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SITE ASSESSMENT,  
REMEDIAL ACTION &  
REVITALIZATION

Ms Addie Walker  
South Carolina Department of Health and Environmental Control  
2600 Bull Street  
Columbia, SC 29201

September 16, 2013

Dear Ms Walker,

**Subject: VCC Progress Report #2  
Auriga, Spartanburg Facility  
BoW Site ID# 00225, VCC 13-5841-RP  
AECOM Project No. 60280417**

Please find enclosed the above referenced report. As indicated in the Voluntary Cleanup Contract, three hard copies and one electronic copy on CD are included.

If you have questions, please contact me at 404 965 9657

Sincerely,



Bryon Dahlgren, PE  
Project Manager



Environment

Prepared for:  
CNA Holdings LLC  
Dallas, TX

Prepared by:  
AECOM  
Atlanta, GA  
60280417  
September 2013

# Auriga Spartanburg Voluntary Cleanup Contract 13-5841-RP Progress Report September 2013



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## 1.0 Introduction

The purpose of this document is to provide to the South Carolina Department of Health and Environmental Control (DHEC) an update of activities at the Auriga facility in Spartanburg, South Carolina (SC) (site) under Voluntary Cleanup Contract 13-5841-RP (VCC) signed March 12, 2013. Activity to be completed at the site was defined in the VCC work plan submitted April 26, 2013. This progress report covers the period of May 1, 2013 through August 31, 2103.

## 2.0 Actions Completed during Reporting Period

The VCC requires submittal of this first progress report within 60 days of signing. Therefore, the first progress report was submitted in May 2013 and covered the period between March 12 and April 30. As described in the VCC work plan, this second progress report has been scheduled to align with the existing monitoring and reporting schedule. This progress report covers the period between May 1 and August 31. Future progress reports will continue on a semiannual basis with the next report to be submitted by March 31, 2014.

A proposed schedule was presented in the VCC work plan. The schedule is updated as Figure 1 of this report.

### 2.1 Reporting

Three documents were submitted to DHEC during this reporting period.

A letter responding to a request for slug test data and the injection radius area of influence assessment was provided on May 7, 2013.

Comments to the DMT area direct push results and injection plan report were received from DHEC on June 11, 2013. A response to these comments and revision to the on-site injection plan for remediation of chloroform was submitted on July 16, 2013.

The report on results of the direct push investigation for the Bruckner Road area and recommendations for injection in that area was submitted on August 19, 2013.

### 2.2 Monitoring

The annual sampling event was completed between June 17 and June 20, 2013. The sampling event was completed as described in the VCC work plan. This plan was approved verbally during a telephone conversation between Addie Walker and Bryon Dahlgren on May 28, 2013. The June 2013 sampling plan is presented in Table 1. The June 2013 sampling locations are shown on Figure 2.

Data produced as a result of this monitoring event is presented in Section 4 below. Section 4 also includes an update of the 2010 Remedial Effectiveness Report, as required by the VCC.

### 2.3 Remediation

No new remediation work was initiated during this reporting period.

Cyclic recovery of DowTherm A™ phase material from well MW-07 continued during the period.

### **3.0 Actions Scheduled for Next Reporting Period**

The next reporting period will extend from September 1, 2013 through February 28, 2014. Activities expected to be completed during the third period are presented in the schedule on Figure 1.

#### **3.1 Reporting**

No reports are currently scheduled for submittal during the next period. Remediation activities for both the DMT area and the Bruckner Road area are planned to begin within this period. Depending on the final schedule of mobilization, brief status reports of activities may be provided.

The next progress report covering the upcoming period will be submitted by March 31, 2014. This progress report will include the results of the semiannual chloroform sampling event and will also provide an update on the status of remediation work.

#### **3.2 Monitoring**

The semiannual chloroform sampling event is scheduled for December 2013. The plan for the December 2013 annual sampling event is presented in the VCC work plan. The monitoring plan is presented in Table 2 and the monitoring locations are presented on Figure 3 of this report.

#### **3.3 Remediation**

Chloroform remediation activities are scheduled for the next period. The proposed schedule is presented on Figure 1. Approval of the VCC work plan and injection plans is the first step in proceeding with the remedial actions. Because approvals are pending, the schedule of remedial actions is approximate.



## 4.0 Environmental Data Generated during Reporting Period

The June annual sampling event was completed during this period. A summary of groundwater analytical results is presented in Table 3. A summary of surface water analytical results is presented in Table 4. The complete laboratory analytical reports are presented in Appendix A.

The results of this monitoring event, including an update of the 2010 Remedial Effectiveness report is presented below.

Groundwater elevations were measured as part of the monitoring activities. A potentiometric map was developed for wells screened in saprolite, and a potentiometric map was developed for wells screened in bedrock. Some of the wells at the site were placed at the transition from saprolite into bedrock and data from these wells were included in both maps. The potentiometric map for saprolite is presented in Figure 4. The potentiometric map for bedrock is presented in Figure 5.

Groundwater flows away from the site in two general directions, with a divide running near the approximate center of the plant area. Groundwater north of this divide flows toward the Cherokee Creek. Groundwater south of the divide flows toward the Pacolet River. A transitional area is present in the region of the former sludge holding area and former DMT equalization basin. Groundwater in this region flows either toward the Cherokee Creek or the Pacolet River depending on how far north or south the location.

### 4.1 Summary of 2013 Results

The June 2013 analytical results for key site parameters are presented below. Discussion of these results in relation to historic data and progress is presented in the update of Remedial Effectiveness assessment is presented in Section 4.2.

#### 4.1.1 1,4-Dioxane

1,4-Dioxane analytical results for monitoring wells and surface water sampling locations for the 2013 event are presented on Figures 6 and 7.

Detections of 1,4-dioxane in saprolite are noted in the central plant area and downgradient of the former Fiber 1 EQ Basin. Lower concentrations were also noted west of the DMT area. Detections are also noted in these same areas in bedrock, as well as the former sludge drying lagoon area and downgradient of the former DMT equalization basin.

Concentrations of 1,4-dioxane were reported in surface water at locations SW-4 (0.00405 milligrams per liter (mg/L)) and SW-10 (0.00256 mg/L).

#### 4.1.2 DowTherm A™

DowTherm A™ is comprised of diphenyl ether and 1,1-biphenyl. Diphenyl ether represents the larger fraction and also degrades less rapidly than 1,1-biphenyl. Therefore, concentrations of diphenyl ether are both more frequent and higher than the concentrations of 1,1-biphenyl.

The diphenyl ether results in saprolite and bedrock are presented in Figures 8 and 9.

DowTherm A™ remains present in the central plant area and at lower concentrations downgradient of the Fiber 1 EQ Basin. In bedrock, low concentrations of diphenyl ether are also noted immediately downgradient of the former sludge drying lagoon.

DowTherm A™ components were non-detect in surface water.

### 4.1.3 Chloroform and Other Volatile Organics

Chloroform is the primary volatile organic compound identified at the site. Concentrations of chloroform prior to injection were up to a maximum of 15 mg/L. The extent and magnitude of detections have been significantly decreased since the injection activities were completed with the majority of locations now reported non-detect (<0.005 mg/L) levels.

June 2013 chloroform concentrations are presented in Figures 10 and 11. In late 2012, additional direct push samples were collected to enhance further remedial planning. The locations of the direct push samples were placed to supplement the existing well locations. The results of these sampling events and proposed additional actions have recently been submitted in separate reports. The chloroform results for September 2012 DMT area direct push samples for saprolite and refusal (interpreted for this site as approximately top of bedrock) are presented on Figures 12 and 13. The chloroform results for December 2012 Bruckner Road direct push samples are presented on Figure 14. Isoconcentration contours are not included on Figures 10 through 14. The data presented have been collected over a period of several months and includes both permanent well and direct push screening data. Also, the interpretation of the remaining plume is not subject to normal interpretation because portions of the plume have been remediated.

The highest chloroform concentration reported by the June well sampling was 0.821 mg/L at saprolite well MW-109. Saprolite wells are mostly non-detect (<0.005 mg/L). Detections exceeding the Maximum Contaminant Level (MCL) for chloroform (0.080 mg/L, total trihalomethanes) were noted at adjacent wells MW-105 and MW-106 and well EW-41, in addition to MW-109. Chloroform concentrations in bedrock above the MCL were only noted in EW-41 (a transition well also included on the saprolite figure) and shallow bedrock well MW-107.

Other volatile organic parameters were generally not detected above reporting limits. The detections for volatile compounds other than chloroform are presented in Figures 15 and 16. Low detections of tetrachloroethene (PCE) were noted in three saprolite wells. Trichloroethene (TCE) and cis-1,2-dichloroethene were also detected in two of these wells. In addition, cis-1,2-dichloroethene was also detected in four other wells. Two of these three wells are transition zones wells and are therefore presented on both Figures 12 and 13. One additional bedrock well near these wells also reported a detection of cis-1,2-dichloroethene. Acetone was detected in bedrock well EW-40.

