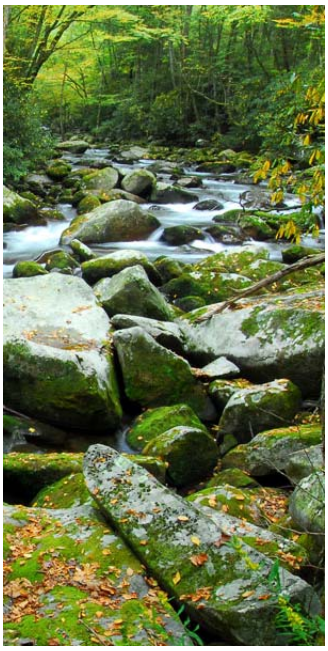

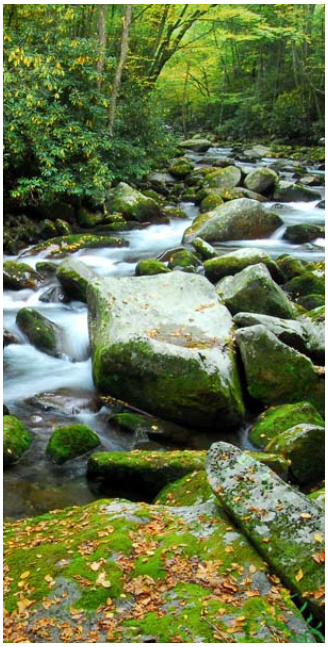

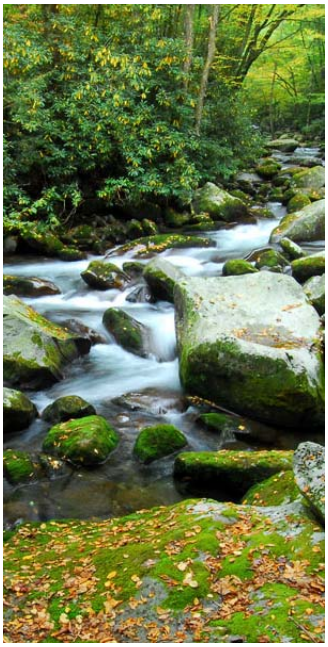

ALTAMONT ENVIRONMENTAL, INC.

ENGINEERING & HYDROGEOLOGY

Preliminary Sub-Slab Vapor Intrusion Assessment Report

Future Highland Business Park
12 Old Charlotte Highway
Asheville, North Carolina

January 31, 2012

Prepared for
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Project: 2401.02

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Executive Summary

Clan Highland, LLC (Highland) contracted Altamont Environmental, Inc. (Altamont) to perform a Preliminary Sub-Slab Vapor Intrusion Assessment (VI Assessment) for the Future Highland Business Park (the site) in Asheville, Buncombe County, North Carolina (Figure 1). The purpose of the VI Assessment is to evaluate the potential for vapor intrusion into the warehouse building located at the site. A site map from the *Results of the First 2011 Monitoring Event*, prepared by RMT, Inc. (RMT), is included as Appendix A (RMT 2011).

Sub-slab soil gas samples were collected from five different locations (SG-1, SG-2, SG-3, SG-4, and SG-5) in the site building on January 12, 2012. Locations of the sub-slab sampling points are shown on the Site Building Floor Plan, included as Figure 2.

Site History

According to the *Comprehensive Site Assessment* (CSA) prepared in 1994 by RMT on behalf of SKF USA, Inc., the site was originally occupied by Leigh Industries from March to December of 1958. Leigh Industries made metal stampings and diffusers for the heating and air conditioning Industry. SKF USA, Inc. operated a ball bearing manufacturer at the site between 1960 until 1973. J. L. deBall Girmes, Inc. operated as a textile manufacturer from 1973 until 1990 when it discontinued operation and began leasing the site to Beacon Manufacturing as a dry goods warehouse (RMT 1994). During a groundwater assessment conducted in 1993, it became apparent that site groundwater was impacted with chlorinated solvents, particularly trichloroethylene (TCE). The most elevated concentrations of TCE were located adjacent to the eastern side of the site building in monitoring wells MW-4 and MW-5 (RMT 1994).

Sub-Slab Soil Vapor Sampling

A total of five sub-slab soil gas locations were installed in the site building on January 10, 2012. The sub-slab soil gas samples were obtained by drilling a 0.75-inch diameter hole with a hammer drill approximately 1 to 2 inches into the building concrete slab. A 0.5-inch diameter hole was then drilled at the bottom of the previous hole, through the building slab, and 2 to 4 inches into the soil below the building. The building sub-slab was 8 to 10 inches thick in all locations. Brass piping with nylon-tape-wrapped threaded fittings was installed in the hole and sealed in place with a non-sanded cement grout. The grout seal was allowed to harden and cure for approximately 24 hours to prevent ambient air from entering the sub-slab soil gas borings. A schematic of a sub-slab soil gas boring is included as Figure 3. Photographs of the sub-slab soil gas sampling ports are shown in Appendix D.

Prior to sampling activities, leak tests were performed on January 11, 2012 at each sample location using helium, which is a non-toxic gas that is absent from the subsurface environment. Shrouds made of plastic, approximately 4 square feet in size were taped to the slab to cover the soil gas probe locations. Sub-slab vapor samples were withdrawn and screened with a calibrated handheld Dielectric Radiodetection MGD-2002 helium detector prior to sampling with the summa canister. A proper seal is confirmed by a helium detection of less than 10 percent on the meter (New York State Department of Health 2006). Concentrations of helium measured by the meter from the sample ports were below 1 percent in all locations.

On January 11, 2012, Altamont initiated sample collection using 6-liter summa canisters with 24-hour regulators. During sample collection, 100 percent helium was re-introduced to each shroud to verify the seal on the sub-slab probe as described above. Summa canisters were collected from the site on January 12, 2012. The sample duration was 21 to 22 hours in each location.

The air samples were submitted to SGS North America, Inc. Laboratory, and analyzed using Environmental Protection Agency (EPA) Method TO-15 for volatile organic compounds (VOCs) and American Society for

Testing and Materials (ASTM) Method D1946 for helium to see if any of the tracer gas leaked through the seal into the borings.

Results, Conclusions, and Recommendations

Laboratory analytical results for five sub-slab soil gas samples collected at the site indicate that no VOCs were detected above the NC Department of Environment and Natural Resources (DENR) Division of Waste Management (DWM) Inactive Hazardous Sites Branch (IHSB) Industrial/Commercial Vapor Intrusion Screening Level for Acceptable Soil Gas Concentrations (IHSB Screening Level) (DENR DWM IHSB 2011b). TCE was detected in all five soil gas sampling locations at a concentration approximately an order of magnitude below the IHSB Screening Level of 610 micrograms per cubic meter (µg/m^3).

Multiple VOCs were detected at low concentrations in soil gas including, benzene, xylene, toluene, and other constituents commonly associated with hydrocarbons. Generally the concentrations of these constituents were approximately an order of magnitude or more below the IHSB Screening Levels. Laboratory analytical results are summarized in Table 1 and the laboratory analytical report is included in Appendix E.

The results of the sub-slab soil gas sampling assessment indicate that a receptor pathway between impacted groundwater and indoor air at the site is not present. The detections of other VOCs, such as BTEX constituents which have not been detected in groundwater, indicate that there may be some residual impacted soil at the site. It is possible that low levels of Varsol™, potentially at concentrations below soil screening criteria, remain in soil near the site building. Varsol™ impacted soil was removed in 1991 and confirmation samples were collected from the excavation to confirm removal. RMT stated in the CSA that Varsol™, a solvent similar to mineral spirits, contains 7 to 14.7 percent BTEX, according to Exxon Chemicals of America, the manufacturer of this solvent (RMT 1994). Another possible explanation for the detections of petroleum related constituents is that floor drains observed in the center of the site building (near IW-2 and SG-3) allowed some of these constituents to discharge to soil below the site building during prior occupant operations at the site. Regardless of the mechanism of release, historical groundwater results and current sub-slab soil gas results indicate that the quantity of petroleum-product-related constituents in media at the site is likely minimal.

An analysis of the potential for off-site vapor intrusion was conducted as part of this assessment for the residences located to the southeast of the site. The results indicate that there is no unacceptable risk to these residences. Groundwater flow direction has consistently been away from these residences. Additionally, three sentinel wells (MW-1, MW-6, and MW-27) between the site and these residences have been sampled by RMT at least 22 times since 1993. According to historical analytical data tables, site constituents have never been detected in these monitoring wells (RMT 2005b, 2006, and 2008).

An additional sub-slab soil gas sampling event in the remaining areas of the site building is recommended to verify the results of this assessment and to confirm that a receptor pathway between impacted media and indoor air in other areas of the site building does not exist. Also, during the next semiannual groundwater sampling event at the site, SKF USA Inc. may want to have groundwater samples analyzed for the additional VOCs detected in soil vapor in order to confirm the conclusion made in historical site reports that groundwater is impacted with only chlorinated solvents.

1.0 Introduction

Clan Highland, LLC (Clan Highland) contracted Altamont Environmental, Inc. (Altamont) to perform a Preliminary Sub-Slab Vapor Intrusion Assessment (VI Assessment) for the Future Highland Business Park (the site) in Asheville, Buncombe County, North Carolina (Figure 1). The purpose of the VI Assessment is to evaluate the potential for vapor intrusion into the warehouse building located at the site. A site map from the *Results of the First 2011 Monitoring Event*, prepared by RMT, Inc. (RMT), is included as Appendix A (RMT 2011). The methodologies and procedures used in this assessment are in general accordance with the following:

- North Carolina Department of Environment and Natural Resources' (DENR's) *Indoor Air and Sub-Slab Vapor Sampling for Brownfields Projects Guidance Checklist* (DENR 2010)
- Section 3.0 of the Environmental Protection Agency's (EPA's) *Assessment of Vapor Intrusion in Homes Near the Raymark Superfund Site Using Basement and Sub-Slab Air Samples* (EPA 2006)
- Appendix E of the Office of Solid Waste and Emergency Response (OSWER) *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils* (Subsurface Vapor Intrusion Guidance) (EPA 2002)
- DENR Inactive Hazardous Sites Branch (DENR DWM IHSB) *Supplemental Guidelines for the Evaluation of Structural Vapor Intrusion Potential for Site Assessment and Remedial Actions Under the Inactive Hazardous Sites Branch* (DENR 2011a)

Sub-slab soil gas samples were collected from five different locations (SG-1, SG-2, SG-3, SG-4, and SG-5) in the site building on January 12, 2012. Locations of the sub-slab sampling points are shown on the Site Building Floor Plan, included as Figure 2. This report contains a site background, a conceptual model for potential vapor intrusion, and the methodologies, procedures, and results of the VI assessment.

1.1 Purpose

A prospective developer intends to purchase the site in its entirety if the results of the VI Assessment indicate that the potential for vapor intrusion is negligible in the portions of the site building not currently occupied by Highland Brewing Company. The Site Building Floor Plan included as Figure 2 indicates where the current parcel border line crosses the building.

1.2 Site History

The original site parcel is also known as the Girmes Site, formerly SKF USA, Inc. Altamont understands that SKF USA, Inc. is currently responsible for managing the environmental conditions at the site.

According to the *Comprehensive Site Assessment* (CSA) prepared in 1994 by RMT, the site was originally occupied by Leigh Industries from March to December of 1958. Leigh Industries made metal stampings and diffusers for the heating and air conditioning Industry. SKF USA, Inc. operated a ball bearing manufacturer at the site between 1960 until 1973. J. L. deBall Girmes, Inc. operated as a textile manufacturer from 1973 until 1990 when they discontinued operation and began leasing the site to Beacon Manufacturing as a dry goods warehouse (RMT 1994).

In 2007, Highland Brewing Company began operating in the southeastern portion of the site building. On August 11, 2010, Clan Highland purchased an approximately 10-acre parcel encompassing the southeastern portion of the site building that was subdivided from the original, approximately 40-acre parcel that comprises the site.

According to a Phase I Environmental Site Assessment for the approximately 10-acre parcel currently owned by Clan Highland, prepared by EnviroAssessments on July 5, 2010, the southeastern portion of the site building currently occupied by Highland Brewing Company was constructed in 1980. This portion of the building was occupied by Blue Ridge Motion Pictures from 2001 to 2007 (EnviroAssessments 2010).

1.3 Historical Site Investigations

1.3.1 Pre-Comprehensive Site Assessment Investigations

According to the CSA, investigation of soils and groundwater at the site began in 1991. A March 1992 plant closure assessment report prepared by Bain, Palmer & Associates (BPA) detected Varsol™, a petroleum-based solvent similar to mineral spirits, in soils located on the northeast side of the facility. RMT stated in the CSA that Varsol™, a solvent similar to mineral spirits, contains 7 to 14.7 percent BTEX, according to Exxon Chemicals of America, the manufacturer of this solvent (RMT 1994). Approximately 1,000 cubic yards of soil were removed from the "drainage area" and 40 truckloads of soil were removed from the "slope debris area", and stockpiled on-site. The polychlorinated biphenyl (PCB) Aroclor 1254™ was detected at concentrations between 1.3 and 5.4 parts per million (ppm) in the stockpiled soil samples. Stockpiled soil was treated off-site, and disposed of in a landfill. Confirmation samples collected from the excavated area confirmed the removal of soils containing Varsol (RMT 1994).

A Phase II Site Assessment was conducted by S&ME in January 1993. The installation of two monitoring wells during this assessment indicated that groundwater beneath the northeast portion of the site was impacted by chlorinated solvents. Soil samples collected from "slope debris" and adjacent to the "pump house" near the northeast corner of the site building were impacted with oil and grease and total petroleum hydrocarbons (TPH). S&ME did not conduct any analysis of PCBs during this investigation (RMT 1994).

A supplemental investigation was conducted by BPA in March 1993 to verify the findings of the Phase II Site Assessment. During this investigation, monitoring wells MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, and MW-10 were installed and sampled. Groundwater results indicated the presence of chlorinated solvents, in particular trichloroethene (TCE), in six of the nine site wells, with the most elevated concentrations located adjacent to the eastern side of the site building in monitoring wells MW-4 and MW-5. Soils at the "pump house" that were affected by TPH and oil and grease compounds were removed and soil samples were collected to document closure (RMT 1994). Only summaries of the BPA assessment, S&ME assessment, and BPA supplemental investigation, which were included in the CSA, were reviewed during preparation of this document as the complete reports were not available.

1.3.2 Comprehensive Site Assessment—November 1994

RMT prepared a CSA for the site in November 1994. Investigational activities included the delineation of impacted groundwater, both on-site and off-site, as well as a volatile organic compound (VOC) source investigation. The source investigation was designed based on testimonials (legal depositions) from former employees and the results of prior investigations. It involved the collection of soil samples from three borings advanced to auger refusal (25.5 to 33.5 feet below ground surface [ft bgs]) along the northeastern side of the site building (between MW-4 and MW-5). The sample collected from the bottom of the soil boring (SB-1) adjacent to MW-5 contained TCE at a concentration of 0.002 parts per million (ppm). RMT stated that an "interference structure" was also detected in this sample during the analysis of semivolatile organic compounds (SVOCs) and "was quantified as the polychlorinated biphenyl (PCB) Aroclor 1254 at a level of 500 ppm". Some waste debris was observed in the bottom of this boring as well. No other constituents were detected in soil collected from the other two borings except for a low concentration of toluene in SB-3. RMT concluded that based on the results of this and previous investigations and the length of time that has passed since the discharge of VOCs (approximately 20 years from the discharge of VOCs to the time the CSA

was prepared in 1994 according to RMT), a source of VOCs is likely no longer present in soil (RMT 1994). A soil boring cross-section map from the CSA is included in Appendix B.

The results of the groundwater investigation conducted during the CSA indicated that groundwater impacted with TCE and related daughter products had migrated from the site to the North Carolina Department of Transportation (DOT) property to the northeast of the site and toward Gashes Creek to the southwest, west, and northwest of the site. TCE was also detected on the Dotson Metal Finishing property located to the west of the site, across Gashes Creek (RMT 1994). Additional investigation conducted for the site's *Corrective Action Plan* (CAP), prepared by RMT, indicated that TCE had been used as part of the Dotson Metal Finishing operation and a release of TCE had occurred on this property (RMT 1996). TCE was detected in surface water samples SW-4, SW-5, and SW-6 collected from Gashes Creek in April 1994 at concentrations of 0.0009, 0.072, and 0.0003 milligrams per Liter (mg/L), respectively.

The most elevated concentrations of TCE on the Girmes site occurred in MW-5 at a concentration of 6.4 mg/L. A plume extends from this well to the east and northeast. A second TCE plume, originating near well MW-14 located on the southwest side of the site building, extends to the west, southwest, and northwest.

According to RMT, neither PCBs, nor benzene, toluene, ethylbenzene, xylenes (BTEX constituents) were detected in groundwater in a sub-set of about nine monitoring wells over the course of two sampling events (RMT 1994). A TCE isoconcentration map, groundwater flow direction map, and cross-section from the CSA are included in Appendix B.

1.3.3 Corrective Action Plan—April 1996

A CAP was prepared by RMT in April 1996. The CAP stated that former employee depositions had indicated that solvent disposal practices included dumping small quantities of spent solvents on the northeast side of the site building. Soil sampling conducted during the CSA did not identify an ongoing source of solvent-impacted soil in this area. Former employees also reported that solvents may have been poured into a drain that extended from the building to the edge of the parking area on the southwest side of the facility. Visual site surveys failed to locate the reported drain. Based on the length of time that has passed since disposal practices occurred, RMT concluded that there is likely no active source of VOCs on-site. A monitored natural attenuation strategy was proposed to address the groundwater plume on the northeastern side of the facility. A groundwater recovery and treatment system, which would include the operation of a series of groundwater recovery wells along the property line adjacent to Gashes Creek, was proposed to address the groundwater plume on the southwestern side of the facility (RMT 1996).

1.3.4 Environmental Reports—1996 to 2001

Environmental reports prepared after the CAP (April 1996) and before the *Groundwater Monitoring Report for the October 2001 Sampling Event* (December 2001) were not available for review prior to finalizing this document. However, groundwater monitoring reports prepared in 2001 contain historical groundwater concentration tables displaying analytical results for November 1993, April 1994, August 1994, September 1994, June 1995, February 1996, June 1996, January 1997, July 1997, January 1998, July 1998, October 1998, January 1999, April 1999, October 1999, January 2000, April 2000, July 2000, October 2000, and April 2001 sampling events.

1.3.5 Groundwater Monitoring Report for the October 2001 Sampling Event

The *Groundwater Monitoring Report for the October 2001 Sampling Event,* prepared by RMT in December 2001 indicated that, in accordance with the CAP, 13 monitoring wells and three recovery wells had been sampled on a quarterly basis and that 29 monitoring wells, three recovery wells, and four surface water stations had been sampled on a semiannual basis until December 11, 2001, when DENR approved a reduction in the sampling requirements. The monitoring frequency was reduced to the semiannual

collection of groundwater and surface water from 29 monitoring wells, three recovery wells, and four surface water stations. Historical groundwater analytical data indicated that concentrations of TCE in monitoring well MW-5 have generally increased from 6.4 mg/L in 1993 to 16 mg/L in October 2001. Concentrations in MW-4 have generally decreased over this same time period. No constituents were detected in the four surface water samples collected from Gashes Creek (RMT 2001).

The groundwater recovery and treatment system began operation March 4, 1998; it pumps water from three wells (RW-1, RW-3, and RW-4) to an air stripper to remove concentrations of VOCs. Treated water is discharged into Gashes Creek. The results of the October 2001 sampling event indicate that a cone of depression continues to be present around the recovery well system to the southwest of the facility. Multiple wells have gone dry including monitoring wells MW-14, MW-18, MW-21, and MW-22. Since shortly after the startup of the groundwater recovery system, tetrachloroethene (PCE) has been detected in the influent for the treatment system. Therefore, the three existing recovery wells in addition to monitoring wells MW-19, MW-23, MW-24, MW-26R, MW-28, and MW-28A have been sampled for PCE in addition to TCE, 1,2-dichloroethene (1,2-DCE), and vinyl chloride since January 1999. RMT concluded that the PCE detected in monitoring wells and recovery wells originated on the southwest side of Gashes Creek and was not attributable to past site activities (RMT 2001).

1.3.6 Groundwater Monitoring Report for the April 2002 Sampling Event

The *Groundwater Monitoring Report for the April 2002 Sampling Event,* prepared by RMT in June 2002 indicated that conditions at the site remain largely the same as they were during the October 2001 monitoring event (RMT 2002a).

