	2061.03	2059.58	2060.86	2062.00	2062.89
MW-5	2121.44	2055.35	2055.13	2054.60	2054.85	2055.04	2055.61
MW-6	2102.22	2055.31	2054.24	2054.65	2055.44	2054.76	2055.34
MW-7	2071.17	2051.89	2052.12	2051.75	2052.07	2051.87	2052.18
MW-8	2075.22	2052.65	2053.34	2052.58	2056.57	2053.34	2053.99
MW-9	2072.29	2052.96	2053.71	2052.83	2050.62	2053.52	2054.11
MW-10	2076.30	2053.34	2056.66	2054.94	2055.18	2055.64	2056.51
MW-11	2109.60	2034.17	2036.35	2033.34	2035.15	2035.79	2038.43
MW-12	2040.65	2027.51	2032.83	2028.36	2034.33	2033.16	2036.75
MW-13	2044.67	2030.29	2032.07	2030.47	2034.73	2031.78	2036.92
MW-14	2119.88	<2040.20	<2040.20	<2040.20	<2040.20	<2040.20	<2040.20
MW-15	2058.15	2044.68	2044.85	2044.46	2045.42	2045.51	2045.86
MW-15A	2058.16	2045.27	2045.81	2043.00	2046.14	NM	2046.52
MW-16	2059.22	2052.60	2052.62	2052.50	2052.62	2052.52	2052.62
MW-16A	2059.33	2052.80	2054.65	2052.71	2052.88	2053.37	2053.03
MW-17	2056.71	2042.34	2045.26	2042.44	2046.83	2044.54	2051.33
MW-18	2036.36	<2010.30	<2010.30	<2010.30	2019.88	<2010.30	2021.02
MW-19	2037.74	2012.39	2013.55	2012.59	2016.28	2013.43	2017.76
MW-20	2027.36	2011.79	2012.21	2011.78	2012.43	2012.05	2012.74
MW-21	2036.74	<2006.90	<2006.90	<2006.90	2011.95	<2006.90	2021.51
MW-22	2082.12	<2025.90	<2025.90	<2025.90	2025.97	<2025.90	<2025.90
MW-23	2027.54	2009.88	2010.81	2010.50	2018.37	2010.83	2019.94
MW-24	2035.05	2009.90	2010.79	2010.73	2020.03	2010.97	2021.10
MW-26R	2021.35	2014.55	2013.95	2014.16	2017.18	NM	2018.12
MW-27	2051.08	2019.06	2020.42	2019.50	2023.57	2020.05	2024.24
MW-28	2022.48	2011.57	2012.73	2011.63	2012.18	2011.47	2011.89
MW-28A	2022.69	2011.03	2011.79	2011.08	2011.91	2011.02	2011.70
RW-1	2031.70	1953.68	1958.29	1949.65	1996.87	1949.55	2019.87
RW-2	2071.70	2049.89	2050.96	2049.99	2050.72	2050.89	2051.43
RW-3	2033.40	1950.43	2004.52	2004.01	2017.20	2005.00	2018.52
RW-4	2032.10	1966.66	1973.11	1980.49	2010.00	1983.13	2020.02

Elevations are in feet above mean sea level.

⁽¹⁾ Top of casing measured in feet above mean sea level.

* Pre-startup

NM - Not Measured, well not accessible.

NOTE: System startup was March 4, 1998.

Water levels preceded with less than sign (<) indicates dry well.

Section 3

Groundwater and Surface Water Quality

Groundwater samples were collected from 26 monitoring wells and from recovery wells RW-1 and RW-4 on April 1 through April 3, 2003. Recovery well RW-3 has been off-line since April 2002 because of low yield and related operational problems; thus, no groundwater samples have been collected. Surface water samples were also collected from the four surface water stations, SW-1, SW-2, SW-3, and SW-4. Sampling locations are shown on Figure 1 and Plate 1. Wells MW-1, MW-14, and MW-22 were dry at that time due to drawdown and could not be sampled. Groundwater samples were analyzed for tetrachloroethene (PCE), 1,2-PCE, and vinyl chloride. In addition, six monitoring wells and recovery wells RW-1 and RW-4 were analyzed for PCE. Analytical results are summarized in Table 2. Laboratory analytical reports are presented in Appendix B. Table 3 and Table 4 present summaries of historical concentrations of PCE and 1,2-PCE.

3.1 Standard Monitoring Program

During the April 2003 sampling event, 17 monitoring wells were sampled on the northeast side of the Girmes facility (Plate 1). PCE was detected in samples collected from nine wells, with the concentrations exceeding the North Carolina (NC) 2L standard of 0.0028 mg/L in six of the wells. Four wells, MW-2, MW-4, MW-5, and MW-9, had a decrease in PCE concentrations since last sampled in October 2002. PCE concentrations increased in well MW-20. PCE concentrations remained generally unchanged in samples collected from wells MW-8, MW-10, MW-11, and MW-16A.

1,2-PCE was detected in samples collected from five monitoring wells. The detected concentrations exceeded the NC 2L standard of 0.07 mg/L in only one well—MW-4. 1,2-PCE concentrations decreased in three wells, MW-4, MW-9, and MW-10, and remained relatively unchanged in well MW-20. Concentrations of 1,2-PCE detected in samples collected from wells MW-2 and MW-17 during October 2002 had no detections during the April 2003 sampling event.

Vinyl chloride was detected in samples collected from only two wells, MW-10 and MW-13 on the northeast side of the Girmes facility, at concentrations that exceeded the NC 2L standard of 0.000015 mg/L.

On the southwest side of the Girmes facility, nine monitoring wells—MW-18, MW-19, MW-21, MW-23, MW-24, MW-26R, MW-27, MW-28, and MW-28A—and two recovery wells—RW-1 and RW-4—were sampled. Monitoring wells MW-14 and MW-22 were dry and could not be sampled. Recovery well RW-3 was not operating during the April 2003 sampling event and therefore was not sampled. Because the April 2003 sampling event was conducted at the end of a 6-week system-off cycle, monitoring wells MW-18 and MW-21 had sufficient water to sample. Until the pulsed pumping was initiated in November 2002, monitoring wells MW-18 and MW-21 had been continuously dry as a result of pumping of the recovery wells and were last sampled in July 1997 and January 1998, respectively.

PCE was detected in groundwater samples collected from six monitoring wells (MW-18, MW-19, MW-21, MW-23, MW-24, and MW-28A) and both recovery wells, at concentrations exceeding the NC 2L standards. PCE was also detected in monitoring well MW-26R at a concentration below the NC 2L standard. 1,2-PCE was detected in groundwater samples collected from three of the monitoring wells (MW-21, MW-26R, and MW-28A) and in both recovery wells (RW-1 and RW-4). Only MW-26R had concentrations of 1,2-PCE exceeding the NC 2L standard.

PCE concentrations increased in samples collected from monitoring wells MW-24 since last sampled in October 2002. Concentrations of PCE detected in samples collected from MW-18 have increased since this well was last sampled in January 1998. PCE concentrations detected in samples collected from monitoring wells MW-19, MW-23, MW-28A, and recovery wells RW-1 and RW-4 have decreased since last sampled in October 2002. Concentrations of PCE detected in samples collected from MW-21 have decreased since this well was last sampled in January 1998. The PCE concentration in MW-26R remained generally unchanged since it was last sampled.

Concentrations of 1,2-PCE have decreased in samples collected from monitoring well MW-26R and recovery well RW-1 since last sampled in October 2002, and in samples collected from well MW-21 since last sampled in January 1998. The 1,2-PCE concentrations detected in samples collected from monitoring well MW-28A and recovery well RW-4 were generally unchanged. While 1,2-PCE was detected in samples collected from wells MW-19 and MW-23 during the October 2002 sampling event, it was not detected in samples collected from these wells during the April 2003 sampling event.

Vinyl chloride was detected in samples collected from one monitoring well (MW-26R) on the southwest side of the Girmes facility. This well is located on Dotson's property on the southwest side of Gashes Creek. The detected concentration, 0.064 mg/L, has declined slightly since the previous sampling event and remains above the NC 2L standard.

Surface water samples were collected from four surface water stations during the April 2003 sampling event, SW-1, SW-2, SW-3, and SW-4. None of the surface water samples collected had detections of PCE, 1,2-PCE, or vinyl chloride.

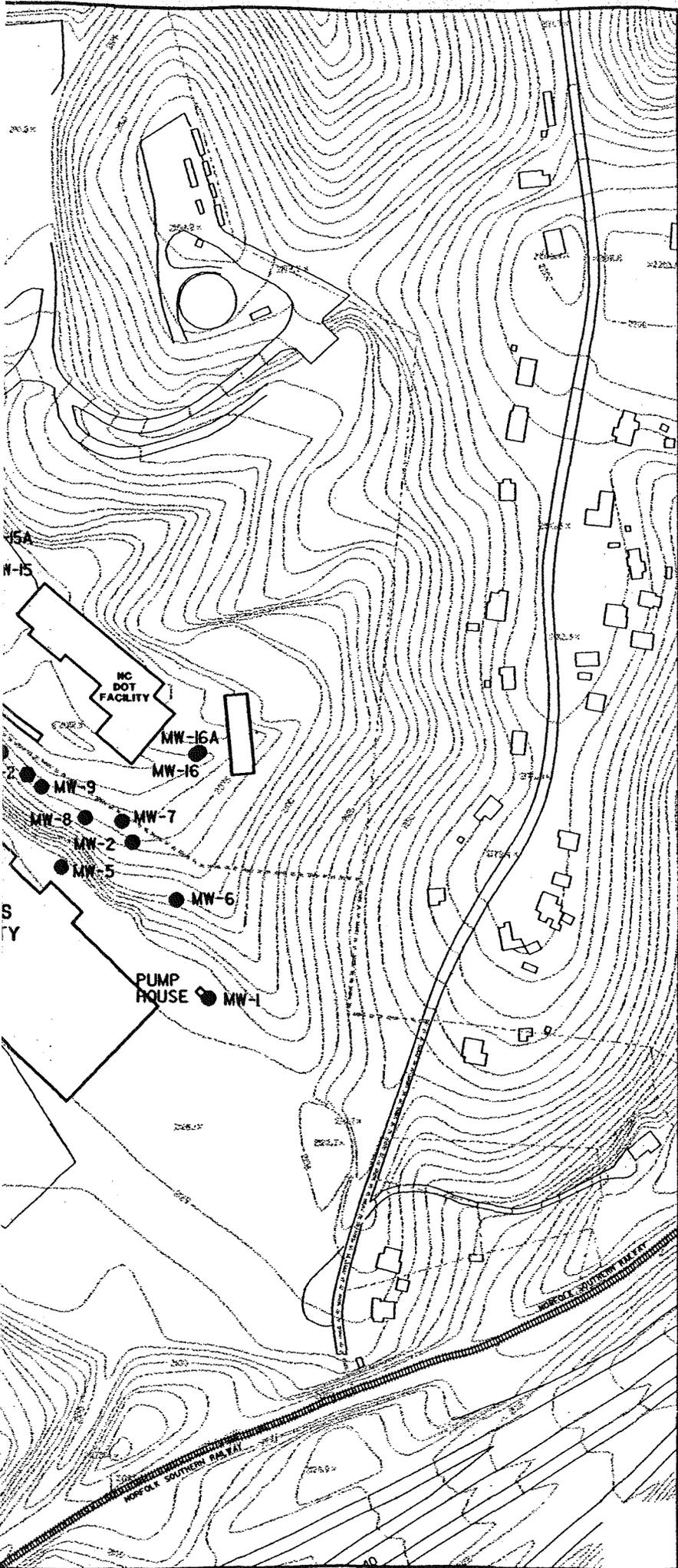
3.2 Tetrachloroethene

Since shortly after startup of the groundwater recovery system, PCE was found in the influent to the treatment system. Select monitoring wells sampled during the January 1999 monitoring event were analyzed for PCE in addition to the standard analytical parameters. The January 1999 analytical results, along with historical groundwater analytical data collected at the site during the PCE, led SKF to conclude that the PCE and other PCE found on the southwest side of Gashes Creek have no relationship to the affected groundwater found on the Girmes facility.

In the groundwater monitoring report for the January 1999 sampling event, SKF modified the groundwater monitoring program to continue monitoring all of the wells specified in the CAP according to the specified schedule. In addition to PCE, 1,2-PCE, and vinyl chloride, recovery wells RW-1, RW-3, and RW-4 and select monitoring wells would also be sampled for PCE.

During the April 2003 sampling event, monitoring wells MW-18, MW-19, MW-21, MW-23, MW-24, MW-26R, MW-28, and MW-28A and the two operating recovery wells were analyzed for PCE. Analytical results are included in Table 2. PCE continues to be detected in samples collected from monitoring wells MW-23 and MW-28A located on the southwest side of Gashes Creek. Concentrations of PCE have decreased in samples collected from well MW-23 since last sampled in October 2002. Although PCE was not detected in the groundwater sample collected from recovery well RW-1, it was detected in the duplicate sample collected from that well. The PCE concentrations detected in RW-1 have decreased since last sampled in April 2002. When operating, recovery wells RW-1 and RW-4 recover groundwater from the southwest side of Gashes Creek. All three of the groundwater samples in which PCE was detected (MW-23, MW-28A, and RW-1 (DUP – 03102)) had concentrations exceeding the NC 2L standard. PCE has consistently been found in these wells since analyses for PCE began in January 1999.

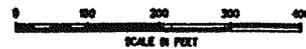
The analytical results for PCE confirm the results from previous sampling events since January 1999. The PCE found in these wells appears to be the result of a release on the southwest side of Gashes Creek and does not appear to be related to groundwater quality on the Girmes facility. However, for the time being, SKF will continue analyzing groundwater samples from wells MW-19, MW-23, MW-24, MW-26R, MW-28, MW-28A, RW-1, RW-3, and RW-4 for PCE in order to monitor concentration trends and their effects on the groundwater recovery system.



LEGEND

- ▲ SW-1 SURFACE WATER SAMPLING LOCATION
- MW-15 MONITORING WELL LOCATION
- - - - - PROPERTY LINE - OTHER
- 900 TOPOGRAPHIC CONTOUR

NOTE:
 DIGITIZED BASE MAP PROVIDED BY THE CITY OF ASHEVILLE, NORTH CAROLINA NOVEMBER, 1993.
 THE LOCATIONS OF THE STORM SEWER LINES WERE INCLUDED AS PART OF THE BASE MAP.



PROJECT NO:	BA 10000
PREPARED BY:	J. S. BOCHOLD
DRAWN BY:	J. S. BOCHOLD
CHECKED BY:	
APPROVED BY:	
APPROVED BY:	B. S. WAGSON
APPROVED BY:	
DATE:	JUNE 1993
JOB NO.:	7044.2



80 Terdon Boulevard
 P.O. Box 8178
 Greenville, SC 29602
 864 288-0123

LOCATION OF DATA POINTS
 GAMES SITE, formerly SCF USA
 ASHEVILLE, NORTH CAROLINA

SCALE
 AS NOTED

FIGURE NO.
 1

Table 2
Analytical Results for Groundwater and Surface Water Samples ⁽¹⁾
Collected April 1, 2003 through April 3, 2003

LOCATION	DATE	TCE	1,2-DCE, TOTAL	VINYL CHLORIDE	PCE
NC 2L Standard		0.0028	0.07	0.000015	0.0007
MW-01	04/01/03	NA	NA	NA	NA
MW-02	04/02/03	0.014	<0.002	<0.001	NA
MW-04	04/02/03	0.34	0.33	<0.005	NA
MW-05	04/02/03	12	0.44	<0.1	NA
MW-06	04/02/03	<0.001	<0.002	<0.001	NA
MW-07	04/02/03	<0.001	<0.002	<0.001	NA
MW-08	04/02/03	0.00096J	<0.002	<0.001	NA
MW-09	04/02/03	0.39	0.011	<0.0025	NA
MW-10	04/02/03	0.001	0.0095	0.00051J	NA
MW-11	04/02/03	0.004	<0.002	<0.001	NA
MW-12	04/01/03	<0.001	<0.002	<0.001	NA
MW-13	04/01/03	<0.001	<0.002	0.0064	NA
MW-14	04/01/03	NA	NA	NA	NA
MW-15	04/01/03	<0.001	<0.002	<0.001	NA
MW-15A	04/01/03	<0.001	<0.002	<0.001	NA
MW-16	04/01/03	<0.001	<0.002	<0.001	NA
MW-16A	04/01/03	0.0006J	<0.002	<0.001	NA
MW-17	04/01/03	<0.001	<0.002	<0.001	NA
MW-18	04/02/03	0.0055	<0.002	<0.001	<0.001
MW-19	04/02/03	0.0038	<0.002	<0.001	<0.001
MW-20	04/01/03	0.012	0.0049	<0.001	NA
MW-21	04/02/03	0.012	0.0059	<0.001	<0.001
MW-22	04/01/03	NA	NA	NA	NA
MW-23	04/01/03	0.0082	<0.002	<0.001	0.031j
MW-24	04/02/03	0.014	<0.002	<0.001	<0.001
MW-26R	04/01/03	0.00061J	0.075	0.064	<0.001
MW-27	04/02/03	<0.001	<0.002	<0.001	NA
MW-28	04/01/03	<0.001	<0.002	<0.001	<0.001
MW-28A	04/01/03	0.0055	0.0015J	<0.001	0.0034
MW-28A (DU-03101)	04/01/03	0.0058	0.0015J	<0.001	0.0034
RW-01	04/03/03	0.2	0.01	<0.005	<0.005j
RW-01 (DU-03102)	04/03/03	0.23	0.011	<0.002	0.02j
RW-04	04/03/03	0.05	0.0022	<0.001	<0.001j
SW-01	04/03/03	<0.001	<0.002	<0.001	NA
SW-02	04/03/03	<0.001	<0.002	<0.001	NA
SW-03	04/03/03	<0.001	<0.002	<0.001	NA
SW-04	04/03/03	<0.001	<0.002	<0.001	NA

⁽¹⁾ Analytical results are reported in milligrams per liter (mg/L) unless otherwise noted.

J - Qualitative mass spectral evidence of analyte present; concentration is less than reporting limit.

j - Concentration considered an estimate based on data validation.

< - Concentration less than the Quantitation Limit.

NA - Not analyzed.

Shaded value indicates exceedance of NC 2L Standard

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater⁽¹⁾

WELL	SAMPLING DATE								
	NOV-93	APR-94	AUG-94	SEP-94	JUN-95	JAN/FEB-96	JUN-96	JAN-97	JUL-97
MW-1	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-2	0.11	NA	NA	NA	0.058 D	0.088	0.037	0.052	0.035
MW-4	1.5	NA	NA	NA	0.95 D	0.74	0.71	0.64	0.45 D
MW-5	6.4	NA	NA	NA	5.8 D	5.2	5.6	7.3	7.1 D
MW-6	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-7	0.014	NA	NA	NA	ND	ND	0.0011	0.0064	0.015
MW-8	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-9	3.0	NA	NA	NA	1.8 D	2.7	1.9	2.2	1.9
MW-10	0.22	NA	NA	NA	0.042 E	ND	0.038(0.034)*	0.025	0.029
MW-11	ND	NA	NA	NA	0.0016	ND	0.0044	0.0022	0.0028
MW-12	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-13	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-14	0.52	NA	NA	NA	0.080 D	0.08	0.2	0.065	0.038
MW-15	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-15A	ND	NA	NA	NA	0.0026	ND	0.0022	ND	0.0089
MW-16	ND	NA	NA	NA	0.0012	ND	ND	ND	ND(ND)*
MW-16A	ND	NA	NA	NA	ND	ND	ND	ND(ND)*	ND
MW-17	0.0075(0.0076)*	NA	NA	NA	0.0039	ND	ND(ND)*	0.0006 Q	ND
MW-18		0.0033	0.0017	NA	ND	0.001	ND	0.0014/0.0013	0.0011
MW-19		0.0037	0.18	0.04	0.11 D	0.028	0.061	0.56	0.071
MW-20		ND	NA	NA	ND	ND	ND	ND	0.0032
MW-21		0.49	0.49	NA	0.35 D	0.32	0.42	0.29	0.35
MW-22		ND	NA	NA	ND	ND	ND	ND	ND
MW-23			3.5	5.7	11.0 D	14.0	13.0	12.0	8.7 D(8.3 D)*
MW-24			2.2	0.2	0.22 D	0.23	0.21	0.22	0.19 D
MW-26R								0.0005 Q	0.0013
MW-27			ND	NA	ND	ND	ND	ND	ND
MW-28					ND	ND	ND	ND	0.0015
MW-28A					0.054 D	0.14	0.076	0.072	0.083
RW-1					9.9/0.91**	0.26	0.77		1.0
RW-3									0.94
RW-4									0.4

⁽¹⁾ Analytical results are reported in milligrams per liter (mg/L) unless otherwise noted.

D - Analyte value from diluted analysis.

E - Analyte concentration exceeds calibration range.

J - Qualitative evidence of analyte present: Concentration detected is greater than the method detection limit but less than the reporting limit.

Q - The analyte has been detected between the Limit of Detection (LOD) and Limit of Quantitation (LOQ).

The results are qualified due to the uncertainty of analyte concentrations within this range.

NA - Not analyzed.

ND - Not detected.

* - Analytical results for duplicate samples shown in parentheses.

** - Analytical results for samples collected at the beginning/end of pumping tests.

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater⁽¹⁾

WELL	SAMPLING DATE								
	JAN-98	JUL-98	OCT-98	JAN-99	APR-99	JUL-99	OCT-99	JAN-00	APR-00
MW-1	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-2	0.038	0.016	0.031	0.047	0.037	0.031	0.042	0.051	0.042
MW-4	0.52	0.27	0.39 D	0.56	0.45	0.3	0.36	0.38	0.29 (0.23)*
MW-5	7.2	8.0	8.4 D	9.2 (9.40)*	13.0 D	12.0 D	14 D	16	15 D
MW-6	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-7	0.017	NA	0.014	NA	0.022	NA	0.026 (0.024)	NA	0.0037
MW-8	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-9	1.4	0.82	0.53	0.49	0.88	0.73	0.58 D	0.36	0.65
MW-10	0.031	NA	0.025	NA	0.012	NA	0.018	NA	0.0042
MW-11	0.0018	NA	0.0023	NA	0.0031	NA	0.0035	NA	0.0033
MW-12	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-13	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14	0.035	NA	DRY	NA	DRY	NA	DRY	NA	NA
MW-15	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-15A	0.0019	NA	ND (ND)*	NA	0.00085 J	NA	0.00054 J	NA	ND
MW-16	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-16A	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-17	ND	NA	ND	NA	ND	NA	0.00083 J	NA	ND
MW-18	ND	NA	DRY	NA	DRY	NA	DRY	NA	NA
MW-19	0.019	0.024	0.039	0.046	0.028	0.04	0.076	0.084 (0.076)*	0.0075
MW-20	0.0034	NA	0.014 (0.014)*	NA	0.015	NA	0.0094 (0.0086)	NA	0.02 (0.017)*
MW-21	0.31	NA	DRY	NA	DRY	NA	DRY	NA	NA
MW-22	ND	NA	ND	NA	DRY	NA	DRY	NA	NA
MW-23	10.0	1.6	0.33	0.2	0.1	0.086(0.087)*	0.084	0.046	0.051
MW-24	0.22	0.099	0.066	0.047	0.051	0.044(0.045)*	0.025	0.028	0.028
MW-26R	0.003	0.0017	ND	0.00076 J	0.0015	0.0013	0.00083 J	0.00062 J	0.0011
MW-27	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-28	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-28A	0.067	0.036	0.031	0.03	0.023	0.023	0.017	0.016	0.013
RW-1		1.9 D	1.7	1.1	0.6	0.7	0.49 D	0.74	0.69
RW-3		0.63	0.84 D	0.7	0.59	0.71	0.6 D	0.71	0.62
RW-4		0.2	0.17	0.13	0.13	0.14	0.089	0.12 (0.12)*	0.17

⁽¹⁾ Analytical results are reported in milligrams per liter (mg/L) unless otherwise noted.

D - Analyte value from diluted analysis.

E - Analyte concentration exceeds calibration range.

J - Qualitative evidence of analyte present: Concentration detected is greater than the method detection limit but less than the reporting limit.

Q - The analyte has been detected between the Limit of Detection (LOD) and Limit of Quantitation (LOQ).

The results are qualified due to the uncertainty of analyte concentrations within this range.

NA - Not analyzed.

ND - Not detected.

* - Analytical results for duplicate samples shown in parentheses.

** - Analytical results for samples collected at the beginning/end of pumping tests.

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater⁽¹⁾

WELL	SAMPLING DATE						
	JUL-00	OCT-00	APR-01	OCT-01	APR-02	OCT-02	APR-03
MW-1	NA	ND	ND	ND	ND	ND	DRY
MW-2	0.029	0.035	NA	0.024	0.031	0.026 k	0.014
MW-4	0.26	0.45	0.32	0.46	0.33	0.41 k (0.42k)	0.34
MW-5	16	17 D	13	16	11 D	14 k	12
MW-6	NA	ND	ND	ND	ND	ND	ND
MW-7	NA	0.0027	0.0009J	ND	ND	ND	ND
MW-8	NA	ND	0.0011	0.0011	0.0014	0.0013	0.00096J
MW-9	0.83	1	0.34	0.65	0.41	0.96 k	0.39
MW-10	NA	0.016	0.0038	0.0041	0.0011	0.002	0.001
MW-11	NA	0.003	0.0023	0.0036	0.0029	0.0031	0.004
MW-12	NA	ND	ND	ND	ND	ND	ND
MW-13	ND	ND	ND	0.00053 J	ND	ND	ND
MW-14	NA	NA	NA	NA	NA	NA	DRY
MW-15	NA	ND	ND	ND	ND	ND	ND
MW-15A	NA	ND	0.0015	ND	ND	ND	ND
MW-16	NA	ND	ND	ND	ND	ND	ND
MW-16A	NA	ND	ND	0.00052 J	ND	ND (0.00072Jj)	0.0006J
MW-17	NA	0.0011	0.00057J (0.00054J)	0.0033	0.0044	0.01	ND
MW-18	NA	NA	NA	NA	NA	NA	0.0055
MW-19	0.036	0.092	0.016	0.11	0.064	0.18 k	0.0038
MW-20	NA	0.018	0.011	0.012	0.012	0.0091	0.012
MW-21	NA	NA	NA	NA	NA	NA	0.012
MW-22	NA	NA	NA	NA	NA	NA	DRY
MW-23	0.014	0.017	0.041	0.0099	0.027	0.028 k	0.0082
MW-24	0.017	0.013 (0.014)	0.012	0.0066	0.0047	0.0062	0.014
MW-26R	ND	ND	0.0025	0.0096	ND	0.00076 J	0.00061J
MW-27	NA	ND	ND	ND	ND	ND	ND
MW-28	NA	ND	ND	ND	ND (ND)	ND	ND
MW-28A	0.013	0.01	0.0085	0.0059	0.0058	0.0065	0.0055
RW-1	0.13	1.3	0.6	0.54	0.16	0.51 k	0.2
RW-3	0.56	0.61	0.57	0.63	NA	NA	NA
RW-4	0.39 D (0.39 D)	0.13	0.19 (0.16)	0.077	0.034 (0.034)	0.066 Nk	0.05

⁽¹⁾ Analytical results are reported in milligrams per liter (mg/L) unless otherwise noted.

D - Analyte value from diluted analysis.

E - Analyte concentration exceeds calibration range.

J - Qualitative evidence of analyte present: Concentration detected is greater than the method detection limit but less than the reporting limit.

Q - The analyte has been detected between the Limit of Detection (LOD) and Limit of Quantitation (LOQ).

The results are qualified due to the uncertainty of analyte concentrations within this range.

NA - Not analyzed.

ND - Not detected.

* - Analytical results for duplicate samples shown in parentheses.

** - Analytical results for samples collected at the beginning/end of pumping tests.

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater⁽¹⁾

WELL	SAMPLING DATE								
	NOV-93	APR-94	AUG-94	SEP-94	JUN-95	JAN/FEB-96	JUN-96	JAN-97	JUL-97
MW-1	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-2	0.025	NA	NA	NA	0.012	ND	0.0096	ND	0.004
MW-4	0.74	NA	NA	NA	0.67 D	0.36	0.71	ND	0.51 D
MW-5	ND	NA	NA	NA	0.085 E	ND	0.27	ND	0.2
MW-6	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-7	0.038	NA	NA	NA	ND	ND	ND	ND	0.001 J
MW-8	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-9	ND	NA	NA	NA	0.045 E	ND	ND	ND	0.043
MW-10	1.2	NA	NA	NA	0.60 D	0.38	0.45(0.39)*	ND	0.47
MW-11	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-12	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-13	ND	NA	NA	NA	0.003	ND	0.0044	0.022	0.002
MW-14	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-15	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-15A	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-16	ND	NA	NA	NA	ND	ND	ND	ND	ND(ND)*
MW-16A	ND	NA	NA	NA	ND	ND	ND	ND(ND)*	ND
MW-17	ND(ND)*	NA	NA	NA	ND	ND	ND(ND)*	ND	ND
MW-18		0.0086	0.0036	NA	0.0026	ND	ND	0.0011 Q(0.0013 Q)*	0.0012 J
MW-19		ND	ND	0.019	0.0085	ND	0.004	ND	0.0038
MW-20		ND	NA	NA	0.0029	ND	0.26	ND	0.0043
MW-21		0.13	0.14	NA	0.25 D	0.20	ND	ND	0.13
MW-22		ND	NA	NA	ND	ND	0.68	ND	ND
MW-23			ND	ND	0.38	ND	ND	ND	0.28 D(0.27 D)*
MW-24			ND	ND	0.003	ND	ND	ND	0.0024
MW-26R								0.003 Q	0.0063
MW-27			ND	NA	ND	ND	ND	ND	
MW-28					ND	ND	ND	ND	
MW-28A					0.0073	0.018	0.033	0.011	0.011
RW-1					0.56/0.24**	0.08	0.2	NA	0.013
RW-3									ND
RW-4									0.0085 J

⁽¹⁾ Analytical results are reported in milligrams per liter (mg/L) unless otherwise noted.

D - Analyte value from diluted analysis.

E - Analyte concentration exceeds calibration range.

J - Qualitative evidence of analyte present: Concentration detected is greater than the method detection limit but less than the reporting limit.

Q - The analyte has been detected between the Limit of Detection (LOD) and Limit of Quantitation (LOQ).

The results are qualified due to the uncertainty of analyte concentrations within this range.

NA - Not analyzed.

ND - Not detected.

* - Analytical results for duplicate samples shown in parentheses.

** - Analytical results for samples collected at the beginning/end of pumping tests.

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater⁽¹⁾

WELL	SAMPLING DATE								
	JAN-98	JUL-98	OCT-98	JAN-99	APR-99	JUL-99	OCT-99	JAN-2000	APR-2000
MW-1	ND	NA	<0.002	NA	ND	NA	ND	NA	ND
MW-2	0.0035	0.0022	0.0024	0.003	0.0024	0.002	0.003	0.003	0.0029
MW-4	0.52	0.38	0.39 D	0.76	0.55	0.33	0.41	0.38	0.26 (0.26)*
MW-5	0.15	0.13	0.12	0.15	0.19	0.19 D	0.22	0.26	0.23
MW-6	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-7	ND	NA	0.00086 J	NA	ND	NA	0.0013 J (0.0013 J)*	NA	ND
MW-8	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-9	0.03	0.019	0.012	0.011	ND	0.015	0.016	0.0082	0.012
MW-10	0.47	NA	0.4	NA	0.2	NA	0.3	NA	0.065
MW-11	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-12	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-13	ND	0.0014 J	0.00093 J	ND	DRY	ND	DRY	ND	ND
MW-14	ND	NA	DRY	NA	ND	NA	NA	NA	ND
MW-15	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-15A	ND	NA	ND (ND)*	NA	ND	NA	ND	NA	ND
MW-16	ND	NA	ND	0.002	ND	NA	ND	NA	ND
MW-16A	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-17	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-18	ND	NA	DRY	NA	DRY	NA	DRY	NA	NA
MW-19	ND	0.0012 J	0.0015 J	NA	ND	ND	0.0035	0.0037 (0.0031)*	ND
MW-20	0.0054	NA	0.0071 (0.0075)*	NA	0.007	NA	0.0056 (0.0056)*	NA	0.0077 (0.0066)*
MW-21	0.13	NA	DRY	NA	DRY	NA	DRY	NA	NA
MW-22	ND	NA	ND	NA	DRY	NA	DRY	NA	NA
MW-23	0.34	0.11	0.025	0.016	0.017	0.011(0.011)*	0.012	0.0069	0.0078
MW-24	ND	0.0013 J	0.0081J	0.00056 J	ND	ND(ND)*	ND	ND	ND
MW-26R	0.0081	0.016	0.018	0.028	0.067	0.076	0.064	0.058	0.077
MW-27	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-28	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-28A	0.0086	0.0052	0.0067	0.0068	0.0045	0.0039	0.0033	0.0029	0.0023
RW-1		0.05	0.062	0.042	0.024	0.027	0.024	0.024	0.021
RW-3		0.038	0.022	0.045	0.045	0.051	0.061	0.057	0.042
RW-4		0.0053	0.0046	0.0031	0.0036	0.0034	0.0025	0.0032 (0.0033)*	0.0041

⁽¹⁾ Analytical results are reported in milligrams per liter (mg/L) unless otherwise noted.

D - Analyte value from diluted analysis.

E - Analyte concentration exceeds calibration range.

J - Qualitative evidence of analyte present: Concentration detected is greater than the method detection limit but less than the reporting limit.

Q - The analyte has been detected between the Limit of Detection (LOD) and Limit of Quantitation (LOQ).

The results are qualified due to the uncertainty of analyte concentrations within this range.

NA - Not analyzed.

ND - Not detected.

* - Analytical results for duplicate samples shown in parentheses.

** - Analytical results for samples collected at the beginning/end of pumping tests.

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater⁽¹⁾

WELL	SAMPLING DATE					
	OCT-2000	APR-2001	OCT-2001	APR-2002	OCT-2002	APR-2003
MW-1	ND	ND	ND	ND	ND	DRY
MW-2	0.0022	NA	0.0011 J	0.0017 J	0.0014 J	ND
MW-4	0.59	0.63	0.71	0.44	0.63 (0.61)	0.33
MW-5	0.3	0.3	0.29	0.34	0.46	0.44
MW-6	ND	ND	ND	ND	ND	ND
MW-7	ND	ND	ND	ND	ND	ND
MW-8	ND	ND	ND	ND	ND	ND
MW-9	0.022	0.0079	0.014	0.012	0.024	0.011
MW-10	0.22	0.094	0.085	0.021	0.029	0.0095
MW-11	ND	ND	ND	ND	ND	ND
MW-12	ND	ND	ND	ND	ND	ND
MW-13	ND	ND	ND	ND	ND	ND
MW-14	NA	NA	NA	NA	NA	DRY
MW-15	ND	ND	ND	ND	ND	ND
MW-15A	ND	ND	ND	ND	ND	ND
MW-16	ND	ND	ND	ND	ND	ND
MW-16A	ND	ND	ND	ND	ND (ND)	ND
MW-17	ND	ND (ND)	ND	0.00084 J	0.0021	ND
MW-18	ND	NA	NA	NA	NA	ND
MW-19	0.0036	0.00058J	0.0035	0.0023	0.006	ND
MW-20	0.0066	0.0053	ND	0.0055	0.0046	0.0049
MW-21	NA	NA	NA	NA	NA	0.0059
MW-22	NA	NA	NA	NA	NA	DRY
MW-23	0.002	0.005	0.0016 J	0.0036	0.0029	ND
MW-24	ND	ND	ND	ND	ND	ND
MW-26R	0.045	0.064	0.16	0.17	0.13	0.075
MW-27	ND	ND	ND	ND	ND	ND
MW-28	ND	ND	ND	ND (ND)	ND	ND
MW-28A	0.0019 J	0.0016J	0.0012 J	ND	0.0016 J	0.0015J
RW-1	0.034	0.018	0.014	0.015	0.016	0.01
RW-3	0.047	0.05	0.047	NA	NA	NA
RW-4	0.0031	0.0048 (0.0044)	0.0015 J	ND (ND)	0.0012 J	0.0022

⁽¹⁾ Analytical results are reported in milligrams per liter (mg/L) unless otherwise noted.

