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**New York State Department of Environmental Conservation**

# Site Number 7-04-009A

## Vestal Water Supply Site Quarterly Report

Fourth Quarter 2011

May 2012

ARCADIS MALCOLM PIRNIE

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**Vestal Water Supply Site**
**Quarterly Report**

**Fourth Quarter 2011**

Site Number 7-04-009A

Prepared for:
New York State Department of
Environmental Conservation

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Date:
May 2012

ARCADIS MALCOLM PIRNIE

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## 1. Introduction

The New York State Department of Environmental Conservation (NYSDEC) has issued a Work Assignment (# D004443-4) to Malcolm Pirnie, Inc. (Malcolm Pirnie) for Operation, Maintenance, and Monitoring at the Vestal Water Supply Site in New York State (Site # 7-04-009A). Malcolm Pirnie has prepared this Quarterly Report in accordance with the NYSDEC-approved Work Plan to summarize site activities.

## 2. Site Description

The Vestal Water Supply (Site 1-1) Site is located on Pumphouse Road, Vestal, Broome County, New York (Figure 2-1), along the southern bank of the Susquehanna River. Well 1-1 is located just south of the Susquehanna River and northwest of an industrial park located along Stage Road. Until 1980, Well 1-1 was the main source of water for Water District 1, which provides drinking water for several areas of the Town of Vestal. Currently, there are two other production wells, Wells 1-2A and 1-3 that function as the main source of water for Water District 1. Well 1-1A was installed in 1993 to replace Well 1-1 and is currently being used to pump and treat groundwater, which is then discharged to the Susquehanna River.

## 3. Operation and Maintenance

Malcolm Pirnie has maintained continuous operation of the groundwater treatment plant at the Vestal Water Supply Site. This includes the operation, maintenance, and influent/effluent sampling in accordance with the operations and maintenance (O&M) manual (Final Operation and Maintenance Manual, Long-Term Response, Operable Unit (OU) 1, Vestal Well 1-1 Site, Vestal, New York) (Tetra Tech EC, Inc., 2006) (Final O&M Manual). As indicated in the Work Assignment, no work was performed on the Vestal Water Supply (Site 1-1) soil vapor extraction system.

As part of managing the Vestal Water Supply Site, Malcolm Pirnie has a subcontract with Environmental Compliance, Inc. (ECI), who has unique knowledge of operating the groundwater treatment plant. ECI provides materials, labor, equipment, and supervision to maintain continuous operation of the groundwater treatment plant.

A variable frequency drive (VFD) was installed in February 2009 to provide soft-start operation for the Well 1-1A replacement well pump motor and reduced torque on the Certa-Lock® PVC drop pipe. The VFD also provides energy savings by allowing the well pump motor to be operated at a reduced speed. Compared to the full load rating of the pump motor and at an estimated energy cost of $0.083 per kilo-watt (KW) the VFD (at the current setting of 51 hertz) has the potential to provide an estimated annual energy cost savings up to $9,000.

### 3.1 System Operation

As indicated in the ECI Monthly Reports and O&M Logs (Appendix A), the groundwater treatment system ran uninterrupted during the fourth quarter, 2011, with the exception of several short power outages in December 2011.

Table 3-1 and Figure 3-1 summarize groundwater treatment system flow rates from the Monthly Reports and System O&M Logs. As shown in Table 3-1, the groundwater treatment system flow rate for Well 1-1A decreased from an average of 219 gallons per minute (GPM) in October 2011 to an average of 199 GPM in December 2011. As shown on Table 3-1, approximately 27,429,120 gallons of water were treated during the fourth quarter 2011 operating period.

Due to continued reductions in yield, Well 1-1A is scheduled to be developed quarterly as presented in the NYSDEC-approved budget addendum and Schedule 211 forms

(June 2011). Quarterly well maintenance is scheduled to proceed in the first quarter 2012.

### 3.2 Influent – Effluent Sampling

Fourth quarter 2011 influent and effluent groundwater samples were collected from the Well 1-1A treatment system in accordance with the Work Plan. Influent and effluent groundwater samples were sent to TestAmerica Laboratories following chain-of-custody protocols for analysis of volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 8260B. The laboratory analytical reporting forms are provided in Appendix B. The laboratory analytical data for the treatment plan samples are summarized in Tables 3-2 (influent VOCs) and Table 3-3 (effluent VOCs); Figure 3-2 presents the Well 1-1A treatment plant total influent VOC concentrations over time.

As shown in Table 3-2, influent groundwater samples collected from the Well 1-1A treatment system during the fourth quarter 2011 contained concentrations of 1,1,1 trichloroethane, 1,1 dichloroethene, 1,1, dichloroethene, cis-1,2 dichloroethene, trichloroethene, and vinyl chloride exceeded the corresponding NYSDEC Class GA Standards. Figure 3-2 shows that the total VOC concentrations detected in the October, November, and December Well 1-1A influent samples (350 µg/L, 335 µg/L, and 301 µg/L, respectively) were within the range of previous sampling events.

Table 3-3 shows that VOCs were not detected in any of the fourth quarter 2011 effluent samples collected from the treatment system, with the exception of one compound. Acetone, a common laboratory contaminant, was detected at an estimated concentration (below the laboratory reporting limit) of 1.5 µg/L during the October 2011 sampling event.

Based on influent sample concentrations and total flow volumes from the Well 1-1A treatment system, approximately 75 pounds of VOCs were removed by the treatment system during the fourth quarter 2011 operating period.

## 4. Groundwater Monitoring

Groundwater monitoring wells were sampled in accordance with the Work Plan during the second quarter, 2011. The results of the sampling event were submitted to the NYSDEC with the second quarter 2011 Vestal Water Supply Site Quarterly Report and Annual Groundwater Monitoring Summary. An iso-concentration map showing the total VOCs concentrations in June 2011 samples collected from the wells in the shallow groundwater monitoring well network is provided in Appendix C. The next annual groundwater monitoring event is scheduled for the third quarter of 2012.

At the request of the United States Environmental Protection Agency (USEPA), Malcolm Pirnie provided access to on-site groundwater monitoring wells on October 26, 2011, so the USEPA could measure groundwater levels in the wells. According to the USEPA, the groundwater level data are being used to develop a groundwater model to support the USEPA's remedial strategies for source remediation of Area 4 in the Stage Road Industrial Park.

## 5. Recommendations

Recommendations for revised instrumentation and controls have been presented to the NYSDEC in the PRR (Malcolm Pirnie, 2010).

The effluent discharge line from the clear well to the NYSDEC Flood Management Area has a significant accumulation of precipitate and should be replaced. A scope of work and bid proposal package was prepared and submitted to the NYSDEC in October 2011 for review.

Based on well inspections performed during the second quarter, 2011 (Vestal Water Supply Site Quarterly Report and Annual Groundwater Monitoring Summary, 2011), the protective casings for groundwater monitoring wells 4009-1 and 4009-6 are damaged and should be replaced.

Due to continued reductions in flow from Well 1-1A, AquaGard well maintenance should be performed quarterly.

## 6. Summary

The Vestal Well 1-1A groundwater treatment system ran uninterrupted during the fourth quarter, 2011, with the exception of several short power outages in December 2011.

The average flow rate through the treatment system during the fourth quarter, 2011, was 207 GPM, a decrease of approximately 37 GPM from the previous quarter. Total flow through the treatment system from October to December 2011 was approximately 27.4-million gallons. Based on monthly influent and effluent sampling, the treatment system successfully removes VOCs from groundwater extracted from the capture zone. Approximately 75 pounds of VOCs were removed by the treatment system during the fourth quarter, 2011 operational period.

The next groundwater sampling event is scheduled to be completed during the third quarter, 2012.

Water levels were measured by USEPA in October 2011 to develop a groundwater model.

## 7. References

ARCADIS / Malcolm Pirnie, 2011. Vestal Water Supply Site Quarterly Report and Annual Groundwater Monitoring Summary, Second Quarter 2011. Site Number 7-04-009A.

Malcolm Pirnie, 2010, Periodic Review Report, Vestal Water Supply Site, Site Number 7-04-009A.

Tetra Tech EC, Inc., 2006, Final Operation and Maintenance Manual, Long-Term Response, Operable Unit 1, Vestal Well 1-1 Site, Vestal, New York.

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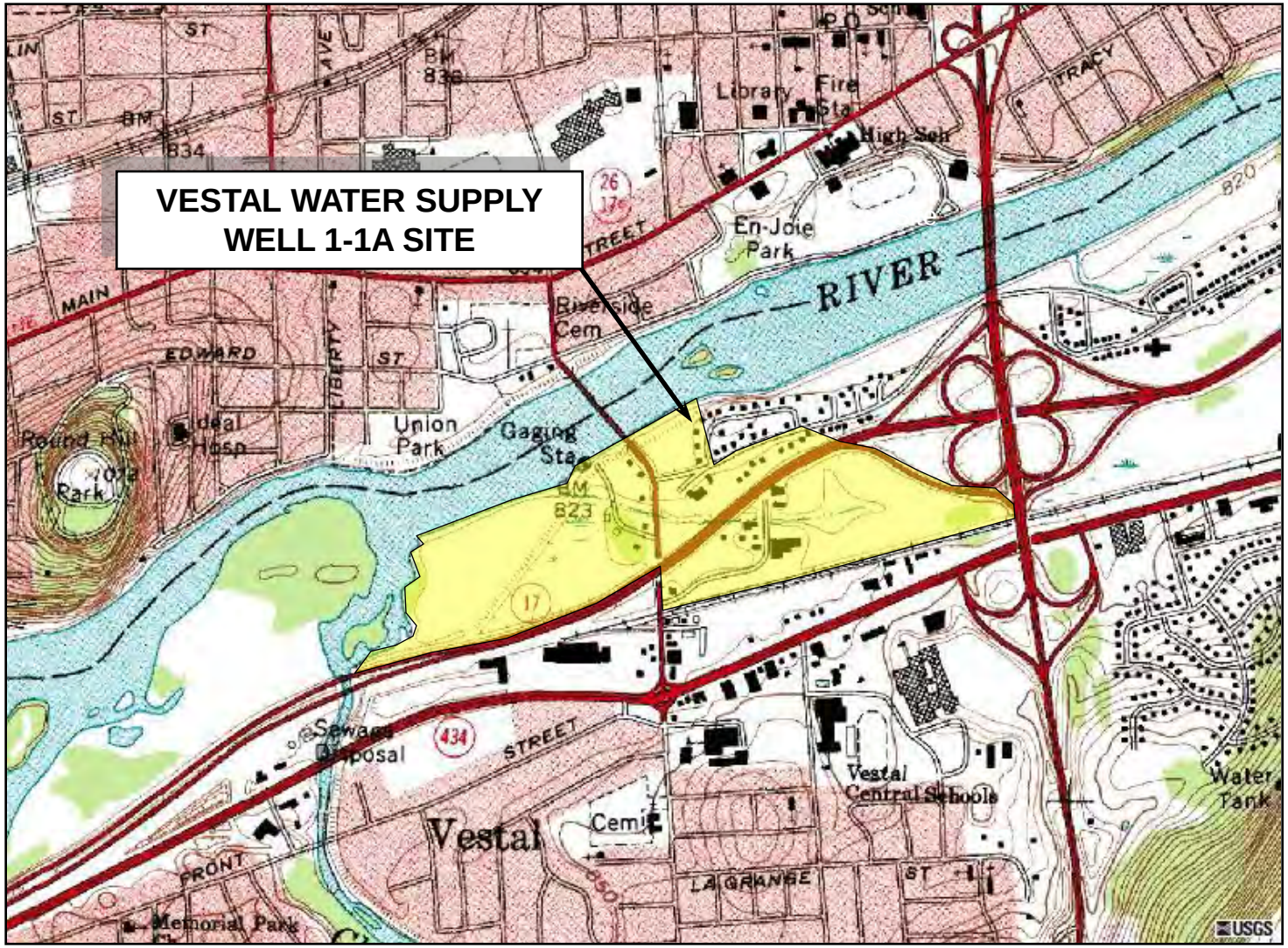
Figure 2-1
**SITE LOCATION**
Vestal Water Supply Site
Vestal, New York
Site Number 7-04-009A

0 2,000 ft




Source: USGS 7.5-minute Series Topographic Quadrangle, Endicott (1988).

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**Figure 3-1**
**Well 1-1A Treatment Plant Flow**
**Vestal Water Supply Site**
**NYSDEC Site Number 7-04-009A**

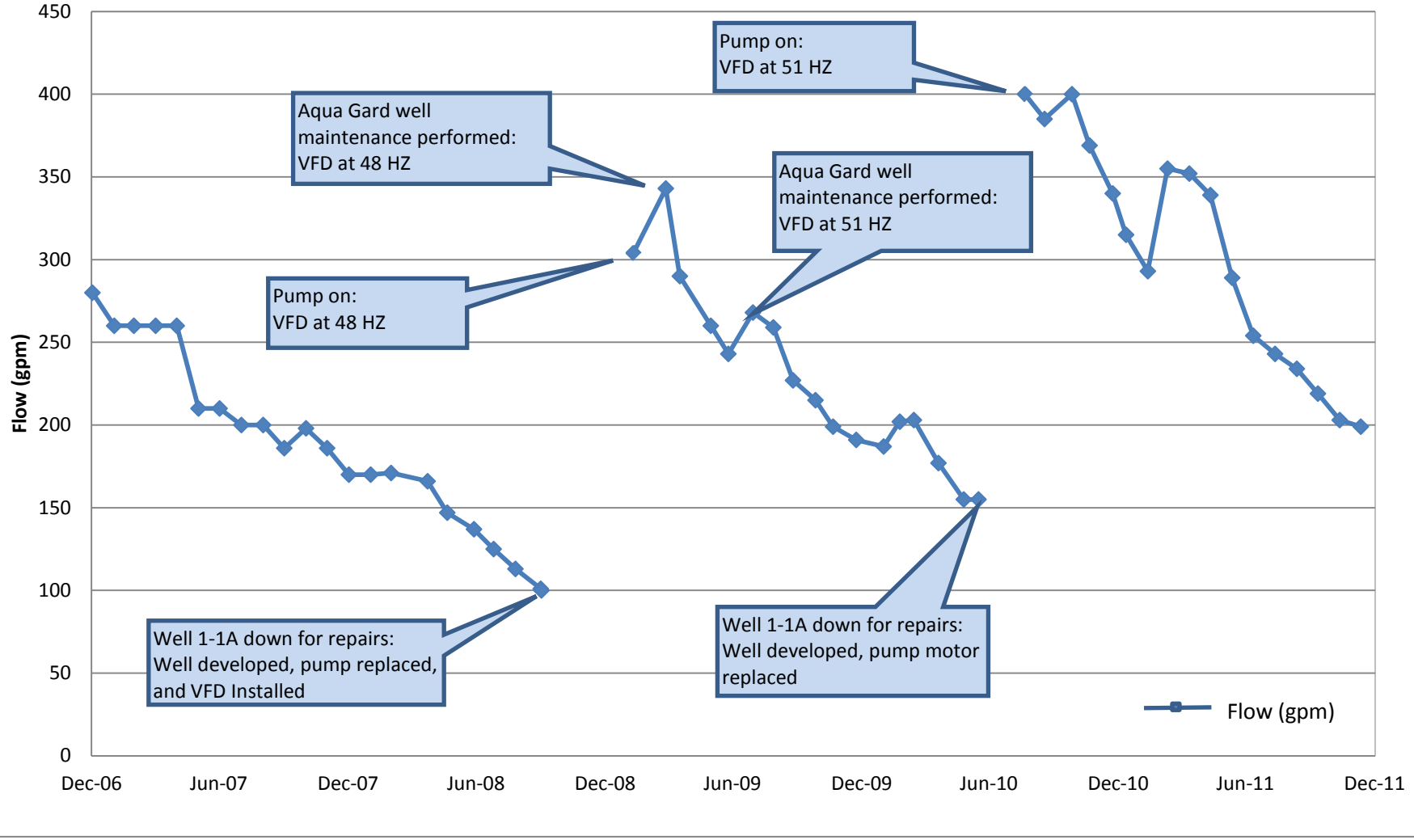

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**Figure 3-2**
**Well 1-1A Treatment Plant Total VOCs Concentrations**
**Vestal Water Supply Site**
**NYSDEC Site Number 7-04-009A**

