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Engineers, Scientists and Geologists

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January 31, 2014

Mr. Damon Ridley
Indiana Department of Environmental Management
Voluntary Remediation Program
100 North Senate Avenue
Indianapolis, IN 46204

Re: Updated ISCR Pilot Test Results
Indiana Machine Works Site, 135 East Harrison Street, Mooresville, IN
VRP # 6051201

Mr. Ridley,

On behalf of Indiana Technology Development (ITD) we hereby submit the Updated In-Situ Chemical Reduction (ISCR) Pilot Test Results Report for the Indiana Machine Works facility for your evaluation. Enclosed are two hard copies and an electronic copy on CD.

This report includes information on the materials injected; the methods; the injection locations; and baseline, 45-day, 90-day, and 231-day groundwater and/or vapor intrusion results as well as post-injection soil analytical results associated with the second plume of dissolved chlorinated volatile organic compounds (cVOCs) beneath Harrison Street.

This data clearly shows that the pilot test was successful in creating a reducing environment where PCE, TCE, cDCE, and VC were destroyed/metabolized to the ethene end point with no remaining CVOCs present above RDCLs in the target area. The sampling further showed that neither VI nor methane buildup were an issue. These results meet the criteria for reduction of vinyl chloride in the conclusions of the IDEM November 22, 2013 letter, which was the primary reason for not allowing full-scale implementation at that time. We request approval for full-scale implementation at this time and plan to move forward with this work as soon as reasonably possible.

Please contact either of the undersigned with any questions you may have about this matter.

Sincerely,
TROY RISK, INC.

Don H. Neeley, LPG, CHMM
Technical Director

Paul Troy, LPG
Principal Geologist

cc: Tonya Bond, Peter Racher (Plews Shadley Racher & Braun) electronic copy
Philip Kappes, John Stimson (ITD) - electronic copy

Updated ISCR Pilot Test Results

Indiana Machine Works
135 East Harrison Street
Mooresville, Indiana

Prepared for:

Indiana Technology Development, Inc.
540 West 92nd Street
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Attn: John Stimson

and

Indiana Department of Environmental Management
Office of Land Quality – State Cleanup Section
100 North Senate Avenue, Indianapolis, Indiana 46204
Attn: Mr. Damon Ridley

Prepared By:

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Technical Director

January 31, 2014

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List of Acronyms Commonly Used in Environmental Reports

AMSL	Above Mean Sea Level
AST	Aboveground Storage Tank
bgs	Below ground surface
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
cDCE	1,2-cis-Dichloroethylene
CIIASL	Commercial/Industrial Indoor Air Screening Level
CIGWVESL	Commercial/Industrial Groundwater Vapor Exposure Screening Level
CISDCSL	Commercial/Industrial Soil Direct Contact Screening Level
COC	Chemical of Concern/Chain of Custody (context)
cPAHs	Carcinogenic Polycyclic Aromatic Hydrocarbons
CSM	Conceptual Site Model
CVOC	Chlorinated Volatile Organic Compound
DAF	Dilution Attenuation Factor
DCE	Dichloroethylene,1,2-(mixed isomers)
DNAPL	Dense Non-Aqueous Phase Liquid
EFR	Enhanced Fluid Recovery
ELTF	Excess Liability Trust Fund
EPA	United States Environmental Protection Agency
ERC	Environmental Restrictive Covenant
ERO	Environmental Restrictive Ordinance
ESA	Environmental Site Assessment
ESDCSL	Excavation Soil Direct Contact Screening Level
FID	Flame Ionization Detector
FSI	Further Site Investigation
ft	Foot or Ft
GIS	Geographic Information System
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
IDCL	Industrial Default Closure Level
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
ISC	Initial Site Characterization
ISCO	In-Situ Chemical Oxidation
ISCR	In-Situ Chemical Reduction
LNAPL	Light Non-Aqueous Phase Liquid
LUST	Leaking Underground Storage Tank
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MS/MSD	Matrix Spike / Matrix Spike Duplicate
MTG	Migration To Groundwater
ug/kg	Microgram per kilogram
ug/L	Microgram per liter
mg/kg	Milligram per kilogram
mg/L	Milligram per liter
MPE	Multi-Phase Extraction
NAPL	Non-Aqueous Phase Liquid
NFA	No Further Action
O&M	Operation and Maintenance
ORC	Oxygen Releasing Compound
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PCE	Perchloroethene / Tetrachloroethene
PEC	Potential Exposure Concentration
PID	Photoionization Detector
PNOD	Potassium Natural Oxidant Demand
POC	Perimeter of Compliance
ppb	Parts per billion
ppm	Parts per million
QA/QC	Quality Assurance / Quality Control
QAPP	Quality Assurance Project Plan
RCG	Remediation Closure Guide
RCRA	Resource Conservation and Recovery Act
RDCL	Residential Default Closure Level
RGWSL	Residential Groundwater Screening Level
ROW	Right-of-way
RVEGWSL	Residential Vapor Exposure Groundwater Screening Level
RIASL	Residential Indoor Air Screening Level
RISC	Risk Integrated System of Closure
RSDCSL	Residential Soil Direct Contact Screening Level
RSL	Regional Screening Level or Residential Screening Level (context)
RWP	Remediation Work Plan
SAP	Sampling and Analysis Plan
SCFM	Standard Cubic Ft per Minute
SIR	Site Investigation Report
SL	Screening Level
SMTGWSL	Soil Migration to Groundwater Screening Level
SVE	Soil Vapor Extraction
SVOCs	Semi-volatile Organic Compounds
TCE	Trichloroethene
tDCE	1,2-trans-Dichloroethene,
TFV	Total Flame-ionizable Vapors
TOC	Top of Casing
TPH	Total Petroleum Hydrocarbons
USCS	Unified Soil Classification System
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UST	Underground Storage Tank
VC	Vinyl chloride
VFA	Volatile Fatty Acid
VFC	Virtual Filing Cabinet
VI	Vapor Intrusion
VOC	Volatile Organic Compound
VRP	Voluntary Remediation Program
ZVI	Zero-Valent Iron (Fe^0)

Updated ISCR Pilot Test Results
Indiana Machine Works
135 East Harrison Street, Mooresville, IN
IDEM VRP Site No. 6051201
Troy Risk Project No. 95.03.06
January 31, 2014

1.0 EXECUTIVE SUMMARY

This report documents the results of sampling through December 2013 related to an In-Situ Chemical Reduction pilot test for treatment of Plume 2 associated with the Indiana Machine Works Facility located at 135 East Harrison Street in Mooresville, IN (the Site). This work was completed in response to IDEM's November 22, 2013 letter responding to the October 21, 2013 ISCR Pilot Test Results Report. Chemical impacts to soil and groundwater had been detected at the Site, some of which exceed the IDEM's current regulatory standards. This document, which is being submitted pursuant to the requirements of the IDEM VRP, documents the results observed during a subsequent groundwater sampling events in the pilot test area. This document was prepared in accordance with the IDEM's *RISC Technical Guidance* (as amended January 2006).