1.3.7 Groundwater Monitoring Report for the October 2002 Sampling Event

The *Groundwater Monitoring Report for the October 2002 Sampling Event,* prepared by RMT in December 2002 indicated that conditions at the site remain largely the same as they were during the April 2002 monitoring event. DENR had approved a pulsed pumping cycle for the recovery system on October 14, 2002. Starting November 11, 2002, the system was shut o-ff for six weeks then re-started for a six-week pumping cycle, then repeated (RMT 2002b).

1.3.8 Groundwater Monitoring Report for the April 2003 Sampling Event

The *Groundwater Monitoring Report for the April 2003 Sampling Event,* prepared by RMT in June 2003, indicated that conditions at the site remain largely the same as they were during the October 2002 monitoring event. Water level gauging conducted prior to restarting the groundwater recovery system in March 2003 demonstrated that there was still a small effect on the water table from long-term pumping of the recovery system as indicated by monitoring wells MW-14 and MW-22, which were measured to be dry (RMT 2003a). However, monitoring well MW-14 was often dry even prior to recovery system startup. Recovery well RW-3 has not been operating since April 2002 due to low yield and related operational issues (RMT 2003a).

1.3.9 Groundwater Monitoring Report for the October 2003 Sampling Event

The *Groundwater Monitoring Report for the October 2003 Sampling Event,* prepared by RMT in December 2003 indicated that conditions at the site remain largely the same as they were during the April 2003 monitoring event (RMT 2003b).

1.3.10 Environmental Reports—2004

Environmental reports prepared in 2004 were not available for review during preparation of this document. However, groundwater monitoring reports prepared in 2005 contain historical groundwater concentration tables displaying analytical results for the April and October 2004 sampling events.

1.3.11 Groundwater Monitoring Report for the April 2005 Sampling Event

The *Groundwater Monitoring Report for the April 2005 Sampling Event,* prepared by RMT in June 2005, indicated that conditions at the site remain largely the same as they were during the October 2003 monitoring event. Since baseline groundwater conditions were established at the site during preparation of the CSA, concentrations of TCE have decreased substantially in many wells. For example, concentrations of TCE in MW-9 decreased from 3.0 mg/L in 1993 to 0.25 mg/L in 2005. Concentrations of TCE in MW-4 decreased from 1.5 mg/L in 1993 to 0.28 mg/L in 2005. On the southwestern side of the site, concentrations of TCE in MW-24 decreased from 2.2 mg/L in 1994 to 0.0053 mg/L in 2005. Concentrations of TCE in MW-19 decreased from 0.018 mg/L in 1994 to below laboratory detection limits in 2005. Concentrations of TCE in MW-23, located on the western side of Gashes Creek, decreased from 3.5 mg/L in 1994 to 0.0038 mg/L in 2005 (RMT 2005a). Historical analytical concentration tables for TCE and 1,2-DCE from the *Groundwater Monitoring Report for the April 2005 Sampling Event* are included in Appendix C.

1.3.12 Groundwater Monitoring Report for the October 2005 Sampling Event

The *Groundwater Monitoring Report for the October 2005 Sampling Event,* prepared by RMT in December 2005, indicated that conditions at the site remain largely the same as they were during the April 2005 monitoring event (RMT 2005b).

1.3.13 Groundwater Monitoring Report for the April 2006 Sampling Event

The *Groundwater Monitoring Report for the April 2006 Sampling Event,* prepared by RMT in May 2006 indicated that conditions at the site remain largely the same as they were during the October 2005 monitoring event. Two additional monitoring wells (MW-5A and MW-29) were installed at the site in January 2006. MW-5A was installed adjacent to MW-5 in bedrock and 15 feet deeper than the bottom of MW-5. This well was installed to assess vertical water quality in this area. MW-29 was installed adjacent to MW-14 as MW-14 has been dry since system startup. Concentrations of TCE have generally decreased in MW-5 from a maximum concentration of 17 mg/L in October 2000 to 3.7 mg/L detected in April 2006. TCE was detected at a concentration of 7.2 mg/L in MW-5A in April 2006. TCE was detected at a concentration of 0.3 mg/L in MW-29 in April 2006, which is slightly lower than the concentration of TCE detected in MW-14 in November 1993 (0.52 mg/L). RMT stated that a plan to enhance the remediation strategy at the site would be discussed with DENR during May 2006 (RMT 2006).

1.3.14 Environmental Reports—May 2006—March 2008

Environmental reports prepared after the *Groundwater Monitoring Report for the April 2006 Sampling Event* and before the *Summary of Chemical Oxidation Pilot Study* were not available for review during preparation of this document.

1.3.15 Summary of Chemical Oxidation Pilot Study

The *Summary of Chemical Oxidation Pilot Study,* prepared by RMT in March 2008 summarized the activities and results of a chemical oxidation pilot study conducted inside the site building. The pilot study involved the installation of two performance-monitoring wells (MW-101 and MW-102) and two injection wells (IW-01 and IW-02). These wells were installed in bedrock, below the water table, at a terminal depth of 77.4 feet below ground surface (ft bgs), 87.5 ft bgs, 83.0 ft bgs, and 82.5 ft bgs, respectively. The location of these

wells was chosen based on knowledge of past site activities, observations inside the building, and a Gore-Sorber® soil gas study conducted at the site (note: this soil gas study was not available for review.) A residual source of VOCs was believed to exist beneath the former maintenance area (RMT 2008). The location of the pilot study wells can be seen on the site map provided in Appendix A.

The pilot study involved the injection of catalyzed sodium persulfate into the two injection wells over two injection events (June 4 and 5, 2007 and July 21, 2007), preceded by a baseline monitoring event, and followed by performance monitoring events. The results of the baseline sampling event conducted May 2007 indicated that concentrations of TCE in wells MW-101, MW-102, IW-1, and IW-2 were detected at 0.038 mg/L, 0.93 mg/L, 0.18 mg/L, and 0.63 mg/L, respectively. The results of the final performance monitoring event conducted in January 2008 demonstrated that with the exception of MW-29, the injection wells, and MW-101, concentrations of TCE had generally increased in site wells. The final performance concentration measured in MW-102 was 2.23 mg/L (RMT 2008).

RMT concluded that catalyzed sodium persulfate was effective at reducing VOC concentrations in groundwater, but that delivery of the oxidant to a residual source area in fractured bedrock proved challenging. No additional injection activities were planned. However, RMT stated that "additional investigation activities (soil gas sampling) to further evaluate the site may be considered." The next groundwater sampling event was scheduled for January 2009 (RMT 2008).

1.3.16 Environmental Reports—2009

Environmental reports prepared during 2009 were not available for review during preparation of this document.

1.3.17 Summary of May 2010 Sampling Results

The *Summary of May 2010 Sampling Results,* prepared by RMT in June 2010, summarizes the results of a monitoring event conducted on a subset of site wells, surface water points, and pore water points located adjacent to Gashes Creek. RMT stated that this technical memorandum was prepared to verify the results of a February 2010 sampling event, to demonstrate that site-related constituents are not impacting surface water, and to confirm that continued operation of the groundwater recovery system is not required to protect the surface water pathway (RMT 2010).

RMT concluded that even though detections of site constituents exceeded groundwater standards in most of the pore water samples collected, site constituents are not detected in surface water or do not exceed surface water standards. An estimated detection of 1,2-Dichloroethene (1,2-DCE) at a concentration of 0.00029 mg/L was observed in surface water sample SW-7 (located adjacent to pore water sample PW-12). During this event, concentrations of PCE in monitoring well MW-28A were detected at their highest concentration to date (0.0357 mg/L). RMT stated that PCE in this well is not believed to be the result of historical activities conducted at the Former Girmes Site. RMT recommended an additional monitoring event for the fourth quarter of 2010 (RMT 2010).

Although RMT did not state whether the groundwater recovery system was operating at this time, most likely it was non-operational during an evaluation of this type. Operation of the groundwater recovery system may have been discontinued sometime between March 2008 and May 2010. It is unclear if the groundwater recovery system is currently operating.

1.3.18 Results of First 2011 Monitoring Event

The *Results of the First 2011 Monitoring Event,* prepared by RMT in April 2011, indicated that conditions at the site remain largely the same as they were during the May 2010 monitoring event. VOCs were not detected in any of the surface water samples collected (RMT 2011). A summary of analytical results from the *First 2011 Monitoring Event* is included in Appendix C.

1.4 Site Characteristics

The site is located at 12 Old Charlotte Highway in Asheville, Buncombe County, North Carolina. The site consists of two parcels totaling approximately 40.58 acres. The site is located on a ridgeline oriented to the northwest and is approximately 80-feet higher than the properties to the east, west, and south. Drainage across the site flows to the southwest, northwest, and northeast depending on the location within the site. Eventually drainage reaches Gashes Creek, which flows roughly north along the southwestern site boundary toward the Swannanoa River. According to the United States Geological Survey (USGS) topographical map for the area, the site sits at an elevation of 2,120 feet (National Geodetic Vertical Datum of [NGVD] 1929) (see Figure 1 and the site map in Appendix A).

Currently, the site is occupied by Highland Brewery in the southeastern portion of the site building and various tenants use the northwestern portion of the site building for predominantly warehouse space. A site building floor plan is included as Figure 2. The site is bounded by Gashes Creek to the southwest, DOT property to the north and northeast, and Norfolk Southern Railway and Gashes Creek Road to the south and southeast.

According to DENR's *Geologic Map of North Carolina*, the site is located in the Blue Ridge Physiographic Province. The bedrock in this area is comprised of the rocks of the Ashe Metamorphic Suite consisting of high-grade metamorphic marine sediments (DENR 1985).

According to the CSA, the hill that the site rests on is composed of saprolitic soils consisting of silts, silty sands, and clayey silty sands, to a depth of approximately 25 to 43 ft bgs. The saprolite is underlain by fractured crystalline rock, generally interpreted to be an amphibolite gneiss, interlayered with mica schist and felsic gneiss. RMT reported that the bedrock saprolite interface dips downward mimicking topography. Groundwater below the site building is generally located at a depth of approximately 60 to 70 ft bgs. The saprolite unit is dry below the site building. Groundwater generally flows toward the southwest, west, north, and northeast depending on the location within the site (RMT 1994).

2.0 Site Investigation

2.1 Health and Safety Information

Prior to conducting any field activities at the site, Altamont technicians participated in an initial thorough discussion of Altamont's *Corporate Health and Safety Plan* prior to beginning work at the site. In addition, health and safety "tailgate" meetings were held at the beginning of each field work day. All personnel wore the following safety gear, at a minimum:

- Long pants and steel-toed boots (at all times)
- Hardhats, safety glasses, cut-resistant gloves, and nitrile gloves (as appropriate for specific activities)

2.2 Off-Site Vapor Intrusion Assessment

The results of a receptor survey conducted by RMT during the CSA indicated that there are no probable current users of groundwater within a 1,500-foot radius of the site. Three production wells were identified, one on the site property and one on the Dotson property. However, none of these are in use. Also, no public water intakes were identified within 1,500 feet. The nearest residences to the site are located on Gashes Creek Road, within 1,500 feet (RMT 1994). However, these residential properties are located on a ridgeline, above and to the west of the site. Groundwater flow direction at the site has consistently been away from these residences. Furthermore, there are three monitoring wells (MW-1, MW-6, and MW-27) that are in between the site and these residences. Between November 1993 and January 2008, monitoring well MW-1 has been sampled 22 times, MW-6 has been sampled 26 times, and MW-27 has been sampled 23 times. According to historical analytical data tables, site constituents have never been detected in these monitoring wells (RMT 2005b, 2006, and 2008). Therefore no off-site vapor intrusion assessment is recommended by Altamont at this time. If the results of a future receptor survey indicate other potential receptor pathways, those receptor pathways will be evaluated.

2.3 On-Site Vapor Intrusion Assessment

2.3.1 Sub-Slab Soil Gas Sampling

The vapor intrusion assessment activities were conducted in general accordance with *Indoor Air and Sub-Slab Vapor Sampling for Brownfields Projects Guidance Checklist,* Section 3.0 of the *Assessment of Vapor Intrusion in Homes Near the Raymark Superfund Site Using Basement and Sub-Slab Air Samples*, Appendix E of the *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)*, and *Supplemental Guidelines for the Evaluation of Structural Vapor Intrusion Potential for Site Assessment and Remedial Actions Under the Inactive Hazardous Sites Branch* (DENR 2010, EPA 2006, EPA 2002, and DENR 2011a, respectively).

2.3.2 Sub-Slab Sampling Point Installation

A total of five sub-slab soil gas locations were installed in the site building on January 10, 2012. Approximate locations of the sub-slab locations are shown on Figure 2. Two sub-slab soil gas locations (SG-1 and SG-2) were installed in an area between MW-102 and MW-5 (see the Figure 2 and the site map in Appendix A). One sub-slab location was installed in between MW-102 and IW-2. One sub-slab location (SG-4) was installed near MW-4 and one additional sub-slab location (SG-5) was installed near MW-29.

The sub-slab soil gas samples were obtained by drilling a 0.75-inch diameter hole with a hammer drill approximately 1 to 2 inches into the building concrete slab. A 0.5-inch diameter hole was then drilled at the bottom of the previous hole, through the building slab, and 2 to 4 inches into the soil below the building.

The building sub-slab was 8 to 10 inches thick in all locations. After drilling, dust and dirt was removed from the hole with a vacuum and the interior of the hole was wiped clean with a wet paper towel to prepare the hole for the grout seal and facilitate air flow from the sub-surface.

Brass piping with nylon-tape-wrapped threaded fittings was installed in the hole and sealed in place with a non-sanded cement grout. The grout seal was allowed to harden and cure for approximately 24-hours to prevent ambient air from entering the sub-slab soil gas borings. This time period also allowed the soil gas points to equilibrate. A schematic of a sub-slab soil gas boring is included as Figure 3. Photographs of the sub-slab soil gas sampling ports are shown in Appendix D.

2.3.3 Leak Testing

Prior to sampling activities, leak tests were performed on January 11, 2012 at each sample location using helium, which is a non-toxic gas that is absent from the subsurface environment. Shrouds made of plastic, approximately 4 square feet in size, was taped to the slab to cover the soil gas probe locations. Helium gas with a concentration of 100 percent was introduced into the shrouds covering the sub-slab sample locations. Sub-slab vapor samples were withdrawn and screened with a calibrated handheld Dielectric Radiodetection MGD-2002 helium detector prior to sampling with the summa canister. A proper seal is confirmed by a helium detection of less than 10 percent on the meter (New York State Department of Health 2006). Helium was measured in the shrouds at a concentration of approximately 65 percent. The actual concentration in the shroud was likely greater since inserting the probe into the shroud allowed some air mixing to occur at the edge of the shroud. Concentrations of helium measured by the meter from the sample ports were below 1 percent in all locations.

2.3.4 Sample Collection

On January 11, 2012, Altamont initiated sample collection using 6-liter laboratory certified summa canisters with 24-hour regulators. Polyethylene tubing with brass compression fittings was used to connect the sample port to the summa canisters. New tubing was used at each sample location. Prior to sample collection, the helium detector was used to purge the sample collection lines. During sample collection, 100 percent helium was re-introduced to each shroud to verify the seal on the sub-slab probe as described above. Summa canisters were collected from the site on January 12, 2012. The sample duration was 21 to 22 hours in each location. Approximately 2.5 to 4 inches of mercury remained in each summa canister at sample collection for laboratory quality control purposes. Photographs showing the soil gas sampling system assembly are included in Appendix D.

2.3.5 Air Sample Analysis

The air samples were submitted to SGS North America, Inc. Laboratory, and analyzed using Environmental Protection Agency (EPA) Method TO-15 for VOCs and American Society for Testing and Materials (ASTM) Method D1946 for helium. Results of the TO-15 analysis were compared to the Acceptable Soil Gas Concentrations listed in the IHSB Industrial/Commercial Vapor Intrusion Screening Levels to determine the risks of vapor intrusion at the site. In addition, helium analysis results were analyzed to see if any of the tracer gas leaked through the seal into the borings.

2.3.6 Building Characteristics

A building floor plan is included as Figure 2. Photographs of the building interior can also be seen in the photographic log included as Appendix D. Generally the building is comprised of large open warehouse space with some office areas. The central heating, ventilation, and air conditioning (HVAC) is no longer functional. Large space heaters and fans attached to the ceiling provide heating and cooling for the building. Multiple locations where the roof was leaking slightly were noted during field activities at the site. Former hallways between the warehouse space where this investigation was conducted and the building

space where Highland Brewery operates have been sealed with a concrete firewall. Long rectangular-shaped repairs in the slab, indicative of former floor drains, were observed in the slab in the central portion of the site building, near IW-1 and SG-3.

2.3.7 Atmospheric Conditions

According to the Asheville Regional Airport's publicly available rainfall data, approximately 0.1 inches of rain fell on January 10, 1.48 inches of rain fell on January 11, and 0.02 inches of rain fell on January 12. Wind direction and speed during this assessment was approximately 4 to 8 miles per hour to the south and southeast. The Asheville Regional Airport is located approximately 10 miles to the southwest of the site.

A digital thermometer measured temperature near sub-slab soil gas location SG-1 during the assessment. The temperature was 56 degrees Fahrenheit (°F) when sample collection was initiated and 54°F when the sampling was completed. Temperature was measured at between 56°F and 58°F at the other four sampling locations when the sampling was initiated. The minimum temperature over this time period was 54°F, which demonstrates that temperature fluctuated very little during the sample collection period.

2.4 Sampling Results

Laboratory analytical results for the sub-slab soil gas assessment are summarized on Table 1. No VOCs were detected above the IHSB Industrial/Commercial Vapor Intrusion Screening Level for Acceptable Soil Gas Concentrations (IHSB Screening Level) (IHSB 2011b). TCE was detected in all five soil gas sampling locations. The most elevated detections of TCE occurred in SG-3 and SG-4 at concentrations of 86 and 70 micrograms per cubic meter (µg/m^3), respectively. These detections were nearly an order of magnitude below the IHSB Screening Level of 610 µg/m^3. Tetrachloroethene was detected above the laboratory reporting limit in only one location, SG-4, at a concentration of 22 µg/m^3, which is below the IHSB Screening Level of 210 µg/m^3.

The most elevated detection of a VOC was acetone, which was detected in all soil gas samples at a concentration of between 140 and 480 µg/m^3, well below the IHSB Screening level of 280,000 µg/m^3. Acetone was detected at a very low level in the laboratory method blank, indicating that these results may be slightly elevated compared to the actual concentration in sub-slab soil gas.

Multiple VOCs were detected at low concentrations including, benzene, xylene, toluene, and other constituents commonly associated with hydrocarbon-based products like Varsol™ and similar solvents. Generally the concentrations of these constituents were approximately an order of magnitude or more below the IHSB Screening Levels. The laboratory analytical report is included in Appendix E.

2.4.1 Quality Control Measures

Quality control (QC) samples consisted of one duplicate sample (Dup). The duplicate sample was collected concurrently with SG-1, located near MW-5. The duplicate sample demonstrated good reproducibility.

Additional QC measures included the analysis of helium for each sample to measure the degree to which the sub-slab soil gas points leaked air from the surface to the sub-surface. The most elevated concentration of helium was measured in SG-1 at a concentration of 9.8 percent. The lowest concentration of helium was measured in SG-4 at a concentration of 0.4 percent by volume. Helium results indicate that concentrations of constituents detected in the soil gas samples may be slightly depressed by an amount directly proportional to the concentration of helium detected in each sample. However, a proper seal is confirmed by a helium detection of less than 10 percent by volume (New York State Department of Health 2006).

3.0 Updated Conceptual Site Model

During the course of investigations at the site, an active source area of VOCs in soil could not be located. RMT concluded that based on the length of time that has passed since improper solvent disposal practices occurred at the site, a residual source of VOCs in soil likely does not exist (RMT 1994, 1996). The results of the *Summary of Chemical Oxidation Pilot Study,* prepared by RMT in March 2008, indicated that there may be a residual source zone of VOCs in bedrock below the site building (RMT 2008). However, concentrations of site constituents in the injection and performance monitoring wells installed within the site building were lower than the concentrations of site constituents in MW-5 and MW-5A. This data suggests that the source of VOCs in this area originated closer to MW-5. MW-5 is located near where prior employees of the former site owners and occupants stated that small quantities of spent solvents had periodically been disposed of (RMT 1996). Most likely a residual source zone of VOCs exists in bedrock in the area to the northeast of the site building.

