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Sent Via Email

July 22, 2014

Mr. Matt Aufman
REC Program
Inactive Hazardous Sites Branch
Superfund Section
NC Division of Waste Management
1646 Mail Service Center
Raleigh, NC 27699-1646

Reference: Groundwater Remedial Action Plan
Trion, Inc., Sanford, NC
NONCD 0002843
H&H Project No. BAI.004

Dear Mr. Aufman:

Hart & Hickman is pleased to provide this Groundwater Remedial Action Plan for the above-referenced site.

As discussed with REC Program personnel, once the 30 day public notice period for the RAP is complete, the current Remediating Party (RP) will certify the Work Phase Completion Certification. However, the current RP will not be implementing the RAP. Due to finalization of bankruptcy proceedings involving the current RP another entity plans to enter into an Administrative Agreement with the REC Program in the near future and will implement the RAP.

The required certification statements for the RAP are included as Appendix A of the document. If you have any questions, please contact me at (919) 847-4241.

Sincerely,

Hart & Hickman, PC

Leonard C. Moretz

Leonard C. Moretz, L.G., RSM
Project Director/Branch Manager

Attachments

cc: Josh Brock
Barrier Advisors, Inc.
As Plan Administrator for Trion, Inc. and
Trustee of the FC Term Lenders Liquidating Trust

David Dean, Esq.
Consultant to Barrier Advisors, Inc.

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Groundwater Remedial Action Plan

Trion, Inc. Facility
101 McNeill Road
Sanford, North Carolina

H&H Job No. BAI-004
June 30, 2014

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H&H Job No. BAI-004

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Groundwater Remedial Action Plan
Trion, Inc. Facility
101 McNeill Road
Sanford, NC
H&H Job No. BAI-004

1.0 Introduction

This Groundwater Remedial Action Plan (GW-RAP) has been prepared on behalf of Fedders Corporation (Fedders) by Hart & Hickman, P.C. (H&H) for groundwater impacted at the Trion, Inc. (Trion) facility and property located at 101 McNeill Road in Sanford, Lee County, North Carolina (Site). This GW-RAP has been prepared in accordance with an Administrative Agreement (AA) for a voluntary Registered Environmental Consultant (REC)-directed assessment and remedial action executed on August 24, 2010-Directed Assessment and Remedial Action Pursuant to North Carolina General Statutes (N.C.G.S.) 130A-310.9(c) and 15A North Carolina Administrative Code (NCAC) 13C .0300 (Docket No. 10-SF-337) with Department of Environment and Natural Resources (DENR) for voluntary remedial action at the Site under North Carolina's REC Program. Under this AA and in accordance with the rules and requirements of the REC program, Fedders retained H&H as its REC.

This GW-RAP has been prepared to meet the specific requirements of the following:

- Section III.C of the AA for the Site;
- DENR *Registered Environmental Consultant Program Implementation Guidance* dated December 2013 (referred to herein as the REC Guidance); and,
- Requirements for a RAP contained in North Carolina Administrative Code (NCAC) Title 15A 13C .0306 (l).

This RAP solely addresses groundwater contamination because the Remedial Investigation (RI) only identified impacts to groundwater.

The report is organized into sections to include the following:

- Site Information (Section 2.0);

- Summary of RI Results (Section 3.0);
- Remedial Action (RA) Objectives (Section 4.0);
- Feasibility Study (Section 5.0);
- Proposed Remedy (Section 6.0); and,
- References (7.0).

The signed and notarized Remediating Party and Registered Site Manager Document Certification Statements are included after the front cover and in **Appendix A**.

2.0 Site Information

2.1 Facility Description

Fedders was the parent company of Trion; however, Fedders is in bankruptcy. The Site is currently owned and operated by Trion IAQ, a division of Air System Components, Inc. (ASC), a wholly owned subsidiary of AD Industries, Inc. (formerly Tomkins Industries, Inc.), an Ohio corporation ("ADI"). ADI purchased the assets of Trion, Inc. out of the bankruptcy proceedings of Fedders and its subsidiaries. At the time of the asset purchase, ADI was a wholly owned subsidiary of Tomkins Limited. On November 9, 2012 Air Distribution Technologies, Inc. acquired ADI and ASC from Tomkins Limited and its subsidiaries in a stock purchase.

2.2 Site Identification and Background

Operations at the Site include manufacturing, assembly, and warehousing of air purification equipment. Manufacturing activities consist of metal stamping, forming of parts, parts washing, painting, welding, air cleaning, unit assembly and packaging, and warehousing prior to shipping. Prior to 1966, the Site was reportedly vacant land. White Consolidated, Inc. (White), formerly Whiting Roberts Company, owned the Site from 1966 until 1984. White manufactured textile equipment at the Site during this period. Air purification equipment has been manufactured at the Site from 1984 to the present.

The Site is located at 101 McNeill Road in Sanford, Lee County, North Carolina (latitude 35° 30' 52" N, longitude 79° 12' 51" W). The Site consists of approximately 25 acres with a 269,000 square-foot one-story building (Facility) located to the northeast of the intersection of U.S. Route 421 and McNeill Road in Sanford, North Carolina. Mixed industrial and residential properties surround the Site. The Facility consists of office space, a warehouse, and manufacturing space. A paved (asphalt and concrete) driveway, storage area, and loading dock area are present to the rear (east) of the Facility. Investment Recovery Services (IRS) currently owns the adjacent property behind the Site. Immediately behind the IRS building is the railroad right of way. A grass/landscaped area and a large pond are located on the northern side of the Facility. The pond was reportedly used for irrigation and fishing purposes and was noted to exist

prior to development of the Site. The intermittent stream running from the pond eastward continues in the adjacent IRS property. **Figures 1 and 2** depict site location and permanent features of the Site.

3.0 Summary of RI Results

The objectives of the RI were to identify releases of hazardous substances to the environment, identify potential exposure pathways, characterize the nature of such releases, collect sufficient sampling data to support a cleanup-level determination, delineate the areal and vertical extent of contamination, and characterize Site conditions sufficiently to conduct a feasibility study of remedial alternatives and support a proposed remedy.

H&H summarized previous environmental assessments conducted at the Site by URS Corporation (URS) and Environmental Quality Management, Inc. (EQM) in the certified *Remedial Investigation Work Plan* (RIWP) dated October 20, 2010. The summary includes both the Phase I Environmental Site Assessment (Phase I ESA) and Phase II Environmental Site Assessment (Phase II ESA) activities conducted at the Site by URS.

The Phase I RI Report under the REC Program was completed by H&H in November 2013. Below are the summary, conclusions and recommendations provided in that report:

- The storm sewer line was located on the IRS property using a combination of EM and GPR techniques. A fiber-optic camera mounted on a motorized crawler was used to examine the integrity of this storm sewer line. Several cracks and open joints were documented.
- Soil samples were collected along the storm sewer line located on the IRS property to evaluate the potential for this feature to be the source of groundwater impacts. No constituents were detected in soil samples above Soil Remediation Goals (SRGs);
- Sediment samples were collected at the storm sewer line outfall and upgradient of this location. These samples were screened for volatile organic vapor using a photo-ionization detector (PID). Impacts were not identified in the sediment samples during field screening, and therefore the samples were not submitted for laboratory analysis.
- Groundwater samples were collected from previously existing Site monitoring wells and from off-site monitoring wells installed as part of the Phase I RI. The main constituent of concern (COC), trichloroethene (TCE), was detected at concentrations above the 2L

Standards in Site monitoring wells TMW-4, MW-8, and offsite wells MW-13, and MW-17. Cis-1,2-dichloroethene (DCE), a breakdown product of TCE was detected in well MW-8 above its 2L Standard. Additionally, vinyl chloride, a breakdown product of TCE, was detected slightly above its 2L standard of 0.03 µg/L in offsite deep well DMW-1. Dissolved-phase chlorinated volatile organic compounds (CVOCs), including cis-1,2-DCE, trans-1,2-DCE, tetrachloroethene (PCE), and TCE, were detected at concentrations above the laboratory reporting limits, but below 2L Standards in monitoring wells TMW-4, TMW-5, MW-6, MW-8, MW-11, MW-13, and MW-17.

- Acetone was detected above its 2L Standard of 6,000 µg/L in offsite deep monitoring well DMW-1 during sampling events conducted in June and early August 2013. These detections were a surprise because no other monitoring wells, either on Site or off site, had acetone detected at concentrations within an order of magnitude of the 2L Standard. Information recently provided by employees of the Trion, Inc facility indicate that acetone was used at the facility from 1995 – 2005 in the power supply department to clean circuit boards. Approximately 8 ounces of acetone was reportedly used per day. The acetone was stored in the paint supply room and used acetone was mixed with paint waste and sent offsite as hazardous waste for incineration.
- Chromium was detected at concentrations that slightly exceed the 2L Standards in the groundwater samples collected from monitoring wells MW-14, MW-15, and DMW-1. Manganese was detected at concentrations that exceed the 2L Standards in the groundwater samples collected from all of the monitoring wells except MW-8; including the background well TMW-1. Turbidity of the groundwater samples likely contributed to these elevated concentrations. Background concentrations of chromium and manganese are highly variable in this area; therefore, their presence is not interpreted to be the result of Site-related activities but rather is considered naturally occurring.
- TCE was detected in Site monitoring wells MW-8 and TMW-4 and off-site monitoring well MW-13 at concentrations exceeding the IHSB Industrial/Commercial Vapor Intrusion Screening Criteria of 4.4 µg/L. These wells are located within 100 ft of occupied or potentially occupied buildings; therefore, in accordance with the June 2011 "IHSB Supplemental Guidelines for the Evaluation of Structural Vapor Intrusion Potential for Site Assessments and Remedial Actions" collection of soil vapor samples

was necessary. Based upon the soil vapor sampling results from SV-1, collected adjacent to well MW-13 on the adjacent IRS property, risk to workers at the nearby IRS building from vapor intrusion is not a concern. Due to high seasonal water table, a soil vapor sample was not collected near wells MW-8 and TMW-1. It is anticipated that either a soil vapor or a sub-slab sample will be collected near these well locations during preparation of the RAP.

- The groundwater CVOC contaminant plume resulting from releases from the Site, which is part of the Administrative Agreement, has been adequately defined. However, the source, nature and extent of the recently detected acetone have not been defined.

Based upon the results of the Phase I RI and the historical investigative activities, the following conclusions and recommendations were developed:

- No additional assessment or remedial work is necessary associated with the storm sewer line.
- Chromium and manganese are naturally occurring and are present in Site groundwater at concentrations similar to background; therefore, no additional assessment for metals is recommended.
- The extent of the CVOC groundwater plume has been adequately defined.
- Based upon a soil vapor sample collected near well MW-13 on the adjacent off-site property, it does not appear that vapor intrusion of Site-related contaminants is a user risk. However, a soil vapor sample could not be collected on the Site near well MW-8 due to the high water table. Therefore, the Phase II RI will include either the collection of a soil vapor sample once the high water table subsides, or collection of a sub-slab vapor sample beneath the Facility, near well MW-8.