D - Analyte value from diluted analysis.

E - Analyte concentration exceeds calibration range.

J - Qualitative evidence of analyte present: Concentration detected is greater than the method detection limit but less than the reporting limit.

Q - The analyte has been detected between the Limit of Detection (LOD) and Limit of Quantitation (LOQ).

The results are qualified due to the uncertainty of analyte concentrations within this range.

NA - Not analyzed.

ND - Not detected.

* - Analytical results for duplicate samples shown in parentheses.

** - Analytical results for samples collected at the beginning/end of pumping tests.

Section 4

Recovery System Performance

The groundwater recovery system is designed to use three recovery wells to capture affected groundwater. Water from these wells is pumped to an air stripper, where VOCs are removed, and treated water is discharged into Gashes Creek per NPDES Permit No. NC0086088. During the April 2002 sampling event it was discovered that the pump in well RW-3 was not operating. Attempts to restart the pump were unsuccessful. Well RW-3 has a yield of about ½ gallon per minute. Such a low flow in combination with the amount of vertical head between the pump and the land surface results in stress on the pump and its electrical system. This, in turn, results in increased maintenance. The remaining two wells (RW-1 and RW-4) recover approximately 15 and 7 gallons per minute, respectively, and account for nearly all of the yield from the groundwater recovery system. Since recovery well RW-3 contributes very little to the overall yield of the groundwater recovery system, it has remained offline since April 2002 and groundwater recovery continues to include only wells RW-1 and RW-4.

The groundwater recovery system is now operating on a pulse pumping cycle of “on” for 6 weeks, followed by “off” for 6 weeks. This pulsed pumping cycle operational mode was initiated on November 11, 2002. The dates that the system was turned on and off during the past six months are summarized in Section 2.

Influent and effluent to the stripper is sampled on a monthly basis during “on” pumping cycles. Effluent flow is recorded continuously. The analytical results for the influent and effluent are used along with the flow data to estimate the amount of trichloroethene removed each month. Monthly volumes of treated groundwater and the estimated amount of TCE removed since system startup in March 1998 through April 2003 are summarized in Table 5. The estimated amount of groundwater that was recovered and treated during November 2002 through April 2003 is 3.12 million gallons. It is estimated that over 13 pounds of TCE were removed during November 2002 through April 2003. As shown on Table 5, the amount of TCE removed increased from about 2.4 pounds per month in September and October 2002 to 9.3 pounds for the month of January 2003. The mass removal for January is based on influent samples collected 4 days after the system was restarted. The mass removed in February 2003 had declined to 1.9 pounds. This decline is attributed to two factors: (1) the system was only operated for 14 days in February, and (2) the mass for February is based on influent samples collected just prior to system shutdown, after 43 days of pumping. TCE concentrations are expected to decline over the pumping period. In April 2003, the mass of TCE removed had declined further to 1.4 pounds. This estimate for April is based on an influent sample collected

shortly (within hours) of the system being restarted. It is likely the recovery system and recovery wells had not been fully purged prior to influent sample collection. Future influent samples collected following system restart will be collected 4 days following startup to evaluate effects of pulse pumping on TCE concentrations recovered.

Table 5
Operations Summary for Period Beginning March 4, 1998, and Ending October 31, 2002

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
02/98	0	0	0	Not operational
03/98	28	1.58	N/C	Startup 03/04/98
04/98	30	1.62	39.1	Normal operation
05/98	31	1.64	35.6	Normal operation
06/98	30	1.58	17.1	Normal operation
07/98	31	1.53	17.9	Normal operation. Adjusted pump rate for RW-4
08/98	31	1.42	14.2	RMT coordinating maintenance of pump controllers
09/98	30	1.47	13.5	Normal operation, pump controllers repaired/calibrated
10/98	31	1.40	11.7	Removed pump from RW-3. Pump will be cleaned and repaired, as needed.
11/98	30	1.30	11.9	RW-3 pump replaced
12/98	31	1.28	6.7	Normal operation
01/99	31	1.31	7.5	Auto dialer was reprogrammed. System inspected.
02/99	28	1.33	7.42	Normal operation
03/99	31	1.33	3.27	Normal operation. Calibrated flow meter and updated flow meter software.
04/99	30	1.35	1.90	Normal operation. System inspected during groundwater sampling.
05/99	31	1.46	10.7	Normal operation
06/99	30	1.39	7.06	Normal operation
07/99	31	1.46	7.05	Normal operation
08/99	31	1.42	7.1	Normal operation
09/99	30	1.33	6.6	Normal operation
10/99	31	1.35	4.5	Normal operation. System inspected during groundwater sampling.
11/99	30	1.31	6.1	Normal operation
12/99	31	1.29	6.0	Normal operation

- (1) Not calculated, no influent sample collected.
- (2) Estimate based on data collected during system restart. Flow rate and VOC recovery rate will likely decline during operation.
- (3) Mass removal was based on TCE concentration of influent sample collected at time of shutdown (after 43 days of operation).

Table 5
Operations Summary for Period Beginning March 4, 1998, and Ending October 31, 2002

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
01/00	31	1.19	5.2	Normal operation
02/00	29	1.17	5.8	Normal operation
03/00	31	1.25	6.6	Normal operation
04/00	30	1.08	6.3	Normal operation
05/00	31	0.661	1.05	Flow from RW-4 has declined. Field technician will adjust flow
06/00	30	0.693	1.9	Maintenance issues identified during site visit. Flow remains lower than normal
07/00	31	0.624 ⁽²⁾	3.02	Pumps functional at a reduced rate. Meters are marginally functional.
08/00	31	0.725	4.6	Replacement equipment purchased, operation and maintenance (O&M) trip scheduled.
09/00	30	1.274	11.7	Repairs made on September 6 and 7. Flow restored to approximately 45,000 gpd.
10/00	31	1.27 ⁽²⁾	12.7	Normal operation
11/00	30	1.10	17.4	Effluent flow meter calibrated, normal operation
12/00	31	1.03	5.5	Normal operation
1/01	31	1.02	3.9	Normal operation
2/01	28	0.97	2.7	Normal operation
3/01	31	0.85	2.8 ⁽²⁾	Normal operation
4/01	30	1.02	3.2	Flow rates adjusted and yield increased
5/01	31	1.05	5.2	Normal operation
6/01	30	1.11	4.4	Normal operation
7/01	31	1.14	3.8	Normal operation
8/01	31	1.14	3.6	Normal operation
9/01	30	1.06	3.9	Normal operation
10/01	31	1.06 ⁽¹⁾	3.9 ⁽²⁾	Normal operation
11/01	30	1.03	3.8	Normal operation
12/01	31	1.08	3.9	Normal operation

⁽¹⁾ Not calculated, no influent sample collected.

⁽²⁾ Estimate based on data collected during system restart. Flow rate and VOC recovery rate will likely decline during operation.

⁽³⁾ Mass removal was based on TCE concentration of influent sample collected at time of shutdown (after 43 days of operation).

Table 5
Operations Summary for Period Beginning March 4, 1998, and Ending October 31, 2002

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
01/02	31	1.06	3.0	Normal operation
02/02	28	0.95	2.6	Normal operation
03/02	31	1.07	3.5	Normal operation
04/02	30	1.03 ⁽²⁾	3.5 ⁽²⁾	Well RW-3 not operating
05/02	31	1.09	3.3	The pump in well RW-3 not operating.
06/02	30	1.02	3.3	The pump in well RW-3 not operating.
07/02	31	1.02	3.3	The pump in well RW-3 not operating.
08/02	31	1.1	3.4	The pump in well RW-3 not operating.
09/02	30	1.01	2.4	The pump in well RW-3 not operating.
10/02	31	1.02 ⁽²⁾	2.4 ⁽²⁾	The pump in well RW-3 not operating.
11/02	10	0.33	0.77	10 days of operation this month; system off-line
12/02	31	0	0	System off-line for month of December.
01/03	29	1.12	9.3 ⁽²⁾	System was restarted the first week of January.
02/03	14	0.46	1.9 ⁽³⁾	System shut down February 14, 2003.
03/03	31	0	0	System off-line for month of March.
04/03	30	1.21	1.4	Normal operation
	1,850	68.38	413.84	Total since system startup

⁽¹⁾ Not calculated, no influent sample collected.

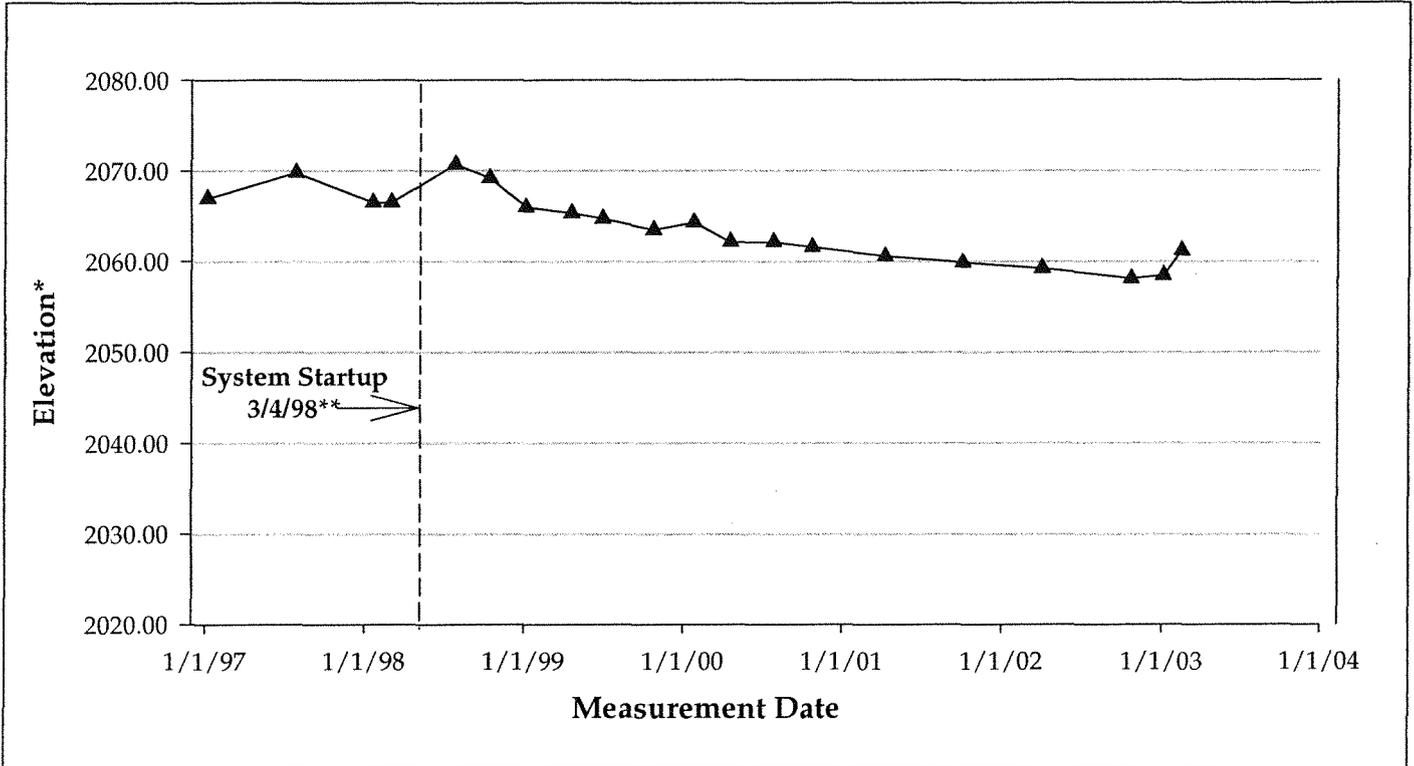
⁽²⁾ Estimate based on data collected during system restart. Flow rate and VOC recovery rate will likely decline during operation.

⁽³⁾ Mass removal was based on TCE concentration of influent sample collected at time of shutdown (after 43 days of operation).

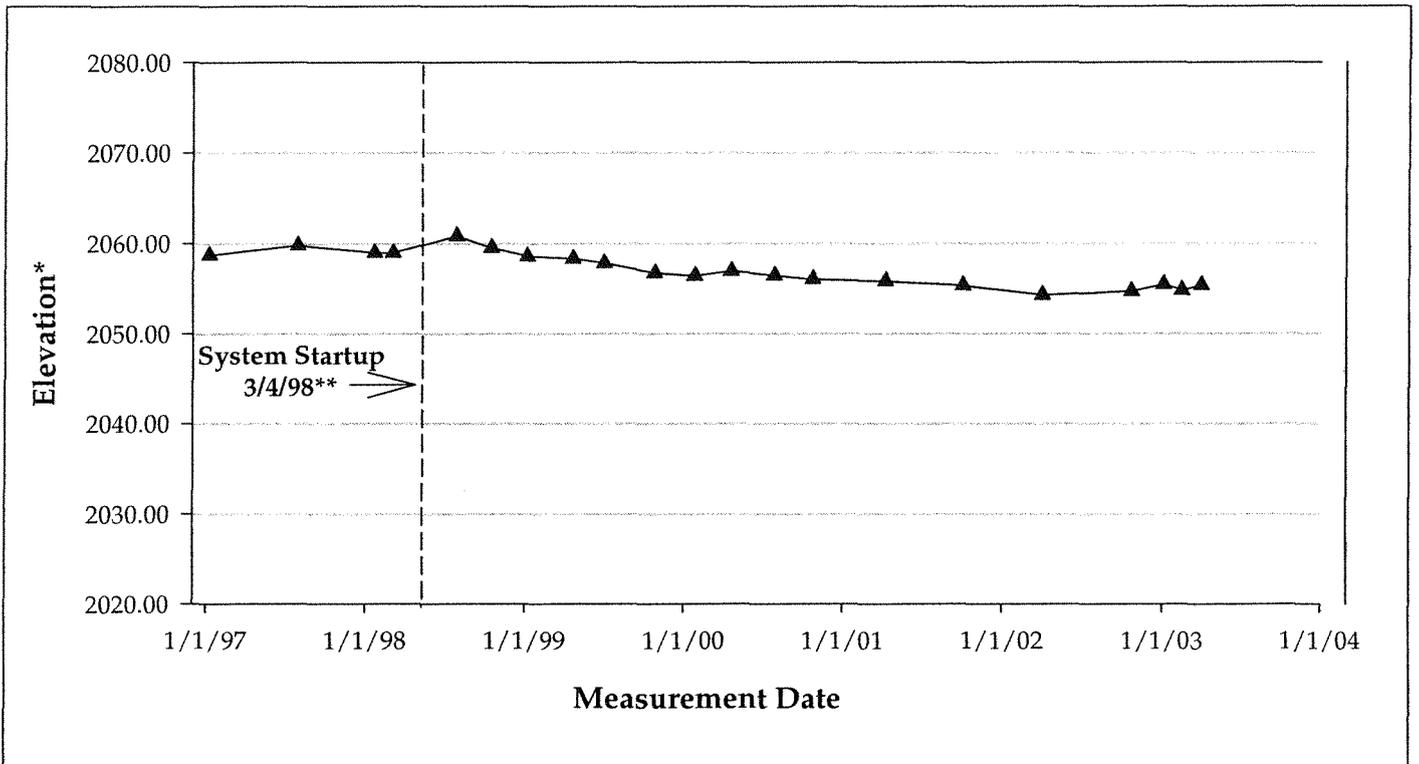
Appendix A

Hydrographs for Bedrock Wells

HYDROGRAPH - MONITORING WELL MW-1



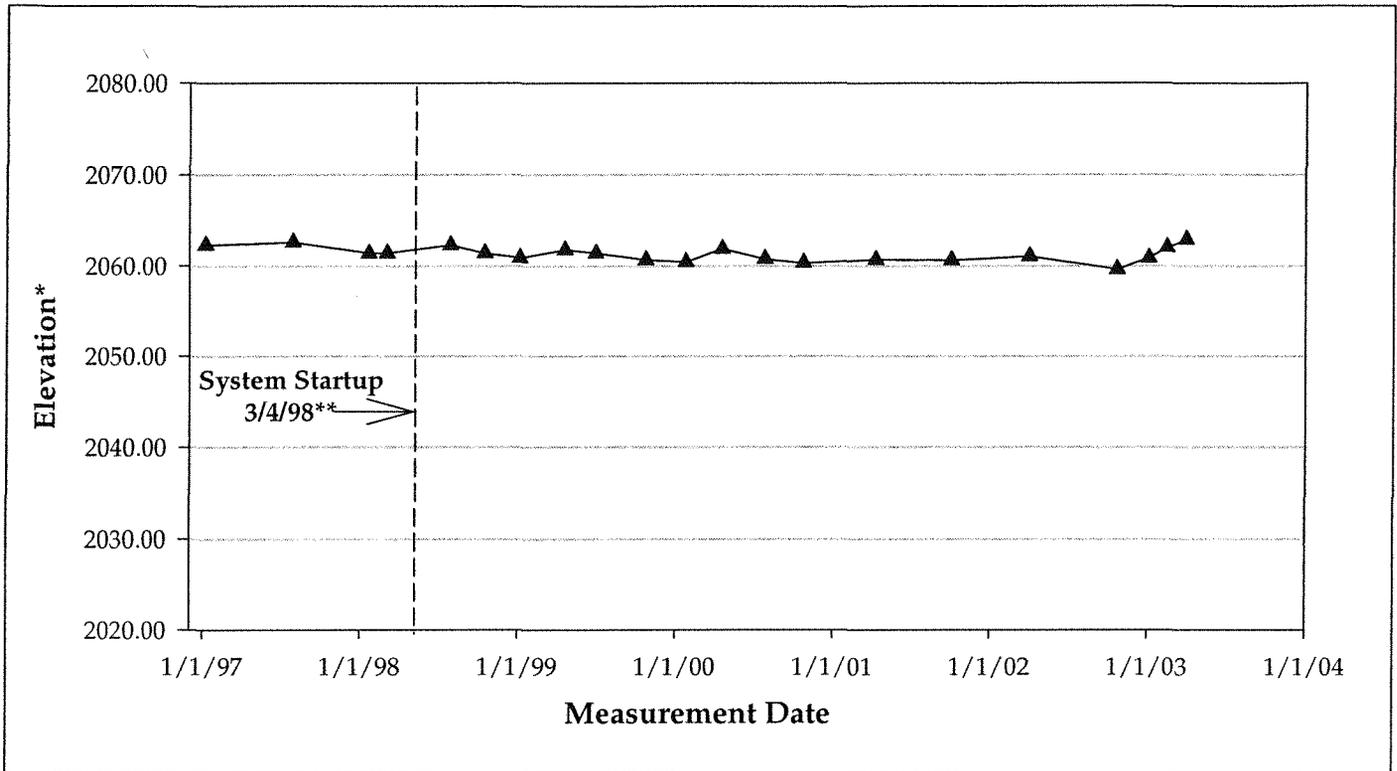
HYDROGRAPH - MONITORING WELL MW-6



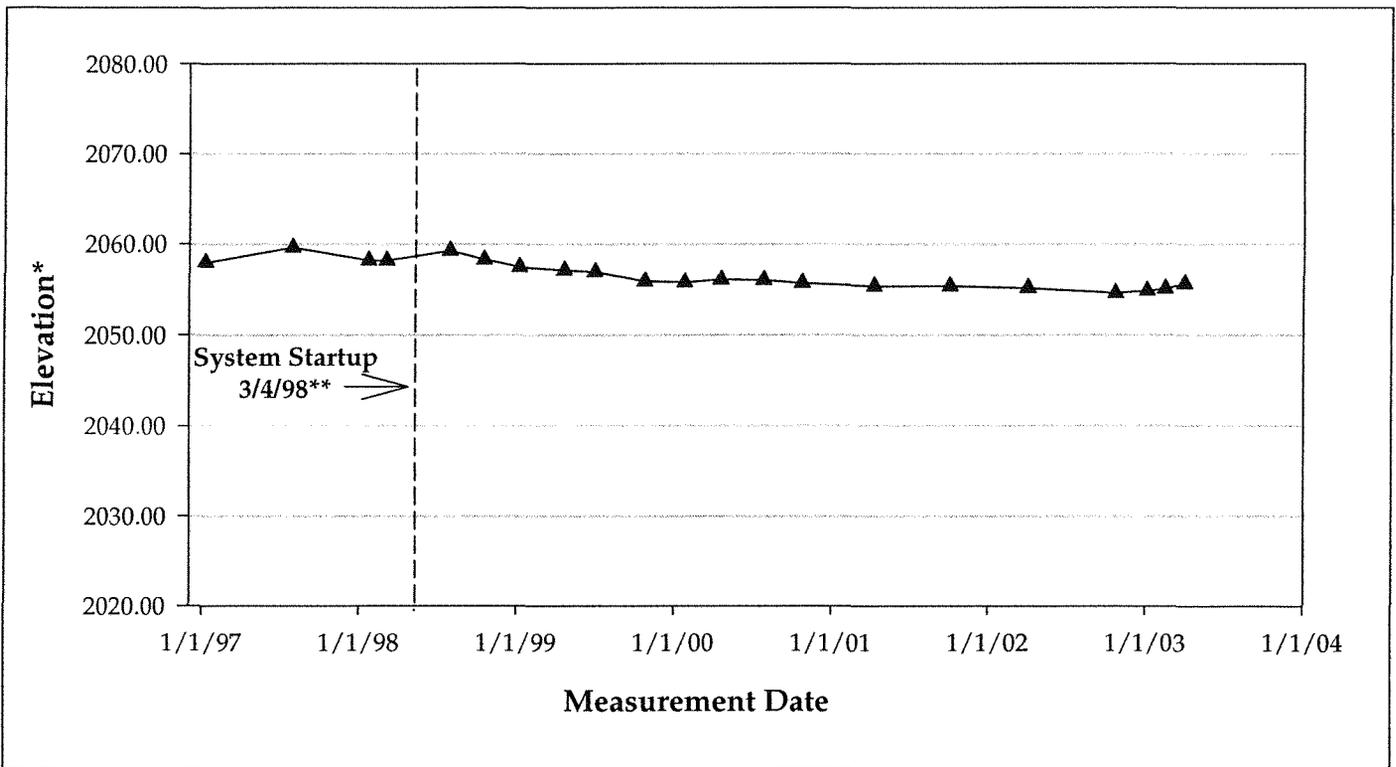
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - MONITORING WELL MW-4



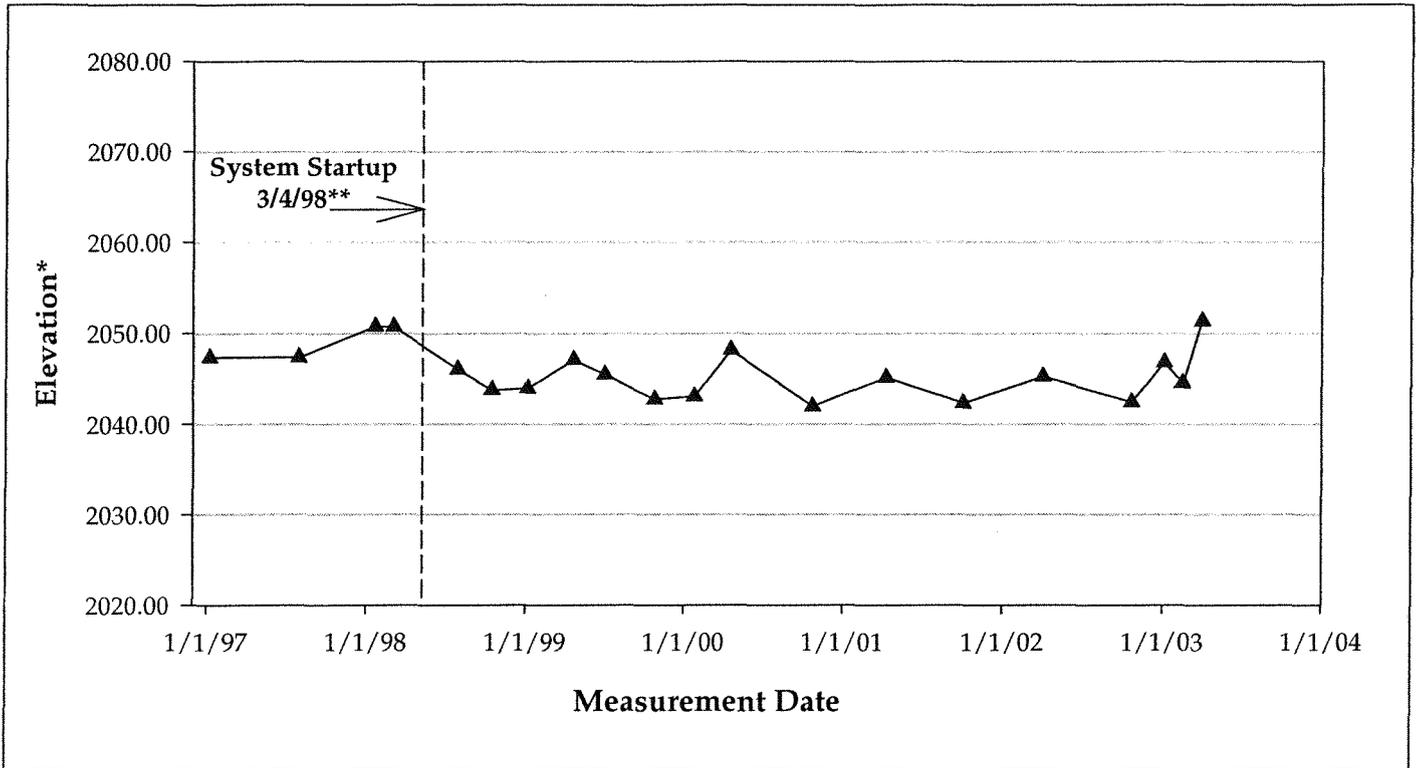
HYDROGRAPH - MONITORING WELL MW-5



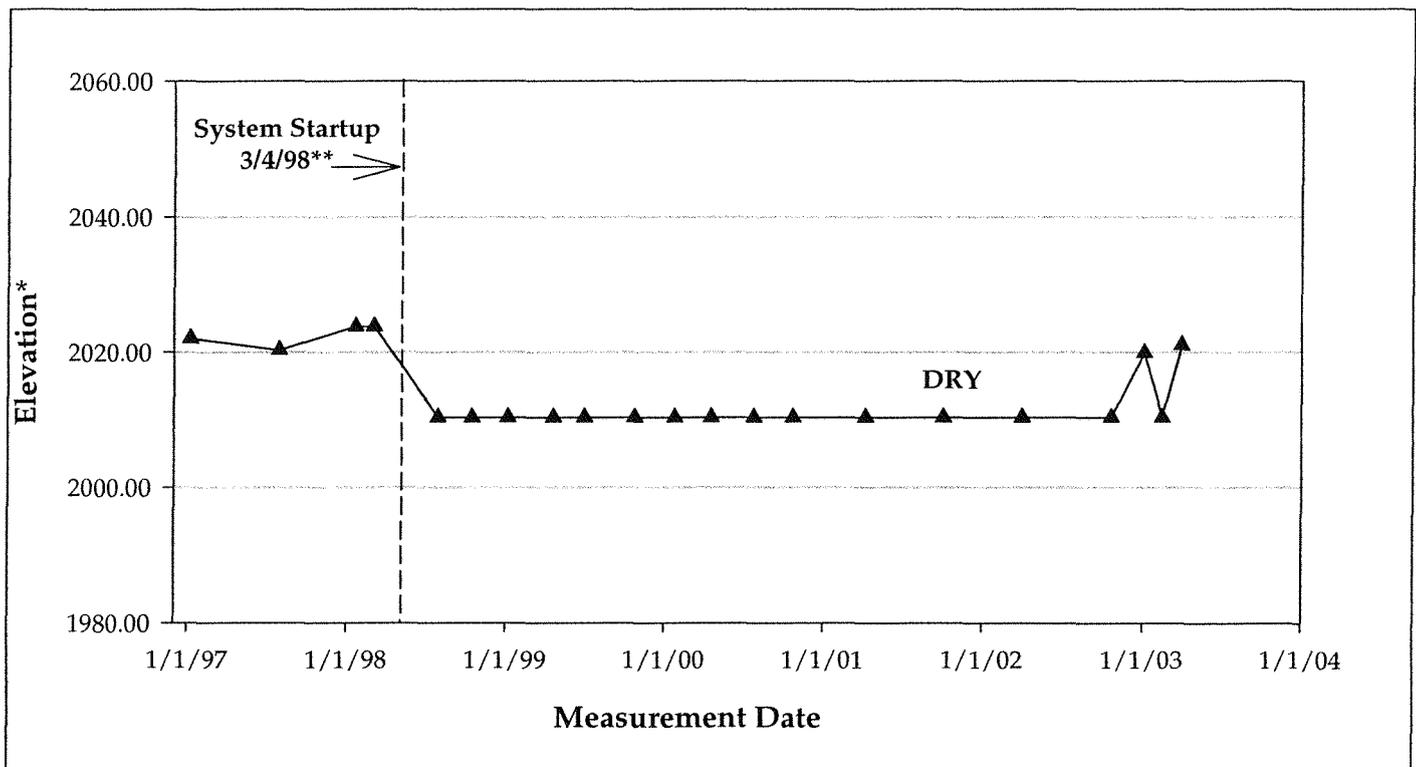
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - MONITORING WELL MW-17



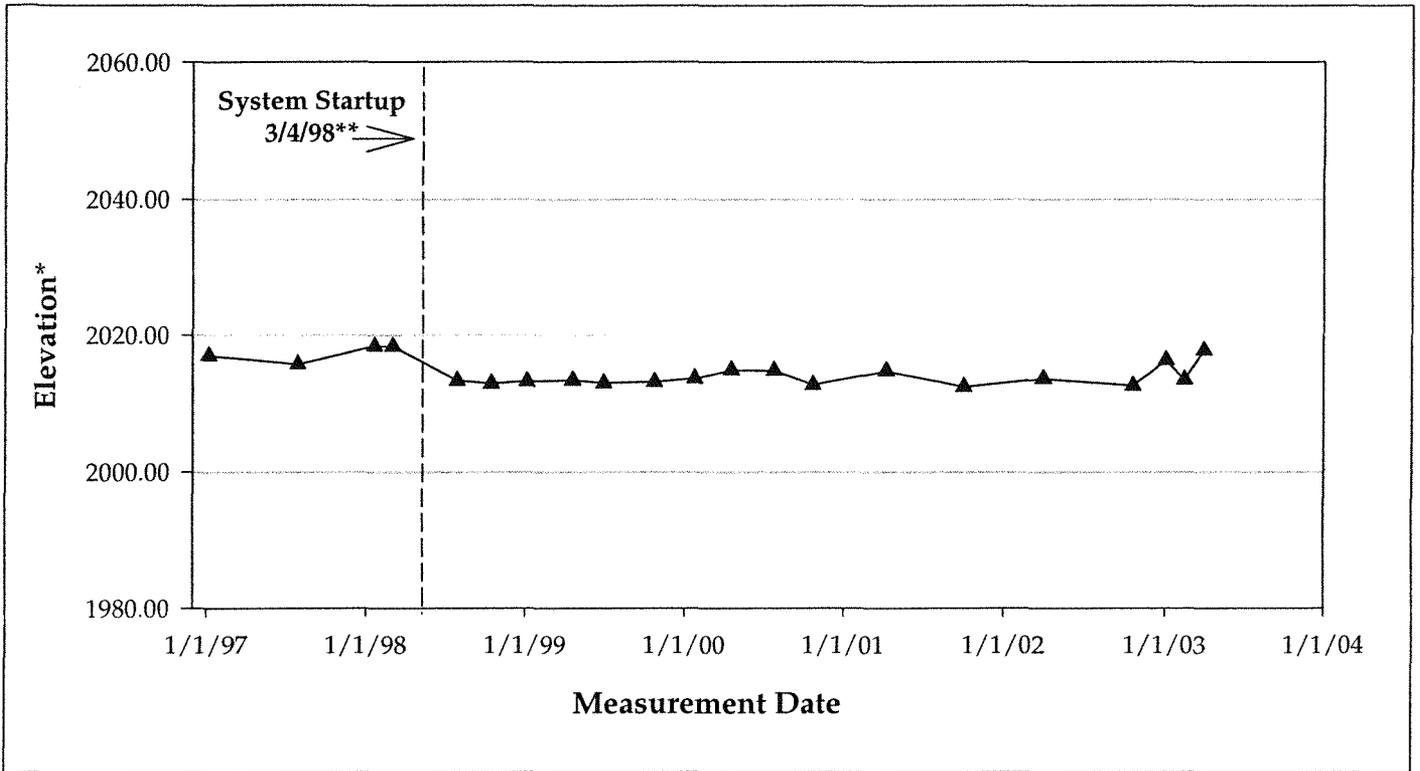
HYDROGRAPH - MONITORING WELL MW-18



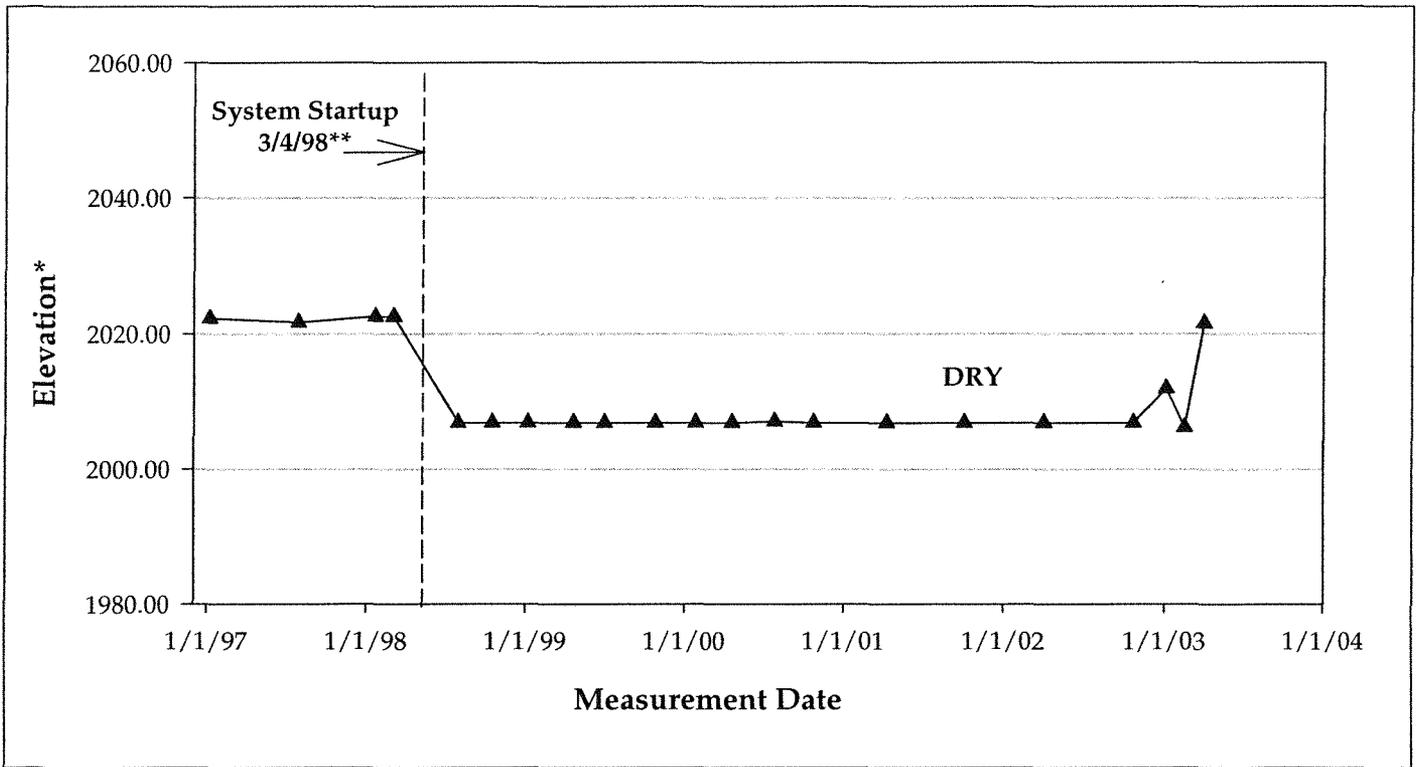
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - MONITORING WELL MW-19