Generally, groundwater flow at the site has mimicked topography, flowing to the northeast in the northeast portion of the site and flowing to the southwest, west, and north in the southwestern, western, and northwestern portions of the site, respectively (RMT 1994). However, the groundwater recovery system, which operated from March 1998 to sometime between March 2008 and May 2010, created a large cone of depression near Gashes Creek (RMT 2001). This may have affected groundwater flow direction in the area near the site building. Considering that by April 2006, the groundwater recovery system had removed 88.42 million gallons of water and treated 604.74 pounds of TCE since system startup (RMT 2006), the recovery wells may have drawn impacted groundwater from the area near MW-5 to the southwest into the area where performance monitoring well MW-102 is located.

Historical groundwater data indicated that there may be a receptor pathway between impacted groundwater in the area near MW-5, MW-5A, and MW-102 and indoor air in the vicinity of these wells. However, the results of the sub-slab soil gas sampling assessment described in previous sections indicate that this receptor pathway is not present. Although there are low concentrations of TCE and other VOCs in soil vapor below the slab of the site building, all detected concentrations are below IHSB screening levels. Interestingly, the concentrations of TCE detected in soil vapor in locations below the site building are not proportionate to the concentrations of TCE in groundwater directly below the soil gas sampling locations. For example, the most elevated concentration of TCE in groundwater occurs in monitoring well MW-5A, near SG-1. But concentrations of TCE in soil gas below the slab were very similar throughout the site building, with the most elevated concentration occurring in SG-3. This result is likely due to the depth of groundwater below the site (approximately 60 to 70 ft bgs), and the fact that groundwater is located only in bedrock, below the saprolite. The likely reason that TCE soil gas concentrations are so similar in the various locations sampled below the site building is that TCE vapors migrating upwards through bedrock and saprolite from groundwater have abundant time and space to reach an equilibrium concentration in the soil matrix below the site building through processes of diffusion and dispersion.

Many of the other VOC constituents detected in sub-slab soil gas at very low concentrations are typically associated with petroleum products. In 1993, RMT analyzed for BTEX constituents on a sub-set of approximately nine monitoring wells over the course of two sampling events. These constituents have not been detected in groundwater. During 1991, BPA excavated and removed Varsol (a petroleum based solvent that contains BTEX constituents) from impacted soil from near the northeast corner of the site building. Confirmation samples from the excavation verified that impacted soil had been removed (RMT 1994). It is possible that low levels of Varsol, potentially at concentrations below soil screening criteria, remain in soil near the site building. Another possible explanation is that floor drains observed in the center of the site building (near IW-2 and SG-3) allowed some of these constituents to discharge to soil below the site building during prior occupant operations at the site. Regardless of the mechanism of release, historical groundwater results and current sub-slab soil gas results indicate that the concentration of these

constituents in media at the site is unlikely to pose an unacceptable risk to human health and the environment.

4.0 Conclusions and Recommendations

Laboratory analytical results for five sub-slab soil gas samples collected at the site indicate that no VOCs were detected above the IHSB Industrial/Commercial Vapor Intrusion Screening Level for Acceptable Soil Gas Concentrations (IHSB 2011b). TCE was detected in all five soil gas sampling locations at a concentration approximately an order of magnitude below the IHSB Screening Level of 610 µg/m^3.

Multiple VOCs were detected at low concentrations in soil gas including benzene, xylene, toluene, and other constituents commonly associated with petroleum products. Generally the concentrations of these constituents were approximately an order of magnitude or more below the IHSB Screening Levels. Laboratory analytical results are summarized in Table 1 and the laboratory analytical report is included in Appendix E.

The results of the sub-slab soil gas sampling assessment indicate that a receptor pathway between impacted groundwater and indoor air at the site is not present. The detections of other VOCs, such as BTEX constituents which have not been detected in groundwater, indicate that there may be some residual impacted soil at the site. It is possible that low levels of Varsol, potentially at concentrations below soil screening criteria, remain in soil near the site building. Another possible explanation is that floor drains observed in the center of the site building (near IW-2 and SG-3) allowed some of these constituents to discharge to soil below the site building during prior occupant operations at the site. Regardless of the mechanism of release, historical groundwater results and current sub-slab soil gas results indicate that the quantity of petroleum-product-related constituents in media at the site is likely minimal.

An analysis of the potential for off-site vapor intrusion was conducted as part of this assessment for the residences located to the southeast of the site. The results indicate that there is no unacceptable risk to the occupants of these residences. Groundwater flow direction has consistently been in a direction away from these residences. Additionally, three sentinel wells (MW-1, MW-6, and MW-27) between the site and these residences have been sampled at least 22 times since 1993. According to historical analytical data tables, site constituents have never been detected in these monitoring wells (RMT 2005b, 2006, and 2008).

An additional sub-slab soil gas sampling event in the remaining areas of the site building is recommended to verify the results of this assessment and to confirm that a receptor pathway between impacted media and indoor air in other areas of the site building does not exist. Also, during the next semiannual groundwater sampling event at the site, the prospective developer may want to request SKF USA Inc. have analyzed all or a sub-set of all collected groundwater samples for the additional VOCs detected in soil vapor in order to confirm the conclusion made in historical site reports that groundwater is impacted with only chlorinated solvents. Typically, the inclusion of additional VOCs in the laboratory analysis is easily accomplished. Furthermore, it should not result in an increase in cost to SKF USA Inc. of more than about $30 per sample analyzed.

5.0 References

Altamont Environmental, Inc. 2011. *Corporate Health and Safety Plan*.

DENR. 1985. *Geologic Map of North Carolina*.

DENR. 2010. *Indoor Air and Sub-Slab Vapor Sampling for Brownfields Projects Guidance Checklist.*

DENR DWM IHSB. 2011a. *Supplemental Guidelines for the Evaluation of Structural Vapor Intrusion Potential for Site Assessment and Remedial Actions Under the Inactive Hazardous Sites Branch*. June 21.

DENR DWM IHSB. 2011b. IHSB Industrial / Commercial Vapor Intrusion Screening Table. August.

EnviroAssessments. 2010. *Phase I Environmental Site Assessment, Clan Highland LLC, 12 Old Charlotte Highway, Suite H, Asheville, Buncombe County, North Carolina*. July 5.

EPA. 2002. *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance). November.*

EPA. *2006. Assessment of Vapor Intrusion in Homes Near the Raymark Superfund Site Using Basement and Sub-Slab Air Samples.* March.

New York State Department of Health (NYSDOH), Center for Environmental Health, Bureau of Environmental Exposure Investigation. 2006. *Guidance for Evaluating Soil Vapor Intrusion in the State of New York.*

RMT, Inc. 1994. *Comprehensive Site Assessment—Girmes Site, Formerly SKF USA, Inc*. November.

RMT, Inc. 1996. *Corrective Action Plan—Girmes Site, Formerly SKF USA, Inc.* April.

RMT, Inc. 2001. *Groundwater Monitoring Report for the October 2001 Sampling Event—Girmes Site, Formerly SKF USA Inc.—Buncombe County, North Carolina.* December.

RMT, Inc. 2002a. *Groundwater Monitoring Report for the April 2002 Sampling Event—Girmes Site, Formerly SKF USA Inc.—Buncombe County, North Carolina.* June.

RMT, Inc. 2002b. *Groundwater Monitoring Report for the October 2002 Sampling Event—Girmes Site, Formerly SKF USA Inc.—Buncombe County, North Carolina.* December.

RMT, Inc. 2003a. *Groundwater Monitoring Report for the April 2003 Sampling Event—Girmes Site, Formerly SKF USA Inc. —Buncombe County, North Carolina.* June.

RMT, Inc. 2003b. *Groundwater Monitoring Report for the October 2003 Sampling Event—Girmes Site, Formerly SKF USA Inc.—Buncombe County, North Carolina.* December.

RMT, Inc. 2005a. *Groundwater Monitoring Report for the April 2005 Sampling Event—Girmes Site, Formerly SKF USA Inc.—Buncombe County, North Carolina.* June.

RMT, Inc. 2005b. *Groundwater Monitoring Report for the October 2005 Sampling Event—Girmes Site, Formerly SKF USA Inc.—Buncombe County, North Carolina.* December.

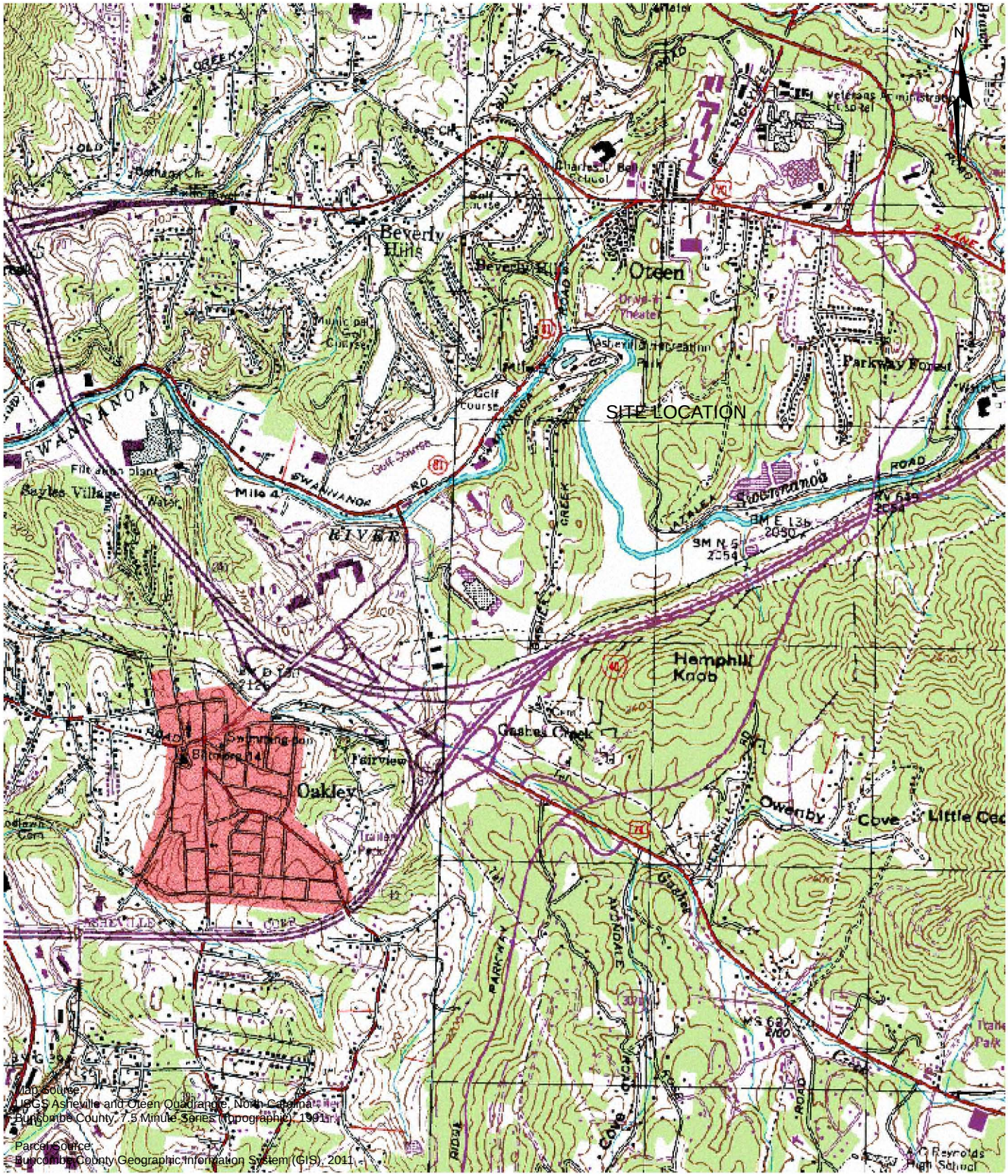
RMT, Inc. 2006. *Groundwater Monitoring Report for the April 2006 Sampling Event—Girmes Site, Formerly SKF USA Inc.—Buncombe County, North Carolina.* May.

RMT, Inc. 2008. *Summary of Chemical Oxidation Pilot Study—Former Girmes Site, Asheville, North Carolina, Underground Injection Control Permit # WI10100043.* March 20.

RMT, Inc. 2010. *Summary of May 2010 Sampling Results—Former Girmes Site, Asheville, North Carolina.* June 23.

RMT, Inc. 2011. *Results of First 2011 Monitoring Event. Former Girmes Site—Asheville, North Carolina.* April 14.

FIGURES



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SITE LOCATION MAP

FUTURE HIGHLAND BUSINESS PARK

12 OLD CHARLOTTE HIGHWAY
ASHEVILLE, NORTH CAROLINA 28803

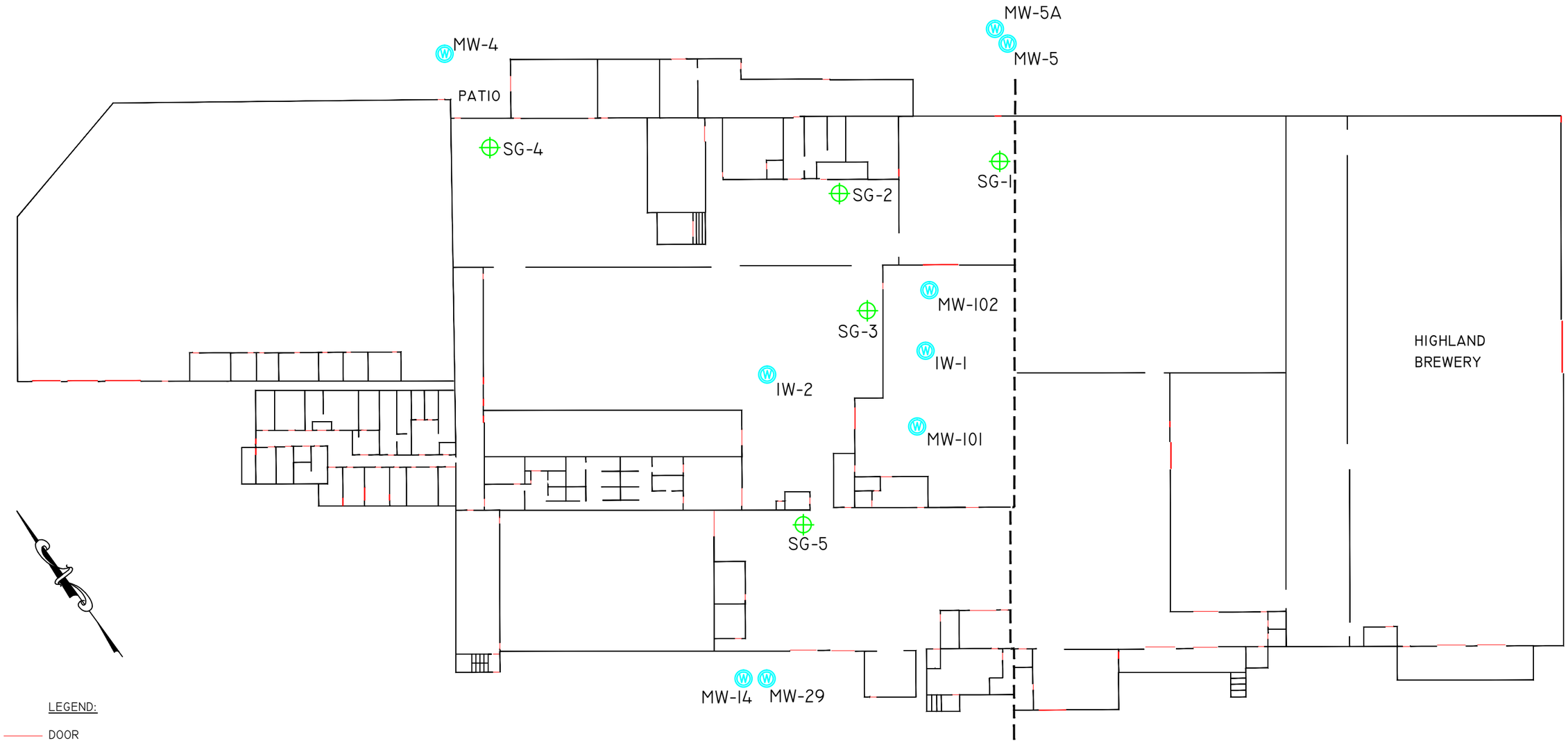
FIGURE

1

Drawn By: Adam Tripp
Project Manager: Stu Ryman
Client:Clan Highland LLC
Date: 12/20/2011

SCALE
0 500 1,000 2,000 Feet

P:\Highland Brewing\BrownfieldsDocs\Figures\GIS\Figure 1 - Site Location Map.mxd



LEGEND:

- DOOR
- SUB-SLAB SOIL GAS SAMPLING LOCATION
- MONITORING OR INJECTION WELL
- CURRENT PROPERTY LINE

NOTES:
1. MONITORING WELL AND SOIL GAS LOCATIONS ARE APPROXIMATE.
2. SITE BUILDING FLOOR PLAN DRAWN FROM SITE EMERGENCY EXIT MAP AND VISUAL OBSERVATIONS MADE BY ALTAMONT.

REV.	DATE	DESCRIPTION	BY	CHK	APV

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DRAWN BY: MARTA A. VANDUSSEN
PROJECT MANAGER: STU RYMAN
CLIENT: CLAN HIGHLAND, LLC
DATE: 01/30/2012

NOT TO SCALE

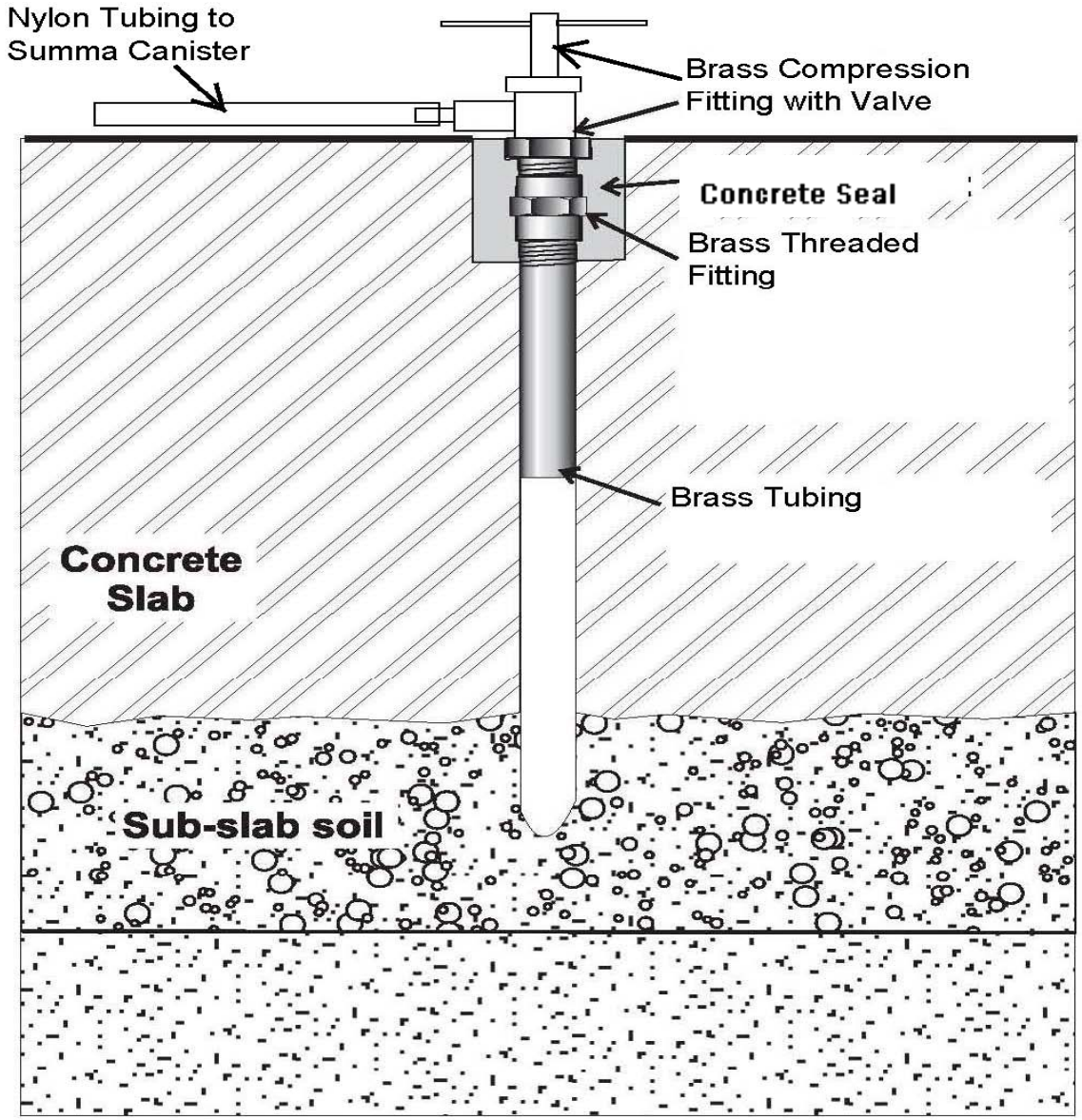
SITE BUILDING FLOOR PLAN

FUTURE HIGHLAND BUSINESS PARK
12 OLD CHARLOTTE HIGWAY
ASHEVILLE, NORTH CAROLINA

FIGURE 2

FILE PATH: P:\HIGHLAND BREWING COMPANY\PRELIM VAPOR ASSESSMENT\FIGURES

Figure 3. Schematic of Sub-Slab Soil Gas Boring



Note: Figure is not to scale.