The RI had been considered complete until the (June/August 2013) detections of acetone in off-site deep monitoring well DMW-1. However, additional investigation was necessary to determine the source, nature and extent of the acetone.

The *Phase I RI Report* discussed the environmental setting of the site, described the subgrade piping, soil, and groundwater assessments activities. A storm sewer line was located on the IRS property and soil samples were collected along the line with no detected constituents above soil remediation goals (SRGs). Groundwater samples were collected from existing wells and two off-site monitoring wells which were installed as part of the Phase I RI. Most recent concentrations above the 15A NCAC 02L .0202 Groundwater Standards - Effective April 1, 2013 (2L standards) for trichloroethene (TCE) on-site were MW-8 (72 µg/L), TMW-4 (10 µg/L), and off-site in MW-13 (36 µg/L). Off-site DMW-1 was above the 2L standard for acetone during the last Phase I RI sampling event (11,000 µg/L). It was concluded this would be addressed in the Phase II RI. The degradation product cis-1,2-dichloroethene (cDCE) was detected above 2L standards in MW-8 (160 µg/L); it and other degradation products trans-1,2-dichloroethene (tDCE) and vinyl chloride (VC) were detected below the 2L standard on-site in MW-8, TMW-4, MW-11, and off-site in MW-13, and MW-17 (**Figure 3**). It was concluded that no further remedial work is necessary associated with the storm sewer line, elevated metals were naturally occurring at the Site, and that the chlorinated volatile organic compound (CVOC) groundwater plume was adequately defined. Vapor intrusion does not appear to pose a risk however soil vapor near well MW-8 was not assessed due to high water table and will be addresses in the Phase II RI along with an investigation into acetone concentrations in DMW-1.

As outlined in the *Phase II RI Report* dated March 11, 2014 an extensive development and purging of DMW-1 was conducted followed by two sampling events approximately one week apart, and soil vapor was sampled near MW-8. In both sampling events for DMW-1 acetone was not present and no other constituent were above the 2L standard (**Figure 3**). The subslab vapor sample near MW-8 did not contain any detectable concentrations of analyzed constituents.

Given the findings of the Phase I and Phase II RI Reports conducted by H&H it is concluded that groundwater is impacted by a defined plume of TCE above the 2L standard from an undefined source and degradation products are present in detectable amounts. The vertical extent of known exceedance of the 2L standard is 50ft and the areal extent can be seen in **Figure 4**. The Phase II RI confirms that acetone is not a contaminant of concern (COC), and that vapor intrusion is not a concern at the Site.

4.0 Remedial Action Objective

The objective of the proposed groundwater RA is to bring TCE and its degradation products (cDCE, tDCE, and VC) below the current 2L groundwater standards for an industrial/commercial facility that does not supply private well drinking water or impact public water systems. The area to be remediated is shown aerially in **Figure 4** to the deepest known vertical extent above 2L standards extending to 50 ft below ground surface (bgs).

5.0 Feasibility Study

This Feasibility Study (FS) was performed to evaluate available remedial alternatives for achieving the RA objective presented in Section 4.0 for the Site. The FS is structured as specified in 15A NCAC 13C .0300 and REC program guidance. Multiple potential remedies were screened to identify the most appropriate options, and these options are subjected to further comparative analysis.

5.1 Screening of Available Remedies

5.1.1 No Action

The No Action alternative was considered as a baseline response action. Because TCE and various degradation products are present in groundwater at concentrations above applicable groundwater quality standards, the No Action alternative does not meet the specified RA objectives. Accordingly, this option is not considered further in the FS.

5.1.2 Institutional Controls

Institutional controls include site access restrictions such as perimeter fencing, no trespassing signs, deed restrictions, prohibiting use of groundwater, zoning ordinances restricting development, providing an alternate water supply to groundwater users, and other instruments to deter uninformed parties from coming into contact or otherwise being exposed to potential environmental risks associated with the Site impacts. There is minimal risk for exposure to the public or the environment because municipal water is supplied to both the Site and the adjacent property (IRS building) and there are no outlets on or off site for groundwater. However, due to the presence of COCs in groundwater beneath the site and the adjacent IRS property at concentrations above applicable groundwater quality standards, the institutional controls alternative does not meet the specified RA objectives. Accordingly, this option is not considered further in the FS.

5.1.3 Pump and Treat

Pump and Treat (P&T) refers to extraction of groundwater from recovery wells or trenches followed by ex-situ treatment of the groundwater. P&T can also affect containment of groundwater, thereby preventing migration of impacted groundwater in an aquifer. However, this technology can be ineffective in aquifer restoration. Groundwater extraction is typically used to: 1) remove bulk contaminant mass from the aquifer, and 2) provide hydraulic containment of dissolved compounds in groundwater. P&T removal of dissolved VOCs from groundwater typically occurs at an exponential decay rate (i.e., the initial removal rate is high when VOC concentrations are relatively high, and during subsequent removal at lower VOC concentrations the rate is very slow). Consequently, the use of a P&T remedy on a plume with low VOC concentrations would not typically be expected to result in significant reductions. Hydraulic plume containment by means of groundwater pumping is not necessary for this site because the plume is relatively small and no water supply wells are threatened. Based on the potential limited effectiveness of pump and treat groundwater systems for low concentration plumes and the lack of need for hydraulic plume control, a P&T remedial option does not appear to be an appropriate remedial technology for this Site and will not be considered further in the FS.

5.1.4 Monitored Natural Attenuation

Monitored natural attenuation (MNA) refers to natural processes that occur in an aquifer to adsorb, disperse, dilute, and/or degrade COCs present in groundwater. These naturally-occurring mechanisms have been shown to effectively attenuate COC concentrations in groundwater at many sites. Biodegradation is one of the main MNA mechanisms. Naturally occurring microbes in the groundwater break down contaminants into other compounds and can completely mineralize contaminants to carbon dioxide and water. The primary process for biodegradation of TCE is reductive dechlorination, which occurs under anaerobic conditions. The local environmental conditions determine if degradation products have a short-lived existence and if the reductive dechlorination process will result in full mineralization of the CVOCs. The naturally-occurring geo-chemical conditions the Site appear to be conducive to achieving applicable groundwater quality standards for TCE by natural attenuation mechanisms in a

reasonable period of time. This is evident by the consistent presence of degradation products during groundwater sampling events and favorable redox parameters present within the plume; therefore, this option is considered further in the FS.

5.1.5 In-Situ Chemical Reduction

In-situ chemical reduction (ISCR) refers to the use of chemical amendments to promote reducing conditions in aquifer formations which transform or remove target constituents from groundwater. The chemical amendments are generally introduced as injected liquid solutions. This FS evaluates the injection of a reducing agent to convert TCE to ethene and other non-toxic degradation products. Injections at the Site may not be able to achieve effective distribution due to the lithology of the aquifer at the depths the plume is located, therefore ineffectively treating the COCs. Although there are some limitations with implementation of ICSR at the Site, because the technology could be effective in reducing TCE concentrations, this option is retained for comparison to other options in the FS.

5.1.6 In-Situ Bioremediation

In-situ bioremediation (ISB) is to the use of organic substrates to promote reducing conditions in aquifer formations which reductively dechlorinate chlorinated solvents such as TCE into non-toxic end products. Amendments are typically injected into the subsurface as liquid solutions. The FS evaluates the injection of an organic material to facilitate degradation of TCE to ethene and other non-toxic end products. Injections at the Site may not be able to achieve effective distribution due to the lithology of the aquifer at the depths the plume is located, therefore ineffectively treating the COC. Incomplete degradation of TCE can occur with in-situ bioremediation leaving cDCE and VC un-degraded. Due to the high toxicity of VC and its mobile nature (gaseous) future vapor intrusion issues could occur. Although there are some limitations with implementation of ISB at the Site, because the technology could be effective in reducing TCE concentrations, this option is retained for comparison to other options in the FS.

5.1.7 Permeable Reactive Barrier

The use of a subsurface permeable reactive barrier (PRB) to treat groundwater in-situ has been used at numerous sites. The PRB concept involves placing reactive material into a subsurface trench or through injection wells located perpendicular to the natural groundwater flow path. The impacted groundwater passes through the PRB and treated groundwater exits from the downgradient side of the PRB. A PRB remedy relies upon effective emplacement of material so the groundwater comes in contact with the reactive material. The Triassic Basin site geology is complex and groundwater flow is relatively slow; therefore this site does not lend itself to a PRB remedy. For these reasons, a PBR will not be retained for further evaluation.

5.2 Comparative Analysis of Retained Remedies

The groundwater remedies retained after the screening of available options presented above include the following:

1. Monitored Natural Attenuation
2. In-Situ Chemical Reduction
3. In-Situ Bioremediation

Consistent with IHSB 15A NCAC 3C rules, this section compares these groundwater remedial alternatives based on eight FS criteria:

- Protection of human health and the environment
- Compliance with applicable or relevant and appropriate requirements (ARARs)
- Long-term effectiveness
- Reduction of toxicity, mobility, and volume
- Short-term effectiveness
- Implementability
- Cost
- Community Acceptance

The comparison of these alternatives is presented in **Table 1**. The proposed remedy based upon this evaluation is presented in the following section.

6.0 Proposed Remedy

6.1 Justification for Selection of Proposed Remedy

The top ranked proposed remedy for this Site is Option 1- Monitored Natural Attenuation (MNA) as described in **Table 1** via the criteria described in IHSB 15A NCAC 3C rules as detailed in Section 5.2.

Ranking:

1. Monitored Natural Attenuation
2. In-Situ Bioremediation
3. In-Situ Chemical Reduction

Rational is described below:

- Restrictive lithology in the aquifer from groundwater to depth of contaminant would greatly compromise the effectiveness of any injection activities (Options 2 and 3)
- Portions of the plume are underneath infrastructure and relatively inaccessible for injections (Options 2 and 3)
- Options 2 and 3 both require additional infrastructure implemented at the site and temporary site exclusion work areas
- Options 2 and 3 require additional utilities location, drilling, chemicals handling and explanation to the public
- Option 1 does not require additional infrastructure
- Option 1 is a cost effective technology for aquifer restoration of a low concentration CVOC plume in an industrial setting

The naturally-occurring geo-chemical conditions at the Site appear to be conducive to achieving applicable groundwater quality standards for TCE and it's daughter products by natural attenuation mechanisms in a reasonable period of time. This is evident by degradation products being consistently detected during groundwater sampling events and favorable redox parameters present within the plume.