On the north side of the property, several chlorinated organics were detected in the bedrock well EW-14 near Lake Patrick.

The detections of other volatile organics are consistent with historic data. The presence of cis-1,2-dichloroethene within the vicinity of the former DMT area is consistent with prior observations that PCE and TCE appear to be degrading as a side effect of the chloroform remediation activities.

### 4.1.4 Dissolved Oxygen and ORP

Dissolved oxygen data are presented on Figures 17 and 18. ORP data are presented on Figures 19 and 20. These figures present similar results with reducing conditions and low dissolved oxygen concentrations in the same locations, as expected. The low oxygen areas are consistent with either

the presence of DowTherm A™ components (Figures 8 and 9) or the former lactate injection activities in the vicinity of the former DMT area. Degradation of 1,1-biphenyl and removal of chloroform mass are consistent with these conditions.

## 4.2 Review of Remedial Effectiveness

### 4.2.1 1,4-Dioxane

Historic remediation of 1,4-dioxane at the site was completed through operation of a perimeter extraction system and a UV/peroxide treatment system. Based on the conclusions of the Preliminary Risk Evaluation contained in the Operating Strategy Report and with DHEC approval, extraction along the Cherokee Creek and Pacolet River ended in early 2002.

Extraction along the southern portion of the property was terminated in early 2003 as part of the enhanced reductive dechlorination (ERD) remediation program. Monitoring of 1,4-dioxane was maintained as part of the sampling program for the former DMT area. Because 1,4-dioxane was removed in the last tier of screening in the preliminary risk evaluation for the north and eastern portion of the property, long-term monitoring was also maintained for these areas.

Historic time vs. concentration plots for 1,4-dioxane are presented in the appendix. The plots are organized by area at the site. The first set of charts presents the trends for wells located near the conflux of the Cherokee Creek and the Pacolet River. Concentrations at wells in this area were identified by DHEC as a potential cause for impact to nearby surface water. As the trend plots demonstrate, concentrations of 1,4-dioxane in the wells in this area have declined significantly over time.

The assessment of 1,4-dioxane presented in the operating strategy report included a review of hydraulic gradients, estimated flux to surface water and anticipated surface water concentrations. The conservative calculations presented in the operating strategy report estimated 1,4-dioxane concentrations based on estimated mean annual flows resulted in concentrations of 0.0184 mg/L in the Pacolet River and 0.644 mg/L in Cherokee Creek. Based on these concentrations the preliminary risk evaluation included in the operating strategy report removed 1,4-dioxane as a chemical of potential concern for the portions of the site near the surface water features.

Surface water monitoring prior to and since the operating strategy report has supported the conclusions of the report and has shown that the assessment was conservative. Concentrations have been <0.01 mg/L in the majority of samples and in all samples for most locations. In the June 2013 sampling results all of the surface water samples in the vicinity of the conflux of the Cherokee and Pacolet were non-detect (<0.002 mg/L).

Concentration trend charts for wells located along the Cherokee Creek, as well as along the Pacolet River and the former DMT area are also included in the appendix. Concentrations of 1,4-dioxane at wells in these areas have declined or remained stable. The wells which have shown stable concentrations have been at levels an order of magnitude or more less than for wells which have demonstrated declines.

Two surface water locations reported detections of 1,4-dioxane in samples collected during June 2013. The sample from SW-4 located along the Cherokee Creek reported a concentration of 0.00405 mg/L. SW-4 is located downgradient of the former equalization base. This is the first detection of 1,4-dioxane at SW-4 which historically had a reporting limits of 0.010 mg/L. The sample from SW-10 located downgradient of Outfall 002 along the Pacolet River reported a detection of 0.00256 mg/L. Samples from this locations have most frequently reported non-detect results (<0.010 mg/L), but

isolated detections of 0.02 to 0.40 mg/L have been noted. Neither of these detections are interpreted as a change in site conditions.

Trend plots for 1,4-dioxane in the central plant area are also presented in the appendix. The June 2010 Remedial Effectiveness report noted that concentrations of 1,4-dioxane in the central plant area were higher than those reported in the 2001 Operating Strategy report. As shown in the updated trend plots in the appendix of this report, concentrations have declined at 6 of the 9 locations presented. The results for samples from well MW-53 increased following 2010. The results from this well have declined in 2012 and 2013, but remain higher than the 2010 results and the 2013 result of 6.36 mg/L is the highest detection at the site for this event. Nearby bedrock well RW-91 has also increased from 0.322 mg/L in 2010 to 1.65 mg/L in 2013. A small increase was also noted at well RW-08 from 0.0539 in 2010 to 0.102 mg/L in 2013. Data are presented for several other wells in the central plant area on Figure 6 and 7, but are not included in the trends charts due to limited data. These wells generally report low concentrations and the data available suggest stable results. One exception is well MW-05 which is also located in the vicinity of MW-53 and RW-91. The result at well MW-05 has increased on 0.305 mg/L in 2011 to 0.834 mg/L in 2013, consistent with a localized increase. 1,4-Dioxane is mobile in groundwater and the increases noted in some wells within the central plant area are likely the result of plume migration, with continued long-term overall declines in the maximum values throughout the plume.

Throughout the site, concentrations have declined over time. The concentrations of 1,4-dioxane have declined as the plume has migrated and dispersed. The Pacolet River provides a major drainage feature for the site and groundwater from the site ultimately enters the river. The mass flux of 1,4-dioxane into both the Cherokee Creek and the Pacolet River is insufficient to produce routinely measureable concentrations. Once in surface water, natural attenuation of the remaining mass continues by UV oxidation and other processes.

Continued monitoring of 1,4-dioxane, including the locations sampled in June of 2013 is recommended in the VCC work plan. Further evaluation will be included in the Remedial Investigation (RI) report.

#### **4.2.2 DowTherm A™**

DowTherm A™ has been identified at the site with a plume existing in the vicinity of the central plant area and the former Fiber 1 EQ basin and Lake Patrick. Free product DowTherm A™ is extracted from well MW-7 located immediately downgradient of the former Fiber 1 EQ basin. Historic data has also indicated that lower concentrations of DowTherm A™ components are present between the former DMT equalization basin and former sludge drying lagoon areas.

Time vs. concentration trend plots for diphenyl ether are presented in the appendix. Most of the locations have demonstrated stable or declining concentrations over time. Some of the wells have shown an increase in concentrations since the early 1990s, but since the time of the Operating Strategy Report the concentrations have been more stable.

Concentrations of diphenyl ether tend to fluctuate significantly at several wells. Compared to the 2010 trends the only increase noted is at well RW-80 which was 0.316 mg/L in 2010 and is 1.6 mg/L in 2013, still below the 4 – 6 mg/L range noted in the mid-2000s. Decreased concentrations since 2010 were noted at wells RW-79, RW-91, and RW-92.

The preliminary risk evaluation (PRE) included an assessments of diphenyl ether and 1,1-biphenyl. Neither of these parameters was retained as chemicals of potential concern for human or ecological

impact for the site. The site conditions are stable to declining and lower in concentration than at the time of the PRE.

Surface water sampling has been maintained at the site and has included analysis for DowTherm A™ components. Nearly three hundred surface water samples have been collected from the length of the Cherokee Creek and Pacolet River between 1999 and 2013. Diphenyl ether was detected at located SW-05 in August 2011 with a concentration of 0.0177 mg/L. Diphenyl ether was non-detect (<0.010 mg/L) in the 24 prior samples from this location, as well as in the samples collected in 2012 and 2013. Diphenyl ether has not been detected in the surface water samples from the other locations. 1,1-Biphenyl has never been detected in surface water.

Extraction from well MW-07 continues as a remedial measure for the DowTherm A™ presence at the site. The VCC work plan has proposed additional investigation to better define the current conditions in this area and potential modifications to the current extraction plan. The results of this work, once approved, will be included in the RI report.

Long-term monitoring for DowTherm A™ components is included in the VCC work plan.

#### **4.2.3 Chloroform**

Remediation of chloroform has consisted of a series of enhanced reductive dechlorination events in the former DMT area and at well RW-108. Each of the events has consisted of injection of sodium lactate into one or more wells by gravity flow.

The first event occurred in May 2003. Seventy 55-gallon drums of sodium lactate solution were diluted and injected into eleven wells at the site. Additional injection was completed in a series of smaller events between the summer of 2004 and early 2005. An additional 68 drums of sodium lactate were injected over the course of these events. Finally, eight drums of lactate were diluted and injected into well RW-108 between late 2007 and early 2008. The ERD treatment process has been highly effective in remediating the chloroform plume. Both the concentrations and the extent of chloroform detections have been significantly decreased.

The effectiveness of the ERD treatment is summarized in Table 5. Table 5 provides a list of monitoring locations in the treatment area. The locations are divided into injection locations and non-injection locations. For each well the pre-injection concentration and post injection concentration is shown. The pre-injection concentration is the highest concentration recorded between November 2001 and March 2003. These dates limit the data to results collected after the data collected for the Preliminary Risk Evaluation in the Operating Strategy Report and before injection was initiated. Monitoring wells RW-47 and MW-45 were not tested during this period, so the most recent result prior to that period is listed.