TABLES

Table 1
Soil Gas Sample Analytical Results Summary
Preliminary Sub-Slab Vapor Intrusion Assessment
Future Highland Business Park
Asheville, North Carolina

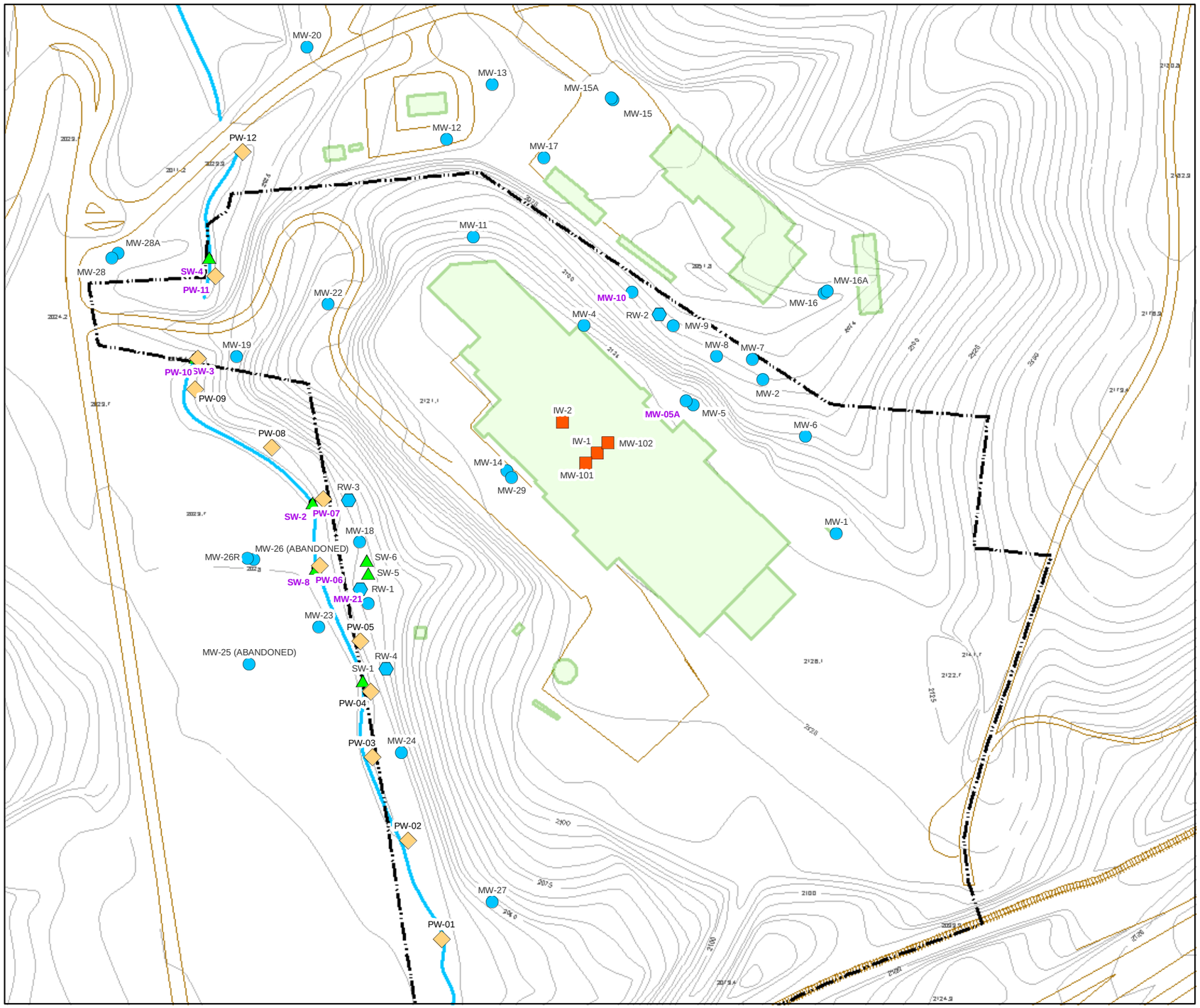
Constituent	Sample ID: / Date Collected:	SG-1 1/12/2012	DUP 1/12/2012	SG-2 1/12/2012	SG-3 1/12/2012	SG-4 1/12/2012	SG-5 1/12/2012
VOCs (µg/m³) (Method TO-15)	IHSB Screening Levels						
1,2,4-Trimethylbenzene	62	0.59	0.49	1.2	1.4	<0.98	1.2
2-Butanone (MEK)	44,000	15	15	13	41	13	12
2-Hexanone	NL	3.1	3.0	3.1	9.8	2.8	3.3
4-Methyl-2-pentanone (MIBK)	26,000	1.6	1.5	2.5	5.3	3.9	1.8
Acetone	280,000	290	310	140	480	200	160
Benzene	160	1.5	1.4	1.9	2.3	0.77	1.5
Carbon disulfide	6,200	0.81	0.81	1.2	2.0	<0.62	2.9
Chloroform	53	1.8	1.7	1.6	2.1	6.3	1.8
Chloromethane	780	0.83	0.83	0.83	0.91	<0.41	0.74
Cyclohexane	NL	1.1	1.1	1.4	1.5	<0.69	<0.69
Dichlorodifluoromethane	880	1.9	1.9	2.0	2.0	2.8	2.0
Ethylbenzene	490	7.4	6.5	10	17	0.87	5.2
Ethyl acetate	NL	7.6	6.8	5.8	<0.72	<0.72	2.5
Isopropyl alcohol	NL	20	20	4.9	32	19	12
Methylene Chloride	2,600	9.4	8.3	14	16	11	10
Tetrachloroethene	210	<0.68	<0.68	<1.4	<1.4	22	<1.4
Tetrahydrofuran	NL	1.2	1.1	0.94	1.4	<0.59	0.94
Toluene	44,000	41	38	36	53	3.3	19
Trichloroethene	610	28	27	37	86	70	32
Trichlorofluoromethane	6,200	2.5	2.4	1.6	1.6	1.8	1.6
iso-Octane	NL	1.3	1.2	1.7	2.1	<0.93	0.93
m&p-Xylene	880	16	13	30	48	2.8	15
n-Heptane	NL	3.5	3.5	4.1	5.7	2.8	1.8
n-Hexane	6,200	7.8	7.8	11	12	6.3	7.4
o-Xylene	880	3.8	3.1	7.8	11	<0.87	4.3
Leak Test Gas - Helium (%v/v) (ASTM Method D1946 MOD)							
Helium	NL	9.8	8.3	2.4	7.6	0.40	3.0

Notes:

Detections	Only detected constituents are reported in this table. For a full list of analytes, see the laboratory analytical report.
Dup	Collected concurrently with SG-1.
VOCs	volatile organic compounds
µg/m³	micrograms per cubic meter
%v/v	percent volume of total volume
IHSB Screening Level	IHSB Industrial/Commercial Vapor Intrusion Screening Levels for Acceptable Soil Gas Concentrations are from the DENR IHSB Vapor Intrusion Screening Levels, August 2011.
<0.49	Indicates that the concentration was not detected above the laboratory reporting limit.
Reporting Limits	Reporting limits were compared againsts IHSB Screening Levels to ensure that the RLs were below the associated screening level.
10.9	Indicates constituent was detected above the associated RL.
5.6	Indicates constituent was detected above the associated IHSB Industrial/Commercial Vapor Intrusion Screening Level.
NL	Not Listed in IHSB Industrial/Commercial Vapor Intrusion Screening Levels

APPENDICES

APPENDIX A
SITE MAP (RMT 2011)



LEGEND

- Injection Well & Performance Monitoring Well Location
- Monitoring Well Location
- Recovery Well Location
- Surface Water Sampling Location
- Pore Water Sample Location

NOTES

PURPLE LABELS INDICATE SAMPLE COLLECTION DURING THE MARCH 2011 SAMPLING EVENT.

0 200 400

Feet

FORMER GIRMES SITE (SKF USA INC)
ASHEVILLE, NC

SITE MAP

DRAWN BY: JCM	SCALE AS NOTED	PROJECT NO.: 03404.57.001
CHECKED BY: MER		DATE: APRIL 2011
APPROVED BY:		FIGURE NO.: 1

RMT

Patewood Plaza One, Suite 100
30 Patewood Drive
Greenville, SC 29615-3535
Phone: 864-281-0030
FAX: 864-281-0288

Map Document: (C:\Program Files\ArcGIS\Bin\Templates\RMT_NewLogo_Oct2007\11x17 Landscape_Patewood.mxt)
10/24/2007 -- 8:30:49 AM

APPENDIX B
CSA FIGURES (RMT 1994)

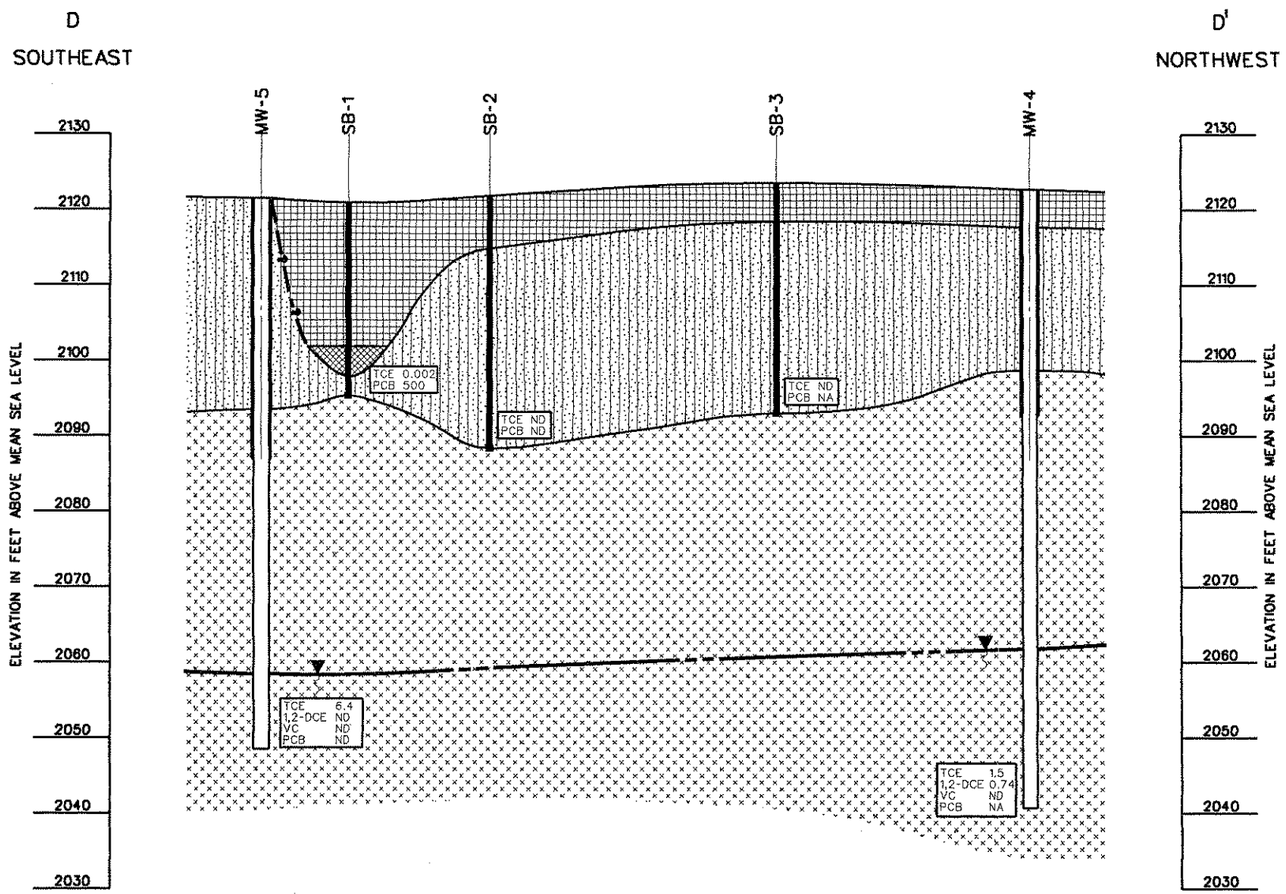
Cross Section of Potential Source Area

Trichloroethene Concentrations in Ground Water

Configuration of Water Table, September 19, 1994

Cross Section A-A' With Trichloroethene Isoconcentrations

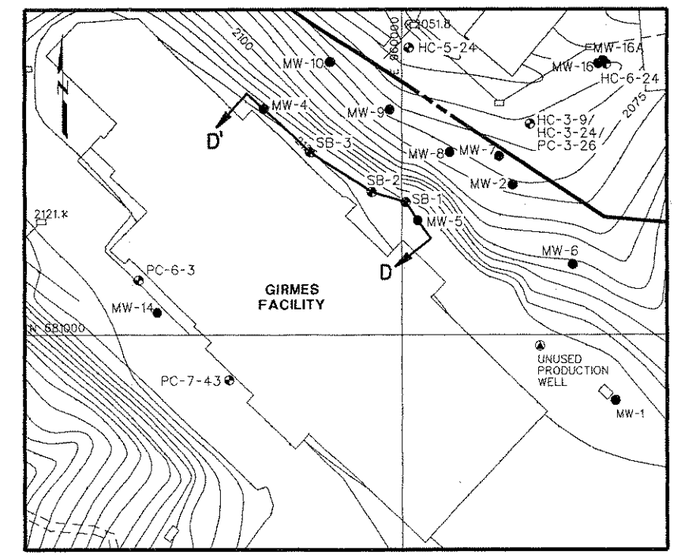
/usr3/hydro/7014401h/70144x03.sec
cgh 11-16-94



CROSS SECTION D - D'

0 25 50 75 100

HORIZONTAL SCALE IN FEET
VERTICAL SCALE AS SHOWN
VERTICAL EXAGGERATION 2.5X



PLAN VIEW

0 100 200
SCALE IN FEET

NOTE:
DIGITIZED BASE MAP PROVIDED BY THE CITY OF ASHEVILLE, NORTH CAROLINA NOVEMBER, 1993.

LEGEND

FILL - CLAY, FINE GRAINED SAND, SILT

WASTE DEBRIS

SILTY SAND AND CLAYEY SILTY SAND (SAPROLITE)

BEDROCK - FOLIATED GRANITIC GNEISS AND AMPHIBOLITE WITH SOME MICA SCHIST

WATER TABLE SURFACE - NOVEMBER 9, 1993

OPEN HOLE WELL WITH SURFACE CASING

BORING

D D'
GEOLOGIC CROSS SECTION

TCE 64
1,2-DCE ND
VC ND
PCB ND/NA

GROUND WATER ANALYTICAL RESULTS:
TCE - TRICHLOROETHENE AND CONCENTRATION
1,2-DCE - 1,2 DICHLOROEHTENE AND CONCENTRATION
VC - VINYL CHLORIDE AND CONCENTRATION
PCB - POLYCHLORINATED BIPHENYLS AND CONCENTRATION
ND - NOT DETECTED
ANALYTICAL RESULTS SHOWN IN ppm.

TCE ND
PCB NA

SOIL ANALYTICAL RESULTS:
TCE - TRICHLOROETHENE AND CONCENTRATION
PCB - POLYCHLORINATED BIPHENYLS AND CONCENTRATION
ND - NOT DETECTED
NA - NOT ANALYZED
ANALYTICAL RESULTS SHOWN IN ppm.

FIGURE 3-1

CROSS SECTION OF POTENTIAL SOURCE AREA

GIRMES SITE, formerly SKF USA
ASHEVILLE, NORTH CAROLINA

RMT 70144.02
1194

APPENDIX C
SITE ANALYTICAL TABLES

Historical Concentration Tables in Groundwater for TCE and 1,2-DCE (RMT 2005)

Analytical Results–March 2011 (RMT 2011)

Table 3

Historical Trichloroethene Concentrations Detected in Groundwater[1]

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

Table 3

Historical Trichloroethene Concentrations Detected in Groundwater[1]

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

Table 3

Historical Trichloroethene Concentrations Detected in Groundwater[1]

WELL	SAMPLING DATE								
	JUL-00	OCT-00	APR-01	OCT-01	APR-02	OCT-02	APR-03	OCT-03	MAR-04
MW-1	NA	ND	ND	ND	ND	ND	DRY	ND	ND
MW-2	0.029	0.035	NA	0.024	0.031	0.026 k	0.014	0.012	0.0028
MW-4	0.26	0.45	0.32	0.46	0.33	0.41 k (0.42k)	0.34	0.28	0.38
MW-5	16	17 D	13	16	11 D	14 k	12	6.6	7
MW-6	NA	ND	ND	ND	ND	ND	ND	ND	ND
MW-7	NA	0.0027	0.0009J	ND	ND	ND	ND	ND	ND
MW-8	NA	ND	0.0011	0.0011	0.0014	0.0013	0.00096J	ND	ND
MW-9	0.83	1	0.34	0.65	0.41	0.96 k	0.39	0.31	0.38
MW-10	NA	0.016	0.0038	0.0041	0.0011	0.002	0.001	0.0029	0.00079 J
MW-11	NA	0.003	0.0023	0.0036	0.0029	0.0031	0.004	0.0027	0.0025
MW-12	NA	ND	ND	ND	ND	ND	ND	ND	ND
MW-13	ND	ND	ND	0.00053 J	ND	ND	ND	0.074	ND
MW-14	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-15	NA	ND	ND	ND	ND	ND	ND	ND	ND
MW-15A	NA	ND	0.0015	ND	ND	ND	ND	ND	ND
MW-16	NA	ND	ND	ND	ND	ND	ND	ND	ND
MW-16A	NA	ND	ND	0.00052 J	ND	ND (0.00072Jj)	0.0006J	0.00039 J	ND
MW-17	NA	0.0011	0.00057J (0.00054J)	0.0033	0.0044	0.01	ND	ND	ND
MW-18	NA	NA	NA	NA	NA	NA	0.0055	0.0078	0.0067
MW-19	0.036	0.092	0.016	0.11	0.064	0.18 k	0.0038	0.044	0.02
MW-20	NA	0.018	0.011	0.012	0.012	0.0091	0.012	0.007	0.0063
MW-21	NA	NA	NA	NA	NA	NA	0.012	0.0014	0.0085
MW-22	NA	NA	NA	NA	NA	NA	NA	ND	ND
MW-23	0.014	0.017	0.041	0.0099	0.027	0.028 k	0.0082	0.004	0.0022
MW-24	0.017	0.013 (0.014)	0.012	0.0066	0.0047	0.0062	0.014	0.011	0.0078
MW-26R	ND	ND	0.0025	0.0096	ND	0.00076 J	0.00061J	0.00041 J	0.0014
MW-27	NA	ND	ND	ND	ND	ND	ND	ND	ND
MW-28	NA	ND	ND	ND	ND (ND)	ND	ND	0.00024 J	ND
MW-28A	0.013	0.01	0.0085	0.0059	0.0058	0.0065	0.0055	ND	0.0079
RW-1	0.13	1.3	0.6	0.54	0.16	0.51 k	0.2	1.1 D	0.44
RW-3	0.56	0.61	0.57	0.63	NA	NA	NA	NA	NA
RW-4	0.39 D (0.39 D)	0.13	0.19 (0.16)	0.077	0.034 (0.034)	0.066 Nk	0.05	0.18	0.2

Table 3

Historical Trichloroethene Concentrations Detected in Groundwater[1]

WELL	SAMPLING DATE	
	OCT-04	APR-05
MW-1	ND	ND
MW-2	0.0031	0.0031 j
MW-4	0.28	0.28 j
MW-5	5.9	5.3 j
MW-6	ND	ND
MW-7	0.0022	ND
MW-8	ND	ND
MW-9	0.19	0.25 j
MW-10	ND	ND
MW-11	0.0017	0.0015 j
MW-12	ND	ND
MW-13	ND	ND
MW-14	NA	NA
MW-15	ND	ND
MW-15A	0.0011	ND
MW-16	ND	ND
MW-16A	ND	ND
MW-17	ND	ND
MW-18	NA	0.0023 j
MW-19	0.0085	ND
MW-20	0.008	0.0068 j
MW-21	NA	0.0093 j
MW-22	ND	ND
MW-23	0.0021	0.0038 j
MW-24	0.0042	0.0053 j
MW-26R	ND	0.0056 j
MW-27	ND	ND
MW-28	ND	ND
MW-28A	0.01	0.011 j
RW-1	1.1	0.72
RW-3	NA	NA
RW-4	0.2	0.24

Table 3

Historical Trichloroethene Concentrations Detected in Groundwater

Qualifiers

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

D - Analyte value from diluted analysis.