The second ranked remedial alternative is Option 3- In-Situ Bioremediation. While injection on the Site would pose many difficulties, the mobility and longevity of organic substrate amendments would make ISB a preferable candidate over ISCR. However given implementation, community acceptance, and overall cost of injections, MNA is the preferred remedial alternative.

6.1.1 Natural Attenuation Parameter Data

Natural attenuation of groundwater contaminants occur by physical, chemical, and biological processes. Biodegradation by reductive dechlorination and by abiotic processes are the primary degradation pathways for the type of primary COCs present at the site. Anaerobic bacteria utilize additional electron acceptors in the following order of preference: nitrate (nitrate reduction), ferric iron (iron reduction), sulfate (sulfate reduction), and carbon dioxide (methanogenesis). Because reductive dechlorination occurs under similar conditions to the above anaerobic reactions, the noted constituents may compete with chlorinated VOCs as an electron acceptor. The concentrations of these constituents can provide an indication of the potential for reductive dechlorination. Several anaerobic processes typically occur simultaneously in a single aquifer due to local variability in reducing conditions and reactant concentrations.

During the sampling event conducted in June 2013, select monitoring wells were sampled for anaerobic natural attenuation parameters including nitrate, sulfate, chloride, methane, ethane, ethene, and total organic carbon. H&H obtained field measurements of DO, ORP, pH, ferrous iron, and conductivity for evaluation (**Table 3**). In addition, degradation products can provide direct evidence of reductive dechlorination (**Table 1**). These data are discussed further below.

<u>Degradation Products</u>

If degradation products such as chlorinated VOC intermediates or chlorides are present, reductive dechlorination has occurred or is occurring. High degradation product concentrations relative to parent products are an excellent indication of the presence of reductive dechlorination.

Based on the presence of TCE degradation products, predominantly as cDCE, reductive dechlorination is occurring to some extent at the site. MW-8 since March 2011 and MW-17 since May 2012 through June 2013 have consistently had cDCE concentrations over two times the parent TCE concentrations. MW-13 from March 2011 through June 2013 had cDCE concentrations slightly higher than TCE concentrations. In addition to sustained prolonged cDCE production, TMW-4 and MW-11 previously demonstrated cDCE concentrations two to three orders of magnitude higher than the parent compound TCE in March 2011. VC was detected in DMW-1 during the June and August 2013 sampling events. Below the degradation of PCE to non-toxic ethene is shown step-wise:

$$C_2Cl_4 \text{ (PCE)} + 1\ H_2 \rightarrow C_2H_1Cl_3 \text{ (TCE)} + 1\ HCl$$
$$C_2H_1Cl_3 \text{ (TCE)} + 1\ H_2 \rightarrow C_2H_2Cl_2 \text{ (DCE)} + 1\ HCl$$
$$C_2H_2Cl_2 \text{ (DCE)} + 1\ H_2 \rightarrow C_2H_3Cl_1 \text{ (VC)} + 1\ HCl$$
$$C_2H_3Cl_1 \text{ (VC)} + 1\ H_2 \rightarrow C_2H_4 \text{ (ethene)} + 1\ HCl$$

Overall reaction: $C_2Cl_4 \text{ (PCE)} + 4\ H_2 \rightarrow C_2H_4 \text{ (ethene)} + 4\ HCl$

Ethene is the non-toxic end product of VC degradation, and can degrade into ethane and/or completely mineralize to carbon dioxide. All monitoring wells sampled for ethene and ethane were non-detect during the June 2013 event.

At each step of the reductive dechlorination reaction a chloride ion is also produced. Therefore, higher chloride concentrations relative to background are another indicator of reductive dechlorination. Chloride was detected in area groundwater at concentrations ranging from 13 mg/L to 15 mg/L within the plume (MW-8 and MW-13) during the June 2013 sampling event. Downgradient of the plume in MW-17 chloride was detected at 8.8 mg/L. Upgradient of the plume (TMW-1) chloride was 13 mg/L, indicating chloride concentration within the plume and downgradient are indicative of native aquifer geochemistry. Increased amounts of chloride within or downgradient of the plume would indicate further dechlorination.

Nitrate

Nitrate may be used as an electron acceptor for anaerobic biodegradation via denitrification and may have been depleted by anaerobic biodegradation processes. In this process, nitrate is reduced and nitrite is produced. Therefore, measurement of nitrate provides an indication of anaerobic nitrate-reducing conditions in the aquifer. In general, nitrate concentrations less than background are considered indicative of anaerobic biodegradation. At concentrations greater than 1 mg/L, nitrate may compete with the reductive dechlorination process.

Nitrate as N was detected at concentrations ranging from 0.26 mg/L to 0.52 mg/L within the plume (MW-8 and MW-13), and 0.66 mg/L downgradient (MW-17). No distinct nitrate trends were observed comparing nitrate concentrations detected in impacted monitoring wells with non-impacted monitoring wells (TMW-1 at 0.05 mg/L) as all monitored well were under 1mg/L nitrate as N. Therefore, nitrate will likely not compete with reductive dechlorination.

Ferrous Iron

Ferrous iron is a by-product of ferric iron reduction or iron-reducing conditions which are favorable to natural attenuation. The presence of ferrous iron in groundwater at concentrations greater than 1.0 mg/l is typically considered to be an indication of iron-reducing conditions. Ferrous iron has only been detected in MW-8 and MW-17 at 0.25 mg/L, which suggests that iron will likely not compete with reductive dechlorination.

Sulfate

Sulfate may also be used as an electron acceptor for anaerobic biodegradation. This process is known as sulfate reduction and results in the depletion of sulfate and production of sulfide in the aquifer. In addition, sulfate at concentrations greater than 20 mg/l may compete with the reductive dechlorination process.

Sulfate was detected within the plume at 2.2 mg/L and 10 mg/L (MW-8 and MW-13). These values were lower than upgradient (TMW-1 at 14 mg/L) and downgradient (MW-17 at 12 mg/L) indicating minimum sulfate reduction may have occurred within the plume. The sulfate

concentrations in multiple monitoring wells do not exceeded 20 mg/L indicating no potential for competition with reductive dechlorination.

Methane

Methane is a product of methanogenic anaerobic degradation. Methanogenisis is a direct competitor of reductive dechlorination for both acetate and hydrogen produced from fermentation of organic carbon, but can also cometabolically degrade TCE to VC. All monitoring wells sampled for methane were non-detect during the June 2013 event. Based on these data, methanogenic conditions do not appear to be present.

Total Organic Carbon

Total Organic Carbon (TOC) is utilized as an electron donor in the reductive dechlorination process and is needed to drive the process. Organic carbon can be naturally occurring or man-made. TOC concentrations ranged from 1.0 mg/L to 1.1 mg/L within the plume (MW-8 and MW-13), 2.4 mg/L downgradient (MW-17), and 4.2 mg/L upgradient (TMW-1). The TOC concentrations are below the concentration (> 20 mg/l) considered most favorable for reductive dechlorination according to EPA Protocol. The low TOC levels may be inhibiting the potential for efficient reductive dechlorination as concentrations of TOC are significantly lower in the plume than background and below 20 mg/L.

Dissolved Oxygen

Reductive dechlorination occurs under anaerobic or anoxic conditions (ideally less than 1.0 mg/L). Upgradient of the plume in June 2013 dissolved oxygen (DO) was 3.57 mg/L. Concentrations within the plume during the last sampling event for each monitoring well ranged from 0.42 mg/L to 2.60 mg/L (MW-8, TMW-4, MW-7, and MW-13) with the exception of DMW-1 (5.31) likely due to extensive purging of the well approximately one month prior to reading. Downgradient ranged from 1.09 mg/L to 3.67 mg/L (MW-14, MW-16, and MW-17). These data suggest that the majority of the plume area has low DO conditions, and overall is favorable for reductive dechlorination to occur.

pH

The pH values measured in monitoring well DMW-1 were between 11.84 and 10.07 from May 2012 to August 2013 suggesting the potential presence of cement grout or bentonite near the well screens that is dissolving into groundwater resulting in elevated pH values. Otherwise, groundwater pH measurements ranged from 7.35 to 8.48 within the plume (MW-8, TMW-4, MW-7, and MW-13), downgradient groundwater pH measurements ranged from 6.27 to 9.06 (MW-14, MW-16, and MW-17) from April 2011 to June 2013. Ambient pH (upgradient TMW-1) was measured as 7.12 in June 2013. In general, the site pH data are within the range (5 to 9) which is considered to be favorable for reductive dechlorination to occur. Notably higher pH ranges (6/6.5 to 9) are more favorable as degradation of VC to ethene by *Dehalococcoides spp.* can be inhibited at lower pHs.

ORP

The ORP of groundwater is a measure of electron activity and is an indicator of the relative tendency of a solution to accept or transfer electrons. The ORP of a groundwater system depends upon and influences rates of biodegradation. ORP levels less than +50 mV are acceptable for anaerobic chlorinated solvent degradation; below –100 mV, conditions are most conducive for supporting anaerobic biodegradation of chlorinated solvents. ORP levels at the site ranged from -3.5 to 38.6 within the plume (DMW-1, MW-8, TMW-4, MW-7, and MW-13), downgradient ranged from 6.4 to 153.7 (MW-14, MW-16, and MW-17) from April 2011 to June 2013. Most ORP levels measured at the site are within the range in which reductive dechlorination can occur.

In summary, the natural attenuation parameters indicate a generally reductive environment that is conducive to anaerobic biodegradation of Site-specific COCs. The presence of TCE degradation products cDCE and VC provides direct evidence that degradation through reductive dechlorination is occurring at the site. The site is in anoxic to anaerobic redox stages as evident by low OPR, low DO, and decreased amounts of sulfate within the plume. pH is favorable (above 6) and ambient pH upgradient is highly favorable (above 7) to complete reductive dechlorination. TOC is low (< 3 mg/L) however, and this may inhibit reductive dechlorination. Influent groundwater from upgradient contains higher TOC than within the plume and may

promote dechlorination as upgradient groundwater enters the plume. Overall these parameters indicate favorable conditions for continued reductive dechlorination to occur.

6.2 Activities Necessary for Implementation

Quarterly groundwater sampling will occur for the first year post RAP certification and annually thereafter for a projected time frame of 30 years.