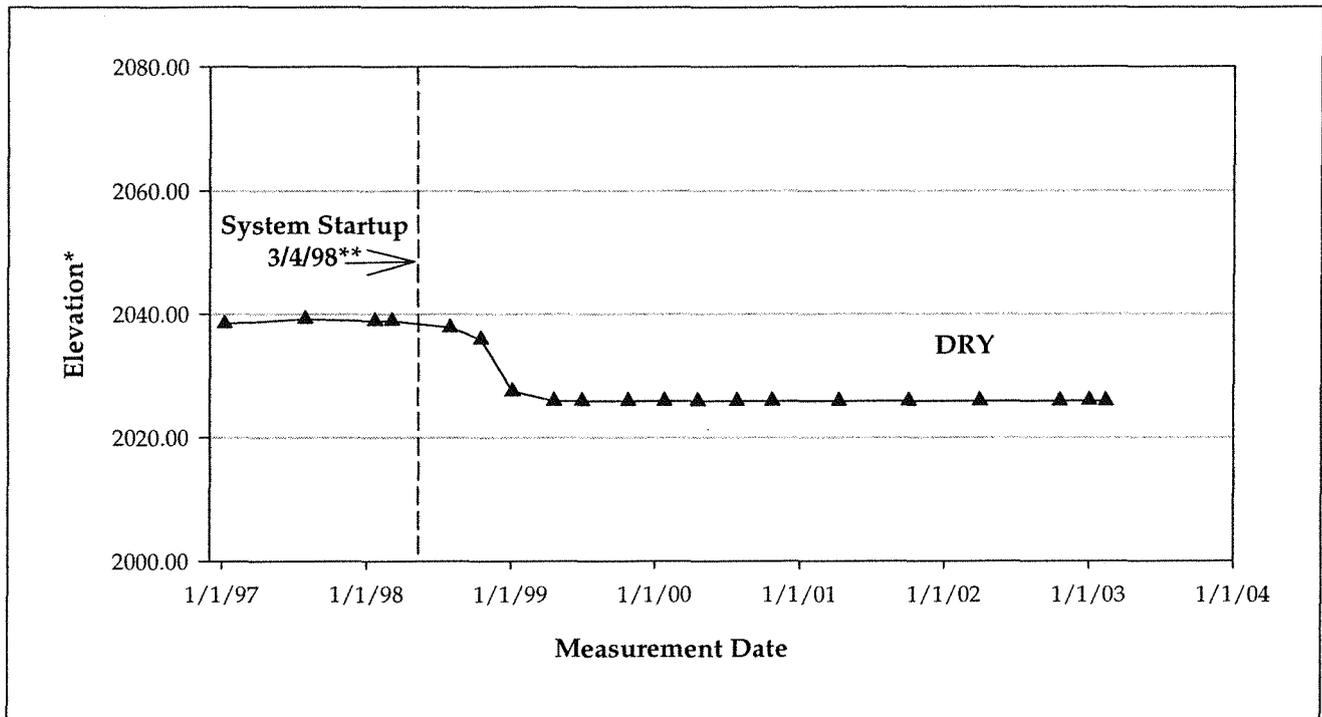
HYDROGRAPH - MONITORING WELL MW-21



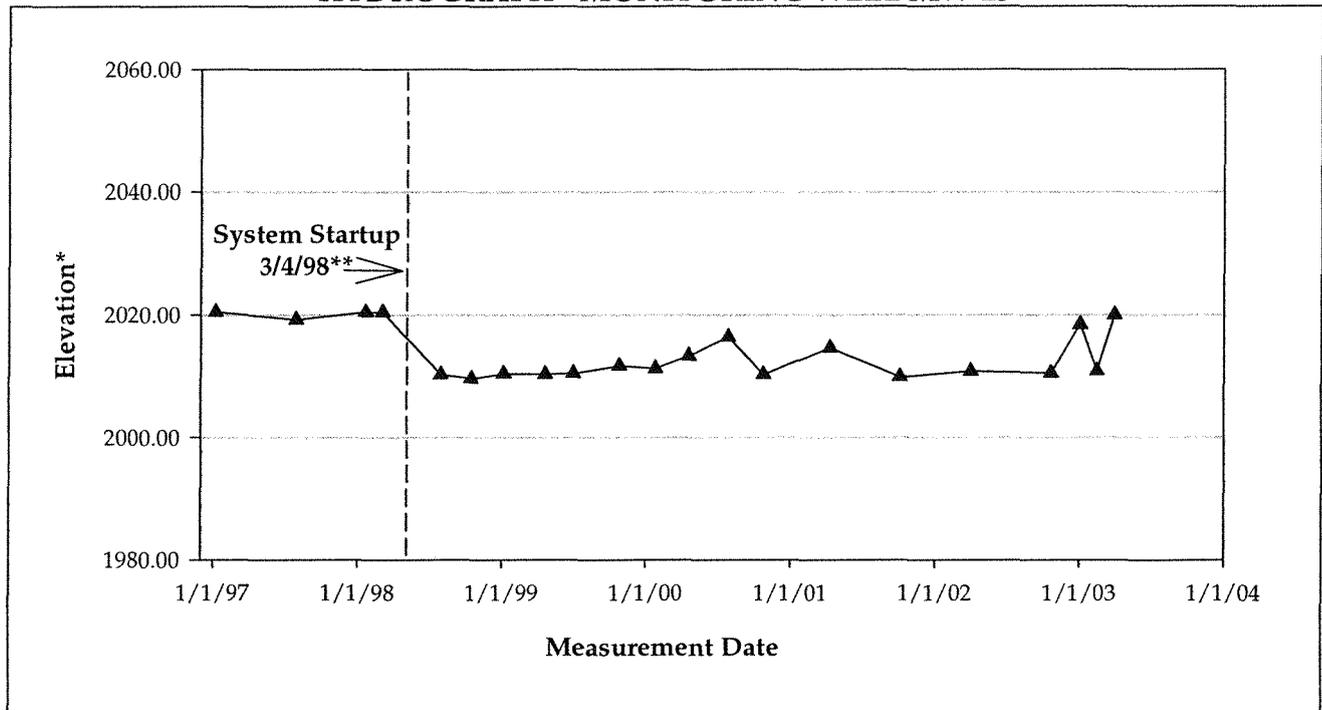
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - MONITORING WELL MW-22



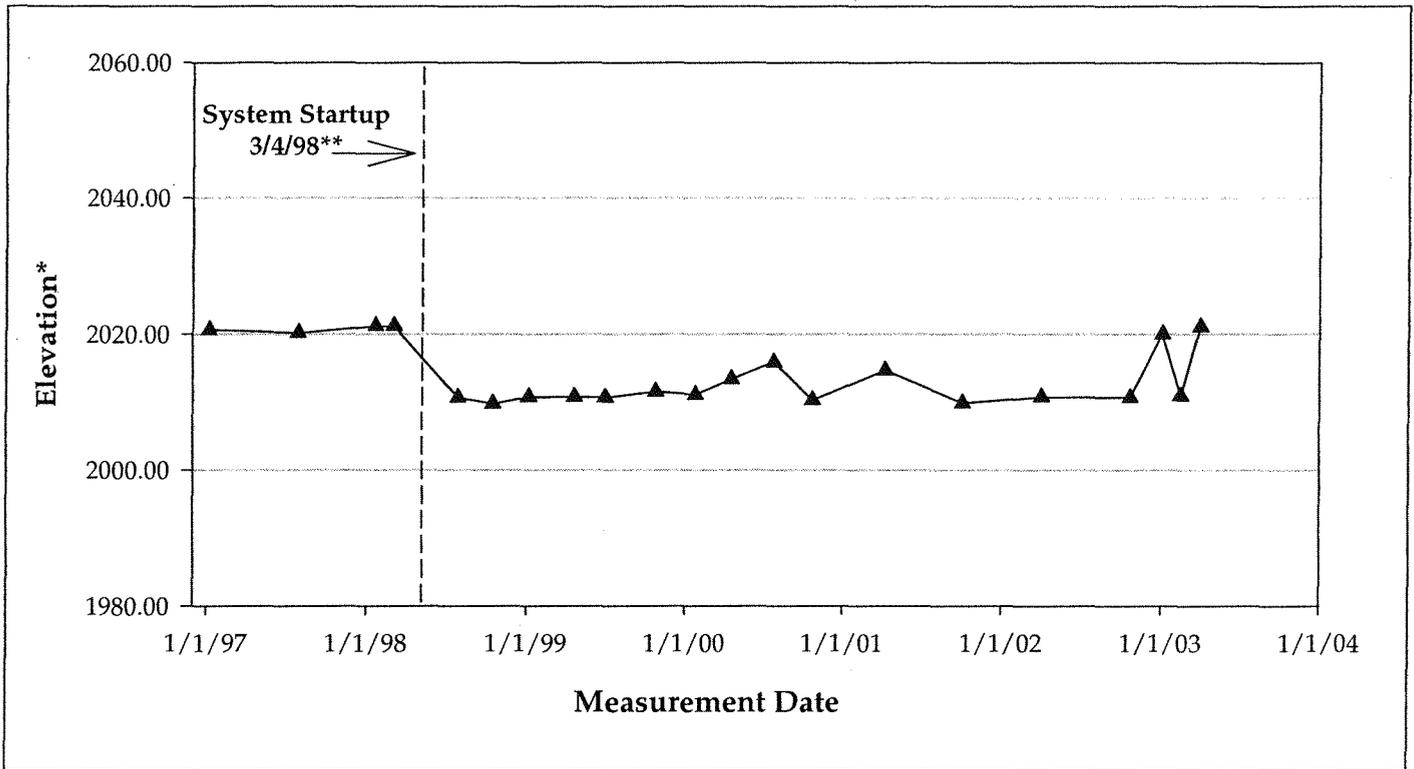
HYDROGRAPH - MONITORING WELL MW-23



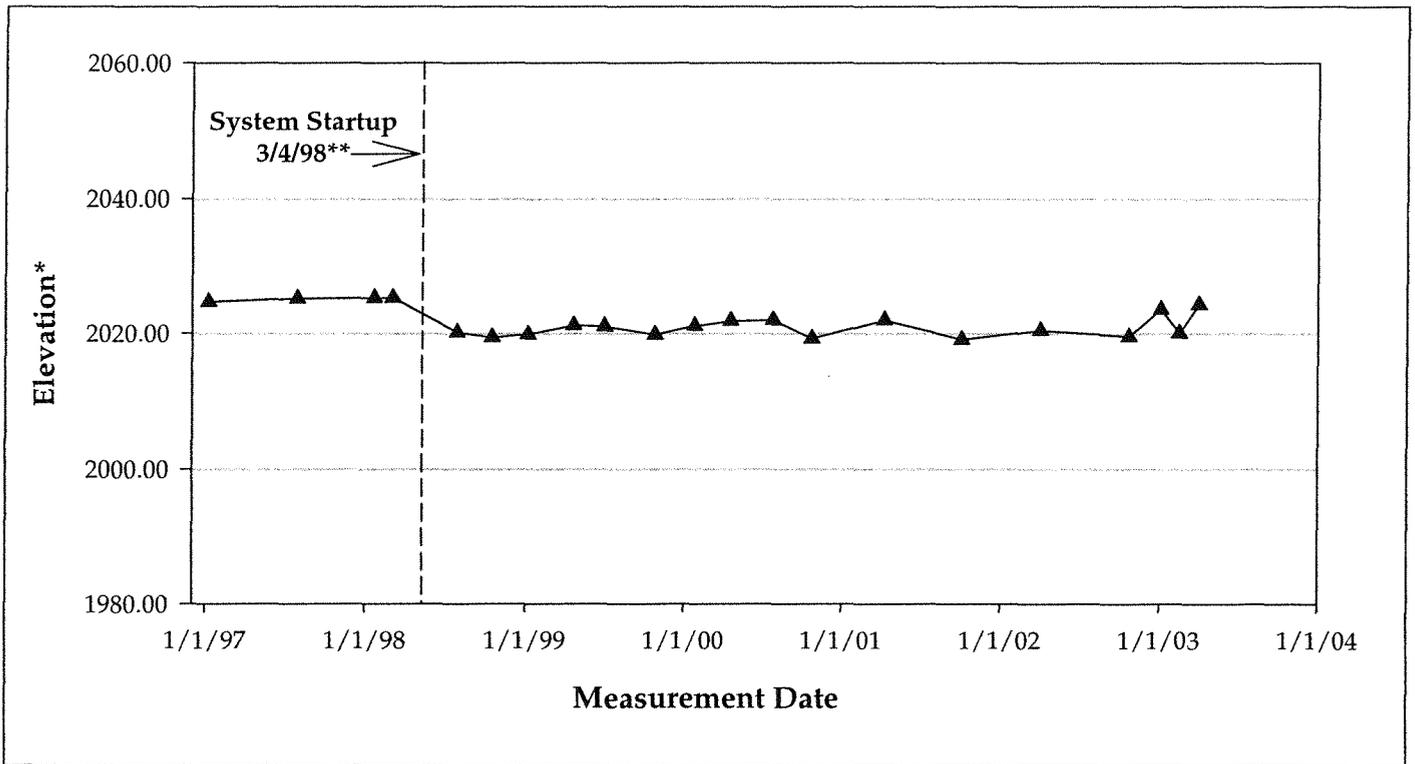
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - MONITORING WELL MW-24



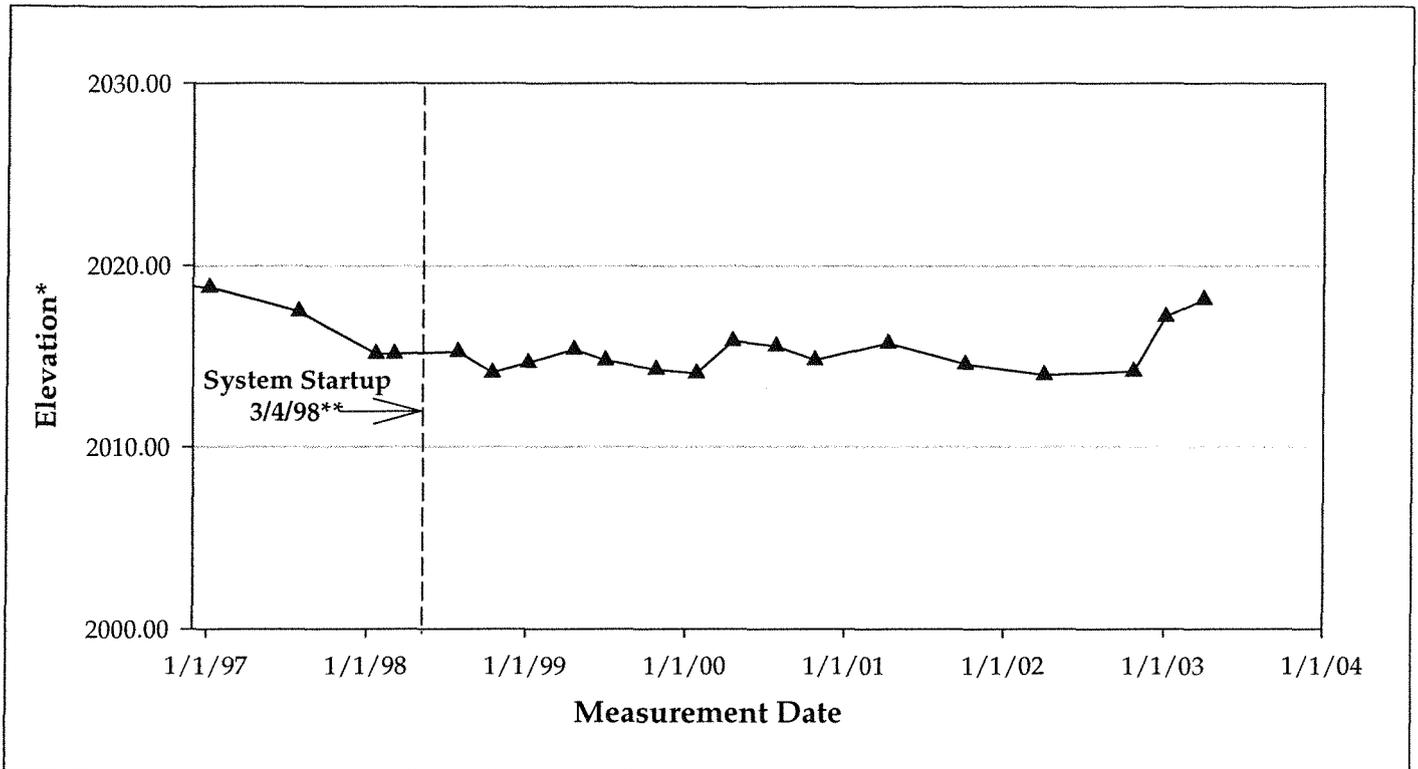
HYDROGRAPH - MONITORING WELL MW-27



* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

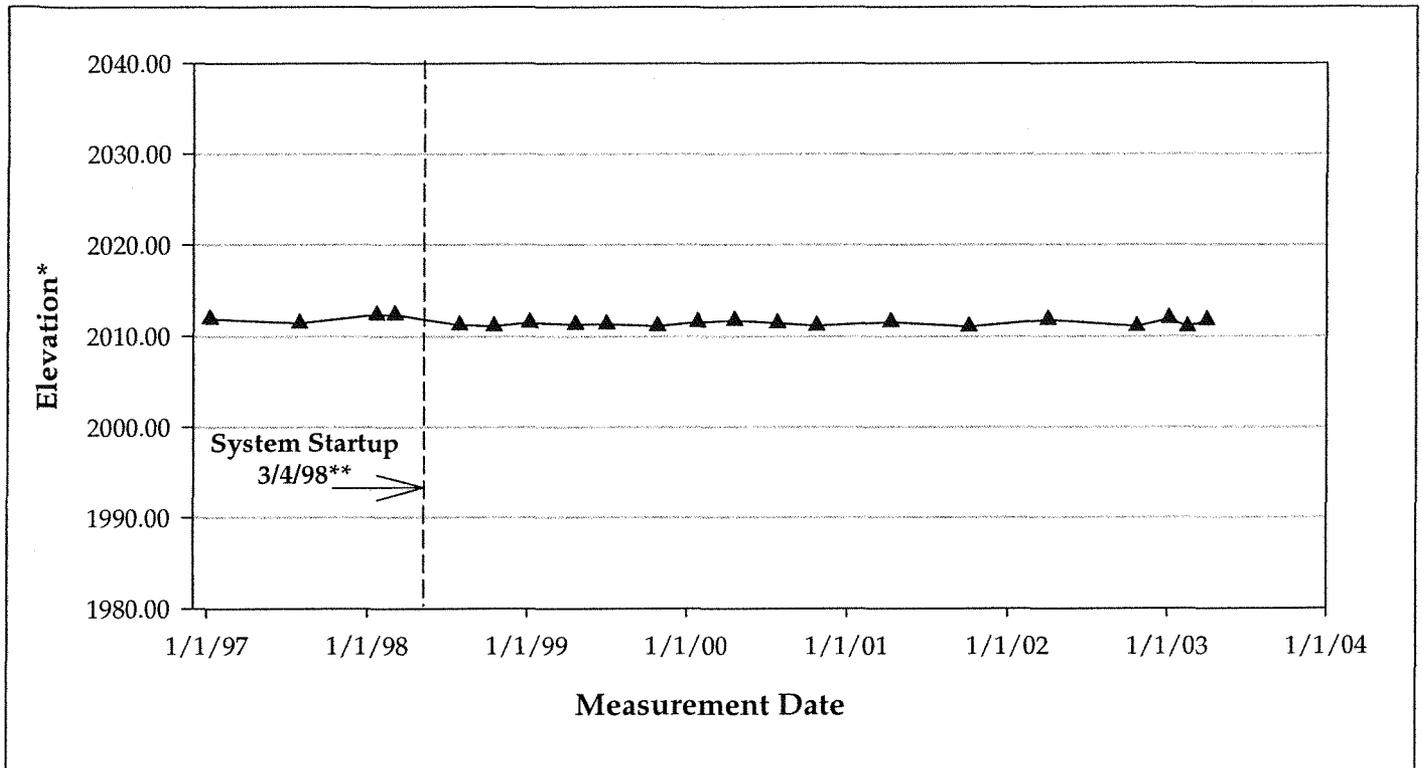
HYDROGRAPH - MONITORING WELL MW-26R



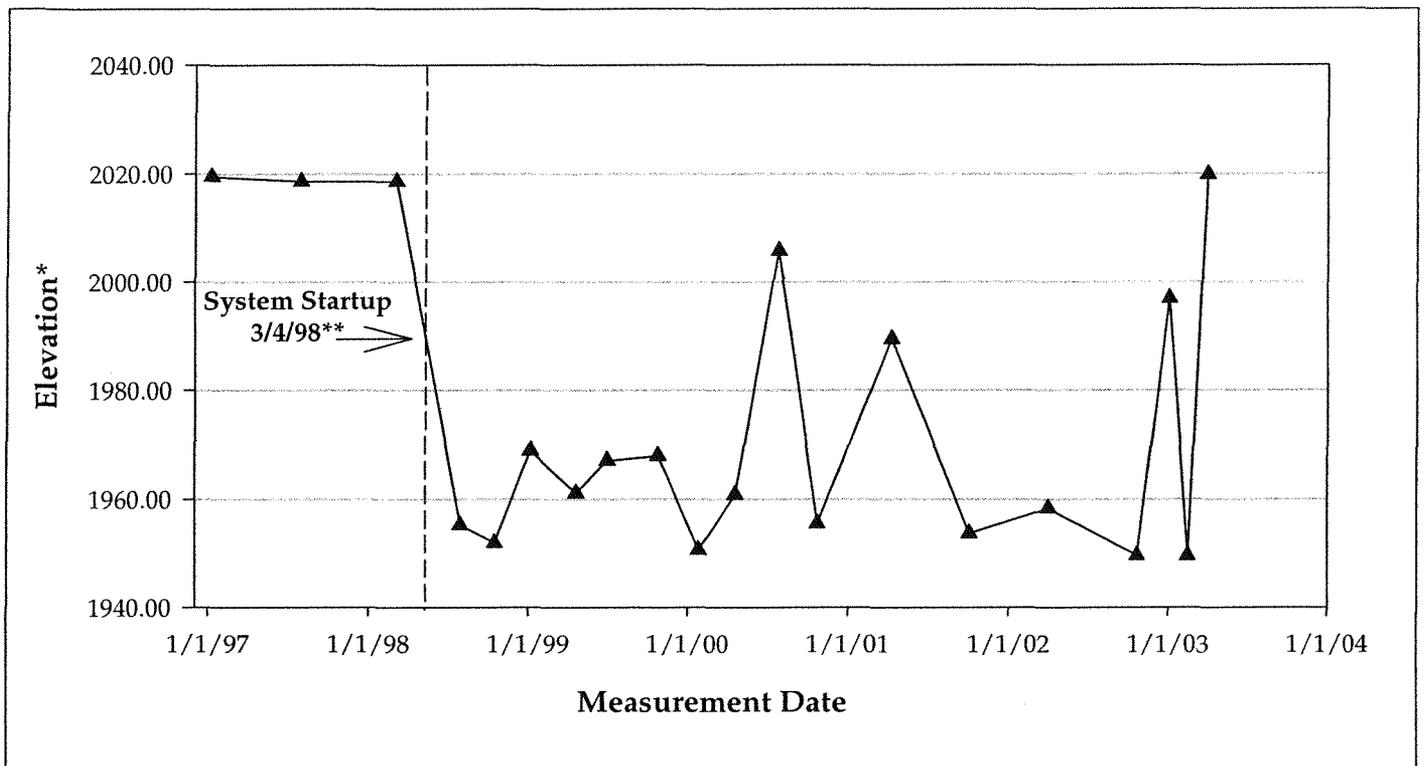
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - MONITORING WELL MW-28A



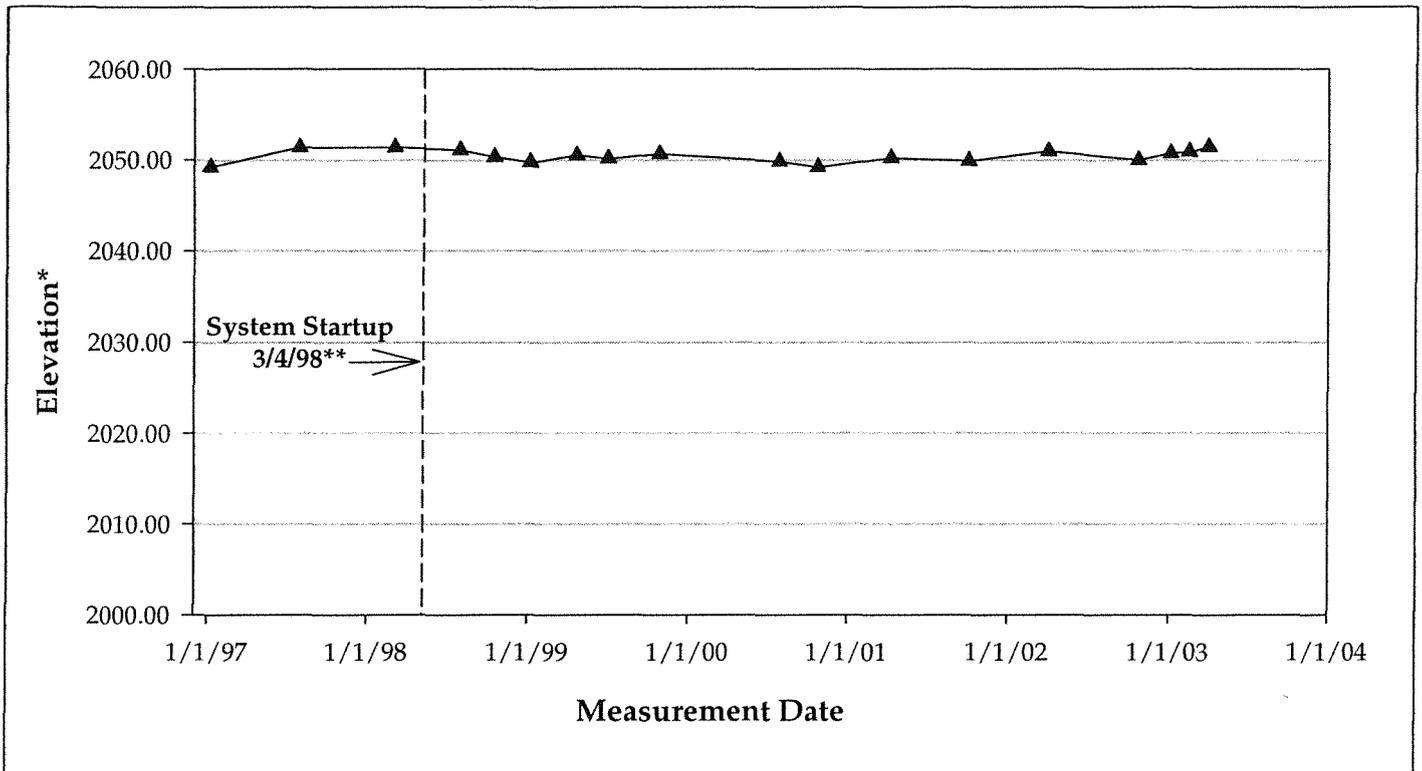
HYDROGRAPH - RECOVERY WELL RW-1



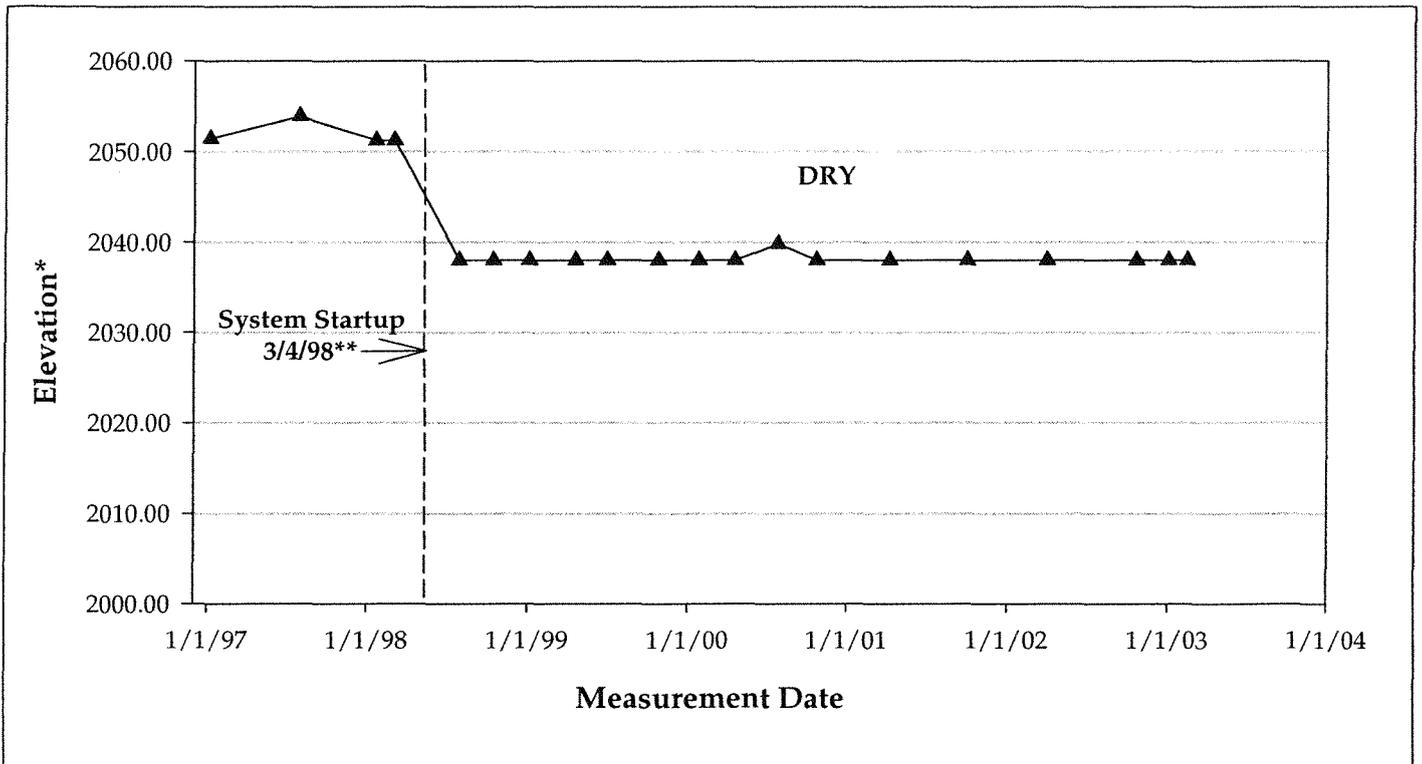
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - RECOVERY WELL RW-2



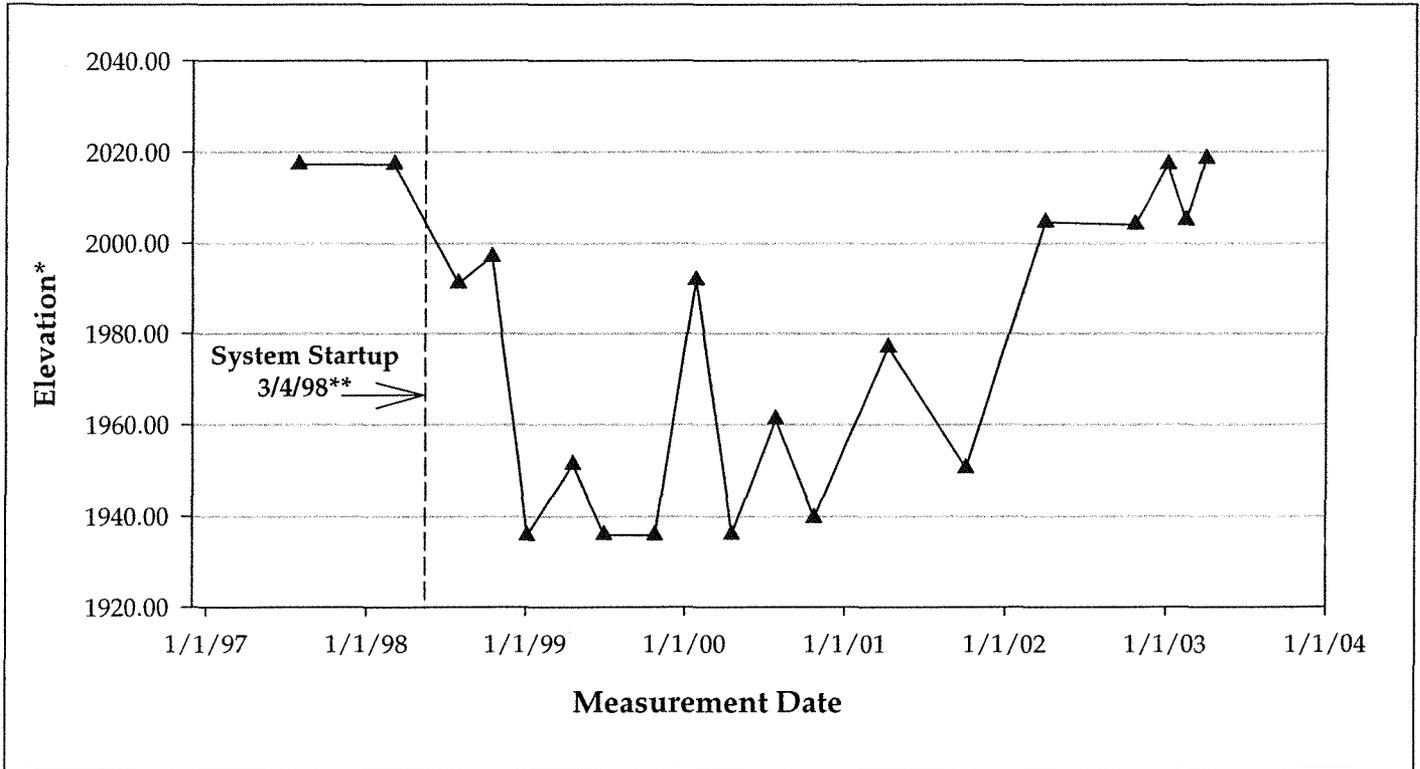
HYDROGRAPH - MONITORING WELL MW-14



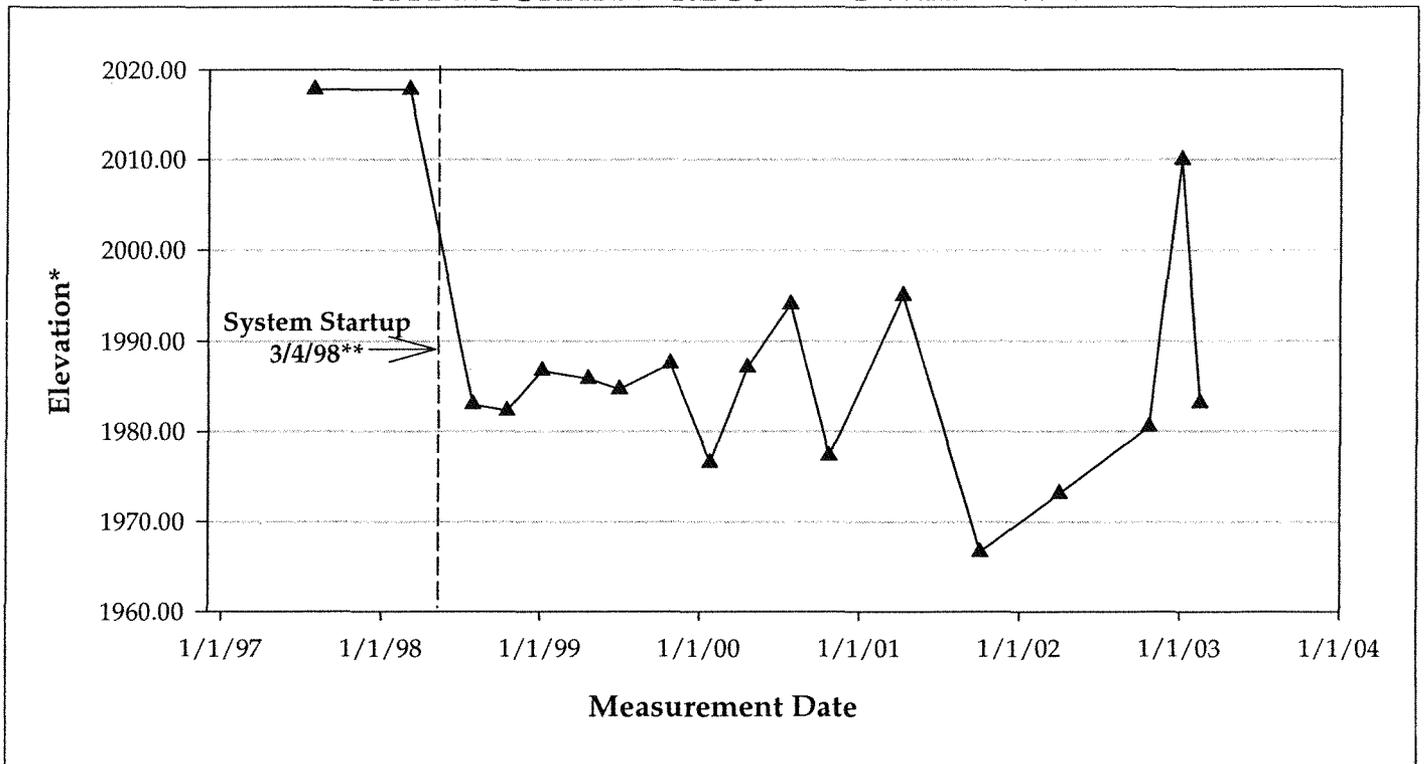
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - RECOVERY WELL RW-3