As shown in Table 5, the majority of locations in the treatment area are reporting non-detect results for chloroform (<0.005 mg/L). Four locations have detections which exceed the MCL. The locations of these detections are shown on Figures 10 and 11. Three of the locations are in the vicinity of the former DMT area and the fourth, MW-109, is near Bruckner Road. The results presented on Table 5 demonstrate that the lactate injection has been very effective in remediation of chloroform mass within the areas of impact. As described in Section 4.1.3 above, recent direct push studies have defined additional areas outside of the treatment zone and additional plans have been proposed for these locations.

Historic sampling at surface water location SW-12 has demonstrated that some portion of the chloroform plume is captured by Bruckner Creek. Concentrations at this location have ranged from

<0.005 mg/L to 0.0281 mg/L. These concentrations are significantly below the total trihalomethane MCL of 0.080 mg/L. Recently sampling locations SW-13 and SW-14 have been added along Bruckner Creek. As shown on Figure 10, chloroform is detected at these locations with declining concentrations with distance downstream towards to Pacolet.

Historic sampling of three private wells located on the far side of the stream have been non-detect for chloroform (<0.005 mg/L). These results indicate that the chloroform mass if passing beneath the creek is not significant in magnitude and will ultimately discharge to the creek. Recently wells RW-110 and RW-111 (Figure 11) have been added just across Bruckner Creek. Chloroform was detected in the sample collected from RW-110 at 0.00514 mg/L and was non-detect (<0.005 mg/L) in the sample collected from RW-111. These results confirm the interpretation that limited concentrations well below the MCL may pass beneath the creek but drainage from the other side results in capture of the chloroform by the creek. Bruckner Creek then drains to the Pacolet River.

In summary, the ERD treatment has been very effective in the former DMT area. Additional areas for treatment remain around both the former DMT area and Bruckner Road. Plans to address these areas have been submitted to DHEC. Wells located beyond this stream indicated that significant mass does not move beyond the stream. The stream drains to the Pacolet River. Groundwater which does not reach the stream drains along shorter pathways which run directly into the Pacolet River.

## **5.0 Problems Encountered and Responses**

No problems were encountered during this period.

## Tables



**Table 1  
Annual Monitoring Plan**

<b>Sample Location</b>	<b>VOCs (8260)</b>	<b>1,4-Dioxane</b>	<b>DowTherm A™</b>	<b>Natural Attenuation Parameters</b>
<b>Groundwater</b>				
EW-01		X	X	
EW-02		X	X	
EW-07		X		
EW-14	X	X	X	
EW-15		X		
EW-16		X	X	
EW-17		X	X	
EW-20	X	X		
EW-22		X	X	
EW-26		X	X	
EW-27		X	X	
EW-28		X	X	
EW-30	X			X
EW-31		X		X
EW-32		X	X	
EW-36	X			X
EW-37	X	X		X
EW-38	X	X		
EW-39	X			X
EW-40	X			X
EW-41	X	X		X
EW-43		X	X	
EW-47	X	X		
EW-49	X	X	X	X
EW-50	X			X
EW-52	X	X	X	X
EW-53	X	X	X	X
MW-03	X	X		
MW-05		X	X	
MW-07		X	X	
MW-09A		X		
MW-26		X		
MW-39		X	X	
MW-40R		X	X	
MW-41		X		
MW-42		X	X	
MW-45	X			X
MW-46	X			X
MW-53		X	X	
MW-57		X		
MW-81		X	X	
MW-96		X	X	
MW-97		X	X	

**Table 1  
Annual Monitoring Plan**

<b>Sample Location</b>	<b>VOCs (8260)</b>	<b>1,4-Dioxane</b>	<b>DowTherm A™</b>	<b>Natural Attenuation Parameters</b>
MW-98	X	X		
MW-99	X	X	X	X
MW-102		X	X	
MW-103	X	X	X	X
MW-105	X	X	X	X
MW-106	X	X	X	X
MW-107	X	X	X	X
MW-109	X	X	X	X
RW-08		X	X	
RW-24		X	X	
RW-29	X	X	X	X
RW-43		X	X	
RW-47	X			X
RW-48	X	X	X	X
RW-56		X		
RW-65	X	X	X	X
RW-79		X	X	
RW-80		X	X	
RW-82		X	X	
RW-83A		X	X	
RW-84		X	X	
RW-85		X	X	
RW-86		X	X	
RW-87		X	X	
RW-91		X	X	
RW-92		X	X	
RW-108	X	X	X	X
RW-110	X	X		X
RW-111	X	X		X
<b>Surface Water</b>				
SW-01	X	X	X	
SW-02	X	X	X	
SW-03	X	X	X	
SW-04	X	X	X	
SW-05	X	X	X	
SW-06	X	X	X	
SW-07	X	X	X	
SW-08	X	X	X	
SW-09	X	X	X	
SW-10	X	X	X	
SW-11	X	X	X	
SW-12	X	X	X	
SW-13	X	X		
SW-14	X	X		

NA Parameters - Temperature, pH, dissolved oxygen (DO), oxidation-reduction potential (ORP), ortho phosphate, sulfate, sulfide, alkalinity, chloride, nitrate, nitrite, dissolved ferrous iron, dissolved manganese, and total organic carbon (TOC).

**Table 2**  
**December Chloroform Monitoring Plan**

<b>Sample Location</b>	<b>VOCs</b>	<b>NA Params</b>
<b>Groundwater</b>		
EW-31	X	X
EW-37	X	X
EW-41	X	X
EW-49	X	X
EW-52	X	X
EW-53	X	X
MW-99	X	X
MW-103	X	X
MW-105	X	X
MW-106	X	X
MW-107	X	X
MW-109	X	X
RW-29	X	X
RW-48	X	X
RW-65	X	X
RW-108	X	X
RW-110	X	X
RW-111	X	X
<b>Surface Water</b>		
SW-12	X	
SW-13	X	
SW-14	X	

NA Params - Natural Attenuation Parameters:  
 Temperature, pH, dissolved oxygen (DO), ORP, alkalinity, chloride,  
 dissolved ferrous iron, manganese, and total organic carbon (TOC)

**Table 3**  
**Summary of Groundwater Analytical Results**  
**June 2013**  
**Auriga Spartanburg Facility**  
**AECOM Project No. 60280417**

Parameter	Unit	EW-01 6/19/2013	EW-02 6/19/2013	EW-07 6/20/2013	EW-14 6/19/2013	EW-15 6/20/2013	EW-16 6/19/2013	EW-17 6/20/2013	EW-20 6/19/2013	EW-22 6/19/2013	EW-26 6/20/2013
<b>Volatile Organics and 1,4-Dioxane</b>											
acetone	mg/L	NA	NA	NA	<0.02	NA	NA	NA	<0.01	NA	NA
chloroform	mg/L	NA	NA	NA	<0.01	NA	NA	NA	<0.005	NA	NA
1,1-dichloroethane	mg/L	NA	NA	NA	0.0943	NA	NA	NA	<0.005	NA	NA
1,1-dichloroethene	mg/L	NA	NA	NA	0.0191	NA	NA	NA	<0.005	NA	NA
cis-1,2-dichloroethene	mg/L	NA	NA	NA	0.0969	NA	NA	NA	<0.005	NA	NA
trans-1,2-dichloroethene	mg/L	NA	NA	NA	0.0153	NA	NA	NA	<0.005	NA	NA
1,4-dioxane	mg/L	0.0363	0.0931	0.108	0.162	0.0462	2.53	0.0173	0.00855	0.708	0.107
1,1,1,2-tetrachloroethane	mg/L	NA	NA	NA	0.33	NA	NA	NA	<0.005	NA	NA
tetrachloroethene	mg/L	NA	NA	NA	<0.01	NA	NA	NA	<0.005	NA	NA
trichloroethene	mg/L	NA	NA	NA	0.18	NA	NA	NA	<0.005	NA	NA
vinyl chloride	mg/L	NA	NA	NA	0.0202	NA	NA	NA	<0.01	NA	NA
<b>DowTherm A™</b>											
1,1-biphenyl	mg/L	<0.01	<0.01	NA	0.0989	NA	<0.01	<0.01	NA	<0.01	<0.01
diphenyl ether	mg/L	<0.01	0.481	NA	0.885	NA	0.119	<0.01	NA	0.0127	<0.01
<b>Field and Natural Attenuation Parameters</b>											
alkalinity	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
chloride	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
dissolved oxygen	mg/L	0.35	1.57	0.6	0.56	0.49	0.31	0.57	0.56	0.34	0.51
ferrous Fe	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
groundwater elevation	feet MSL	675.9	668.16	641.64	680.95	651.47	646.23	679.74	685.47	647.89	644.67
manganese (dissolved)	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
nitrate nitrogen	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
nitrite nitrogen	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ORP	mV	-33.4	-9.6	-95.1	-13	-81.9	-31.2	-140.7	-63.9	-49.5	-138.8
orthophosphate phosphorus	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	su	5.56	6.09	6.86	5.2	6.84	5.94	6.85	6.86	6.09	6.69
specific conductance	umhos/cm	181	148	140	172	270	8.9	151	77	765	378
sulfate	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sulfide	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
temperature	degrees C	17.8	18.34	18.65	17.08	16.27	17.45	16.77	17.33	16.79	17.23
total organic carbon	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