Prior to each groundwater sampling event, a comprehensive round of groundwater elevations will be collected using an electronic water level meter. Groundwater samples will be collected from the following monitoring wells:

- TMW-1 (background, upgradient)
- DMW-1 (deep well, within CVOC plume)
- TMW-4 (within CVOC plume)
- MW-7 (deep well, within CVOC plume)
- MW-8 (within CVOC plume)
- MW-13 (within CVOC plume)
- MW-14 (downgradient)
- MW-16 (downgradient)
- MW-17 (downgradient)

The monitoring wells will be sampled via the low flow/low stress sampling method using a peristaltic pump and dedicated tubing. Groundwater will be pumped at a flow rate that minimizes water-level drawdown (approximately 150-50 mL/min) while stabilization parameters are monitored. Stabilization is considered to be achieved when three consecutive readings, taken at three to five minute intervals, are within the following limits:

- Turbidity (± 10%, less than 10 NTUs)
- DO (± 0.3 mg/L)
- Specific conductance (± 3%)
- pH (± 0.1 unit)
- ORP (± 10 mV)

- Temperature (± 3%)

Measurements, except turbidity, will be obtained using a flow-through cell. Because of the fine silty nature of the sediments, low turbidity (<10 NTUs) has historically not been achievable in many of the previous sampling events. Once stabilization is achieved, ferrous iron will be tested with a field testing kit. Groundwater samples will be collected directly into laboratory supplied containers and submitted for analysis of the following MNA parameters:

- Total organic carbon by Standard Method 5310B
- Methane, ethane, and ethene by method RSK-175
- Anions (Chloride, Sulfate, and Nitrate as N) by method 9056A

After collecting groundwater samples for the above parameters, samples will be collected for VOCs by EPA Method 8260B via low flow reverse sampling. Blind duplicate samples and trip blanks will be collected during each sampling event. Because disposal tubing will be used for purging and sampling, equipment blanks will not be collected. Purge water, decontamination fluids, and waste materials will be properly contained for off-site disposal. See Section 6.7 Decontamination Procedures and 6.8 Removal of Hazardous Waste from Site for further detail.

6.3 Proposed Treatability Studies or Additional Site Characterization

If during the course of monitoring the contaminant concentrations downgradient of the plume (MW-14, MW-17 and MW-16) increase significantly above the 2L standards for a prolonged period, further delineation and revisiting of the RA may be warranted. Otherwise, no additional site characterization or treatability studies are anticipated.

6.4 Procedures and Schedule for Remedial Action

Quarterly groundwater sampling will occur for the first year post RAP certification. After a year of quarterly monitoring, the data will be evaluated to determine if annual monitoring will provide sufficient data. Based upon historic data, it is anticipated that annual monitoring will be conducted after the first year of quarterly monitoring for a projected time frame of 30 years as detailed in Section 6.2.

Remedial Progress Reports will be submitted quarterly for one year after implementation and annually thereafter. Each Remedial Progress Report will be submitted within 60 days of the sampling event. Progress Reports will include copies of laboratory analytical data and other relevant measurements, summary tables, and figures depicting plume location, groundwater gradient, and other information as appropriate. Laboratory analytical data will include the laboratory summary sheet, laboratory results, QA/QC results, and chain of custody documentation. The reports will also include an evaluation of the remedy's continued viability and recommendations for any minor changes in monitoring. If it's determined the selected remedy will not meet remedial objectives, a RAP Addendum will be prepared outlining another remedy.

6.5 Proposed Criteria for Remedial Action Completion

The objectives of the proposed groundwater RA is to bring TCE and its degradation products (cDCE, tDCE, and VC) below the 2L standards for an industrial/commercial facility that does not supply private well drinking water or impact public water systems. Once these standards have been met for all wells in the monitoring network during annual monitoring, quarterly monitoring will again be implemented. Once 2L standards (or the equivalent at the time) have been met for four consecutive quarters remedial action will be complete. If REC Program and/or NCDENR (or their successor in function) rules are modified/changed to allow less restrictive goals for RA completion, then those less restrictive rules may be utilized to determine RA completion.

6.6 Community Health and Site Specific Health and Safety Plan

The Community Health and Site Specific Health and Safety Plan (HASP) is included in **Appendix B**. It is very unlikely the community will be affected by Site monitoring activities; however, measures to protect the community and site workers from exposure will be taken. No unauthorized personnel will be permitted in the work areas. Vehicular traffic associated with sampling events is minimal and will consist of pick-up truck or normal passenger vehicles. This traffic will use the same ingress and egress routes as the site's existing traffic, and will have

duration less than one week per sampling event. This additional traffic is not expected to negatively impact the surrounding community.

Decontamination procedures and containerization of hazardous waste will be performed to protect the public and the environment. See Section 6.7 Decontamination Procedures and 6.8 Removal of Hazardous Waste from Site for further detail.

There will be little risk or disruption to the community during the implementation and progression of the remedy. In addition there is minimal risk for exposure the public or the environment since municipal water is supplied to both the Site and the adjacent property (IRS building) and there are no outlets on or off site for groundwater. Therefore, this remedy should be acceptable to the community. Additionally, as required, this RAP will be subject to a 30 day public comment period.

6.7 Decontamination Procedures

Reusable equipment (i.e., water level meters, downhole probes, etc.) will be decontaminated in accordance with NCDENR and EPA standard protocols. Decontamination fluids and waste materials will be properly contained for off-site disposal. Other sampling devices shall be dedicated and/or disposable. Dedicated or disposable sampling apparatus will be properly contained for disposal if it has come into contact with hazardous materials or suspect hazardous materials. If dedicated or disposable equipment can be properly decontaminated after use, it may be disposed of as non-hazardous in an appropriate container after decontamination.

6.8 Removal of Hazardous Waste from Site

Based upon VOC concentrations in groundwater, it is not anticipated the purge water will be considered hazardous waste. However, this determination will be made based upon analytical data from individual sampling events. All purge water will be containerized in 55 gallon drums, properly labeled, manifested, and disposed at a properly licensed disposal facility.

7.0 References

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TABLES

Table 1
Summary of Groundwater Analytical Data
Trion, Inc. Facility
Sanford, North Carolina
H&H Job No. BAI-004

Well ID	Sample Date	VOCs (8260B)											
		Acetone	Chloroform	Chloromethane	Trichlorofluoromethane	1,2-Dichlorobenzene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Toluene	1,2,4-Trichlorobenzene	Vinyl Chloride
Units		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Screening Criteria (1)		6,000	70	3	2,000	20	70	100	0.7	3	600	70	0.03
Screening Criteria (2)		20,000,000	35	220	160	2,300	NS	140	49	4.4	16,000	30	25
TMW-1	2/26/2008	<25.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	9/10/2009	<25.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	3/1/2011	6.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50
TMW-2	2/26/2008	<25.0	<1.0	2.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	9/10/2009	<25.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	3/2/2011	13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50
TMW-3	2/26/2008	<25.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	9/10/2009	<25.0	<1.0	<1.0	0.86 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	3/1/2011	<5.0	<0.50	<0.50	0.94	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50
TMW-4	2/26/2008	<25.0	<1.0	<1.0	<1.0	<1.0	30.2	2.0	<1.0	**9.5**	<1.0	<1.0	<0.50
	3/13/2008	<25.0	<1.0	<1.0	<1.0	<1.0	35.6	2.9	<1.0	**10.9**	<1.0	<1.0	<0.50
	9/10/2009	<25.0	<1.0	<1.0	<1.0	<1.0	48.0	3.2	<1.0	**13.3**	<1.0	<1.0	<0.50
	3/2/2011	<5.0	<0.50	<0.50	<0.50	<0.50	49	3.6	<0.50	**10**	<0.50	<1.0	<0.50
TMW-5	2/26/2008	<25.0	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	9/10/2009	<25.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	5/12/2011[3]	<5.0	<0.50	<0.50	2.2	<0.50	<0.50	<0.50	0.57	<0.50	<0.50	<1.0	<0.50
MW-6	9/10/2009	<25.0	<1.0	<1.0	<1.0	<1.0	0.27 J	<1.0	<1.0	2.9	<1.0	<1.0	<0.50
	3/2/2011	16	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<1.0	<0.50
MW-7	4/23/2008	2.9 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.69 J	<1.0	<1.0	<1.0	<0.50
	9/10/2009	<25.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	3/2/2011	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50
MW-8	4/23/2008	<25.0	<1.0	<1.0	<1.0	0.56 J	38.9	2.9	<1.0	**12.7**	<1.0	3.9	<0.50
	9/10/2009	<25.0	0.14 J	<1.0	<1.0	<1.0	**113**	9.5	<1.0	**61.6**	<1.0	<1.0	<0.50
	3/1/2011	<5.0	<0.50	<0.50	<0.50	<0.50	**160**	12	<0.50	**61**	<0.50	<1.0	<0.50
	6/20/2013	<5.0	<0.50	<0.50	<0.50	<0.50	**160**	13	<0.50	**72**	<0.50	<1.0	<0.50
MW-9	5/1/2008	<25.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	9/10/2009	<25.0	<1.0	<1.0	<1.0	<1.0	0.30 J	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	3/2/2011	15	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50
MW-10	4/23/2008	<25.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	9/10/2009	<25.0	<1.0	<1.0	0.27 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	3/1/2011	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50
MW-11	5/1/2008	<25.0	<1.0	<1.0	<1.0	<1.0	**137**	6.2	<1.0	2.3	<1.0	<1.0	<0.50
	9/10/2009	<25.0	<1.0	<1.0	<1.0	<1.0	27.4	0.94 J	<1.0	1.8	<1.0	<1.0	<0.50
	3/1/2011	<5.0	<0.50	<0.50	<0.50	<0.50	51	2.6	<0.50	1.8	<0.50	<1.0	<0.50
MW-12	5/1/2008	<25.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	9/10/2009	<25.0	<1.0	<1.0	0.22 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
	3/1/2011	7.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50
MW-13	3/2/2011	<5.0	<0.50	<0.50	<0.50	<0.50	37	1.8	<0.50	**30**	<0.50	<1.0	<0.50
	5/12/2011[4]	<5.0	<0.50	<0.50	<0.50	<0.50	39	1.8	<0.50	**34**	<0.50	<1.0	<0.50
	6/20/2013	<5.0	<0.50	<0.50	<0.50	<0.50	40	2.0	<0.50	**36**	<0.50	<1.0	<0.50
MW-14	3/2/2011	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50
	6/20/2013	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50
MW-15	3/2/2011	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.66	<1.0	<0.50
MW-16	5/18/2012	41.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50
MW-17	5/18/2012	<5.0	<0.50	<0.50	<0.50	<0.50	8.1	<0.50	<0.50	**4.9**	<0.50	<1.0	<0.50
	6/20/2013	<5.0	<0.50	<0.50	<0.50	<0.50	5.3	<0.50	<0.50	2.7	<0.50	<1.0	<0.50
DMW-1	5/18/2012	7.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50
	6/20/2013	**6,500**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.0	<1.0	**0.70**
	8/2/2013	**11,000**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	**0.52**
	8/22/2013	1,900	<25	<12	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0
	9/11/2013	**7,780**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.50	<1.00
	12/11/2013	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.83	<0.50	<0.50	<0.50
	12/18/2013[5]	<5.0	4.8	<0.50	<0.50	<0.50	0.65	<0.50	<0.50	1.8	<0.50	<0.50	<0.50