The pilot test results show that ISCR was effective for treatment of Plume 2 COCs. The evidence to support this statement includes:

- Reduction of PCE from a baseline concentration of 245 µg/L in groundwater to not detected at the MDL of 5 µg/L in MW-14 during the December 18, 2013 sampling event (approximately 230 days later).
- Initial expected buildup (maximum of 790 µg/L on August 1, 2013) and subsequent destruction of vinyl chloride in MW-14 (not detected at 2 µg/L on December 18, 2013).
- A significant increase in the concentration of ethene in MW-14 (from <0.2 mg/L to 240 mg/L) indicating the transformation of VOCs to a non-toxic endpoint.
- A reduction of ORP in MW-14 from +223 mV prior to injection to -145 mV after 90 days.
- An average 10°C increase in temperature for the wells around the pilot test area.
- And the presence of VFAs, most notably in MW-14, indicating metabolic processes are occurring.

Based on this data, Troy Risk recommends full-scale implementation of ISCR treatment for Plume 2. Implementation of this recommendation would decrease the likelihood of the deeper water-bearing unit being impacted from the Plume 2 area. We also recommend additional groundwater monitoring to further evaluate and document the degradation of CVOCs, especially vinyl chloride, to ethene. IDEM has previously directed that indoor and crawl space air be sampled to evaluate whether the TCE detected in the crawl space in 205 and 207 E. Harrison

Street residences is affecting indoor air quality or vice versa. Troy Risk recommends proceeding with that sampling in conjunction with full-scale implementation.

2.0 INTRODUCTION

2.1 Chemicals of Concern

Analytical results from soil and groundwater testing in the Plume 2 area indicate the presence of VOCs in concentrations exceeding applicable regulatory standards. Among the COCs identified, PCE, TCE, and VC are reported to exceed IDEM's RISC IDCL. In addition, 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethylene (1,1-DCE), cDCE, and 1,1,1-trichloroethane (1,1,1-TCA) were observed below their respective RISC RDCLs in groundwater in the Plume 2 area.

2.2 Site Location and Land Use within the Local Area

The Site is located at 135 East Harrison Street, Mooresville, Indiana in Brown Township of Morgan County, and is situated at an approximate elevation of 690 ft AMSL. The Site is bounded on the west by residential properties; on the south by a car wash and lumber yard, across Broad Alley; on the east by a residential property, across Conrail Railroad; and on the north by a residential property, automobile repair facility and parking lot, across Harrison Street (see Figures 1 and 2).

2.3 Site Geology and Hydrogeology

Soil borings indicate a relatively uniform geology over most of the project area. In a typical profile from undisturbed areas the surface layer is a brown silty clay loam and/or clay loam to a depth of approximately 6 ft bgs. The surficial clay-rich deposits are generally underlain by sands with interbedded, discontinuous loams and silt loams to a depth of approximately 16 ft bgs. A continuous layer of dense, dry (moist in some borings) silty clay loam, clay loam, sandy clay or silty clay is present beneath the extent of the project area to a depth of approximately 21 to 26 ft bgs, followed by a fine to medium sand to a depth of at least 40 ft bgs.

During the course of the subsurface investigations Troy Risk defined three hydrostratigraphic units based upon their potential to affect migration of COCs at the Site. The hydrostratigraphic units are as follows:

<u>Hydrostratigraphic Unit #1</u>

- Saturated alluvial deposits consisting of sands interbedded with discontinuous loams.
- Approximate depth interval is 6 to 16 ft bgs.
- Primary groundwater bearing unit impacted with chemicals of concern.
- Groundwater velocity in this unit estimated between 1.6 and 44 ft/year, with a geometric mean velocity of approximately 9 ft/year.

Hydrostratigraphic Unit #2

- Dry to moist, dense silty clay loam and clay loam.
- Approximate depth interval is 16 to 26 ft bgs.

Hydrostratigraphic Unit #3

- Saturated, fine to medium, dark brown to gray sand.
- Approximate depth interval is 22 ft bgs to at least 40 ft bgs.
- Soil and groundwater testing performed to date indicate highly localized COCs migration into this unit near TRI-208/MW-33D.

3.0 ISCR PILOT TEST

The ISCR pilot test was initiated on May 1, 2013, in a portion of the area labeled Plume 2 in the vicinity of MW-14. A detailed discussion of this test by Innovative Environmental Technologies, Inc. (IET) is included in Appendix B. The IET report discusses issues at the Site and the dosages (or pounds) of EHC, calcium propionate, ZVI, sodium sulfite, Hydrolized Kelp, yeast extract, B2, and B12 injected and includes spreadsheets showing proposed versus actual dosages injected at each depth at each boring and generalized figures. Figure 3 shows the locations of the injection points relative to other Site features, monitoring wells, and Plume 2.

The objective of the ISCR pilot test was to evaluate whether in-situ abiotic and microbial processes accelerated dechlorination of Site COCs following injection of reducing agents. Microbial elements were injected to advance the biological dechlorination processes, and a 1-3 micron, ZVI colloidal suspension was co-injected to quickly reduce the dissolved-phased CVOCs and produce hydrogen for synergistic microbial mineralization. Injected materials were a proprietary blend of sodium sulfite, ZVI, calcium propionate, Vitamins B2 and B12, yeast extract, hydrolyzed kelp, and EHC® (as an electron donor). Injections in the test area were made from the top of each Geoprobe point downward at depths of 5-7, 9-11, and 13-15 feet.

Reductive dechlorination typically impacts PCE, then TCE, then cDCE, then last transforming vinyl chloride into ethene. So, an initial increase in daughter products is expected before they are eventually reduced to ethene. Although the last step (reduction to ethene) is the most recalcitrant, reductive dechlorination is capable of full degradation of CVOCs.

On December 18th and 19th, 2013, samples were collected to evaluate ISCR progress in Plume 2 at approximately 230 days post pilot test. Sampling included groundwater, vapor intrusion, soil gas, and sewer gas.

4.0 ISCR Pilot Test Results

4.1 Groundwater Data

A baseline groundwater sampling event was performed on April 24, 2013, one week prior to injection of ISCR materials, for the monitoring wells in the immediate ISCR pilot test area (MW-9, MW-14, MW-26R, MW-29, and MW-30). The baseline data and data from the groundwater sampling on June 18, 2013 (48 days after the injections), the August 1, 2013 sampling (91 days after injection), and December 18, 2013 (231 days after injection) are shown in Tables 1 and 2 and on Figure 3. Table 3 shows the volatile fatty acids (VFAs), ethene/ ethane/methane, and dissolved and total iron results for the key wells. Table 4 shows the pH and ORP and other groundwater geochemistry data obtained during the sampling for the key monitoring wells on those dates. Additional discussion of the data from the remaining wells is included in the IET report included as Appendix B.

4.1.1 VOC Analytical Results

The results of the groundwater samples collected from MW-14 are indicative of the efficacy of the ISCR approach as this well is near the center of the pilot test area. Figure 6 plots the concentrations of the primary CVOCs (PCE, TCE, cDCE, and VC) for MW-14 starting with the baseline sampling event and ending with the December 18, 2013 sampling event. As this plot shows, while treatment caused the expected temporary sequential buildups of each of the primary CVOCs, these CVOCs were destroyed by the 231-day post-injection point as none were detected in the groundwater sample from MW-14 obtained on December 18, 2013 above MDLs at their respective RDCLs. This evaluation is discussed in greater detail in the following paragraphs.