**Table 3**  
**Summary of Groundwater Analytical Results**  
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Parameter	Unit	EW-27 6/19/2013	EW-27 Dup 6/19/2013	EW-28 6/19/2013	EW-30 6/18/2013	EW-31 6/17/2013	EW-32 6/20/2013	EW-36 6/17/2013	EW-37 6/18/2013	EW-38 6/19/2013	EW-39 6/18/2013
<b>Volatile Organics and 1,4-Dioxane</b>											
acetone	mg/L	NA	NA	NA	<0.01	NA	NA	<0.01	<0.01	<0.01	<0.01
chloroform	mg/L	NA	NA	NA	0.0785	NA	NA	<0.005	0.0491	<0.005	<0.005
1,1-dichloroethane	mg/L	NA	NA	NA	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005
1,1-dichloroethene	mg/L	NA	NA	NA	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005
cis-1,2-dichloroethene	mg/L	NA	NA	NA	<0.005	NA	NA	0.0236	<0.005	<0.005	<0.005
trans-1,2-dichloroethene	mg/L	NA	NA	NA	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005
1,4-dioxane	mg/L	0.0247	0.0264	0.164	NA	0.0116	0.463	NA	0.00213	0.0353	NA
1,1,1,2-tetrachloroethane	mg/L	NA	NA	NA	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005
tetrachloroethene	mg/L	NA	NA	NA	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005
trichloroethene	mg/L	NA	NA	NA	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005
vinyl chloride	mg/L	NA	NA	NA	<0.01	NA	NA	<0.01	<0.01	<0.01	<0.01
<b>DowTherm A™</b>											
1,1-biphenyl	mg/L	<0.01	<0.01	0.0382	NA	NA	<0.01	NA	NA	NA	NA
diphenyl ether	mg/L	<0.01	<0.01	0.315	NA	NA	0.0264	NA	NA	NA	NA
<b>Field and Natural Attenuation Parameters</b>											
alkalinity	mg/L	NA	NA	NA	69.3	120	NA	43.1	23.1	NA	191
chloride	mg/L	NA	NA	NA	6.86	7.8	NA	3.21	10.6	NA	13.4
dissolved oxygen	mg/L	1.6	NA	1.96	1.71	0.48	0.62	1.61	0.29	0.17	0.14
ferrous Fe	mg/L	NA	NA	NA	1.5	1	NA	4.8	0	NA	1.25
groundwater elevation	feet MSL	664.98	NA	667.64	677.6	672.25	651.02	727.14	721.6	646.47	718.86
manganese (dissolved)	mg/L	NA	NA	NA	1.99	1.57	NA	0.166	0.693	NA	0.166
nitrate nitrogen	mg/L	NA	NA	NA	<0.1	0.0534	NA	0.033	2.76	NA	<0.1
nitrite nitrogen	mg/L	NA	NA	NA	<0.1	<0.02	NA	0.0854	<0.1	NA	<0.1
ORP	mV	-86.8	NA	18.2	-12.6	-147.3	48.8	-23.4	146.1	-186.5	-136.6
orthophosphate phosphorus	mg/L	NA	NA	NA	<0.03	<0.03	NA	<0.03	<0.03	NA	0.694
pH	su	6.75	NA	5.8	5.98	7.25	6.67	6.09	5.62	7.24	7.03
specific conductance	umhos/cm	94	NA	147	169	250	219	132	111	126	397
sulfate	mg/L	NA	NA	NA	<1	<1	NA	<1	1.16	NA	<1
sulfide	mg/L	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05
temperature	degrees C	16.6	NA	20.77	19.4	20.35	19.15	19.31	19.99	18.51	21.23
total organic carbon	mg/L	NA	NA	NA	<1	<1	NA	<1	<1	NA	<1

**Table 3**  
**Summary of Groundwater Analytical Results**  
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Parameter	Unit	EW-40 6/17/2013	EW-41 6/18/2013	EW-43 6/19/2013	EW-47 6/19/2013	EW-49 6/17/2013	EW-50 6/18/2013	EW-52 6/17/2013	EW-53 6/18/2013	MW-03 6/19/2013	MW-05 6/18/2013
<b>Volatile Organics and 1,4-Dioxane</b>											
acetone	mg/L	3.38	<0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA
chloroform	mg/L	<0.25	0.0916	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NA
1,1-dichloroethane	mg/L	<0.25	<0.005	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NA
1,1-dichloroethene	mg/L	<0.25	<0.005	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NA
cis-1,2-dichloroethene	mg/L	<0.25	<0.005	NA	<0.005	0.00733	<0.005	0.0578	<0.005	<0.005	NA
trans-1,2-dichloroethene	mg/L	<0.25	<0.005	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NA
1,4-dioxane	mg/L	NA	0.00227	0.0691	0.029	0.00572	NA	0.0158	0.00215	<0.002	0.834
1,1,1,2-tetrachloroethane	mg/L	<0.25	<0.005	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NA
tetrachloroethene	mg/L	<0.25	<0.005	NA	<0.005	<0.005	<0.005	<0.005	<0.005	0.00866	NA
trichloroethene	mg/L	<0.25	<0.005	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NA
vinyl chloride	mg/L	<0.5	<0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA
<b>DowTherm A™</b>											
1,1-biphenyl	mg/L	NA	NA	<0.01	NA	<0.01	NA	<0.01	<0.01	NA	0.113
diphenyl ether	mg/L	NA	NA	<0.01	NA	<0.01	NA	<0.01	<0.01	NA	0.449
<b>Field and Natural Attenuation Parameters</b>											
alkalinity	mg/L	15100	25.7	NA	NA	111	496	51.5	56.7	NA	NA
chloride	mg/L	3	3.3	NA	NA	2.07	6.06	2.99	9.24	NA	NA
dissolved oxygen	mg/L	0.31	0.78	2.6	2.5	2.06	2.03	2.12	0.54	0.86	2.32
ferrous Fe	mg/L	6.2	NA	NA	NA	0.3	1	4	1.5	NA	NA
groundwater elevation	feet MSL	671.8	672.14	673.13	667.12	728.62	725.24	724.96	696.78	751.35	749.02
manganese (dissolved)	mg/L	7.02	0.524	NA	NA	0.044	0.046	0.226	1.56	NA	NA
nitrate nitrogen	mg/L	0.358	0.218	NA	NA	<0.1	<0.1	???	<0.1	NA	NA
nitrite nitrogen	mg/L	<0.02	<0.1	NA	NA	<0.1	<0.1	0.0876	<0.1	NA	NA
ORP	mV	-240.4	27.5	-45.1	125.1	-41.2	-68.6	-30.2	-54.1	210.7	138.8
orthophosphate phosphorus	mg/L	<0.03	0.0457	NA	NA	0.0383	1.11	<0.03	<0.03	NA	NA
pH	su	7.75	5.76	6.49	5.46	7.73	7.18	5.86	6.32	6.7	4.55
specific conductance	umhos/cm	43775	95	215	74	273	857	162	174	45	79
sulfate	mg/L	<1	<1	NA	NA	9.87	5.36	<1	<1	NA	NA
sulfide	mg/L	<0.05	<0.05	NA	NA	0.991	<0.05	<0.05	<0.05	NA	NA
temperature	degrees C	17.5	20.1	21.37	18.78	21.66	20.43	21.28	22.09	20.16	22.83
total organic carbon	mg/L	37900	<1	NA	NA	9.01	6.03	<1	<1	NA	NA