Notes:
1) Analytical results compared to NC DENR 15A NCAC 2L Groundwater Standards, revised April 1, 2013
2) Analytical results compared to NC DENR Inactive Hazardous Sites Branch (IHSB) Industrial
Vapor Intrusion Preliminary Acceptable Groundwater Concentrations, revised July 2012
3) Sample collected from TMW-5 on 5/12/11 due to well obstruction during 3/1/11 - 3/2/11 sampling event
4) Sample collected from MW-13 on 5/12/11 to confirm concentrations detected during 3/2/11 sampling event
5) Sample collected on 12/18/13 (DMW-1), trip blank contained 1.1 (µg/L) chloroform
Only those compounds detected in at least one sample are shown above
Bold indicates an exceedance of the 2L Groundwater screening criteria referenced in note 1
Shaded indicates an exceedance of the IHSB screening criteria referenced in note 2
Method number follows parameter in parenthesis
VOCs= Volatile Organic Compound
NA = Not Analyzed, NS = Screening criteria not specified

Table 2
Feasibility Study
Trion, Inc. Facility
Sanford, North Carolina
H&H Job No. BAI-004

Evaluation Criteria	Option 1 Monitored Natural Attenuation	Option 2 In-Situ Chemical Reduction	Option 3 In-Situ Bioremediation
Protection of Human Health and the Environment	Reduces target constituent concentrations in ground water.	Reduces target constituent concentrations in ground water.	Reduces target constituent concentrations in ground water.
Compliance with ARARs	May achieve applicable ground water quality standards in plume.	May achieve applicable ground water quality standards in area of influence.	May achieve applicable ground water quality standards in area of influence.
Long-Term Effectiveness	Requires long term monitoring to assure effectiveness. Likely to be in operation for 15 to 30 years or longer in order to achieve applicable ground water quality standards.	Effectiveness is reliant on distribution of injectant in aquifer and promotion of reducing conditions in area(s) of impacts. Multipe injection events may be needed to achive distribution and contaminant contact. Requires monitoring to assure effectiveness. Likely to be in operation 5-10 years or longer.	Effectiveness is reliant on distribution of injectant in aquifer and promotion of reducing conditions in area(s) of impacts. Multiple injection events may be needed to achive distribution and contaminant contact. Use of additional injectates maybe needed (bioaugmentation). Requires monitoring to assure effectiveness. Likely to be in operation 5-10 years or longer.
Reduction of Toxicity, Mobility, and Volume	Toxicity reduced by reduction of target constituent concentrations. Degradation products may build up in significant quantities contributing to higher toxicities (ie VC). Overall contaminant mass reduced by reduction of CVOCs.	Toxicity reduced by reduction of target constituent concentrations. Contaminant migration from areas where injection is not effective may occur. Degradation products may build up in significant quantities contributing to higher toxicities (ie VC). Overall contaminant mass reduced by reduction of CVOCs.	Toxicity reduced by reduction of target constituent concentrations. Contaminant migration from areas where injection is not effective may occur. Degradation products may build up in significant quantities contributing to higher toxicities (ie VC). Overall contaminant mass reduced by reduction of CVOCs.
Short-Term Effectiveness	Only trained and properly outfitted workers will be on-site computing the work. Site and community HASP will restrict exposure to the public.	Only trained and properly outfitted workers will be on-site computing the work. Site and community HASP will restrict exposure to the public.	Only trained and properly outfitted workers will be on-site computing the work. Site and community HASP will restrict exposure to the public.
Implementability	Monitoring of existing wells has no additional requirements. Site access has been previously granted and locations are assessable. One week for implementation per quarter for first year, annually thereafter.	Extensive experience in industry for injected remedies. Precautions for underground utilities, and drilling and chemical handling safety required. Some areas may be difficult to access due to structures on the Site. One week for implementation per event.	Extensive experience in industry for injected remedies. Precautions for underground utilities, and drilling and chemical handling safety required. Some areas may be difficult to access due to structures on the Site. One week for implementation per event.
Cost	$44,000 first year, $11,000 annually for 28 yrs, $44,000 final year, totaling $396,000 over 30 years	$1,145,000 for injection well installation, three injections plus monitoring for 10 years	$1,154,000 for injection well installation, three injections plus monitoring for 10 years
Community Acceptance	Readily accepted in industrial setting. Previously in operation.	Will likely require explaining method to community to assure safety as it involves injection chemicals into the subsurface.	Will likely require explaining method to community to assure safety as it involves injection chemicals into the subsurface.

Table 3
Summary of MNA Data
Trion, Inc. Facility
Sanford, North Carolina
H&H Job No. BAI-004

Well ID	Sample Date	MNA Parameters											
		Dissolved Oxygen (mg/L)	pH (standard units)	Conductivity (µs/cm^2)	ORP (mV)	Chloride (mg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	Nitrate as N (mg/L)	Sulfate (mg/L)	Ferrous Iron (mg/L)	Total Organic Carbon (mg/L)
TMW-1	6/20/2013	3.57	7.12	366	-3.1	13	<1.00	<1.00	<5.00	0.05	14	NA	4.2
DMW-1	5/18/2012	3.31	11.84	826	-96.1	NA	NA	NA	NA	NA	NA	NA	NA
	6/20/2013	6.13	11.11	452	-55.8	NA	NA	NA	NA	NA	NA	ND	NA
	8/2/2013	6.66	10.07	426	-91.2	NA	NA	NA	NA	NA	NA	NA	NA
	8/22/2013	4.22	10.80	397	-68.5	NA	NA	NA	NA	NA	NA	NA	NA
	9/11/2013	5.31	11.06	413	-3.5	NA	NA	NA	NA	NA	NA	NA	NA
TMW-4	3/2/2011	1.35	7.35	417	28.6	NA	NA	NA	NA	NA	NA	NA	NA
MW-7	3/2/2011	1.69	8.12	340	38.6	NA	NA	NA	NA	NA	NA	NA	NA
MW-8	3/1/2011	1.16	7.35	428	42.7	NA	NA	NA	NA	NA	NA	NA	NA
	6/20/2013	0.42	6.95	403	33.2	13	<1.00	<1.00	<5.00	0.26	2.2	0.25	1.1
MW-13	3/2/2011	4.60	7.31	434	48.1	NA	NA	NA	NA	NA	NA	NA	NA
	5/12/2011	2.18	6.27	454	142.5	NA	NA	NA	NA	NA	NA	NA	NA
	6/20/2013	2.60	8.48	323	15.2	15	<1.00	<1.00	<5.00	0.52	10	ND	1.0
MW-14	3/2/2011	5.21	8.14	351	45.1	NA	NA	NA	NA	NA	NA	NA	NA
	6/20/2013	1.09	9.06	236	15.2	NA	NA	NA	NA	NA	NA	ND	NA
MW-16	5/18/2012	1.31	7.61	301	6.4	NA	NA	NA	NA	NA	NA	NA	NA
MW-17	5/18/2012	1.48	6.93	395	37.5	NA	NA	NA	NA	NA	NA	NA	NA
	6/20/2013	3.67	6.27	195	153.7	8.8	<1.00	<1.00	<5.00	0.66	12	0.25	2.4

Notes:

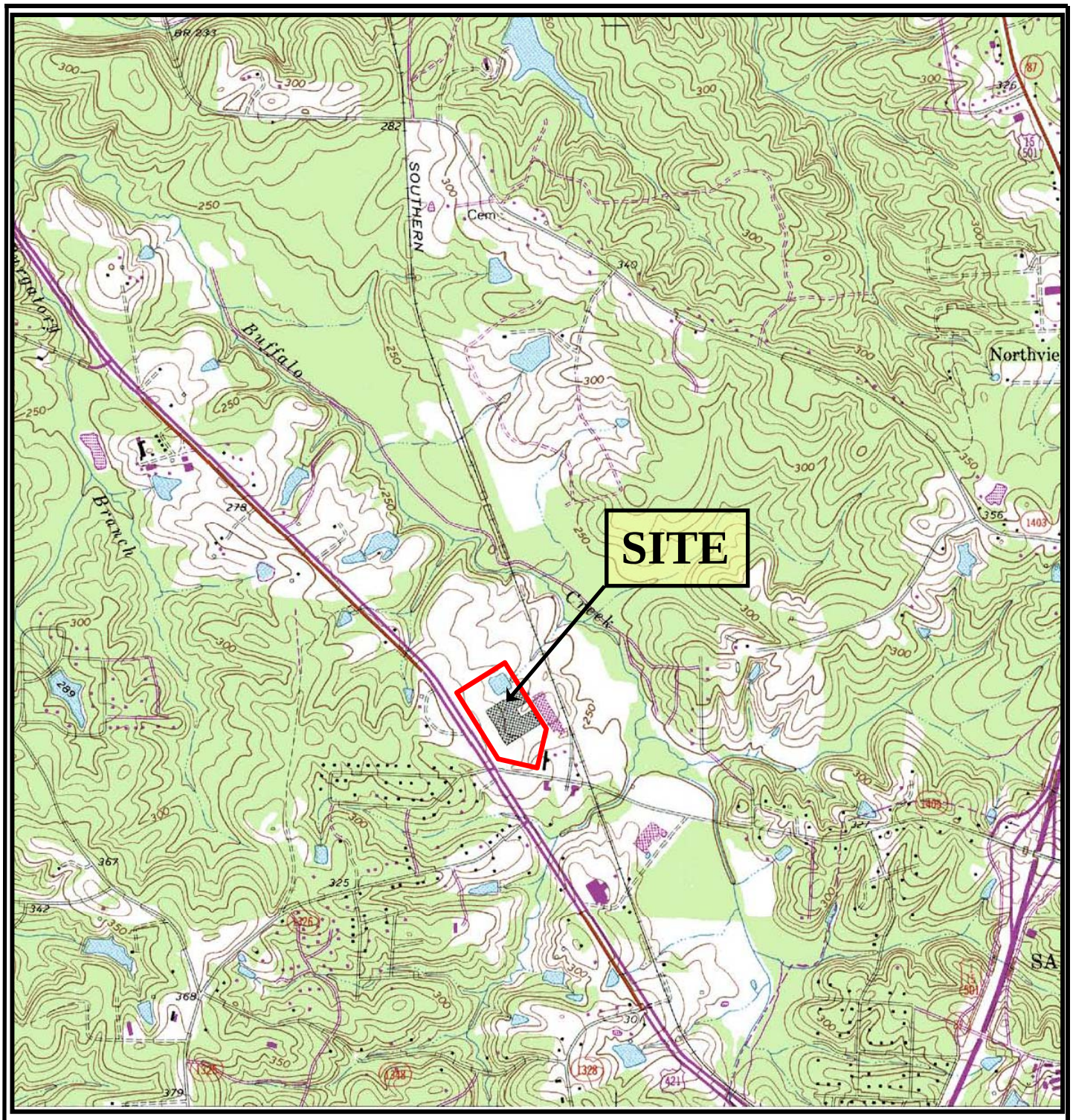
1) DMW-1 purged and re-developed on 8/2/2013

2) Dissolved oxygen, pH, conductivity, and ORP stabilization parameters obtained from YSI 556. Ferrous iron obtained from HACH field test kit. Other parameters were shipped for laboratoryanalysis: total organic carbon was analyzed by Standard Method 5310B, methane, ethane, ethene by method RSK-175 and anions (Chloride, Sulfate, and Nitrate as N) by method 9056A.