HYDROGRAPH - RECOVERY WELL RW-4



* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

Appendix B

Laboratory Analytical Reports



Corporate Office & Laboratory
1241 Bellevue Street, Suite 9 • Green Bay, WI 54302
920-469-2436 • FAX: 920-469-8827 • 800-7-ENCHEM
www.enchem.com

Analytical Report Number: 832909

Client : RMT - GREENVILLE

Project Name : SKF Girmes Site

Project Number : 70144.32

Lab Sample Number	Field ID	Matrix	Collection Date	Lab Sample Number	Field ID	Matrix	Collection Date
832909-001	TBLK-03101	WATER	04/01/03	832909-026	MW-27	WATER	04/02/03
832909-002	MW-28	WATER	04/01/03	832909-027	MW-11	WATER	04/02/03
832909-003	MW-28A	WATER	04/01/03	832909-028	MW-19	WATER	04/02/03
832909-004	MW-12	WATER	04/01/03	832909-031	RW-4	WATER	04/03/03
832909-005	MW-13	WATER	04/01/03	832909-032	SW-1	WATER	04/03/03
832909-006	MW-20	WATER	04/01/03	832909-033	RW-1	WATER	04/03/03
832909-007	MW-17	WATER	04/01/03	832909-034	SW-4	WATER	04/03/03
832909-008	MW-15	WATER	04/01/03	832909-035	SW-3	WATER	04/03/03
832909-009	MW-15A	WATER	04/01/03	832909-038	SW-2	WATER	04/03/03
832909-010	MW-16	WATER	04/01/03	832909-039	DU-03101	WATER	
832909-011	MW-16A	WATER	04/01/03	832909-040	DU-03102	WATER	
832909-012	MW-23	WATER	04/01/03				
832909-013	MW-26R	WATER	04/01/03				
832909-014	RBLK-03101	WATER	04/02/03				
832909-015	MW-04	WATER	04/02/03				
832909-016	MW-05	WATER	04/02/03				
832909-017	MW-10	WATER	04/02/03				
832909-018	MW-09	WATER	04/02/03				
832909-019	MW-08	WATER	04/02/03				
832909-020	MW-07	WATER	04/02/03				
832909-021	MW-02	WATER	04/02/03				
832909-022	MW-06	WATER	04/02/03				
832909-023	MW-18	WATER	04/02/03				
832909-024	MW-21	WATER	04/02/03				
832909-025	MW-24	WATER	04/02/03				

The "Q" flag is present when a parameter has been detected below the LOQ. This indicates the results are qualified due to the uncertainty of the parameter concentration between the LOD and the LOQ.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample comments. Release of this final report is authorized by Laboratory management, as is verified by the following signature. Reported results shall not be reproduced, except in full, without the written approval of the lab. The sample results relate only to the analytes of interest tested.

Approval Signature

4/18/03

Date



EPA Level 2

CHAIN OF CUSTODY RECORD

No 74819

100 Verdae Boulevard, P.O. Box 16778 • Greenville, SC 29606-6778 • Phone (864) 281-0030 • Fax (864) 281-0288

Project No. 70144.32 Project/Client: SKF - Ashville, N.C.

Project Manager/Contact Person: Dan Madison / WMB

Lab No.	Yr. 03 Date	Time	Sample Station ID	Total Number Of Containers	MATRIX
001	4-1-03		TBLK-03101	3	DI
002	4	0840	MW-28	1	GW
003		0915	MW-28A		
004		0945	MW-12		
005		1015	MW-13		
006		1035	MW-20		
007		1110	MW-17		
008		1145	MW-15		
009	4-1	1220	MW-15A	3	GW
010		1250	MW-16		

Filtered (Yes/No)	
Preserved (Code)	
Analyses Requested	See Attached W/D
Comments:	Non Equilibrium data 4/4/03

- PRESERVED CODES
- A - NONE
 - B - HNO₃
 - C - H₂SO₄
 - D - NaOH
 - E - HCl
 - F - METHANOL
 - G - _____

SPECIAL INSTRUCTIONS 832909

SAMPLER Relinquished by (Sig.) Bill Madril	Date/Time 1730 4-3-03	Received by (Sig.) Airborne Et #	Date/Time 49409429274
Relinquished by (Sig.) Airborne	Date/Time 4/4/03 11:00	Received by (Sig.) A. Williams	Date/Time 4/4/03 11:00
Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time

- HAZARDS ASSOCIATED WITH SAMPLES
- Flammable
 - Corrosive
 - Highly Toxic
 - Other (list)

Turn Around (circle one) Normal Rush

Report Due _____

(For Lab Use Only)

Receipt Temp: 4°C

Temp Blank Y N

Receipt pH (Wet/Metals) _____

Custody Seal: Present Absent Intact/Not Intact Seal #'s



CHAIN OF CUSTODY RECORD

No 74821

100 Verdae Boulevard, P.O. Box 16778 • Greenville, SC 29606-6778 • Phone (864) 281-0030 • Fax (864) 281-0288

Project No. 70144.32	Project/Client: SKF - Asheville, N.C.
Project Manager/Contact Person: Dan Madison / WMB	

Lab No.	Yr.	Date	Time	Sample Station ID	Total Number Of Containers	MATRIX
011	03	4-1	1330	MW-16A	3	GW
012		4-1	1520	MW-23	3	GW
013		4-1	1550	MW-26R	3	GW
014		4-2	0830	RB4C-03101	3	DI
015			0900	MW-4	3	GW
016			0945	MW-5		
017			1015	MW-10		
018			1030	MW-9		
019			1045	MW-8		
020		4-2	1105	MW-7	3	GW

Filtered (Yes/No)	Y
Preserved (Code)	E
Analyses Requested	W/D
See Attached	W/D

Comments:

PRESERVED CODES
 A - NONE
 B - HNO₃
 C - H₂SO₄
 D - NaOH
 E - HCl
 F - METHANOL
 G - _____

SPECIAL INSTRUCTIONS 832909

SAMPLER Relinquished by (Sig.) <i>Bill Melli</i>	Date/Time 4-3-03 1730	Received by (Sig.) <i>Airborne Env #49409429274</i>	Date/Time 4/3/03 11:00	HAZARDS ASSOCIATED WITH SAMPLES <input type="checkbox"/> Flammable <input type="checkbox"/> Corrosive <input type="checkbox"/> Highly Toxic <input type="checkbox"/> Other (list) _____	Turn Around (circle one) Normal Rush
Relinquished by (Sig.) <i>Airborne</i>	Date/Time 4/4/03 11:00	Received by (Sig.) <i>A. Williams</i>	Date/Time 4/3/03 11:00		Report Due _____
Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time		(For Lab Use Only) Receipt Temp: _____ Temp Blank Y <input checked="" type="checkbox"/> N 4°C Receipt pH (Wet/Metals) _____
Custody Seal: Present/Absent Intact/Not Intact Seal #'s					



CHAIN OF CUSTODY RECORD

No 74822

100 Verdae Boulevard, P.O. Box 16778 • Greenville, SC 29606-6778 • Phone (864) 281-0030 • Fax (864) 281-0288

Project No. 70144.32 Project/Client: SRF-Ashville, N.C.
 Project Manager/Contact Person: Dan Madison/wmb

Total Number
Of Containers

MATRIX

Filtered (Yes/No) NR
 Preserved (Code) NR
 Analyses Requested See Attached w/D
 PRESERVED CODES
 A - NONE
 B - HNO₃
 C - H₂SO₄
 D - NaOH
 E - HCl
 F - METHANOL
 G - _____

Lab No.	Yr. <u>04</u> Date	Time	Sample Station ID	Total Number Of Containers	MATRIX	Comments:
<u>021</u>	<u>4-2</u>	<u>1125</u>	<u>MW-2</u>	<u>3</u>	<u>GW</u>	
<u>022</u>		<u>1140</u>	<u>MW-6</u>			
<u>023</u>		<u>1315</u>	<u>MW-18</u>			
<u>024</u>		<u>1330</u>	<u>MW-21</u>			
<u>025</u>		<u>1405</u>	<u>MW-24</u>			
<u>026</u>		<u>1440</u>	<u>MW-27</u>			
<u>027</u>		<u>1505</u>	<u>MW-11</u>	<u>3</u>		
<u>028</u>	<u>4-2</u>	<u>1530</u>	<u>MW-19 ms/msd</u>	<u>6</u>	<u>GW</u>	
<u>030</u>	<u>4-3</u>	<u>0835</u>	<u>RW-4</u>	<u>3</u>	<u>GW</u>	
<u>032</u>	<u>4-3</u>	<u>0850</u>	<u>SW-1</u>	<u>3</u>	<u>SW</u>	

SPECIAL INSTRUCTIONS 839 909

SAMPLER Relinquished by (Sig.) <u>Bill Meek</u>	Date/Time <u>1730</u> <u>4-3-03</u>	Received by (Sig.) <u>Air Force Ex #494094292 74</u>	Date/Time <u>4/3/03</u>	HAZARDS ASSOCIATED WITH SAMPLES <input type="checkbox"/> Flammable <input type="checkbox"/> Corrosive <input type="checkbox"/> Highly Toxic <input type="checkbox"/> Other (list) _____	Turn Around (circle one) Normal Rush
Relinquished by (Sig.) <u>Air Force 4/3/03 11:00</u>	Date/Time <u>4/3/03 11:00</u>	Received by (Sig.) <u>[Signature]</u>	Date/Time <u>4/3/03 11:00</u>		Report Due _____
Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time		(For Lab Use Only) Receipt Temp: _____ Temp Blank <u>Y</u> <u>4°C</u> Receipt pH (Wet/Metals) _____
Custody Seal: Present/Absent Intact/Not Intact Seal #'s					



CHAIN OF CUSTODY RECORD

No 74823

100 Verdae Boulevard, P.O. Box 16778 • Greenville, SC 29606-6778 • Phone (864) 281-0030 • Fax (864) 281-0288

Project No. 70144132	Project/Client: SKF - Asheville, N.C.
Project Manager/Contact Person: Dan Madison/WMB	

Lab No.	Yr.	Date	Time	Sample Station ID	Total Number Of Containers	MATRIX
032	03	4-3	0905	Rw-1	3	GW
			0920	Rw-3	3	GW
033			0940	SW-4	3	SW
034			0955	SW-3	6	SW
035	03	4-3	1015	SW-2	3	SW
039						
036				Du-03101	3	
037				Du03102	3	

Filtered (Yes/No)	
Preserved (Code)	TC
Analyses Requested	See Attached w/d
Comments:	

- PRESERVED CODES
- A - NONE
 - B - HNO₃
 - C - H₂SO₄
 - D - NaOH
 - E - HCl
 - F - METHANOL
 - G - _____

SPECIAL INSTRUCTIONS 832909

SAMPLER Relinquished by (Sig.) <i>Bob Medlin</i>	Date/Time 4-3-03 1730	Received by (Sig.) <i>Airborne # 49409429274</i>	Date/Time 4/4/03	HAZARDS ASSOCIATED WITH SAMPLES <input type="checkbox"/> Flammable <input type="checkbox"/> Corrosive <input type="checkbox"/> Highly Toxic <input type="checkbox"/> Other (list) _____	Turn Around (circle one) Normal Rush Report Due _____
Relinquished by (Sig.) <i>the owner 4/4/03 11:00</i>	Date/Time 4/4/03 11:00	Received by (Sig.) <i>L. Williams</i>	Date/Time 4/4/03		(For Lab Use Only)
Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time		Receipt Temp: Temp Blank Y <input checked="" type="checkbox"/> N 40C

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : TBLK-03101

Matrix Type : WATER
Collection Date : 04/01/03
Report Date : 04/17/03
Lab Sample Number : 832909-001

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-28

Matrix Type : WATER
Collection Date : 04/01/03
Report Date : 04/17/03
Lab Sample Number : 832909-002

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-28A

Matrix Type : WATER
Collection Date : 04/01/03
Report Date : 04/17/03
Lab Sample Number : 832909-003

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	1.5	J 2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Tetrachloroethene	3.4	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	5.5	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436
800-7-ENCHEM
Fax: 920-469-8827

En Chem Inc.

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-12

Matrix Type : WATER
Collection Date : 04/01/03
Report Date : 04/17/03
Lab Sample Number : 832909-004

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE

Matrix Type : WATER

Project Name : SKF Girmes Site

Collection Date : 04/01/03

Project Number : 70144.32

Report Date : 04/17/03

Field ID : MW-13

Lab Sample Number : 832909-005

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	6.4	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-20

Matrix Type : WATER
Collection Date : 04/01/03
Report Date : 04/17/03
Lab Sample Number : 832909-006

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	4.9	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	12	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-17

Matrix Type : WATER
Collection Date : 04/01/03
Report Date : 04/17/03
Lab Sample Number : 832909-007

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE

Matrix Type : WATER

Project Name : SKF Girmes Site

Collection Date : 04/01/03

Project Number : 70144.32

Report Date : 04/17/03

Field ID : MW-16

Lab Sample Number : 832909-010

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-16A

Matrix Type : WATER
Collection Date : 04/01/03
Report Date : 04/17/03
Lab Sample Number : 832909-011

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	0.60	J 1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Gimes Site
Project Number : 70144.32
Field ID : MW-23

Matrix Type : WATER
Collection Date : 04/01/03
Report Date : 04/17/03
Lab Sample Number : 832909-012

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Tetrachloroethene	31	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	8.2	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-26R

Matrix Type : WATER
Collection Date : 04/01/03
Report Date : 04/17/03
Lab Sample Number : 832909-013

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	75	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	0.61	J 1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	64	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : RBLK-03101

Matrix Type : WATER
Collection Date : 04/02/03
Report Date : 04/17/03
Lab Sample Number : 832909-014

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE

Matrix Type : WATER

Project Name : SKF Girmes Site

Collection Date : 04/02/03

Project Number : 70144.32

Report Date : 04/17/03

Field ID : MW-04

Lab Sample Number : 832909-015

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	330	10	5	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	340	5.0	5	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 5.0	5.0	5	ug/L		04/08/03	SW846 5030B	SW846 8260B

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436
800-7-ENCHEM
Fax: 920-469-8827

En Chem Inc.

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-05

Matrix Type : WATER
Collection Date : 04/02/03
Report Date : 04/17/03
Lab Sample Number : 832909-016

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	440	200	100	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	12000	100	100	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 100	100	100	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-10

Matrix Type : WATER
Collection Date : 04/02/03
Report Date : 04/17/03
Lab Sample Number : 832909-017

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	9.5	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	0.51	J 1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-09

Matrix Type : WATER
Collection Date : 04/02/03
Report Date : 04/17/03
Lab Sample Number : 832909-018

VOLATILES - SPECIAL LIST

Prep Date: 04/10/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	11	5.0	2.5	ug/L		04/10/03	SW846 5030B	SW846 8260B
Trichloroethene	390	2.5	2.5	ug/L		04/10/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.5	2.5	2.5	ug/L		04/10/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE

Matrix Type : WATER

Project Name : SKF Girmes Site

Collection Date : 04/02/03

Project Number : 70144.32

Report Date : 04/17/03

Field ID : MW-08

Lab Sample Number : 832909-019

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	0.96	J 1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-07

Matrix Type : WATER
Collection Date : 04/02/03
Report Date : 04/17/03
Lab Sample Number : 832909-020

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-02

Matrix Type : WATER
Collection Date : 04/02/03
Report Date : 04/17/03
Lab Sample Number : 832909-021

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	14	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE

Matrix Type : WATER

Project Name : SKF Girmes Site

Collection Date : 04/02/03

Project Number : 70144.32

Report Date : 04/17/03

Field ID : MW-06

Lab Sample Number : 832909-022

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE

Matrix Type : WATER

Project Name : SKF Girmes Site

Collection Date : 04/02/03

Project Number : 70144.32

Report Date : 04/17/03

Field ID : MW-18

Lab Sample Number : 832909-023

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	5.5	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

En Chem Inc.

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-21

Matrix Type : WATER
Collection Date : 04/02/03
Report Date : 04/17/03
Lab Sample Number : 832909-024

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	5.9	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	12	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-24

Matrix Type : WATER
Collection Date : 04/02/03
Report Date : 04/17/03
Lab Sample Number : 832909-025

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	14	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436
800-7-ENCHEM
Fax: 920-469-8827

En Chem Inc.

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-27

Matrix Type : WATER
Collection Date : 04/02/03
Report Date : 04/17/03
Lab Sample Number : 832909-026

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-11

Matrix Type : WATER
Collection Date : 04/02/03
Report Date : 04/17/03
Lab Sample Number : 832909-027

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	4.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-19

Matrix Type : WATER
Collection Date : 04/02/03
Report Date : 04/17/03
Lab Sample Number : 832909-028

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	3.8	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436
800-7-ENCHEM
Fax: 920-469-8827

En Chem Inc.

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girres Site
Project Number : 70144.32
Field ID : RW-4

Matrix Type : WATER
Collection Date : 04/03/03
Report Date : 04/17/03
Lab Sample Number : 832909-031

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	2.2	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	50	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE

Matrix Type : WATER

Project Name : SKF Girmes Site

Collection Date : 04/03/03

Project Number : 70144.32

Report Date : 04/17/03

Field ID : SW-1

Lab Sample Number : 832909-032

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE

Matrix Type : WATER

Project Name : SKF Gimes Site

Collection Date : 04/03/03

Project Number : 70144.32

Report Date : 04/17/03

Field ID : RW-1

Lab Sample Number : 832909-033

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	10	10	5	ug/L		04/08/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 5.0	5.0	5	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	200	5.0	5	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 5.0	5.0	5	ug/L		04/08/03	SW846 5030B	SW846 8260B

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436
800-7-ENCHEM
Fax: 920-469-8827

En Chem Inc.

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : SW-4

Matrix Type : WATER
Collection Date : 04/03/03
Report Date : 04/17/03
Lab Sample Number : 832909-034

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : SW-3

Matrix Type : WATER
Collection Date : 04/03/03
Report Date : 04/17/03
Lab Sample Number : 832909-035

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE

Matrix Type : WATER

Project Name : SKF Girmes Site

Collection Date : 04/03/03

Project Number : 70144.32

Report Date : 04/17/03

Field ID : SW-2

Lab Sample Number : 832909-038

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE

Matrix Type : WATER

Project Name : SKF Girmes Site

Collection Date :

Project Number : 70144.32

Report Date : 04/17/03

Field ID : DU-03101

Lab Sample Number : 832909-039

VOLATILES - SPECIAL LIST

Prep Date: 04/08/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	1.5	J 2.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Tetrachloroethene	3.4	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Trichloroethene	5.8	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 1.0	1.0	1	ug/L		04/08/03	SW846 5030B	SW846 8260B

Analytical Report Number: 832909

Client : RMT - GREENVILLE

Matrix Type : WATER

Project Name : SKF Girmes Site

Collection Date :

Project Number : 70144.32

Report Date : 04/17/03

Field ID : DU-03102

Lab Sample Number : 832909-040

VOLATILES - SPECIAL LIST

Prep Date: 04/09/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	11	4.0	2	ug/L		04/09/03	SW846 5030B	SW846 8260B
Tetrachloroethene	20	2.0	2	ug/L		04/09/03	SW846 5030B	SW846 8260B
Trichloroethene	230	2.0	2	ug/L		04/09/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	2	ug/L		04/09/03	SW846 5030B	SW846 8260B



Integrated
Environmental
Solutions

100 Verdae Blvd. 29607-3825
P.O. Box 16778 29606-6778
Greenville, SC
Telephone: 864-281-0030
Fax: 864-281-0288

December 16, 2003

Ms. Laura Kay Dechant
Hydrogeologist
North Carolina Department of Environment
and Natural Resources
Division of Environmental Management
Groundwater Section
50 Woodfin Place
Asheville, North Carolina 28801

Subject: Groundwater Monitoring Report
Girmes Site, Formerly SKF USA Inc.
Ground Water Incident No. 10032
Buncombe County, North Carolina


12/03

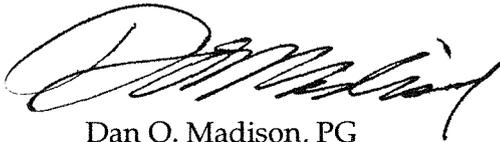
Dear Kay:

Enclosed is the Groundwater Monitoring Report for the October 2003 sampling event at the Girmes site (formerly SKF USA Inc.) in Asheville, North Carolina. We are scheduled to conduct the next groundwater sampling event in April 2004.

If you have questions, please call me at (864) 281-0030.

Sincerely,

RMT, Inc.



Dan O. Madison, PG

cc with enclosure: Mr. William McGlocklin
Mr. Billy Clarke
Ms. Leanne Campbell

100 Verdae Boulevard (29607-3825)
PO Box 16778 (29606-6778)
Greenville, South Carolina
Telephone (864) 281-0030
Fax (864) 281-0288



Groundwater Monitoring Report for the October 2003 Sampling Event Groundwater Incident No. 10032

Girmes Site, Formerly SKF USA Inc.

Buncombe County, North Carolina

December 2003

Michael B. Parker, P.E.
Senior Client Service Manager



RMT North Carolina, Inc. | Girmes Site
Groundwater Monitoring Report for October 2003

E:\WPGVL\PJT\00-70144\32\R007014432-002.DOC

© 2003 RMT, Inc.
All Rights Reserved

Certification

The hydrogeology work for the Girmes Site, formerly SKF USA Inc., in Buncombe County, North Carolina, was performed by an RMT, Inc. consulting hydrogeologist in support of RMT North Carolina, Inc.



Dan O. Madison, Jr., P.G.
RMT, Inc.

Table of Contents

1.	Introduction.....	1
2.	Groundwater Elevations.....	3
3.	Groundwater and Surface Water Quality	9
3.1	Standard Monitoring Program.....	9
3.2	Additional Analytical Parameter	11
4.	Recovery System Performance	22
5.	Conclusions and Recommendations.....	27

List of Tables

Table 1	Summary of Groundwater Elevations	5
Table 2	Analytical Results for Groundwater and Surface Water Samples Collected October 7, 2003 through October 28, 2003.....	13
Table 3	Historical Trichloroethene Concentrations Detected in Groundwater	14
Table 4	Historical 1,2-Dichloroethene Concentrations Detected in Groundwater	18
Table 5	Operations Summary for Period Beginning March 4, 1998, and Ending October 31, 2003.....	24

List of Figures

Figure 1	Location of Data Points	12
----------	-------------------------------	----

List of Appendices

Appendix A	Hydrographs for Bedrock Wells
Appendix B	Laboratory Analytical Reports

List of Plates

Plate 1	Configuration of Water Table October 6, 2003
---------	--

Section 1

Introduction

The J.L. deBall Girmes of America (Girmes) site is a former textile plant located on Old Highway 74 East in Asheville, North Carolina. Girmes owned the site from 1973 until 2001 when it was purchased by LMC, LLC. The site was formerly occupied by SKF USA Inc. (SKF) from approximately 1960 to 1973. The North Carolina Department of Environment and Natural Resources (NC DENR) issued SKF a Notice of Violation (NOV) on April 2, 1993 (Groundwater Incident Number 10032). In response to the NOV and associated correspondence, SKF conducted comprehensive site assessment (CSA) activities in 1993 and 1994. Volatile organic compounds (VOCs), in particular trichloroethene (TCE), 1,2-dichloroethene (1,2-DCE), and vinyl chloride, were found in groundwater at the site. The results of the CSA were submitted to NC DENR in November 1994. Following the CSA, a corrective action plan (CAP) to address the VOC-impacted groundwater was prepared and submitted to NC DENR in October 1996.

RMT North Carolina, Inc. (RMT) was retained by SKF to implement the CAP. A groundwater recovery system consisting of three groundwater recovery wells and an air stripper unit was installed in 1997 and early 1998. The system began operation on March 4, 1998.

The CAP specified that groundwater elevations were to be measured in all wells on a quarterly basis. Water samples were to be collected from all 29 monitoring wells, 3 recovery wells, and 4 surface water stations, on a semiannual basis. Thirteen of these monitoring wells, along with the three recovery wells, were also to be sampled quarterly. The CAP specified that the samples were to be analyzed for TCE, 1,2-DCE, and vinyl chloride.

On December 11, 2000, NC DENR approved reducing the monitoring frequency from quarterly to semiannually. Beginning in 2001, the 29 monitoring wells, 3 recovery wells, and 4 surface water stations were sampled on a semiannual basis. Groundwater elevations were also measured on a semiannual basis. Water samples and elevations are now collected in April and October of each year.

In August 2002, RMT proposed to switch the operation of the groundwater recovery system from continuous pumping to a pulsed pumping schedule in an effort to increase contaminant recovery. In October 2002, RMT proposed further modifications to the pumping cycle. Under the pulsed pumping schedule, the groundwater recovery system would operate one cycle per quarter. Each cycle consists of 6 weeks of pumping followed by 6 weeks of no pumping.

Ms. Kay Dechant of NC DENR approved the modified pulse pumping plan on October 14, 2002, and the first pumping cycle was initiated on November 11, 2002.

The latest semiannual sampling event was conducted during the week of October 6, 2003. This report presents results of the October 2003 sampling event.

Section 2

Groundwater Elevations

The recovery system has been operating on a pulsed pumping cycle since November 11, 2002. Groundwater levels have been measured in monitoring wells and recovery wells at the Girmes site at the end of each on and off pumping cycle since the pulsed pumping was initiated. During this monitoring period, groundwater levels were measured on June 26, August 11, and October 6, 2003. Water levels are summarized in Table 1 along with pre-startup elevations measured in January 1998, and historical water levels measured since system startup. The following table summarizes the pumping cycles since November 2002.

Summary of Pulsed Pumping Cycles

RECOVERY SYSTEM SHUT DOWN	RECOVERY SYSTEM START UP
November 11, 2002	January 3, 2003 ⁽¹⁾
February 14, 2003 ⁽¹⁾	April 2, 2003
May 13, 2003	July 1, 2003 ⁽¹⁾
August 12, 2003 ⁽¹⁾	October 7, 2003 ⁽¹⁾

⁽¹⁾ Groundwater levels were measured prior to system startup or shut down on these days

Water levels measured on October 6, 2003, were used to construct the water table map shown on Plate 1. These water levels reflect water table conditions near the end of the fourth system-off cycle. As specified in the CAP, hydrographs were also prepared for bedrock wells MW-4, MW-5, MW-14, MW-17, MW-18, MW-19, MW-21, MW-22, MW-23, MW-24, MW-27, and MW-28A. These hydrographs are presented in Appendix A. The hydrographs include water levels measured in 1997 to identify groundwater trends prior to system startup. Several wells exhibited significant drawdown after system startup. For these wells, an inferred data point based on the last actually measured water level prior to startup was plotted on the hydrograph for March 4, 1998, which was the date of system startup. The purpose of the inferred data point is to better illustrate drawdown since system startup.

The water table configuration and hydrographs for wells MW-14, MW-18, MW-19, MW-21, MW-22, MW-23, MW-24, and MW-27 have shown a cone of depression around the recovery wells since system startup. As expected, the June and October 2003 (see Plate 1) water levels, measured before the recovery system was restarted following an "off" cycle, do not show this cone of depression around the recovery system. However, monitoring well MW-14 on the

southwest side of the facility has remained dry during the pulsed pumping cycles thus continuing to exhibit some influence of the drawdown resulting from the long-term pumping of the recovery wells.

The water level in monitoring wells on the southwest side of the facility exhibited fluctuations in response to the on and off cycles of the recovery system. Water level increases were observed on June 26, 2003, and October 6, 2003, at the end of the system-off cycles. On August 11, 2003, at the end of the third system-on cycle, the water levels had returned to normal drawdown levels observed prior to cycling of the system. Water level fluctuations ranged from about 13 to 60 feet in recovery wells RW-1, RW-3, and RW-4. Water levels in the surrounding monitoring wells fluctuated between less than one foot at MW-26R to approximately 15 feet at MW-21. Monitoring wells MW-28 and MW-28A each exhibited less than a ½ foot of fluctuation; however, it is not clear if this is the result of cycling of the system or normal climatic conditions. Of the 18 monitoring wells located on the northeast side of the facility, 10 exhibited one foot or less fluctuation in water level over the six month period. Wells MW-1, MW-5, and MW-6 had increases in water level between April and June 2003 and leveled out for the remainder of the monitoring period. Four wells, MW-10, MW-12, MW-13, and MW-17 had overall decreasing trends during the six month period. The remaining well, MW-11, had water levels to increase at the beginning of the monitoring period, level out, and decrease between August and October 2003.

**Table 1
Summary of Groundwater Elevations**

LOCATION	TOP OF CASING ⁽¹⁾	WATER TABLE ELEVATION AND DATE OF MEASUREMENT					
		01/21/98*	07/29/98	10/15/98	01/05/99	04/20/99	07/01/99
MW-1	2123.16	2066.52	2070.69	2069.22	2065.99	2065.31	2064.71
MW-2	2074.52	2053.45	2053.59	2052.65	2052.87	2052.94	2053.45
MW-4	2122.38	2061.38	2062.27	2061.36	2060.89	2061.75	2061.39
MW-5	2121.44	2058.17	2059.24	2058.29	2057.45	2057.11	2056.94
MW-6	2102.22	2058.96	2060.80	2059.50	2058.56	2058.31	2057.82
MW-7	2071.17	2052.76	2052.82	2052.42	2052.34	2052.44	2052.36
MW-8	2075.22	2054.34	2054.60	2053.57	2053.26	2053.89	2054.10
MW-9	2072.29	2053.32	2054.37	2053.61	2053.15	2054.50	2053.45
MW-10	2076.30	2052.95	2033.79	2050.70	2051.08	2053.25	2051.79
MW-11	2109.60	2046.88	2044.25	2041.25	2039.26	2039.45	2038.37
MW-12	2040.65	2038.44	2032.49	2031.57	2033.09	2031.37	2033.56
MW-13	2044.67	2037.38	2033.76	2031.99	2031.49	2033.42	2032.25
MW-14	2119.88	<2040.20	<2040.20	<2040.20	<2040.20	<2040.20	<2040.20
MW-15	2058.15	2046.02	2046.09	2045.67	2045.25	2045.75	2045.25
MW-15A	2058.16	2047.38	2046.75	2046.11	2045.73	2046.20	2045.95
MW-16	2059.22	2052.79	2052.74	2052.75	2052.70	2052.77	2052.79
MW-16A	2059.33	2053.16	2053.04	2053.07	2053.15	2053.08	2052.96
MW-17	2056.71	2050.77	2046.05	2043.77	2043.96	2047.10	2045.47
MW-18	2036.36	2023.81	<2010.30	<2010.30	<2010.30	<2010.30	<2010.30
MW-19	2037.74	2018.32	2013.29	2012.86	2013.18	2013.35	2012.96
MW-20	2027.36	2013.59	2012.86	2012.30	2012.28	2012.59	2012.27
MW-21	2036.74	2022.53	<2006.90	<2006.90	<2006.90	<2006.90	<2006.90
MW-22	2082.12	2038.87	2037.80	2035.89	2027.47	<2025.90	<2025.90
MW-23	2027.54	2020.41	2010.26	2009.62	2010.42	2010.34	2010.49
MW-24	2035.05	2021.21	2010.71	2009.78	2010.80	2010.82	2010.72
MW-26R	2021.35	2015.12	2015.23	2014.08	2014.64	2015.35	2014.76
MW-27	2051.08	2025.26	2020.13	2019.38	2019.83	2021.15	2021.03
MW-28	2022.48	2012.11	2011.33	2011.37	2011.70	2012.22	2011.57
MW-28A	2022.69	2012.36	2011.22	2011.11	2011.52	2011.30	2011.33
RW-1	2031.70	NM	1955.30	1951.93	1968.90	1961.13	1967.09
RW-2	2071.70	NM	2051.09	2050.32	2049.72	2050.52	2050.15
RW-3	2033.40	NM	1991.13	1996.98	1935.75	1951.25	1935.88
RW-4	2032.10	NM	1982.98	1982.30	1986.74	1985.84	1984.70

Elevations are in feet above mean sea level.

⁽¹⁾ Top of casing measured in feet above mean sea level.

* Pre-startup

NM - Not Measured, well not accessible.

NOTE: System startup was March 4, 1998.

Water levels preceded with less than sign (<) indicates dry well.