E - Analyte concentration exceeds calibration range.

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

j - Concentration considered an estimate based on data validation.

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

Q - The analyte has been detected between the Limit of Detection (LOD) and Limit of Quantitation (LOQ).
The results are qualified due to the uncertainty of analyte concentrations within this range.

NA - Not analyzed.

ND - Not detected.

* - Analytical results for duplicate samples shown in parentheses.

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

< - Concentration less than the Quantitation Limit.

Table 4

Historical 1,2-Dichloroethene Concentrations Detected in Groundwater[1]

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

Table 4

Historical 1,2-Dichloroethene Concentrations Detected in Groundwater[1]

WELL	SAMPLING DATE								
	JAN-98	JUL-98	OCT-98	JAN-99	APR-99	JUL-99	OCT-99	JAN-00	APR-00
MW-1	ND	NA	<0.002	NA	ND	NA	ND	NA	ND
MW-2	0.0035	0.0022	0.0024	0.003	0.0024	0.002	0.003	0.003	0.0029
MW-4	0.52	0.38	0.39 D	0.76	0.55	0.33	0.41	0.38	0.26 (0.26)*
MW-5	0.15	0.13	0.12	0.15	0.19	0.19 D	0.22	0.26	0.23
MW-6	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-7	ND	NA	0.00086 J	NA	ND	NA	0.0013 J (0.0013 J)*	NA	ND
MW-8	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-9	0.03	0.019	0.012	0.011	ND	0.015	0.016	0.0082	0.012
MW-10	0.47	NA	0.4	NA	0.2	NA	0.3	NA	0.065
MW-11	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-12	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-13	ND	0.0014 J	0.00093 J	ND	DRY	ND	DRY	ND	ND
MW-14	ND	NA	DRY	NA	ND	NA	NA	NA	ND
MW-15	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-15A	ND	NA	ND (ND)*	NA	ND	NA	ND	NA	ND
MW-16	ND	NA	ND	0.002	ND	NA	ND	NA	ND
MW-16A	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-17	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-18	ND	NA	DRY	NA	DRY	NA	DRY	NA	NA
MW-19	ND	0.0012 J	0.0015 J	NA	ND	ND	0.0035	0.0037 (0.0031)*	ND
MW-20	0.0054	NA	0.0071 (0.0075)*	NA	0.007	NA	0.0056 (0.0056)*	NA	0.0077 (0.0066)*
MW-21	0.13	NA	DRY	NA	DRY	NA	DRY	NA	NA
MW-22	ND	NA	ND	NA	DRY	NA	DRY	NA	NA
MW-23	0.34	0.11	0.025	0.016	0.017	0.011(0.011)*	0.012	0.0069	0.0078
MW-24	ND	0.0013 J	0.0081J	0.00056 J	ND	ND(ND)*	ND	ND	ND
MW-26R	0.0081	0.016	0.018	0.028	0.067	0.076	0.064	0.058	0.077
MW-27	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-28	ND	NA	ND	NA	ND	NA	ND	NA	ND
MW-28A	0.0086	0.0052	0.0067	0.0068	0.0045	0.0039	0.0033	0.0029	0.0023
RW-1		0.05	0.062	0.042	0.024	0.027	0.024	0.024	0.021
RW-3		0.038	0.022	0.045	0.045	0.051	0.061	0.057	0.042
RW-4		0.0053	0.0046	0.0031	0.0036	0.0034	0.0025	0.0032 (0.0033)*	0.0041

Table 4

Historical 1,2-Dichloroethene Concentrations Detected in Groundwater[1]

WELL	SAMPLING DATE							
	OCT-00	APR-01	OCT-01	APR-02	OCT-02	APR-03	OCT-03	MAR-04
MW-1	ND	ND	ND	ND	ND	DRY	ND	ND
MW-2	0.0022	NA	0.0011 J	0.0017 J	0.0014 J	ND	0.0051	ND
MW-4	0.59	0.63	0.71	0.44	0.63 (0.61)	0.33	0.28	0.18
MW-5	0.3	0.3	0.29	0.34	0.46	0.44	0.36	0.36
MW-6	ND	ND	ND	ND	ND	ND	ND	ND
MW-7	ND	ND	ND	ND	ND	ND	ND	ND
MW-8	ND	ND	ND	ND	ND	ND	ND	ND
MW-9	0.022	0.0079	0.014	0.012	0.024	0.011	0.014	0.016
MW-10	0.22	0.094	0.085	0.021	0.029	0.0095	ND	0.011
MW-11	ND	ND	ND	ND	ND	ND	ND	ND
MW-12	ND	ND	ND	ND	ND	ND	ND	ND
MW-13	ND	ND	ND	ND	ND	ND	0.0032	ND
MW-14	NA	NA	NA	NA	NA	NA	NA	NA
MW-15	ND	ND	ND	ND	ND	ND	ND	ND
MW-15A	ND	ND	ND	ND	ND	ND	ND	ND
MW-16	ND	ND	ND	ND	ND	ND	ND	ND
MW-16A	ND	ND	ND	ND	ND (ND)	ND	ND	ND
MW-17	ND	ND (ND)	ND	0.00084 J	0.0021	ND	ND	ND
MW-18	ND	NA	NA	NA	NA	ND	0.0027	ND
MW-19	0.0036	0.00058J	0.0035	0.0023	0.006	ND	0.0018 J	ND
MW-20	0.0066	0.0053	ND	0.0055	0.0046	0.0049	0.0037	0.0036
MW-21	NA	NA	NA	NA	NA	0.0059	0.017	0.0026
MW-22	NA	NA	NA	NA	NA	NA	ND	ND
MW-23	0.002	0.005	0.0016 J	0.0036	0.0029	ND	ND	ND
MW-24	ND	ND	ND	ND	ND	ND	ND	ND
MW-26R	0.045	0.064	0.16	0.17	0.13	0.075	0.033	0.033
MW-27	ND	ND	ND	ND	ND	ND	ND	ND
MW-28	ND	ND	ND	ND (ND)	ND	ND	ND	ND
MW-28A	0.0019 J	0.0016J	0.0012 J	ND	0.0016 J	0.0015J	ND	0.0026
RW-1	0.034	0.018	0.014	0.015	0.016	0.01	0.027	0.011
RW-3	0.047	0.05	0.047	NA	NA	NA	NA	NA
RW-4	0.0031	0.0048 (0.0044)	0.0015 J	ND (ND)	0.0012 J	0.0022	0.004	0.0037

Table 4

Historical 1,2-Dichloroethene Concentrations Detected in Groundwater[1]

WELL	SAMPLING DATE	
	OCT-04	APR-05
MW-1	ND	ND
MW-2	ND	ND
MW-4	0.2	0.18
MW-5	0.34	0.27
MW-6	ND	ND
MW-7	ND	ND
MW-8	ND	ND
MW-9	0.0097	0.017
MW-10	0.0085	0.01
MW-11	ND	ND
MW-12	ND	ND
MW-13	ND	ND
MW-14	NA	NA
MW-15	ND	ND
MW-15A	ND	ND
MW-16	ND	ND
MW-16A	ND	ND
MW-17	ND	ND
MW-18	NA	ND
MW-19	ND	ND
MW-20	0.0041	0.0058
MW-21	NA	0.0019
MW-22	ND	ND
MW-23	ND	ND
MW-24	ND	ND
MW-26R	0.014	0.044
MW-27	ND	ND
MW-28	ND	ND
MW-28A	0.0033	0.0034
RW-1	0.029	0.016
RW-3	NA	NA
RW-4	0.0035	0.0054

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

Qualifiers

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

D - Analyte value from diluted analysis.

E - Analyte concentration exceeds calibration range.

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

Q - The analyte has been detected between the Limit of Detection (LOD) and Limit of Quantitation (LOQ).
The results are qualified due to the uncertainty of analyte concentrations within this range.

NA - Not analyzed.

ND - Not detected.

* - Analytical results for duplicate samples shown in parentheses.

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

< - Concentration less than the Quantitation Limit.

RECOVERY SYSTEM PERFORMANCE

Table 1
Analytical Results - March 2011
Former Girmes Site
Asheville, NC

Well	PCE	TCE	VC	Total 1,2-DCE	*cis* - 1,2-DCE	*trans* - 1,2-DCE
MW-05A	<0.05	4.23	<0.05	0.185	0.175	<0.05
MW-05A (DU-11101)	<0.001	3.62	<0.001	0.212	0.2	0.0124
MW-10	<0.001	0.00073J	<0.001	0.0195	0.0152	0.0043
MW-21	<0.001	0.0118	<0.001	0.00078J	0.00078J	<0.001
PW-06	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PW-07	<0.001	0.0422	0.00089J	0.015	0.0149	<0.001
PW-10	0.0012	0.0018	<0.001	0.00059J	0.00059J	<0.001
PW-11	<0.001	0.0132	<0.001	0.0094	0.0091	<0.001
SW-02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SW-03	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SW-04	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SW-08	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
TBLK-11101	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Concentrations are in mg/L
J - estimated value

APPENDIX D
PHOTOGRAPHIC LOG

Photograph 1. View inside the site building near SG-4.

Photograph 2. View inside the site building looking toward IW-2 from hallway between SG-3 and SG-5. Evidence of concrete repair from former floor drains can be seen in the foreground.

Photograph 3. View inside the site building. SG-2 is located just to the right and SG-3 is located just to the left.

Photograph 4. Representative view of a space heater inside the site building.

Photograph 5. Representative view of the non-functioning HVAC ductwork.

Photograph 6. View of the concrete firewall between the Highland Brewery portion of the site building and the remaining site building. SG-1 is located just to the right of the edge of the photo.

Photograph 7. Representative view of the hole drilled for soil gas collection.

Photograph 8. Representative view of sub-slab soil gas point being sealed with non-sanded grout.

Photograph 9. View of sample collection at SG-1 and Dup with shroud filled with helium. Photo taken January 11, 2012.

APPENDIX E
LABORATORY ANALYTICAL REPORT

Laboratory Report of Analysis

To: Adam Tripp
Altamont Envrionmental, Inc.
231 Haywood St
Asheville, NC 28801

Report Number: **31200092**

Client Project: **Highland VI**

Dear Adam Tripp,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or services performed during this project, please call Michael D. Page at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Michael D. Page
Project Manager
michael.page@sgs.com

Date

Print Date: 01/18/2012

N.C. Certification # 481

SGS North America Inc.
5500 Business Drive, Wilmington, NC 28405
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Laboratory Qualifiers

Report Definitions

DL	Method, Instrument, or Estimated Detection Limit per Analytical Method
CL	Control Limits for the recovery result of a parameter
LOQ	Reporting Limit
DF	Dilution Factor
RPD	Relative Percent Difference
LCS(D)	Laboratory Control Spike (Duplicate)
MS(D)	Matrix Spike (Duplicate)
MB	Method Blank

Qualifier Definitions

*	Recovery or RPD outside of control limits
B	Analyte was detected in the Lab Method Blank at a level above the LOQ
U	Undetected (Reported as ND or < DL)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit
A	Amount detected is less than the Lower Method Calibration Limit
J	Estimated Concentration.
O	The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high
E	Amount detected is greater than the Upper Calibration Limit
S	The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s)
Q	Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s)
I	Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s)
DPE	Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s)
TIC	Tentatively Identified Compound
EMPC	Estimated Maximum possible Concentration due to ion ratio failure
ND	Not Detected
K	Result is estimated due to ion ratio failure in High Resolution PCB Analysis
P	RPD > 40% between results of dual columns
D	Spike or surrogate was diluted out in order to achieve a parameter result within instrument calibration range

Samples requiring manual integrations for various congeners and/or standards are marked and dated by the analyst. A code definition is provided below:

M1	Mis-identified peak
M2	Software did not integrate peak
M3	Incorrect baseline construction (i.e. not all of peak included; two peaks integrated as one)
M4	Pattern integration required (i.e. DRO, GRO, PCB, Toxaphene and Technical Chlordane)
M5	Other - Explained in case narrative

Note Results pages that include a value for "Solids (%)" have been adjusted for moisture content.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
Dup	31200092001	01/12/2012 08:50	01/13/2012 10:15	Air
SG-1	31200092002	01/12/2012 08:50	01/13/2012 10:15	Air
SG-2	31200092003	01/12/2012 08:51	01/13/2012 10:15	Air
SG-3	31200092004	01/12/2012 08:52	01/13/2012 10:15	Air
SG-4	31200092005	01/12/2012 08:54	01/13/2012 10:15	Air
SG-5	31200092006	01/12/2012 08:53	01/13/2012 10:15	Air

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Case Narrative

LCS for HBN 19115 [AXX/1021]

TO15 - The reported recovery for Methylene Chloride in the LCS associated with batch AIR1024 is above the QC limit.

MB for HBN 19115 [AXX/1021]

TO15 - Acetone is present in the LMB associated with batch AIR1024 at a concentration of 0.2 ppbv.

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Results of **Dup**

Client Sample ID: **Dup**
Client Project ID: **Highland VI**
Lab Sample ID: 31200092001-A
Lab Project ID: 31200092

Collection Date: 01/12/2012 08:50
Received Date: 01/13/2012 10:15
Matrix: Air

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
1,1,1-Trichloroethane	ND	0.10	ND	0.55	
1,1,2,2-Tetrachloroethane	ND	0.10	ND	0.69	
1,1,2-Trichloroethane	ND	0.10	ND	0.55	
1,1-Dichloroethane	ND	0.10	ND	0.40	
1,1-Dichloroethene	ND	0.10	ND	0.40	
1,2,4-Trichlorobenzene	ND	0.10	ND	0.74	
1,2,4-Trimethylbenzene	**0.10**	0.10	**0.49**	0.49	
1,2-Dibromoethane	ND	0.10	ND	0.77	
1,2-Dichlorobenzene	ND	0.10	ND	0.60	
1,2-Dichloroethane	ND	0.10	ND	0.40	
1,2-Dichloropropane	ND	0.10	ND	0.46	
1,2-Dichlorotetrafluoroethane	ND	0.10	ND	0.70	
1,3,5-Trimethylbenzene	ND	0.10	ND	0.49	
1,3-Butadiene	ND	0.10	ND	0.22	
1,3-Dichlorobenzene	ND	0.10	ND	0.60	
1,4 Dioxane	ND	0.10	ND	0.36	
1,4-Dichlorobenzene	ND	0.10	ND	0.60	
2-Butanone	**5.1**	0.10	**15**	0.29	
2-Hexanone	**0.74**	0.10	**3.0**	0.41	
4-Ethyltoluene	ND	0.10	ND	0.49	
4-Methyl-2-pentanone	**0.36**	0.10	**1.5**	0.41	
Acetone	**130**	4.0	**310**	9.5	
Allyl chloride	ND	0.10	ND	0.31	
Benzene	**0.44**	0.10	**1.4**	0.32	
Benzyl chloride	ND	0.40	ND	2.1	
Bromodichloromethane	ND	0.10	ND	0.67	
Bromoform	ND	0.10	ND	1.0	
Bromomethane	ND	0.10	ND	0.39	
Carbon disulfide	**0.26**	0.10	**0.81**	0.31	
Carbon tetrachloride	ND	0.10	ND	0.63	
Chlorobenzene	ND	0.10	ND	0.46	
Chloroethane	ND	0.10	ND	0.26	
Chloroform	**0.34**	0.10	**1.7**	0.49	
Chloromethane	**0.40**	0.10	**0.83**	0.21	
Cyclohexane	**0.32**	0.10	**1.1**	0.34	
Dibromochloromethane	ND	0.10	ND	0.85	
Dichlorodifluoromethane	**0.38**	0.10	**1.9**	0.49	
cis-1,3-Dichloropropene	ND	0.10	ND	0.45	

Print Date: 01/18/2012

N.C. Certification # 481

Results of **Dup**

Client Sample ID: **Dup**
Client Project ID: **Highland VI**
Lab Sample ID: 31200092001-A
Lab Project ID: 31200092

Collection Date: 01/12/2012 08:50
Received Date: 01/13/2012 10:15
Matrix: Air

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
trans-1,3-Dichloropropene	ND	0.10	ND	0.45	
Ethyl Benzene	**1.5**	0.10	**6.5**	0.43	
Ethyl acetate	**1.9**	0.10	**6.8**	0.36	
Hexachlorobutadiene	ND	0.40	ND	4.3	
Isopropyl Alcohol	**8.3**	0.40	**20**	0.98	
Methylene chloride	**2.4**	0.40	**8.3**	1.4	
Propene	ND	0.40	ND	0.69	
Styrene	ND	0.10	ND	0.43	
Tetrachloroethene	ND	0.10	ND	0.68	
Tetrahydrofuran	**0.38**	0.10	**1.1**	0.29	
Toluene	**10**	0.10	**38**	0.38	
Trichloroethene	**5.1**	0.10	**27**	0.54	
Trichlorofluoromethane	**0.42**	0.10	**2.4**	0.56	
Trichlorotrifluoroethane	ND	0.10	ND	0.77	
Vinyl acetate	ND	0.10	ND	0.35	
Vinyl bromide	ND	0.10	ND	0.44	
Vinyl chloride	ND	0.10	ND	0.26	
cis-1,2-Dichloroethene	ND	0.10	ND	0.40	
iso-Octane	**0.26**	0.10	**1.2**	0.47	
m,p-Xylene	**3.0**	0.20	**13**	0.87	
n-Heptane	**0.86**	0.10	**3.5**	0.41	
n-Hexane	**2.2**	0.40	**7.8**	1.4	
o-Xylene	**0.72**	0.10	**3.1**	0.43	
tert-Butyl methyl ether (MTBE)	ND	0.10	ND	0.36	
trans-1,2-Dichloroethene	ND	0.10	ND	0.40	

Surrogates

4-Bromofluorobenzene	105	70-130

Batch Information

Analytical Batch: **AIR1024**
Analytical Method: **EPA TO-15**
Instrument: **MSD11**
Analyst: **XLC**
Analytical Date/Time: **01/13/2012 20:21**
Dilution: **1**

Prep Batch: **AXX1021**
Prep Method: **EPA TO-15 PREP**
Prep Date/Time: **01/13/2012 00:00**
Prep Initial Wt./Vol.: **200 mL**
Prep Extract Vol: **400 mL**

Print Date: 01/18/2012

N.C. Certification # 481

Results of **SG-1**

Client Sample ID: **SG-1**
Client Project ID: **Highland VI**
Lab Sample ID: 31200092002-A
Lab Project ID: 31200092