The PCE concentration in MW-14 was 245 µg/L during the baseline sampling. On June 18 (48 days later) it had increased to 661 µg/L. This is not unexpected, as a part of the process is to desorb contaminants on soil grains. The PCE concentration in MW-14 on August 1, 2013 was not detected at the method detection limit (MDL) of 100 µg/L (the detection limit is elevated due to the presence of daughter products at relatively high concentrations as will be discussed below). If the PCE concentration was 50 µg/L, one half of the MDL, for the August 1 sampling this would indicate an approximately 80% decrease in PCE concentration from the pre-injection level. The PCE concentration in MW-14 on December 17, 2013 was not detected at the MDL of 5 µg/L. The TCE concentration in MW-14 showed a similar pattern: 29.4 µg/L during the baseline sampling, an increase to 109 µg/L on June 18, not detected at the MDL of 100 µg/L on August 1, and not detected at the MDL of 5 µg/L on December 18.

These data show that ISCR was effective, since the primary CVOCs were destroyed or metabolized. A review of the MW-14 data for cDCE and vinyl chloride shows that cDCE increased from the baseline concentration of 47 µg/L to 799 µg/L on June 18 and was reduced to 480 µg/L on August 1, 2013 and not detected at the MDL of 5 µg/L on December 18. Vinyl chloride was initially not detected at the MDL of 2 µg/L, then not detected at an MDL of 40 µg/L, but was present at 790 µg/L during the August 1, 2013 sampling event and was below the MDL of 2 µg/L on December 18. This is indicative of the transformational process of dechlorination and shows that the process is complete for the targeted well. The only other

CVOC detected in MW-14 during this period was 1,1,1-TCA which was present at 16.5 µg/L during the baseline sampling, but not detected at 100 µg/L during the two subsequent sampling events or at 5 µg/L in the December 18, 2013 event.

The data at MW-30, the next monitoring well downgradient of the injection zone shows a similar pattern to MW-14 for PCE (323 µg/L on April 24, increase to 520 µg/L on June 18, decrease to 315 µg/L on August 1, and below MDL of 5 µg/L on December 18), but had only been reduced to the baseline level after 90 days. TCE concentrations in MW-30 increased slightly over the pilot test period from 21.9 µg/L to 31.9 µg/L to 34.3 µg/L but have declined to below the MDL of 5 µg/L on December 18. cDCE, however, initially increased dramatically during the first 90 days with results of 45.7 µg/L, 53.8 µg/L, and 1,020 µg/L and has significantly declined at the 230-day point with a result of 70.8 µg/L. Vinyl chloride showed an increase over this period: <2 µg/L, 2.72 µg/L, 3.25 µg/L, 179 µg/L. This shows a comparable sequential buildup and decrease of CVOCs as at MW-14, except for vinyl chloride which has yet to decrease, albeit delayed slightly because this location is outside of the test area and injectants had farther to migrate before having an impact on the groundwater chemistry. We believe this increase will be addressed at MW-30 during the full-scale implementation which includes this area.

The next downgradient well is MW-26R. No COCs were detected in this well during the baseline, 45-day, 90-day, or 230-day sampling events. The results for MW-9 and MW-29 which are both outside the injection area are discussed in more detail in the IET report included as Appendix B. They state that MW-9 was not significantly affected by the pilot test and that MW-29 had an increase in total CVOCs, especially PCE (423 µg/L in April, 858 µg/L in June, 927 µg/L in August, and 1,010µg/L in December) and to a lesser extent TCE, and cDCE (see Table 2 for details). We propose to address the CVOCs in the area of MW-29 by extending the treatment area to include this area.

IDEM requested that additional analytical data be obtained for monitoring well MW-33D which is screened in the lower hydrostratigraphic unit immediately downgradient of the test area. This data has been added for the one pre-injection sampling (November 16, 2012) and for the December 18, 2013 sampling event. This data shows that CVOC concentrations have not significantly changed over this time. Although there was a roughly 25% increase in PCE and TCE concentration over this time, the cDCE concentration was reduced by about 25% and the 1,1,1-TCA concentration decreased by almost 45%. Not enough data is available at this time to adequately evaluate whether these changes are random fluctuations or not.

4.1.2 Ethane/Methane/Ethene Analytical Results

The most important other analytical result for MW-14 in the middle of the injection zone is the increase in ethene seen during the course of the pilot test. Ethene was not detected at an MDL of 0.2 mg/L during the baseline sampling, but was present at 4.2 µg/L in June, increased to 240 µg/L in August, and has declined to 46 µg/L in December. The increase occurred as CVOCs were metabolized to ethene. This decrease in ethene was expected as ethene is itself readily metabolized, i.e. is only present temporarily, and ethene is no longer being generated after the CVOCs have all been destroyed/metabolized.

Ethene was detected at 0.24 µg/L in MW-30 in the pre-injection sample and the June 18 sample. It had increased by more than a factor of three, to 0.90 µg/L by August 1, and to 1,930 µg/L in December. This increase through December indicates that CVOCs were still being metabolized/ destroyed in this location downgradient of the injection area at that time. These are clear indications of the transformation of chlorinated VOCs, specifically vinyl chloride, to the non-toxic ethene end product. This data is shown in Table 3.
Methane was included as an analyte to evaluate possible buildup of methane in the subsurface or subsurface structures. Methane was not detected in MW-14 in the middle of the injection zone prior to the injection, but was present at 44 µg/L on June 18, 2,900 µg/L on August 1, and 28,100 µg/L on December 18. Methane was present at 2,800 µg/L in MW-30 during the baseline sampling prior to injection, at 4,200 µg/L on June 18, at 2,200 µg/L on August 1, and at 16,400 µg/L on December 18. In MW-9 methane concentrations decreased from the initial pre-test level of 1.5 µg/L to not detected on August 1 (MDL 0.2 µg/L) and December 18 (MDL 10 µg/L). In MW-29 methane concentrations increased to a maximum of 18 µg/L on August 1 and decreased to 16.9 µg/L on December 18.

The maximum methane concentration of 28,100 µg/L in groundwater (in MW-14) and 1,950 ppm in subsurface air (Point 3, east of the injection area) are less than 10% of the lower explosive limit (LEL) of 50,000 ppm (5%) for methane. Very low concentrations of methane (maximum 65 ppm) were initially observed in the crawl spaces of both homes on June 17, 2013, but were not present during the August 1, 2013 or December 18 monitoring events.

4.1.3 Volatile Fatty Acids Analytical Results

Additional supporting data is the increase in volatile fatty acids (VFAs) in MW-14 during the pilot test. Lactic, acetic, formic, and other VFAs were shown to increase during the pilot test from initial values on June 18 to the second sampling on August 1. These VFAs are an indication of the metabolic processes associated with dechlorination. Analysis for VFAs was not performed during the December sampling event. This data is shown in Table 3.