**Table 1
Summary of Groundwater Elevations**

LOCATION	TOP OF CASING ⁽¹⁾	WATER TABLE ELEVATION AND DATE OF MEASUREMENT					
		10/25/99	01/25/00	04/18/00	05/04/00	10/23/00	04/09/01
MW-1	2123.16	2063.46	2064.29	2062.12	2062.11	2061.57	2060.56
MW-2	2074.52	2052.39	2052.28	2053.06	2052.65	2052.18	NM
MW-4	2122.38	2060.63	2060.43	2061.84	2060.73	2060.30	2060.67
MW-5	2121.44	2055.88	2055.78	2056.08	2056.01	2055.68	2055.34
MW-6	2102.22	2056.72	2056.37	2056.94	2056.42	2056.02	2055.79
MW-7	2071.17	2051.88	2051.97	2052.55	2052.35	2051.73	2052.15
MW-8	2075.22	2052.65	2052.46	2054.46	2053.82	2053.47	2053.96
MW-9	2072.29	2052.67	2052.98	2053.75	2053.39	2052.41	2053.29
MW-10	2076.30	2049.77	2052.32	2055.15	2052.30	2051.37	2053.76
MW-11	2109.60	2037.19	2036.91	2037.79	2038.05	2036.62	2035.70
MW-12	2040.65	2028.13	2030.41	2036.74	NM	2026.78	2034.46
MW-13	2044.67	2030.23	2030.32	2034.76	2032.18	2029.64	2032.54
MW-14	2119.88	<2040.20	<2040.20	<2040.20	2039.83	<2040.20	<2040.20
MW-15	2058.15	2044.59	2044.50	2047.26	NM	2044.33	2047.66
MW-15A	2058.16	2045.61	2045.55	2046.20	NM	2045.06	2045.81
MW-16	2059.22	2052.61	2052.77	2052.51	NM	2052.62	2052.76
MW-16A	2059.33	2052.89	2052.96	2052.84	NM	2052.81	2052.95
MW-17	2056.71	2042.74	2043.09	2048.16	NM	2041.97	2045.15
MW-18	2036.36	<2010.30	<2010.30	<2010.30	<2010.30	<2010.30	<2010.30
MW-19	2037.74	2013.09	2013.61	2014.85	2014.77	2012.66	2014.69
MW-20	2027.36	2011.89	2011.77	2012.61	2012.12	2011.57	2012.24
MW-21	2036.74	<2006.90	<2006.90	<2006.90	2007.11	<2006.90	<2006.90
MW-22	2082.12	<2025.90	<2025.90	<2025.90	<2025.90	<2025.90	<2025.90
MW-23	2027.54	2011.70	2011.25	2013.30	2016.40	2010.26	2014.60
MW-24	2035.05	2011.58	2011.17	2013.45	2015.90	2010.33	2014.72
MW-26R	2021.35	2014.25	2014.05	2015.84	2015.55	2014.78	2015.71
MW-27	2051.08	2019.80	2021.11	2021.81	2021.95	2019.20	2021.96
MW-28	2022.48	2011.64	2012.47	2011.97	2011.65	2011.55	2011.80
MW-28A	2022.69	2011.11	2011.54	2011.72	2011.44	2011.15	2011.55
RW-1	2031.70	1967.95	1950.66	1960.80	2005.76	1955.56	1989.42
RW-2	2071.70	NM	NM	2050.65	2049.83	2049.19	2050.18
RW-3	2033.40	1935.77	1991.85	1936.00	1961.15	1939.67	1976.97
RW-4	2032.10	1987.49	1976.54	1987.07	1994.01	1977.30	1994.98

Elevations are in feet above mean sea level.

⁽¹⁾ Top of casing measured in feet above mean sea level.

* Pre-startup

NM - Not Measured, well not accessible.

NOTE: System startup was March 4, 1998.

Water levels preceded with less than sign (<) indicates dry well.

**Table 1
Summary of Groundwater Elevations**

LOCATION	TOP OF CASING ⁽¹⁾	WATER TABLE ELEVATION AND DATE OF MEASUREMENT					
		10/03/01	04/01/02	10/21/02	01/03/03	02/14/03	03/31/03
MW-1	2123.16	2059.85	2059.20	2058.11	2058.43	2058.17	<2056.03
MW-2	2074.52	2052.32	2052.43	2051.96	2052.42	2052.13	2052.56
MW-4	2122.38	2060.60	2061.03	2059.58	2060.86	2062.00	2062.89
MW-5	2121.44	2055.35	2055.13	2054.60	2054.85	2055.04	2055.61
MW-6	2102.22	2055.31	2054.24	2054.65	2055.44	2054.76	2055.34
MW-7	2071.17	2051.89	2052.12	2051.75	2052.07	2051.87	2052.18
MW-8	2075.22	2052.65	2053.34	2052.58	2056.57	2053.34	2053.99
MW-9	2072.29	2052.96	2053.71	2052.83	2050.62	2053.52	2054.11
MW-10	2076.30	2053.34	2056.66	2054.94	2055.18	2055.64	2056.51
MW-11	2109.60	2034.17	2036.35	2033.34	2035.15	2035.79	2038.43
MW-12	2040.65	2027.51	2032.83	2028.36	2034.33	2033.16	2036.75
MW-13	2044.67	2030.29	2032.07	2030.47	2034.73	2031.78	2036.92
MW-14	2119.88	<2040.20	<2040.20	<2040.20	<2040.20	<2040.20	<2040.20
MW-15	2058.15	2044.68	2044.85	2044.46	2045.42	2045.51	2045.86
MW-15A	2058.16	2045.27	2045.81	2043.00	2046.14	NM	2046.52
MW-16	2059.22	2052.60	2052.62	2052.50	2052.62	2052.52	2052.62
MW-16A	2059.33	2052.80	2054.65	2052.71	2052.88	2053.37	2053.03
MW-17	2056.71	2042.34	2045.26	2042.44	2046.83	2044.54	2051.33
MW-18	2036.36	<2010.30	<2010.30	<2010.30	2019.88	<2010.30	2021.02
MW-19	2037.74	2012.39	2013.55	2012.59	2016.28	2013.43	2017.76
MW-20	2027.36	2011.79	2012.21	2011.78	2012.43	2012.05	2012.74
MW-21	2036.74	<2006.90	<2006.90	<2006.90	2011.95	<2006.90	2021.51
MW-22	2082.12	<2025.90	<2025.90	<2025.90	2025.97	<2025.90	<2025.90
MW-23	2027.54	2009.88	2010.81	2010.50	2018.37	2010.83	2019.94
MW-24	2035.05	2009.90	2010.79	2010.73	2020.03	2010.97	2021.10
MW-26R	2021.35	2014.55	2013.95	2014.16	2017.18	NM	2018.12
MW-27	2051.08	2019.06	2020.42	2019.50	2023.57	2020.05	2024.24
MW-28	2022.48	2011.57	2012.73	2011.63	2012.18	2011.47	2011.89
MW-28A	2022.69	2011.03	2011.79	2011.08	2011.91	2011.02	2011.70
RW-1	2031.70	1953.68	1958.29	1949.65	1996.87	1949.55	2019.87
RW-2	2071.70	2049.89	2050.96	2049.99	2050.72	2050.89	2051.43
RW-3	2033.40	1950.43	2004.52	2004.01	2017.20	2005.00	2018.52
RW-4	2032.10	1966.66	1973.11	1980.49	2010.00	1983.13	2020.02

Elevations are in feet above mean sea level.

⁽¹⁾ Top of casing measured in feet above mean sea level.

* Pre-startup

NM - Not Measured, well not accessible.

NOTE: System startup was March 4, 1998.

Water levels preceded with less than sign (<) indicates dry well.

**Table 1
Summary of Groundwater Elevations**

LOCATION	TOP OF CASING ⁽¹⁾	WATER TABLE ELEVATION AND DATE OF MEASUREMENT		
		06/26/03	08/11/03	10/06/03
MW-1	2123.16	<2056.03	2061.71	2061.84
MW-2	2074.52	2053.32	2053.38	2052.77
MW-4	2122.38	2062.9	2062.57	2062.23
MW-5	2121.44	2057.56	2057.84	2057.65
MW-6	2102.22	2056.9	2057.00	2056.37
MW-7	2071.17	2052.75	2052.72	2052.26
MW-8	2075.22	2054.81	2054.51	2053.72
MW-9	2072.29	2054.87	2054.58	2054.06
MW-10	2076.30	2055.56	2054.71	2053.36
MW-11	2109.60	2041.65	2041.00	2040.15
MW-12	2040.65	2035.62	2034.65	2031.28
MW-13	2044.67	2036.62	2035.70	2033.80
MW-14	2119.88	<2040.20	<2040.20	<2040.20
MW-15	2058.15	2046.52	2046.40	2046.01
MW-15A	2058.16	2047.26	2047.21	2046.52
MW-16	2059.22	2052.65	2052.62	2052.61
MW-16A	2059.33	2052.9	2052.83	2052.84
MW-17	2056.71	2049.92	2048.88	2046.15
MW-18	2036.36	2020.74	<2010.30	2020.29
MW-19	2037.74	2016.54	2014.03	2015.66
MW-20	2027.36	2013.3	2013.13	2012.52
MW-21	2036.74	2021.09	2006.29	2020.51
MW-22	2082.12	2037.97	<2025.90	2035.72
MW-23	2027.54	2019.63	2012.17	2018.88
MW-24	2035.05	2020.81	2012.72	2020.15
MW-26R	2021.35	2017.73	2016.94	2017.03
MW-27	2051.08	2023.77	2021.53	2023.04
MW-28	2022.48	2011.65	2011.59	2011.60
MW-28A	2022.69	2011.51	2011.54	2011.22
RW-1	2031.70	2019.75	1958.92	2019.20
RW-2	2071.70	2052	2050.88	2050.97
RW-3	2033.40	2018.65	2005.44	2018.07
RW-4	2032.10	2020.14	1987.55	2019.59

Elevations are in feet above mean sea level.

⁽¹⁾ Top of casing measured in feet above mean sea level.

* Pre-startup

NM - Not Measured, well not accessible.

NOTE: System startup was March 4, 1998.

Water levels preceded with less than sign (<) indicates dry well.

Section 3

Groundwater and Surface Water Quality

Groundwater samples were collected from 28 monitoring wells and from recovery wells RW-1 and RW-4 on October 7 through October 9, 2003. Two monitoring wells, MW-20 and MW-12, and recovery well RW-1 were re-sampled on October 28, 2003 due to suspect analyses. Recovery well RW-3 has been off-line since April 2002 because of low yield and related operational problems; thus, no groundwater samples have been collected at this location. Surface water samples were also collected from the four surface water stations, SW-1, SW-2, SW-3, and SW-4. Sampling locations are shown on Figure 1 and Plate 1. Monitoring well MW-14 was dry at that time due to drawdown and could not be sampled. Groundwater samples were analyzed for TCE, 1,2-DCE, and vinyl chloride. In addition, eight monitoring wells and recovery wells RW-1 and RW-4 were analyzed for PCE. Analytical results are summarized in Table 2. Laboratory analytical reports are presented in Appendix B. Table 3 and Table 4 present summaries of historical concentrations of TCE and 1,2-DCE.

3.1 Standard Monitoring Program

During the October 2003 sampling event, 18 monitoring wells were sampled on the northeast side of the Girmes facility (Plate 1). TCE was detected in samples collected from nine wells, with the concentrations exceeding the North Carolina (NC) 2L standard of 0.0028 mg/L in seven of the wells. Four wells, MW-4, MW-5, MW-9, and MW-20 had a decrease in TCE concentrations since last sampled in April 2003. TCE concentrations increased in well MW-13. TCE concentrations remained generally unchanged in samples collected from wells MW-2, MW-10, MW-11, and MW-16A.

1,2-DCE was detected in samples collected from six monitoring wells. The detected concentrations exceeded the NC 2L standard of 0.07 mg/L in two wells—MW-4 and MW-5. 1,2-DCE concentrations decreased in three wells, MW-4, MW-5, and MW-20. 1,2-DCE concentrations increased in wells MW-2 and MW-13, and remained relatively unchanged in well MW-9. The concentration of 1,2-DCE detected in the sample collected from well MW-10 during April 2003 had no detection during the October 2003 sampling event.

Vinyl chloride was not detected in any of the samples collected from wells on the northeast side of the Girmes facility.

On the southwest side of the Girmes facility, ten monitoring wells—MW-18, MW-19, MW-21, MW-22, MW-23, MW-24, MW-26R, MW-27, MW-28, and MW-28A—and two recovery wells—RW-1 and RW-4—were sampled. Monitoring well MW-14 was dry and could not be sampled. Recovery well RW-3 was not operating during the October 2003 sampling event and therefore was not sampled. Because the October 2003 sampling event was conducted at the end of a 6-week system-off cycle, monitoring wells MW-18 and MW-21 had sufficient water to sample. Until the pulsed pumping was initiated in November 2002, monitoring wells MW-18 and MW-21 had been continuously dry as a result of pumping of the recovery wells.

TCE was detected in groundwater samples collected from four monitoring wells (MW-18, MW-19, MW-23, and MW-24) and both recovery wells, at concentrations exceeding the NC 2L standards. TCE was also detected in three monitoring wells (MW-21, MW-26R, and MW-28) at a concentration below the NC 2L standard. 1,2-DCE was detected in groundwater samples collected from four of the monitoring wells (MW-18, MW-19, MW-21, and MW-26R) and in both recovery wells (RW-1 and RW-4), at concentrations below the NC 2L standard.

TCE concentrations increased in samples collected from monitoring wells MW-18, MW-19, and MW-28, and recovery wells RW-1 and RW-4, since last sampled in April 2003. TCE concentrations detected in samples collected from monitoring wells MW-21, MW-23, and MW-28A have decreased since last sampled in April 2003. The TCE concentrations in MW-24 and MW-26R have remained generally unchanged since they were last sampled.

Concentrations of 1,2-DCE have increased in samples collected from monitoring wells MW-18, MW-19, MW-21, and both recovery wells since last sampled in April 2003. Concentrations of 1,2-DCE have decreased in samples collected from monitoring wells MW-26R and MW-28A since last sampled in April 2003.

Vinyl chloride was detected in samples collected from two monitoring wells (MW-21 and MW-26R) on the southwest side of the Girmes facility at concentrations exceeding the NC 2L standard. The concentration of vinyl chloride has increased in the sample collected from monitoring well MW-21 since last sampled in April 2003. Monitoring well MW-26R is located on Dotson's property on the southwest side of Gashes Creek. The detected concentration in monitoring well MW-26R, 0.029 mg/L, has declined slightly since the previous sampling event and remains above the NC 2L standard.

Surface water samples were collected from four surface water stations during the October 2003 sampling event, SW-1, SW-2, SW-3, and SW-4. None of the surface water samples collected had detections of TCE, 1,2-DCE, or vinyl chloride.

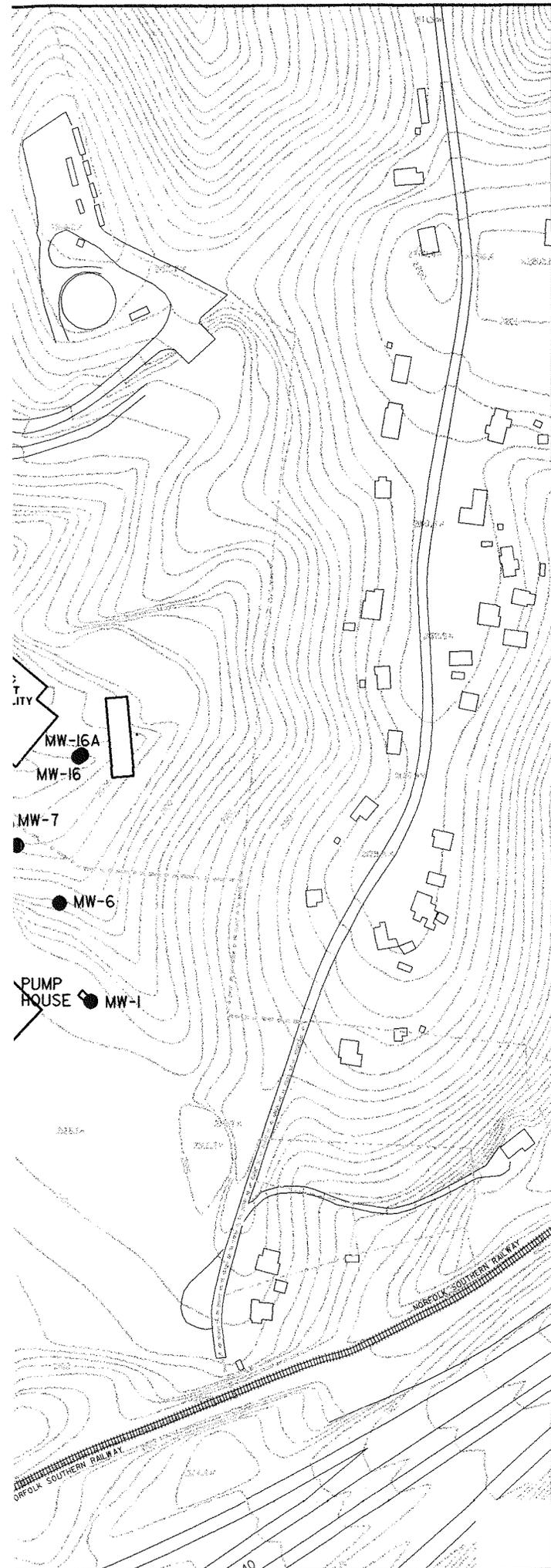
3.2 Additional Analytical Parameter

Since shortly after startup of the groundwater recovery system, tetrachloroethene (PCE) was found in the influent to the treatment system. Select monitoring wells sampled during the January 1999 monitoring event were analyzed for PCE in addition to the standard analytical parameters. The January 1999 analytical results, along with historical groundwater analytical data collected at the site during the CSA, led SKF to conclude that the PCE and other VOCs found on the southwest side of Gashes Creek have no relationship to the affected groundwater found on the Girmes facility.

In the groundwater monitoring report for the January 1999 sampling event, SKF modified the groundwater monitoring program to continue monitoring all of the wells specified in the CAP according to the specified schedule. In addition to TCE, 1,2-DCE, and vinyl chloride, recovery wells RW-1, RW-3, and RW-4 and select monitoring wells would also be sampled for PCE.

During the October 2003 sampling event, monitoring wells MW-18, MW-19, MW-21, MW-23, MW-24, MW-26R, MW-28, and MW-28A and the two operating recovery wells were analyzed for PCE. Analytical results are included in Table 2. PCE was detected in two monitoring wells (MW-18 and MW-23) and recovery well RW-1, at concentrations exceeding the NC 2L standards. Concentrations of PCE detected in samples collected from monitoring well MW-18 and recovery well RW-1 have increased since last sampled in April 2003. Concentrations of PCE have decreased in samples collected from well MW-23 since last sampled in April 2003. When operating, recovery wells RW-1 and RW-4 recover groundwater from the southwest side of Gashes Creek.

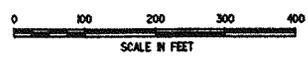
The analytical results for PCE confirm the results from previous sampling events since January 1999. The PCE found in these wells appears to be the result of a release on the southwest side of Gashes Creek and does not appear to be related to groundwater quality on the Girmes facility. However, SKF will continue to analyze groundwater samples from wells MW-18, MW-19, MW-21, MW-23, MW-24, MW-26R, MW-28, MW-28A, RW-1, RW-3, and RW-4 for PCE to monitor concentration trends and their effects on the groundwater recovery system.



LEGEND

- ▲ SW-1 SURFACE WATER SAMPLING LOCATION
- MW-15 MONITORING WELL LOCATION
- PROPERTY LINE - OTHER
- 900 TOPOGRAPHIC CONTOUR

NOTE:
 DIGITIZED BASE MAP PROVIDED BY THE CITY OF ASHEVILLE, NORTH CAROLINA NOVEMBER, 1993.
 THE LOCATIONS OF THE STORM SEWER LINES WERE INCLUDED AS PART OF THE BASE MAP.



PROJECT NO:	D.O. MADSON
PREPARED BY:	J. S. BECHTOLD
DRAWN BY:	J. S. BECHTOLD
CHECKED BY:	D.O. MADSON
APPROVED BY:	
APPROVED BY:	D. O. MADSON
DATE:	JUNE 1999
JOB NO.:	7044

AMI		100 Yerdas Boulevard P.O. Box 8178 Greenville, SC 29606 (864) 288-0030
LOCATION OF DATA POINTS		
GIRMES SITE, formerly SKF USA		
ASHEVILLE, NORTH CAROLINA		
SCALE AS NOTED		FIGURE NO. 1

Table 2
Analytical Results for Groundwater and Surface Water Samples⁽¹⁾

LOCATION	DATE	TCE	1,2-DCE, TOTAL	VINYL CHLORIDE	PCE
NC 2L Standard		0.0028	0.07	0.000015	0.0007
MW-01	10/08/03	<0.001	<0.002	<0.002	NA
MW-02	10/08/03	0.012	0.0051	<0.002	NA
MW-04	10/09/03	0.28	0.28	<0.004	NA
MW-05	10/09/03	6.6	0.36	<0.1	NA
MW-06	10/08/03	<0.001	<0.002	<0.002	NA
MW-07	10/08/03	<0.001	<0.002	<0.002	NA
MW-08	10/08/03	<0.001	<0.002	<0.002	NA
MW-09	10/08/03	0.31	0.014	<0.004	NA
MW-10	10/08/03	0.0029	<0.002	<0.002	NA
MW-11	10/09/03	0.0027	<0.002	<0.002	NA
MW-12	10/28/03	<0.001	<0.002	<0.002	NA
MW-13	10/08/03	0.074	0.0032	<0.002	NA
MW-14	NA	NA	NA	NA	NA
MW-15	10/08/03	<0.001	<0.002	<0.002	NA
MW-15A	10/09/03	<0.001	<0.002	<0.002	NA
MW-16	10/09/03	<0.001	<0.002	<0.002	NA
MW-16A	10/09/03	0.00039 J	<0.002	<0.002	NA
MW-17	10/08/03	<0.001	<0.002	<0.002	NA
MW-18	10/07/03	0.0078	0.0027	<0.002	0.011
MW-19	10/07/03	0.044	0.0018 J	<0.002	<0.001
MW-20	10/28/03	0.007	0.0037	<0.002	NA
MW-20 (DU-03403)	10/28/03	0.007	0.0035	<0.002	<0.001
MW-21	10/07/03	0.0014	0.017	0.00092 J	<0.001
MW-22	10/07/03	<0.001	<0.002	<0.002	NA
MW-23	10/07/03	0.004	<0.002	<0.002	0.0097
MW-24	10/07/03	0.011	<0.002	<0.002	<0.001
MW-26R	10/07/03	0.00041 J	0.033	0.029	<0.001
MW-26R(DU-03401)	10/07/03	0.00044 J	0.034	0.028	<0.001
MW-27	10/07/03	<0.001	<0.002	<0.002	NA
MW-28	10/07/03	0.00024 J	<0.002	<0.002	<0.001
MW-28A	10/07/03	<0.001	<0.002	<0.002	<0.001
RW-01	10/28/03	1.1 D	0.027	<0.002	0.022
RW-04	10/07/03	0.18	0.004	<0.002	<0.001
SW-01	10/09/03	<0.001	<0.002	<0.002	NA
SW-02	10/09/03	<0.001	<0.002	<0.002	NA
SW-03	10/09/03	<0.001	<0.002	<0.002	NA
SW-04	10/09/03	<0.001	<0.002	<0.002	NA

⁽¹⁾ Analytical results are reported in milligrams per liter (mg/L) unless otherwise noted.
D - Results from diluted sample.

J - Qualitative mass spectral evidence of analyte present; concentration is less than reporting limit.

< - Concentration less than the Quantitation Limit.

NA - Not analyzed.

Shaded value indicates exceedance of NC 2L Standard

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater⁽¹⁾

WELL	SAMPLING DATE								
	NOV-93	APR-94	AUG-94	SEP-94	JUN-95	JAN/FEB-96	JUN-96	JAN-97	JUL-97
MW-1	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-2	0.11	NA	NA	NA	0.058 D	0.088	0.037	0.052	0.035
MW-4	1.5	NA	NA	NA	0.95 D	0.74	0.71	0.64	0.45 D
MW-5	6.4	NA	NA	NA	5.8 D	5.2	5.6	7.3	7.1 D
MW-6	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-7	0.014	NA	NA	NA	ND	ND	0.0011	0.0064	0.015
MW-8	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-9	3.0	NA	NA	NA	1.8 D	2.7	1.9	2.2	1.9
MW-10	0.22	NA	NA	NA	0.042 E	ND	0.038(0.034)*	0.025	0.029
MW-11	ND	NA	NA	NA	0.0016	ND	0.0044	0.0022	0.0028
MW-12	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-13	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-14	0.52	NA	NA	NA	0.080 D	0.08	0.2	0.065	0.038
MW-15	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-15A	ND	NA	NA	NA	0.0026	ND	0.0022	ND	0.0089
MW-16	ND	NA	NA	NA	0.0012	ND	ND	ND	ND(ND)*
MW-16A	ND	NA	NA	NA	ND	ND	ND	ND(ND)*	ND
MW-17	0.0075(0.0076)*	NA	NA	NA	0.0039	ND	ND(ND)*	0.0006 Q	ND
MW-18		0.0033	0.0017	NA	ND	0.001	ND	0.0014/0.0013	0.0011
MW-19		0.0037	0.18	0.04	0.11 D	0.028	0.061	0.56	0.071
MW-20		ND	NA	NA	ND	ND	ND	ND	0.0032
MW-21		0.49	0.49	NA	0.35 D	0.32	0.42	0.29	0.35
MW-22		ND	NA	NA	ND	ND	ND	ND	ND
MW-23			3.5	5.7	11.0 D	14.0	13.0	12.0	8.7 D(8.3 D)*
MW-24			2.2	0.2	0.22 D	0.23	0.21	0.22	0.19 D
MW-26R								0.0005 Q	0.0013
MW-27			ND	NA	ND	ND	ND	ND	ND
MW-28					ND	ND	ND	ND	0.0015
MW-28A					0.054 D	0.14	0.076	0.072	0.083
RW-1					9.9/0.91**	0.26	0.77		1.0
RW-3									0.94
RW-4									0.4

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater⁽¹⁾

WELL	SAMPLING DATE								
	JAN-98	JUL-98	OCT-98	JAN-99	APR-99	JUL-99	OCT-99	JAN-00	APR-00
MW-1	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-2	0.038	0.016	0.031	0.047	0.037	0.031	0.042	0.051	0.042
MW-4	0.52	0.27	0.39 D	0.56	0.45	0.3	0.36	0.38	0.29 (0.23)*
MW-5	7.2	8.0	8.4 D	9.2 (9.40)*	13.0 D	12.0 D	14 D	16	15 D
MW-6	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-7	0.017	NA	0.014	NA	0.022	NA	0.026 (0.024)	NA	0.0037
MW-8	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-9	1.4	0.82	0.53	0.49	0.88	0.73	0.58 D	0.36	0.65
MW-10	0.031	NA	0.025	NA	0.012	NA	0.018	NA	0.0042
MW-11	0.0018	NA	0.0023	NA	0.0031	NA	0.0035	NA	0.0033
MW-12	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-13	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14	0.035	NA	DRY	NA	DRY	NA	DRY	NA	NA
MW-15	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-15A	0.0019	NA	ND (ND)*	NA	0.00085 J	NA	0.00054 J	NA	ND
MW-16	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-16A	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-17	ND	NA	ND	NA	ND	NA	0.00083 J	NA	ND
MW-18	ND	NA	DRY	NA	DRY	NA	DRY	NA	NA
MW-19	0.019	0.024	0.039	0.046	0.028	0.04	0.076	0.084 (0.076)*	0.0075
MW-20	0.0034	NA	0.014 (0.014)*	NA	0.015	NA	0.0094 (0.0086)	NA	0.02 (0.017)*
MW-21	0.31	NA	DRY	NA	DRY	NA	DRY	NA	NA
MW-22	ND	NA	ND	NA	DRY	NA	DRY	NA	NA
MW-23	10.0	1.6	0.33	0.2	0.1	0.086(0.087)*	0.084	0.046	0.051
MW-24	0.22	0.099	0.066	0.047	0.051	0.044(0.045)*	0.025	0.028	0.028
MW-26R	0.003	0.0017	ND	0.00076 J	0.0015	0.0013	0.00083 J	0.00062 J	0.0011
MW-27	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-28	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-28A	0.067	0.036	0.031	0.03	0.023	0.023	0.017	0.016	0.013
RW-1		1.9 D	1.7	1.1	0.6	0.7	0.49 D	0.74	0.69
RW-3		0.63	0.84 D	0.7	0.59	0.71	0.6 D	0.71	0.62
RW-4		0.2	0.17	0.13	0.13	0.14	0.089	0.12 (0.12)*	0.17

Table 3
Historical Trichloroethene Concentrations Detected in Groundwater⁽¹⁾

WELL	SAMPLING DATE							
	JUL-00	OCT-00	APR-01	OCT-01	APR-02	OCT-02	APR-03	OCT-03
MW-1	NA	ND	ND	ND	ND	ND	DRY	ND
MW-2	0.029	0.035	NA	0.024	0.031	0.026 k	0.014	0.012
MW-4	0.26	0.45	0.32	0.46	0.33	0.41 k (0.42k)	0.34	0.28
MW-5	16	17 D	13	16	11 D	14 k	12	6.6
MW-6	NA	ND	ND	ND	ND	ND	ND	ND
MW-7	NA	0.0027	0.0009J	ND	ND	ND	ND	ND
MW-8	NA	ND	0.0011	0.0011	0.0014	0.0013	0.00096j	ND
MW-9	0.83	1	0.34	0.65	0.41	0.96 k	0.39	0.31
MW-10	NA	0.016	0.0038	0.0041	0.0011	0.002	0.001	0.0029
MW-11	NA	0.003	0.0023	0.0036	0.0029	0.0031	0.004	0.0027
MW-12	NA	ND	ND	ND	ND	ND	ND	ND
MW-13	ND	ND	ND	0.00053 J	ND	ND	ND	0.074
MW-14	NA	NA	NA	NA	NA	NA	DRY	NA
MW-15	NA	ND	ND	ND	ND	ND	ND	ND
MW-15A	NA	ND	0.0015	ND	ND	ND	ND	ND
MW-16	NA	ND	ND	ND	ND	ND	ND	ND
MW-16A	NA	ND	ND	0.00052 J	ND	ND (0.00072j)	0.0006j	0.00039 J
MW-17	NA	0.0011	0.00057J (0.00054J)	0.0033	0.0044	0.01	ND	ND
MW-18	NA	NA	NA	NA	NA	NA	0.0055	0.0078
MW-19	0.036	0.092	0.016	0.11	0.064	0.18 k	0.0038	0.044
MW-20	NA	0.018	0.011	0.012	0.012	0.0091	0.012	0.007
MW-21	NA	NA	NA	NA	NA	NA	0.012	0.0014
MW-22	NA	NA	NA	NA	NA	NA	DRY	ND
MW-23	0.014	0.017	0.041	0.0099	0.027	0.028 k	0.0082	0.004
MW-24	0.017	0.013 (0.014)	0.012	0.0066	0.0047	0.0062	0.014	0.011
MW-26R	ND	ND	0.0025	0.0096	ND	0.00076 J	0.00061J	0.00041 J
MW-27	NA	ND	ND	ND	ND	ND	ND	ND
MW-28	NA	ND	ND	ND	ND (ND)	ND	ND	0.00024 J
MW-28A	0.013	0.01	0.0085	0.0059	0.0058	0.0065	0.0055	ND
RW-1	0.13	1.3	0.6	0.54	0.16	0.51 k	0.2	1.1 D
RW-3	0.56	0.61	0.57	0.63	NA	NA	NA	NA
RW-4	0.39 D (0.39 D)	0.13	0.19 (0.16)	0.077	0.034 (0.034)	0.066 Nk	0.05	0.18

Table 3 Historical Trichloroethene Concentrations Qualifiers

⁽¹⁾ Analytical results are reported in milligrams per liter (mg/L) unless otherwise noted.

D - Analyte value from diluted analysis.

E - Analyte concentration exceeds calibration range.

J - Qualitative evidence of analyte present: Concentration detected is greater than the method detection limit but less than the reporting limit.

j - Concentration considered an estimate based on data validation.

k - Analyte present; reported value may be biased high.

Q - The analyte has been detected between the Limit of Detection (LOD) and Limit of Quantitation (LOQ).

The results are qualified due to the uncertainty of analyte concentrations within this range.

NA - Not analyzed.

ND - Not detected.

* - Analytical results for duplicate samples shown in parentheses.

** - Analytical results for samples collected at the beginning/end of pumping tests.

< - Concentration less than the Quantitation Limit.