**Table 3**  
**Summary of Groundwater Analytical Results**  
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Parameter	Unit	MW-07 6/18/2013	MW-09A 6/18/2013	MW-26 6/20/2013	MW-39 6/18/2013	MW-40R 6/18/2013	MW-41 6/18/2013	MW-42 6/18/2013	MW-45 6/17/2013	MW-46 6/18/2013	MW-53 6/19/2013
<b>Volatile Organics and 1,4-Dioxane</b>											
acetone	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.01	<0.01	NA
chloroform	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.005	<0.005	NA
1,1-dichloroethane	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.005	<0.005	NA
1,1-dichloroethene	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.005	<0.005	NA
cis-1,2-dichloroethene	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.005	<0.005	NA
trans-1,2-dichloroethene	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.005	<0.005	NA
1,4-dioxane	mg/L	0.0481	0.0514	0.0912	0.709	1.12	0.0166	0.0147	NA	NA	6.36
1,1,2,2-tetrachloroethane	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.005	<0.005	NA
tetrachloroethene	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.005	<0.005	NA
trichloroethene	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.005	<0.005	NA
vinyl chloride	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.01	<0.01	NA
<b>DowTherm A™</b>											
1,1-biphenyl	mg/L	2.73	NA	NA	1.39	0.377	NA	0.0184	NA	NA	0.622
diphenyl ether	mg/L	9.13	NA	NA	5.41	1.3	NA	0.0621	NA	NA	2.14
<b>Field and Natural Attenuation Parameters</b>											
alkalinity	mg/L	NA	NA	NA	NA	NA	NA	NA	8.4	13.1	NA
chloride	mg/L	NA	NA	NA	NA	NA	NA	NA	1.44	16.5	NA
dissolved oxygen	mg/L	1.66	4.54	1.92	0.15	2.54	0.18	4.28	5.04	6.67	0.63
ferrous Fe	mg/L	NA	NA	NA	NA	NA	NA	NA	0	0	NA
groundwater elevation	feet MSL	739.1	751.32	681.4	741.23	724	749.11	740.61	708.89	693.01	761.76
manganese (dissolved)	mg/L	NA	NA	NA	NA	NA	NA	NA	0.013	0.097	NA
nitrate nitrogen	mg/L	NA	NA	NA	NA	NA	NA	NA	1.79	1.87	NA
nitrite nitrogen	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.02	<0.1	NA
ORP	mV	-21.9	222.3	15.8	-162.7	211.3	174.8	48.4	186	182.8	84.7
orthophosphate phosphorus	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.03	<0.03	NA
pH	su	6.23	6.52	4.27	6.86	6.45	6.8	6.06	6.54	6.71	4.79
specific conductance	umhos/cm	226	55	67	133	125	146	69	48	199	2342
sulfate	mg/L	NA	NA	NA	NA	NA	NA	NA	<1	35.3	NA
sulfide	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA
temperature	degrees C	24.49	25.12	18.96	22.6	23.87	26.06	23.01	20.72	21.3	22.76
total organic carbon	mg/L	NA	NA	NA	NA	NA	NA	NA	<1	<1	NA

**Table 3**  
**Summary of Groundwater Analytical Results**  
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Parameter	Unit	MW-57 6/19/2013	MW-81 6/19/2013	MW-96 6/19/2013	MW-97 6/19/2013	MW-98 6/17/2013	MW-99 6/17/2013	MW-102 6/18/2013	MW-103 6/17/2013	MW-105 6/17/2013	MW-106 6/17/2013
<b>Volatile Organics and 1,4-Dioxane</b>											
acetone	mg/L	NA	NA	NA	NA	<0.01	<0.01	NA	<0.01	<0.01	<0.01
chloroform	mg/L	NA	NA	NA	NA	<0.005	0.00863	NA	<0.005	0.135	0.0731
1,1-dichloroethane	mg/L	NA	NA	NA	NA	<0.005	<0.005	NA	<0.005	<0.005	<0.005
1,1-dichloroethene	mg/L	NA	NA	NA	NA	<0.005	<0.005	NA	<0.005	<0.005	<0.005
cis-1,2-dichloroethene	mg/L	NA	NA	NA	NA	0.165	0.132	NA	<0.005	0.02	<0.005
trans-1,2-dichloroethene	mg/L	NA	NA	NA	NA	<0.005	<0.005	NA	<0.005	<0.005	<0.005
1,4-dioxane	mg/L	0.00554	0.0493	0.0249	0.0126	0.0553	0.0388	0.123	<0.002	0.00545	<0.002
1,1,1,2-tetrachloroethane	mg/L	NA	NA	NA	NA	<0.005	<0.005	NA	<0.005	<0.005	<0.005
tetrachloroethene	mg/L	NA	NA	NA	NA	0.0336	0.162	NA	<0.005	<0.005	<0.005
trichloroethene	mg/L	NA	NA	NA	NA	0.0146	0.0349	NA	<0.005	<0.005	<0.005
vinyl chloride	mg/L	NA	NA	NA	NA	<0.01	<0.01	NA	<0.01	<0.01	<0.01
<b>DowTherm A™</b>											
1,1-biphenyl	mg/L	NA	1.19	<0.01	<0.01	NA	<0.01	0.0116	<0.01	<0.01	<0.01
diphenyl ether	mg/L	NA	4.42	0.0562	<0.01	NA	<0.01	0.0401	<0.01	<0.01	<0.01
<b>Field and Natural Attenuation Parameters</b>											
alkalinity	mg/L	NA	NA	NA	NA	NA	3.15	NA	<1	9.98	2.1
chloride	mg/L	NA	NA	NA	NA	NA	1.7	NA	3.19	6.06	5.84
dissolved oxygen	mg/L	6.2	0.3	2.5	6.92	1.95	2.19	0.23	6.1	4.11	6.89
ferrous Fe	mg/L	NA	NA	NA	NA	NA	0	NA	0	0	0
groundwater elevation	feet MSL	736.62	760.37	684.83	687.04	733.55	732.32	746.43	692.32	718.79	719.41
manganese (dissolved)	mg/L	NA	NA	NA	NA	NA	0.031	NA	0.034	<0.01	0.012
nitrate nitrogen	mg/L	NA	NA	NA	NA	NA	0.875	NA	2.52	1.64	1.23
nitrite nitrogen	mg/L	NA	NA	NA	NA	NA	<0.02	NA	<0.02	<0.02	<0.1
ORP	mV	256.5	-73.7	189.9	260.7	19.6	29.6	245.1	106.8	164.6	182.3
orthophosphate phosphorus	mg/L	NA	NA	NA	NA	NA	<0.03	NA	<0.03	<0.03	<0.03
pH	su	5.88	6.46	6.53	6.29	4.07	3.79	4.82	4.3	5.31	4.77
specific conductance	umhos/cm	29	142	79	54	62	37	151	55	64	37
sulfate	mg/L	NA	NA	NA	NA	NA	<1	NA	<1	<1	<1
sulfide	mg/L	NA	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	<0.05
temperature	degrees C	19.6	22.84	17.56	17.45	21.69	22.21	24.61	18.09	20.1	19.98
total organic carbon	mg/L	NA	NA	NA	NA	NA	<1	NA	<1	<1	<1



**Table 3**  
**Summary of Groundwater Analytical Results**  
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Parameter	Unit	MW-107 6/17/2013	MW-109 6/17/2013	RW-08 6/18/2013	RW-24 6/19/2013	RW-29 6/17/2013	RW-29 Dup 6/17/2013	RW-43 6/20/2013	RW-47 6/18/2013	RW-48 6/17/2013	RW-56 6/19/2013
<b>Volatile Organics and 1,4-Dioxane</b>											
acetone	mg/L	<0.01	<0.01	NA	NA	<0.01	<0.01	NA	<0.01	<0.01	NA
chloroform	mg/L	0.0836	0.821	NA	NA	<0.005	<0.005	NA	<0.005	<0.005	NA
1,1-dichloroethane	mg/L	<0.005	<0.005	NA	NA	<0.005	<0.005	NA	<0.005	<0.005	NA
1,1-dichloroethene	mg/L	<0.005	<0.005	NA	NA	<0.005	<0.005	NA	<0.005	<0.005	NA
cis-1,2-dichloroethene	mg/L	<0.005	<0.005	NA	NA	<0.005	<0.005	NA	<0.005	<0.005	NA
trans-1,2-dichloroethene	mg/L	<0.005	<0.005	NA	NA	<0.005	<0.005	NA	<0.005	<0.005	NA
1,4-dioxane	mg/L	0.00231	<0.002	0.102	0.418	<0.002	<0.002	1.08	NA	<0.002	0.0634
1,1,1,2-tetrachloroethane	mg/L	<0.005	<0.005	NA	NA	<0.005	<0.005	NA	<0.005	<0.005	NA
tetrachloroethene	mg/L	<0.005	<0.005	NA	NA	<0.005	<0.005	NA	<0.005	<0.005	NA
trichloroethene	mg/L	<0.005	<0.005	NA	NA	<0.005	<0.005	NA	<0.005	<0.005	NA
vinyl chloride	mg/L	<0.01	<0.01	NA	NA	<0.01	<0.01	NA	<0.01	<0.01	NA
<b>DowTherm A™</b>											
1,1-biphenyl	mg/L	<0.01	<0.01	0.313	<0.01	<0.01	<0.01	<0.01	NA	<0.01	NA
diphenyl ether	mg/L	<0.01	<0.01	1.46	0.0432	<0.01	<0.01	<0.01	NA	<0.01	NA
<b>Field and Natural Attenuation Parameters</b>											
alkalinity	mg/L	21.5	21.5	NA	NA	62	64.1	NA	567	119	NA
chloride	mg/L	1.93	3.25	NA	NA	1.38	1.34	NA	2.86	4.84	NA
dissolved oxygen	mg/L	5.84	5.64	2.04	0.68	0.37	NA	0.48	1.04	0.31	4.71
ferrous Fe	mg/L	0	0	NA	NA	0	NA	NA	1	1.4	NA
groundwater elevation	feet MSL	688.35	675.55	745.9	658.24	773.85	NA	643.24	689	708.78	736.11
manganese (dissolved)	mg/L	<0.01	<0.01	NA	NA	<0.01	0.01	NA	0.262	1.36	NA
nitrate nitrogen	mg/L	1.14	1.21	NA	NA	<0.1	<0.1	NA	<0.1	???	NA
nitrite nitrogen	mg/L	<0.02	<0.02	NA	NA	<0.1	<0.1	NA	<0.1	<0.02	NA
ORP	mV	27.4	116	-36.2	-92.3	-47.9	NA	-52.1	-113.4	-176	88
orthophosphate phosphorus	mg/L	0.0574	0.0603	NA	NA	<0.03	<0.03	NA	<0.03	<0.03	NA
pH	su	4.26	5.81	7.4	6.73	7.26	NA	6.92	6.98	7.06	6.71
specific conductance	umhos/cm	68	0.063	246	651	155	NA	257	982	242	88
sulfate	mg/L	<1	<1	NA	NA	10.5	10.4	NA	<1	<1	NA
sulfide	mg/L	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	NA
temperature	degrees C	18.32	17.93	23.18	16.76	17.82	NA	18.37	18.33	19.72	22.65
total organic carbon	mg/L	<1	<1	NA	NA	<1	<1	NA	1.22	<1	NA