4.1.4 Groundwater Chemistry Data

Groundwater chemistry data was obtained from each of the five key monitoring wells during each sampling event and from the deep well MW-33D on December 18. Data included pH, specific conductance, ORP, dissolved oxygen, turbidity and temperature. This data is shown in Table 4.

The ORP data is another indication of the effectiveness of the application of materials in MW-14. The ORP during the baseline sampling event was 223 mV. The ORP dropped to -115 mV in June to -145 mV in August and rose to -56 mV in December. ORP readings in each of the four key monitoring wells near the injection area decreased significantly (an average of 211.25 mV) over the April to August sampling period. Only MW-26R, the furthest downgradient well, did not see a notable change in ORP. These reductions in ORP are a clear indication that the subsurface was becoming more anaerobic, and thereby conducive to reductive dechlorination. Although this data is not supported by the DO data, DO sensors are notoriously difficult to obtain accurate data with.

ORP data for MW-30, just downgradient of the test area, has decreased from 236 mV initially, to 101 mV in June, to 91 mV in August, to -106 mV in December. This indicates that this location has only recently achieved anaerobic conditions that will facilitate the microbial activity which will metabolize vinyl chloride to ethene. Thus, the destruction of the buildup of vinyl chloride observed to date at this location is now underway and should be reflected in future sampling in monitoring well MW-30.

Another interesting trend in this data is the increase in temperature from the baseline to subsequent data. The average baseline temperature was 11.87°C. The average June temperature was 21.74°C and the average August 1 temperature was 22.08°C. This indicates an average increase of roughly 10°C from the pre-injection baseline data to the post-injection data. A comparable change in temperature in MW-30 is not observed until the December 18 sampling. This further confirms the ORP data showing that biological activity at that location increased from August to December.

4.2 Soil Analytical Data

Soil samples were obtained using direct-push methods on July 31, 2013 immediately adjacent to previous borings TRI-207 and TRI-208 from the same intervals previously submitted for laboratory analysis for comparison. These samples were from 8-10 ft bgs in TRI-207PT and from 4-6 ft bgs from TRI-208PT. The new borings are not shown as distinct from the original borings due to the scale of the map, but were each within 2 feet of the prior borings. Analytical data for key nearby borings and the borings performed as a part of the pilot test are included as Table 5 and shown on Figure 4. Boring logs for these borings are included in Appendix C.

Comparison of the analytical results shows that the detected PCE concentration in TRI-207PT was roughly three times greater (49.3 mg/kg) than the original concentration (13.9 mg/kg). The TCE concentration in TRI-207PT was roughly one third (0.038 mg/kg) than the original concentration (0.107 mg/kg). The cDCE concentration was very similar to previously (new: 0.0739 mg/kg vs. old: 0.080 mg/kg). 1,1,1-TCA was the only other COC detected in both samples. Its concentration in the new sample (0.0537 mg/kg) was roughly double the original concentration (0.0249 mg/kg). In contrast, the result (0.0267 mg/kg) for the new sample from TRI-208PT had roughly one quarter the PCE concentration of the original sample (0.109 mg/kg). The only other analyte detected in either of the two samples was cDCE in TRI-208PT at 0.0094 mg/kg (versus not detected at an MDL of 0.006 mg/kg for the original sample).

The soil analytical data is not instructive for the purposes of evaluating the pilot test. The apparent increase in PCE concentration in TRI-207PT is most likely attributable to spatial variation rather than any other factor. The soil type in the recent boring was slightly less fine-grained (sandy clay loam) relative to the original soil observed in TRI-207 (sandy clay). It is likely the higher concentration in the recent boring merely indicates the difference in lithology.

4.3 Vapor Intrusion Analytical Data

Crawl space samples were initially obtained from the two residences (205 and 207 E. Harrison Street, a duplex with a divided crawl space with a common wall) closest to the injection area to evaluate the potential for indoor air effects from the injection program. As requested by IDEM in their letter dated November 22, 2013, 155 E. Harrison Street was added to the list of sampling

locations for the December sampling. Analytical data is included as Table 6 and shown on Figure 5.

Prior to the start of the pilot test, PCE was detected at concentrations ranging from 16.0 $\mu g/m^3$ to 24.90 $\mu g/m^3$ and TCE at 3.6 $\mu g/m^3$ to 10.40 $\mu g/m^3$ in the crawl space of the 205 E. Harrison Street residence. Subsequent to the injection event on May 1, 2013, PCE concentrations in the crawl space have ranged from 7.26 $\mu g/m^3$ on June 18 to 10.9 $\mu g/m^3$ on August 1 to 7.1 $\mu g/m^3$ on December 18. TCE concentrations were 30.30 $\mu g/m^3$ on June 18, 20.90 $\mu g/m^3$ on August 1, and 3.20 $\mu g/m^3$ on December 18, 2013. It is important to note that indoor air TCE concentrations have historically been four to ten times higher (maximum 47.70 $\mu g/m^3$ on April 24, 2012) than crawl space results at this residence starting with the April 2012 VI sampling.

Crawl space air sample PCE results for the 205 E. Harrison Street residence (the closest structure to the pilot test) after injection were roughly half of the results prior to the pilot test. TCE results for this crawl space after injection were higher than prior results, but still less than the indoor air results from prior testing and may represent movement of indoor air into the crawl space rather than buildup of TCE from the pilot test. An indoor air sample could not be collected from the 205 E. Harrison residence during the December 18 sampling event due to the tenant being out of town for an extended period of time.

Data from the 207 E. Harrison Street residence was different than at the 205 E. Harrison Street residence. PCE concentrations prior to injection ranged from 4.6 $\mu g/m^3$ to 16.9 $\mu g/m^3$ in the three pre-injection sampling events at an MDL of 1.07 $\mu g/m^3$. Post- injection crawl space air PCE results for this residence (the next closest structure to the pilot test) were comparable to the two results prior to the pilot test. PCE concentrations after injection were 11.0 $\mu g/m^3$ on June 18, 15.7 $\mu g/m^3$ on August 1, and 14.0 $\mu g/m^3$ on December 18.

However, TCE was not detected in the 207 E. Harrison Street crawl space prior to the pilot test (three sampling events), but was present at a maximum of 9.35 $\mu g/m^3$ on June 18 after the injection event. The TCE concentration decreased by roughly 34% to 6.18 $\mu g/m^3$ at the August 1 sampling event and was below the MDL of 1.1 $\mu g/m^3$ during the December 18 sampling event. This may suggest that the increase in TCE is a temporary effect, but additional data would be required to verify this. However, another possibility is that since TCE concentrations were not present in the 205 E. Harrison Street crawl space until April 2012 and no sampling was done in this area after the June 2012 sampling (less than three weeks after TCE was first seen in the 205 E. Harrison Street residence crawl space) until the June 2013 sampling, that the TCE present in the crawl space under the 207 E. Harrison Street residence, which has a common wall with the 205 E. Harrison Street residence, represents impacted air coming from that residence's crawl space (and associated indoor air source), not from the subsurface.