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater⁽¹⁾

WELL	SAMPLING DATE								
	NOV-93	APR-94	AUG-94	SEP-94	JUN-95	JAN/FEB-96	JUN-96	JAN-97	JUL-97
MW-1	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-2	0.025	NA	NA	NA	0.012	ND	0.0096	ND	0.004
MW-4	0.74	NA	NA	NA	0.67 D	0.36	0.71	ND	0.51 D
MW-5	ND	NA	NA	NA	0.085 E	ND	0.27	ND	0.2
MW-6	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-7	0.038	NA	NA	NA	ND	ND	ND	ND	0.001 J
MW-8	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-9	ND	NA	NA	NA	0.045 E	ND	ND	ND	0.043
MW-10	1.2	NA	NA	NA	0.60 D	0.38	0.45(0.39)*	ND	0.47
MW-11	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-12	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-13	ND	NA	NA	NA	0.003	ND	0.0044	0.022	0.002
MW-14	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-15	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-15A	ND	NA	NA	NA	ND	ND	ND	ND	ND
MW-16	ND	NA	NA	NA	ND	ND	ND	ND	ND(ND)*
MW-16A	ND	NA	NA	NA	ND	ND	ND	ND(ND)*	ND
MW-17	ND(ND)*	NA	NA	NA	ND	ND	ND(ND)*	ND	ND
MW-18		0.0086	0.0036	NA	0.0026	ND	ND	0.0011 Q(0.0013 Q)*	0.0012 J
MW-19		ND	ND	0.019	0.0085	ND	0.004	ND	0.0038
MW-20		ND	NA	NA	0.0029	ND	0.26	ND	0.0043
MW-21		0.13	0.14	NA	0.25 D	0.20	ND	ND	0.13
MW-22		ND	NA	NA	ND	ND	0.68	ND	ND
MW-23			ND	ND	0.38	ND	ND	ND	0.28 D(0.27 D)*
MW-24			ND	ND	0.003	ND	ND	ND	0.0024
MW-26R								0.003 Q	0.0063
MW-27			ND	NA	ND	ND	ND	ND	
MW-28					ND	ND	ND	ND	
MW-28A					0.0073	0.018	0.033	0.011	0.011
RW-1					0.56/0.24**	0.08	0.2	NA	0.013
RW-3									ND
RW-4									0.0085 J

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater⁽¹⁾

WELL	SAMPLING DATE								
	JAN-98	JUL-98	OCT-98	JAN-99	APR-99	JUL-99	OCT-99	JAN-2000	APR-2000
MW-1	ND	NA	<0.002	NA	ND	NA	ND	NA	ND
MW-2	0.0035	0.0022	0.0024	0.003	0.0024	0.002	0.003	0.003	0.0029
MW-4	0.52	0.38	0.39 D	0.76	0.55	0.33	0.41	0.38	0.26 (0.26)*
MW-5	0.15	0.13	0.12	0.15	0.19	0.19 D	0.22	0.26	0.23
MW-6	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-7	ND	NA	0.00086 J	NA	ND	NA	0.0013 J (0.0013 J)*	NA	ND
MW-8	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-9	0.03	0.019	0.012	0.011	ND	0.015	0.016	0.0082	0.012
MW-10	0.47	NA	0.4	NA	0.2	NA	0.3	NA	0.065
MW-11	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-12	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-13	ND	0.0014 J	0.00093 J	ND	DRY	ND	DRY	ND	ND
MW-14	ND	NA	DRY	NA	ND	NA	NA	NA	ND
MW-15	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-15A	ND	NA	ND (ND)*	NA	ND	NA	ND	NA	ND
MW-16	ND	NA	ND	0.002	ND	NA	ND	NA	ND
MW-16A	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-17	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-18	ND	NA	DRY	NA	DRY	NA	DRY	NA	NA
MW-19	ND	0.0012 J	0.0015 J	NA	ND	ND	0.0035	0.0037 (0.0031)*	ND
MW-20	0.0054	NA	0.0071 (0.0075)*	NA	0.007	NA	0.0056 (0.0056)*	NA	0.0077 (0.0066)*
MW-21	0.13	NA	DRY	NA	DRY	NA	DRY	NA	NA
MW-22	ND	NA	ND	NA	DRY	NA	DRY	NA	NA
MW-23	0.34	0.11	0.025	0.016	0.017	0.011(0.011)*	0.012	0.0069	0.0078
MW-24	ND	0.0013 J	0.0081J	0.00056 J	ND	ND(ND)*	ND	ND	ND
MW-26R	0.0081	0.016	0.018	0.028	0.067	0.076	0.064	0.058	0.077
MW-27	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-28	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-28A	0.0086	0.0052	0.0067	0.0068	0.0045	0.0039	0.0033	0.0029	0.0023
RW-1		0.05	0.062	0.042	0.024	0.027	0.024	0.024	0.021
RW-3		0.038	0.022	0.045	0.045	0.051	0.061	0.057	0.042
RW-4		0.0053	0.0046	0.0031	0.0036	0.0034	0.0025	0.0032 (0.0033)*	0.0041

Table 4
Historical 1,2-Dichloroethene Concentrations Detected in Groundwater⁽¹⁾

WELL	SAMPLING DATE						
	OCT-2000	APR-2001	OCT-2001	APR-2002	OCT-2002	APR-2003	OCT-2003
MW-1	ND	ND	ND	ND	ND	DRY	ND
MW-2	0.0022	NA	0.0011 J	0.0017 J	0.0014 J	ND	0.0051
MW-4	0.59	0.63	0.71	0.44	0.63 (0.61)	0.33	0.28
MW-5	0.3	0.3	0.29	0.34	0.46	0.44	0.36
MW-6	ND	ND	ND	ND	ND	ND	ND
MW-7	ND	ND	ND	ND	ND	ND	ND
MW-8	ND	ND	ND	ND	ND	ND	ND
MW-9	0.022	0.0079	0.014	0.012	0.024	0.011	0.014
MW-10	0.22	0.094	0.085	0.021	0.029	0.0095	ND
MW-11	ND	ND	ND	ND	ND	ND	ND
MW-12	ND	ND	ND	ND	ND	ND	ND
MW-13	ND	ND	ND	ND	ND	ND	0.0032
MW-14	NA	NA	NA	NA	NA	DRY	NA
MW-15	ND	ND	ND	ND	ND	ND	ND
MW-15A	ND	ND	ND	ND	ND	ND	ND
MW-16	ND	ND	ND	ND	ND	ND	ND
MW-16A	ND	ND	ND	ND	ND (ND)	ND	ND
MW-17	ND	ND (ND)	ND	0.00084 J	0.0021	ND	ND
MW-18	ND	NA	NA	NA	NA	ND	0.0027
MW-19	0.0036	0.00058 J	0.0035	0.0023	0.006	ND	0.0018 J
MW-20	0.0066	0.0053	ND	0.0055	0.0046	0.0049	0.0037
MW-21	NA	NA	NA	NA	NA	0.0059	0.017
MW-22	NA	NA	NA	NA	NA	DRY	ND
MW-23	0.002	0.005	0.0016 J	0.0036	0.0029	ND	ND
MW-24	ND	ND	ND	ND	ND	ND	ND
MW-26R	0.045	0.064	0.16	0.17	0.13	0.075	0.033
MW-27	ND	ND	ND	ND	ND	ND	ND
MW-28	ND	ND	ND	ND (ND)	ND	ND	ND
MW-28A	0.0019 J	0.0016 J	0.0012 J	ND	0.0016 J	0.0015 J	ND
RW-1	0.034	0.018	0.014	0.015	0.016	0.01	0.027
RW-3	0.047	0.05	0.047	NA	NA	NA	NA
RW-4	0.0031	0.0048 (0.0044)	0.0015 J	ND (ND)	0.0012 J	0.0022	0.004

Table 4 Historical 1,2-Dichloroethene Qualifiers

⁽¹⁾ Analytical results are reported in milligrams per liter (mg/L) unless otherwise noted.

D - Analyte value from diluted analysis.

E - Analyte concentration exceeds calibration range.

J - Qualitative evidence of analyte present: Concentration detected is greater than the method detection limit but less than the reporting limit.

Q - The analyte has been detected between the Limit of Detection (LOD) and Limit of Quantitation (LOQ).

The results are qualified due to the uncertainty of analyte concentrations within this range.

NA - Not analyzed.

ND - Not detected.

* - Analytical results for duplicate samples shown in parentheses.

** - Analytical results for samples collected at the beginning/end of pumping tests.

< - Concentration less than the Quantitation Limit.

Section 4

Recovery System Performance

The groundwater recovery system is designed to use three recovery wells to capture affected groundwater. Water from these wells is pumped to an air stripper, where VOCs are removed, and treated water is discharged into Gashes Creek per National Pollutant Discharge Elimination System (NPDES) Permit No. NC0086088. During the April 2002 sampling event it was discovered that the pump in well RW-3 was not operating. Attempts to restart the pump were unsuccessful. Well RW-3 has a yield of about ½ gallon per minute (gpm). Such a low flow in combination with the amount of vertical head between the pump and the land surface results in stress on the pump and its electrical system. This, in turn, results in increased maintenance. The remaining two wells (RW-1 and RW-4) recover approximately 15 and 7 gpm, respectively, and account for nearly all of the yield from the groundwater recovery system. Since recovery well RW-3 contributes very little to the overall yield of the groundwater recovery system, it has remained offline since April 2002 and groundwater recovery continues to include only wells RW-1 and RW-4.

The groundwater recovery system is now operating on a pulse pumping cycle of “on” for 6 weeks, followed by “off” for 6 weeks. This pulsed pumping cycle operational mode was initiated on November 11, 2002. The dates that the system was turned on and off during the past six months are summarized in Section 2.

Influent and effluent to the stripper is sampled on a monthly basis during “on” pumping cycles. Effluent flow is recorded continuously. The analytical results for the influent and effluent are used along with the flow data to estimate the amount of trichloroethene removed each month. Monthly volumes of treated groundwater and the estimated amount of TCE removed since system startup in March 1998 through October 2003 are summarized in Table 5. The estimated amount of groundwater that was recovered and treated during May 2003 through October 2003 is 3.20 million gallons. It is estimated that over 23 pounds of TCE were removed during May 2003 through October 2003. As shown on Table 5, the amount of TCE removed increased from an estimated 2 pounds per month in May 2003 to 11.9 pounds for the month of July 2003. The mass removal for July is based on influent samples collected 6 days after the system was restarted. The mass removed in August 2003 had declined to 1.7 pounds. This decline is attributed to two factors: (1) the system was only operated for 11 days in August, and (2) the mass for August is based on influent samples collected just prior to system shutdown, after 42 days of pumping. TCE concentrations are expected to decline over the pumping period. In October 2003, the mass of TCE removed was estimated at 7.5 pounds. This estimate for October

is based on an influent sample collected seven days after the system was restarted. The system was operated for several days prior to influent sample collection in order to fully purge the recovery system and recovery wells. This delayed influent sample collection method provides for a better evaluation of the effects of pulse pumping on TCE concentrations recovered.

Table 5
Operations Summary for Period Beginning March 4, 1998, and Ending October 31, 2003

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
02/98	0	0	0	Not operational
03/98	28	1.58	N/C	Startup 03/04/98
04/98	30	1.62	39.1	Normal operation
05/98	31	1.64	35.6	Normal operation
06/98	30	1.58	17.1	Normal operation
07/98	31	1.53	17.9	Normal operation. Adjusted pump rate for RW-4
08/98	31	1.42	14.2	RMT coordinating maintenance of pump controllers
09/98	30	1.47	13.5	Normal operation, pump controllers repaired/calibrated
10/98	31	1.40	11.7	Removed pump from RW-3. Pump will be cleaned and repaired, as needed.
11/98	30	1.30	11.9	RW-3 pump replaced
12/98	31	1.28	6.7	Normal operation
01/99	31	1.31	7.5	Auto dialer was reprogrammed. System inspected.
02/99	28	1.33	7.42	Normal operation
03/99	31	1.33	3.27	Normal operation. Calibrated flow meter and updated flow meter software.
04/99	30	1.35	1.90	Normal operation. System inspected during groundwater sampling.
05/99	31	1.46	10.7	Normal operation
06/99	30	1.39	7.06	Normal operation
07/99	31	1.46	7.05	Normal operation
08/99	31	1.42	7.1	Normal operation
09/99	30	1.33	6.6	Normal operation
10/99	31	1.35	4.5	Normal operation. System inspected during groundwater sampling.
11/99	30	1.31	6.1	Normal operation
12/99	31	1.29	6.0	Normal operation

- (1) Not calculated, no influent sample collected.
(2) Estimate based on data collected during system restart. Flow rate and VOC recovery rate will likely decline during operation.
(3) Mass removal was based on TCE concentration of influent sample collected at time of shutdown (after 43 days of operation).

Table 5
Operations Summary for Period Beginning March 4, 1998, and Ending October 31, 2003

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
01/00	31	1.19	5.2	Normal operation
02/00	29	1.17	5.8	Normal operation
03/00	31	1.25	6.6	Normal operation
04/00	30	1.08	6.3	Normal operation
05/00	31	0.661	1.05	Flow from RW-4 has declined. Field technician will adjust flow
06/00	30	0.693	1.9	Maintenance issues identified during site visit. Flow remains lower than normal
07/00	31	0.624 ⁽²⁾	3.02	Pumps functional at a reduced rate. Meters are marginally functional.
08/00	31	0.725	4.6	Replacement equipment purchased, operation and maintenance (O&M) trip scheduled.
09/00	30	1.274	11.7	Repairs made on September 6 and 7. Flow restored to approximately 45,000 gpd.
10/00	31	1.27 ⁽²⁾	12.7	Normal operation
11/00	30	1.10	17.4	Effluent flow meter calibrated, normal operation
12/00	31	1.03	5.5	Normal operation
1/01	31	1.02	3.9	Normal operation
2/01	28	0.97	2.7	Normal operation
3/01	31	0.85	2.8 ⁽²⁾	Normal operation
4/01	30	1.02	3.2	Flow rates adjusted and yield increased
5/01	31	1.05	5.2	Normal operation
6/01	30	1.11	4.4	Normal operation
7/01	31	1.14	3.8	Normal operation
8/01	31	1.14	3.6	Normal operation
9/01	30	1.06	3.9	Normal operation
10/01	31	1.06 ⁽¹⁾	3.9 ⁽²⁾	Normal operation
11/01	30	1.03	3.8	Normal operation
12/01	31	1.08	3.9	Normal operation

⁽¹⁾ Not calculated, no influent sample collected.

⁽²⁾ Estimate based on data collected during system restart. Flow rate and VOC recovery rate will likely decline during operation.

⁽³⁾ Mass removal was based on TCE concentration of influent sample collected at time of shutdown (after 43 days of operation).

Table 5
Operations Summary for Period Beginning March 4, 1998, and Ending October 31, 2003

CALENDAR MONTH	DAYS	WATER TREATED (million gallons)	TCE REMOVED (pounds)	COMMENTS
01/02	31	1.06	3.0	Normal operation
02/02	28	0.95	2.6	Normal operation
03/02	31	1.07	3.5	Normal operation
04/02	30	1.03 ⁽²⁾	3.5 ⁽²⁾	Well RW-3 not operating
05/02	31	1.09	3.3	The pump in well RW-3 not operating.
06/02	30	1.02	3.3	The pump in well RW-3 not operating.
07/02	31	1.02	3.3	The pump in well RW-3 not operating.
08/02	31	1.1	3.4	The pump in well RW-3 not operating.
09/02	30	1.01	2.4	The pump in well RW-3 not operating.
10/02	31	1.02 ⁽²⁾	2.4 ⁽²⁾	The pump in well RW-3 not operating.
11/02	10	0.33	0.77	10 days of operation this month; system off-line
12/02	0 ⁽⁴⁾	0	0	System off-line for month of December.
01/03	29	1.12	9.3 ⁽²⁾	System was restarted the first week of January.
02/03	14	0.46	1.9 ⁽³⁾	System shut down February 14, 2003.
03/03	0 ⁽⁴⁾	0	0	System off-line for month of March.
04/03	30	1.21	1.4	Normal operation
05/03	13	0.50 ⁽²⁾	2 ⁽²⁾	13 days of operation this month; system off-line
06/03	0 ⁽⁴⁾	0	0	System off-line for month of June.
07/03	31	1.3	11.9	Normal operation
08/03	11	0.41	1.7	11 days of operation this month
09/03	0	0	0	System off-line for month of September.
10/03	26	0.99	7.5	26 days of operation for month of October
	1,869	71.58	436.94	Total since system startup

⁽¹⁾ Not calculated, no influent sample collected.

⁽²⁾ Estimate based on data collected during system restart. Flow rate and VOC recovery rate will likely decline during operation.

⁽³⁾ Mass removal was based on TCE concentration of influent sample collected at time of shutdown (after 43 days of operation).

⁽⁴⁾ Indicates system was off-line for entire month.

Section 5

Conclusions and Recommendations

Data gathered during the past semiannual monitoring period indicates that the groundwater recovery system is operating effectively. Pulse pumping of the system appears to have increased the volume of VOCs removed. Recovered groundwater continues to be treated and discharged to Gashes Creek in compliance with the NPDES permit.

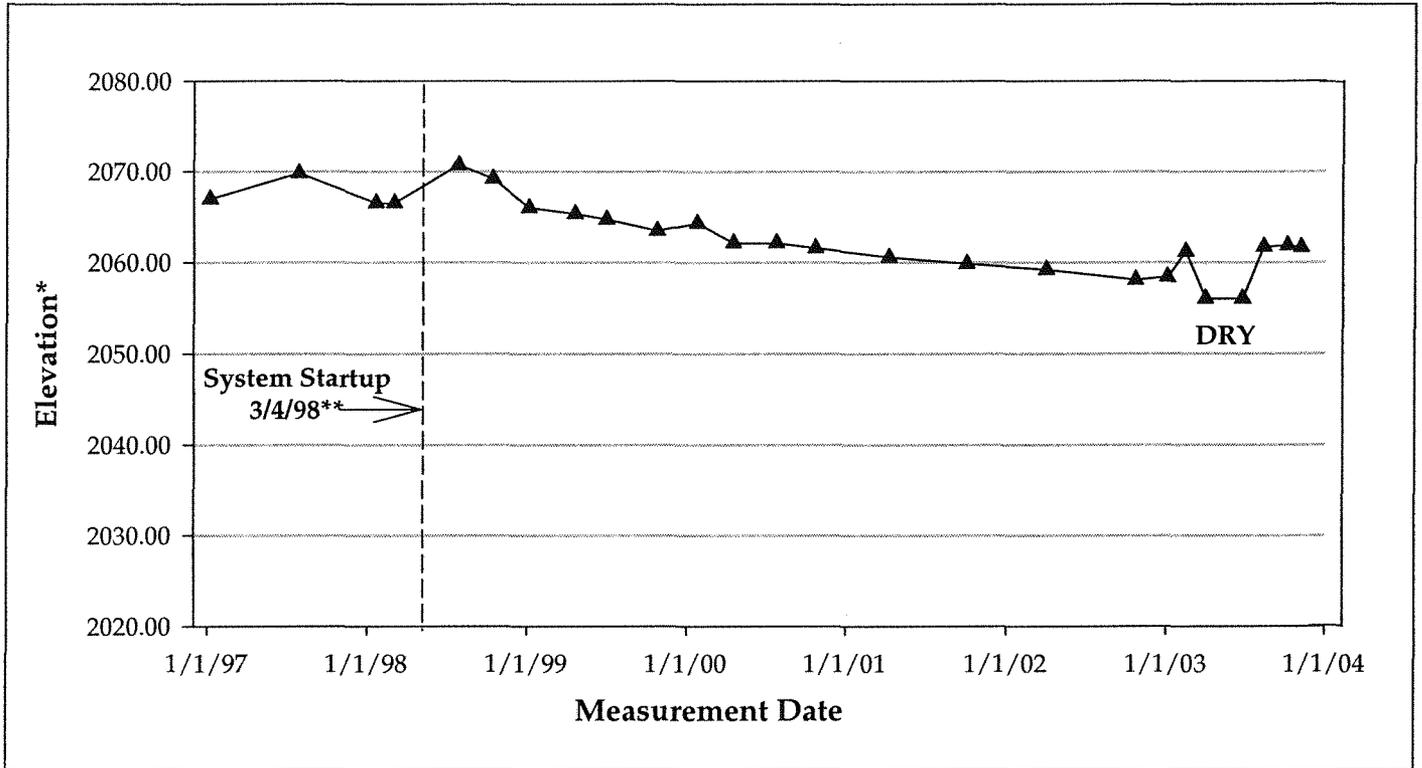
Based on these conclusions, RMT offers the following recommendations:

- Continue monitoring groundwater and surface water quality on a semiannual basis.
- Continue operating the groundwater recovery and treatment system on a 6-week on/6-week off pulse cycle.
- Sample influent flow into the treatment system for TCE on a weekly basis during two of the 6-week on cycles to validate removal rates.

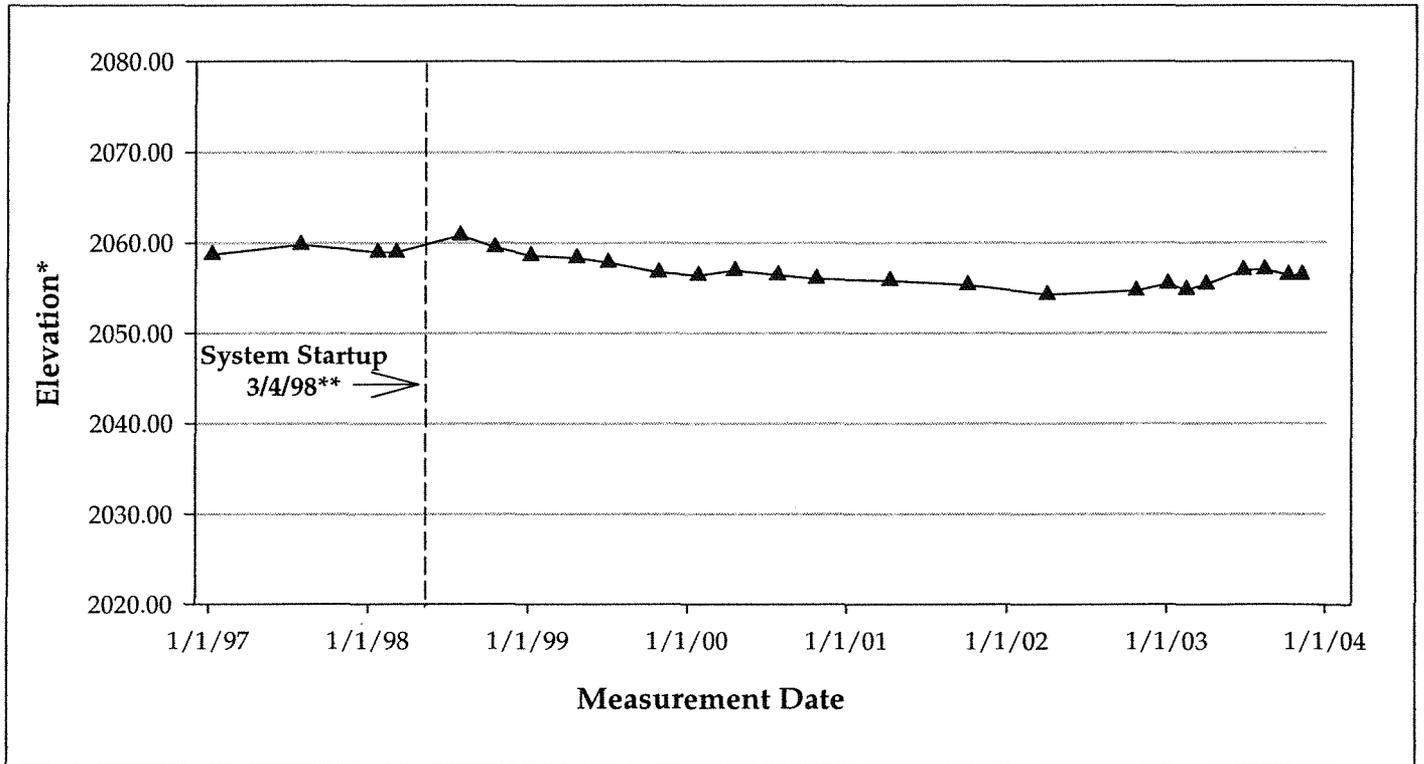
Appendix A

Hydrographs for Bedrock Wells

HYDROGRAPH - MONITORING WELL MW-1



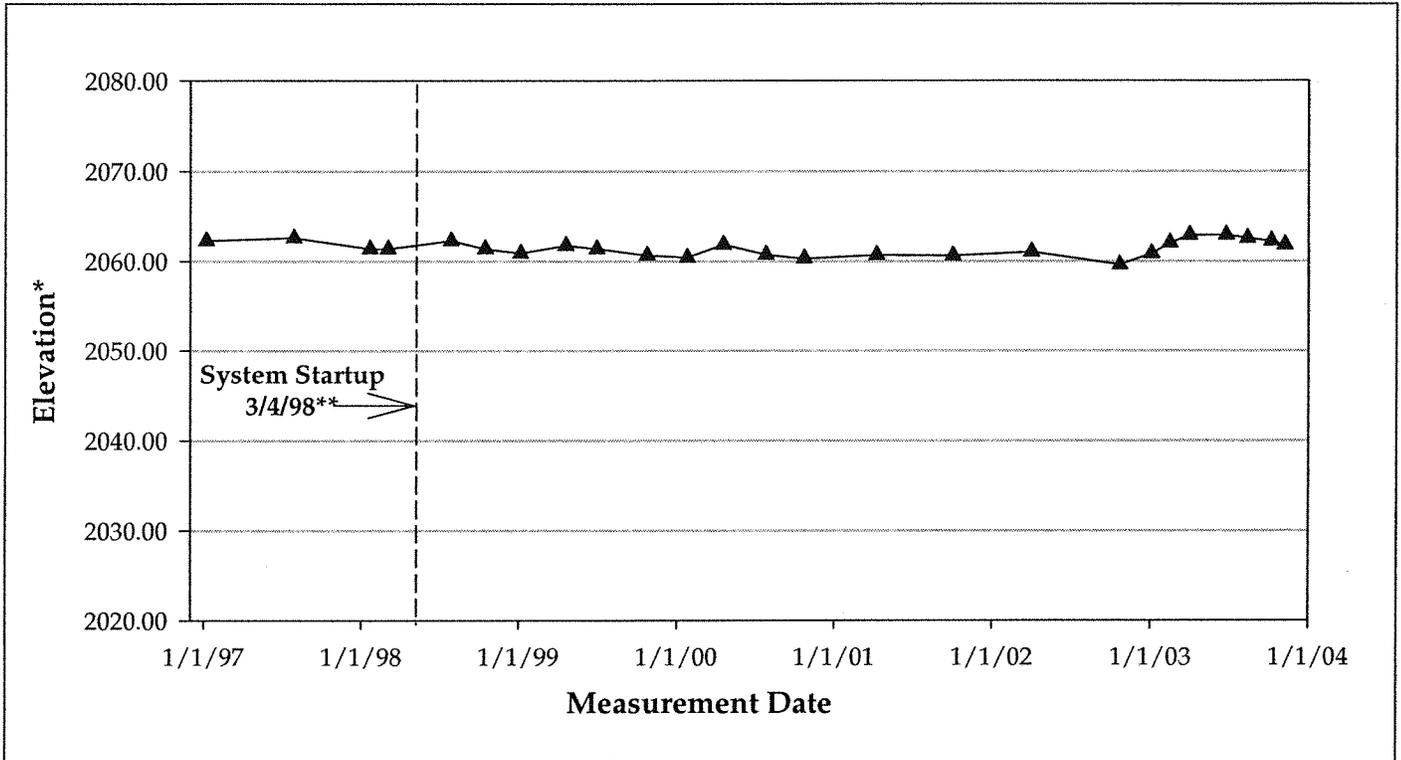
HYDROGRAPH - MONITORING WELL MW-6



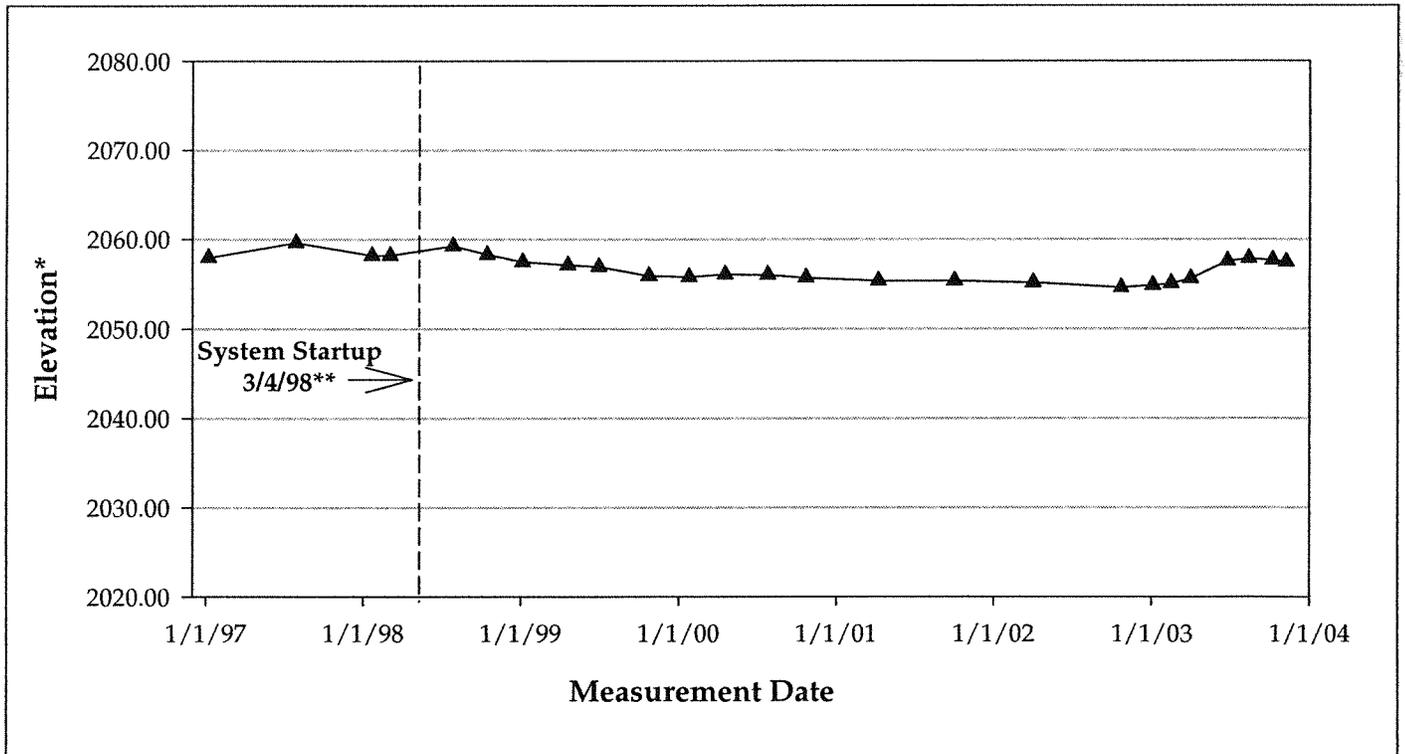
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - MONITORING WELL MW-4



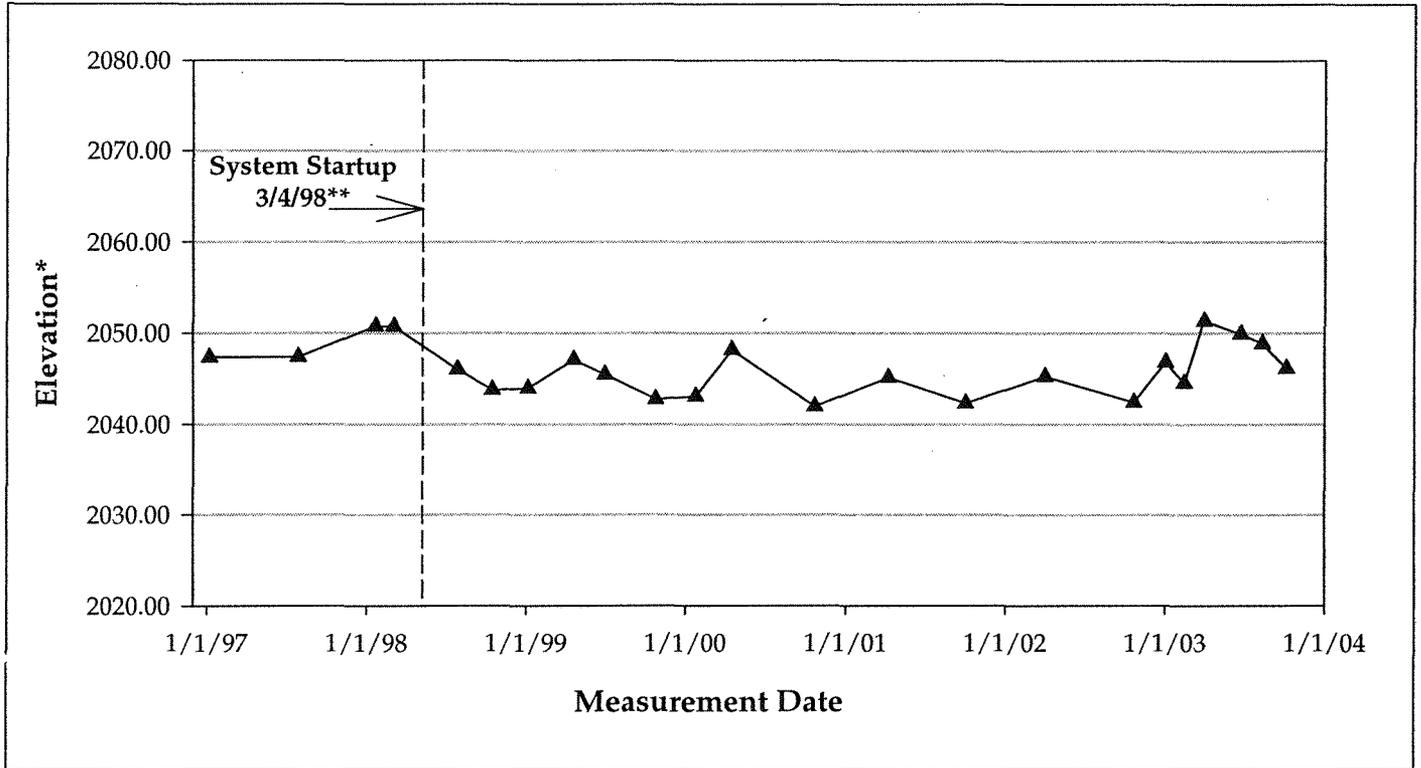
HYDROGRAPH - MONITORING WELL MW-5



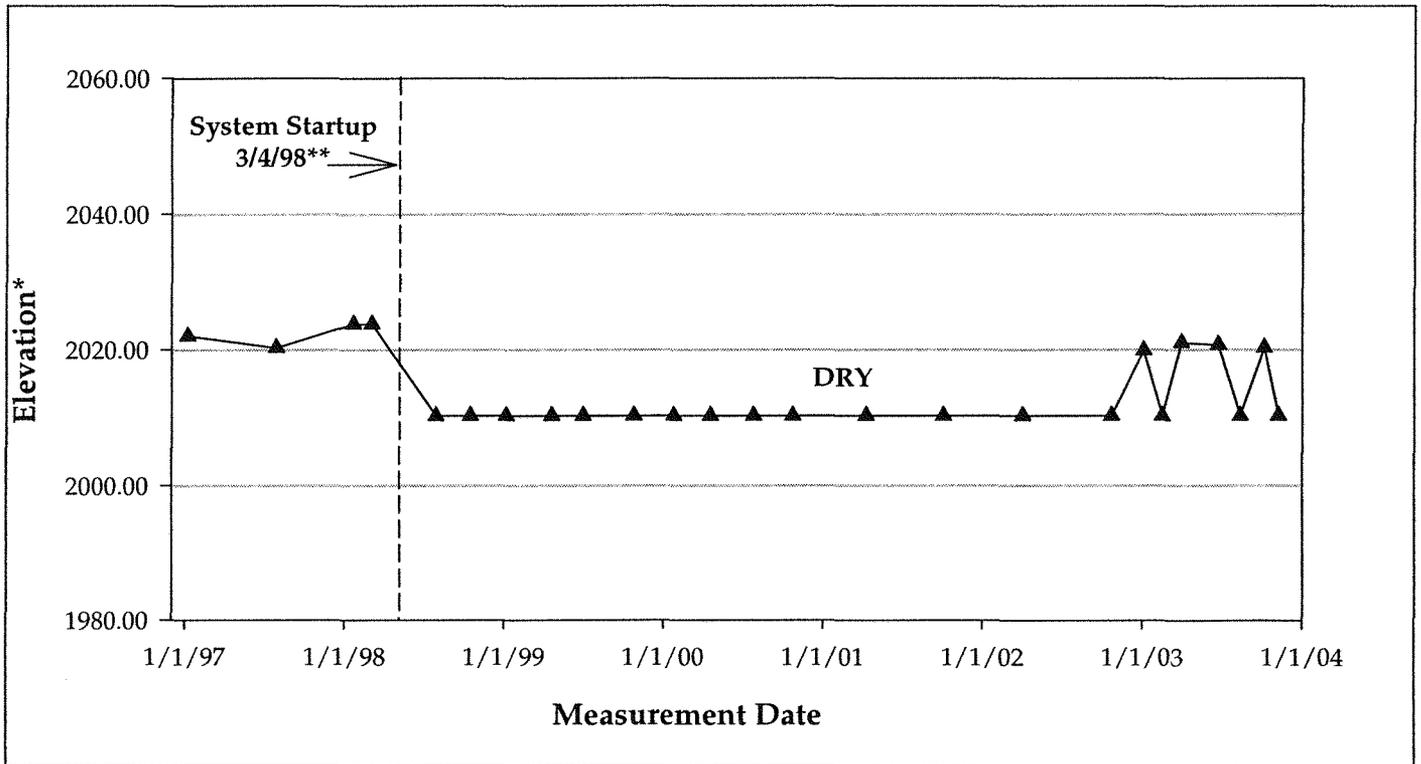
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - MONITORING WELL MW-17