**Table 3**  
**Summary of Groundwater Analytical Results**  
**June 2013**  
**Auriga Spartanburg Facility**  
**AECOM Project No. 60280417**

Parameter	Unit	RW-65 6/18/2013	RW-79 6/19/2013	RW-80 6/19/2013	RW-82 6/19/2013	RW-83A 6/19/2013	RW-83A Dup 6/19/2013	RW-84 6/19/2013	RW-85 6/19/2013	RW-86 6/19/2013	RW-87 6/19/2013
<b>Volatile Organics and 1,4-Dioxane</b>											
acetone	mg/L	<0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA
chloroform	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethane	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethene	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-dichloroethene	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dioxane	mg/L	<0.002	<0.004	0.0964	0.499	0.00589	0.00582	0.0235	0.00319	3.81	0.00305
1,1,1,2-tetrachloroethane	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA
tetrachloroethene	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA
trichloroethene	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA
vinyl chloride	mg/L	<0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>DowTherm A™</b>											
1,1-biphenyl	mg/L	<0.01	<0.01	0.196	0.767	<0.01	<0.01	<0.01	<0.01	0.0162	<0.01
diphenyl ether	mg/L	<0.01	<0.01	1.6	2.71	0.0101	<0.01	<0.01	<0.01	1.23	<0.01
<b>Field and Natural Attenuation Parameters</b>											
alkalinity	mg/L	104	NA	NA	NA	NA	NA	NA	NA	NA	NA
chloride	mg/L	12.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
dissolved oxygen	mg/L	0.98	4.94	2.04	1.94	0.42	NA	1.16	0.61	1.87	1.29
ferrous Fe	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
groundwater elevation	feet MSL	686.28	757.46	764.4	756.7	764.17	NA	761.13	758.75	757.99	763.79
manganese (dissolved)	mg/L	1.77	NA	NA	NA	NA	NA	NA	NA	NA	NA
nitrate nitrogen	mg/L	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
nitrite nitrogen	mg/L	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
ORP	mV	-96.3	48.1	80.1	-9.7	-105.3	NA	-87.5	19.8	-89.6	154.8
orthophosphate phosphorus	mg/L	<0.03	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	su	7.02	6.64	4.21	6.17	6.16	NA	6.4	6.96	6.67	6.74
specific conductance	umhos/cm	258	109	562	381	169	NA	128	159	739	245
sulfate	mg/L	8.96	NA	NA	NA	NA	NA	NA	NA	NA	NA
sulfide	mg/L	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
temperature	degrees C	20.44	22.56	35.89	26	24.4	NA	24.45	25.29	30.18	23.47
total organic carbon	mg/L	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA

**Table 3**  
**Summary of Groundwater Analytical Results**  
**June 2013**  
**Auriga Spartanburg Facility**  
**AECOM Project No. 60280417**

Parameter	Unit	RW-91 6/18/2013	RW-92 6/18/2013	RW-108 6/17/2013	RW-110 6/17/2013	RW-111 6/17/2013
<b>Volatile Organics and 1,4-Dioxane</b>						
acetone	mg/L	NA	NA	<0.01	<0.01	<0.01
chloroform	mg/L	NA	NA	<0.005	0.00514	<0.005
1,1-dichloroethane	mg/L	NA	NA	<0.005	<0.005	<0.005
1,1-dichloroethene	mg/L	NA	NA	<0.005	<0.005	<0.005
cis-1,2-dichloroethene	mg/L	NA	NA	<0.005	<0.005	<0.005
trans-1,2-dichloroethene	mg/L	NA	NA	<0.005	<0.005	<0.005
1,4-dioxane	mg/L	1.65	0.871	<0.002	<0.002	<0.002
1,1,1,2-tetrachloroethane	mg/L	NA	NA	<0.005	<0.005	<0.005
tetrachloroethene	mg/L	NA	NA	<0.005	<0.005	<0.005
trichloroethene	mg/L	NA	NA	<0.005	<0.005	<0.005
vinyl chloride	mg/L	NA	NA	<0.01	<0.01	<0.01
<b>DowTherm A™</b>						
1,1-biphenyl	mg/L	0.0822	<0.01	<0.01	NA	NA
diphenyl ether	mg/L	0.263	0.422	<0.01	NA	NA
<b>Field and Natural Attenuation Parameters</b>						
alkalinity	mg/L	NA	NA	199	NA	NA
chloride	mg/L	NA	NA	4.99	NA	NA
dissolved oxygen	mg/L	0.23	0.87	0.56	3.57	0.31
ferrous Fe	mg/L	NA	NA	0.12	0.3	0.02
groundwater elevation	feet MSL	756.23	757.48	674.83	684.09	701.38
manganese (dissolved)	mg/L	NA	NA	0.202	NA	NA
nitrate nitrogen	mg/L	NA	NA	NA	NA	NA
nitrite nitrogen	mg/L	NA	NA	NA	NA	NA
ORP	mV	-9.2	-85	-116.8	89.9	-105.1
orthophosphate phosphorus	mg/L	NA	NA	0.0442	NA	NA
pH	su	5.72	6.74	7.44	6.91	8.69
specific conductance	umhos/cm	208	455	264	182	178
sulfate	mg/L	NA	NA	1.66	NA	NA
sulfide	mg/L	NA	NA	<0.05	NA	NA
temperature	degrees C	22.1	27.27	18.24	16.66	17.5
total organic carbon	mg/L	NA	NA	<1	NA	NA

**Table 4**  
**Summary of Surface Water Analytical Results**  
**June 2013**  
**Auriga Spartanburg Facility**  
**AECOM Project No. 60280417**

Parameter	Unit	SW-01 6/18/2013	SW-01 Dup 6/18/2013	SW-02 6/18/2013	SW-03 6/18/2013	SW-04 6/18/2013	SW-05 6/18/2013	SW-06 6/18/2013	SW-07 6/18/2013	SW-08 6/18/2013	SW-09 6/18/2013	SW-10 6/18/2013	SW-11 6/18/2013	SW-11 Dup 6/18/2013	SW-12 6/18/2013	SW-13 6/18/2013	SW-14 6/18/2013
chloroform	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0237	0.0115	0.0075
1,4-dioxane	mg/L	<0.002	<0.002	<0.002	<0.002	0.00405	<0.002	<0.002	<0.002	<0.002	<0.002	0.00256	<0.002	<0.002	<0.002	<0.002	<0.002
dissolved oxygen	mg/L	6.54	NA	7.02	6.94	7.74	6.06	6.92	7.71	6.25	6.58	6.77	7.07	7.07	6.29	6.61	7.8
ORP	mV	-52.8	NA	-54.1	-44.6	-50.7	-49	-45	-42.1	-52.4	-65.9	-40.7	-70.8	-70.8	94.1	116.5	144.2
pH	su	7.11	NA	9.05	6.92	7.29	7.08	6.87	7.11	7.38	8.18	7.36	8.72	8.72	6.59	6.52	6.44
specific conductance	umhos/cm	71	NA	75	66	77	66	55	56	67	106	135	269	269	101	92	88
turbidity	NTU	14.6	NA	10.1	9.1	8.2	18	11.1	11.6	9.7	12.2	10.06	16.4	16.4	8.23	3.5	4.67
temperature	degrees C	22.9	NA	23.13	22.15	21.89	23.04	24.35	24.5	24.08	24.14	25.36	24.01	24.01	20.08	20.27	20.36