3) TMW-1 is upgradient of the plume and is shown for comparison to background levels.

NA = Not Analyzed, ND= Non-detect

FIGURES



N

0 2000 4000

APPOXIMATE SCALE IN FEET

U.S.G.S. QUADRANGLE MAP

COLON, NC 1970, REVISED 1981

QUADRANGLE
7.5 MINUTE SERIES (TOPOGRAPHIC)

TITLE	**SITE LOCATION MAP**
PROJECT	**TRION, INC. FACILITY** 101 MCNEILL ROAD SANFORD, NORTH CAROLINA
hart hickman SMARTER ENVIRONMENTAL SOLUTIONS	3334 HILLSBOROUGHSTREET RALEIGH, NORTH CAROLINA (919) 847-4241

DATE:	3-06-14	REVISION NO:	0
JOB NO:	BAI-004	FIGURE NO:	1

TMW-2
POND
GRAVEL
RAILROAD RIGHT-OF-WAY
MW-9
MW-15
MW-16
MW-8
MW-14
MW-6
TMW-4
MW-10
MW-7
MW-17
IRS BUILDING
MW-11
TMW-5
MW-13
TRION BUILDING
DMW-1
PROCESS WATER PIT
MW-12
TMW-1
TMW-3
ASPHALT
US HIGHWAY 421
ASPHALT
MCNEILL ROAD

N

APPROXIMATE
0 150 300
SCALE IN FEET

NOTE:

1. SITE FEATURES SURVEYED BY ESP ASSOCIATES, PA ON 3/30/2009 AND 7/17/2012.

LEGEND

- TYPE II MONITORING WELL
- TYPE III MONITORING WELL
- SITE PROPERTY
- PROPERTY PARCEL
- INTERMITTENT STREAM

TITLE

SITE MAP

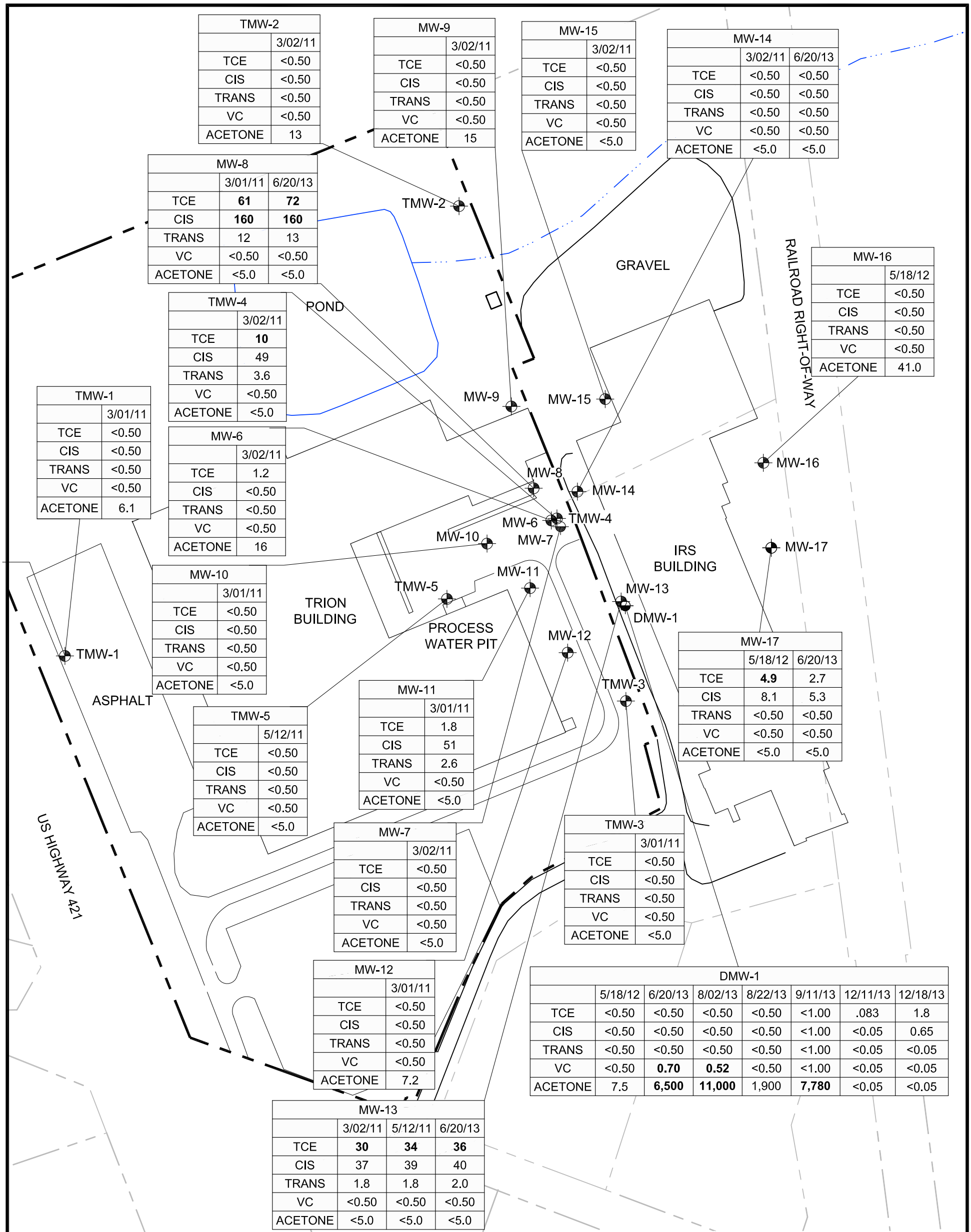
PROJECT

TRION, INC. FACILITY
101 MCNEILL ROAD
SANFORD, NORTH CAROLINA

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)
License # C-1269 / #C-245 Geology

DATE: 3–11–14	REVISION NO. 0
JOB NO. BAI–004	FIGURE NO. 2

S:\AAA-Master Projects\Barrier Investment Advisors (BAI)\BAI-004\Report\GW RAP\Figures 2-5.dwg, FIG 2, 3/11/2014 10:55:10 AM, JDavis



TMW-2	
	3/02/11
TCE	<0.50
CIS	<0.50
TRANS	<0.50
VC	<0.50
ACETONE	13

MW-9	
	3/02/11
TCE	<0.50
CIS	<0.50
TRANS	<0.50
VC	<0.50
ACETONE	15

MW-15	
	3/02/11
TCE	<0.50
CIS	<0.50
TRANS	<0.50
VC	<0.50
ACETONE	<5.0

MW-14		
	3/02/11	6/20/13
TCE	<0.50	<0.50
CIS	<0.50	<0.50
TRANS	<0.50	<0.50
VC	<0.50	<0.50
ACETONE	<5.0	<5.0

MW-8		
	3/01/11	6/20/13
TCE	**61**	**72**
CIS	**160**	**160**
TRANS	12	13
VC	<0.50	<0.50
ACETONE	<5.0	<5.0

MW-16	
	5/18/12
TCE	<0.50
CIS	<0.50
TRANS	<0.50
VC	<0.50
ACETONE	41.0

TMW-4	
	3/02/11
TCE	**10**
CIS	49
TRANS	3.6
VC	<0.50
ACETONE	<5.0

TMW-1	
	3/01/11
TCE	<0.50
CIS	<0.50
TRANS	<0.50
VC	<0.50
ACETONE	6.1

MW-6	
	3/02/11
TCE	1.2
CIS	<0.50
TRANS	<0.50
VC	<0.50
ACETONE	16

MW-10	
	3/01/11
TCE	<0.50
CIS	<0.50
TRANS	<0.50
VC	<0.50
ACETONE	<5.0

MW-17		
	5/18/12	6/20/13
TCE	**4.9**	2.7
CIS	8.1	5.3
TRANS	<0.50	<0.50
VC	<0.50	<0.50
ACETONE	<5.0	<5.0

TMW-5	
	5/12/11
TCE	<0.50
CIS	<0.50
TRANS	<0.50
VC	<0.50
ACETONE	<5.0

MW-11	
	3/01/11
TCE	1.8
CIS	51
TRANS	2.6
VC	<0.50
ACETONE	<5.0

MW-7	
	3/02/11
TCE	<0.50
CIS	<0.50
TRANS	<0.50
VC	<0.50
ACETONE	<5.0

TMW-3	
	3/01/11
TCE	<0.50
CIS	<0.50
TRANS	<0.50
VC	<0.50
ACETONE	<5.0

MW-12	
	3/01/11
TCE	<0.50
CIS	<0.50
TRANS	<0.50
VC	<0.50
ACETONE	7.2

DMW-1							
	5/18/12	6/20/13	8/02/13	8/22/13	9/11/13	12/11/13	12/18/13
TCE	<0.50	<0.50	<0.50	<0.50	<1.00	.083	1.8
CIS	<0.50	<0.50	<0.50	<0.50	<1.00	<0.05	0.65
TRANS	<0.50	<0.50	<0.50	<0.50	<1.00	<0.05	<0.05
VC	<0.50	**0.70**	**0.52**	<0.50	<1.00	<0.05	<0.05
ACETONE	7.5	**6,500**	**11,000**	1,900	**7,780**	<0.05	<0.05

MW-13			
	3/02/11	5/12/11	6/20/13
TCE	**30**	**34**	**36**
CIS	37	39	40
TRANS	1.8	1.8	2.0
VC	<0.50	<0.50	<0.50
ACETONE	<5.0	<5.0	<5.0

NOTES:

1. GROUNDWATER SAMPLES COLLECTED ON 03/01/2011 - 03/02/2011, 05/12/2011, 5/18/2012, 6/20/13, 8/2/13, 8/22/13, 9/11/13, 12/11/13, AND 12/18/13.
2. TCE = TRICHLOROETHENE
3. CIS = CIS-1,2-DICHLOROETHENE
4. TRANS = TRANS-1,2-DICHLOROETHENE
5. VC = VINYL CHLORIDE
6. **BOLD** VALUES EXCEED REGULATORY STANDARDS