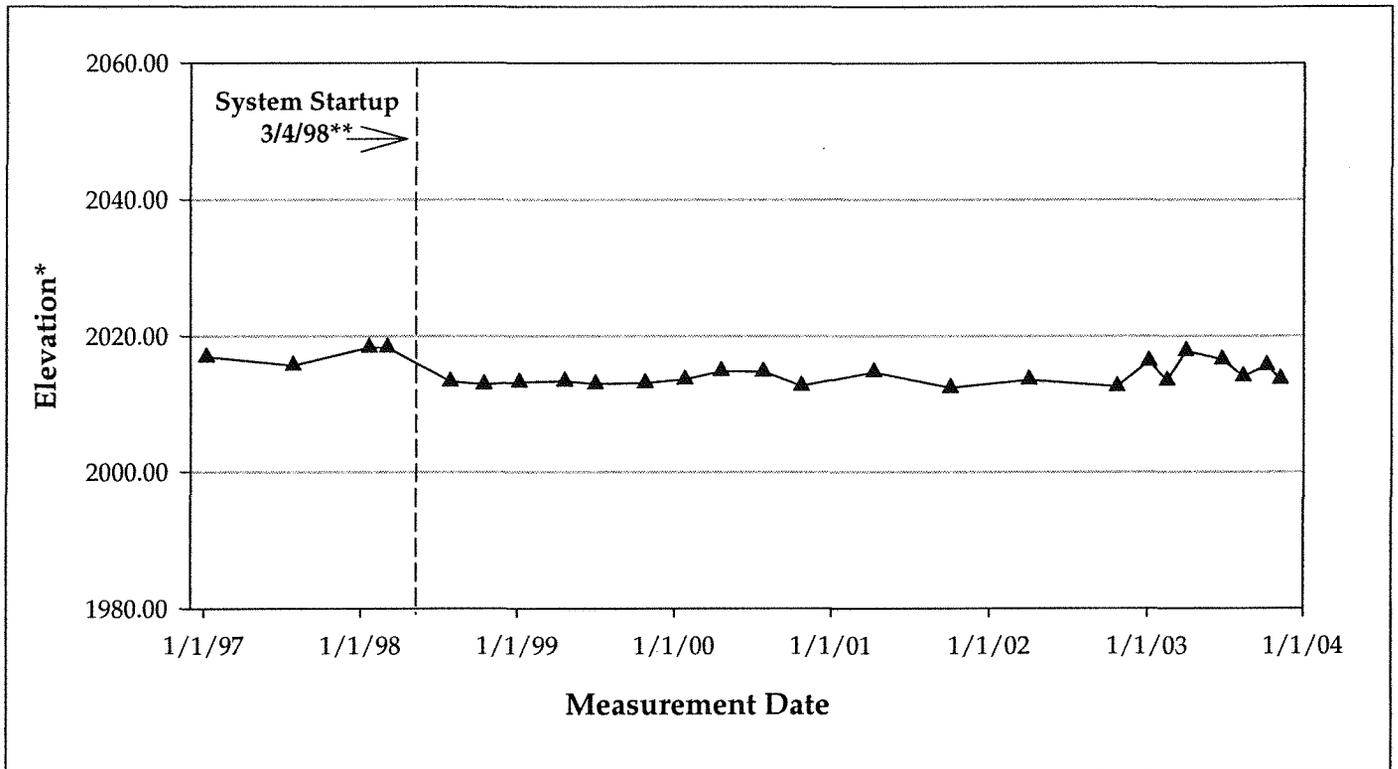
HYDROGRAPH - MONITORING WELL MW-18



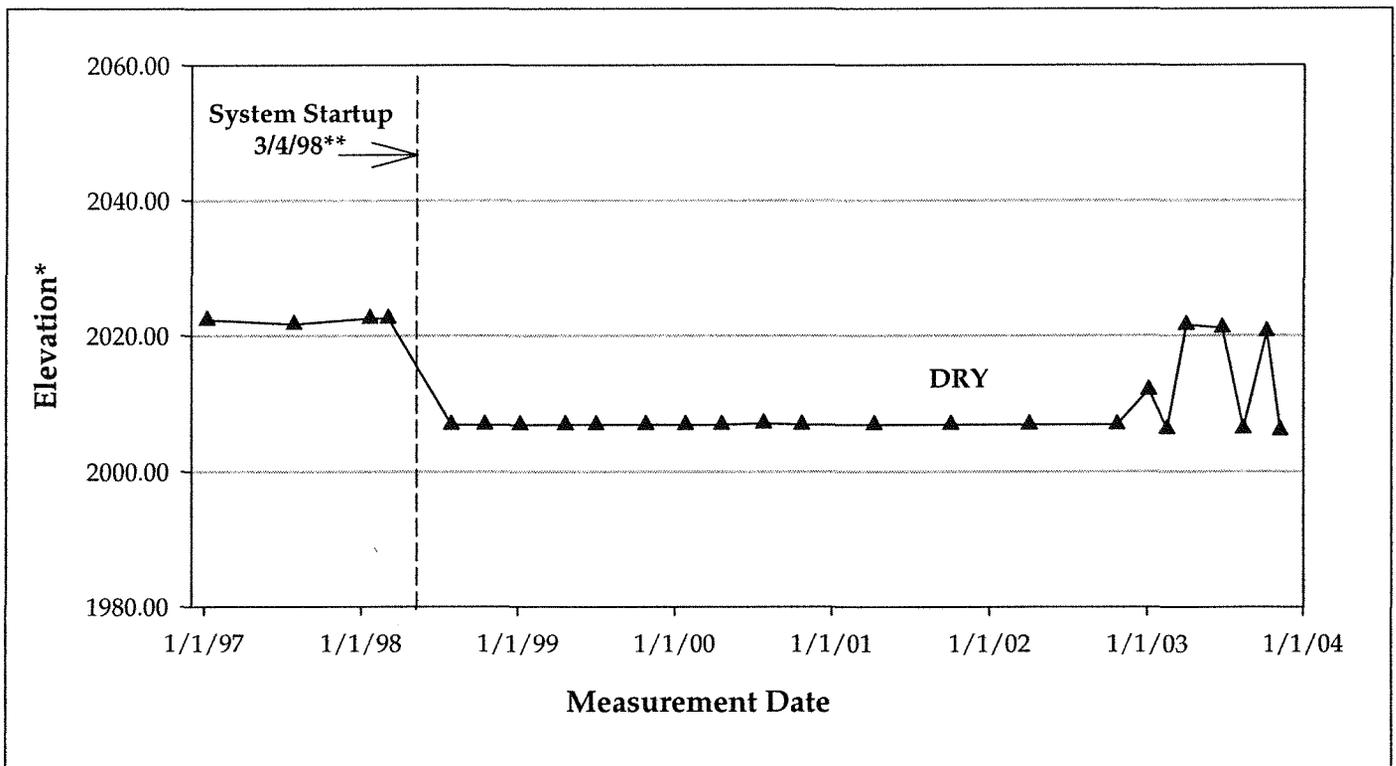
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - MONITORING WELL MW-19



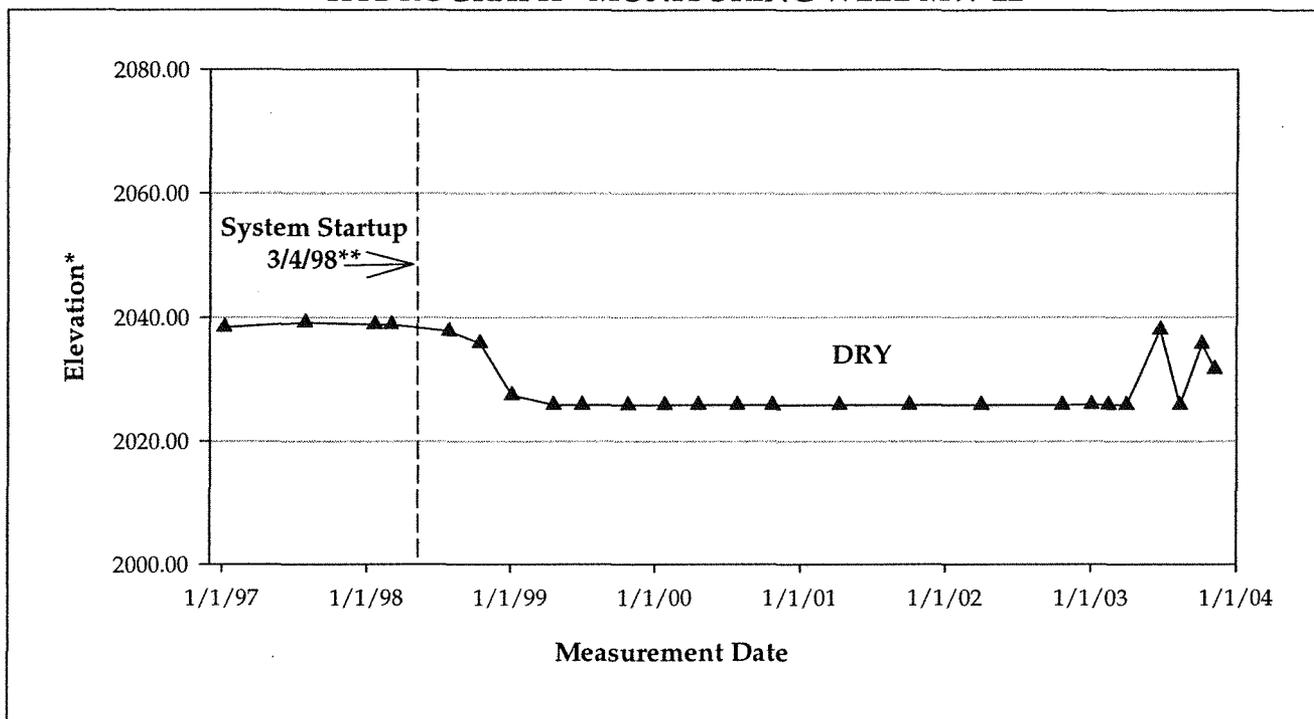
HYDROGRAPH - MONITORING WELL MW-21



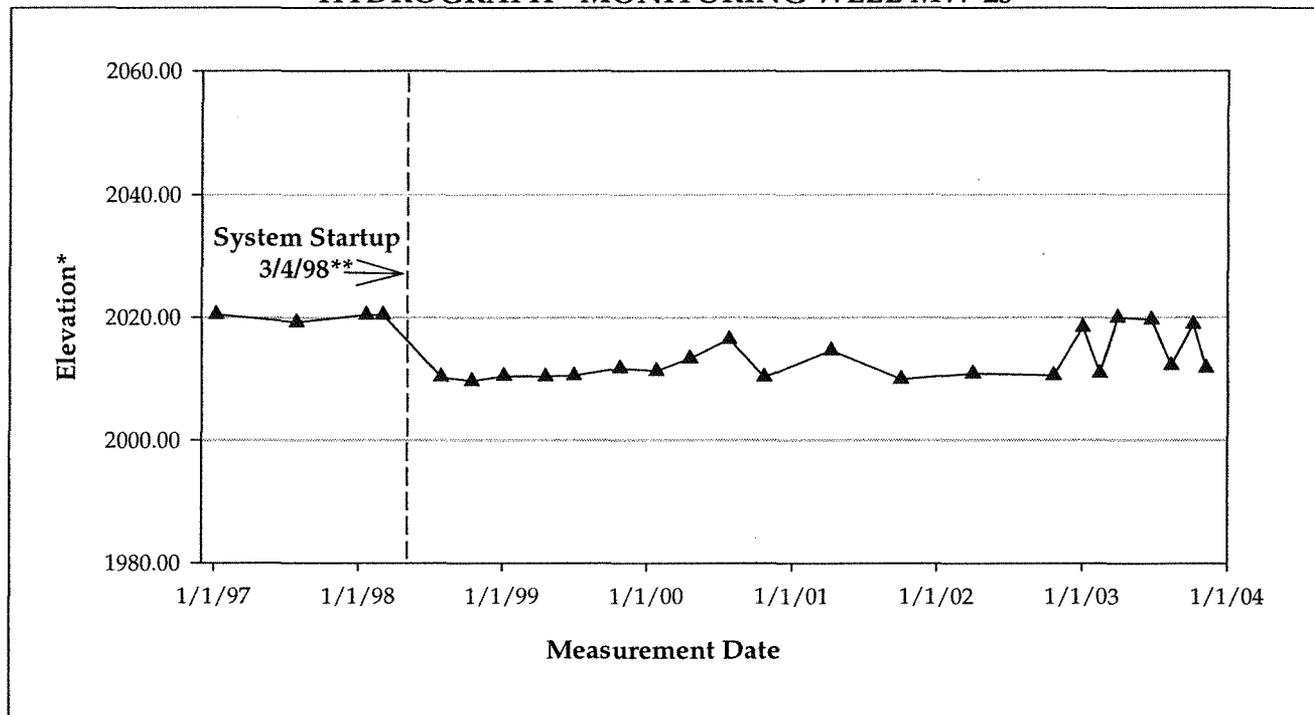
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - MONITORING WELL MW-22



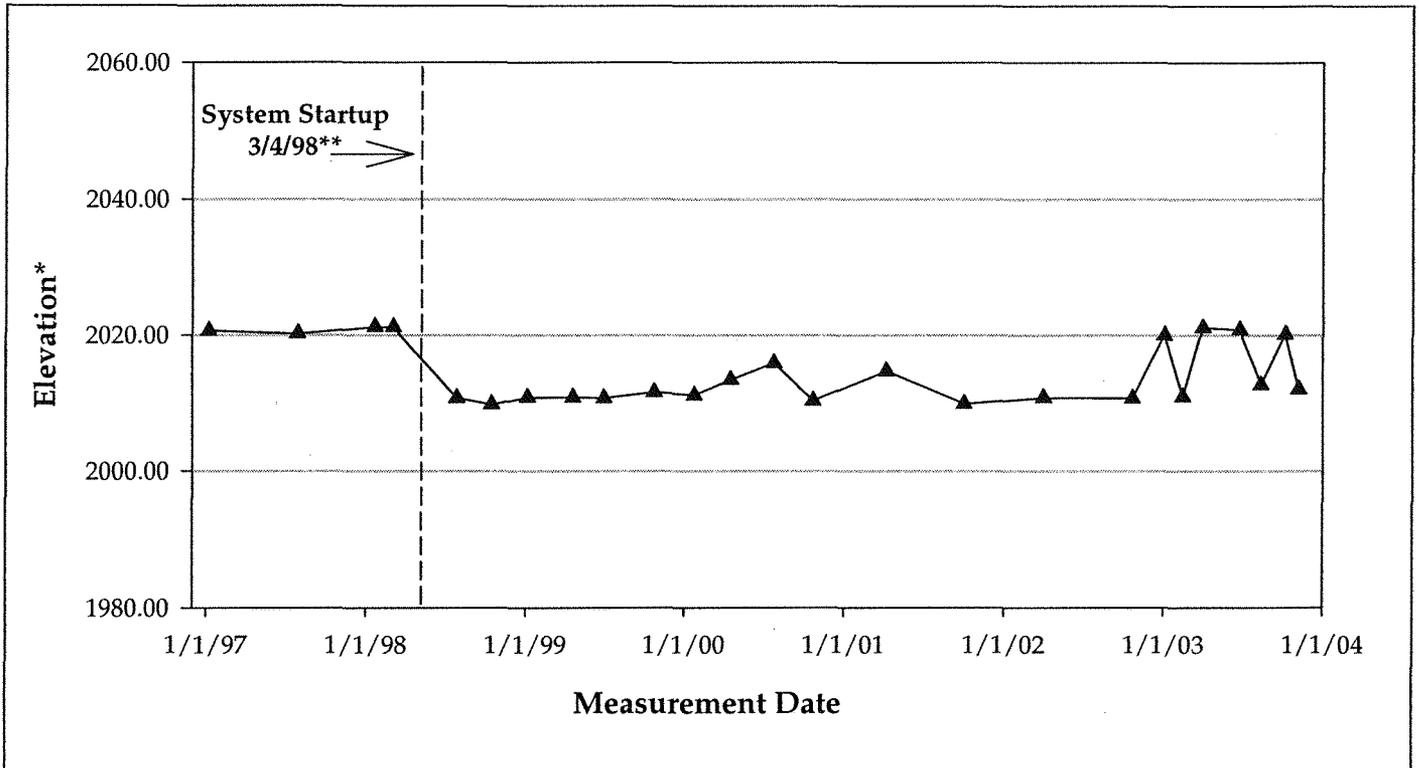
HYDROGRAPH - MONITORING WELL MW-23



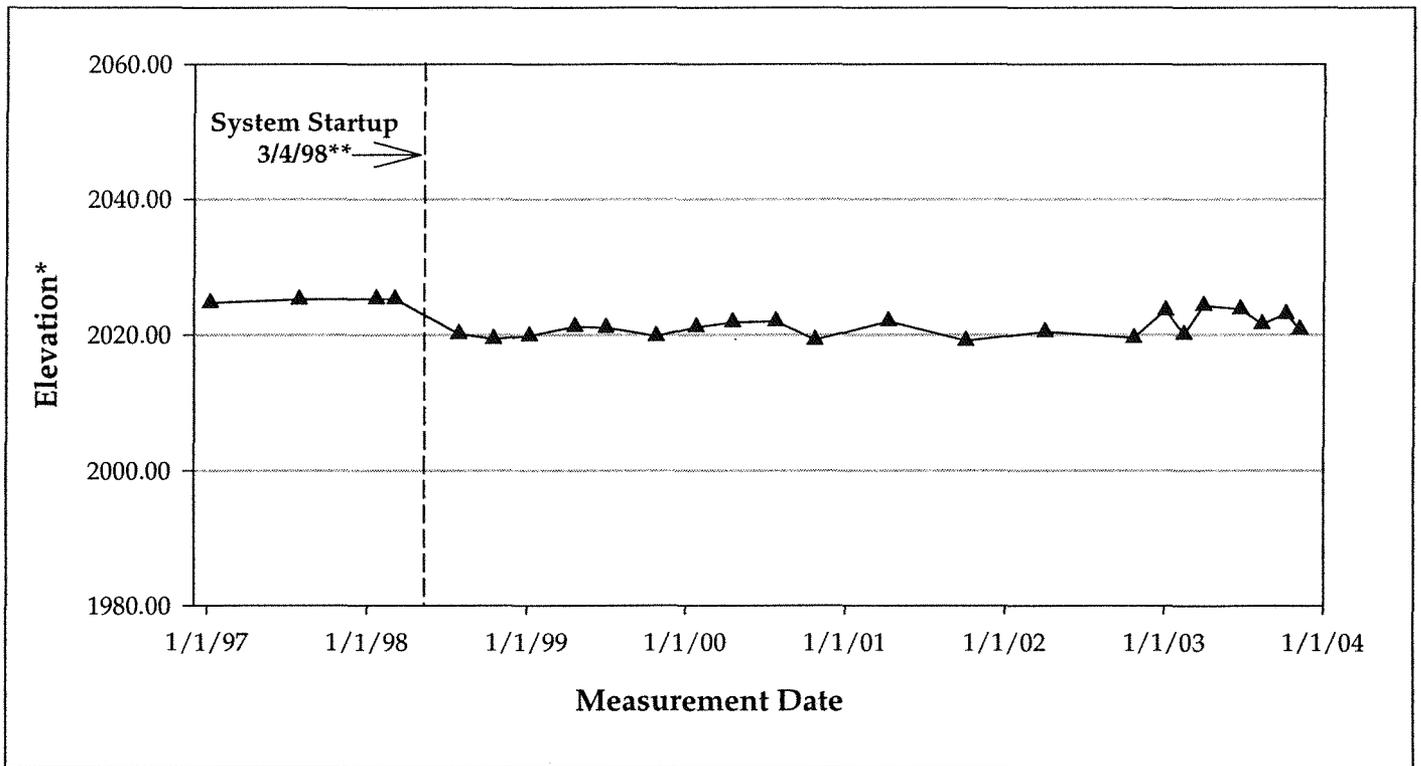
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - MONITORING WELL MW-24



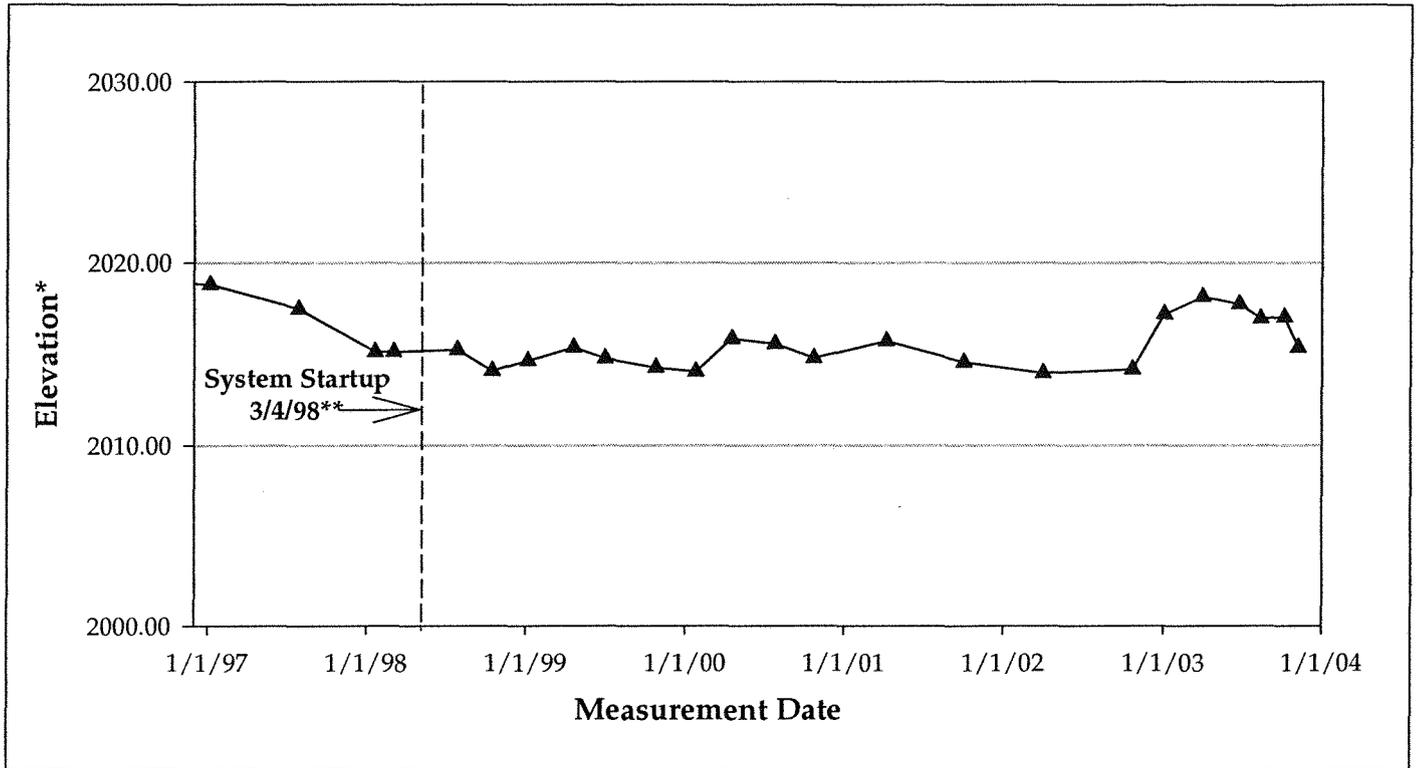
HYDROGRAPH - MONITORING WELL MW-27



* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

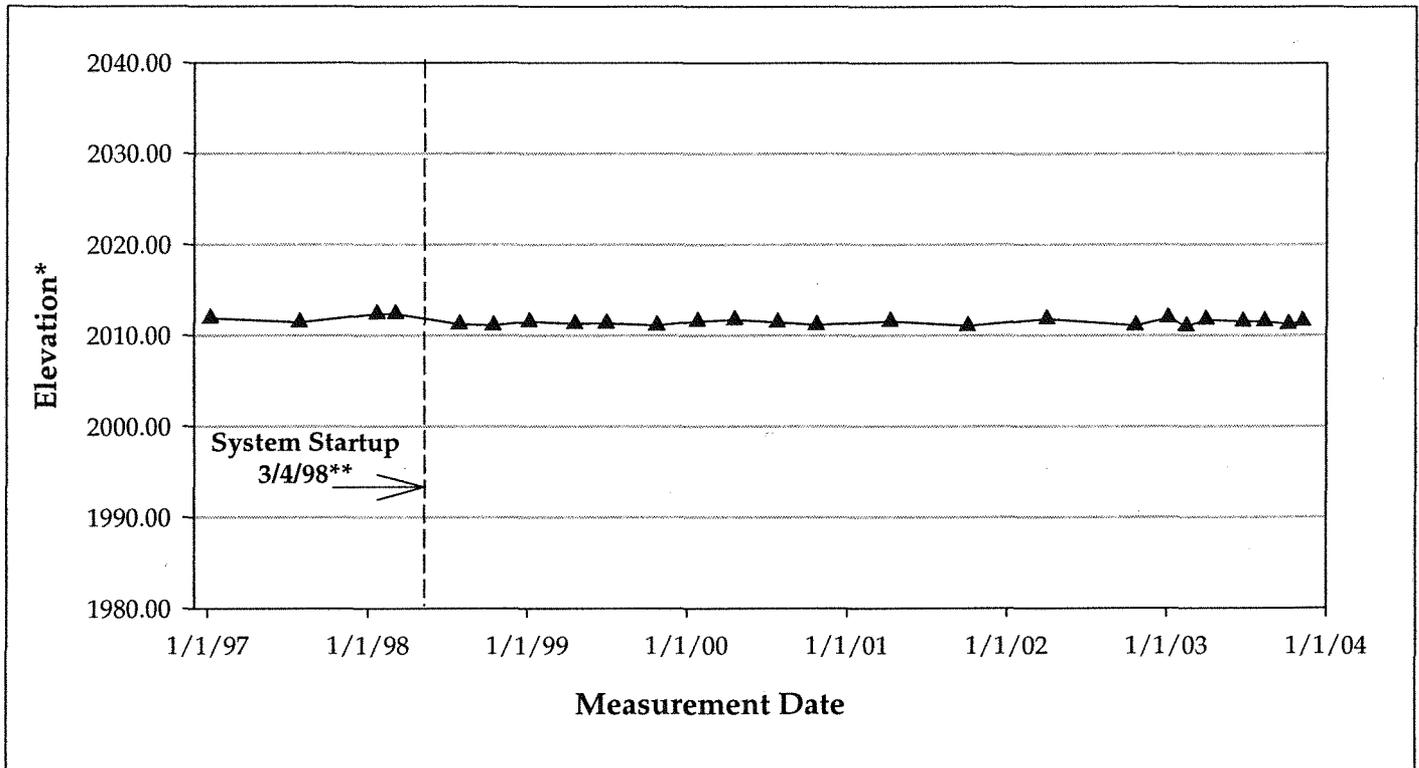
HYDROGRAPH - MONITORING WELL MW-26R



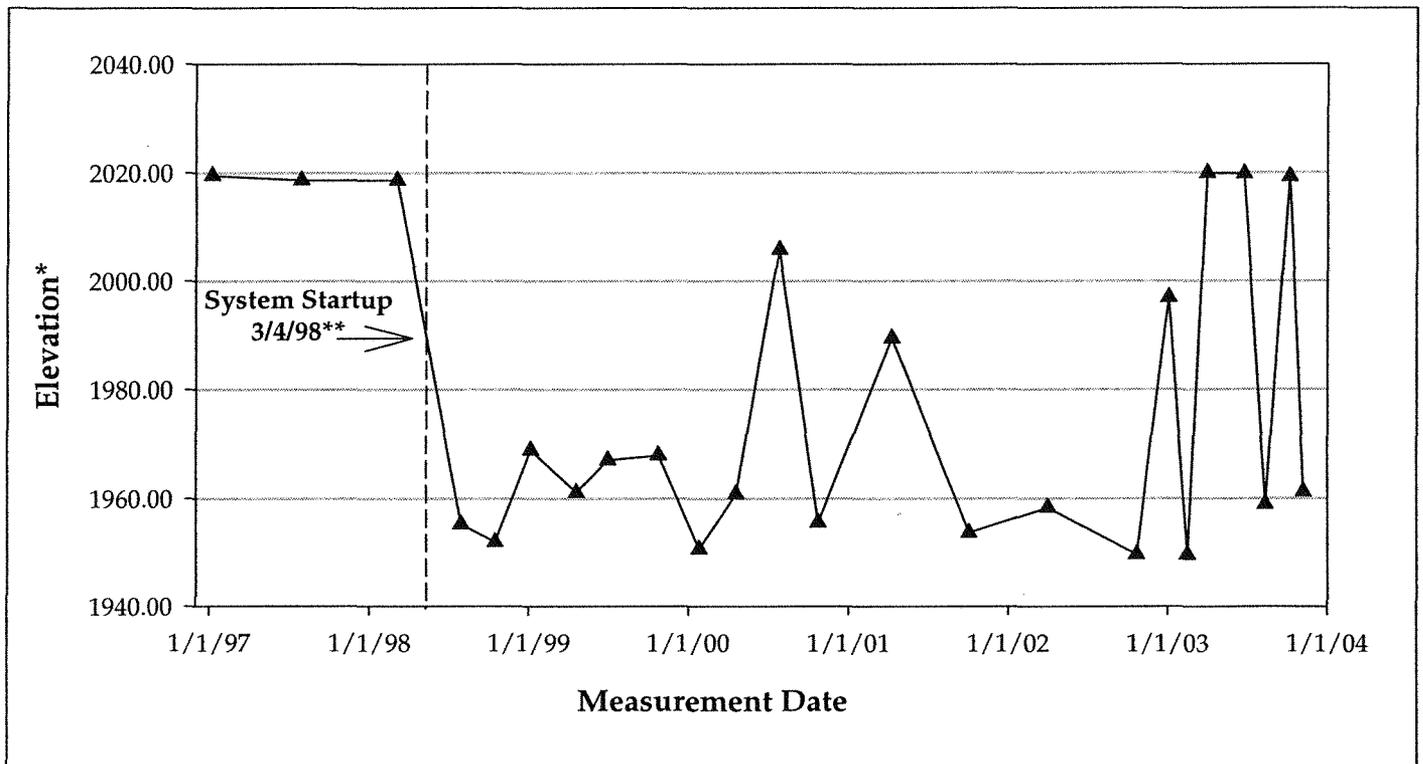
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - MONITORING WELL MW-28A



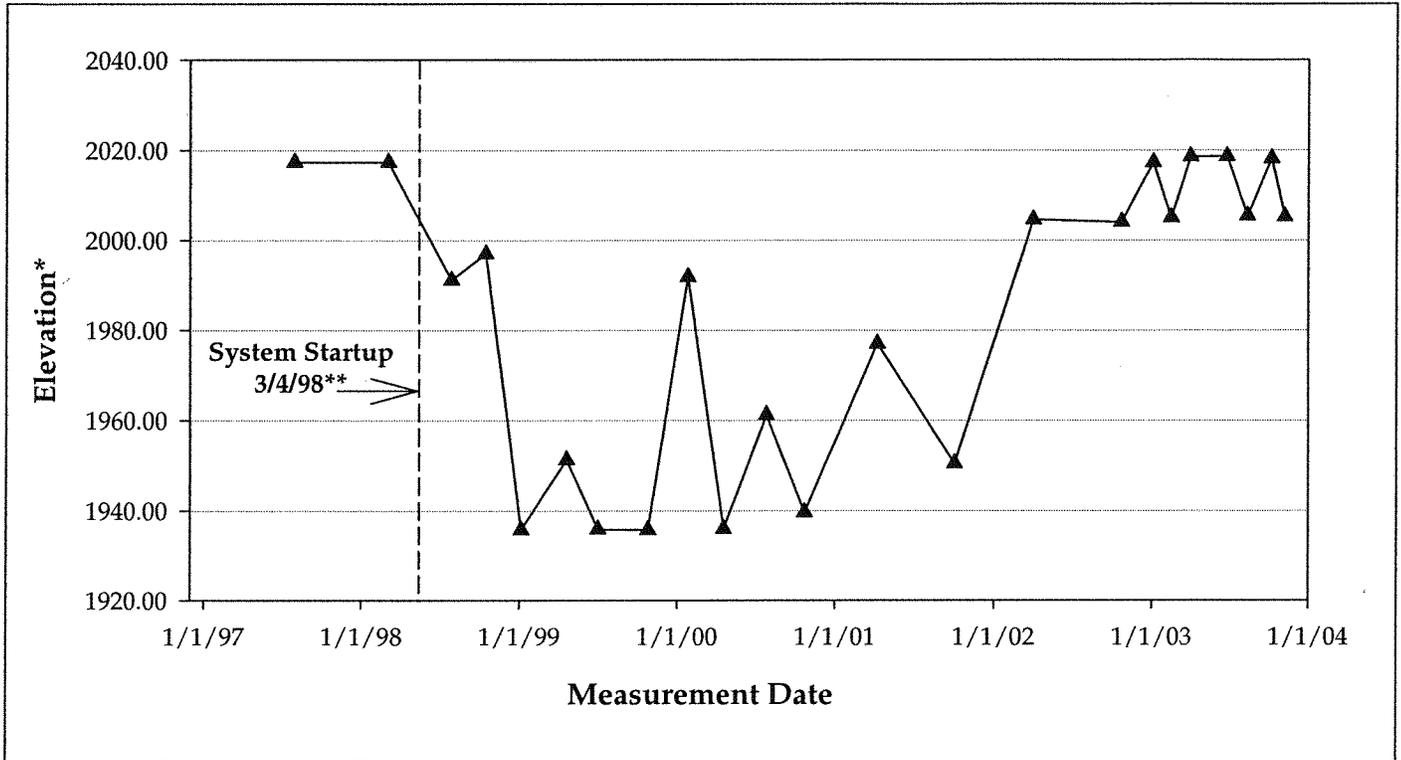
HYDROGRAPH - RECOVERY WELL RW-1



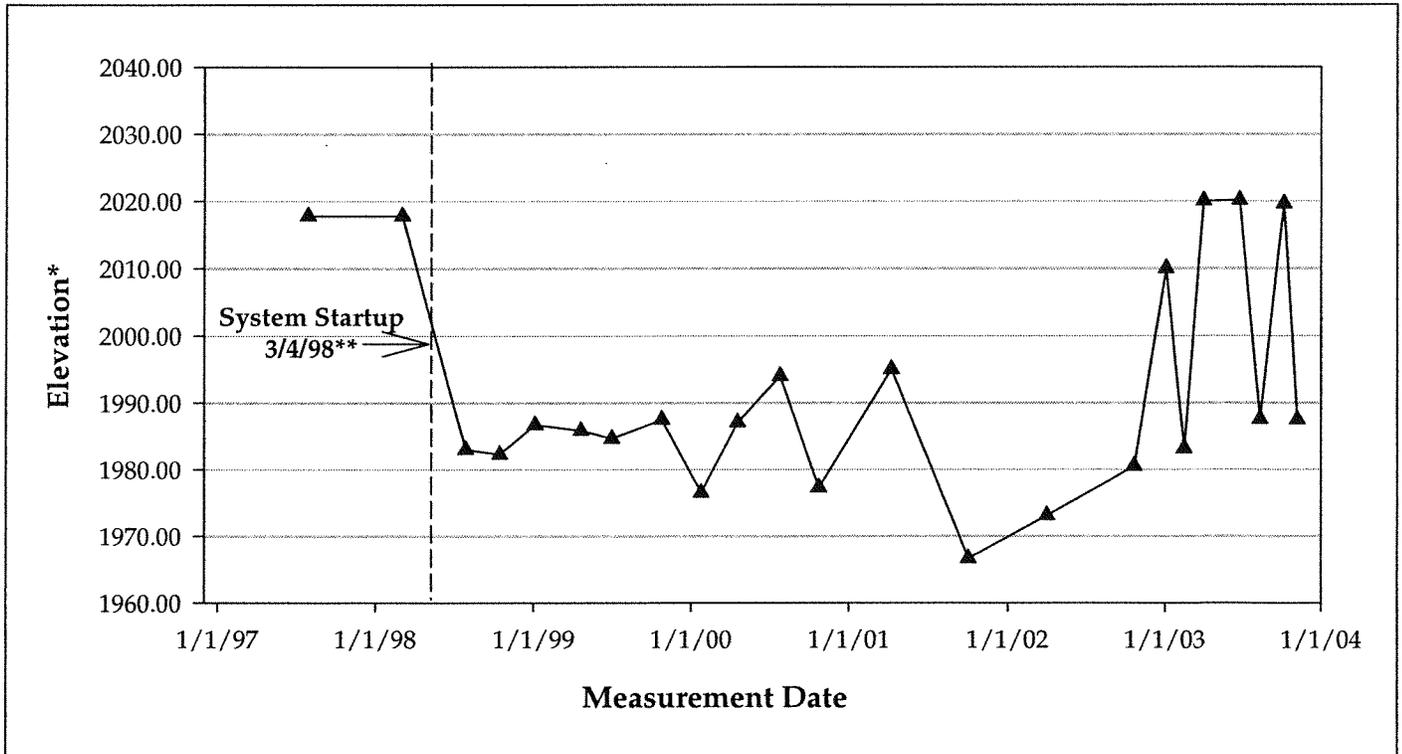
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - RECOVERY WELL RW-3