NA - Not Analyzed

degrees C - degrees Celsius

mg/L - milligrams per liter

mV - millivolts

NTU = nephelometric turbidity units

su - standard units

umhos/cm - micromhos/cm

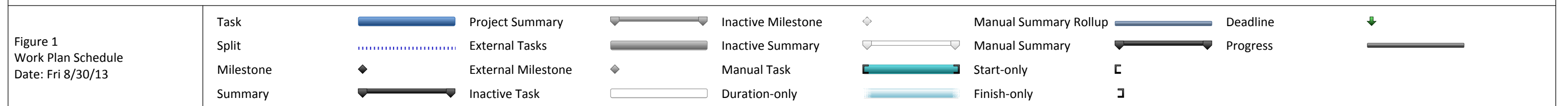
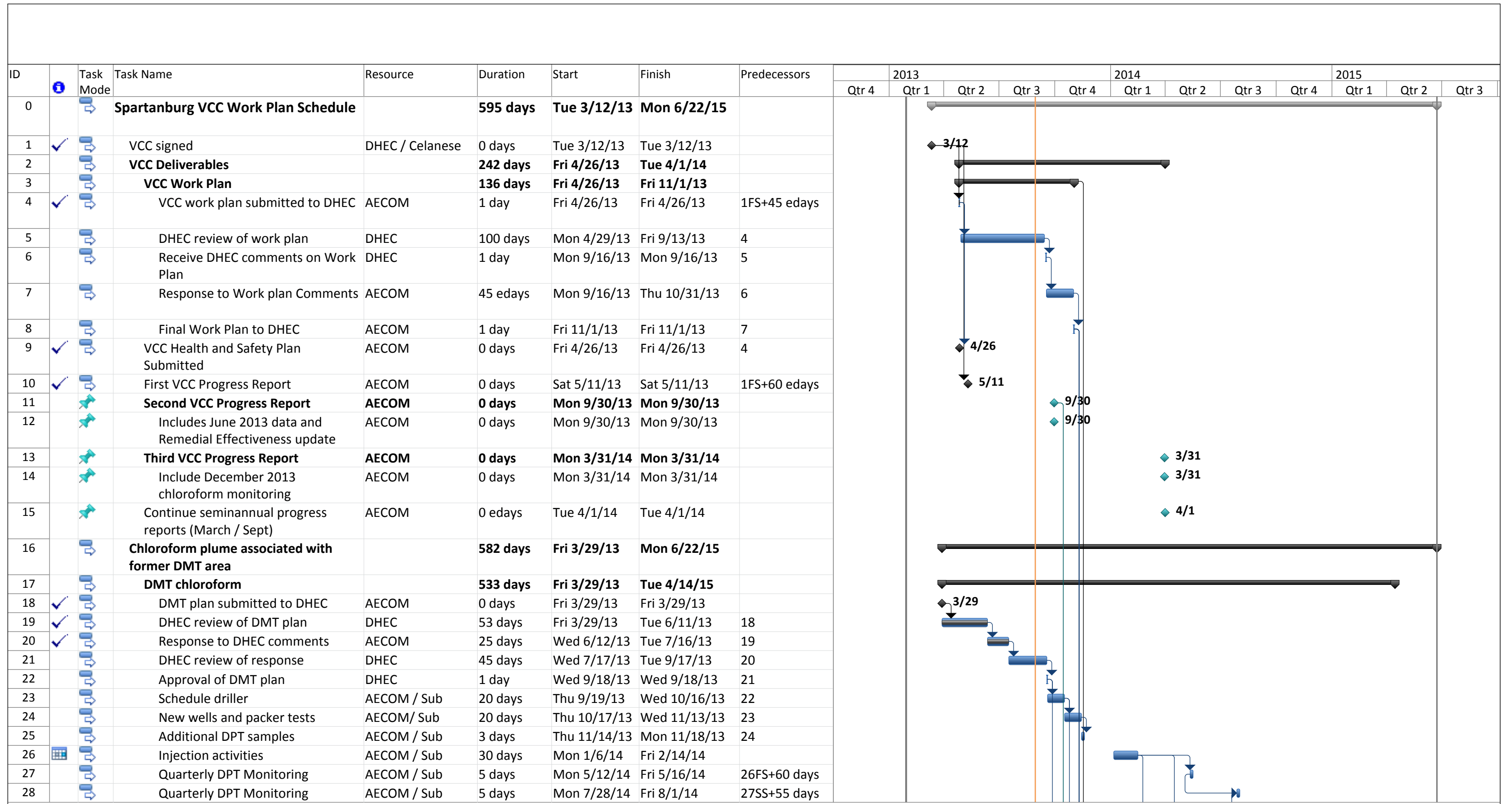
**Table 5**  
**Summary of Chloroform Remediation Results**  
**Auriga Spartanburg**

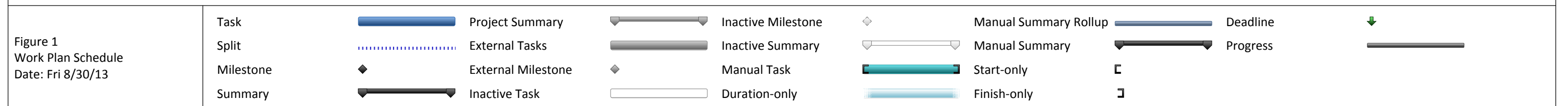
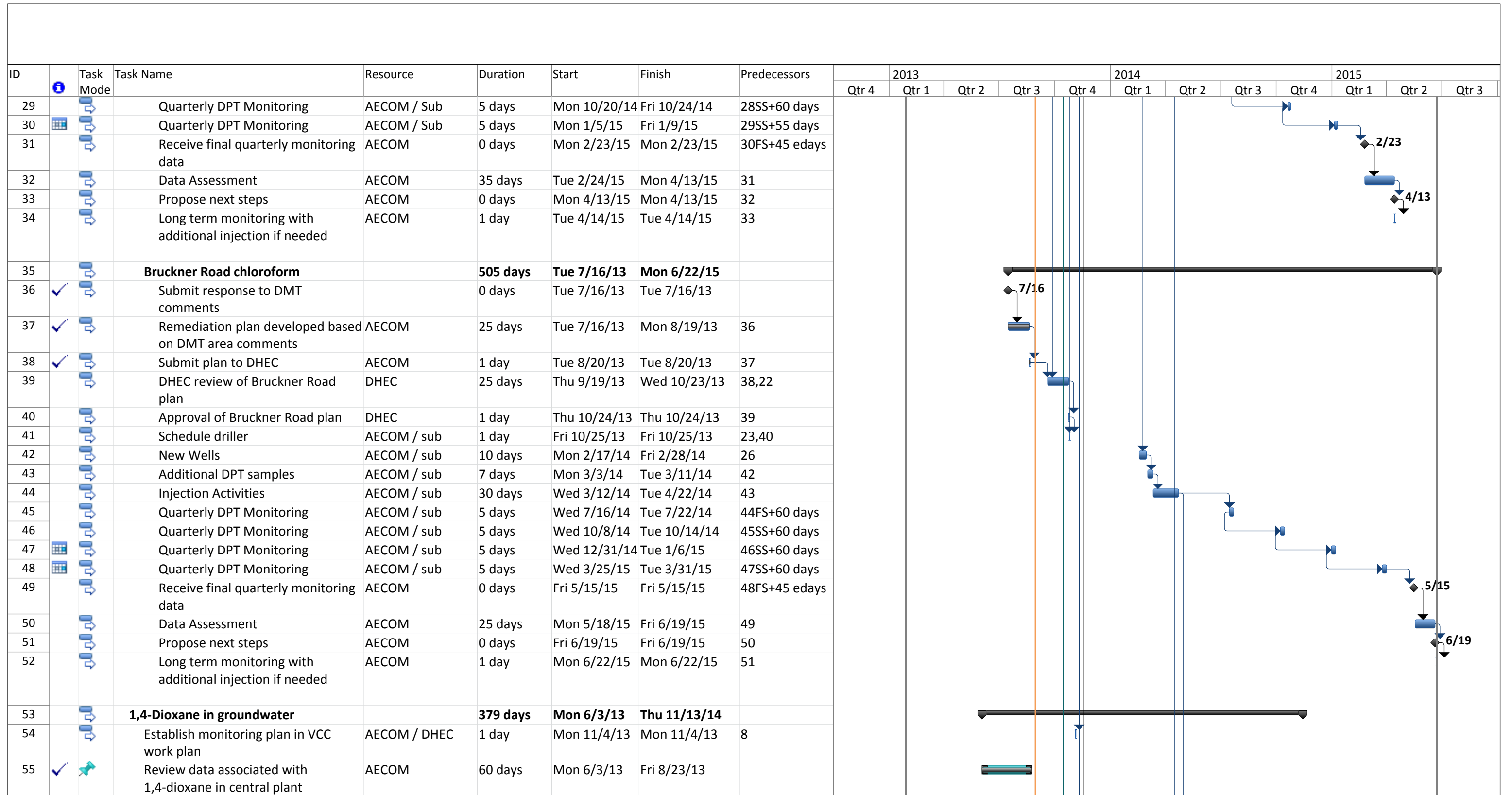
Data in mg/L	Pre-Injection Concentration	June 2013 Concentration
<b>Injection Locations</b>		
	EW-30	2.36
	EW-31	1.57
	EW-37	4.6
	EW-39	8.36
	EW-40	3.21
	EW-41	1.74
	EW-44	4.0
	EW-49	0.93
	EW-50	0.463
	EW-53	4.02
	RW-47	1.16
	RW-48	15.0
	RW-65	4.19
	RW-108	0.358
<b>Monitoring Locations</b>		
	EW-36	0.217
	EW-52	0.0135
	MW-45	0.014
	MW-99	0.014
	MW-103	0.376
	MW-105	0.349
	MW-106	0.461
	MW-107	0.0063
	MW-109	0.14