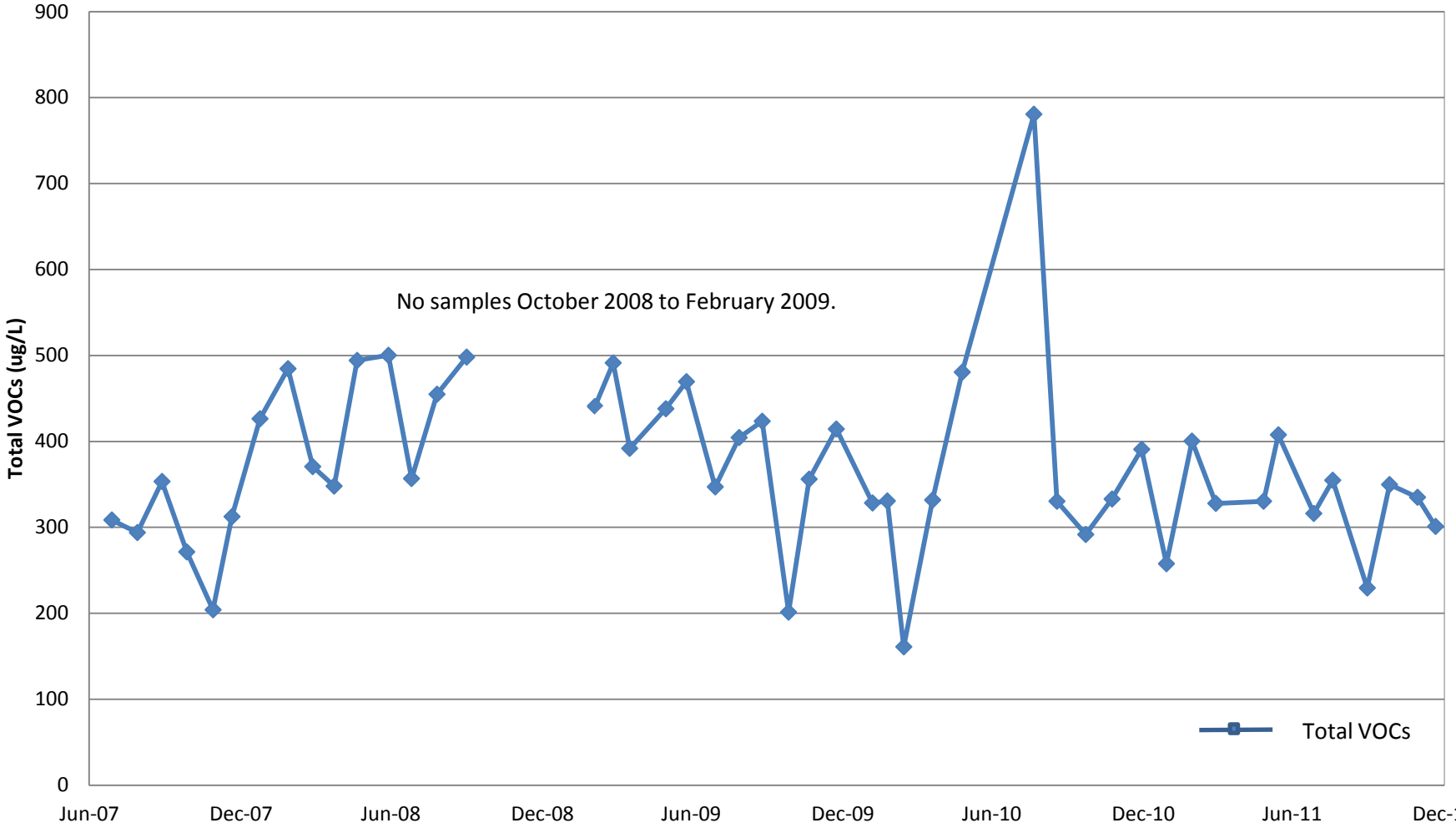

**TABLE 3-1**
**WELL 1-1A FLOW SUMMARY**
**VESTAL WATER SUPPLY**
**VESTAL, NEW YORK**
**NYSDEC SITE NO. 7-04-009A**

| Date | System Operation[1] (days/month) | Pumping Rate[1] (gpm) | Total Flow[2] (gallons) | Quarterly Flow (gallons) |
|---|---|---|---|---|
| January-07 | 31 | 280 | 12,499,200 | 33,840,000 |
| February-07 | 28 | 260 | 10,483,200 | |
| March-07 | 29 (3) | 260 | 10,857,600 | |
| April-07 | 30 | 260 | 11,232,000 | 31,910,400 |
| May-07 | 31 | 260 | 11,606,400 | |
| June-07 | 30 | 210 | 9,072,000 | |
| July-07 | 31 | 210 | 9,374,400 | 26,942,400 |
| August-07 | 31 | 200 | 8,928,000 | |
| September-07 | 30 | 200 | 8,640,000 | |
| October-07 | 31 | 186 | 8,303,040 | 24,874,560 |
| November-07 | 29 | 198 | 8,268,480 | |
| December-07 | 31 | 186 | 8,303,040 | |
| January-08 | 31 | 170 | 7,588,800 | 22,321,440 |
| February-08 | 29 | 170 | 7,099,200 | |
| March-08 | 31 | 171 | 7,633,440 | |
| April-08 | 30 | 166 | 7,171,200 | 19,651,680 |
| May-08 | 31 | 147 | 6,562,080 | |
| June-08 | 30 | 137 | 5,918,400 | |
| July-08 | 31 | 125 | 5,580,000 | 14,987,520 |
| August-08 | 31 | 113 | 5,044,320 | |
| September-08 | 30 | 101 | 4,363,200 | |
| October-08 | 6 (4) | 100 | 864,000 | 864,000 |
| November-08 | 0 (4) | 0 | 0 | |
| December-08 | 0 (4) | 0 | 0 | |
| January-09 | 0 (4) | 0 | 0 | 22,641,120 |
| February-09 | 19 (4) | 304 | 8,317,440 | |
| March-09 | 29 (3) | 343 | 14,323,680 | |
| April-09 | 30 | 290 | 12,528,000 | 34,257,600 |
| May-09 | 30 (5) | 260 | 11,232,000 | |
| June-09 | 30 | 243 | 10,497,600 | |
| July-09 | 29 (4) | 268 | 11,191,680 | 31,160,160 |
| August-09 | 29 (5) | 259 | 10,815,840 | |
| September-09 | 28 (5) | 227 | 9,152,640 | |
| October-09 | 31 | 215 | 9,597,600 | 26,720,640 |
| November-09 | 30 (5) | 199 | 8,596,800 | |
| December-09 | 31 | 191 | 8,526,240 | |

**TABLE 3-1**
**WELL 1-1A FLOW SUMMARY**
**VESTAL WATER SUPPLY**
**VESTAL, NEW YORK**
**NYSDEC SITE NO. 7-04-009A**

| Date | System Operation[1] (days/month) | | Pumping Rate[1] (gpm) | Total Flow[2] (gallons) | Quarterly Flow (gallons) |
|---|---|---|---|---|---|
| January-10 | 25 | (3) | 187 | 6,732,000 | 23,938,560 |
| February-10 | 28 | | 202 | 8,144,640 | |
| March-10 | 31 | | 203 | 9,061,920 | |
| April-10 | 30 | | 177 | 7,646,400 | 16,128,000 |
| May-10 | 31 | | 155 | 6,919,200 | |
| June-10 | 7 | (4) | 155 | 1,562,400 | |
| July-10 | 0 | (4) | 0 | 0 | 23,544,000 |
| August-10 | 12 | (4) | 400 | 6,912,000 | |
| September-10 | 30 | | 385 | 16,632,000 | |
| October-10 | 31 | | 400 | 17,856,000 | 47,911,680 |
| November-10 | 28 | (5) | 369 | 14,878,080 | |
| December-10 | 31 | | 340 | 15,177,600 | |
| January-11 | 31 | | 315 | 14,061,600 | 40,278,240 |
| February-11 | 27 | (5) | 293 | 11,391,840 | |
| March-11 | 29 | (3) | 355 | 14,824,800 | |
| April-11 | 26 | (3) | 352 | 13,178,880 | 39,820,320 |
| May-11 | 29 | (3) | 339 | 14,156,640 | |
| June-11 | 30 | | 289 | 12,484,800 | |
| July-11 | 29 | (5) | 254 | 10,607,040 | 29,178,720 |
| August-11 | 29 | (3) | 243 | 10,147,680 | |
| September-11 | 25 | (3) | 234 | 8,424,000 | |
| October-11 | 31 | | 219 | 9,776,160 | |
| November-11 | 30 | | 203 | 8,769,600 | 27,429,120 |
| December-11 | 31 | | 199 | 8,883,360 | |
| **Total Flow (2007)** | | | | **117,567,360** | |
| **Total Flow (2008)** | | | | **65,750,400** | |
| **Total Flow (2009)** | | | | **93,790,080** | |
| **Total Flow (2010)** | | | | **111,522,240** | |
| **Total Flow (2011)** | | | | **136,706,400** | |

Notes:
1 - From Environmental Compliance, Inc. O&M Reports and Malcolm Pirnie, Inc. field notes.
2 - Calculated assuming system operating 24-hours per day
3 - System shut down for flooding
4 - System shut down for repairs
5 - System down due to power failure
gpm - Gallons per minute

**TABLE 3-2**
**SUMMARY OF GROUNDWATER TREATMENT SYSTEM VOCS (INFLUENT)**
**VESTAL WATER SUPPLY**
**VESTAL, NEW YORK**
**NYSDEC SITE #7-04-009A**

| Sample ID<br>Sampling Date<br>Matrix<br>Units | NYSDEC GA Standard ug/L | WELL 1A-INF 7/27/2007 WATER ug/L | WELL 1A-INF 8/27/2007 WATER ug/L | WELL 1A-INF 9/26/2007 WATER ug/L | WELL 1A-INF 10/26/2007 WATER ug/L | WELL 1A-INF 11/27/2007 WATER ug/L | WELL 1A-INF 12/20/2007 WATER ug/L | WELL 1A-INF 1/23/2008 WATER ug/L | WELL 1A-INF 2/26/2008 WATER ug/L | WELL 1A-INF 3/27/2008 WATER ug/L | WELL 1A-INF 4/22/2008 WATER ug/L | WELL 1A-INF 5/20/2008 WATER ug/L | WELL 1A-INF 6/27/2008 WATER ug/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VOCs** | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 5 | **170** | **160** | **200** | **140** | **110** | **170** | **230** | **250** | **180** | **180** | **300 E** | **290** |
| 1,1,2,2-Tetrachloroethane | 5 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| 1,1,2-Trichloroethane | 1 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| 1,1-Dichloroethane | 5 | **20** | **19** | **23** | **22** | **15** | **24** | **30** | **31** | **27** | **26** | **27** | **28** |
| 1,1-Dichloroethene | 5 | **12** | **10** | **14 J** | **11** | **8.2 J** | **13 J** | **18 M** | **18** | **17** | **9.7 J** | **17** | **20 J** |
| 1,2-Dichloroethane | 0.6 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| 1,2-Dichloropropane | 5 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U * | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| 2-Hexanone | | 20 U | 10 U | 40 U | 10 U | 20 U | 40 U | 20 U * | 20 U | 10 U | 20 U | 10 U | 40 U |
| Acetone | | 20 U | 10 U | 40 U | 10 U | 20 U | 40 UM | 20 U * | 20 U | 10 U | 20 U | 0.5 J B | 11 J B |
| Benzene | 1 | 10 U | 0.39 J | 20 U | 5 U | 10 U | 20 U | 0.6 J | 10 U | 0.38 J | 10 U | 10 U | 20 U |
| Bromodichloromethane | 50 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| Bromoform | | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| Bromomethane | 5 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U * | 10 U | 5 U | 10 U | 10 U | 20 U |
| Carbon disulfide | | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| Carbon tetrachloride | 5 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | **35** | 5 U | 10 U | 10 U | 20 U |
| Chlorobenzene | 5 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| Chloroethane | 5 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U * | 10 U | 10 U | 0.79 J | 10 U | 10 U | 20 U |
| Chloroform | 7 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| Chloromethane | | 10 U | 5 U | 20 U | 5 U * | 10 U | 20 U * | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| cis-1,2-Dichloroethene | 5 | **55** | **54** | **58** | **50** | **39** | **57** | **71** | **73** | **76** | **72** | **78** | **77** |
| cis-1,3-Dichloropropene | 0.4 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| Dibromochloromethane | 50 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| Ethylbenzene | 5 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| Methyl Ethyl Ketone | 50 | 20 U | 10 U | 40 U | 10 U | 20 U | 40 U | 20 U * | 20 U | 10 U | 20 U | 10 U | 40 U |
| Methyl Isobutyl Ketone | | 20 U | 10 U | 40 U | 10 U | 20 U | 40 U | 20 U | 20 U | 10 U | 20 U | 10 U | 40 U |
| Methylene Chloride | 5 | 10 U | 5 U | 20 U * | 5 U | 10 U M | 2.2 JMB | 0.94 J | 10 U | 5 U | 2.2 J B | 0.32 JB | 3.5 J B |
| Styrene | 5 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| Tetrachloroethene | 5 | 1.3 J | 5 U | 20 U | 0.97 J | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| Toluene | 5 | 10 U | 0.15 J | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| trans-1,2-Dichloroethene | 5 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| trans-1,3-Dichloropropene | 0.4 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 10 U | 10 U | 5 U | 10 U | 10 U | 20 U |
| Trichloroethene | 5 | **46** | **47** | **53** | **41 B** | **29** | **37** | **62** | **69** | **62** | **54 * B** | **65** | **64** |
| Vinyl chloride | 2 | **4.3 J** | **3.4 J** | **5.4 J** | **6.5 *** | **2.9 J** | **9.3 JM** | **11** | **8.6 J** | **7.5** | **4.1 J** | **6.4 J** | **6.7 J** |
| Xylenes, Total | 5 | 10 U | 5 U | 20 U | 5 U | 10 U | 20 U | 2.8 J | 10 U | 5 U | 10 U | 10 U | 20 U |
| Total VOCs | | 309 | 294 | 353 | 271 | 204 | 313 | 426 | 485 | 371 | 348 | 494 | 500 |

Notes

- Concentration exceeds corresponding NYSDEC Class GA Standard.

U - Not detected at the indicated concentration.
J - Estimated concentration.
M - Manual integrated compound.
B - Analyte found in associated blank as well as the sample.
E - Concentration exceeds instrument calibration range.
D - Laboratory Dilution.
* - MS or MSD exceeded control limits.

**TABLE 3-2**
**SUMMARY OF GROUNDWATER TREATMENT SYSTEM VOCS (INFLUENT)**
**VESTAL WATER SUPPLY**
**VESTAL, NEW YORK**
**NYSDEC SITE #7-04-009A**

| Sample ID<br>Sampling Date<br>Matrix<br>Units | NYSDEC GA Standard ug/L | WELL 1A-INF 7/25/2008 WATER ug/L | WELL 1A-INF 8/25/2008 WATER ug/L | WELL 1A-INF 9/30/2008 WATER ug/L | WELL 1A-INF 3/5/2009 WATER ug/L | WELL 1A-INF 3/27/2009 WATER ug/L | WELL 1A-INF 4/16/2009 WATER ug/L | WELL 1A-INF 5/30/2009 WATER ug/L | WELL 1A-INF 6/24/2009 WATER ug/L | WELL 1A-INF 7/29/2009 WATER ug/L | WELL 1A-INF 8/27/2009 WATER ug/L | WELL 1A-INF 9/24/2009 WATER ug/L | WELL 1A-INF 10/26/2009 WATER ug/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VOCs** | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 5 | **220** | **270** | **300** | **260** | **280** | **220** | **250** | **270** | **190** | **220** | **230** | **110** |
| 1,1,2,2-Tetrachloroethane | 5 | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| 1,1,2-Trichloroethane | 1 | 20 U | 20 U | 25 U * | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| 1,1-Dichloroethane | 5 | **23** | **27** | **28** | **28** | **31** | **25** | **27** | **27** | **21** | **23** | **26** | **14** |
| 1,1-Dichloroethene | 5 | **13 J** | **19 J** | **19 J** | **19 J** | **22 *** | **20** | **24 *** | **22** | **18 *** | **19** | **19** | **8.7 J** |
| 1,2-Dichloroethane | 0.6 | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| 1,2-Dichloropropane | 5 | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| 2-Hexanone | | 40 U | 40 U | 50 U | 50 U | 8 U | 20 U | 40 U | 8 U | 8 U | 8 U | 20 U | 20 U |
| Acetone | | 40 U | 4.7 J | 5.2 J | 50 U | 2.3 J * | 20 U * | 12 J | 10 | 13 B | 23 | 20 U | 4.2 J |
| Benzene | 1 | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| Bromodichloromethane | 50 | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| Bromoform | | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| Bromomethane | 5 | 20 U | 20 U | 25 U | 25 U | 4 U | 10 U | 20 U | 4 U | 4 U | 4 U | 10 U | 10 U |
| Carbon disulfide | | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| Carbon tetrachloride | 5 | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| Chlorobenzene | 5 | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| Chloroethane | 5 | 20 U | 20 U | 25 U | 25 U | 4 U | 10 U | 20 U | 4 U * | 4 U * | 4 U | 10 U | 10 U |
| Chloroform | 7 | 20 U | 20 U | 25 U * | 25 U | 0.67 J B | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| Chloromethane | | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U * | 2 U | 2 U | 10 U | 10 U |
| cis-1,2-Dichloroethene | 5 | **50** | **68** | **75** | **65** | **63** | **60** | **53** | **55** | **49** | **51** | **70** | **31** |
| cis-1,3-Dichloropropene | 0.4 | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| Dibromochloromethane | 50 | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| Ethylbenzene | 5 | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| Methyl Ethyl Ketone | 50 | 40 U | 40 U | 50 U | 50 U | 8 U | 20 U | 40 U | 8 U | 8 U | 8 U | 20 U | 20 U |
| Methyl Isobutyl Ketone | | 40 U | 40 U | 50 U | 50 U | 8 U | 20 U | 40 U | 8 U | 8 U | 8 U | 20 U | 20 U |
| Methylene Chloride | 5 | 20 U | 20 U | 25 U | 25 U | **7.9 J B** | **2.3 J B** | **11 J B** | **14** | **9.1** | 4.9 J B | 3.9 J B | 10 U |
| Styrene | 5 | 20 U * | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| Tetrachloroethene | 5 | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| Toluene | 5 | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| trans-1,2-Dichloroethene | 5 | 20 U | 20 U | 25 U | 25 U | 0.51 J | 10 U | 20 U | 1.5 J | 2 U * | 2 U | 10 U | 10 U |
| trans-1,3-Dichloropropene | 0.4 | 20 U | 20 U | 25 U | 25 U | 2 U | 10 U | 20 U | 2 U | 2 U | 2 U | 10 U | 10 U |
| Trichloroethene | 5 | **45** | **59** | **64** | **59** | **58** | **55** | **50** | **59** | **47** | **56** | **66** | **29** |
| Vinyl chloride | 2 | **5.8 J** | **7.2 J** | **6.9 J** | **10 J** | **14** | **9.6 J** | **11 J** | **11** | 2 U | **7.6** | **8.6 J** | **4.5 J** |
| Xylenes, Total | 5 | 20 U | 20 U | 25 U | 25 U | **12** | 10 U | 20 U | 4 U | 4 U | 4 U | 10 U | 10 U |
| Total VOCs | | 357 | 455 | 498 | 441 | 491 | 392 | 438 | 470 | 347 | 405 | 424 | 201 |

Notes

- Concentration exceeds corresponding NYSDEC Class GA Standard.

U - Not detected at the indicated concentration.
J - Estimated concentration.
M - Manual integrated compound.
B - Analyte found in associated blank as well as the sample.
E - Concentration exceeds instrument calibration range.
D - Laboratory Dilution.
* - MS or MSD exceeded control limits.