Crawl space and indoor air samples were collected from the 155 E. Harrison residence during the December 18, 2013 sampling event. The VI results were below MDLs for this property (3.4 $\mu g/m^3$ for PCE and 1.1 $\mu g/m^3$ for TCE) for both indoor and crawl space air.

4.4 Field Data

Field measurements were made of methane, oxygen, and carbon monoxide in sampling points along the sewer line and in the crawl spaces of 205 and 207 E. Harrison Street. A multi-gas meter was used to obtain the measurements. Field measurements are displayed on Table 7 and shown on Figure 5.

The primary purpose of this work was to monitor methane concentrations to make sure that they did not become a concern in either the sewer system or the crawl spaces in nearby structures. Although low levels of methane (30 and 65 ppm, respectively) were observed in both crawl spaces (205 and 207 E. Harrison St.) on June 17, 2013, no methane was observed in either crawl space on August 1, 2013. Methane was not detected in the crawl spaces of the 155, 205, or 207 E. Harrison residences on December 18, 2013.

Troy Risk also installed three monitoring points in the backfill of the sewer line running from west to east on the south side of E. Harrison Street through the impacted area using an air knife. Construction logs for these monitoring points are included in Appendix C. Higher concentrations (1,200 to 1,950 ppm) were observed on the May 3, 2013 monitoring event, two days after the injection event, with subsequently lower results (110 to 310 on June 18, 2013), still lower results (0 to 170 ppm) on the August 1, and not detected (0.0 ppm) during the December 18 sampling event.

5.0 Conclusions and Recommendations

5.1 Conclusions

The analytical data clearly shows that CVOCs are being destroyed/metabolized to the desired end point, ethene. This is most evident in the following:

- reduction of PCE, TCE, cDCE, and VC in MW-14 to below detection levels meeting RDCLs,
- the reduction of PCE and TCE to below detection levels (at RDCLs) and expected temporary increase in daughter products (cDCE and VC) in MW-30, and
- the initial presence and increasing concentrations of the ethene end product over time in MW-14 and MW-30 during the transformation of CVOCs to ethene.

Further supporting evidence includes the overall chemical conditions of the water-bearing unit, especially the decrease in ORP and the increase in temperature, and the presence of VFAs demonstrating metabolic processes are taking place (reductive dechlorination).

As expected, VC concentrations temporarily increased, most notably to a maximum of 790 µg/L in MW-14, before being completely destroyed (VC not detected at the RDCL of 2.0 µg/L) at 231 days after injection. This temporary increase was mirrored at MW-30 (maximum VC 179 µg/L) downgradient of the injection area, but delayed due to the time required for injectants to be effective at this location outside the pilot test injection area. However, the presence of increasing concentrations of ethene in MW-30 indicates that the remaining VC is being transformed into the

non-toxic ethene end product. These are vital pieces of data as they indicate that a buildup of VC will not be the end product of this process.

Analytical data for the deeper zone (Hydrostratigraphic Unit #3), as represented by the sampling at MW-33D, are ambiguous at this point regarding any effects of injection on CVOC concentrations in the lower water-bearing unit. Full-scale implementation includes injection in the immediate vicinity of MW-33D to treat the sorbed and dissolved CVOCs identified in that area.

VI sampling was inconclusive since no indoor air sample could be obtained at 205 E. Harrison Street in December and the data from the 207 E. Harrison Street residence is ambiguous. No air impacts were observed in either indoor or crawl space air at the 155 E. Harrison Street residence.

Methane buildup is not a significant issue for this application at this site. Although some methane appears to have been generated due to the creation of a reducing environment, methane levels have not been observed to approach dangerous levels at any location.

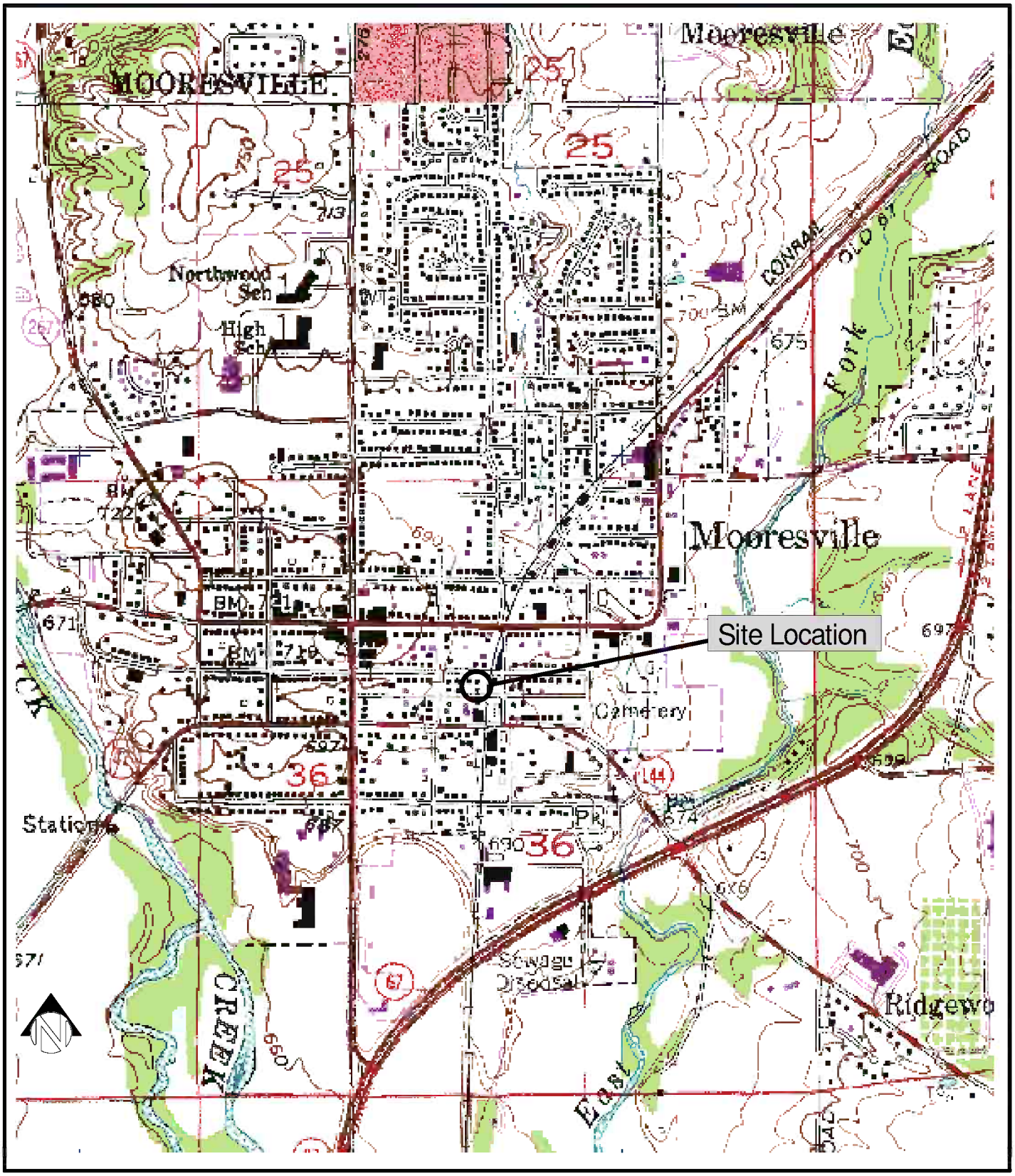
5.2 Recommendations

Full-scale implementation of ISCR treatment for the Plume 2 area is recommended as soon as reasonably possible to further reduce the likelihood of impacts to deeper water-bearing units. The planned injection points are shown on Figure 8.