\* - December 2012 result, most recent sample from this location

\*\* - June 2012 result, most recent sample from this location

## Figures

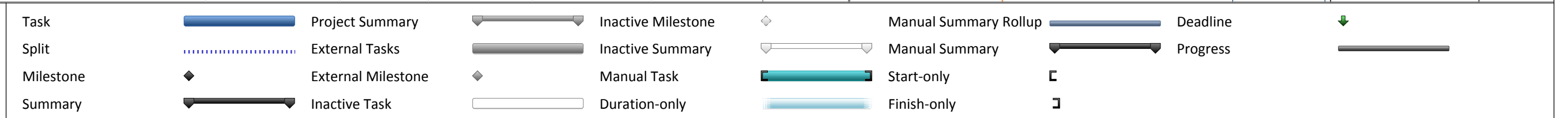






ID	Task Mode	Task Name	Resource	Duration	Start	Finish	Predecessors	2013				2014				2015		
								Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2
56	✓	Update conditions in Remedial Effectiveness update	AECOM	0 days	Mon 9/30/13	Mon 9/30/13	11					◆ 9/30						
57		Update conditions in RI report	AECOM	0 days	Thu 11/13/14	Thu 11/13/14	89											◆ 11/13
58		<b>DowTherm A in groundwater</b>		<b>294 days</b>	<b>Mon 9/30/13</b>	<b>Thu 11/13/14</b>						◆ 9/30						◆ 11/13
59		Establish monitoring plan in VCC work plan	AECOM / DHEC	1 day	Mon 11/4/13	Mon 11/4/13	8											
60	✓	Update conditions in Remedial Effectiveness update	AECOM	0 days	Mon 9/30/13	Mon 9/30/13	11					◆ 9/30						
61		Update conditions in RI report	AECOM	0 days	Thu 11/13/14	Thu 11/13/14	89											◆ 11/13
62		<b>DowTherm A DNAPL</b>		<b>199 days</b>	<b>Mon 11/4/13</b>	<b>Thu 8/7/14</b>												
63		Establish monitoring plan in VCC work plan	AECOM / DHEC	1 day	Mon 11/4/13	Mon 11/4/13	8											
64		Establish DNAPL investigation in VCC work plan	AECOM / DHEC	1 day	Mon 11/4/13	Mon 11/4/13	8											
65		Complete chloroform related field activities	AECOM / sub	0 days	Tue 4/22/14	Tue 4/22/14	26,44											
66		Complete DowTherm A field investigation	AECOM / sub	20 days	Wed 4/30/14	Tue 5/27/14	65FS+5 days											
67		Receive data	AECOM / lab	1 day	Wed 7/2/14	Wed 7/2/14	66FS+25 days											
68		Review results	AECOM	25 days	Thu 7/3/14	Wed 8/6/14	67											
69		Submit recommendations to DHEC	AECOM	1 day	Thu 8/7/14	Thu 8/7/14	68											
70		<b>Other chlorinated solvents in groundwater</b>		<b>1 day</b>	<b>Mon 11/4/13</b>	<b>Mon 11/4/13</b>												
71		include assessment of Fall 2012 investigation in VCC work plan	AECOM	1 day	Mon 11/4/13	Mon 11/4/13	8											
72		Establish monitoring plan in VCC work plan	AECOM/DHEC	1 day	Mon 11/4/13	Mon 11/4/13	8											
73		<b>Cherokee Creek sediments and ecological habitat</b>		<b>269 days</b>	<b>Mon 11/4/13</b>	<b>Thu 11/13/14</b>												
74		submit plan forward in VCC work plan	AECOM	1 day	Mon 11/4/13	Mon 11/4/13	3											
75		review recommendations and update in RI	AECOM	1 day	Thu 11/13/14	Thu 11/13/14	93											
76		<b>Site wide activities</b>		<b>369 days</b>	<b>Mon 6/17/13</b>	<b>Thu 11/13/14</b>												
77	✓	<b>June 2013 Annual Sampling</b>		<b>28 days</b>	<b>Mon 6/17/13</b>	<b>Wed 7/24/13</b>												
78	✓	Sample collection	EFM / AECOM	5 days	Mon 6/17/13	Fri 6/21/13												
79	✓	Receive data from lab	AECOM / lab	1 day	Mon 7/22/13	Mon 7/22/13	78FS+20 days											
80	✓	Data Validation	AECOM	2 days	Tue 7/23/13	Wed 7/24/13	79											

Figure 1  
Work Plan Schedule  
Date: Fri 8/30/13



ID	Task Mode	Task Name	Resource	Duration	Start	Finish	Predecessors	2013				2014				2015		
								Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2
81		<b>December 2013 Monitoring</b>		<b>28 days</b>	<b>Sat 12/7/13</b>	<b>Wed 1/15/14</b>												
82		Sample collection	EFM / AECOM	2 days	Sat 12/7/13	Mon 12/9/13												
83		Receive Data	AECOM / lab	0 days	Mon 1/13/14	Mon 1/13/14	82FS+25 days											
84		Data Validation	AECOM	2 days	Tue 1/14/14	Wed 1/15/14	83											
85		<b>June 2014 Annual Sampling</b>		<b>27 days</b>	<b>Mon 6/9/14</b>	<b>Tue 7/15/14</b>												
86		Sample collection	EFM / AECOM	5 days	Mon 6/9/14	Fri 6/13/14												
87		Receive data from lab	AECOM / lab	1 day	Mon 7/14/14	Mon 7/14/14	86FS+20 days											
88		Data Validation	AECOM	1 day	Tue 7/15/14	Tue 7/15/14	87											
89		<b>Remedial Investigation Report</b>		<b>87 days</b>	<b>Wed 7/16/14</b>	<b>Thu 11/13/14</b>												
90		Complete work plan investigations	AECOM / DHEC / subs	1 day	Wed 7/16/14	Wed 7/16/14	88,67											
91		draft RI	AECOM	50 days	Thu 7/17/14	Wed 9/24/14	90											
92		review RI	Celanese	25 days	Thu 9/25/14	Wed 10/29/14	91											
93		complete RI	AECOM	10 days	Thu 10/30/14	Wed 11/12/14	92											
94		Submit RI	AECOM	1 day	Thu 11/13/14	Thu 11/13/14	93											
95		Continue Monitoring as established in Work Plan	AECOM / EFM	1 eday	Tue 7/15/14	Wed 7/16/14	85											

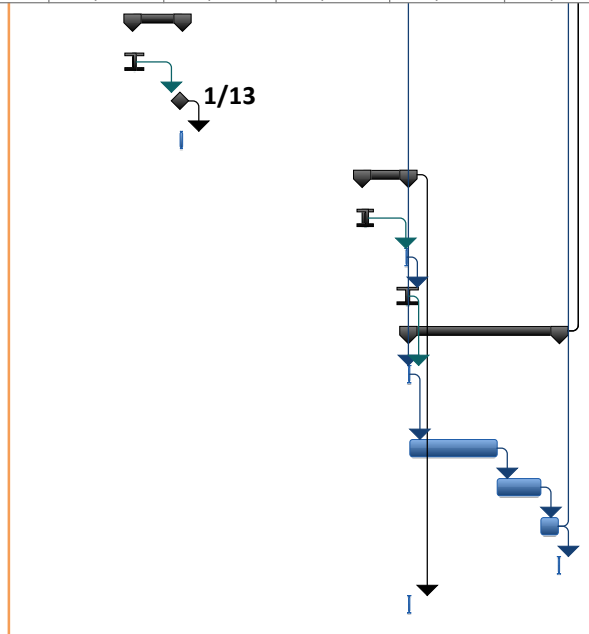


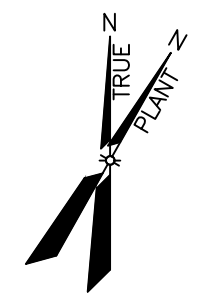
Figure 1 Work Plan Schedule Date: Fri 8/30/13	Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
	Split		External Tasks		Inactive Summary		Manual Summary		Progress	
	Milestone		External Milestone		Manual Task		Start-only			
	Summary		Inactive Task		Duration-only		Finish-only			



**LEGEND**

- MONITORING WELL LOCATION
- ☒ SURFACE WATER SAMPLE LOCATION

NOTE: LOCATION OF MW-40R IS APPROXIMATE - SURVEY PENDING.



**FIGURE 2**  
SAMPLE LOCATION MAP  
JUNE 2013

AURIGA SPARTANBURG FACILITY  
SPARTANBURG, SOUTH CAROLINA