Collection Date: 01/12/2012 08:50
Received Date: 01/13/2012 10:15
Matrix: Air

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
1,1,1-Trichloroethane	ND	0.10	ND	0.55	
1,1,2,2-Tetrachloroethane	ND	0.10	ND	0.69	
1,1,2-Trichloroethane	ND	0.10	ND	0.55	
1,1-Dichloroethane	ND	0.10	ND	0.40	
1,1-Dichloroethene	ND	0.10	ND	0.40	
1,2,4-Trichlorobenzene	ND	0.10	ND	0.74	
1,2,4-Trimethylbenzene	**0.12**	0.10	**0.59**	0.49	
1,2-Dibromoethane	ND	0.10	ND	0.77	
1,2-Dichlorobenzene	ND	0.10	ND	0.60	
1,2-Dichloroethane	ND	0.10	ND	0.40	
1,2-Dichloropropane	ND	0.10	ND	0.46	
1,2-Dichlorotetrafluoroethane	ND	0.10	ND	0.70	
1,3,5-Trimethylbenzene	ND	0.10	ND	0.49	
1,3-Butadiene	ND	0.10	ND	0.22	
1,3-Dichlorobenzene	ND	0.10	ND	0.60	
1,4 Dioxane	ND	0.10	ND	0.36	
1,4-Dichlorobenzene	ND	0.10	ND	0.60	
2-Butanone	**5.2**	0.10	**15**	0.29	
2-Hexanone	**0.76**	0.10	**3.1**	0.41	
4-Ethyltoluene	ND	0.10	ND	0.49	
4-Methyl-2-pentanone	**0.40**	0.10	**1.6**	0.41	
Acetone	**120**	4.0	**290**	9.5	
Allyl chloride	ND	0.10	ND	0.31	
Benzene	**0.46**	0.10	**1.5**	0.32	
Benzyl chloride	ND	0.40	ND	2.1	
Bromodichloromethane	ND	0.10	ND	0.67	
Bromoform	ND	0.10	ND	1.0	
Bromomethane	ND	0.10	ND	0.39	
Carbon disulfide	**0.26**	0.10	**0.81**	0.31	
Carbon tetrachloride	ND	0.10	ND	0.63	
Chlorobenzene	ND	0.10	ND	0.46	
Chloroethane	ND	0.10	ND	0.26	
Chloroform	**0.36**	0.10	**1.8**	0.49	
Chloromethane	**0.40**	0.10	**0.83**	0.21	
Cyclohexane	**0.32**	0.10	**1.1**	0.34	
Dibromochloromethane	ND	0.10	ND	0.85	
Dichlorodifluoromethane	**0.38**	0.10	**1.9**	0.49	
cis-1,3-Dichloropropene	ND	0.10	ND	0.45	

Print Date: 01/18/2012

N.C. Certification # 481

Results of **SG-1**

Client Sample ID: **SG-1**
Client Project ID: **Highland VI**
Lab Sample ID: 31200092002-A
Lab Project ID: 31200092

Collection Date: 01/12/2012 08:50
Received Date: 01/13/2012 10:15
Matrix: Air

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
trans-1,3-Dichloropropene	ND	0.10	ND	0.45	
Ethyl Benzene	**1.7**	0.10	**7.4**	0.43	
Ethyl acetate	**2.1**	0.10	**7.6**	0.36	
Hexachlorobutadiene	ND	0.40	ND	4.3	
Isopropyl Alcohol	**8.3**	0.40	**20**	0.98	
Methylene chloride	**2.7**	0.40	**9.4**	1.4	
Propene	ND	0.40	ND	0.69	
Styrene	ND	0.10	ND	0.43	
Tetrachloroethene	ND	0.10	ND	0.68	
Tetrahydrofuran	**0.40**	0.10	**1.2**	0.29	
Toluene	**11**	0.10	**41**	0.38	
Trichloroethene	**5.3**	0.10	**28**	0.54	
Trichlorofluoromethane	**0.44**	0.10	**2.5**	0.56	
Trichlorotrifluoroethane	ND	0.10	ND	0.77	
Vinyl acetate	ND	0.10	ND	0.35	
Vinyl bromide	ND	0.10	ND	0.44	
Vinyl chloride	ND	0.10	ND	0.26	
cis-1,2-Dichloroethene	ND	0.10	ND	0.40	
iso-Octane	**0.28**	0.10	**1.3**	0.47	
m,p-Xylene	**3.7**	0.20	**16**	0.87	
n-Heptane	**0.86**	0.10	**3.5**	0.41	
n-Hexane	**2.2**	0.40	**7.8**	1.4	
o-Xylene	**0.88**	0.10	**3.8**	0.43	
tert-Butyl methyl ether (MTBE)	ND	0.10	ND	0.36	
trans-1,2-Dichloroethene	ND	0.10	ND	0.40	

Surrogates

4-Bromofluorobenzene	107	70-130

Batch Information

Analytical Batch: **AIR1024**
Analytical Method: **EPA TO-15**
Instrument: **MSD11**
Analyst: **XLC**
Analytical Date/Time: **01/13/2012 16:10**
Dilution: **1**

Prep Batch: **AXX1021**
Prep Method: **EPA TO-15 PREP**
Prep Date/Time: **01/13/2012 00:00**
Prep Initial Wt./Vol.: **200 mL**
Prep Extract Vol: **400 mL**

Print Date: 01/18/2012

N.C. Certification # 481

Results of **SG-2**

Client Sample ID: **SG-2**
Client Project ID: **Highland VI**
Lab Sample ID: 31200092003-A
Lab Project ID: 31200092

Collection Date: 01/12/2012 08:51
Received Date: 01/13/2012 10:15
Matrix: Air

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
1,1,1-Trichloroethane	ND	0.20	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.20	ND	1.4	
1,1,2-Trichloroethane	ND	0.20	ND	1.1	
1,1-Dichloroethane	ND	0.20	ND	0.81	
1,1-Dichloroethene	ND	0.20	ND	0.79	
1,2,4-Trichlorobenzene	ND	0.20	ND	1.5	
1,2,4-Trimethylbenzene	**0.24**	0.20	**1.2**	0.98	
1,2-Dibromoethane	ND	0.20	ND	1.5	
1,2-Dichlorobenzene	ND	0.20	ND	1.2	
1,2-Dichloroethane	ND	0.20	ND	0.81	
1,2-Dichloropropane	ND	0.20	ND	0.92	
1,2-Dichlorotetrafluoroethane	ND	0.20	ND	1.4	
1,3,5-Trimethylbenzene	ND	0.20	ND	0.98	
1,3-Butadiene	ND	0.20	ND	0.44	
1,3-Dichlorobenzene	ND	0.20	ND	1.2	
1,4 Dioxane	ND	0.20	ND	0.72	
1,4-Dichlorobenzene	ND	0.20	ND	1.2	
2-Butanone	**4.3**	0.20	**13**	0.59	
2-Hexanone	**0.76**	0.20	**3.1**	0.82	
4-Ethyltoluene	ND	0.20	ND	0.98	
4-Methyl-2-pentanone	**0.60**	0.20	**2.5**	0.82	
Acetone	**59**	0.80	**140**	1.9	
Allyl chloride	ND	0.20	ND	0.63	
Benzene	**0.60**	0.20	**1.9**	0.64	
Benzyl chloride	ND	0.80	ND	4.1	
Bromodichloromethane	ND	0.20	ND	1.3	
Bromoform	ND	0.20	ND	2.1	
Bromomethane	ND	0.20	ND	0.77	
Carbon disulfide	**0.40**	0.20	**1.2**	0.62	
Carbon tetrachloride	ND	0.20	ND	1.3	
Chlorobenzene	ND	0.20	ND	0.92	
Chloroethane	ND	0.20	ND	0.53	
Chloroform	**0.32**	0.20	**1.6**	0.98	
Chloromethane	**0.40**	0.20	**0.83**	0.41	
Cyclohexane	**0.40**	0.20	**1.4**	0.69	
Dibromochloromethane	ND	0.20	ND	1.7	
Dichlorodifluoromethane	**0.40**	0.20	**2.0**	0.99	
cis-1,3-Dichloropropene	ND	0.20	ND	0.91	

Print Date: 01/18/2012

N.C. Certification # 481

Results of **SG-2**

Client Sample ID: **SG-2**
Client Project ID: **Highland VI**
Lab Sample ID: 31200092003-A
Lab Project ID: 31200092

Collection Date: 01/12/2012 08:51
Received Date: 01/13/2012 10:15
Matrix: Air

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
trans-1,3-Dichloropropene	ND	0.20	ND	0.91	
Ethyl Benzene	**2.4**	0.20	**10**	0.87	
Ethyl acetate	**1.6**	0.20	**5.8**	0.72	
Hexachlorobutadiene	ND	0.80	ND	8.5	
Isopropyl Alcohol	**2.0**	0.80	**4.9**	2.0	
Methylene chloride	**4.1**	0.80	**14**	2.8	
Propene	ND	0.80	ND	1.4	
Styrene	ND	0.20	ND	0.85	
Tetrachloroethene	ND	0.20	ND	1.4	
Tetrahydrofuran	**0.32**	0.20	**0.94**	0.59	
Toluene	**9.6**	0.20	**36**	0.75	
Trichloroethene	**6.9**	0.20	**37**	1.1	
Trichlorofluoromethane	**0.28**	0.20	**1.6**	1.1	
Trichlorotrifluoroethane	ND	0.20	ND	1.5	
Vinyl acetate	ND	0.20	ND	0.70	
Vinyl bromide	ND	0.20	ND	0.87	
Vinyl chloride	ND	0.20	ND	0.51	
cis-1,2-Dichloroethene	ND	0.20	ND	0.79	
iso-Octane	**0.36**	0.20	**1.7**	0.93	
m,p-Xylene	**7.0**	0.40	**30**	1.7	
n-Heptane	**1.0**	0.20	**4.1**	0.82	
n-Hexane	**3.0**	0.80	**11**	2.8	
o-Xylene	**1.8**	0.20	**7.8**	0.87	
tert-Butyl methyl ether (MTBE)	ND	0.20	ND	0.72	
trans-1,2-Dichloroethene	ND	0.20	ND	0.79	
Surrogates					
4-Bromofluorobenzene	107	70-130			

Batch Information

Analytical Batch: **AIR1024**
Analytical Method: **EPA TO-15**
Instrument: **MSD11**
Analyst: **XLC**
Analytical Date/Time: **01/13/2012 16:48**
Dilution: **1**

Prep Batch: **AXX1021**
Prep Method: **EPA TO-15 PREP**
Prep Date/Time: **01/13/2012 00:00**
Prep Initial Wt./Vol.: **100 mL**
Prep Extract Vol: **400 mL**

Print Date: 01/18/2012

N.C. Certification # 481

Results of **SG-3**

Client Sample ID: **SG-3**
Client Project ID: **Highland VI**
Lab Sample ID: 31200092004-A
Lab Project ID: 31200092

Collection Date: 01/12/2012 08:52
Received Date: 01/13/2012 10:15
Matrix: Air

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
1,1,1-Trichloroethane	ND	0.20	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.20	ND	1.4	
1,1,2-Trichloroethane	ND	0.20	ND	1.1	
1,1-Dichloroethane	ND	0.20	ND	0.81	
1,1-Dichloroethene	ND	0.20	ND	0.79	
1,2,4-Trichlorobenzene	ND	0.20	ND	1.5	
1,2,4-Trimethylbenzene	**0.28**	0.20	**1.4**	0.98	
1,2-Dibromoethane	ND	0.20	ND	1.5	
1,2-Dichlorobenzene	ND	0.20	ND	1.2	
1,2-Dichloroethane	ND	0.20	ND	0.81	
1,2-Dichloropropane	ND	0.20	ND	0.92	
1,2-Dichlorotetrafluoroethane	ND	0.20	ND	1.4	
1,3,5-Trimethylbenzene	ND	0.20	ND	0.98	
1,3-Butadiene	ND	0.20	ND	0.44	
1,3-Dichlorobenzene	ND	0.20	ND	1.2	
1,4 Dioxane	ND	0.20	ND	0.72	
1,4-Dichlorobenzene	ND	0.20	ND	1.2	
2-Butanone	**14**	0.20	**41**	0.59	
2-Hexanone	**2.4**	0.20	**9.8**	0.82	
4-Ethyltoluene	ND	0.20	ND	0.98	
4-Methyl-2-pentanone	**1.3**	0.20	**5.3**	0.82	
Acetone	**200**	4.0	**480**	9.5	
Allyl chloride	ND	0.20	ND	0.63	
Benzene	**0.72**	0.20	**2.3**	0.64	
Benzyl chloride	ND	0.80	ND	4.1	
Bromodichloromethane	ND	0.20	ND	1.3	
Bromoform	ND	0.20	ND	2.1	
Bromomethane	ND	0.20	ND	0.77	
Carbon disulfide	**0.64**	0.20	**2.0**	0.62	
Carbon tetrachloride	ND	0.20	ND	1.3	
Chlorobenzene	ND	0.20	ND	0.92	
Chloroethane	ND	0.20	ND	0.53	
Chloroform	**0.44**	0.20	**2.1**	0.98	
Chloromethane	**0.44**	0.20	**0.91**	0.41	
Cyclohexane	**0.44**	0.20	**1.5**	0.69	
Dibromochloromethane	ND	0.20	ND	1.7	
Dichlorodifluoromethane	**0.40**	0.20	**2.0**	0.99	
cis-1,3-Dichloropropene	ND	0.20	ND	0.91	

Print Date: 01/18/2012

N.C. Certification # 481

Results of **SG-3**

Client Sample ID: **SG-3**
Client Project ID: **Highland VI**
Lab Sample ID: 31200092004-A
Lab Project ID: 31200092

Collection Date: 01/12/2012 08:52
Received Date: 01/13/2012 10:15
Matrix: Air

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
trans-1,3-Dichloropropene	ND	0.20	ND	0.91	
Ethyl Benzene	**3.8**	0.20	**17**	0.87	
Ethyl acetate	ND	0.20	ND	0.72	
Hexachlorobutadiene	ND	0.80	ND	8.5	
Isopropyl Alcohol	**13**	0.80	**32**	2.0	
Methylene chloride	**4.5**	0.80	**16**	2.8	
Propene	ND	0.80	ND	1.4	
Styrene	ND	0.20	ND	0.85	
Tetrachloroethene	ND	0.20	ND	1.4	
Tetrahydrofuran	**0.48**	0.20	**1.4**	0.59	
Toluene	**14**	0.20	**53**	0.75	
Trichloroethene	**16**	0.20	**86**	1.1	
Trichlorofluoromethane	**0.28**	0.20	**1.6**	1.1	
Trichlorotrifluoroethane	ND	0.20	ND	1.5	
Vinyl acetate	ND	0.20	ND	0.70	
Vinyl bromide	ND	0.20	ND	0.87	
Vinyl chloride	ND	0.20	ND	0.51	
cis-1,2-Dichloroethene	ND	0.20	ND	0.79	
iso-Octane	**0.44**	0.20	**2.1**	0.93	
m,p-Xylene	**11**	0.40	**48**	1.7	
n-Heptane	**1.4**	0.20	**5.7**	0.82	
n-Hexane	**3.4**	0.80	**12**	2.8	
o-Xylene	**2.6**	0.20	**11**	0.87	
tert-Butyl methyl ether (MTBE)	ND	0.20	ND	0.72	
trans-1,2-Dichloroethene	ND	0.20	ND	0.79	
Surrogates					
4-Bromofluorobenzene	107	70-130			

Batch Information

Analytical Batch: **AIR1024**
Analytical Method: **EPA TO-15**
Instrument: **MSD11**
Analyst: **XLC**
Analytical Date/Time: **01/13/2012 18:24**
Dilution: **1**

Prep Batch: **AXX1021**
Prep Method: **EPA TO-15 PREP**
Prep Date/Time: **01/13/2012 00:00**
Prep Initial Wt./Vol.: **100 mL**
Prep Extract Vol: **400 mL**

Print Date: 01/18/2012

N.C. Certification # 481

Results of **SG-4**

Client Sample ID: **SG-4**
Client Project ID: **Highland VI**
Lab Sample ID: 31200092005-A
Lab Project ID: 31200092

Collection Date: 01/12/2012 08:54
Received Date: 01/13/2012 10:15
Matrix: Air

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
1,1,1-Trichloroethane	ND	0.20	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.20	ND	1.4	
1,1,2-Trichloroethane	ND	0.20	ND	1.1	
1,1-Dichloroethane	ND	0.20	ND	0.81	
1,1-Dichloroethene	ND	0.20	ND	0.79	
1,2,4-Trichlorobenzene	ND	0.20	ND	1.5	
1,2,4-Trimethylbenzene	ND	0.20	ND	0.98	
1,2-Dibromoethane	ND	0.20	ND	1.5	
1,2-Dichlorobenzene	ND	0.20	ND	1.2	
1,2-Dichloroethane	ND	0.20	ND	0.81	
1,2-Dichloropropane	ND	0.20	ND	0.92	
1,2-Dichlorotetrafluoroethane	ND	0.20	ND	1.4	
1,3,5-Trimethylbenzene	ND	0.20	ND	0.98	
1,3-Butadiene	ND	0.20	ND	0.44	
1,3-Dichlorobenzene	ND	0.20	ND	1.2	
1,4 Dioxane	ND	0.20	ND	0.72	
1,4-Dichlorobenzene	ND	0.20	ND	1.2	
2-Butanone	**4.5**	0.20	**13**	0.59	
2-Hexanone	**0.68**	0.20	**2.8**	0.82	
4-Ethyltoluene	ND	0.20	ND	0.98	
4-Methyl-2-pentanone	**0.96**	0.20	**3.9**	0.82	
Acetone	**83**	2.0	**200**	4.8	
Allyl chloride	ND	0.20	ND	0.63	
Benzene	**0.24**	0.20	**0.77**	0.64	
Benzyl chloride	ND	0.80	ND	4.1	
Bromodichloromethane	ND	0.20	ND	1.3	
Bromoform	ND	0.20	ND	2.1	
Bromomethane	ND	0.20	ND	0.77	
Carbon disulfide	ND	0.20	ND	0.62	
Carbon tetrachloride	ND	0.20	ND	1.3	
Chlorobenzene	ND	0.20	ND	0.92	
Chloroethane	ND	0.20	ND	0.53	
Chloroform	**1.3**	0.20	**6.3**	0.98	
Chloromethane	ND	0.20	ND	0.41	
Cyclohexane	ND	0.20	ND	0.69	
Dibromochloromethane	ND	0.20	ND	1.7	
Dichlorodifluoromethane	**0.56**	0.20	**2.8**	0.99	
cis-1,3-Dichloropropene	ND	0.20	ND	0.91	

Print Date: 01/18/2012

N.C. Certification # 481

Results of **SG-4**

Client Sample ID: **SG-4**
Client Project ID: **Highland VI**
Lab Sample ID: 31200092005-A
Lab Project ID: 31200092

Collection Date: 01/12/2012 08:54
Received Date: 01/13/2012 10:15
Matrix: Air

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
trans-1,3-Dichloropropene	ND	0.20	ND	0.91	
Ethyl Benzene	**0.20**	0.20	**0.87**	0.87	
Ethyl acetate	ND	0.20	ND	0.72	
Hexachlorobutadiene	ND	0.80	ND	8.5	
Isopropyl Alcohol	**7.9**	0.80	**19**	2.0	
Methylene chloride	**3.1**	0.80	**11**	2.8	
Propene	ND	0.80	ND	1.4	
Styrene	ND	0.20	ND	0.85	
Tetrachloroethene	**3.3**	0.20	**22**	1.4	
Tetrahydrofuran	ND	0.20	ND	0.59	
Toluene	**0.88**	0.20	**3.3**	0.75	
Trichloroethene	**13**	0.20	**70**	1.1	
Trichlorofluoromethane	**0.32**	0.20	**1.8**	1.1	
Trichlorotrifluoroethane	ND	0.20	ND	1.5	
Vinyl acetate	ND	0.20	ND	0.70	
Vinyl bromide	ND	0.20	ND	0.87	
Vinyl chloride	ND	0.20	ND	0.51	
cis-1,2-Dichloroethene	ND	0.20	ND	0.79	
iso-Octane	ND	0.20	ND	0.93	
m,p-Xylene	**0.64**	0.40	**2.8**	1.7	
n-Heptane	**0.68**	0.20	**2.8**	0.82	
n-Hexane	**1.8**	0.80	**6.3**	2.8	
o-Xylene	ND	0.20	ND	0.87	
tert-Butyl methyl ether (MTBE)	ND	0.20	ND	0.72	
trans-1,2-Dichloroethene	ND	0.20	ND	0.79	

Surrogates

4-Bromofluorobenzene	104	70-130

Batch Information

Analytical Batch: **AIR1024**
Analytical Method: **EPA TO-15**
Instrument: **MSD11**
Analyst: **XLC**
Analytical Date/Time: **01/13/2012 19:03**
Dilution: **1**

Prep Batch: **AXX1021**
Prep Method: **EPA TO-15 PREP**
Prep Date/Time: **01/13/2012 00:00**
Prep Initial Wt./Vol.: **100 mL**
Prep Extract Vol: **400 mL**

Print Date: 01/18/2012

N.C. Certification # 481

Results of **SG-5**

Client Sample ID: **SG-5**
Client Project ID: **Highland VI**
Lab Sample ID: 31200092006-A
Lab Project ID: 31200092