As requested by IDEM in their November 22, 2013 letter, quarterly groundwater monitoring of the key monitoring wells (MW-8, MW-9, MW-14, MW-26R, MW-27, MW-29, MW-30 and MW-33D) should be performed 90, 180, and 270 days after full-scale treatment to evaluate the degradation of CVOCs, especially vinyl chloride, to ethene, and to evaluate control of the dissolved plume.

Also, concurrently with quarterly groundwater monitoring, indoor air sampling should be conducted at the 155, 205, 207 and 209 E. Harrison Street residences, as previously directed by IDEM in their November 22, 2013 letter, to evaluate if TCE seen in the crawl space is affecting indoor air quality. Crawl space sampling should be performed at the same time to provide data to evaluate the relationship between crawl space air and indoor air at these locations.

FIGURES



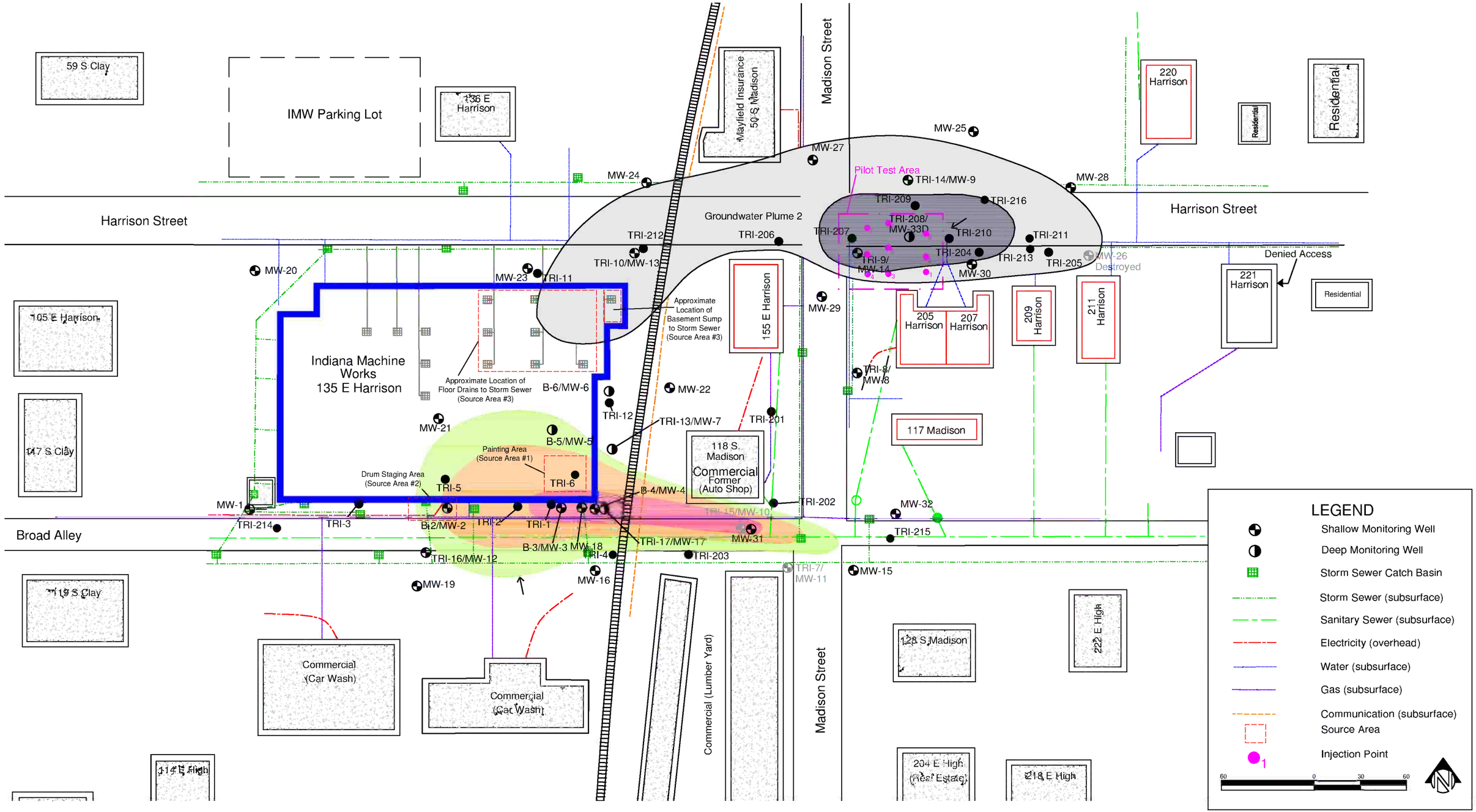
Topographic Map

Indiana Machine Works
135 East Harrison Street
Mooresville, Indiana

Project Number:	95.03.06
Drawing File:	Topo
Date:	August 24, 2006
Scale:	1:24,000
Drawn By: PEB *Checked by:* PT	

TROY RISK INC.