**TABLE 3-2**
**SUMMARY OF GROUNDWATER TREATMENT SYSTEM VOCS (INFLUENT)**
**VESTAL WATER SUPPLY**
**VESTAL, NEW YORK**
**NYSDEC SITE #7-04-009A**

| Sample ID<br>Sampling Date<br>Matrix<br>Units | NYSDEC GA Standard ug/L | WELL 1A-INF 11/20/2009 WATER ug/L | WELL 1A-INF 12/23/2009 WATER ug/L | WELL 1A-INF 2/5/2010 WATER ug/L | WELL 1A-INF 2/23/2010 WATER ug/L | WELL 1A-INF 3/15/2010 WATER ug/L | WELL 1A-INF 4/19/2010 WATER ug/L | WELL 1A-INF 5/25/2010 WATER ug/L | WELL 1A-INF 8/20/2010 WATER ug/L | WELL 1A-INF 9/17/2010 WATER ug/L | WELL 1A-INF 10/22/2010 WATER ug/L | WELL 1A-INF 11/23/2010 WATER ug/L | WELL 1A-INF 12/29/2010 WATER ug/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VOCs** | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 5 | **200** | **240** | **170** | **170** | **91** | **180** | **270** | **420** | **180** | **150** | **180** | **220** |
| 1,1,2,2-Tetrachloroethane | 5 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| 1,1,2-Trichloroethane | 1 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| 1,1-Dichloroethane | 5 | **24** | **27** | **23** | **22** | **14** | **22** | **30** | **48** | **23** | **18** | **23** | **28** |
| 1,1-Dichloroethene | 5 | **16 J** | **20** | **16** | **17** | **7.5** | **16** | **21** | **34** | **15** | **15** | **14** | **19 J** |
| 1,2-Dichloroethane | 0.6 | 20 U | 20 U | 5 U | 5 U | 5 U * | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| 1,2-Dichloropropane | 5 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| 2-Hexanone | | 40 U | 40 U * | 10 U | 10 U | 10 U | 10 U | 20 U | 40 U | 10 U | 10 U | 20 U | 40 U |
| Acetone | | 40 U | 5.8 J | 10 U | 10 U | 10 U | 10 U | 20 U | 40 U | 10 U | 10 U | 2.6 J | 40 U |
| Benzene | 1 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Bromodichloromethane | 50 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Bromoform | | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Bromomethane | 5 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Carbon disulfide | | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Carbon tetrachloride | 5 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Chlorobenzene | 5 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Chloroethane | 5 | 20 U | 20 U | 5 U | 5 U | 5 U * | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Chloroform | 7 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Chloromethane | | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U * | 5 U * | 10 U | 20 U |
| cis-1,2-Dichloroethene | 5 | **54** | **55** | **56** | **57** | **22** | **53** | **75** | **140** | **52** | **47** | **48** | **57** |
| cis-1,3-Dichloropropene | 0.4 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Dibromochloromethane | 50 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Ethylbenzene | 5 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Methyl Ethyl Ketone | 50 | 40 U | 40 U | 10 U | 10 U | 10 U | 10 U | 20 U | 40 U | 10 U | 10 U | 20 U | 40 U |
| Methyl Isobutyl Ketone | | 40 U | 40 U | 10 U | 10 U | 10 U | 10 U | 20 U | 40 U * | 10 U | 10 U | 20 U | 40 U |
| Methylene Chloride | 5 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 1.6 J B | 4.7 J B | 5 U | 5 U | 10 U | 20 U |
| Styrene | 5 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Tetrachloroethene | 5 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Toluene | 5 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| trans-1,2-Dichloroethene | 5 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| trans-1,3-Dichloropropene | 0.4 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Trichloroethene | 5 | **53** | **58** | **56** | **58** | **23** | **52** | **71** | **120** | **51** | **47** | **49** | **58** |
| Vinyl chloride | 2 | **9.1 J** | **8.6 J** | **7.4** | **6.7** | **3.5 J** | **8.8** | **12** | **14 J** | **9.4** | **9.7** | **9 J** | **8.8 J** |
| Xylenes, Total | 5 | 20 U | 20 U | 5 U | 5 U | 5 U | 5 U | 10 U | 20 U | 5 U | 5 U | 10 U | 20 U |
| Total VOCs | | 356 | 414 | 328 | 331 | 161 | 332 | 481 | 781 | 330 | 292 | 333 | 391 |

Notes

- Concentration exceeds corresponding NYSDEC Class GA Standard.

U - Not detected at the indicated concentration.
J - Estimated concentration.
M - Manual integrated compound.
B - Analyte found in associated blank as well as the sample.
E - Concentration exceeds instrument calibration range.
D - Laboratory Dilution.
* - MS or MSD exceeded control limits.

**TABLE 3-2**
**SUMMARY OF GROUNDWATER TREATMENT SYSTEM VOCS (INFLUENT)**
**VESTAL WATER SUPPLY**
**VESTAL, NEW YORK**
**NYSDEC SITE #7-04-009A**

| Sample ID<br>Sampling Date<br>Matrix<br>Units | NYSDEC GA Standard ug/L | WELL 1A-INF 1/28/2011 WATER ug/L | WELL 1A-INF 2/28/2011 WATER ug/L | WELL 1A-INF 3/29/2011 WATER ug/L | WELL 1A-INF 5/26/2011 WATER ug/L | WELL 1A-INF 6/13/2011 WATER ug/L | WELL 1A-INF 7/26/2011 WATER ug/L | WELL 1A-INF 8/18/2011 WATER ug/L | WELL 1A-INF 9/29/2011 WATER ug/L | WELL 1A-INF 10/26/2011 WATER ug/L | WELL 1A-INF 11/29/2011 WATER ug/L | WELL 1A-INF 12/21/2011 WATER ug/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VOCs** | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 5 | **140** | **220** | **170** | **180** | **240** | **180** | **200** | **120** | **190** | **200 D** | **150** |
| 1,1,2,2-Tetrachloroethane | 5 | 10 | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| 1,1,2-Trichloroethane | 1 | 10 | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| 1,1-Dichloroethane | 5 | **19** | **27** | **25** | **23** | **26** | **20** | **24** | **17** | **23** | **19** | **22** |
| 1,1-Dichloroethene | 5 | **13** | **22** | **18** | **15** | **20** | **13** | **17** | **11** | **16** | **23** | **18** |
| 1,2-Dichloroethane | 0.6 | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| 1,2-Dichloropropane | 5 | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| 2-Hexanone | | 20 U | 40 U | 10 U | 10 U | 8 U | 20 U | 20 U | 10 U | 10 U | 5 U | 10 U |
| Acetone | | 3.1 J | 14 J B | 10 U | 10 U | 4.8 J B | 20 U | 11 J | 10 U | 2.7 J | 10 U | 20 U |
| Benzene | 1 | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| Bromodichloromethane | 50 | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| Bromoform | | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| Bromomethane | 5 | 10 U | 20 U | 5 U* | 5 U | 4 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| Carbon disulfide | | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| Carbon tetrachloride | 5 | 10 U | 20 U | 5 U | 5 U | 2 U * | 10 U | 10 U * | 5 U | 5 U | 1 U | 2 U |
| Chlorobenzene | 5 | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| Chloroethane | 5 | 10 U | 20 U | 5 U | 5 U | 4 U | 10 U | 10 U | 5 U | 5 U | 0.49 J | 2 U |
| Chloroform | 7 | 10 U | 20 U | 5 U | 5 U | 0.71 J B | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| Chloromethane | | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| cis-1,2-Dichloroethene | 5 | **39** | **63** | **53** | **52** | **52** | **46** | **51** | **37** | **57** | **42** | **51** |
| cis-1,3-Dichloropropene | 0.4 | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| Dibromochloromethane | 50 | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| Ethylbenzene | 5 | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| Methyl Ethyl Ketone | 50 | 20 U | 40 U | 10 U | 10 U | 8 U | 20 U | 20 U | 10 U | 10 U | 10 U | 20 U |
| Methyl Isobutyl Ketone | | 20 U | 40 U | 10 U | 10 U | 8 U | 20 U | 9.7 J | 10 U | 10 U | 5 U | 10 U |
| Methylene Chloride | 5 | 2.5 J B | 3.4 J B | 5 U | 5 U | 8 U | 10 U | 4 J B | 5 U | 5 U | 1 U | 2 U |
| Styrene | 5 | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| Tetrachloroethene | 5 | 10 U | 20 U | 5 U | 5 U | 2 U * | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| Toluene | 5 | 10 U | 20 U | 5 U | 5 U | 2 U * | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| trans-1,2-Dichloroethene | 5 | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| trans-1,3-Dichloropropene | 0.4 | 10 U | 20 U | 5 U | 5 U | 2 U | 10 U | 10 U | 5 U | 5 U | 1 U | 2 U |
| Trichloroethene | 5 | **40** | **62** | **53** | **54** | **61** | **51** | **55** | **39** | **53** | **45** | **53** |
| Vinyl chloride | 2 | **6.7 J** | **6.4 J** | **8.9** | **6.4** | **8.7** | **6.2 J** | **7.8 J** | **5.5** | **8.1** | **5.5** | **7.1** |
| Xylenes, Total | 5 | 10 U | 20 U | 5 U | 5 U | 4 U | 10 U | 10 U | 5 U | 5 U | 2 U | 4 U |
| Total VOCs | | 258 | 400 | 328 | 330 | 408 | 316 | 355 | 230 | 350 | 335 | 301 |

Notes

- Concentration exceeds corresponding NYSDEC Class GA Standard.

U - Not detected at the indicated concentration.
J - Estimated concentration.
M - Manual integrated compound.
B - Analyte found in associated blank as well as the sample.
E - Concentration exceeds instrument calibration range.
D - Laboratory Dilution.
* - MS or MSD exceeded control limits.

**TABLE 3-3**
**SUMMARY OF GROUNDWATER TREATMENT SYSTEM VOCS (EFFLUENT)**
**VESTAL WATER SUPPLY**
**VESTAL, NEW YORK**
**NYSDEC SITE #7-04-009A**

| Sample ID<br>Sampling Date<br>Matrix<br>Units | NYSDEC GA Standard ug/L | WELL 1A-EFF 7/27/2007 WATER ug/L | WELL 1A-EFF 8/27/2007 WATER ug/L | WELL 1A-EFF 9/26/2007 WATER ug/L | WELL 1A-EFF 10/26/2007 WATER ug/L | WELL 1A-EFF 11/27/2007 WATER ug/L | WELL 1A-EFF 12/20/2007 WATER ug/L | WELL 1A-EFF 1/23/2008 WATER ug/L | WELL 1A-EFF 2/26/2008 WATER ug/L | WELL 1A-EFF 3/27/2008 WATER ug/L | WELL 1A-EFF 4/22/2008 WATER ug/L | WELL 1A-EFF 5/20/2008 WATER ug/L | WELL 1A-EFF 6/27/2008 WATER ug/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| 1,1,2,2-Tetrachloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| 1,1,2-Trichloroethane | 1 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| 1,1-Dichloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| 1,1-Dichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U * |
| 1,2-Dichloroethane | 0.6 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| 1,2-Dichloropropane | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| 2-Hexanone | | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Acetone | | 10 U | 10 U | 10 U | 10 U | 10 U | 10 UM | 10 U | 10 U | 10 U | 1.8 J | 1.2 J B | 10 U |
| Benzene | 1 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| Bromodichloromethane | 50 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U * | 5 U | 5 U | 5 U | 10 U | 5 U |
| Bromoform | | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| Bromomethane | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U * | 5 U | 5 U | 5 U | 10 U | 5 U |
| Carbon disulfide | | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U * | 5 U | 5 U | 5 U | 10 U | 5 U * |
| Carbon tetrachloride | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| Chlorobenzene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| Chloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U * |
| Chloroform | 7 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| Chloromethane | | 5 U | 5 U | 5 U | 5 U * | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| cis-1,2-Dichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 0.3 J | 5 U |
| cis-1,3-Dichloropropene | 0.4 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| Dibromochloromethane | 50 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| Ethylbenzene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| Methyl Ethyl Ketone | 50 | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Methyl Isobutyl Ketone | | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Methylene Chloride | 5 | 5 U | 5 U | 5 U * | 5 U | 5 U | 0.38 JB | 5 U | 5 U | 1.2 JB | 5 U | 0.34 J B | 5 U |
| Styrene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| Tetrachloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| Toluene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| trans-1,2-Dichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| trans-1,3-Dichloropropene | 0.4 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| Trichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 1.1 J*B | 10 U | 5 U |
| Vinyl chloride | 2 | 5 U | 5 U | 5 U | 5 U * | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |
| Xylenes, Total | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | 5 U |

Notes
U - Not detected at the indicated concentration.
J - Estimated concentration.
M - Manual integrated compound.
B - Analyte found in associated blank as well as the sample.
* - MS or MSD exceeded control limits.

**TABLE 3-3**
**SUMMARY OF GROUNDWATER TREATMENT SYSTEM VOCS (EFFLUENT)**
**VESTAL WATER SUPPLY**
**VESTAL, NEW YORK**
**NYSDEC SITE #7-04-009A**

| Sample ID<br>Sampling Date<br>Matrix<br>Units | NYSDEC GA Standard ug/L | WELL 1A-EFF 7/25/2008 WATER ug/L | WELL 1A-EFF 8/25/2008 WATER ug/L | WELL 1A-EFF 9/30/2008 WATER ug/L | WELL 1A-EFF 3/5/2009 WATER ug/L | WELL 1A-EFF 3/27/2009 WATER ug/L | WELL 1A-EFF 4/16/2009 WATER ug/L | WELL 1A-EFF 5/30/2009 WATER ug/L | WELL 1A-EFF 6/24/2009 WATER ug/L | WELL 1A-EFF 7/29/2009 WATER ug/L | WELL 1A-EFF 8/27/2009 WATER ug/L | WELL 1A-EFF 9/24/2009 WATER ug/L | WELL 1A-EFF 10/26/2009 WATER ug/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 5 | 5 U | 5 U | 5 U | 1.5 J | 0.5 U | 5 U | 5 U | 5 U | 0.96 | 0.5 U | 5 U | 5 U |
| 1,1,2,2-Tetrachloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| 1,1,2-Trichloroethane | 1 | 5 U | 5 U | 5 U * | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| 1,1-Dichloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 0.27 J | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| 1,1-Dichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 0.16 J * | 5 U | 5 U * | 5 U * | 0.5 U * | 0.5 U | 5 U | 5 U |
| 1,2-Dichloroethane | 0.6 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| 1,2-Dichloropropane | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| 2-Hexanone | | 10 U | 10 U | 10 U | 10 U | 2 U | 10 U | 10 U | 10 U * | 2 U | 2 U | 10 U | 10 U |
| Acetone | | 1 J B | 10 U | 10 U | 1.1 J | 2 U * | 10 U * | 10 U | 10 U | 1.8 J B | 2 U | 10 U | 10 U |
| Benzene | 1 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Bromodichloromethane | 50 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Bromoform | | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Bromomethane | 5 | 5 U | 5 U | 5 U | 5 U | 1 U | 5 U | 5 U | 5 U | 1 U | 1 U | 5 U | 5 U |
| Carbon disulfide | | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Carbon tetrachloride | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Chlorobenzene | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Chloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 1 U | 5 U | 5 U | 5 U | 1 U * | 1 U | 5 U | 5 U |
| Chloroform | 7 | 5 U | 5 U | 5 U * | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Chloromethane | | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U * | 0.5 U | 0.5 U | 5 U | 5 U |
| cis-1,2-Dichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 0.82 | 5 U | 5 U | 5 U | 0.45 J | 0.46 J | 5 U | 5 U |
| cis-1,3-Dichloropropene | 0.4 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Dibromochloromethane | 50 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Ethylbenzene | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Methyl Ethyl Ketone | 50 | 10 U | 10 U | 10 U | 10 U | 2 U | 10 U | 10 U | 10 U | 2 U | 2 U | 10 U | 10 U |
| Methyl Isobutyl Ketone | | 10 U | 10 U | 10 U | 10 U | 2 U | 10 U | 10 U | 10 U | 2 U | 2 U | 10 U | 10 U |
| Methylene Chloride | 5 | 5 U | 5 U | 5 U | 5 U | 2 U | 5 U | 5 U | 5 U | 2 U | 2 U | 5 U | 5 U |
| Styrene | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Tetrachloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Toluene | 5 | 5 U | 5 U | 5 U | 5 U | 0.33 J | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| trans-1,2-Dichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U * | 0.5 U * | 0.5 U | 5 U | 5 U |
| trans-1,3-Dichloropropene | 0.4 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Trichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 J | 5 U | 5 U | 5 U | 0.37 J | 0.29 J | 5 U | 5 U |
| Vinyl chloride | 2 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 0.5 U | 0.5 U | 5 U | 5 U |
| Xylenes, Total | 5 | 5 U | 5 U | 5 U | 5 U | 3.4 | 5 U | 5 U | 5 U | 1 U | 1 U | 5 U | 5 U |

Notes
U - Not detected at the indicated concentration.
J - Estimated concentration.
M - Manual integrated compound.
B - Analyte found in associated blank as well as the sample.
* - MS or MSD exceeded control limits.

**TABLE 3-3**
**SUMMARY OF GROUNDWATER TREATMENT SYSTEM VOCS (EFFLUENT)**
**VESTAL WATER SUPPLY**
**VESTAL, NEW YORK**
**NYSDEC SITE #7-04-009A**

| Sample ID<br>Sampling Date<br>Matrix<br>Units | NYSDEC GA Standard ug/L | WELL 1A-EFF 11/20/2009 WATER ug/L | WELL 1A-EFF 12/23/2009 WATER ug/L | WELL 1A-EFF 2/5/2010 WATER ug/L | WELL 1A-EFF 2/23/2010 WATER ug/L | WELL 1A-EFF 3/15/2010 WATER ug/L | WELL 1A-EFF 4/19/2010 WATER ug/L | WELL 1A-EFF 5/25/2010 WATER ug/L | WELL 1A-EFF 8/20/2010 WATER ug/L | WELL 1A-EFF 9/17/2010 WATER ug/L | WELL 1A-EFF 10/22/2010 WATER ug/L | WELL 1A-EFF 11/23/2010 WATER ug/L | WELL 1A-EFF 12/29/2010 WATER ug/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 2.1 J | 5 U | 5 U | 5 U | 3 J |
| 1,1,2,2-Tetrachloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1,2-Trichloroethane | 1 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1-Dichloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1-Dichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichloroethane | 0.6 | 5 U | 5 U | 5 U | 5 U | 5 U * | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichloropropane | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2-Hexanone | | 10 U | 10 U * | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Acetone | | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Benzene | 1 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromodichloromethane | 50 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromoform | | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromomethane | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Carbon disulfide | | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Carbon tetrachloride | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chlorobenzene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 5 U * | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chloroform | 7 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chloromethane | | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U * | 5 U * | 5 U | 5 U |
| cis-1,2-Dichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 2 J | 5 U | 5 U | 5 U | 2.3 J |
| cis-1,3-Dichloropropene | 0.4 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Dibromochloromethane | 50 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Ethylbenzene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Methyl Ethyl Ketone | 50 | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Methyl Isobutyl Ketone | | 10 U | 10 U * | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U * | 10 U | 10 U | 10 U | 10 U |
| Methylene Chloride | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Styrene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Tetrachloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Toluene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| trans-1,2-Dichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| trans-1,3-Dichloropropene | 0.4 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Trichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 0.67 J | 5 U | 5 U | 5 U | 1.4 J |
| Vinyl chloride | 2 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Xylenes, Total | 5 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |

Notes
U - Not detected at the indicated concentration.
J - Estimated concentration.
M - Manual integrated compound.
B - Analyte found in associated blank as well as the sample.
* - MS or MSD exceeded control limits.