Collection Date: 01/12/2012 08:53
Received Date: 01/13/2012 10:15
Matrix: Air

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
1,1,1-Trichloroethane	ND	0.20	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.20	ND	1.4	
1,1,2-Trichloroethane	ND	0.20	ND	1.1	
1,1-Dichloroethane	ND	0.20	ND	0.81	
1,1-Dichloroethene	ND	0.20	ND	0.79	
1,2,4-Trichlorobenzene	ND	0.20	ND	1.5	
1,2,4-Trimethylbenzene	**0.24**	0.20	**1.2**	0.98	
1,2-Dibromoethane	ND	0.20	ND	1.5	
1,2-Dichlorobenzene	ND	0.20	ND	1.2	
1,2-Dichloroethane	ND	0.20	ND	0.81	
1,2-Dichloropropane	ND	0.20	ND	0.92	
1,2-Dichlorotetrafluoroethane	ND	0.20	ND	1.4	
1,3,5-Trimethylbenzene	ND	0.20	ND	0.98	
1,3-Butadiene	ND	0.20	ND	0.44	
1,3-Dichlorobenzene	ND	0.20	ND	1.2	
1,4 Dioxane	ND	0.20	ND	0.72	
1,4-Dichlorobenzene	ND	0.20	ND	1.2	
2-Butanone	**4.2**	0.20	**12**	0.59	
2-Hexanone	**0.80**	0.20	**3.3**	0.82	
4-Ethyltoluene	ND	0.20	ND	0.98	
4-Methyl-2-pentanone	**0.44**	0.20	**1.8**	0.82	
Acetone	**69**	0.80	**160**	1.9	
Allyl chloride	ND	0.20	ND	0.63	
Benzene	**0.48**	0.20	**1.5**	0.64	
Benzyl chloride	ND	0.80	ND	4.1	
Bromodichloromethane	ND	0.20	ND	1.3	
Bromoform	ND	0.20	ND	2.1	
Bromomethane	ND	0.20	ND	0.77	
Carbon disulfide	**0.92**	0.20	**2.9**	0.62	
Carbon tetrachloride	ND	0.20	ND	1.3	
Chlorobenzene	ND	0.20	ND	0.92	
Chloroethane	ND	0.20	ND	0.53	
Chloroform	**0.36**	0.20	**1.8**	0.98	
Chloromethane	**0.36**	0.20	**0.74**	0.41	
Cyclohexane	ND	0.20	ND	0.69	
Dibromochloromethane	ND	0.20	ND	1.7	
Dichlorodifluoromethane	**0.40**	0.20	**2.0**	0.99	
cis-1,3-Dichloropropene	ND	0.20	ND	0.91	

Print Date: 01/18/2012

N.C. Certification # 481

Results of **SG-5**

Client Sample ID: **SG-5**
Client Project ID: **Highland VI**
Lab Sample ID: 31200092006-A
Lab Project ID: 31200092

Collection Date: 01/12/2012 08:53
Received Date: 01/13/2012 10:15
Matrix: Air

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
trans-1,3-Dichloropropene	ND	0.20	ND	0.91	
Ethyl Benzene	**1.2**	0.20	**5.2**	0.87	
Ethyl acetate	**0.68**	0.20	**2.5**	0.72	
Hexachlorobutadiene	ND	0.80	ND	8.5	
Isopropyl Alcohol	**4.8**	0.80	**12**	2.0	
Methylene chloride	**3.0**	0.80	**10**	2.8	
Propene	ND	0.80	ND	1.4	
Styrene	ND	0.20	ND	0.85	
Tetrachloroethene	ND	0.20	ND	1.4	
Tetrahydrofuran	**0.32**	0.20	**0.94**	0.59	
Toluene	**5.0**	0.20	**19**	0.75	
Trichloroethene	**6.0**	0.20	**32**	1.1	
Trichlorofluoromethane	**0.28**	0.20	**1.6**	1.1	
Trichlorotrifluoroethane	ND	0.20	ND	1.5	
Vinyl acetate	ND	0.20	ND	0.70	
Vinyl bromide	ND	0.20	ND	0.87	
Vinyl chloride	ND	0.20	ND	0.51	
cis-1,2-Dichloroethene	ND	0.20	ND	0.79	
iso-Octane	**0.20**	0.20	**0.93**	0.93	
m,p-Xylene	**3.5**	0.40	**15**	1.7	
n-Heptane	**0.44**	0.20	**1.8**	0.82	
n-Hexane	**2.1**	0.80	**7.4**	2.8	
o-Xylene	**1.0**	0.20	**4.3**	0.87	
tert-Butyl methyl ether (MTBE)	ND	0.20	ND	0.72	
trans-1,2-Dichloroethene	ND	0.20	ND	0.79	

Surrogates

4-Bromofluorobenzene	104	70-130

Batch Information

Analytical Batch: **AIR1024**
Analytical Method: **EPA TO-15**
Instrument: **MSD11**
Analyst: **XLC**
Analytical Date/Time: **01/13/2012 19:42**
Dilution: **1**

Prep Batch: **AXX1021**
Prep Method: **EPA TO-15 PREP**
Prep Date/Time: **01/13/2012 00:00**
Prep Initial Wt./Vol.: **100 mL**
Prep Extract Vol: **400 mL**

Print Date: 01/18/2012

N.C. Certification # 481

Batch Summary

Analytical Method: EPA TO-15

Prep Method: EPA TO-15 PREP
Prep Batch: AXX1021
Prep Date: 01/13/2012 00:00

Client Sample ID	Lab Sample ID	Analysis Date	Analytical Batch	Instrument	Analyst
LCS for HBN 19115 [AXX/1021]	54361	01/13/2012 13:04	AIR1024	MSD11	XLC
MB for HBN 19115 [AXX/1021]	54362	01/13/2012 14:54	AIR1024	MSD11	XLC
SG-1	31200092002	01/13/2012 15:31	AIR1024	MSD11	XLC
SG-1	31200092002	01/13/2012 16:10	AIR1024	MSD11	XLC
SG-2	31200092003	01/13/2012 16:48	AIR1024	MSD11	XLC
SG-2(54250DUP)	54363	01/13/2012 17:46	AIR1024	MSD11	XLC
SG-3	31200092004	01/13/2012 18:24	AIR1024	MSD11	XLC
SG-4	31200092005	01/13/2012 19:03	AIR1024	MSD11	XLC
SG-5	31200092006	01/13/2012 19:42	AIR1024	MSD11	XLC
Dup	31200092001	01/13/2012 20:21	AIR1024	MSD11	XLC
Dup	31200092001	01/13/2012 21:00	AIR1024	MSD11	XLC
SG-3	31200092004	01/13/2012 21:51	AIR1024	MSD11	XLC
SG-4	31200092005	01/13/2012 22:30	AIR1024	MSD11	XLC

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Member of SGS Group

Method Blank Summary

Blank ID: MB for HBN 19115 [AXX/1021] Matrix: Air
Blank Lab ID: 54362
QC for Samples:
31200092001, 31200092002, 31200092003, 31200092004, 31200092005, 31200092006

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
Benzene	ND	0.050	ND	0.16	
Bromomethane	ND	0.050	ND	0.19	
Carbon tetrachloride	ND	0.050	ND	0.31	
Chlorobenzene	ND	0.050	ND	0.23	
Chloroform	ND	0.050	ND	0.24	
cis-1,3-Dichloropropene	ND	0.050	ND	0.23	
cis-1,2-Dichloroethene	ND	0.050	ND	0.20	
1,2-Dibromoethane	ND	0.050	ND	0.38	
1,2-Dichlorobenzene	ND	0.050	ND	0.30	
1,3-Dichlorobenzene	ND	0.050	ND	0.30	
1,4-Dichlorobenzene	ND	0.050	ND	0.30	
Dichlorodifluoromethane	ND	0.050	ND	0.25	
1,1-Dichloroethane	ND	0.050	ND	0.20	
1,2-Dichloroethane	ND	0.050	ND	0.20	
1,2-Dichloropropane	ND	0.050	ND	0.23	
1,1-Dichloroethene	ND	0.050	ND	0.20	
1,2-Dichlorotetrafluoroethane	ND	0.050	ND	0.35	
Ethyl Benzene	ND	0.050	ND	0.22	
Chloroethane	ND	0.050	ND	0.13	
Hexachlorobutadiene	ND	0.20	ND	2.1	
Chloromethane	ND	0.050	ND	0.10	
Methylene chloride	ND	0.20	ND	0.69	
Styrene	ND	0.050	ND	0.21	
1,1,2,2-Tetrachloroethane	ND	0.050	ND	0.34	
Tetrachloroethene	ND	0.050	ND	0.34	
Toluene	ND	0.050	ND	0.19	
trans-1,3-Dichloropropene	ND	0.050	ND	0.23	
1,1,1-Trichloroethane	ND	0.050	ND	0.27	
1,1,2-Trichloroethane	ND	0.050	ND	0.27	
Trichloroethene	ND	0.050	ND	0.27	
1,2,4-Trichlorobenzene	ND	0.050	ND	0.37	
Trichlorofluoromethane	ND	0.050	ND	0.28	
Trichlorotrifluoroethane	ND	0.050	ND	0.38	
1,2,4-Trimethylbenzene	ND	0.050	ND	0.25	
1,3,5-Trimethylbenzene	ND	0.050	ND	0.25	
Vinyl chloride	ND	0.050	ND	0.13	
m,p-Xylene	ND	0.10	ND	0.43	
Acetone	**0.20**	0.20	0.48	0.48	
o-Xylene	ND	0.050	ND	0.22	
Bromodichloromethane	ND	0.050	ND	0.34	

Print Date: 01/18/2012 N.C. Certification # 481

Method Blank Summary

Blank ID: MB for HBN 19115 [AXX/1021] Matrix: Air
Blank Lab ID: 54362
QC for Samples:
31200092001, 31200092002, 31200092003, 31200092004, 31200092005, 31200092006

Results by **EPA TO-15**

	(ppbV)		(µg/m³)		
Parameter	Result	LOQ/CL	Result	LOQ/CL	Qual
1,3-Butadiene	ND	0.050	ND	0.11	
Carbon disulfide	ND	0.050	ND	0.16	
Benzyl chloride	ND	0.20	ND	1.0	
Allyl chloride	ND	0.050	ND	0.16	
Cyclohexane	ND	0.050	ND	0.17	
Dibromochloromethane	ND	0.050	ND	0.43	
1,4 Dioxane	ND	0.050	ND	0.18	
4-Ethyltoluene	ND	0.050	ND	0.25	
Ethyl acetate	ND	0.050	ND	0.18	
trans-1,2-Dichloroethene	ND	0.050	ND	0.20	
n-Heptane	ND	0.050	ND	0.20	
n-Hexane	ND	0.20	ND	0.70	
iso-Octane	ND	0.050	ND	0.23	
Isopropyl Alcohol	ND	0.20	ND	0.49	
2-Butanone	ND	0.050	ND	0.15	
4-Methyl-2-pentanone	ND	0.050	ND	0.20	
2-Hexanone	ND	0.050	ND	0.20	
Propene	ND	0.20	ND	0.34	
tert-Butyl methyl ether (MTBE)	ND	0.050	ND	0.18	
Tetrahydrofuran	ND	0.050	ND	0.15	
Bromoform	ND	0.050	ND	0.52	
Vinyl acetate	ND	0.050	ND	0.18	
Vinyl bromide	ND	0.050	ND	0.22	

Surrogates

4-Bromofluorobenzene	106	70.0-130

Batch Information

Analytical Batch: **AIR1024**
Analytical Method: **EPA TO-15**
Instrument: **MSD11**
Analyst: **XLC**
Analytical Date/Time: **01/13/2012 14:54**
Dilution: **1**

Prep Batch: **AXX1021**
Prep Method: **EPA TO-15 PREP**
Prep Date/Time: **01/13/2012 00:00**
Prep Initial Wt./Vol.: **400 mL**
Prep Extract Vol: **400 mL**

Print Date: 01/18/2012 N.C. Certification # 481

Blank Spike Summary

Blank Spike ID: LCS for HBN 19115 [AXX/1021]
Blank Spike Lab ID: 54361
Date Analyzed: 01/13/2012 13:04

Matrix: Air

QC for Samples: 31200092001, 31200092002, 31200092003, 31200092004, 31200092005, 31200092006

Results by **EPA TO-15**

	(ppbv)			(µg/m³)				
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	Qual
Benzene	5.0	4.7	93	16	15	93	70.0-130	
Bromomethane	5.0	4.8	95	19	19	95	70.0-130	
Carbon tetrachloride	5.0	5.1	101	31	32	101	70.0-130	
Chlorobenzene	5.0	4.6	93	23	21	93	70.0-130	
Chloroform	5.0	4.7	94	24	23	94	70.0-130	
cis-1,3-Dichloropropene	5.0	5.5	110	23	25	110	70.0-130	
cis-1,2-Dichloroethene	5.0	4.5	91	20	18	91	70.0-130	
1,2-Dibromoethane	5.0	5.1	102	38	39	102	70.0-130	
1,2-Dichlorobenzene	5.0	4.7	93	30	28	93	70.0-130	
1,3-Dichlorobenzene	5.0	4.8	96	30	29	96	70.0-130	
1,4-Dichlorobenzene	5.0	4.8	95	30	29	95	70.0-130	
Dichlorodifluoromethane	5.0	4.7	95	25	23	95	70.0-130	
1,1-Dichloroethane	5.0	4.5	91	20	18	91	70.0-130	
1,2-Dichloroethane	5.0	4.9	98	20	20	98	70.0-130	
1,2-Dichloropropane	5.0	5.0	99	23	23	99	70.0-130	
1,1-Dichloroethene	5.0	4.8	96	20	19	96	70.0-130	
1,2-Dichlorotetrafluoroethane	5.0	4.7	94	35	33	94	70.0-130	
Ethyl Benzene	5.0	5.3	105	22	23	105	70.0-130	
Chloroethane	5.0	4.3	85	13	11	85	70.0-130	
Hexachlorobutadiene	5.0	4.4	89	53	47	89	70.0-130	
Chloromethane	5.0	4.6	93	10	9.5	93	70.0-130	
Methylene chloride	5.0	7.5	**149***	17	26	**149***	70.0-130	
Styrene	5.0	5.8	115	21	25	115	70.0-130	
1,1,2,2-Tetrachloroethane	5.0	5.1	101	34	35	101	70.0-130	
Tetrachloroethene	5.0	4.6	92	34	31	92	70.0-130	
Toluene	5.0	5.0	99	19	19	99	70.0-130	
trans-1,3-Dichloropropene	5.0	5.0	99	23	23	99	70.0-130	
1,1,1-Trichloroethane	5.0	5.0	99	27	27	99	70.0-130	
1,1,2-Trichloroethane	5.0	4.8	96	27	26	96	70.0-130	
Trichloroethene	5.0	4.8	97	27	26	97	70.0-130	
1,2,4-Trichlorobenzene	5.0	5.3	106	37	39	106	70.0-130	
Trichlorofluoromethane	5.0	4.9	97	28	28	97	70.0-130	
Trichlorotrifluoroethane	5.0	4.4	88	38	34	88	70.0-130	
1,2,4-Trimethylbenzene	5.0	5.0	101	25	25	101	70.0-130	
1,3,5-Trimethylbenzene	5.0	5.0	100	25	25	100	70.0-130	

Print Date: 01/18/2012

N.C. Certification # 481

Blank Spike Summary

Blank Spike ID: LCS for HBN 19115 [AXX/1021]
Blank Spike Lab ID: 54361
Date Analyzed: 01/13/2012 13:04

Matrix: Air

QC for Samples: 31200092001, 31200092002, 31200092003, 31200092004, 31200092005, 31200092006

Results by **EPA TO-15**

	(ppbv)			(µg/m³)				
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	Qual
Vinyl chloride	5.0	4.7	94	13	12	94	70.0-130	
m,p-Xylene	10	10	105	43	43	105	70.0-130	
Acetone	5.0	4.9	98	12	12	98	50.0-150	
o-Xylene	5.0	5.3	106	22	23	106	70.0-130	
Bromodichloromethane	5.0	5.4	109	34	36	109	70.0-130	
1,3-Butadiene	5.0	4.5	90	11	10	90	70.0-130	
Carbon disulfide	5.0	5.1	101	16	16	101	70.0-130	
Benzyl chloride	5.0	5.3	107	26	27	107	70.0-130	
Allyl chloride	5.0	4.7	95	16	15	95	70.0-130	
Cyclohexane	5.0	4.6	91	17	16	91	70.0-130	
Dibromochloromethane	5.0	5.7	114	43	49	114	70.0-130	
1,4 Dioxane	5.0	5.7	115	18	21	115	70.0-130	
4-Ethyltoluene	5.0	5.4	108	25	27	108	70.0-130	
Ethyl acetate	5.0	6.0	119	18	22	119	50.0-150	
trans-1,2-Dichloroethene	5.0	4.5	91	20	18	91	70.0-130	
n-Heptane	5.0	4.7	94	20	19	94	50.0-150	
n-Hexane	5.0	5.4	108	18	19	108	70.0-130	
iso-Octane	5.0	4.9	98	23	23	98	70.0-130	
Isopropyl Alcohol	5.0	4.9	97	12	12	97	70.0-130	
2-Butanone	5.0	5.3	106	15	16	106	70.0-130	
4-Methyl-2-pentanone	5.0	6.2	125	20	25	125	70.0-130	
2-Hexanone	5.0	6.6	132	20	27	132	50.0-150	
Propene	5.0	5.7	114	8.6	9.8	114	50.0-150	
tert-Butyl methyl ether (MTBE)	5.0	5.2	105	18	19	105	70.0-130	
Tetrahydrofuran	5.0	5.7	113	15	17	113	50.0-150	
Bromoform	5.0	5.3	105	52	55	105	70.0-130	
Vinyl acetate	5.0	5.2	104	18	18	104	70.0-130	
Vinyl bromide	5.0	4.9	98	22	21	98	70.0-130	
Surrogates								
4-Bromofluorobenzene			109				70.0-130	

Print Date: 01/18/2012

N.C. Certification # 481

Blank Spike Summary

Blank Spike ID: LCS for HBN 19115 [AXX/1021]
Blank Spike Lab ID: 54361
Date Analyzed: 01/13/2012 13:04

Matrix: Air

QC for Samples: 31200092001, 31200092002, 31200092003, 31200092004, 31200092005, 31200092006

Results by **EPA TO-15**

	(%)			(µg/m³)				
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	Qual

Batch Information

Analytical Batch: **AIR1024**
Analytical Method: **EPA TO-15**
Instrument: **MSD11**
Analyst: **XLC**

Prep Batch: **AXX1021**
Prep Method: **EPA TO-15 PREP**
Prep Date/Time: **01/13/2012 00:00**
Spike Init Wt./Vol.: **400 mL** Extract Vol: **400 mL**

SGS North America Inc.
5500 Business Drive, Wilmington, NC 28405
t 910.350.1903 f 910.350.1557 www.us.sgs.com
Member of SGS Group

Duplicate Sample Summary

Original Sample ID: 31200092003-A
Duplicate Sample ID: 54363

Analysis Date: 01/13/2012 16:48
Analysis Date: 01/13/2012 17:46
Matrix: Air

QC for Samples: 31200092001, 31200092002, 31200092003, 31200092004, 31200092005, 31200092006

Results by **EPA TO-15**

PARAMETER	Original (ppbv)	Duplicate (ppbv)	RPD (%)	RPD CL
1,1,1-Trichloroethane	ND	ND	0	25.00
1,1,2,2-Tetrachloroethane	ND	ND	0	25.00
1,1,2-Trichloroethane	ND	ND	0	25.00
1,1-Dichloroethane	ND	ND	0	25.00
1,1-Dichloroethene	ND	ND	0	25.00
1,2,4-Trichlorobenzene	ND	ND	0	25.00
1,2,4-Trimethylbenzene	0.24	0.24	0.0	25.00
1,2-Dibromoethane	ND	ND	0	25.00
1,2-Dichlorobenzene	ND	ND	0	25.00
1,2-Dichloroethane	ND	ND	0	25.00
1,2-Dichloropropane	ND	ND	0	25.00
1,2-Dichlorotetrafluoroethane	ND	ND	0	25.00
1,3,5-Trimethylbenzene	ND	ND	0	25.00
1,3-Butadiene	ND	ND	0	25.00
1,3-Dichlorobenzene	ND	ND	0	25.00
1,4 Dioxane	ND	ND	0	25.00
1,4-Dichlorobenzene	ND	ND	0	25.00
2-Butanone	4.3	4.7	8.9	25.00
2-Hexanone	0.76	0.84	10	25.00
4-Ethyltoluene	ND	ND	0	25.00
4-Methyl-2-pentanone	0.60	0.68	13	25.00
Acetone	59	63	6.6	25.00
Allyl chloride	ND	ND	0	25.00
Benzene	0.60	0.64	6.5	25.00
Benzyl chloride	ND	ND	0	25.00
Bromodichloromethane	ND	ND	0	25.00
Bromoform	ND	ND	0	25.00
Bromomethane	ND	ND	0	25.00
Carbon disulfide	0.40	0.44	9.5	25.00
Carbon tetrachloride	ND	ND	0	25.00
Chlorobenzene	ND	ND	0	25.00
Chloroethane	ND	ND	0	25.00
Chloroform	0.32	0.36	12	25.00
Chloromethane	0.40	0.44	9.5	25.00
cis-1,2-Dichloroethene	ND	ND	0	25.00
cis-1,3-Dichloropropene	ND	ND	0	25.00
Cyclohexane	0.40	0.40	0.0	25.00
Dibromochloromethane	ND	ND	0	25.00
Dichlorodifluoromethane	0.40	0.40	0.0	25.00
Ethyl acetate	1.6	1.8	12	25.00