Figure: 1



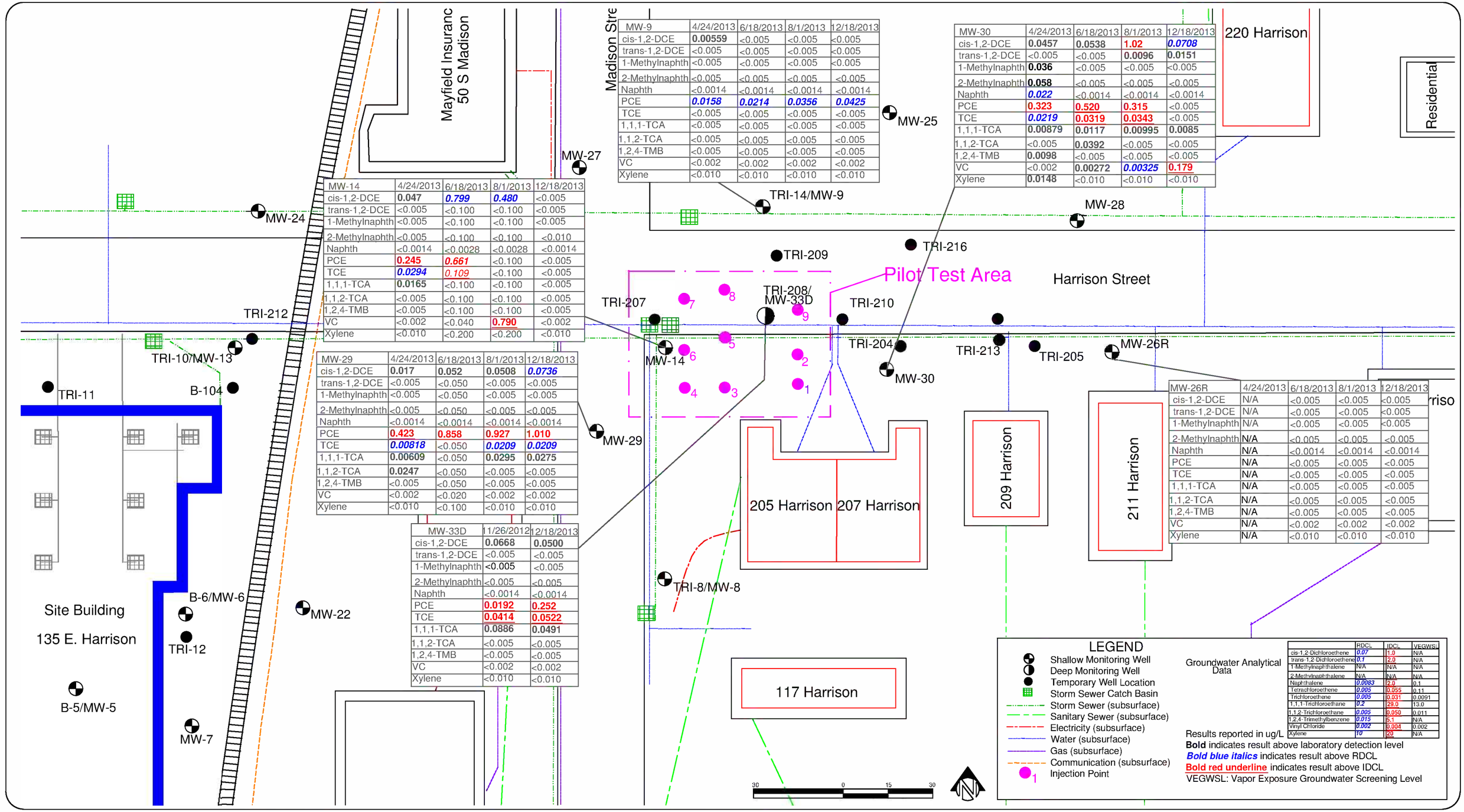
Pilot Test Site Vicinity and Utility Map

Indiana Machine Works
135 East Harrison Street
Mooresville, IN

Project Number:	95.05
Drawing File:	*Site Map*
Date:	October 11, 2013
Scale:	1"= 60'
Drawn By: MR	*Checked by:* DN

TROY RISK INC.

Figure: 2



Pilot Test Groundwater Analytical Results Map

March, June, August, & December 2013

Indiana Machine Works
135 East Harrison Street
Mooresville, IN

Project Number:	95.05
Drawing File:	Hist Soil Detail
Date:	January 20, 2014
Scale:	1"= 30'
Drawn By: MR	*Checked by:* DN

TROY RISK INC.

Figure: 3

TRI-207	9/17/12		7/31/13
	8-10'	18-20'	8-10'
c-DCE	**0.08**	<0.006	**0.0739**
t-DCE	<0.006	<0.006	<0.006
MC	<0.024	<0.006	**0.0537**
TCE	***0.107***	<0.006	***0.038***
PCE	**13.9**	<0.006	**49.3**
VC	<0.002	<0.002	<0.002

TRI-208	9/17/12		7/31/13
	4-6'	26-28'	4-6'
c-DCE	<0.006	**0.0152**	**0.0094**
t-DCE	<0.006	<0.006	<0.006
MC	<0.006	<0.006	<0.006
TCE	<0.006	**0.0452**	<0.006
PCE	***0.109***	**0.866**	**0.0267**
VC	<0.002	<0.002	<0.002

Mayfield Insuranc
50 S Madison
Madison Stre
220 Harrison
Residential
MW-25
MW-27
MW-24
TRI-14/MW-9
MW-28
TRI-209
TRI-216
Pilot Test Area
Harrison Street
TRI-207
TRI-208/
MW-33D
TRI-210
TRI-212
TRI-206
TRI-10/MW-13
TRI-11
B-104
MW-14
TRI-204
TRI-213
TRI-205
MW-26R
MW-30
155 E Harrison
MW-29
205 Harrison
207 Harrison
209 Harrison
211 Harrison
221 Harriso
TRI-8/MW-8
B-6/MW-6
MW-22
Site Building
135 E. Harrison
TRI-12
TRI-201
117 Harrison
B-5/MW-5
MW-7

30 0 15 30

LEGEND

- Shallow Monitoring Well
- Deep Monitoring Well
- Temporary Well Location
- Storm Sewer Catch Basin
- Storm Sewer (subsurface)
- Sanitary Sewer (subsurface)
- Electricity (subsurface)
- Water (subsurface)
- Gas (subsurface)
- Communication (subsurface)
- 1 Injection Point

Soil Analytical Data

	RDCL	IDCL
c-DCE	***0.4***	5.8
t-DCE	***0.68***	14
MC	***1.9***	280
TCE	***0.058***	0.640
PCE	***0.057***	0.350
VC	***0.013***	0.027

Results reported in mg/kg
c-DCE: cis-1,2-Dichloroethene
t-DCE: trans-1,2-Dichloroethene
MC: Methyl Chloroform
TCE: Trichloroethene
PCE: Tetrachloroethene
VC: Vinyl Chloride

Bold indicates result above laboratory detection level
Bold blue italics indicates result above RDCL
Bold red underline indicates result above IDCL
RDCL: Residential Default Closure Level
IDCL: Industrial Default Closure Level