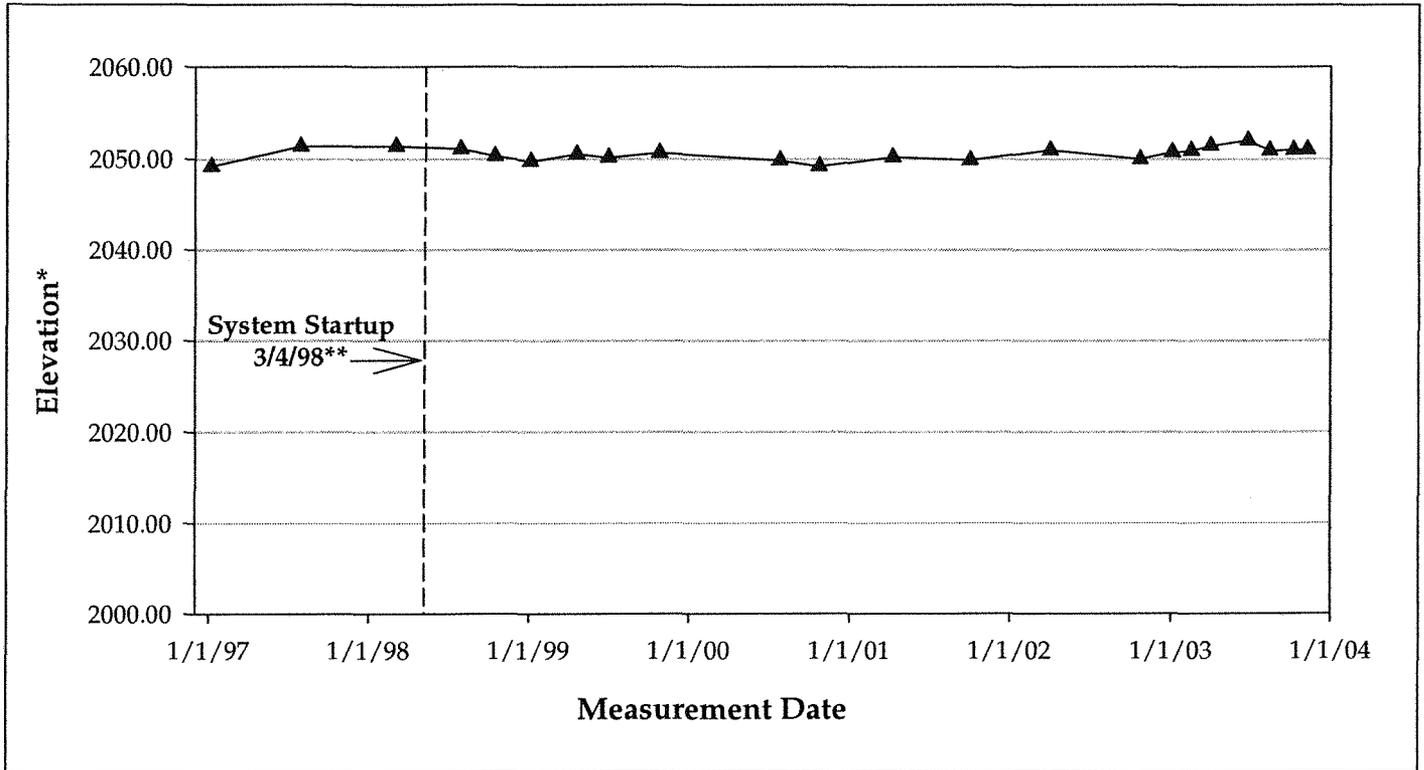
HYDROGRAPH - RECOVERY WELL RW-4



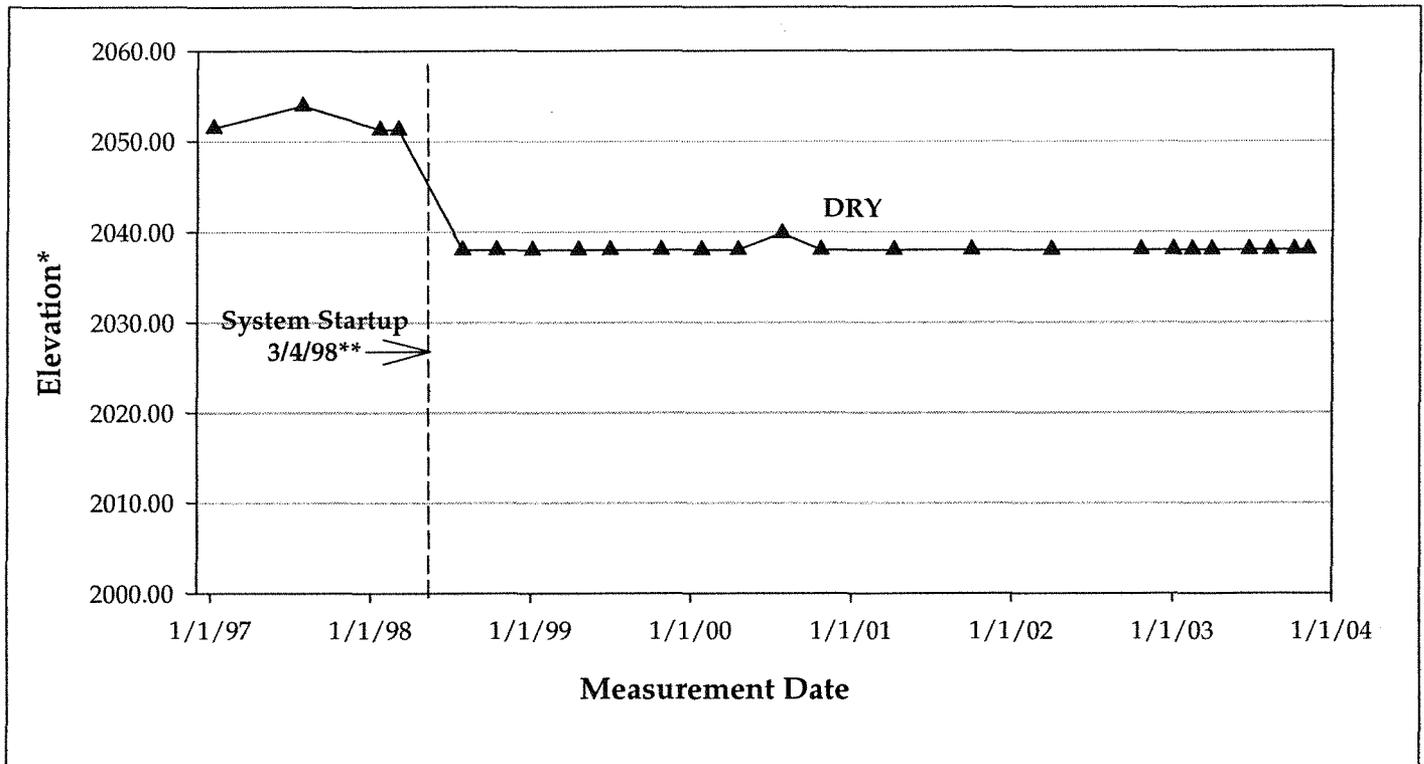
* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

HYDROGRAPH - RECOVERY WELL RW-2



HYDROGRAPH - MONITORING WELL MW-14



* Elevation in Feet Above Mean Sea Level

** Inferred data point added for 3/4/1998 to reflect water level prior to system startup

Appendix B

Laboratory Analytical Reports



Corporate Office & Laboratory
1241 Bellevue Street, Suite 9, Green Bay, WI 54302
920-469-2436, 800-7-ENCHEM, Fax: 920-469-8827
www.enchem.com

Analytical Report Number: 839794A

Client : RMT - GREENVILLE

Project Name : SKF GIRMES SITE

Project Number : 70144.32

Lab Sample Number	Field ID	Matrix	Collection Date
839794-001	TBLK-03401	WATER	10/07/03
839794-002	MW-26R	GROUN	10/07/03
839794-003	MW-23	GROUN	10/07/03
839794-004	MW-19	GROUN	10/07/03
839794-005	MW-22	GROUN	10/07/03
839794-006	MW-27	GROUN	10/07/03
839794-007	MW-24	GROUN	10/07/03
839794-008	RW-4	GROUN	10/07/03
839794-009	RW-1	GROUN	10/07/03
839794-010	DU-03401	GROUN	
839794-011	MW-18	GROUN	10/07/03
839794-012	MW-21	GROUN	10/07/03
839794-013	MW-28	GROUN	10/07/03
839794-014	MW-28A	GROUN	10/07/03
839794-015	MW-10	GROUN	10/08/03
839794-016	MW-09	GROUN	10/08/03
839794-020	DU-03402	GROUN	
839794-031	RBLK-03401	WATER	10/09/03

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample comments. Release of this final report is authorized by Laboratory management, as is verified by the following signature. Reported results shall not be reproduced, except in full, without the written approval of the lab. The sample results relate only to the analytes of interest tested.

Approval Signature

Date



Corporate Office & Laboratory
1241 Bellevue Street, Suite 9, Green Bay, WI 54302
920-469-2436, 800-7-ENCHEM, Fax: 920-469-8827
www.enchem.com

Analytical Report Number: 839794B

Client : RMT - GREENVILLE

Project Name : SKF GIRMES SITE

Project Number : 70144.32

Lab Sample Number	Field ID	Matrix	Collection Date
839794-017	MW-08	GROUN	10/08/03
839794-018	MW-07	GROUN	10/08/03
839794-019	MW-02	GROUN	10/08/03
839794-021	MW-06	GROUN	10/08/03
839794-022	MW-01	GROUN	10/08/03
839794-023	MW-20	GROUN	10/08/03
839794-024	MW-12	GROUN	10/08/03
839794-025	MW-13	GROUN	10/08/03
839794-026	MW-17	GROUN	10/08/03
839794-027	MW-15	GROUN	10/08/03
839794-028	MW-04	GROUN	10/09/03
839794-029	MW-05	GROUN	10/09/03
839794-030	MW-15A	GROUN	10/09/03
839794-032	MW-16	GROUN	10/09/03
839794-033	MW-16A	GROUN	10/09/03
839794-034	MW-11	GROUN	10/09/03
839794-035	SW-4	SURFA	10/09/03
839794-036	SW-3	SURFA	10/09/03
839794-037	SW-2	SURFA	10/09/03
839794-038	SW-1	SURFA	10/09/03

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample comments. Release of this final report is authorized by Laboratory management, as is verified by the following signature. Reported results shall not be reproduced, except in full, without the written approval of the lab. The sample results relate only to the analytes of interest tested.

Approval Signature

Date



Corporate Office & Laboratory
1241 Bellevue Street, Suite 9, Green Bay, WI 54302
920-469-2436, 800-7-ENCHEM, Fax: 920-469-8827
www.enchem.com

Analytical Report Number: 840509

Client : RMT - GREENVILLE

Project Name : SKF Girmes Site

Project Number : 70144.32

Lab Sample Number	Field ID	Matrix	Collection Date
840509-001	TBLK-03402	WATER	
840509-002	RW-1	GROUN	10/28/03
840509-003	MW-20	GROUN	10/28/03
840509-004	MW-12	GROUN	10/28/03
840509-005	DU-03403	GROUN	

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample comments. Release of this final report is authorized by Laboratory management, as is verified by the following signature. Reported results shall not be reproduced, except in full, without the written approval of the lab. The sample results relate only to the analytes of interest tested.

Tom Trainer

11/13/03

Approval Signature

Date



CHAIN OF CUSTODY RECORD

839794

No 72757

100 Verdae Boulevard, P.O. Box 16778 • Greenville, SC 29606-6778 • Phone (864) 281-0030 • Fax (864) 281-0288

Project No. 70144.32	Project/Client: SKF
Project Manager/Contact Person: Mike Parker / D. Madison	

Total Number
Of Containers

MATRIX

Filtered (Yes/No)	N
Preserved (Code)	E
Analyses Requested VOCs	/
	/
	/
	/
	/
	/
	/
	/
	/
	/

PRESERVED CODES
 A - NONE
 B - HNO₃
 C - H₂SO₄
 D - NaOH
 E - HCl
 F - METHANOL
 G - _____

Lab No.	Yr. <u>03</u>	Date	Time	Sample Station ID	Total Number Of Containers	MATRIX	Comments:
001	—	—	—	TBLK-03401	3	DI	X
002	10/7	0950		MW-26R	3	GW	X
003	1	1025		MW-23	3		X
004	1	1045		MW-19	3		X
005	1	1105		MW-22	3		X
006	1	1135		MW-27	3		X
007	1	1220		MW-24	3		X
008	1	1330		RW-4	3		X
009	1	1345		RW-1	3		X
010	—	—	—	DU-03401	3		X

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Sig.) <u>J. Oll</u> Date/Time <u>10-10-03</u>		Received by (Sig.) <u>Airborne</u> Date/Time <u>10-10-03</u>		HAZARDS ASSOCIATED WITH SAMPLES <input type="checkbox"/> Flammable <input type="checkbox"/> Corrosive <input type="checkbox"/> Highly Toxic <input type="checkbox"/> Other (list) _____	Turn Around (circle one) Normal Rush
Relinquished by (Sig.) <u>Airborne</u> Date/Time <u>10/11/03 1210</u>		Received by (Sig.) <u>K. [unclear]</u> Date/Time <u>10/11/03 1210</u>			Report Due _____
Relinquished by (Sig.) _____ Date/Time _____		Received by (Sig.) _____ Date/Time _____			(For Lab Use Only) Receipt Temp: <u>2.0°C</u> Receipt pH _____ Temp Blank Y <u>(N)</u> (Wet/Metals) _____ <u>N/A</u>
Custody Seal: Present <u>(Absent)</u> Intact/Not Intact Seal #'s _____					



CHAIN OF CUSTODY RECORD

No 72758

839794

100 Verdae Boulevard, P.O. Box 16778 • Greenville, SC 29606-6778 • Phone (864) 281-0030 • Fax (864) 281-0288

Project No. 70144.32	Project/Client: SKF
Project Manager/Contact Person: Mike Parker/D. Madison	

Total Number
Of Containers

MATRIX

Filtered (Yes/No)	N
Preserved (Code)	E
Analyses Requested VOCs	
Comments:	3-40m 1B

- PRESERVED CODES
- A - NONE
 - B - HNO₃
 - C - H₂SO₄
 - D - NaOH
 - E - HCl
 - F - METHANOL
 - G - _____

Lab No.	Yr.	Date	Time	Sample Station ID	Total Number Of Containers	MATRIX												
011	03	10/7	1415	MW-18	3	GW	X											
012		1430		MW-21	3		X											
013		1455		MW-28	3		X											
014		1540		MW-28A	3		X											
015	03	10/8	0935	MW-10	3		X											
016		0955		MW-9	3		X											
017		1015		MW-8	3		X											
018		1040		MW-7	3		X											
019		1100		MW-2	3		X											
020				DU-03402	3		X											

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Sig.) <i>[Signature]</i>	Date/Time 10-10-03	Received by (Sig.) Airborne	Date/Time 10-10-03	HAZARDS ASSOCIATED WITH SAMPLES <input type="checkbox"/> Flammable <input type="checkbox"/> Corrosive <input type="checkbox"/> Highly Toxic <input type="checkbox"/> Other (list) _____	Turn Around (circle one)	Normal	Rush
Relinquished by (Sig.) Airborne	Date/Time 10/11/03 1210	Received by (Sig.) K... ..	Date/Time 10/11/03 1210		Report Due _____	(For Lab Use Only)	
Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time		Receipt Temp: 2.0°C	Receipt pH	
Custody Seal: Present/Absent				Intact/Not Intact	Seal #'s	Temp Blank Y (N)	(Wet/Metals) <i>MA</i>



CHAIN OF CUSTODY RECORD

No 72759

839794

100 Verdae Boulevard, P.O. Box 16778 • Greenville, SC 29606-6778 • Phone (864) 281-0030 • Fax (864) 281-0288

Project No. 70144.32	Project/Client: SKF
Project Manager/Contact Person: Mike Parker / D. Madison	

Lab No.	Yr. <u>03</u>	Date	Time	Sample Station ID	Total Number Of Containers	MATRIX
021	10/8	1120		MW-6	3	GW
022		1140		MW-1	3	
023		1300		MW-20	3	
024		1335		MW-12	3	
025		1400		MW-13	3	
026		1435		MW-17	3	
027		1510		MW-15	3	
028	10/9	1005		MW-4	3	
029		1050		MW-5	3	
030		1230		MW-15A	3	

Filtered (Yes/No)	N
Preserved (Code)	E
Analyses Requested VOC's	
Comments:	3-40ml B

- PRESERVED CODES
- A - NONE
 - B - HNO₃
 - C - H₂SO₄
 - D - NaOH
 - E - HCl
 - F - METHANOL
 - G - _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Sig.) J. O. O.	Date/Time 10-10-03	Received by (Sig.) Airborne	Date/Time 10-10-03	HAZARDS ASSOCIATED WITH SAMPLES <input type="checkbox"/> Flammable <input type="checkbox"/> Corrosive <input type="checkbox"/> Highly Toxic <input type="checkbox"/> Other (list) _____	Turn Around (circle one) Normal Rush
Relinquished by (Sig.) Airborne	Date/Time 10/11/03 1210	Received by (Sig.) Kaczmarek	Date/Time 10/11/03 1210		Report Due _____
Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time		(For Lab Use Only) Receipt Temp: 2.0°C Temp Blank Y (N) Receipt pH (Wet/Metals) N/A
Custody Seal: Present/ Absent Intact/Not Intact Seal #'s					



CHAIN OF CUSTODY RECORD

839794

No. 74814

100 Verdae Boulevard, P.O. Box 16778 • Greenville, SC 29606-6778 • Phone (864) 281-0030 • Fax (864) 281-0288

Project No. 70144.32	Project/Client: SKF
Project Manager/Contact Person: Mike Parker / D. Madison	

Lab No.	Yr.	Date	Time	Sample Station ID	Total Number Of Containers	MATRIX
031	03	10/9	1245	RBLK-03401	3	DT
032		1315		MW-16	3	GW
033		1355		MW-16A	3	
034		1420		MW-11	3	
035		1500		SW-4	3	SW
036		1515		SW-3	3	
037		1525		SW-2	3	
038		1540		SW-1	3	

Analyses Requested	Filtered (Yes/No)	Preserved (Code)	Comments:
VOLs	N	E	3 40m 13

- PRESERVED CODES
- A - NONE
 - B - HNO₃
 - C - H₂SO₄
 - D - NaOH
 - E - HCl
 - F - METHANOL
 - G - _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Sig.) <i>[Signature]</i>	Date/Time 10-10-03	Received by (Sig.) Airborne	Date/Time 10-10-03	HAZARDS ASSOCIATED WITH SAMPLES <input type="checkbox"/> Flammable <input type="checkbox"/> Corrosive <input type="checkbox"/> Highly Toxic <input type="checkbox"/> Other (list) _____	Turn Around (circle one) Normal Rush
Relinquished by (Sig.) Airborne	Date/Time 10/11/03 1210	Received by (Sig.) <i>[Signature]</i>	Date/Time 10/11/03 1210		Report Due _____
Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time		(For Lab Use Only) Receipt Temp: 2.0°C Temp Blank Y <u>N</u> Receipt pH (Wet/Metals) <i>[Signature]</i>
Custody Seal: Present/ <u>Absent</u> Intact/Not Intact Seal #'s					



CHAIN OF CUSTODY RECORD

840509 No 74844 ¹⁸⁰

100 Verdae Boulevard, P.O. Box 16778 • Greenville, SC 29606-6778 • Phone (864) 281-0030 • Fax (864) 281-0288

Project No. 70144.32	Project/Client: SKF
Project Manager/Contact Person: Mike Parker / Dan Madison	

Lab No.	Yr. <u>03</u>	Date	Time	Sample Station ID	Total Number Of Containers	MATRIX
001	—	—	—	TBLK-03402	3	DI X
002	10/28	1230	—	RW-1	3	GW X
003	(1310	—	MW-20	3	(X
004)	1405	—	MW-12	3	(X
005	—	—	—	DU-03403	3	(X

Filtered (Yes/No)	N
Preserved (Code)	E
Analyses Requested VOCs	/
	/
	/
	/
	/
	/
	/
	/
	/
	/
Comments:	3-40ml Non Ethanol blank 11/14/03

- PRESERVED CODES**
- A - NONE
 - B - HNO₃
 - C - H₂SO₄
 - D - NaOH
 - E - HCl
 - F - METHANOL
 - G - _____

SPECIAL INSTRUCTIONS **# 49409651675**

SAMPLER Relinquished by (Sig.) J. Oll	Date/Time 10/29/03	Received by (Sig.) Airborne	Date/Time 10/29/03	HAZARDS ASSOCIATED WITH SAMPLES <input type="checkbox"/> Flammable <input type="checkbox"/> Corrosive <input type="checkbox"/> Highly Toxic <input type="checkbox"/> Other (list) _____	Turn Around (circle one) Normal <input type="radio"/> Rush <input type="radio"/>
Relinquished by (Sig.) Airborne	Date/Time 10/30/03 10:50	Received by (Sig.) L. Madison	Date/Time 10/30/03 00:150		Report Due _____
Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time		(For Lab Use Only) Receipt Temp: _____ Temp Blank Y <input checked="" type="radio"/> t = 1°C

Custody Seal: Present Absent Intact/Not Intact Seal #'s

En Chem Inc.

Analytical Report Number: 839794

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : TBLK-03401

Matrix Type : WATER
Collection Date : 10/07/03
Report Date : 10/28/03
Lab Sample Number : 839794-001

VOLATILES - SPECIAL LIST

Prep Date: 10/14/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-26R

Matrix Type : GROUNDWATER
Collection Date : 10/07/03
Report Date : 10/28/03
Lab Sample Number : 839794-002

VOLATILES - SPECIAL LIST

Prep Date: 10/14/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	33	2.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B
Trichloroethene	0.41	J 1.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B
Vinyl Chloride	29	2.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-23

Matrix Type : GROUNDWATER
Collection Date : 10/07/03
Report Date : 10/28/03
Lab Sample Number : 839794-003

VOLATILES - SPECIAL LIST

Prep Date: 10/16/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Tetrachloroethene	9.7	1.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Trichloroethene	4.0	1.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-19

Matrix Type : GROUNDWATER
Collection Date : 10/07/03
Report Date : 10/28/03
Lab Sample Number : 839794-004

VOLATILES - SPECIAL LIST

Prep Date: 10/16/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	1.8	J 2.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Trichloroethene	44	1.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-22

Matrix Type : GROUNDWATER
Collection Date : 10/07/03
Report Date : 10/28/03
Lab Sample Number : 839794-005

VOLATILES - SPECIAL LIST

Prep Date: 10/17/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-27

Matrix Type : GROUNDWATER
Collection Date : 10/07/03
Report Date : 10/28/03
Lab Sample Number : 839794-006

VOLATILES - SPECIAL LIST

Prep Date: 10/17/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B

En Chem Inc.

Analytical Report Number: 839794

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-24

Matrix Type : GROUNDWATER
Collection Date : 10/07/03
Report Date : 10/28/03
Lab Sample Number : 839794-007

VOLATILES - SPECIAL LIST

Prep Date: 10/16/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Trichloroethene	11	1.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B

En Chem Inc.

Analytical Report Number: 839794

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : RW-4

Matrix Type : GROUNDWATER
Collection Date : 10/07/03
Report Date : 10/28/03
Lab Sample Number : 839794-008

VOLATILES - SPECIAL LIST

Prep Date: 10/16/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	4.0	2.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Trichloroethene	180	1.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B

En Chem Inc.

Analytical Report Number: 839794

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : DU-03401

Matrix Type : GROUNDWATER
Collection Date :
Report Date : 10/28/03
Lab Sample Number : 839794-010

VOLATILES - SPECIAL LIST

Prep Date: 10/17/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	34	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Trichloroethene	0.44	J 1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Vinyl Chloride	28	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-18

Matrix Type : GROUNDWATER
Collection Date : 10/07/03
Report Date : 10/28/03
Lab Sample Number : 839794-011

VOLATILES - SPECIAL LIST

Prep Date: 10/14/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	2.7	2.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B
Tetrachloroethene	11	1.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B
Trichloroethene	7.8	1.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-21

Matrix Type : GROUNDWATER
Collection Date : 10/07/03
Report Date : 10/28/03
Lab Sample Number : 839794-012

VOLATILES - SPECIAL LIST

Prep Date: 10/14/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	17	2.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B
Trichloroethene	1.4	1.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B
Vinyl Chloride	0.92	J 2.0	1	ug/L		10/14/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-28

Matrix Type : GROUNDWATER
Collection Date : 10/07/03
Report Date : 10/28/03
Lab Sample Number : 839794-013

VOLATILES - SPECIAL LIST

Prep Date: 10/15/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Trichloroethene	0.24	J 1.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-28A

Matrix Type : GROUNDWATER
Collection Date : 10/07/03
Report Date : 10/28/03
Lab Sample Number : 839794-014

VOLATILES - SPECIAL LIST

Prep Date: 10/15/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-10

Matrix Type : GROUNDWATER
Collection Date : 10/08/03
Report Date : 10/28/03
Lab Sample Number : 839794-015

VOLATILES - SPECIAL LIST

Prep Date: 10/15/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Trichloroethene	2.9	1.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B

Analytical Report Number: 839794

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-09

Matrix Type : GROUNDWATER
Collection Date : 10/08/03
Report Date : 10/28/03
Lab Sample Number : 839794-016

VOLATILES - SPECIAL LIST

Prep Date: 10/16/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	14	4.0	2	ug/L		10/16/03	SW846 5030B	SW846 8260B
Trichloroethene	310	2.0	2	ug/L		10/16/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 4.0	4.0	2	ug/L		10/16/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-08

Matrix Type : GROUNDWATER
Collection Date : 10/08/03
Report Date : 10/28/03
Lab Sample Number : 839794-017

VOLATILES - SPECIAL LIST

Prep Date: 10/15/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B

En Chem Inc.

Analytical Report Number: 839794

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-07

Matrix Type : GROUNDWATER
Collection Date : 10/08/03
Report Date : 10/28/03
Lab Sample Number : 839794-018

VOLATILES - SPECIAL LIST

Prep Date: 10/15/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-02

Matrix Type : GROUNDWATER
Collection Date : 10/08/03
Report Date : 10/28/03
Lab Sample Number : 839794-019

VOLATILES - SPECIAL LIST

Prep Date: 10/15/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	5.1	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Trichloroethene	12	1.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-06

Matrix Type : GROUNDWATER
Collection Date : 10/08/03
Report Date : 10/28/03
Lab Sample Number : 839794-021

VOLATILES - SPECIAL LIST

Prep Date: 10/15/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B

En Chem Inc.

Analytical Report Number: 839794

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-01

Matrix Type : GROUNDWATER
Collection Date : 10/08/03
Report Date : 10/28/03
Lab Sample Number : 839794-022

VOLATILES - SPECIAL LIST

Prep Date: 10/15/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-13

Matrix Type : GROUNDWATER
Collection Date : 10/08/03
Report Date : 10/28/03
Lab Sample Number : 839794-025

VOLATILES - SPECIAL LIST

Prep Date: 10/15/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	3.2	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Trichloroethene	74	1.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/15/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-17

Matrix Type : GROUNDWATER
Collection Date : 10/08/03
Report Date : 10/28/03
Lab Sample Number : 839794-026

VOLATILES - SPECIAL LIST

Prep Date: 10/17/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-15

Matrix Type : GROUNDWATER
Collection Date : 10/08/03
Report Date : 10/28/03
Lab Sample Number : 839794-027

VOLATILES - SPECIAL LIST

Prep Date: 10/17/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-04

Matrix Type : GROUNDWATER
Collection Date : 10/09/03
Report Date : 10/28/03
Lab Sample Number : 839794-028

VOLATILES - SPECIAL LIST

Prep Date: 10/16/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	280	4.0	2	ug/L		10/16/03	SW846 5030B	SW846 8260B
Trichloroethene	280	2.0	2	ug/L		10/16/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 4.0	4.0	2	ug/L		10/16/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-05

Matrix Type : GROUNDWATER
Collection Date : 10/09/03
Report Date : 10/28/03
Lab Sample Number : 839794-029

VOLATILES - SPECIAL LIST

Prep Date: 10/16/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	360	100	50	ug/L		10/16/03	SW846 5030B	SW846 8260B
Trichloroethene	6600	50	50	ug/L		10/16/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 100	100	50	ug/L		10/16/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-15A

Matrix Type : GROUNDWATER
Collection Date : 10/09/03
Report Date : 10/28/03
Lab Sample Number : 839794-030

VOLATILES - SPECIAL LIST

Prep Date: 10/17/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : RBLK-03401

Matrix Type : WATER
Collection Date : 10/09/03
Report Date : 10/28/03
Lab Sample Number : 839794-031

VOLATILES - SPECIAL LIST

Prep Date: 10/16/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/16/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-16

Matrix Type : GROUNDWATER
Collection Date : 10/09/03
Report Date : 10/28/03
Lab Sample Number : 839794-032

VOLATILES - SPECIAL LIST

Prep Date: 10/17/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-16A

Matrix Type : GROUNDWATER
Collection Date : 10/09/03
Report Date : 10/28/03
Lab Sample Number : 839794-033

VOLATILES - SPECIAL LIST

Prep Date: 10/17/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Trichloroethene	0.39	J 1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : MW-11

Matrix Type : GROUNDWATER
Collection Date : 10/09/03
Report Date : 10/28/03
Lab Sample Number : 839794-034

VOLATILES - SPECIAL LIST

Prep Date: 10/17/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Trichloroethene	2.7	1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : SW-4

Matrix Type : SURFACE WATER
Collection Date : 10/09/03
Report Date : 10/28/03
Lab Sample Number : 839794-035

VOLATILES - SPECIAL LIST

Prep Date: 10/17/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : SW-3

Matrix Type : SURFACE WATER
Collection Date : 10/09/03
Report Date : 10/28/03
Lab Sample Number : 839794-036

VOLATILES - SPECIAL LIST

Prep Date: 10/17/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : SW-2

Matrix Type : SURFACE WATER
Collection Date : 10/09/03
Report Date : 10/28/03
Lab Sample Number : 839794-037

VOLATILES - SPECIAL LIST

Prep Date: 10/17/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF GIRMES SITE
Project Number : 70144.32
Field ID : SW-1

Matrix Type : SURFACE WATER
Collection Date : 10/09/03
Report Date : 10/28/03
Lab Sample Number : 839794-038

VOLATILES - SPECIAL LIST

Prep Date: 10/17/03

Analyte	Result	EQL	Dilution	Units	Code	Analysis Date	Prep Method	Analysis Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		10/17/03	SW846 5030B	SW846 8260B

Analytical Report Number: 840509

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : TBLK-03402

Matrix Type : WATER
Collection Date :
Report Date : 11/12/03
Lab Sample Number : 840509-001

VOLATILES - SPECIAL LIST

Prep Date: 11/05/03

Analyte	Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : RW-1

Matrix Type : GROUNDWATER
Collection Date : 10/28/03
Report Date : 11/12/03
Lab Sample Number : 840509-002

VOLATILES - SPECIAL LIST

Prep Date: 11/05/03

Analyte	Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1,2-Dichloroethene, Total	27	2.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B
Tetrachloroethene	22	1.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B
Trichloroethene	1100	10	10	ug/L	D	11/05/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-20

Matrix Type : GROUNDWATER
Collection Date : 10/28/03
Report Date : 11/12/03
Lab Sample Number : 840509-003

VOLATILES - SPECIAL LIST

Prep Date: 11/05/03

Analyte	Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1,2-Dichloroethene, Total	3.7	2.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B
Trichloroethene	7.0	1.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B

Analytical Report Number: 840509

Client : RMT - GREENVILLE
Project Name : SKF Girmes Site
Project Number : 70144.32
Field ID : MW-12

Matrix Type : GROUNDWATER
Collection Date : 10/28/03
Report Date : 11/12/03
Lab Sample Number : 840509-004

VOLATILES - SPECIAL LIST

Prep Date: 11/05/03

Analyte	Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1,2-Dichloroethene, Total	< 2.0	2.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B
Trichloroethene	< 1.0	1.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B

Client : RMT - GREENVILLE

Matrix Type : GROUNDWATER

Project Name : SKF Girmes Site

Collection Date :

Project Number : 70144.32

Report Date : 11/12/03

Field ID : DU-03403

Lab Sample Number : 840509-005

VOLATILES - SPECIAL LIST

Prep Date: 11/05/03

Analyte	Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1,2-Dichloroethene, Total	3.5	2.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B
Tetrachloroethene	< 1.0	1.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B
Trichloroethene	7.0	1.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B
Vinyl Chloride	< 2.0	2.0	1	ug/L		11/05/03	SW846 5030B	SW846 8260B

Qualifier Codes

Flag	Applies To	Explanation
A	Inorganic	Analyte is detected in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
B	Inorganic	The analyte has been detected between the method detection limit and the reporting limit.
B	Organic	Analyte is present in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
C	All	Elevated detection limit.
D	All	Analyte value from diluted analysis or surrogate result not applicable due to sample dilution.
E	Inorganic	Estimated concentration due to matrix interferences. During the metals analysis the serial dilution failed to meet the established control limits of 0-10%. The sample concentration is greater than 50 times the IDL for analysis done on the ICP or 100 times the IDL for analysis done on the ICP-MS. The result was flagged with the E qualifier to indicate that a physical interference was observed.
E	Organic	Analyte concentration exceeds calibration range.
F	Inorganic	Due to potential interferences for this analysis by Inductively Coupled Plasma techniques (SW-846 Method 6010), this analyte has been confirmed by and reported from an alternate method.
F	Organic	Surrogate results outside control criteria.
H	All	Preservation, extraction or analysis performed past holding time.
J	Inorganic	The analyte has been detected between the method detection limit and the reporting limit.
J	Organic	Concentration detected is greater than the method detection limit but less than the reporting limit.
K	Inorganic	Sample received unpreserved. Sample was either preserved at the time of receipt or at the time of sample preparation.
K	Organic	Detection limit may be elevated due to the presence of an unrequested analyte.
L	All	Elevated detection limit due to low sample volume.
N	All	Spiked sample recovery not within control limits.
P	Organic	The relative percent difference between the two columns for detected concentrations was greater than 40%.
Q	All	The analyte has been detected between the limit of detection (LOD) and limit of quantitation (LOQ). The results are qualified due to the uncertainty of analyte concentrations within this range.
S	Organic	The relative percent difference between quantitation and confirmation columns exceeds internal quality control criteria. Because the result is unconfirmed, it has been reported as a non-detect with an elevated detection limit.
U	All	The analyte was not detected at or above the reporting limit.
V	All	Sample received with headspace.
W	All	A second aliquot of sample was analyzed from a container with headspace.
X	All	See Sample Narrative.
&	All	Laboratory Control Spike recovery not within control limits.
*	All	Precision not within control limits.
<	All	The analyte was not detected at or above the reporting limit.
1	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses passed QC based on precision criteria.
2	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses failed QC based on precision criteria.
3	Inorganic	BOD result is estimated due to the BOD blank exceeding the allowable oxygen depletion.
4	Inorganic	BOD duplicate precision not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
5	Inorganic	BOD result is estimated due to insufficient oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
6	Inorganic	BOD laboratory control sample not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
7	Inorganic	BOD result is estimated due to complete oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.