Print Date: 01/18/2012

N.C. Certification # 481

Duplicate Sample Summary

Original Sample ID: 31200092003-A
Duplicate Sample ID: 54363

Analysis Date: 01/13/2012 16:48
Analysis Date: 01/13/2012 17:46
Matrix: Air

QC for Samples: 31200092001, 31200092002, 31200092003, 31200092004, 31200092005, 31200092006

Results by **EPA TO-15**

PARAMETER	Original (ppbv)	Duplicate (ppbv)	RPD (%)	RPD CL
Ethyl Benzene	2.4	2.6	8.0	25.00
Hexachlorobutadiene	ND	ND	0	25.00
iso-Octane	0.36	0.40	11	25.00
Isopropyl Alcohol	2.0	2.2	9.5	25.00
m,p-Xylene	7.0	7.5	6.9	25.00
Methylene chloride	4.1	5.2	24	25.00
n-Heptane	1.0	1.2	18	25.00
n-Hexane	3.0	3.6	18	25.00
o-Xylene	1.8	1.9	5.4	25.00
Propene	ND	ND	0	25.00
Styrene	ND	ND	0	25.00
tert-Butyl methyl ether (MTBE)	ND	ND	0	25.00
Tetrachloroethene	ND	ND	0	25.00
Tetrahydrofuran	0.32	0.32	0.0	25.00
Toluene	9.6	10	4.1	25.00
trans-1,2-Dichloroethene	ND	ND	0	25.00
trans-1,3-Dichloropropene	ND	ND	0	25.00
Trichloroethene	6.9	7.4	7.0	25.00
Trichlorofluoromethane	0.28	0.28	0.0	25.00
Trichlorotrifluoroethane	ND	ND	0	25.00
Vinyl acetate	ND	ND	0	25.00
Vinyl bromide	ND	ND	0	25.00
Vinyl chloride	ND	ND	0	25.00
Surrogates				
4-Bromofluorobenzene	107	107	0.0	

Batch Information

Analytical Batch: AIR1024
Analytical Method: EPA TO-15
Instrument: MSD11
Analyst: XLC

Prep Batch: AXX1021
Prep Method: EPA TO-15 PREP
Prep Date/Time: 01/13/2012 00:00

Print Date: 01/18/2012

N.C. Certification # 481

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Tel: (865)291-3000

TestAmerica Job ID: H2A180430
Client Project/Site: 31200092
Client Project Description: SGS - Helium by D1946 MOD

For:
SGS North America, Inc.
5500 Business Drive
Wilmington, NC 28405

Attn: Michael Page

Authorized for release by:
1/23/2012 11:33:02 AM

Terry Walker Wasmund
Project Manager
terry.wasmund@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

PROJECT NARRATIVE
H2A180430

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

The original chain of custody documentation is included with this report.

Sample Receipt

Custody seals were not present.

Quality Control and Data Interpretation

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

Detection Summary

Client: SGS North America, Inc.
Project/Site: 31200092

TestAmerica Job ID: H2A180430

Client Sample ID: 31200092001 — Lab Sample ID: H2A180430001

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Helium	8.3		0.20	%	1.97		D1946 MOD	Total

Client Sample ID: 31200092002 — Lab Sample ID: H2A180430002

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Helium	9.8		0.20	%	2.02		D1946 MOD	Total

Client Sample ID: 31200092003 — Lab Sample ID: H2A180430003

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Helium	2.4		0.21	%	2.1		D1946 MOD	Total

Client Sample ID: 31200092004 — Lab Sample ID: H2A180430004

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Helium	7.6		0.19	%	1.93		D1946 MOD	Total

Client Sample ID: 31200092005 — Lab Sample ID: H2A180430005

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Helium	0.40		0.20	%	1.96		D1946 MOD	Total

Client Sample ID: 31200092006 — Lab Sample ID: H2A180430006

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Helium	3.0		0.20	%	2.01		D1946 MOD	Total

Client Sample Results

Client: SGS North America, Inc.
Project/Site: 31200092

TestAmerica Job ID: H2A180430

Client Sample ID: 31200092001
Date Collected: 01/12/12 08:50
Date Received: 01/18/12 11:30

Lab Sample ID: H2A180430001
Matrix: Air

Method: D1946 MOD - Fixed Gases in Air, ASTM D1946 MOD

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Helium	8.3		0.20	%			01/19/12 09:46	1.97

Client Sample Results

Client: SGS North America, Inc.
Project/Site: 31200092

TestAmerica Job ID: H2A180430

Client Sample ID: 31200092002

Lab Sample ID: H2A180430002

Date Collected: 01/12/12 08:50
Matrix: Air
Date Received: 01/18/12 11:30

Method: D1946 MOD - Fixed Gases in Air, ASTM D1946 MOD

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Helium	9.8		0.20	%			01/19/12 10:16	2.02

Client Sample Results

Client: SGS North America, Inc.
Project/Site: 31200092

TestAmerica Job ID: H2A180430

Client Sample ID: 31200092003
Date Collected: 01/12/12 08:51
Date Received: 01/18/12 11:30

Lab Sample ID: H2A180430003
Matrix: Air

Method: D1946 MOD - Fixed Gases in Air, ASTM D1946 MOD

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Helium	2.4		0.21	%			01/19/12 10:30	2.1

Client Sample Results

Client: SGS North America, Inc.
Project/Site: 31200092

TestAmerica Job ID: H2A180430

Client Sample ID: 31200092004
Date Collected: 01/12/12 08:52
Date Received: 01/18/12 11:30

Lab Sample ID: H2A180430004
Matrix: Air

Method: D1946 MOD - Fixed Gases in Air, ASTM D1946 MOD

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Helium	7.6		0.19	%			01/19/12 10:54	1.93

Client Sample Results

Client: SGS North America, Inc.
Project/Site: 31200092

TestAmerica Job ID: H2A180430

Client Sample ID: 31200092005
Date Collected: 01/12/12 08:54
Date Received: 01/18/12 11:30

Lab Sample ID: H2A180430005
Matrix: Air

Method: D1946 MOD - Fixed Gases in Air, ASTM D1946 MOD

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Helium	0.40		0.20	%			01/19/12 11:08	1.96

Client Sample Results

Client: SGS North America, Inc.
Project/Site: 31200092

TestAmerica Job ID: H2A180430

Client Sample ID: 31200092006
Date Collected: 01/12/12 08:53
Date Received: 01/18/12 11:30

Lab Sample ID: H2A180430006
Matrix: Air

Method: D1946 MOD - Fixed Gases in Air, ASTM D1946 MOD

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Helium	3.0		0.20	%			01/19/12 11:21	2.01

QC Sample Results

Client: SGS North America, Inc.
Project/Site: 31200092

TestAmerica Job ID: H2A180430

Method: D1946 MOD - Fixed Gases in Air, ASTM D1946 MOD

Lab Sample ID: H2A180000104B
Matrix: Air
Analysis Batch: 2018104

Client Sample ID: Method Blank
Prep Type: Total

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Helium	ND		0.10	%			01/19/12 09:22	1

Lab Sample ID: H2A180000104C
Matrix: Air
Analysis Batch: 2018104

Client Sample ID: Lab Control Sample
Prep Type: Total

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Helium	5.00	4.37		%		87	75 - 125

QC Association Summary

Client: SGS North America, Inc.
Project/Site: 31200092

TestAmerica Job ID: H2A180430

GCVOC

Analysis Batch: 2018104

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
H2A180000104B	Method Blank	Total	Air	D1946 MOD	
H2A180000104C	Lab Control Sample	Total	Air	D1946 MOD	
H2A180430001	31200092001	Total	Air	D1946 MOD	
H2A180430002	31200092002	Total	Air	D1946 MOD	
H2A180430003	31200092003	Total	Air	D1946 MOD	
H2A180430004	31200092004	Total	Air	D1946 MOD	
H2A180430005	31200092005	Total	Air	D1946 MOD	
H2A180430006	31200092006	Total	Air	D1946 MOD	

Certification Summary

Client: SGS North America, Inc.
Project/Site: 31200092

TestAmerica Job ID: H2A180430

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Knoxville	ACLASS	DoD ELAP		ADE-1434
TestAmerica Knoxville	Arkansas	State Program	6	88-0688
TestAmerica Knoxville	California	State Program	9	2423
TestAmerica Knoxville	Colorado	State Program	8	N/A
TestAmerica Knoxville	Connecticut	State Program	1	PH-0223
TestAmerica Knoxville	Florida	NELAC	4	E87177
TestAmerica Knoxville	Georgia	State Program	4	906
TestAmerica Knoxville	Hawaii	State Program	9	N/A
TestAmerica Knoxville	Indiana	State Program	5	C-TN-02
TestAmerica Knoxville	Iowa	State Program	7	375
TestAmerica Knoxville	Kansas	NELAC	7	E-10349
TestAmerica Knoxville	Kentucky	State Program	4	90101
TestAmerica Knoxville	Louisiana	NELAC	6	83979
TestAmerica Knoxville	Louisiana	NELAC	6	LA110001
TestAmerica Knoxville	Maryland	State Program	3	277
TestAmerica Knoxville	Michigan	State Program	5	9933
TestAmerica Knoxville	Nevada	State Program	9	TN00009
TestAmerica Knoxville	New Jersey	NELAC	2	TN001
TestAmerica Knoxville	New York	NELAC	2	10781
TestAmerica Knoxville	North Carolina	North Carolina DENR	4	64
TestAmerica Knoxville	North Carolina	North Carolina PHL	4	21705
TestAmerica Knoxville	Ohio	OVAP	5	CL0059
TestAmerica Knoxville	Oklahoma	State Program	6	9415
TestAmerica Knoxville	Pennsylvania	NELAC	3	68-00576
TestAmerica Knoxville	South Carolina	State Program	4	84001
TestAmerica Knoxville	Tennessee	State Program	4	2014
TestAmerica Knoxville	Texas	NELAC	6	T104704380-TX
TestAmerica Knoxville	USDA	USDA		P330-11-00035
TestAmerica Knoxville	Utah	NELAC	8	QUAN3
TestAmerica Knoxville	Virginia	NELAC Secondary AB	3	165
TestAmerica Knoxville	Virginia	State Program	3	165
TestAmerica Knoxville	Washington	State Program	10	C593
TestAmerica Knoxville	West Virginia	West Virginia DEP	3	345
TestAmerica Knoxville	West Virginia	West Virginia DHHR (DW)	3	9955C
TestAmerica Knoxville	Wisconsin	State Program	5	998044300

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

Method Summary

Client: SGS North America, Inc.
Project/Site: 31200092

TestAmerica Job ID: H2A180430

Method	Method Description	Protocol	Laboratory
D1946 MOD	Fixed Gases in Air, ASTM D1946 MOD	ASTM	TAL KNX

Protocol References:

ASTM = ASTM International

Laboratory References:

TAL KNX = TestAmerica Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Sample Summary

Client: SGS North America, Inc.
Project/Site: 31200092

TestAmerica Job ID: H2A180430

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
H2A180430001	31200092001	Air	01/12/12 08:50	01/18/12 11:30
H2A180430002	31200092002	Air	01/12/12 08:50	01/18/12 11:30
H2A180430003	31200092003	Air	01/12/12 08:51	01/18/12 11:30
H2A180430004	31200092004	Air	01/12/12 08:52	01/18/12 11:30
H2A180430005	31200092005	Air	01/12/12 08:54	01/18/12 11:30
H2A180430006	31200092006	Air	01/12/12 08:53	01/18/12 11:30

SGS

H2A180430

CHAIN OF CUSTODY RECORD
SGS North America Inc.

Test America, Knoxville, TN

Locations Nationwide
- Alaska
- New Jersey
- North Carolina
- Maryland
- New York
- Ohio

www.us.sgs.com

106072

(1)

CLIENT: SGS Wilmington

CONTACT: Michael Page PHONE NO:(910 350-1903

PROJECT: 31200092 SITE/PWSID#:

REPORTS TO: michael.page@sgs.com FAX NO.:( )

INVOICE TO: QUOTE #:

P.O. NUMBER:

SGS Reference: 31200092

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(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C= COMP, G= GRAB)	Preservatives Used	Analysis Required (3): Helium								REMARKS
	31200092001	1/12/12	0850	Air	1			X								
	002		0850					X								
	003		0851					X								
	004		0852					X								
	005		0854					X								
	006		0853					X								2 Boxes Rec'd @ Ambient Temp
																without custody seal AAH 1/18/12
																2 Boxes UPS #s 1Z 209 44R 03 4325555 1
																1Z 209 44R 03 4310 896 5

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:
Relinquished By: (2)	Date 1/16/12	Time 1630	Received By: 1/16/12 1130
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature°C:_____._____

Special Deliverable Requirements:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Special Instructions:

Requested Turnaround Time:

☐ RUSH 1/20/12 Date Needed ☒ STD

200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301

5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

White - Retained by Lab
Pink - Retained by Client

TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Lot Number: H2A160430

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ 1a Do not match COC ☐ 1b Incomplete information ☐ 1c Marking smeared ☐ 1d Label torn ☐ 1e No label ☐ 1f COC not received ☐ 1g Other:	4A
2. Is the cooler temperature within limits? (> freezing temp. of water to 6°C, VOST: 10°C)	✓			☐ 2a Temp Blank = _____ ☐ 2b Cooler Temp = _____ ☐ 2c Cooling initiated for recently collected samples, ice present.	
3. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ 3a Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?		✓		☐ 4a Not present ☐ 4b Not intact ☐ 4c Other:	
5. Were all of the samples listed on the COC received?	✓			☐ 5a Samples received-not on COC ☐ 5b Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ 6a Leaking ☐ 6b Broken	
7. Were VOA samples received without headspace?			✓	☐ 7a Headspace (VOA only)	
8. Were samples received in appropriate containers?	✓			☐ 8a Improper container	
9. Did you check for residual chlorine, if necessary?			✓	☐ 9a Could not be determined due to matrix interference	
10. Were samples received within holding time?	✓			☐ 10a Holding time expired	
11. For rad samples, was sample activity info. provided?			✓	☐ Incomplete information	
12. For 1613B water samples is pH<9?			✓	If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____	
13. Are the shipping containers intact?	✓			☐ 13a Leaking ☐ 13b Other:	
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ 14a Not relinquished	
15. Are tests/parameters listed for each sample?	✓			☐ 15a Incomplete information	
16. Is the matrix of the samples noted?	✓			☐ 15a Incomplete information	
17. Is the date/time of sample collection noted?	✓			☐ 15a Incomplete information	
18. Is the client and project name/# identified?	✓			☐ 15a Incomplete information	
19. Was the sampler identified on the COC?		✓			

Quote #: 089483 PM Instructions: _____

Sample Receiving Associate: [signature] Date: 1/18/12

QA026R22.doc, 012811

Perm Gas

Test America - Knoxville ---- Air Canister Dilution Record

Lot Number: 12A180430

Initial Can Pressure							Subsequent Dilution											
Analyst/Date	Tedlar Bag Time	Pbarr (in)	Work Order#	Can #	Pres. upon receipt (- in. or + psig)	Adj. Initial Pres. (- in. or + psig)	Analyst/Date	I - S	Pbarr (in)	Initial Pres. (– in. or psig)	Final Pres. P_f (psig)	First In-can Final Pres. P_f (psig)	Second In-can Final Pres. P_f (psig)	Third In-can Final Pres. P_f (psig)	Serial Dilution Can #	Vol (mL)	Final Pres. P_f (psig)	Comments
1/18/12	NA	28.99	MP92Q	0184	-5.1	8.9												
			MP92R	0181	-5.0	9.6												
			MP92T	0177	-5.7	9.8												
			MP92V	0205	-4.1	9.4												
			MP92W	0180	-3.9	9.9												
			MP92X	0193	-4.6	9.8												

MS057R0doc 06/26/07

SGS

AIR CHAIN OF CUSTODY
SGS North America Inc.

100027

5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

www.us.sgs.com

CLIENT: Altamont Env
CONTACT: Adam Tripp PHONE NO: 828-281-3350
PROJECT: Highland VI SITE#:
REPORTS TO: atripp@altamontenvironmental.com
INVOICE TO: Sue Brewer, 231 Haywood St, Asheville NC 28801
QUOTE #:
P.O. NUMBER:

SGS Reference #: 31200092

page 1 of 1

LAB ID	FIELD SAMPLE ID	SAMPLING START DATE	SAMPLING START TIME	SAMPLING END DATE	SAMPLING END TIME	MATRIX CODE *	CANISTER SERIAL NUMBER	FLOW CONTROLLER SERIAL NUMBER	TO14	TO15	TO15 SIM	PM10	FORMALDEHYDE	FIXED GASES	OTHER Helium			INITIAL PRESSURE(in Hg)	FINAL PRESSRE(in Hg)	RECEIVED PRESSURE(in Hg)	REMARKS
	Dup	1/11/12	1114	1/12/12	850	SG	0184	3454		X					X			27	4		
	SG-1	↓	1114	↓	850	↓	0181	3452		X					X			28	3.5		
	SG-2	↓	1121	↓	851	↓	0177	3442		X					X			27	3.5		
	SG-3	↓	1129	↓	852	↓	0205	3435		X					X			27	2.5		
	SG-4	↓	1138	↓	854	↓	0180	3440		X					X			27.5	3		
	SG-5	↓	1134	↓	853	↓	0193	3480		X					X			27	3		

STANDARD REPORTING LIMIT IS 0.05 PPBV FOR TO14 AND TO15, 5 PPTV FOR TO15 SIM (SELECTED LIST ONLY). PLEASE SPECIFY SPECIAL COMPOUND & REPORTING LIMIT REQUEST

Collected/Relinquished By: (1) [signature]	Date 1/12/12	1042
Relinquished By: (2) [signature]	Date 1/12/12	1250
Relinquished By: (3)	Date	
Relinquished By: (4)	Date 1/13/12	10:15

Received By: [signature]
Received By: FEDEX
Received By:
Received For Laboratory By: [signature]

Shipping Carrier:
Shipping Ticket No:
Special Deliverable Requirements:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT
Turnaround Time : RUSH 5 DAY 10 DAY OTHER

MATRIX CODE *
AMB: AMBIENT AIR SS: SUBSLAB
IND: INDOOR AIR TB: TRIP BLANK
SG: SOIL GAS O: OTHER

SGS North America Inc.

Sample Receipt Checklist (SRC)

Client: **Altamont Environmental** Work Order No.: **31200092**

1. X Shipped
   ___ Hand Delivered

2. X COC Present on Receipt
   ___ No COC
   ___ Additional Transmittal Forms

3. X Custody Tape on Container
   ___ No Custody Tape

4. X Samples Intact
   ___ Samples Broken / Leaking

5. ___ Chilled on Receipt Actual Temp.(s) in °C:
   X Ambient on Receipt
   ___ Walk-in on Ice; Coming down to temp.
   ___ Received Outside of Temperature Specifications

6. X Sufficient Sample Submitted
   ___ Insufficient Sample Submitted

7. ___ Chlorine absent
   ___ HNO3 < 2
   ___ HCL < 2
   ___ Additional Preservatives verified (see notes)

8. X Received Within Holding Time
   ___ Not Received Within Holding Time

9. X No Discrepancies Noted
   ___ Discrepancies Noted
   ___ NCDENR notified of Descrepancies*

10. ___ No Headspace present in VOC vials
    ___ Headspace present in VOC vials >6mm

Notes:

Comments:

Inspected and Logged in by: JJ

Date: Fri-1/13/12 00:00

*NCDENR must be notified when collection, holding time or preservation requirements are not met. MI_11.6