TMW-4	
	3/02/11
TCE	**10**
CIS	49
TRANS	3.6
VC	<0.50
ACETONE	<5.0

SAMPLE IDENTIFICATION
SAMPLE DATE
ANALYTICAL RESULT (µg/L)
CONSTITUENT

LEGEND

- TYPE II MONITORING WELL
- TYPE III MONITORING WELL
- SITE PROPERTY
- PROPERTY PARCEL
- INTERMITTENT STREAM

N

APPROXIMATE
0 150 300
SCALE IN FEET

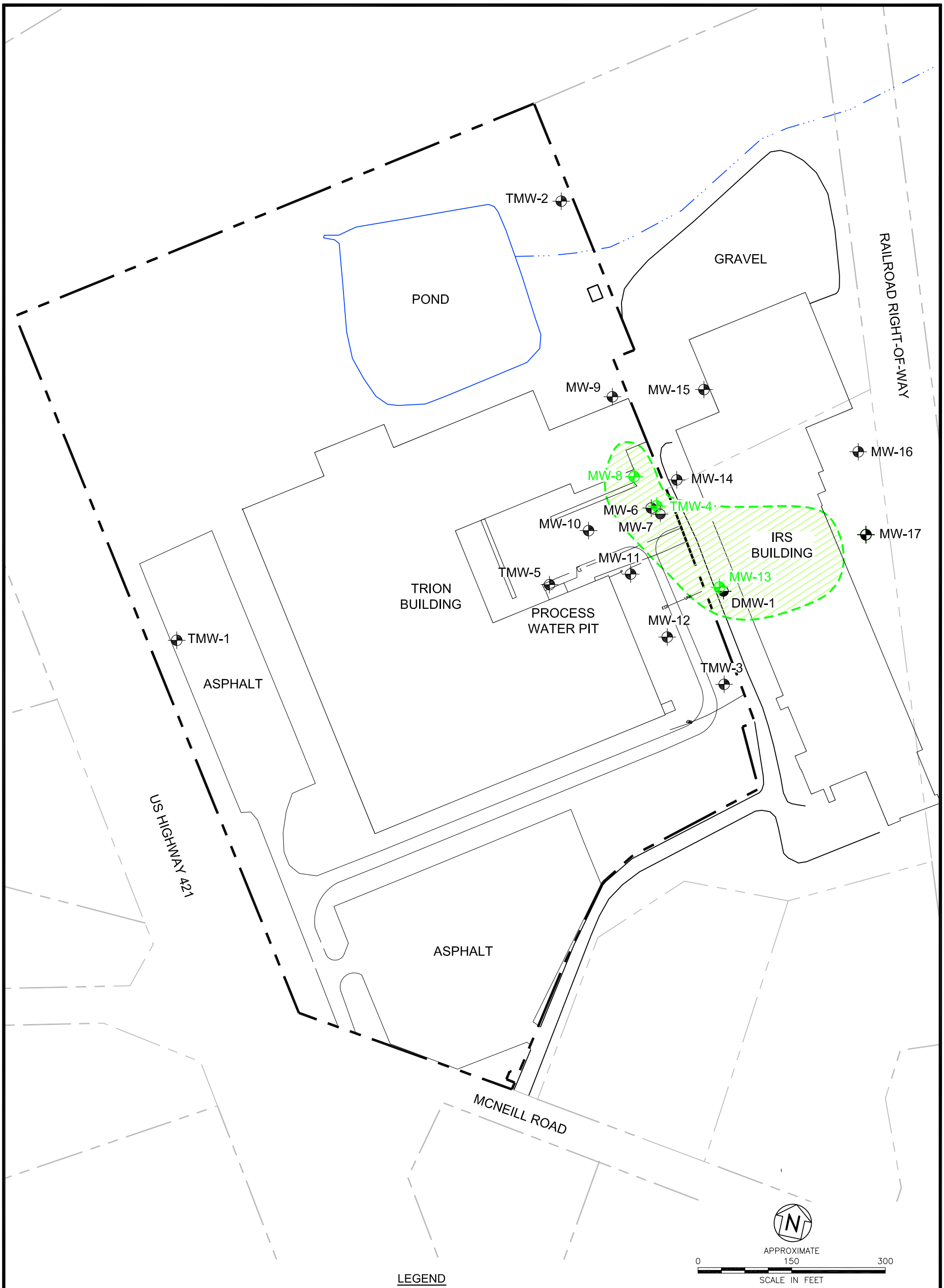
TITLE
GROUNDWATER CONTAMINANT CONCENTRATION MAP

PROJECT
TRION, INC. FACILITY
101 MCNEILL ROAD
SANFORD, NORTH CAROLINA

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)
License # C-1269 / #C-245 Geology

DATE: 3–11–14 | REVISION NO. 0
JOB NO. BAI–004 | FIGURE NO. 3

S:\AAA-Master Projects\Barrier Investment Advisors (BAI)\BAI-004\Report\GW RAP\Figures 2-5.dwg, FIG 3, 3/11/2014 10:56:05 AM, JDavis



NOTES:

1. GROUNDWATER SAMPLES WERE COLLECTED 6/20/13. DMW-1 COLLECTED 8/02/13, 8/22/13, 9/11/13, 12/11/13, AND 12/18/13.
2. CVOC - CHLORINATED VOLATILE ORGANIC COMPOUNDS

LEGEND

- TYPE II MONITORING WELL
- TYPE III MONITORING WELL
- SITE PROPERTY
- PROPERTY PARCEL
- INTERMITTENT STREAM
- OBSERVED EXTENT OF CVOC PLUME ABOVE 2L STANDARD
- WELL IMPACTED BY CVOCs ABOVE 2L STANDARDS

TITLE

OBSERVED EXTENT OF CVOC PLUME ABOVE 2L STANDARD DECEMBER 2013

PROJECT

TRION, INC. FACILITY
101 MCNEILL ROAD
SANFORD, NORTH CAROLINA

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)
License # C-1269 / #C-245 Geology

DATE: 3–11–14	REVISION NO. 0
JOB NO. BAI–004	FIGURE NO. 4

S:\AAA-Master Projects\Barrier Investment Advisors (BAI)\BAI-004\Report\GW RAP\Figures 2-5.dwg, FIG 4, 3/11/2014 10:57:07 AM, JDavis

TMW-2
POND
GRAVEL
RAILROAD RIGHT-OF-WAY
MW-9
MW-15
MW-16
MW-8
MW-14
MW-6
TMW-4
MW-7
MW-10
IRS BUILDING
MW-17
MW-11
TMW-5
MW-13
DMW-1
TRION BUILDING
PROCESS WATER PIT
MW-12
TMW-1
TMW-3
ASPHALT
US HIGHWAY 421
ASPHALT
MCNEILL ROAD

N

APPROXIMATE
0 150 300
SCALE IN FEET

NOTES:

1. GROUNDWATER SAMPLES WERE COLLECTED JUNE 20, 2013.
2. CVOC - CHLORINATED VOLATILE ORGANIC COMPOUNDS

LEGEND

- TYPE II MONITORING WELL
- TYPE III MONITORING WELL
- SITE PROPERTY
- PROPERTY PARCEL
- INTERMITTENT STREAM
- OBSERVED EXTENT OF CVOC PLUME
- PROPOSED MONITORING WELLS

TITLE
PROPOSED MONITORING NETWORK

PROJECT
TRION, INC. FACILITY
101 MCNEILL ROAD
SANFORD, NORTH CAROLINA

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)
License # C-1269 / #C-245 Geology

DATE: 3–11–14	REVISION NO. 0
JOB NO. BAI–004	FIGURE NO. 5

S:\AAA-Master Projects\Barrier Investment Advisors (BAI)\BAI-004\Report\GW RAP\Figures 2-5.dwg, FIG 5, 3/11/2014 10:57:54 AM, JDavis

APPENDIX A

CERTIFICATION STATEMENTS

IHSB SITE NAME Trion, Inc. Site NONCD 0002843

DATE & NAME OF DOCUMENT June 30, 2014, Groundwater RAP

TYPE OF SUBMITTAL (circle all that apply): Report, Work plan, Work Phase Comp. Statement, Schedule Change

REMEDIATING PARTY DOCUMENT CERTIFICATION STATEMENT (.0306(B)(2))

"I certify under penalty of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

Joshua Bock, Auth. Rep. of Trust
Name of Remediating Party

Signature of Remediating Party

7/16/14
Date

NOTARIZATION

Texas (Enter State)

Dallas **COUNTY**

I, Cheryl Marie Roberts, a Notary Public of said County and State, do hereby certify that Joshua Bock did personally appear and sign before me this day, produced proper identification in the form of TX DL, was duly sworn or affirmed, and declared that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certification is true and accurate, and he or she then signed this Certification in my presence.

WITNESS my hand and official seal this 16 day of July, 2014.

Cheryl Marie Roberts
Notary Public (signature)

(OFFICIAL SEAL)

My commission expires: 6/11/17.

CHERYL MARIE ROBERTS
Notary Public, State of Texas
My Commission Expires
June 11, 2017

Document Certification Form No. DC - I
(Revised 8/11)

REC PROGRAM DOCUMENT CERTIFICATION FORM - PAGE 2 OF 2
IHSB SITE NAME Trion, Inc. NONCD 0002843
DATE & NAME OF DOCUMENT June 30, 2014 Groundwater RAP
TYPE OF SUBMITTAL (circle all that apply) Report, Work plan, Work Phase Comp. Statement, Schedule Change

REGISTERED SITE MANAGER CERTIFICATION OF SIGNATURES

As the Registered Environmental Consultant for the Site for which this filing is made, I certify that the signatures included herewith are genuine and authentic original handwritten signatures and/or true, accurate, and complete copies of the genuine and authentic original handwritten signatures of the persons who purport to sign for this filing. I further certify that I have collected through reliable means the originals and/or copies of said signatures from the persons authorized to sign for this filing who, in fact, signed the originals thereof. Those persons and I understand and agree that any copies of signatures have the same legally binding effect as original handwritten signatures, and I certify that any person for whom I am submitting a copy of their signature has provided me with their express consent to submit said copy. Additionally, I certify that I am authorized to attest to the genuineness and authenticity of the signatures, both originals and any copies, being submitted herewith and that by signing below, I do in fact attest to the genuineness and authenticity of all the signatures, both originals and copies, being submitted for this filing.