**TABLE 3-3**
**SUMMARY OF GROUNDWATER TREATMENT SYSTEM VOCS (EFFLUENT)**
**VESTAL WATER SUPPLY**
**VESTAL, NEW YORK**
**NYSDEC SITE #7-04-009A**

| Sample ID<br>Sampling Date<br>Matrix<br>Units | NYSDEC GA Standard ug/L | WELL 1A-EFF 1/28/2011 WATER ug/L | WELL 1A-EFF 2/28/2011 WATER ug/L | WELL 1A-EFF 3/29/2011 WATER ug/L | WELL 1A-EFF 5/26/2011 WATER ug/L | WELL 1A-EFF 6/16/2011 WATER ug/L | WELL 1A-EFF 7/26/2011 WATER ug/L | WELL 1A-EFF 8/18/2011 WATER ug/L | WELL 1A-EFF 9/29/2011 WATER ug/L | WELL 1A-EFF 10/23/2011 WATER ug/L | WELL 1A-EFF 11/29/2011 WATER ug/L | WELL 1A-EFF 12/21/2011 WATER ug/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 0.99 | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| 1,1,2,2-Tetrachloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| 1,1,2-Trichloroethane | 1 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| 1,1-Dichloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| 1,1-Dichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| 1,2-Dichloroethane | 0.6 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| 1,2-Dichloropropane | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| 2-Hexanone | | 10 U | 10 U | 10 U | 10 U | 2 U | 10 U | 10 U | 10 U | 10 U | 5 U | 5 U |
| Acetone | | 10 U | 10 U | 10 U | 10 U | 2 U | 10 U | 10 U | 10 U | 1.5 J | 10 U | 10 U |
| Benzene | 1 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Bromodichloromethane | 50 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Bromoform | | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Bromomethane | 5 | 5 U | 5 U | 5 U | 5 U | 1 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Carbon disulfide | | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Carbon tetrachloride | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U * | 5 U | 5 U | 1 U | 1 U |
| Chlorobenzene | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Chloroethane | 5 | 5 U | 5 U | 5 U | 5 U | 1 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Chloroform | 7 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Chloromethane | | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| cis-1,2-Dichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 0.32 J | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| cis-1,3-Dichloropropene | 0.4 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Dibromochloromethane | 50 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Ethylbenzene | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Methyl Ethyl Ketone | 50 | 10 U | 10 U | 10 U | 10 U | 2 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Methyl Isobutyl Ketone | | 10 U | 10 U | 10 U | 10 U | 2 U | 10 U | 10 U | 10 U | 10 U | 5 U | 5 U |
| Methylene Chloride | 5 | 5 U | 5 U | 5 U | 5 U | 2 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Styrene | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Tetrachloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Toluene | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| trans-1,2-Dichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| trans-1,3-Dichloropropene | 0.4 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Trichloroethene | 5 | 5 U | 5 U | 5 U | 5 U | 0.19 J | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Vinyl chloride | 2 | 5 U | 5 U | 5 U | 5 U | 0.5 U | 5 U | 5 U | 5 U | 5 U | 1 U | 1 U |
| Xylenes, Total | 5 | 5 U | 5 U | 5 U | 5 U | 1 U | 5 U | 5 U | 5 U | 5 U | 2 U | 2 U |

Notes
U - Not detected at the indicated concentration.
J - Estimated concentration.
M - Manual integrated compound.
B - Analyte found in associated blank as well as the sample.
* - MS or MSD exceeded control limits.

ARCADIS MALCOLM PIRNIE

## Appendix A

Monthly Reports and System Operation and Maintenance Logs

**ENVIRONMENTAL COMPLIANCE, INC.**
101 Mount Bethel Rd.
Warren, New Jersey 07059
908-754-1700
908-754-1866 (fax)
http://www.eci-nj.com
j.jimenez@eci-nj.com (email)

# Vestal Well 1-1 Monthly Report
# October 2011

## SECTION I – SUMMARY OF ACTIVITIES

System ran uninterrupted entire month. System operated without issues at a rate of 217 GPM to 221 GPM.

## SECTION II – MONTHLY OPERATIONS & MAINTENANCE

- Checked and adjusted belts
- Lubricated equipment, as needed
- Routine inspection of site
- Cleaned up grounds
- Mowed and trimmed lawn

## SECTION III – REPAIR WORK COMPLETED

- None

## SECTION IV – REPAIR WORK NEEDED

- None

## SECTION V – RECOMMENDATIONS

- None

**ENVIRONMENTAL COMPLIANCE, INC.**
101 Mount Bethel Rd.
Warren, New Jersey 07059
908-754-1700
908-754-1866 (fax)
http://www.eci-nj.com
j.jimenez@eci-nj.com (email)

# Vestal Well 1-1 Monthly Report
# November 2011

## SECTION I – SUMMARY OF ACTIVITIES

System ran uninterrupted entire month. System operated without issues at a rate of 200 GPM to 206 GPM.

## SECTION II – MONTHLY OPERATIONS & MAINTENANCE

- Checked and adjusted belts
- Lubricated equipment, as needed
- Routine inspection of site
- Cleaned up grounds
- Mowed and trimmed lawn

## SECTION III – REPAIR WORK COMPLETED

- None

## SECTION IV – REPAIR WORK NEEDED

- None

## SECTION V – RECOMMENDATIONS

- None

**ENVIRONMENTAL COMPLIANCE, INC.**
101 Mount Bethel Rd.
Warren, New Jersey 07059
908-754-1700
908-754-1866 (fax)
http://www.eci-nj.com
j.jimenez@eci-nj.com (email)

# Vestal Well 1-1 Monthly Report
# December 2011

## SECTION I – SUMMARY OF ACTIVITIES

System ran entire month except for several power interruptions of short duration. System operated without issues at a rate of 198 GPM to 200 GPM.

## SECTION II – MONTHLY OPERATIONS & MAINTENANCE

- Checked and adjusted belts
- Lubricated equipment, as needed
- Changed filters
- Routine inspection of site
- Cleaned up grounds

## SECTION III – REPAIR WORK COMPLETED

- None

## SECTION IV – REPAIR WORK NEEDED

- None

## SECTION V – RECOMMENDATIONS

- None

**ENVIRONMENTAL COMPLIANCE, INC.** **VESTAL WELL 1-1 MONTHLY O & M LOG** **October 2011**

| DAY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TIME** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **WELL HOUSE** | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X |
| PRE LUBE LINE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PUMP MOTOR OIL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **CHEMICAL BUILDING** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SUMP PUMP | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X |
| DISCHARGE VALVES | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X |
| FLOW METER (GPM)* | | | | | | 221 | | | | | | 218 | | | | | | | 218 | | | | | | | | 217 | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **CHLORINE ROOM** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GENERAL CONDITION | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X |
| TOWER PACKING INSP. | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **MAIN PUMPHOUSE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BLOWER AND MOTOR | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X |
| BLOWER AIR FILTERS | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X |
| ALARM / CONTROL PANEL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CLEARWELL LEVEL | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **OTHER*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GROUNDS | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X |
| INGROUND TANK LEVEL | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

***Unadjusted Meter Reading**

| ENVIRONMENTAL COMPLIANCE, INC. | | | | | | VESTAL WELL 1-1 MONTHLY O & M LOG | | | | | | | | | | | | | November 2011 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **DAY** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** |
| **TIME** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **WELL HOUSE** | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | |
| PRE LUBE LINE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PUMP MOTOR OIL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **CHEMICAL BUILDING** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SUMP PUMP | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | |
| DISCHARGE VALVES | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | |
| FLOW METER (GPM)* | | | 206 | | | | | | | 200 | | | | | | | 203 | | | | | | | | | 202 | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **CHLORINE ROOM** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GENERAL CONDITION | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | |
| TOWER PACKING INSP. | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **MAIN PUMPHOUSE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BLOWER AND MOTOR | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | |
| BLOWER AIR FILTERS | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | |
| ALARM / CONTROL PANEL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CLEARWELL LEVEL | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **OTHER*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GROUNDS | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | |
| INGROUND TANK LEVEL | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

***Unadjusted Meter Reading**

| ENVIRONMENTAL COMPLIANCE, INC. | | | | | | | | | VESTAL WELL 1-1 MONTHLY O & M LOG | | | | | | | | | | | December 2011 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **DAY** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** |
| **TIME** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **WELL HOUSE** | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | |
| PRE LUBE LINE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PUMP MOTOR OIL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **CHEMICAL BUILDING** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SUMP PUMP | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | |
| DISCHARGE VALVES | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | |
| FLOW METER (GPM)* | | 198 | | | | | | | 198 | | | | | | | 200 | | | | | | | | | 200 | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **CHLORINE ROOM** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GENERAL CONDITION | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | |
| TOWER PACKING INSP. | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **MAIN PUMPHOUSE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BLOWER AND MOTOR | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | |
| BLOWER AIR FILTERS | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | |
| ALARM / CONTROL PANEL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CLEARWELL LEVEL | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **OTHER*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GROUNDS | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | |
| INGROUND TANK LEVEL | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

***Unadjusted Meter Reading**

ARCADIS MALCOLM PIRNIE

# Appendix B

Analytical Reporting Forms

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

Job Number: 480-13331-1

Job Description: NYSDEC-Standby VESTAL

For:
Malcolm Pirnie, Inc. Invoice to Arcadis
855 Route 146
Suite 210
Clifton Park, NY 12065

Attention: Mr. Jeremy Wyckoff

Approved for release.
Melissa L Deyo
Project Administrator
12/29/2011 12:09 PM

Designee for
Sally Hoffman
Project Manager II
sally.hoffman@testamericainc.com
12/29/2011

The test results in this report meet all NELAP requirements for analytes for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this test report should be directed to the TestAmerica Project Manager who has signed this report. TestAmerica Buffalo NELAC Certifications: CADPH 01169CA, FLDOH E87672, ILEPA 200003, KSDOH E-10187, LADEQ 30708, MDH 036-999-337, NHELAP 2973, NJDEP NY455, NHDOH 10026, ORELAP NY200003, PADEP 68-00281, TXCEQ T-104704412-10-1

**TestAmerica Laboratories, Inc.**
TestAmerica Buffalo 10 Hazelwood Drive, Amherst, NY 14228-2298
Tel (716) 691-2600 Fax (716) 691-7991 www.testamericainc.com

ACCREDITED IN ACCORDANCE WITH nelac

# Table of Contents

# Table of Contents

**Job Narrative**
**480-13331-1**

**Receipt**
All samples were received in good condition within temperature requirements.

**GC/MS VOA**
Method 8260B: The following sample was diluted due to the abundance of target analytes: WELL 1-1A INF (480-13331-1 DL). Elevated reporting limits (RLs) are provided.

Method 8260B:The method blank for batch 43191 contained Chloroform above the method detection limit. The detection was below the reporting limit; therefore, no corrective action was necessary.

Method 8260B: The following compounds were outside control limits in the continuing calibration verification (CCV) associated with batch 43191: Acrolein, 2,2-Dichloropropane, 2-Butanone, Tetrahydrofuran and Hexachlorobutadiene. These compounds are not classified as Calibration Check Compounds (CCCs) in the reference method, and the laboratory defaults to in-house and/or project-specific criteria for evaluation. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for 6 analytes to be outside limits; therefore, the data has been reported.

No other analytical or quality issues were noted.

## SAMPLE SUMMARY

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

| Lab Sample ID | Client Sample ID | Client Matrix | Date/Time Sampled | Date/Time Received |
|---|---|---|---|---|
| 480-13331-1 | WELL 1-1A INF | Water | 11/29/2011 1215 | 11/30/2011 1015 |
| 480-13331-2 | WELL 1-1A EFF | Water | 11/29/2011 1220 | 11/30/2011 1015 |
| 480-13331-3TB | TRIP BLANK | Water | 11/29/2011 0000 | 11/30/2011 1015 |

## EXECUTIVE SUMMARY - Detections

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

| Lab Sample ID / Analyte | Client Sample ID | Result | Qualifier | Reporting Limit | Units | Method |
|---|---|---|---|---|---|---|
| **480-13331-1** | **WELL 1-1A INF** | | | | | |
| 1,1,1-Trichloroethane | | 200 | | 4.0 | ug/L | 8260B |
| 1,1-Dichloroethane | | 19 | | 1.0 | ug/L | 8260B |
| 1,1-Dichloroethene | | 23 | | 1.0 | ug/L | 8260B |
| Chloroethane | | 0.49 | J | 1.0 | ug/L | 8260B |
| cis-1,2-Dichloroethene | | 42 | | 1.0 | ug/L | 8260B |
| Trichloroethene | | 45 | | 1.0 | ug/L | 8260B |
| Vinyl chloride | | 5.5 | | 1.0 | ug/L | 8260B |
| **480-13331-3TB** | **TRIP BLANK** | | | | | |
| Methylene Chloride | | 2.0 | | 1.0 | ug/L | 8260B |

# METHOD SUMMARY

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

| Description | Lab Location | Method | Preparation Method |
|---|---|---|---|
| **Matrix Water** | | | |
| Volatile Organic Compounds (GC/MS) | TAL BUF | SW846 8260B | |
| Purge and Trap | TAL BUF | | SW846 5030B |

**Lab References:**

TAL BUF = TestAmerica Buffalo

**Method References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

## METHOD / ANALYST SUMMARY

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

| Method | Analyst | Analyst ID |
|---|---|---|
| SW846 8260B | Byrnes, Jennifer M | JMB |
| SW846 8260B | Coder, David | DC |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

**Client Sample ID:** **WELL 1-1A INF**

Lab Sample ID: 480-13331-1
Client Matrix: Water

Date Sampled: 11/29/2011 1215
Date Received: 11/30/2011 1015

**8260B Volatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8260B | Analysis Batch: | 480-43191 | Instrument ID: | HP5973G |
| Prep Method: | 5030B | Prep Batch: | N/A | Lab File ID: | G7823.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 12/07/2011 1735 | | | Final Weight/Volume: | 5 mL |
| Prep Date: | 12/07/2011 1735 | | | | |

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | 170 | E | 0.82 | 1.0 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.23 | 1.0 |
| 1,1-Dichloroethane | 19 | | 0.38 | 1.0 |
| 1,1-Dichloroethene | 23 | | 0.29 | 1.0 |
| 1,2-Dibromoethane | 1.0 | U | 0.73 | 1.0 |
| 1,2-Dichloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,2-Dichloropropane | 1.0 | U | 0.72 | 1.0 |
| 2-Hexanone | 5.0 | U | 1.2 | 5.0 |
| 2-Butanone (MEK) | 10 | U | 1.3 | 10 |
| 4-Methyl-2-pentanone (MIBK) | 5.0 | U | 2.1 | 5.0 |
| Acetone | 10 | U | 3.0 | 10 |
| Benzene | 1.0 | U | 0.41 | 1.0 |
| Bromodichloromethane | 1.0 | U | 0.39 | 1.0 |
| Bromoform | 1.0 | U | 0.26 | 1.0 |
| Bromomethane | 1.0 | U | 0.69 | 1.0 |
| Carbon disulfide | 1.0 | U | 0.19 | 1.0 |
| Carbon tetrachloride | 1.0 | U | 0.27 | 1.0 |
| Chlorobenzene | 1.0 | U | 0.75 | 1.0 |
| Dibromochloromethane | 1.0 | U | 0.32 | 1.0 |
| Chloroethane | 0.49 | J | 0.32 | 1.0 |
| Chloroform | 1.0 | U | 0.34 | 1.0 |
| Chloromethane | 1.0 | U | 0.35 | 1.0 |
| cis-1,2-Dichloroethene | 42 | | 0.81 | 1.0 |
| cis-1,3-Dichloropropene | 1.0 | U | 0.36 | 1.0 |
| Ethylbenzene | 1.0 | U | 0.74 | 1.0 |
| Methylene Chloride | 1.0 | U | 0.44 | 1.0 |
| Styrene | 1.0 | U | 0.73 | 1.0 |
| Tetrachloroethene | 1.0 | U | 0.36 | 1.0 |
| Toluene | 1.0 | U | 0.51 | 1.0 |
| trans-1,2-Dichloroethene | 1.0 | U | 0.90 | 1.0 |
| trans-1,3-Dichloropropene | 1.0 | U | 0.37 | 1.0 |
| Trichloroethene | 45 | | 0.46 | 1.0 |
| Vinyl chloride | 5.5 | | 0.90 | 1.0 |
| Xylenes, Total | 2.0 | U | 0.66 | 2.0 |
| m,p-Xylene | 2.0 | U | 0.66 | 2.0 |
| o-Xylene | 1.0 | U | 0.76 | 1.0 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 94 | | 66 - 137 |
| Toluene-d8 (Surr) | 94 | | 71 - 126 |
| 4-Bromofluorobenzene (Surr) | 90 | | 73 - 120 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

**Client Sample ID:** **WELL 1-1A INF**

Lab Sample ID: 480-13331-1
Client Matrix: Water

Date Sampled: 11/29/2011 1215
Date Received: 11/30/2011 1015

**8260B Volatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8260B | Analysis Batch: | 480-43907 | Instrument ID: | HP5973N |
| Prep Method: | 5030B | Prep Batch: | N/A | Lab File ID: | N4349.D |
| Dilution: | 4.0 | | | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 12/10/2011 1359 | Run Type: | DL | Final Weight/Volume: | 5 mL |
| Prep Date: | 12/10/2011 1359 | | | | |

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | 200 | | 3.3 | 4.0 |
| 1,1,2,2-Tetrachloroethane | 4.0 | U | 0.84 | 4.0 |
| 1,1,2-Trichloroethane | 4.0 | U | 0.92 | 4.0 |
| 1,1-Dichloroethane | 19 | | 1.5 | 4.0 |
| 1,1-Dichloroethene | 24 | | 1.2 | 4.0 |
| 1,2-Dibromoethane | 4.0 | U | 2.9 | 4.0 |
| 1,2-Dichloroethane | 4.0 | U | 0.84 | 4.0 |
| 1,2-Dichloropropane | 4.0 | U | 2.9 | 4.0 |
| 2-Hexanone | 20 | U | 5.0 | 20 |
| 2-Butanone (MEK) | 40 | U | 5.3 | 40 |
| 4-Methyl-2-pentanone (MIBK) | 20 | U | 8.4 | 20 |
| Acetone | 40 | U | 12 | 40 |
| Benzene | 4.0 | U | 1.6 | 4.0 |
| Bromodichloromethane | 4.0 | U | 1.6 | 4.0 |
| Bromoform | 4.0 | U | 1.0 | 4.0 |
| Bromomethane | 4.0 | U | 2.8 | 4.0 |
| Carbon disulfide | 4.0 | U | 0.76 | 4.0 |
| Carbon tetrachloride | 4.0 | U | 1.1 | 4.0 |
| Chlorobenzene | 4.0 | U | 3.0 | 4.0 |
| Dibromochloromethane | 4.0 | U | 1.3 | 4.0 |
| Chloroethane | 4.0 | U | 1.3 | 4.0 |
| Chloroform | 4.0 | U | 1.4 | 4.0 |
| Chloromethane | 4.0 | U | 1.4 | 4.0 |
| cis-1,2-Dichloroethene | 44 | | 3.2 | 4.0 |
| cis-1,3-Dichloropropene | 4.0 | U | 1.4 | 4.0 |
| Ethylbenzene | 4.0 | U | 3.0 | 4.0 |
| Methylene Chloride | 4.0 | U | 1.8 | 4.0 |
| Styrene | 4.0 | U | 2.9 | 4.0 |
| Tetrachloroethene | 4.0 | U | 1.4 | 4.0 |
| Toluene | 4.0 | U | 2.0 | 4.0 |
| trans-1,2-Dichloroethene | 4.0 | U | 3.6 | 4.0 |
| trans-1,3-Dichloropropene | 4.0 | U | 1.5 | 4.0 |
| Trichloroethene | 46 | | 1.8 | 4.0 |
| Vinyl chloride | 6.6 | | 3.6 | 4.0 |
| Xylenes, Total | 8.0 | U | 2.6 | 8.0 |
| m,p-Xylene | 8.0 | U | 2.6 | 8.0 |
| o-Xylene | 4.0 | U | 3.0 | 4.0 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 105 | | 66 - 137 |
| Toluene-d8 (Surr) | 103 | | 71 - 126 |
| 4-Bromofluorobenzene (Surr) | 93 | | 73 - 120 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

**Client Sample ID:** **WELL 1-1A EFF**

Lab Sample ID: 480-13331-2
Client Matrix: Water

Date Sampled: 11/29/2011 1220
Date Received: 11/30/2011 1015

**8260B Volatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8260B | Analysis Batch: | 480-43191 | Instrument ID: | HP5973G |
| Prep Method: | 5030B | Prep Batch: | N/A | Lab File ID: | G7824.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 12/07/2011 1757 | | | Final Weight/Volume: | 5 mL |
| Prep Date: | 12/07/2011 1757 | | | | |

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | 1.0 | U | 0.82 | 1.0 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.23 | 1.0 |
| 1,1-Dichloroethane | 1.0 | U | 0.38 | 1.0 |
| 1,1-Dichloroethene | 1.0 | U | 0.29 | 1.0 |
| 1,2-Dibromoethane | 1.0 | U | 0.73 | 1.0 |
| 1,2-Dichloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,2-Dichloropropane | 1.0 | U | 0.72 | 1.0 |
| 2-Hexanone | 5.0 | U | 1.2 | 5.0 |
| 2-Butanone (MEK) | 10 | U | 1.3 | 10 |
| 4-Methyl-2-pentanone (MIBK) | 5.0 | U | 2.1 | 5.0 |
| Acetone | 10 | U | 3.0 | 10 |
| Benzene | 1.0 | U | 0.41 | 1.0 |
| Bromodichloromethane | 1.0 | U | 0.39 | 1.0 |
| Bromoform | 1.0 | U | 0.26 | 1.0 |
| Bromomethane | 1.0 | U | 0.69 | 1.0 |
| Carbon disulfide | 1.0 | U | 0.19 | 1.0 |
| Carbon tetrachloride | 1.0 | U | 0.27 | 1.0 |
| Chlorobenzene | 1.0 | U | 0.75 | 1.0 |
| Dibromochloromethane | 1.0 | U | 0.32 | 1.0 |
| Chloroethane | 1.0 | U | 0.32 | 1.0 |
| Chloroform | 1.0 | U | 0.34 | 1.0 |
| Chloromethane | 1.0 | U | 0.35 | 1.0 |
| cis-1,2-Dichloroethene | 1.0 | U | 0.81 | 1.0 |
| cis-1,3-Dichloropropene | 1.0 | U | 0.36 | 1.0 |
| Ethylbenzene | 1.0 | U | 0.74 | 1.0 |
| Methylene Chloride | 1.0 | U | 0.44 | 1.0 |
| Styrene | 1.0 | U | 0.73 | 1.0 |
| Tetrachloroethene | 1.0 | U | 0.36 | 1.0 |
| Toluene | 1.0 | U | 0.51 | 1.0 |
| trans-1,2-Dichloroethene | 1.0 | U | 0.90 | 1.0 |
| trans-1,3-Dichloropropene | 1.0 | U | 0.37 | 1.0 |
| Trichloroethene | 1.0 | U | 0.46 | 1.0 |
| Vinyl chloride | 1.0 | U | 0.90 | 1.0 |
| Xylenes, Total | 2.0 | U | 0.66 | 2.0 |
| m,p-Xylene | 2.0 | U | 0.66 | 2.0 |
| o-Xylene | 1.0 | U | 0.76 | 1.0 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 94 | | 66 - 137 |
| Toluene-d8 (Surr) | 94 | | 71 - 126 |
| 4-Bromofluorobenzene (Surr) | 90 | | 73 - 120 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

**Client Sample ID:** **TRIP BLANK**

Lab Sample ID: 480-13331-3TB
Client Matrix: Water

Date Sampled: 11/29/2011 0000
Date Received: 11/30/2011 1015

**8260B Volatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8260B | Analysis Batch: | 480-43191 | Instrument ID: | HP5973G |
| Prep Method: | 5030B | Prep Batch: | N/A | Lab File ID: | G7825.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 12/07/2011 1819 | | | Final Weight/Volume: | 5 mL |
| Prep Date: | 12/07/2011 1819 | | | | |

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | 1.0 | U | 0.82 | 1.0 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.23 | 1.0 |
| 1,1-Dichloroethane | 1.0 | U | 0.38 | 1.0 |
| 1,1-Dichloroethene | 1.0 | U | 0.29 | 1.0 |
| 1,2-Dibromoethane | 1.0 | U | 0.73 | 1.0 |
| 1,2-Dichloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,2-Dichloropropane | 1.0 | U | 0.72 | 1.0 |
| 2-Hexanone | 5.0 | U | 1.2 | 5.0 |
| 2-Butanone (MEK) | 10 | U | 1.3 | 10 |
| 4-Methyl-2-pentanone (MIBK) | 5.0 | U | 2.1 | 5.0 |
| Acetone | 10 | U | 3.0 | 10 |
| Benzene | 1.0 | U | 0.41 | 1.0 |
| Bromodichloromethane | 1.0 | U | 0.39 | 1.0 |
| Bromoform | 1.0 | U | 0.26 | 1.0 |
| Bromomethane | 1.0 | U | 0.69 | 1.0 |
| Carbon disulfide | 1.0 | U | 0.19 | 1.0 |
| Carbon tetrachloride | 1.0 | U | 0.27 | 1.0 |
| Chlorobenzene | 1.0 | U | 0.75 | 1.0 |
| Dibromochloromethane | 1.0 | U | 0.32 | 1.0 |
| Chloroethane | 1.0 | U | 0.32 | 1.0 |
| Chloroform | 1.0 | U | 0.34 | 1.0 |
| Chloromethane | 1.0 | U | 0.35 | 1.0 |
| cis-1,2-Dichloroethene | 1.0 | U | 0.81 | 1.0 |
| cis-1,3-Dichloropropene | 1.0 | U | 0.36 | 1.0 |
| Ethylbenzene | 1.0 | U | 0.74 | 1.0 |
| Methylene Chloride | 2.0 | | 0.44 | 1.0 |
| Styrene | 1.0 | U | 0.73 | 1.0 |
| Tetrachloroethene | 1.0 | U | 0.36 | 1.0 |
| Toluene | 1.0 | U | 0.51 | 1.0 |
| trans-1,2-Dichloroethene | 1.0 | U | 0.90 | 1.0 |
| trans-1,3-Dichloropropene | 1.0 | U | 0.37 | 1.0 |
| Trichloroethene | 1.0 | U | 0.46 | 1.0 |
| Vinyl chloride | 1.0 | U | 0.90 | 1.0 |
| Xylenes, Total | 2.0 | U | 0.66 | 2.0 |
| m,p-Xylene | 2.0 | U | 0.66 | 2.0 |
| o-Xylene | 1.0 | U | 0.76 | 1.0 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 94 | | 66 - 137 |
| Toluene-d8 (Surr) | 91 | | 71 - 126 |
| 4-Bromofluorobenzene (Surr) | 89 | | 73 - 120 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

## Surrogate Recovery Report

**8260B Volatile Organic Compounds (GC/MS)**

**Client Matrix: Water**

| Lab Sample ID | Client Sample ID | DCA %Rec | TOL %Rec | BFB %Rec |
|---|---|---|---|---|
| 480-13331-1 | WELL 1-1A INF | 94 | 94 | 90 |
| 480-13331-1 DL | WELL 1-1A INF DL | 105 | 103 | 93 |
| 480-13331-2 | WELL 1-1A EFF | 94 | 94 | 90 |
| 480-13331-3 | TRIP BLANK | 94 | 91 | 89 |
| MB 480-43191/5 | | 91 | 93 | 90 |
| MB 480-43907/28 | | 108 | 108 | 96 |
| LCS 480-43191/4 | | 91 | 93 | 90 |
| LCS 480-43907/5 | | 111 | 108 | 104 |

| Surrogate | Acceptance Limits |
|---|---|
| DCA = 1,2-Dichloroethane-d4 (Surr) | 66-137 |
| TOL = Toluene-d8 (Surr) | 71-126 |
| BFB = 4-Bromofluorobenzene (Surr) | 73-120 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

**Method Blank - Batch: 480-43191**

**Method: 8260B**
**Preparation: 5030B**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 480-43191/5 | Analysis Batch: | 480-43191 | Instrument ID: | HP5973G |
| Client Matrix: | Water | Prep Batch: | N/A | Lab File ID: | G7816.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 12/07/2011 1446 | Units: | ug/L | Final Weight/Volume: | 5 mL |
| Prep Date: | 12/07/2011 1446 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Result | Qual | MDL | RL |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | 1.0 | U | 0.82 | 1.0 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.23 | 1.0 |
| 1,1-Dichloroethane | 1.0 | U | 0.38 | 1.0 |
| 1,1-Dichloroethene | 1.0 | U | 0.29 | 1.0 |
| 1,2-Dibromoethane | 1.0 | U | 0.73 | 1.0 |
| 1,2-Dichloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,2-Dichloropropane | 1.0 | U | 0.72 | 1.0 |
| 2-Hexanone | 5.0 | U | 1.2 | 5.0 |
| 2-Butanone (MEK) | 10 | U | 1.3 | 10 |
| 4-Methyl-2-pentanone (MIBK) | 5.0 | U | 2.1 | 5.0 |
| Acetone | 10 | U | 3.0 | 10 |
| Benzene | 1.0 | U | 0.41 | 1.0 |
| Bromodichloromethane | 1.0 | U | 0.39 | 1.0 |
| Bromoform | 1.0 | U | 0.26 | 1.0 |
| Bromomethane | 1.0 | U | 0.69 | 1.0 |
| Carbon disulfide | 1.0 | U | 0.19 | 1.0 |
| Carbon tetrachloride | 1.0 | U | 0.27 | 1.0 |
| Chlorobenzene | 1.0 | U | 0.75 | 1.0 |
| Dibromochloromethane | 1.0 | U | 0.32 | 1.0 |
| Chloroethane | 1.0 | U | 0.32 | 1.0 |
| Chloroform | 0.882 | J | 0.34 | 1.0 |
| Chloromethane | 1.0 | U | 0.35 | 1.0 |
| cis-1,2-Dichloroethene | 1.0 | U | 0.81 | 1.0 |
| cis-1,3-Dichloropropene | 1.0 | U | 0.36 | 1.0 |
| Ethylbenzene | 1.0 | U | 0.74 | 1.0 |
| Methylene Chloride | 1.0 | U | 0.44 | 1.0 |
| Styrene | 1.0 | U | 0.73 | 1.0 |
| Tetrachloroethene | 1.0 | U | 0.36 | 1.0 |
| Toluene | 1.0 | U | 0.51 | 1.0 |
| trans-1,2-Dichloroethene | 1.0 | U | 0.90 | 1.0 |
| trans-1,3-Dichloropropene | 1.0 | U | 0.37 | 1.0 |
| Trichloroethene | 1.0 | U | 0.46 | 1.0 |
| Vinyl chloride | 1.0 | U | 0.90 | 1.0 |
| Xylenes, Total | 2.0 | U | 0.66 | 2.0 |
| m,p-Xylene | 2.0 | U | 0.66 | 2.0 |
| o-Xylene | 1.0 | U | 0.76 | 1.0 |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 91 | 66 - 137 |
| Toluene-d8 (Surr) | 93 | 71 - 126 |
| 4-Bromofluorobenzene (Surr) | 90 | 73 - 120 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

**Lab Control Sample - Batch: 480-43191**

**Method: 8260B**
**Preparation: 5030B**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | LCS 480-43191/4 | Analysis Batch: | 480-43191 | Instrument ID: | HP5973G |
| Client Matrix: | Water | Prep Batch: | N/A | Lab File ID: | G7817.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 12/07/2011 1512 | Units: | ug/L | Final Weight/Volume: | 5 mL |
| Prep Date: | 12/07/2011 1512 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| 1,1-Dichloroethane | 25.0 | 21.7 | 87 | 71 - 129 | |
| 1,1-Dichloroethene | 25.0 | 17.2 | 69 | 65 - 138 | |
| 1,2-Dichloroethane | 25.0 | 22.5 | 90 | 75 - 127 | |
| Benzene | 25.0 | 20.7 | 83 | 71 - 124 | |
| Chlorobenzene | 25.0 | 22.9 | 92 | 72 - 120 | |
| cis-1,2-Dichloroethene | 25.0 | 20.6 | 82 | 74 - 124 | |
| Ethylbenzene | 25.0 | 23.2 | 93 | 77 - 123 | |
| Tetrachloroethene | 25.0 | 22.9 | 92 | 74 - 122 | |
| Toluene | 25.0 | 21.9 | 88 | 70 - 122 | |
| trans-1,2-Dichloroethene | 25.0 | 20.5 | 82 | 73 - 127 | |
| Trichloroethene | 25.0 | 21.1 | 84 | 74 - 123 | |
| m,p-Xylene | 50.0 | 46.2 | 92 | 76 - 122 | |
| o-Xylene | 25.0 | 22.3 | 89 | 76 - 122 | |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 91 | 66 - 137 |
| Toluene-d8 (Surr) | 93 | 71 - 126 |
| 4-Bromofluorobenzene (Surr) | 90 | 73 - 120 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

**Method Blank - Batch: 480-43907**

**Method: 8260B**
**Preparation: 5030B**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 480-43907/28 | Analysis Batch: | 480-43907 | Instrument ID: | HP5973N |
| Client Matrix: | Water | Prep Batch: | N/A | Lab File ID: | N4345.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 12/10/2011 1205 | Units: | ug/L | Final Weight/Volume: | 5 mL |
| Prep Date: | 12/10/2011 1205 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Result | Qual | MDL | RL |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | 1.0 | U | 0.82 | 1.0 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.23 | 1.0 |
| 1,1-Dichloroethane | 1.0 | U | 0.38 | 1.0 |
| 1,1-Dichloroethene | 1.0 | U | 0.29 | 1.0 |
| 1,2-Dibromoethane | 1.0 | U | 0.73 | 1.0 |
| 1,2-Dichloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,2-Dichloropropane | 1.0 | U | 0.72 | 1.0 |
| 2-Hexanone | 5.0 | U | 1.2 | 5.0 |
| 2-Butanone (MEK) | 10 | U | 1.3 | 10 |
| 4-Methyl-2-pentanone (MIBK) | 5.0 | U | 2.1 | 5.0 |
| Acetone | 10 | U | 3.0 | 10 |
| Benzene | 1.0 | U | 0.41 | 1.0 |
| Bromodichloromethane | 1.0 | U | 0.39 | 1.0 |
| Bromoform | 1.0 | U | 0.26 | 1.0 |
| Bromomethane | 1.0 | U | 0.69 | 1.0 |
| Carbon disulfide | 1.0 | U | 0.19 | 1.0 |
| Carbon tetrachloride | 1.0 | U | 0.27 | 1.0 |
| Chlorobenzene | 1.0 | U | 0.75 | 1.0 |
| Dibromochloromethane | 1.0 | U | 0.32 | 1.0 |
| Chloroethane | 1.0 | U | 0.32 | 1.0 |
| Chloroform | 1.0 | U | 0.34 | 1.0 |
| Chloromethane | 1.0 | U | 0.35 | 1.0 |
| cis-1,2-Dichloroethene | 1.0 | U | 0.81 | 1.0 |
| cis-1,3-Dichloropropene | 1.0 | U | 0.36 | 1.0 |
| Ethylbenzene | 1.0 | U | 0.74 | 1.0 |
| Methylene Chloride | 1.0 | U | 0.44 | 1.0 |
| Styrene | 1.0 | U | 0.73 | 1.0 |
| Tetrachloroethene | 1.0 | U | 0.36 | 1.0 |
| Toluene | 1.0 | U | 0.51 | 1.0 |
| trans-1,2-Dichloroethene | 1.0 | U | 0.90 | 1.0 |
| trans-1,3-Dichloropropene | 1.0 | U | 0.37 | 1.0 |
| Trichloroethene | 1.0 | U | 0.46 | 1.0 |
| Vinyl chloride | 1.0 | U | 0.90 | 1.0 |
| Xylenes, Total | 2.0 | U | 0.66 | 2.0 |
| m,p-Xylene | 2.0 | U | 0.66 | 2.0 |
| o-Xylene | 1.0 | U | 0.76 | 1.0 |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 108 | 66 - 137 |
| Toluene-d8 (Surr) | 108 | 71 - 126 |
| 4-Bromofluorobenzene (Surr) | 96 | 73 - 120 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

**Lab Control Sample - Batch: 480-43907**

**Method: 8260B**
**Preparation: 5030B**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | LCS 480-43907/5 | Analysis Batch: | 480-43907 | Instrument ID: | HP5973N |
| Client Matrix: | Water | Prep Batch: | N/A | Lab File ID: | N4344.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 12/10/2011 1142 | Units: | ug/L | Final Weight/Volume: | 5 mL |
| Prep Date: | 12/10/2011 1142 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| 1,1-Dichloroethane | 25.0 | 25.4 | 102 | 71 - 129 | |
| 1,1-Dichloroethene | 25.0 | 24.3 | 97 | 65 - 138 | |
| 1,2-Dichloroethane | 25.0 | 25.6 | 102 | 75 - 127 | |
| Benzene | 25.0 | 23.7 | 95 | 71 - 124 | |
| Chlorobenzene | 25.0 | 24.2 | 97 | 72 - 120 | |
| cis-1,2-Dichloroethene | 25.0 | 25.0 | 100 | 74 - 124 | |
| Ethylbenzene | 25.0 | 24.4 | 98 | 77 - 123 | |
| Tetrachloroethene | 25.0 | 24.7 | 99 | 74 - 122 | |
| Toluene | 25.0 | 23.5 | 94 | 70 - 122 | |
| trans-1,2-Dichloroethene | 25.0 | 26.0 | 104 | 73 - 127 | |
| Trichloroethene | 25.0 | 24.7 | 99 | 74 - 123 | |
| m,p-Xylene | 50.0 | 48.1 | 96 | 76 - 122 | |
| o-Xylene | 25.0 | 24.4 | 98 | 76 - 122 | |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 111 | 66 - 137 |
| Toluene-d8 (Surr) | 108 | 71 - 126 |
| 4-Bromofluorobenzene (Surr) | 104 | 73 - 120 |

## DATA REPORTING QUALIFIERS

Client: Malcolm Pirnie, Inc. Invoice to Arcadis Job Number: 480-13331-1

| Lab Section | Qualifier | Description |
|---|---|---|
| GC/MS VOA | | |
| | U | Analyzed for but not detected. |
| | E | Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis. |
| | J | Indicates an estimated value. |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

## QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| **GC/MS VOA** | | | | | |
| **Analysis Batch:480-43191** | | | | | |
| LCS 480-43191/4 | Lab Control Sample | T | Water | 8260B | |
| MB 480-43191/5 | Method Blank | T | Water | 8260B | |
| 480-13331-1 | WELL 1-1A INF | T | Water | 8260B | |
| 480-13331-2 | WELL 1-1A EFF | T | Water | 8260B | |
| 480-13331-3TB | TRIP BLANK | T | Water | 8260B | |
| **Analysis Batch:480-43907** | | | | | |
| LCS 480-43907/5 | Lab Control Sample | T | Water | 8260B | |
| MB 480-43907/28 | Method Blank | T | Water | 8260B | |
| 480-13331-1DL | WELL 1-1A INF | T | Water | 8260B | |

**Report Basis**

T = Total

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-13331-1

## Laboratory Chronicle

**Lab ID:** 480-13331-1 **Client ID:** WELL 1-1A INF

Sample Date/Time: 11/29/2011 12:15 Received Date/Time: 11/30/2011 10:15

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | 480-13331-A-1 | | 480-43191 | | 12/07/2011 17:35 | 1 | TAL BUF | DC |
| A:8260B | 480-13331-A-1 | | 480-43191 | | 12/07/2011 17:35 | 1 | TAL BUF | DC |
| P:5030B | 480-13331-C-1 | DL | 480-43907 | | 12/10/2011 13:59 | 4 | TAL BUF | JMB |
| A:8260B | 480-13331-C-1 | DL | 480-43907 | | 12/10/2011 13:59 | 4 | TAL BUF | JMB |

**Lab ID:** 480-13331-2 **Client ID:** WELL 1-1A EFF

Sample Date/Time: 11/29/2011 12:20 Received Date/Time: 11/30/2011 10:15

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | 480-13331-A-2 | | 480-43191 | | 12/07/2011 17:57 | 1 | TAL BUF | DC |
| A:8260B | 480-13331-A-2 | | 480-43191 | | 12/07/2011 17:57 | 1 | TAL BUF | DC |

**Lab ID:** 480-13331-3 **Client ID:** TRIP BLANK

Sample Date/Time: 11/29/2011 00:00 Received Date/Time: 11/30/2011 10:15

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | 480-13331-A-3 | | 480-43191 | | 12/07/2011 18:19 | 1 | TAL BUF | DC |
| A:8260B | 480-13331-A-3 | | 480-43191 | | 12/07/2011 18:19 | 1 | TAL BUF | DC |

**Lab ID:** MB **Client ID:** N/A

Sample Date/Time: N/A Received Date/Time: N/A

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | MB 480-43191/5 | | 480-43191 | | 12/07/2011 14:46 | 1 | TAL BUF | DC |
| A:8260B | MB 480-43191/5 | | 480-43191 | | 12/07/2011 14:46 | 1 | TAL BUF | DC |
| P:5030B | MB 480-43907/28 | | 480-43907 | | 12/10/2011 12:05 | 1 | TAL BUF | JMB |
| A:8260B | MB 480-43907/28 | | 480-43907 | | 12/10/2011 12:05 | 1 | TAL BUF | JMB |

**Lab ID:** LCS **Client ID:** N/A

Sample Date/Time: N/A Received Date/Time: N/A

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | LCS 480-43191/4 | | 480-43191 | | 12/07/2011 15:12 | 1 | TAL BUF | DC |
| A:8260B | LCS 480-43191/4 | | 480-43191 | | 12/07/2011 15:12 | 1 | TAL BUF | DC |
| P:5030B | LCS 480-43907/5 | | 480-43907 | | 12/10/2011 11:42 | 1 | TAL BUF | JMB |
| A:8260B | LCS 480-43907/5 | | 480-43907 | | 12/10/2011 11:42 | 1 | TAL BUF | JMB |

**Lab References:**

TAL BUF = TestAmerica Buffalo

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

Job Number: 480-14361-1

Job Description: NYSDEC-Standby VESTAL

For:
Malcolm Pirnie, Inc. Invoice to Arcadis
855 Route 146
Suite 210
Clifton Park, NY 12065

Attention: Mr. Jeremy Wyckoff

Approved for release.
Melissa L Deyo
Project Administrator
1/9/2012 3:48 PM

Designee for
Sally Hoffman
Project Manager II
sally.hoffman@testamericainc.com
01/09/2012

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**TestAmerica Laboratories, Inc.**
TestAmerica Buffalo 10 Hazelwood Drive, Amherst, NY 14228-2298
Tel (716) 691-2600 Fax (716) 691-7991 www.testamericainc.com

ACCREDITED IN ACCORDANCE WITH nelac

# Table of Contents

# Table of Contents

**Job Narrative**
**480-14361-1**

**Receipt**
All samples were received in good condition within temperature requirements.

**GC/MS VOA**
Method 8260B: The following sample was diluted due to the abundance of target analytes: WELL 1-1A INF (480-14361-1). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

## SAMPLE SUMMARY

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-14361-1

| Lab Sample ID | Client Sample ID | Client Matrix | Date/Time Sampled | Date/Time Received |
|---|---|---|---|---|
| 480-14361-1 | WELL 1-1A INF | Water | 12/21/2011 1050 | 12/22/2011 1015 |
| 480-14361-2 | WELL 1-1A EFF | Water | 12/21/2011 1055 | 12/22/2011 1015 |
| 480-14361-3TB | TRIP BLANK | Water | 12/21/2011 0000 | 12/22/2011 1015 |

## EXECUTIVE SUMMARY - Detections

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-14361-1

| Lab Sample ID / Analyte | Client Sample ID | Result | Qualifier | Reporting Limit | Units | Method |
|---|---|---|---|---|---|---|
| **480-14361-1** | **WELL 1-1A INF** | | | | | |
| 1,1,1-Trichloroethane | | 150 | | 2.0 | ug/L | 8260B |
| 1,1-Dichloroethane | | 22 | | 2.0 | ug/L | 8260B |
| 1,1-Dichloroethene | | 18 | | 2.0 | ug/L | 8260B |
| cis-1,2-Dichloroethene | | 51 | | 2.0 | ug/L | 8260B |
| Trichloroethene | | 53 | | 2.0 | ug/L | 8260B |
| Vinyl chloride | | 7.1 | | 2.0 | ug/L | 8260B |
| **480-14361-3TB** | **TRIP BLANK** | | | | | |
| Methylene Chloride | | 1.8 | | 1.0 | ug/L | 8260B |

# METHOD SUMMARY

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-14361-1

| Description | Lab Location | Method | Preparation Method |
|---|---|---|---|
| **Matrix Water** | | | |
| Volatile Organic Compounds (GC/MS) | TAL BUF | SW846 8260B | |
| Purge and Trap | TAL BUF | | SW846 5030B |

**Lab References:**

TAL BUF = TestAmerica Buffalo

**Method References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

## METHOD / ANALYST SUMMARY

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-14361-1

| Method | Analyst | Analyst ID |
|---|---|---|
| SW846 8260B | Brandt, Todd R | TRB |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-14361-1

**Client Sample ID:** **WELL 1-1A INF**

Lab Sample ID: 480-14361-1
Client Matrix: Water

Date Sampled: 12/21/2011 1050
Date Received: 12/22/2011 1015

**8260B Volatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8260B | Analysis Batch: | 480-46435 | Instrument ID: | HP5973J |
| Prep Method: | 5030B | Prep Batch: | N/A | Lab File ID: | J3956.D |
| Dilution: | 2.0 | | | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 12/30/2011 0214 | | | Final Weight/Volume: | 5 mL |
| Prep Date: | 12/30/2011 0214 | | | | |

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | 150 | | 1.6 | 2.0 |
| 1,1,2,2-Tetrachloroethane | 2.0 | U | 0.42 | 2.0 |
| 1,1,2-Trichloroethane | 2.0 | U | 0.46 | 2.0 |
| 1,1-Dichloroethane | 22 | | 0.76 | 2.0 |
| 1,1-Dichloroethene | 18 | | 0.58 | 2.0 |
| 1,2-Dibromoethane | 2.0 | U | 1.5 | 2.0 |
| 1,2-Dichloroethane | 2.0 | U | 0.42 | 2.0 |
| 1,2-Dichloropropane | 2.0 | U | 1.4 | 2.0 |
| 2-Hexanone | 10 | U | 2.5 | 10 |
| 2-Butanone (MEK) | 20 | U | 2.6 | 20 |
| 4-Methyl-2-pentanone (MIBK) | 10 | U | 4.2 | 10 |
| Acetone | 20 | U | 6.0 | 20 |
| Benzene | 2.0 | U | 0.82 | 2.0 |
| Bromodichloromethane | 2.0 | U | 0.78 | 2.0 |
| Bromoform | 2.0 | U | 0.52 | 2.0 |
| Bromomethane | 2.0 | U | 1.4 | 2.0 |
| Carbon disulfide | 2.0 | U | 0.38 | 2.0 |
| Carbon tetrachloride | 2.0 | U | 0.54 | 2.0 |
| Chlorobenzene | 2.0 | U | 1.5 | 2.0 |
| Dibromochloromethane | 2.0 | U | 0.64 | 2.0 |
| Chloroethane | 2.0 | U | 0.64 | 2.0 |
| Chloroform | 2.0 | U | 0.68 | 2.0 |
| Chloromethane | 2.0 | U | 0.70 | 2.0 |
| cis-1,2-Dichloroethene | 51 | | 1.6 | 2.0 |
| cis-1,3-Dichloropropene | 2.0 | U | 0.72 | 2.0 |
| Ethylbenzene | 2.0 | U | 1.5 | 2.0 |
| Methylene Chloride | 2.0 | U | 0.88 | 2.0 |
| Styrene | 2.0 | U | 1.5 | 2.0 |
| Tetrachloroethene | 2.0 | U | 0.72 | 2.0 |
| Toluene | 2.0 | U | 1.0 | 2.0 |
| trans-1,2-Dichloroethene | 2.0 | U | 1.8 | 2.0 |
| trans-1,3-Dichloropropene | 2.0 | U | 0.74 | 2.0 |
| Trichloroethene | 53 | | 0.92 | 2.0 |
| Vinyl chloride | 7.1 | | 1.8 | 2.0 |
| Xylenes, Total | 4.0 | U | 1.3 | 4.0 |
| m,p-Xylene | 4.0 | U | 1.3 | 4.0 |
| o-Xylene | 2.0 | U | 1.5 | 2.0 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 95 | | 66 - 137 |
| Toluene-d8 (Surr) | 101 | | 71 - 126 |
| 4-Bromofluorobenzene (Surr) | 96 | | 73 - 120 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-14361-1

**Client Sample ID:** **WELL 1-1A EFF**

Lab Sample ID: 480-14361-2
Client Matrix: Water

Date Sampled: 12/21/2011 1055
Date Received: 12/22/2011 1015

**8260B Volatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8260B | Analysis Batch: | 480-46435 | Instrument ID: | HP5973J |
| Prep Method: | 5030B | Prep Batch: | N/A | Lab File ID: | J3934.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 12/29/2011 1758 | | | Final Weight/Volume: | 5 mL |
| Prep Date: | 12/29/2011 1758 | | | | |

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | 1.0 | U | 0.82 | 1.0 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.23 | 1.0 |
| 1,1-Dichloroethane | 1.0 | U | 0.38 | 1.0 |
| 1,1-Dichloroethene | 1.0 | U | 0.29 | 1.0 |
| 1,2-Dibromoethane | 1.0 | U | 0.73 | 1.0 |
| 1,2-Dichloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,2-Dichloropropane | 1.0 | U | 0.72 | 1.0 |
| 2-Hexanone | 5.0 | U | 1.2 | 5.0 |
| 2-Butanone (MEK) | 10 | U | 1.3 | 10 |
| 4-Methyl-2-pentanone (MIBK) | 5.0 | U | 2.1 | 5.0 |
| Acetone | 10 | U | 3.0 | 10 |
| Benzene | 1.0 | U | 0.41 | 1.0 |
| Bromodichloromethane | 1.0 | U | 0.39 | 1.0 |
| Bromoform | 1.0 | U | 0.26 | 1.0 |
| Bromomethane | 1.0 | U | 0.69 | 1.0 |
| Carbon disulfide | 1.0 | U | 0.19 | 1.0 |
| Carbon tetrachloride | 1.0 | U | 0.27 | 1.0 |
| Chlorobenzene | 1.0 | U | 0.75 | 1.0 |
| Dibromochloromethane | 1.0 | U | 0.32 | 1.0 |
| Chloroethane | 1.0 | U | 0.32 | 1.0 |
| Chloroform | 1.0 | U | 0.34 | 1.0 |
| Chloromethane | 1.0 | U | 0.35 | 1.0 |
| cis-1,2-Dichloroethene | 1.0 | U | 0.81 | 1.0 |
| cis-1,3-Dichloropropene | 1.0 | U | 0.36 | 1.0 |
| Ethylbenzene | 1.0 | U | 0.74 | 1.0 |
| Methylene Chloride | 1.0 | U | 0.44 | 1.0 |
| Styrene | 1.0 | U | 0.73 | 1.0 |
| Tetrachloroethene | 1.0 | U | 0.36 | 1.0 |
| Toluene | 1.0 | U | 0.51 | 1.0 |
| trans-1,2-Dichloroethene | 1.0 | U | 0.90 | 1.0 |
| trans-1,3-Dichloropropene | 1.0 | U | 0.37 | 1.0 |
| Trichloroethene | 1.0 | U | 0.46 | 1.0 |
| Vinyl chloride | 1.0 | U | 0.90 | 1.0 |
| Xylenes, Total | 2.0 | U | 0.66 | 2.0 |
| m,p-Xylene | 2.0 | U | 0.66 | 2.0 |
| o-Xylene | 1.0 | U | 0.76 | 1.0 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 92 | | 66 - 137 |
| Toluene-d8 (Surr) | 102 | | 71 - 126 |
| 4-Bromofluorobenzene (Surr) | 98 | | 73 - 120 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-14361-1

**Client Sample ID:** **TRIP BLANK**

Lab Sample ID: 480-14361-3TB
Client Matrix: Water

Date Sampled: 12/21/2011 0000
Date Received: 12/22/2011 1015

**8260B Volatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8260B | Analysis Batch: | 480-46435 | Instrument ID: | HP5973J |
| Prep Method: | 5030B | Prep Batch: | N/A | Lab File ID: | J3935.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 12/29/2011 1820 | | | Final Weight/Volume: | 5 mL |
| Prep Date: | 12/29/2011 1820 | | | | |

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | 1.0 | U | 0.82 | 1.0 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.23 | 1.0 |
| 1,1-Dichloroethane | 1.0 | U | 0.38 | 1.0 |
| 1,1-Dichloroethene | 1.0 | U | 0.29 | 1.0 |
| 1,2-Dibromoethane | 1.0 | U | 0.73 | 1.0 |
| 1,2-Dichloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,2-Dichloropropane | 1.0 | U | 0.72 | 1.0 |
| 2-Hexanone | 5.0 | U | 1.2 | 5.0 |
| 2-Butanone (MEK) | 10 | U | 1.3 | 10 |
| 4-Methyl-2-pentanone (MIBK) | 5.0 | U | 2.1 | 5.0 |
| Acetone | 10 | U | 3.0 | 10 |
| Benzene | 1.0 | U | 0.41 | 1.0 |
| Bromodichloromethane | 1.0 | U | 0.39 | 1.0 |
| Bromoform | 1.0 | U | 0.26 | 1.0 |
| Bromomethane | 1.0 | U | 0.69 | 1.0 |
| Carbon disulfide | 1.0 | U | 0.19 | 1.0 |
| Carbon tetrachloride | 1.0 | U | 0.27 | 1.0 |
| Chlorobenzene | 1.0 | U | 0.75 | 1.0 |
| Dibromochloromethane | 1.0 | U | 0.32 | 1.0 |
| Chloroethane | 1.0 | U | 0.32 | 1.0 |
| Chloroform | 1.0 | U | 0.34 | 1.0 |
| Chloromethane | 1.0 | U | 0.35 | 1.0 |
| cis-1,2-Dichloroethene | 1.0 | U | 0.81 | 1.0 |
| cis-1,3-Dichloropropene | 1.0 | U | 0.36 | 1.0 |
| Ethylbenzene | 1.0 | U | 0.74 | 1.0 |
| Methylene Chloride | 1.8 | | 0.44 | 1.0 |
| Styrene | 1.0 | U | 0.73 | 1.0 |
| Tetrachloroethene | 1.0 | U | 0.36 | 1.0 |
| Toluene | 1.0 | U | 0.51 | 1.0 |
| trans-1,2-Dichloroethene | 1.0 | U | 0.90 | 1.0 |
| trans-1,3-Dichloropropene | 1.0 | U | 0.37 | 1.0 |
| Trichloroethene | 1.0 | U | 0.46 | 1.0 |
| Vinyl chloride | 1.0 | U | 0.90 | 1.0 |
| Xylenes, Total | 2.0 | U | 0.66 | 2.0 |
| m,p-Xylene | 2.0 | U | 0.66 | 2.0 |
| o-Xylene | 1.0 | U | 0.76 | 1.0 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 92 | | 66 - 137 |
| Toluene-d8 (Surr) | 101 | | 71 - 126 |
| 4-Bromofluorobenzene (Surr) | 96 | | 73 - 120 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-14361-1

## Surrogate Recovery Report

**8260B Volatile Organic Compounds (GC/MS)**

**Client Matrix: Water**

| Lab Sample ID | Client Sample ID | DCA %Rec | TOL %Rec | BFB %Rec |
|---|---|---|---|---|
| 480-14361-1 | WELL 1-1A INF | 95 | 101 | 96 |
| 480-14361-2 | WELL 1-1A EFF | 92 | 102 | 98 |
| 480-14361-3 | TRIP BLANK | 92 | 101 | 96 |
| MB 480-46435/4 | | 96 | 102 | 98 |
| LCS 480-46435/3 | | 93 | 102 | 100 |

| Surrogate | Acceptance Limits |
|---|---|
| DCA = 1,2-Dichloroethane-d4 (Surr) | 66-137 |
| TOL = Toluene-d8 (Surr) | 71-126 |
| BFB = 4-Bromofluorobenzene (Surr) | 73-120 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-14361-1