Leonard Moretz
Name of Registered Site Manager

Leonard Moretz
Signature of Registered Site Manager

July 21. 2014
Date

REGISTERED SITE MANAGER DOCUMENT CERTIFICATION STATEMENT (.0306(b)(1))

"I certify under penalty of law that I am personally familiar with the information contained in this submittal, including any and all supporting documents accompanying this certification, and that the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete and complies with the Inactive Hazardous Sites Response Act G.S. 130A-310, et seq, and the remedial action program Rules 15A NCAC 13C .0300. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

Leonard Moretz
Name of Registered Site Manager

Leonard Moretz
Signature of Registered Site Manager

July 21, 2014
Date

NOTARIZATION

North Carolina (Enter State)

Wake COUNTY

I, Ashley Drager, a Notary Public of said County and State, do hereby certify that Leonard Movetz did personally appear and sign before me this day, produced proper identification in the form of Driver License, was duly sworn or affirmed, and declared that, he or she is the duly authorized environmental consultant of the remediating party of the property referenced above and that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certifications is true and accurate, and he or she then signed these Certifications in my presence.

WITNESS my hand and official seal this 21 day of July, 2014.

Ashley Drager
Notary Public (signature)

(OFFICIAL SEAL)

ASHLEY DRAGER NOTARY PUBLIC WAKE COUNTY, NC

My commission expires: 10/30/2017

Document Certification Form No. DC - II
(Revised 8/11)

APPENDIX B

COMMUNITY HEALTH AND SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP)

hart hickman

SMARTER ENVIRONMENTAL SOLUTIONS

Community Health and Site-Specific Health and Safety Plan (HASP)
Trion Inc. Site
101 McNeill Road
Sanford, North Carolina
H&H Job No. BAI-004

Site History (Describe what is known about the site. i.e., type of facility, operations, chemicals, etc.).

H&H is under contract to perform assessment activities at the former Trion Inc. site located at 101 McNeill Rd, in Sanford, North Carolina. The site is currently owned by Air System Components, Inc. dba Trion IAQ The site is the location of a manufacturing facility which formerly utilized chlorinated solvents and to a lesser extent, acetone and petroleum or aromatic hydrocarbon compounds. The exposures anticipated from these compounds are expected to be minimal based on knowledge of current conditions at the site and the level of disturbance posed by proposed sampling and site work practices.

Scope of Work (Describe task(s) to be performed).

The scope of work (SOW) for activities to be performed at the site may include the following:

- Groundwater sampling

Potential Hazards (List known or suspected hazards present on-site and preventative measures).

(1) Physical Hazards (i.e., fire, explosion, traffic, slips, trips, and falls, etc.).

- Slips, trips, and falls during drilling activities,
- Being struck by drilling equipment, and/or nearby traffic,
- Lifting hazards, pitch points, and fall hazards,

(2) Chemical Hazards (i.e., chemicals or products stored on-site).

- Chlorinated volatile organic products

(3) Biological Hazards (i.e., toxic insects, poisonous plants, and poisonous snakes).

- Toxic insects (i.e. wasps, bees, mosquitoes, Black Widow spiders, and fire ants) and poisonous snakes.

(4) Other Hazards

- Heat stress
- Cold stress
- Thunderstorms, lightning and high winds

(1) Minimum Training Required (Review site specific information prior to entering the site).

- 40-hour OSHA HAZWOPER Training and Site Supervisor Equivalent Training

(2) Specialized Training Required (i.e., site specific, or special permits may be necessary).

None required

Emergency Response

(1) On-site emergency contact person and telephone number:

- Sanford Police Dept. (919) 775-8268

(2) Other emergency contacts as appropriate: (i.e., fire, ambulance, 911, etc.)

Ambulance, Fire, Police – phone # 911

- Leo Moretz, Project Director (919) 740-3717 cell
- Shannon Cottrill, Health & Safety Officer (704) 577-8810 cell

(3) Hospital: (i.e., address and telephone number). **Attach Hospital Route Map or Directions**

Central Carolina Hospital 1135 Carthage Street, Sanford, North Carolina. 919-774-2100

Personal Protective Equipment (PPE)

(1) PPE Required: (examples: hard hat, safety glasses with side shields, steel toe boots, tyvek coveralls, respirator, rubber boots, gloves, etc.).

The following PPE will be required during the performance of site activities:

Safety glasses	At all times during the performance of site work, regardless of task(s)
Safety shoes/boots	At all times during the performance of site work, regardless of task(s)
Safety vest	At any time where work is performed in areas of vehicular traffic, or within 25 feet of such an area (including parking lots, public and private roadways, and railroads)
Hearing protection	At any time where noise levels are above natural ambient levels, at any time when working within 25 feet operational heavy equipment (including drill rigs, excavators), and at any time when utilizing portable equipment which created noise levels above natural ambient levels (drill, saw, etc.)
Leather work gloves	At any time the use of leather work gloves is warranted, including but not limited to, operations involving the use of hand tools.
Nitrile gloves	At any time when obtaining environmental samples or handling contaminated or potentially contaminated media
Hard hat	At any time drilling or down hole sampling operations are being performed, when working within 25 feet of operating heavy equipment, and when working within a space with limited overhead clearance and/or overhead obstructions
Tyvek® Coveralls	At any time where dermal exposure to contaminants is imminent or assured, or where exposure to liquid or solid wastes are likely. The use of Tyvek® coveralls may require the modification of the PPE level established for the site.
Respirator	At any time when volatile organic vapor measurements indicate levels at or in excess of the action level established for the site (See Exposure Monitoring below). When used the appropriate respirator cartridge must be utilized. Consultation with the project manager and H&H health and safety officer is required prior to the use of a respirator.

NOTE: **EACH OR ANY COMBINATION OF EACH OF THESE FORMS OF PPE MUST BE UTILIZED IN ACCORDANCE WITH CLIENT-SPECIFIC HEALTH AND SAFETY REQUIREMENTS, IF APPLICABLE.**

Decontamination (Evaluate the need for decontamination, describe procedures, etc.)

Reusable equipment (i.e., water level meters, downhole probes, etc.) should be decontaminated in accordance with H&H's Field Procedures Guide book. Decontamination fluids and waste materials will be properly contained for off-site disposal. Other sampling devices shall be dedicated and/or disposable (i.e., bailers, nitrile gloves). Dedicated or disposable sampling apparatus will be properly contained for disposal if it has come into contact with hazardous materials or suspect hazardous materials. If dedicated or disposable equipment can be properly decontaminated after use, it may be disposed of as non-hazardous in an appropriate container after decontamination.

Site Control and Community Safety (Evaluate the need for site control to protect persons from exposure to hazardous conditions; i.e., work permits, cones, barricade tape, etc.).

H&H personnel shall take necessary measures to maintain site control and limit exposure of persons to hazardous conditions or hazardous materials.

Caution will be taken to minimize risk to the surrounding community and only H&H personnel shall be permitted on site during activities. Barricades will be erected with cones and caution tape as needed to ensure site control. The site will be left in the condition it was found in (all wells locked and bolted) and any safety risks encountered will be remedied to ensure public safety. Any materials left on site (investigation derived waste drums, or other items) will be properly secured to prevent community exposure and labeled to alert the community of the content.

Safety Meetings

Safety meetings will be held on each day during which site work is to be performed. A minimum of one daily safety meeting will be held on the site by all personnel involved in site operations. Additional safety meetings will be conducted as site conditions or hazards change, when returning to the site following breaks in operations such as lunch, or at other appropriate times to be determined by on site personnel or the project manager. Records of these safety meetings will be noted on the safety meeting logs sheets (provided at the end of this document) and in the field book, and will include the date and time of the meeting, names and affiliations of attendees, and any pertinent subjects of discussion.

Additional Information / Notes

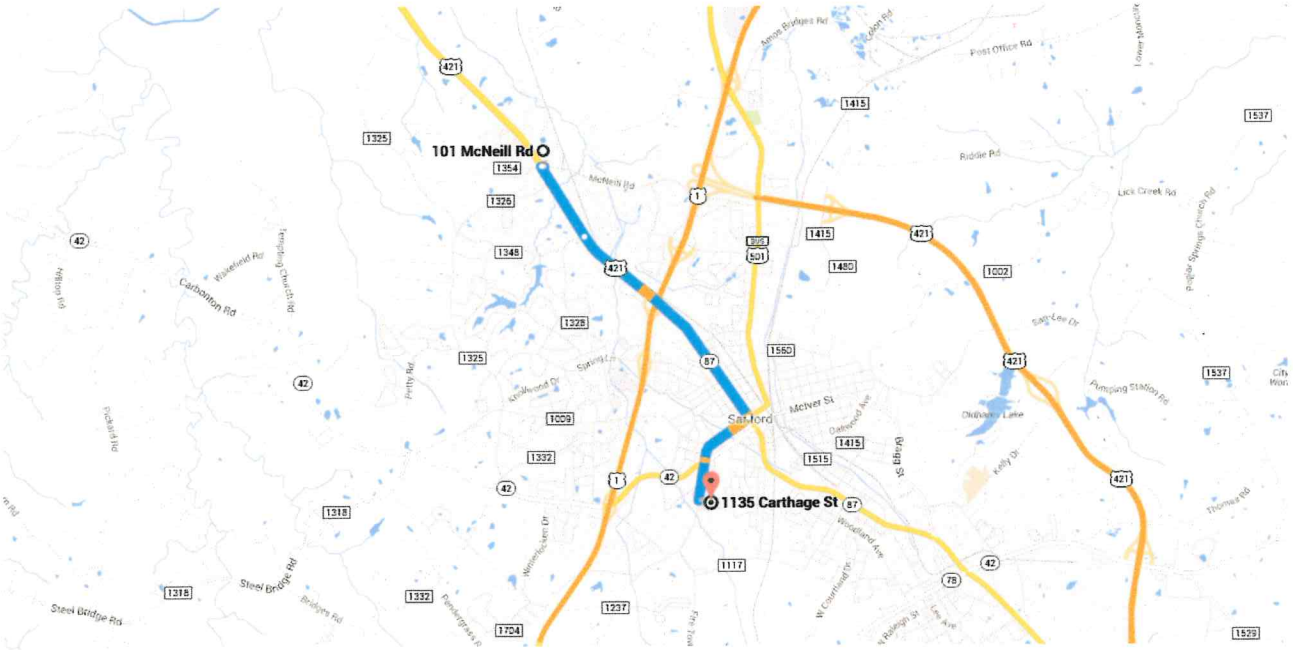
Tail-Gate Safety Briefing Attendance Log

Name	Date

Google

Drive 4.0 miles, 8 min

Directions from **101 McNeill Rd** to **1135 Carthage St**



101 McNeill Rd

Sanford, NC 27330

1. Head **west** on **McNeill Rd** toward **Boone Trail Rd**

   135 ft

2. Turn **left** onto **Boone Trail Rd**

   0.7 mi

3. Continue onto **N Horner Blvd**

   2.2 mi

4. Turn **right** onto **Carthage St**

   Destination will be on the left

   0.9 mi

1135 Carthage St

Sanford, NC 27330

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2014 Google