**Method Blank - Batch: 480-46435**

**Method: 8260B**
**Preparation: 5030B**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 480-46435/4 | Analysis Batch: | 480-46435 | Instrument ID: | HP5973J |
| Client Matrix: | Water | Prep Batch: | N/A | Lab File ID: | J3932.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 12/29/2011 1709 | Units: | ug/L | Final Weight/Volume: | 5 mL |
| Prep Date: | 12/29/2011 1709 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Result | Qual | MDL | RL |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | 1.0 | U | 0.82 | 1.0 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.23 | 1.0 |
| 1,1-Dichloroethane | 1.0 | U | 0.38 | 1.0 |
| 1,1-Dichloroethene | 1.0 | U | 0.29 | 1.0 |
| 1,2-Dibromoethane | 1.0 | U | 0.73 | 1.0 |
| 1,2-Dichloroethane | 1.0 | U | 0.21 | 1.0 |
| 1,2-Dichloropropane | 1.0 | U | 0.72 | 1.0 |
| 2-Hexanone | 5.0 | U | 1.2 | 5.0 |
| 2-Butanone (MEK) | 10 | U | 1.3 | 10 |
| 4-Methyl-2-pentanone (MIBK) | 5.0 | U | 2.1 | 5.0 |
| Acetone | 10 | U | 3.0 | 10 |
| Benzene | 1.0 | U | 0.41 | 1.0 |
| Bromodichloromethane | 1.0 | U | 0.39 | 1.0 |
| Bromoform | 1.0 | U | 0.26 | 1.0 |
| Bromomethane | 1.0 | U | 0.69 | 1.0 |
| Carbon disulfide | 1.0 | U | 0.19 | 1.0 |
| Carbon tetrachloride | 1.0 | U | 0.27 | 1.0 |
| Chlorobenzene | 1.0 | U | 0.75 | 1.0 |
| Dibromochloromethane | 1.0 | U | 0.32 | 1.0 |
| Chloroethane | 1.0 | U | 0.32 | 1.0 |
| Chloroform | 1.0 | U | 0.34 | 1.0 |
| Chloromethane | 1.0 | U | 0.35 | 1.0 |
| cis-1,2-Dichloroethene | 1.0 | U | 0.81 | 1.0 |
| cis-1,3-Dichloropropene | 1.0 | U | 0.36 | 1.0 |
| Ethylbenzene | 1.0 | U | 0.74 | 1.0 |
| Methylene Chloride | 1.0 | U | 0.44 | 1.0 |
| Styrene | 1.0 | U | 0.73 | 1.0 |
| Tetrachloroethene | 1.0 | U | 0.36 | 1.0 |
| Toluene | 1.0 | U | 0.51 | 1.0 |
| trans-1,2-Dichloroethene | 1.0 | U | 0.90 | 1.0 |
| trans-1,3-Dichloropropene | 1.0 | U | 0.37 | 1.0 |
| Trichloroethene | 1.0 | U | 0.46 | 1.0 |
| Vinyl chloride | 1.0 | U | 0.90 | 1.0 |
| Xylenes, Total | 2.0 | U | 0.66 | 2.0 |
| m,p-Xylene | 2.0 | U | 0.66 | 2.0 |
| o-Xylene | 1.0 | U | 0.76 | 1.0 |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 96 | 66 - 137 |
| Toluene-d8 (Surr) | 102 | 71 - 126 |
| 4-Bromofluorobenzene (Surr) | 98 | 73 - 120 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-14361-1

**Lab Control Sample - Batch: 480-46435**

**Method: 8260B**
**Preparation: 5030B**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | LCS 480-46435/3 | Analysis Batch: | 480-46435 | Instrument ID: | HP5973J |
| Client Matrix: | Water | Prep Batch: | N/A | Lab File ID: | J3931.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 12/29/2011 1646 | Units: | ug/L | Final Weight/Volume: | 5 mL |
| Prep Date: | 12/29/2011 1646 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| 1,1-Dichloroethane | 25.0 | 23.4 | 94 | 71 - 129 | |
| 1,1-Dichloroethene | 25.0 | 19.8 | 79 | 65 - 138 | |
| 1,2-Dichloroethane | 25.0 | 23.1 | 92 | 75 - 127 | |
| Benzene | 25.0 | 24.0 | 96 | 71 - 124 | |
| Chlorobenzene | 25.0 | 25.9 | 104 | 72 - 120 | |
| cis-1,2-Dichloroethene | 25.0 | 23.6 | 94 | 74 - 124 | |
| Ethylbenzene | 25.0 | 25.6 | 102 | 77 - 123 | |
| Tetrachloroethene | 25.0 | 25.4 | 102 | 74 - 122 | |
| Toluene | 25.0 | 25.1 | 100 | 70 - 122 | |
| trans-1,2-Dichloroethene | 25.0 | 23.6 | 94 | 73 - 127 | |
| Trichloroethene | 25.0 | 24.1 | 96 | 74 - 123 | |
| m,p-Xylene | 50.0 | 52.6 | 105 | 76 - 122 | |
| o-Xylene | 25.0 | 26.2 | 105 | 76 - 122 | |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 93 | 66 - 137 |
| Toluene-d8 (Surr) | 102 | 71 - 126 |
| 4-Bromofluorobenzene (Surr) | 100 | 73 - 120 |

## DATA REPORTING QUALIFIERS

Client: Malcolm Pirnie, Inc. Invoice to Arcadis Job Number: 480-14361-1

| Lab Section | Qualifier | Description |
|---|---|---|
| GC/MS VOA | | |
| | U | Analyzed for but not detected. |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-14361-1

## QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| **GC/MS VOA** | | | | | |
| **Analysis Batch:480-46435** | | | | | |
| LCS 480-46435/3 | Lab Control Sample | T | Water | 8260B | |
| MB 480-46435/4 | Method Blank | T | Water | 8260B | |
| 480-14361-1 | WELL 1-1A INF | T | Water | 8260B | |
| 480-14361-2 | WELL 1-1A EFF | T | Water | 8260B | |
| 480-14361-3TB | TRIP BLANK | T | Water | 8260B | |

**Report Basis**

T = Total

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 480-14361-1

## Laboratory Chronicle

**Lab ID:** 480-14361-1 **Client ID:** WELL 1-1A INF

Sample Date/Time: 12/21/2011 10:50 Received Date/Time: 12/22/2011 10:15

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | 480-14361-B-1 | | 480-46435 | | 12/30/2011 02:14 | 2 | TAL BUF | TRB |
| A:8260B | 480-14361-B-1 | | 480-46435 | | 12/30/2011 02:14 | 2 | TAL BUF | TRB |

**Lab ID:** 480-14361-2 **Client ID:** WELL 1-1A EFF

Sample Date/Time: 12/21/2011 10:55 Received Date/Time: 12/22/2011 10:15

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | 480-14361-A-2 | | 480-46435 | | 12/29/2011 17:58 | 1 | TAL BUF | TRB |
| A:8260B | 480-14361-A-2 | | 480-46435 | | 12/29/2011 17:58 | 1 | TAL BUF | TRB |

**Lab ID:** 480-14361-3 **Client ID:** TRIP BLANK

Sample Date/Time: 12/21/2011 00:00 Received Date/Time: 12/22/2011 10:15

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | 480-14361-A-3 | | 480-46435 | | 12/29/2011 18:20 | 1 | TAL BUF | TRB |
| A:8260B | 480-14361-A-3 | | 480-46435 | | 12/29/2011 18:20 | 1 | TAL BUF | TRB |

**Lab ID:** MB **Client ID:** N/A

Sample Date/Time: N/A Received Date/Time: N/A

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | MB 480-46435/4 | | 480-46435 | | 12/29/2011 17:09 | 1 | TAL BUF | TRB |
| A:8260B | MB 480-46435/4 | | 480-46435 | | 12/29/2011 17:09 | 1 | TAL BUF | TRB |

**Lab ID:** LCS **Client ID:** N/A

Sample Date/Time: N/A Received Date/Time: N/A

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | LCS 480-46435/3 | | 480-46435 | | 12/29/2011 16:46 | 1 | TAL BUF | TRB |
| A:8260B | LCS 480-46435/3 | | 480-46435 | | 12/29/2011 16:46 | 1 | TAL BUF | TRB |

**Lab References:**

TAL BUF = TestAmerica Buffalo

# Certification Summary

Client: Malcolm Pirnie, Inc. Invoice to Arcadis
Project/Site: NYSDEC-Standby VESTAL

TestAmerica Job ID: 480-14361-1

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Buffalo | Arkansas | State Program | 6 | 88-0686 |
| TestAmerica Buffalo | California | NELAC | 9 | 1169CA |
| TestAmerica Buffalo | Connecticut | State Program | 1 | PH-0568 |
| TestAmerica Buffalo | Florida | NELAC | 4 | E87672 |
| TestAmerica Buffalo | Georgia | Georgia EPD | 4 | N/A |
| TestAmerica Buffalo | Georgia | State Program | 4 | 956 |
| TestAmerica Buffalo | Illinois | NELAC | 5 | 100325 / 200003 |
| TestAmerica Buffalo | Iowa | State Program | 7 | 374 |
| TestAmerica Buffalo | Kansas | NELAC | 7 | E-10187 |
| TestAmerica Buffalo | Kentucky | Kentucky UST | 4 | 30 |
| TestAmerica Buffalo | Kentucky | State Program | 4 | 90029 |
| TestAmerica Buffalo | Louisiana | NELAC | 6 | 02031 |
| TestAmerica Buffalo | Maine | State Program | 1 | NY0044 |
| TestAmerica Buffalo | Maryland | State Program | 3 | 294 |
| TestAmerica Buffalo | Massachusetts | State Program | 1 | M-NY044 |
| TestAmerica Buffalo | Michigan | State Program | 5 | 9937 |
| TestAmerica Buffalo | Minnesota | NELAC | 5 | 036-999-337 |
| TestAmerica Buffalo | New Hampshire | NELAC | 1 | 2337 |
| TestAmerica Buffalo | New Hampshire | NELAC | 1 | 68-00281 |
| TestAmerica Buffalo | New Jersey | NELAC | 2 | NY455 |
| TestAmerica Buffalo | New York | NELAC | 2 | 10026 |
| TestAmerica Buffalo | North Dakota | State Program | 8 | R-176 |
| TestAmerica Buffalo | Oklahoma | State Program | 6 | 9421 |
| TestAmerica Buffalo | Oregon | NELAC | 10 | NY200003 |
| TestAmerica Buffalo | Pennsylvania | NELAC | 3 | 68-00281 |
| TestAmerica Buffalo | Tennessee | State Program | 4 | TN02970 |
| TestAmerica Buffalo | Texas | NELAC | 6 | T104704412-08-TX |
| TestAmerica Buffalo | USDA | USDA | | P330-08-00242 |
| TestAmerica Buffalo | Virginia | NELAC Secondary AB | 3 | 460185 |
| TestAmerica Buffalo | Virginia | State Program | 3 | 278 |
| TestAmerica Buffalo | Washington | State Program | 10 | C1677 |
| TestAmerica Buffalo | Wisconsin | State Program | 5 | 998310390 |

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# ANALYTICAL REPORT

Job Number: 220-16783-1

Job Description: NYSDEC Standby - Vestal Water Supply

For:
Malcolm Pirnie, Inc. Invoice to Arcadis
855 Route 146
Suite 210
Clifton Park, NY 12065

Attention: Mr. Jeremy Wyckoff

Approved for release.
Joan Widomski
Project Manager I
11/10/2011 11:55 AM

Designee for
Jackie Trudell
Project Manager I
jackie.trudell@testamericainc.com
11/10/2011

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**TestAmerica Laboratories, Inc.**
TestAmerica Connecticut 128 Long Hill Cross Road, Shelton, CT 06484
Tel (203) 929-8140 Fax (203) 929-8142 www.testamericainc.com

Job Number: 220-16783-1

Job Description: NYSDEC Standby - Vestal Water Supply

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed within the body of this report. Release of the data contained in this sample data package and in the electronic data deliverable has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Approved for release.
Joan Widomski
Project Manager I
11/10/2011 11:55 AM

Designee for
Jackie Trudell

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**Comments**
No additional comments.

**Receipt**
All samples were received in good condition within temperature requirements.

**GC/MS VOA**
No analytical or quality issues were noted.

# SAMPLE SUMMARY

Client: Malcolm Pirnie, Inc. Invoice to Arcadis Job Number: 220-16783-1

| Lab Sample ID | Client Sample ID | Client Matrix | Date/Time Sampled | Date/Time Received |
|---|---|---|---|---|
| 220-16783-1 | Well 1-1A INF | Water | 10/26/2011 1440 | 10/27/2011 1010 |
| 220-16783-2 | Well 1-1A EFF | Water | 10/26/2011 1445 | 10/27/2011 1010 |
| 220-16783-3TB | Trip Blank | Water | 10/26/2011 1440 | 10/27/2011 1010 |

# EXECUTIVE SUMMARY - Detections

Client: Malcolm Pirnie, Inc. Invoice to Arcadis Job Number: 220-16783-1

| Lab Sample ID / Analyte | Client Sample ID | Result | Qualifier | Reporting Limit | Units | Method |
|---|---|---|---|---|---|---|
| **220-16783-1** | **WELL 1-1A INF** | | | | | |
| Acetone | | 2.7 | J | 10 | ug/L | 8260B |
| 1,1-Dichloroethane | | 23 | | 5.0 | ug/L | 8260B |
| 1,1-Dichloroethene | | 16 | | 5.0 | ug/L | 8260B |
| 1,1,1-Trichloroethane | | 190 | | 5.0 | ug/L | 8260B |
| Trichloroethene | | 53 | | 5.0 | ug/L | 8260B |
| Vinyl chloride | | 8.1 | | 5.0 | ug/L | 8260B |
| cis-1,2-Dichloroethene | | 57 | | 5.0 | ug/L | 8260B |
| **220-16783-2** | **WELL 1-1A EFF** | | | | | |
| Acetone | | 1.5 | J | 10 | ug/L | 8260B |
| **220-16783-3TB** | **TRIP BLANK** | | | | | |
| Acetone | | 4.0 | J | 10 | ug/L | 8260B |
| Methylene Chloride | | 2.7 | J B | 5.0 | ug/L | 8260B |

# METHOD SUMMARY

Client: Malcolm Pirnie, Inc. Invoice to Arcadis Job Number: 220-16783-1

| Description | Lab Location | Method | Preparation Method |
|---|---|---|---|
| **Matrix Water** | | | |
| Volatile Organic Compounds (GC/MS) | TAL CT | SW846 8260B | |
| Purge and Trap | TAL CT | | SW846 5030B |

**Lab References:**

TAL CT = TestAmerica Connecticut

**Method References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

## METHOD / ANALYST SUMMARY

Client: Malcolm Pirnie, Inc. Invoice to Arcadis Job Number: 220-16783-1

| Method | Analyst | Analyst ID |
|---|---|---|
| SW846 8260B | Humbert, Dave | DH |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis  Job Number: 220-16783-1

**Client Sample ID:** **Well 1-1A INF**

Lab Sample ID: 220-16783-1  Date Sampled: 10/26/2011 1440
Client Matrix: Water  Date Received: 10/27/2011 1010

**8260B Volatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8260B | Analysis Batch: | 220-55802 | Instrument ID: | MSN |
| Prep Method: | 5030B | Prep Batch: | N/A | Lab File ID: | N5308.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 10/28/2011 2226 | | | Final Weight/Volume: | 5 mL |
| Prep Date: | 10/28/2011 2226 | | | | |

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| Acetone | 2.7 | J | 1.0 | 10 |
| Benzene | 5.0 | U | 0.74 | 5.0 |
| Bromodichloromethane | 5.0 | U | 0.48 | 5.0 |
| Bromoform | 5.0 | U | 0.46 | 5.0 |
| Bromomethane | 5.0 | U | 2.1 | 5.0 |
| Methyl Ethyl Ketone | 10 | U | 1.1 | 10 |
| Carbon disulfide | 5.0 | U | 0.90 | 5.0 |
| Carbon tetrachloride | 5.0 | U | 1.1 | 5.0 |
| Chlorobenzene | 5.0 | U | 0.72 | 5.0 |
| Chloroethane | 5.0 | U | 1.1 | 5.0 |
| Chloroform | 5.0 | U | 0.67 | 5.0 |
| Chloromethane | 5.0 | U | 1.1 | 5.0 |
| Dibromochloromethane | 5.0 | U | 0.55 | 5.0 |
| 1,1-Dichloroethane | 23 | | 1.0 | 5.0 |
| 1,2-Dichloroethane | 5.0 | U | 0.72 | 5.0 |
| 1,1-Dichloroethene | 16 | | 0.83 | 5.0 |
| 1,2-Dichloropropane | 5.0 | U | 0.71 | 5.0 |
| cis-1,3-Dichloropropene | 5.0 | U | 0.28 | 5.0 |
| trans-1,3-Dichloropropene | 5.0 | U | 0.57 | 5.0 |
| Ethylbenzene | 5.0 | U | 0.87 | 5.0 |
| 2-Hexanone | 10 | U | 1.1 | 10 |
| Methylene Chloride | 5.0 | U | 0.78 | 5.0 |
| methyl isobutyl ketone | 10 | U | 0.38 | 10 |
| Styrene | 5.0 | U | 0.64 | 5.0 |
| 1,1,2,2-Tetrachloroethane | 5.0 | U | 0.81 | 5.0 |
| Tetrachloroethene | 5.0 | U | 0.81 | 5.0 |
| Toluene | 5.0 | U | 0.72 | 5.0 |
| 1,1,1-Trichloroethane | 190 | | 0.69 | 5.0 |
| 1,1,2-Trichloroethane | 5.0 | U | 0.65 | 5.0 |
| Trichloroethene | 53 | | 0.62 | 5.0 |
| Vinyl chloride | 8.1 | | 0.99 | 5.0 |
| Xylenes, Total | 5.0 | U | 2.3 | 5.0 |
| cis-1,2-Dichloroethene | 57 | | 0.99 | 5.0 |
| trans-1,2-Dichloroethene | 5.0 | U | 0.76 | 5.0 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 87 | | 65 - 136 |
| 4-Bromofluorobenzene | 81 | | 51 - 142 |
| Dibromofluoromethane | 83 | | 68 - 132 |
| Toluene-d8 (Surr) | 85 | | 63 - 127 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis | Job Number: 220-16783-1

**Client Sample ID:** **Well 1-1A EFF**

Lab Sample ID: 220-16783-2 | Date Sampled: 10/26/2011 1445
Client Matrix: Water | Date Received: 10/27/2011 1010

**8260B Volatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8260B | Analysis Batch: | 220-55802 | Instrument ID: | MSN |
| Prep Method: | 5030B | Prep Batch: | N/A | Lab File ID: | N5309.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 10/28/2011 2251 | | | Final Weight/Volume: | 5 mL |
| Prep Date: | 10/28/2011 2251 | | | | |

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| Acetone | 1.5 | J | 1.0 | 10 |
| Benzene | 5.0 | U | 0.74 | 5.0 |
| Bromodichloromethane | 5.0 | U | 0.48 | 5.0 |
| Bromoform | 5.0 | U | 0.46 | 5.0 |
| Bromomethane | 5.0 | U | 2.1 | 5.0 |
| Methyl Ethyl Ketone | 10 | U | 1.1 | 10 |
| Carbon disulfide | 5.0 | U | 0.90 | 5.0 |
| Carbon tetrachloride | 5.0 | U | 1.1 | 5.0 |
| Chlorobenzene | 5.0 | U | 0.72 | 5.0 |
| Chloroethane | 5.0 | U | 1.1 | 5.0 |
| Chloroform | 5.0 | U | 0.67 | 5.0 |
| Chloromethane | 5.0 | U | 1.1 | 5.0 |
| Dibromochloromethane | 5.0 | U | 0.55 | 5.0 |
| 1,1-Dichloroethane | 5.0 | U | 1.0 | 5.0 |
| 1,2-Dichloroethane | 5.0 | U | 0.72 | 5.0 |
| 1,1-Dichloroethene | 5.0 | U | 0.83 | 5.0 |
| 1,2-Dichloropropane | 5.0 | U | 0.71 | 5.0 |
| cis-1,3-Dichloropropene | 5.0 | U | 0.28 | 5.0 |
| trans-1,3-Dichloropropene | 5.0 | U | 0.57 | 5.0 |
| Ethylbenzene | 5.0 | U | 0.87 | 5.0 |
| 2-Hexanone | 10 | U | 1.1 | 10 |
| Methylene Chloride | 5.0 | U | 0.78 | 5.0 |
| methyl isobutyl ketone | 10 | U | 0.38 | 10 |
| Styrene | 5.0 | U | 0.64 | 5.0 |
| 1,1,2,2-Tetrachloroethane | 5.0 | U | 0.81 | 5.0 |
| Tetrachloroethene | 5.0 | U | 0.81 | 5.0 |
| Toluene | 5.0 | U | 0.72 | 5.0 |
| 1,1,1-Trichloroethane | 5.0 | U | 0.69 | 5.0 |
| 1,1,2-Trichloroethane | 5.0 | U | 0.65 | 5.0 |
| Trichloroethene | 5.0 | U | 0.62 | 5.0 |
| Vinyl chloride | 5.0 | U | 0.99 | 5.0 |
| Xylenes, Total | 5.0 | U | 2.3 | 5.0 |
| cis-1,2-Dichloroethene | 5.0 | U | 0.99 | 5.0 |
| trans-1,2-Dichloroethene | 5.0 | U | 0.76 | 5.0 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 88 | | 65 - 136 |
| 4-Bromofluorobenzene | 81 | | 51 - 142 |
| Dibromofluoromethane | 81 | | 68 - 132 |
| Toluene-d8 (Surr) | 80 | | 63 - 127 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis | Job Number: 220-16783-1

**Client Sample ID:** **Trip Blank**

Lab Sample ID: 220-16783-3TB | Date Sampled: 10/26/2011 1440
Client Matrix: Water | Date Received: 10/27/2011 1010

**8260B Volatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8260B | Analysis Batch: | 220-55802 | Instrument ID: | MSN |
| Prep Method: | 5030B | Prep Batch: | N/A | Lab File ID: | N5301.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 10/28/2011 1935 | | | Final Weight/Volume: | 5 mL |
| Prep Date: | 10/28/2011 1935 | | | | |

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| Acetone | 4.0 | J | 1.0 | 10 |
| Benzene | 5.0 | U | 0.74 | 5.0 |
| Bromodichloromethane | 5.0 | U | 0.48 | 5.0 |
| Bromoform | 5.0 | U | 0.46 | 5.0 |
| Bromomethane | 5.0 | U | 2.1 | 5.0 |
| Methyl Ethyl Ketone | 10 | U | 1.1 | 10 |
| Carbon disulfide | 5.0 | U | 0.90 | 5.0 |
| Carbon tetrachloride | 5.0 | U | 1.1 | 5.0 |
| Chlorobenzene | 5.0 | U | 0.72 | 5.0 |
| Chloroethane | 5.0 | U | 1.1 | 5.0 |
| Chloroform | 5.0 | U | 0.67 | 5.0 |
| Chloromethane | 5.0 | U | 1.1 | 5.0 |
| Dibromochloromethane | 5.0 | U | 0.55 | 5.0 |
| 1,1-Dichloroethane | 5.0 | U | 1.0 | 5.0 |
| 1,2-Dichloroethane | 5.0 | U | 0.72 | 5.0 |
| 1,1-Dichloroethene | 5.0 | U | 0.83 | 5.0 |
| 1,2-Dichloropropane | 5.0 | U | 0.71 | 5.0 |
| cis-1,3-Dichloropropene | 5.0 | U | 0.28 | 5.0 |
| trans-1,3-Dichloropropene | 5.0 | U | 0.57 | 5.0 |
| Ethylbenzene | 5.0 | U | 0.87 | 5.0 |
| 2-Hexanone | 10 | U | 1.1 | 10 |
| Methylene Chloride | 2.7 | J B | 0.78 | 5.0 |
| methyl isobutyl ketone | 10 | U | 0.38 | 10 |
| Styrene | 5.0 | U | 0.64 | 5.0 |
| 1,1,2,2-Tetrachloroethane | 5.0 | U | 0.81 | 5.0 |
| Tetrachloroethene | 5.0 | U | 0.81 | 5.0 |
| Toluene | 5.0 | U | 0.72 | 5.0 |
| 1,1,1-Trichloroethane | 5.0 | U | 0.69 | 5.0 |
| 1,1,2-Trichloroethane | 5.0 | U | 0.65 | 5.0 |
| Trichloroethene | 5.0 | U | 0.62 | 5.0 |
| Vinyl chloride | 5.0 | U | 0.99 | 5.0 |
| Xylenes, Total | 5.0 | U | 2.3 | 5.0 |
| cis-1,2-Dichloroethene | 5.0 | U | 0.99 | 5.0 |
| trans-1,2-Dichloroethene | 5.0 | U | 0.76 | 5.0 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 86 | | 65 - 136 |
| 4-Bromofluorobenzene | 81 | | 51 - 142 |
| Dibromofluoromethane | 80 | | 68 - 132 |
| Toluene-d8 (Surr) | 81 | | 63 - 127 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 220-16783-1

## Surrogate Recovery Report

**8260B Volatile Organic Compounds (GC/MS)**

**Client Matrix: Water**

| Lab Sample ID | Client Sample ID | DBFM %Rec | DCA %Rec | TOL %Rec | BFB %Rec |
|---|---|---|---|---|---|
| 220-16783-1 | Well 1-1A INF | 83 | 87 | 85 | 81 |
| 220-16783-2 | Well 1-1A EFF | 81 | 88 | 80 | 81 |
| 220-16783-3 | Trip Blank | 80 | 86 | 81 | 81 |
| MB 220-55802/3 | | 83 | 90 | 83 | 87 |
| LCS 220-55802/2 | | 85 | 86 | 82 | 80 |

| Surrogate | Acceptance Limits |
|---|---|
| DBFM = Dibromofluoromethane | 68-132 |
| DCA = 1,2-Dichloroethane-d4 (Surr) | 65-136 |
| TOL = Toluene-d8 (Surr) | 63-127 |
| BFB = 4-Bromofluorobenzene | 51-142 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 220-16783-1

**Method Blank - Batch: 220-55802**

**Method: 8260B**
**Preparation: 5030B**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 220-55802/3 | Analysis Batch: | 220-55802 | Instrument ID: | MSN |
| Client Matrix: | Water | Prep Batch: | N/A | Lab File ID: | N5300.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 10/28/2011 1911 | Units: | ug/L | Final Weight/Volume: | 5 mL |
| Prep Date: | 10/28/2011 1911 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Result | Qual | MDL | RL |
|---|---|---|---|---|
| Acetone | 10 | U | 1.0 | 10 |
| Benzene | 5.0 | U | 0.74 | 5.0 |
| Bromodichloromethane | 5.0 | U | 0.48 | 5.0 |
| Bromoform | 5.0 | U | 0.46 | 5.0 |
| Bromomethane | 5.0 | U | 2.1 | 5.0 |
| Methyl Ethyl Ketone | 10 | U | 1.1 | 10 |
| Carbon disulfide | 5.0 | U | 0.90 | 5.0 |
| Carbon tetrachloride | 5.0 | U | 1.1 | 5.0 |
| Chlorobenzene | 5.0 | U | 0.72 | 5.0 |
| Chloroethane | 5.0 | U | 1.1 | 5.0 |
| Chloroform | 5.0 | U | 0.67 | 5.0 |
| Chloromethane | 5.0 | U | 1.1 | 5.0 |
| Dibromochloromethane | 5.0 | U | 0.55 | 5.0 |
| 1,1-Dichloroethane | 5.0 | U | 1.0 | 5.0 |
| 1,2-Dichloroethane | 5.0 | U | 0.72 | 5.0 |
| 1,1-Dichloroethene | 5.0 | U | 0.83 | 5.0 |
| 1,2-Dichloropropane | 5.0 | U | 0.71 | 5.0 |
| cis-1,3-Dichloropropene | 5.0 | U | 0.28 | 5.0 |
| trans-1,3-Dichloropropene | 5.0 | U | 0.57 | 5.0 |
| Ethylbenzene | 5.0 | U | 0.87 | 5.0 |
| 2-Hexanone | 10 | U | 1.1 | 10 |
| Methylene Chloride | 2.23 | J | 0.78 | 5.0 |
| methyl isobutyl ketone | 10 | U | 0.38 | 10 |
| Styrene | 5.0 | U | 0.64 | 5.0 |
| 1,1,2,2-Tetrachloroethane | 5.0 | U | 0.81 | 5.0 |
| Tetrachloroethene | 5.0 | U | 0.81 | 5.0 |
| Toluene | 5.0 | U | 0.72 | 5.0 |
| 1,1,1-Trichloroethane | 5.0 | U | 0.69 | 5.0 |
| 1,1,2-Trichloroethane | 5.0 | U | 0.65 | 5.0 |
| Trichloroethene | 5.0 | U | 0.62 | 5.0 |
| Vinyl chloride | 5.0 | U | 0.99 | 5.0 |
| Xylenes, Total | 5.0 | U | 2.3 | 5.0 |
| cis-1,2-Dichloroethene | 5.0 | U | 0.99 | 5.0 |
| trans-1,2-Dichloroethene | 5.0 | U | 0.76 | 5.0 |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 90 | 65 - 136 |
| 4-Bromofluorobenzene | 87 | 51 - 142 |
| Dibromofluoromethane | 83 | 68 - 132 |
| Toluene-d8 (Surr) | 83 | 63 - 127 |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 220-16783-1

**Lab Control Sample - Batch: 220-55802**

**Method: 8260B**
**Preparation: 5030B**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | LCS 220-55802/2 | Analysis Batch: | 220-55802 | Instrument ID: | MSN |
| Client Matrix: | Water | Prep Batch: | N/A | Lab File ID: | N5297.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 5 mL |
| Analysis Date: | 10/28/2011 1758 | Units: | ug/L | Final Weight/Volume: | 5 mL |
| Prep Date: | 10/28/2011 1758 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| Acetone | 20.0 | 23.8 | 119 | 41 - 150 | |
| Benzene | 20.0 | 20.7 | 104 | 66 - 131 | |
| Bromodichloromethane | 20.0 | 18.1 | 90 | 78 - 120 | |
| Bromoform | 20.0 | 18.2 | 91 | 66 - 120 | |
| Bromomethane | 20.0 | 23.0 | 115 | 47 - 150 | |
| Methyl Ethyl Ketone | 20.0 | 23.6 | 118 | 42 - 150 | |
| Carbon disulfide | 20.0 | 16.3 | 81 | 55 - 150 | |
| Carbon tetrachloride | 20.0 | 17.0 | 85 | 69 - 135 | |
| Chlorobenzene | 20.0 | 18.2 | 91 | 68 - 120 | |
| Chloroethane | 20.0 | 20.9 | 104 | 49 - 150 | |
| Chloroform | 20.0 | 20.7 | 103 | 77 - 126 | |
| Chloromethane | 20.0 | 18.1 | 90 | 33 - 150 | |
| Dibromochloromethane | 20.0 | 16.0 | 80 | 75 - 120 | |
| 1,1-Dichloroethane | 20.0 | 20.4 | 102 | 75 - 130 | |
| 1,2-Dichloroethane | 20.0 | 21.1 | 106 | 73 - 127 | |
| 1,1-Dichloroethene | 20.0 | 20.1 | 101 | 65 - 142 | |
| 1,2-Dichloropropane | 20.0 | 21.3 | 106 | 69 - 129 | |
| cis-1,3-Dichloropropene | 20.0 | 18.6 | 93 | 63 - 120 | |
| trans-1,3-Dichloropropene | 20.0 | 19.2 | 96 | 73 - 120 | |
| Ethylbenzene | 20.0 | 18.2 | 91 | 62 - 120 | |
| 2-Hexanone | 20.0 | 21.2 | 106 | 46 - 150 | |
| Methylene Chloride | 20.0 | 19.8 | 99 | 56 - 138 | |
| methyl isobutyl ketone | 20.0 | 23.2 | 116 | 70 - 122 | |
| Styrene | 20.0 | 17.8 | 89 | 47 - 120 | |
| 1,1,2,2-Tetrachloroethane | 20.0 | 21.0 | 105 | 75 - 124 | |
| Tetrachloroethene | 20.0 | 17.8 | 89 | 50 - 120 | |
| Toluene | 20.0 | 18.5 | 93 | 66 - 120 | |
| 1,1,1-Trichloroethane | 20.0 | 19.0 | 95 | 73 - 135 | |
| 1,1,2-Trichloroethane | 20.0 | 21.8 | 109 | 76 - 125 | |
| Trichloroethene | 20.0 | 17.4 | 87 | 60 - 122 | |
| Vinyl chloride | 20.0 | 18.7 | 93 | 61 - 150 | |
| Xylenes, Total | 60.0 | 54.5 | 91 | 58 - 120 | |
| cis-1,2-Dichloroethene | 20.0 | 20.5 | 103 | 65 - 120 | |
| trans-1,2-Dichloroethene | 20.0 | 20.4 | 102 | 58 - 120 | |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| 1,2-Dichloroethane-d4 (Surr) | 86 | 65 - 136 |
| 4-Bromofluorobenzene | 80 | 51 - 142 |
| Dibromofluoromethane | 85 | 68 - 132 |
| Toluene-d8 (Surr) | 82 | 63 - 127 |

# DATA REPORTING QUALIFIERS

Client: Malcolm Pirnie, Inc. Invoice to Arcadis Job Number: 220-16783-1

| Lab Section | Qualifier | Description |
|---|---|---|
| GC/MS VOA | | |
| | U | Analyzed for but not detected. |
| | J | Indicates an estimated value. |
| | B | The analyte was found in an associated blank, as well as in the sample. |

Client: Malcolm Pirnie, Inc. Invoice to Arcadis

Job Number: 220-16783-1

## QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| **GC/MS VOA** | | | | | |
| **Analysis Batch:220-55802** | | | | | |
| LCS 220-55802/2 | Lab Control Sample | T | Water | 8260B | |
| MB 220-55802/3 | Method Blank | T | Water | 8260B | |
| 220-16783-1 | Well 1-1A INF | T | Water | 8260B | |
| 220-16783-2 | Well 1-1A EFF | T | Water | 8260B | |
| 220-16783-3TB | Trip Blank | T | Water | 8260B | |

**Report Basis**
T = Total

Client: Malcolm Pirnie, Inc. Invoice to Arcadis Job Number: 220-16783-1

## Laboratory Chronicle

**Lab ID: 220-16783-1** **Client ID: Well 1-1A INF**

Sample Date/Time: 10/26/2011 14:40 Received Date/Time: 10/27/2011 10:10

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | 220-16783-A-1 | | 220-55802 | | 10/28/2011 22:26 | 1 | TAL CT | DH |
| A:8260B | 220-16783-A-1 | | 220-55802 | | 10/28/2011 22:26 | 1 | TAL CT | DH |

**Lab ID: 220-16783-2** **Client ID: Well 1-1A EFF**

Sample Date/Time: 10/26/2011 14:45 Received Date/Time: 10/27/2011 10:10

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | 220-16783-A-2 | | 220-55802 | | 10/28/2011 22:51 | 1 | TAL CT | DH |
| A:8260B | 220-16783-A-2 | | 220-55802 | | 10/28/2011 22:51 | 1 | TAL CT | DH |

**Lab ID: 220-16783-3** **Client ID: Trip Blank**

Sample Date/Time: 10/26/2011 14:40 Received Date/Time: 10/27/2011 10:10

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | 220-16783-A-3 | | 220-55802 | | 10/28/2011 19:35 | 1 | TAL CT | DH |
| A:8260B | 220-16783-A-3 | | 220-55802 | | 10/28/2011 19:35 | 1 | TAL CT | DH |

**Lab ID: MB** **Client ID: N/A**

Sample Date/Time: N/A Received Date/Time: N/A

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | MB 220-55802/3 | | 220-55802 | | 10/28/2011 19:11 | 1 | TAL CT | DH |
| A:8260B | MB 220-55802/3 | | 220-55802 | | 10/28/2011 19:11 | 1 | TAL CT | DH |

**Lab ID: LCS** **Client ID: N/A**

Sample Date/Time: N/A Received Date/Time: N/A

| Method | Bottle ID | Run | Analysis Batch | Prep Batch | Date Prepared / Analyzed | Dil | Lab | Analyst |
|---|---|---|---|---|---|---|---|---|
| P:5030B | LCS 220-55802/2 | | 220-55802 | | 10/28/2011 17:58 | 1 | TAL CT | DH |
| A:8260B | LCS 220-55802/2 | | 220-55802 | | 10/28/2011 17:58 | 1 | TAL CT | DH |

**Lab References:**
TAL CT = TestAmerica Connecticut

ARCADIS MALCOLM PIRNIE

## Appendix C

June 2011 Iso-Concentration Map

N.

N. MAIN ST.

OLD VESTAL RD.

GROUNDWATER TREATMENT PLANT

WELL 1-1A

WELL 1-1

SUSQUEHANNA RIVER

PUMPHOUSE RD.

WELL 1-3

WELL 1-2 & 1-2A

4009-10 **2**

4009-11A **1**

4009-11

4009-9 **5**

4009-15

4009-12

4009-12A **42**

4009-5 **98**

4009-4 **47**

4009-3 **141**

4009-16A

4009-16

4009-7 **674**

4009-8 **1692**

4009-18

4009-20

4009-21

4009-19

4009-17

4009-13A

4009-13

4009-14

4009-2 **33**

4009-1 **8**

STAGE RD.

4009-6

NYS RTE. 17

NYS RTE. 434

100

500

1000

1500

NOTE:
ALL CONCENTRATIONS MEASURED IN ug/l.

150 0 150 300

SCALE: 1" = 300'

## LEGEND:

- TOTAL VOCS ISOCONCENTRATION LINE
- ESTIMATED ISOCONCENTRATION LINE (LIMITED DATA)
- 4009-2 — APPROXIMATE MONITORING WELL LOCATION
- **1037** — TOTAL VOCS CONCENTRATION
- RAILROAD TRACKS
- ROADWAY/DRIVEWAY
- BUILDING
- EDGE OF RIVER

ARCADIS
Infrastructure · Water · Environment · Buildings

NYSDEC STANDBY CONTRACT NO. D004443-4
NYSDEC SITE NO. 7-04-009
VESTAL WATER SUPPLY
VESTAL, NEW YORK

TOTAL VOC CONCENTRATIONS (JUNE 2011)
SCALE: 1" = 300'

ARCADIS-US, INC.
SEPTEMBER 2011
FIGURE 4-4