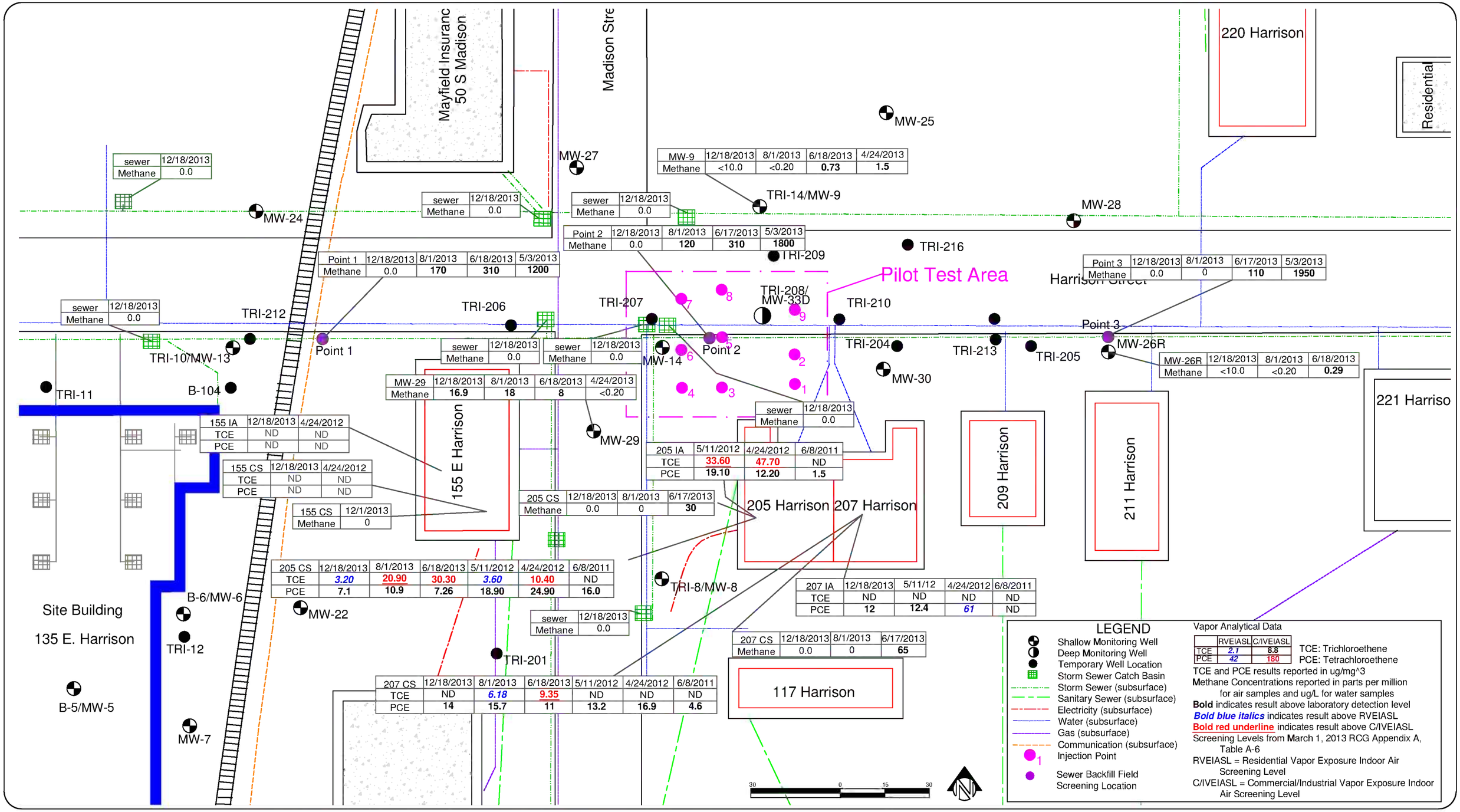
Pilot Test Soil Analytical Results Map

Indiana Machine Works
135 East Harrison Street
Mooresville, IN

Project Number:	95.05
Drawing File:	*Hist Soil Detail*
Date:	October 11, 2013
Scale:	1"= 30'
Drawn By: MR	*Checked by:* DN

FROM RISK INC.

Figure: 4



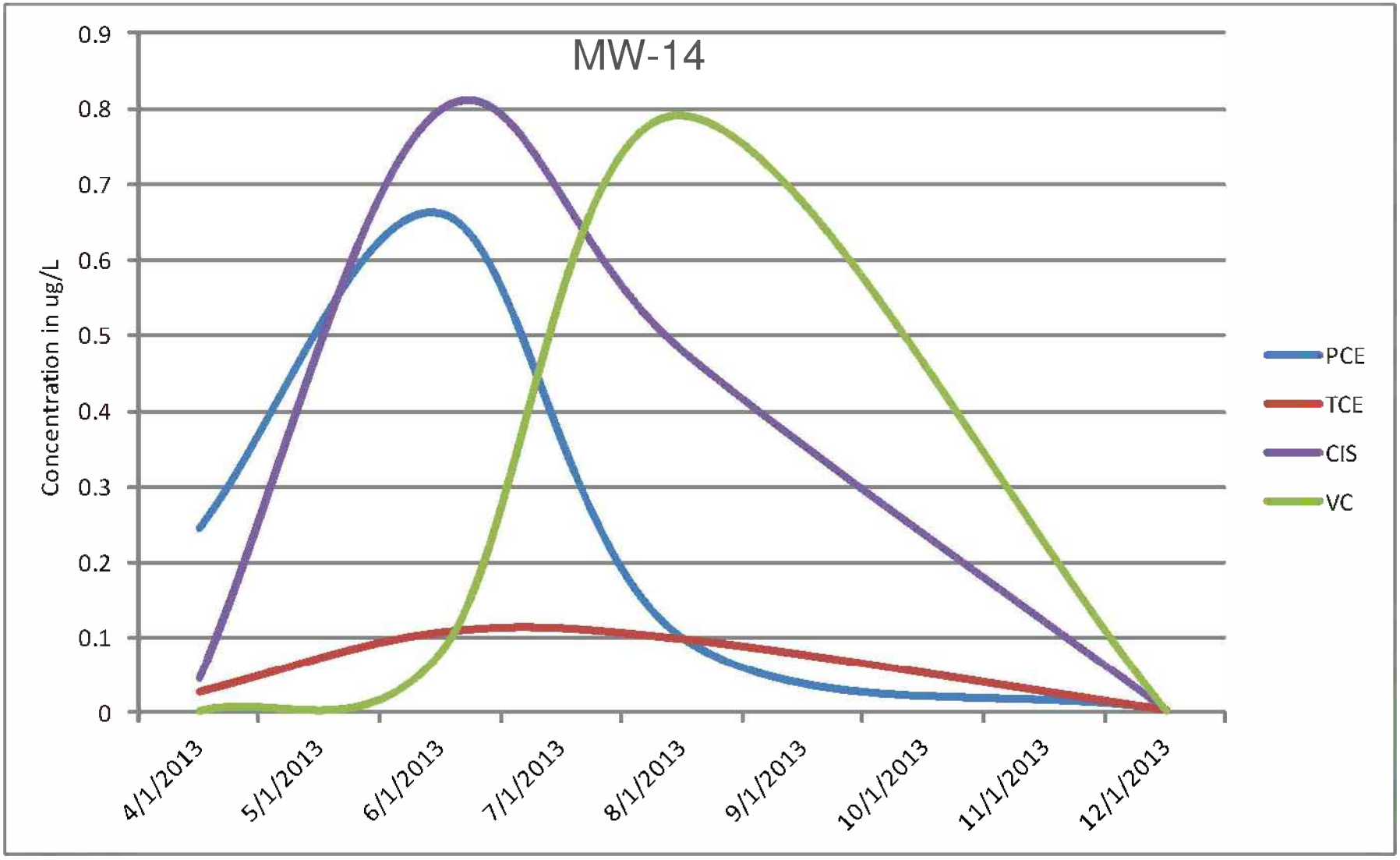
Pilot Test Vapor Intrusion Analytical Results Map

Indiana Machine Works
135 East Harrison Street
Mooresville, IN

Project Number:	95.05
Drawing File:	Hist Soil Detail
Date:	January 16, 2014
Scale:	1"= 30'
Drawn By: MR	*Checked by:* DN

TROY RISK INC.

Figure: 5



Data from groundwater sampling events on:
4/24/2013, 6/18/2013, 8/1/2013, and 12/18/2013

PCE: Tetrachloroethene
TCE: Trichloroethene

CIS: cis-1,2-Dichloroethene
VC: Vinyl Chloride

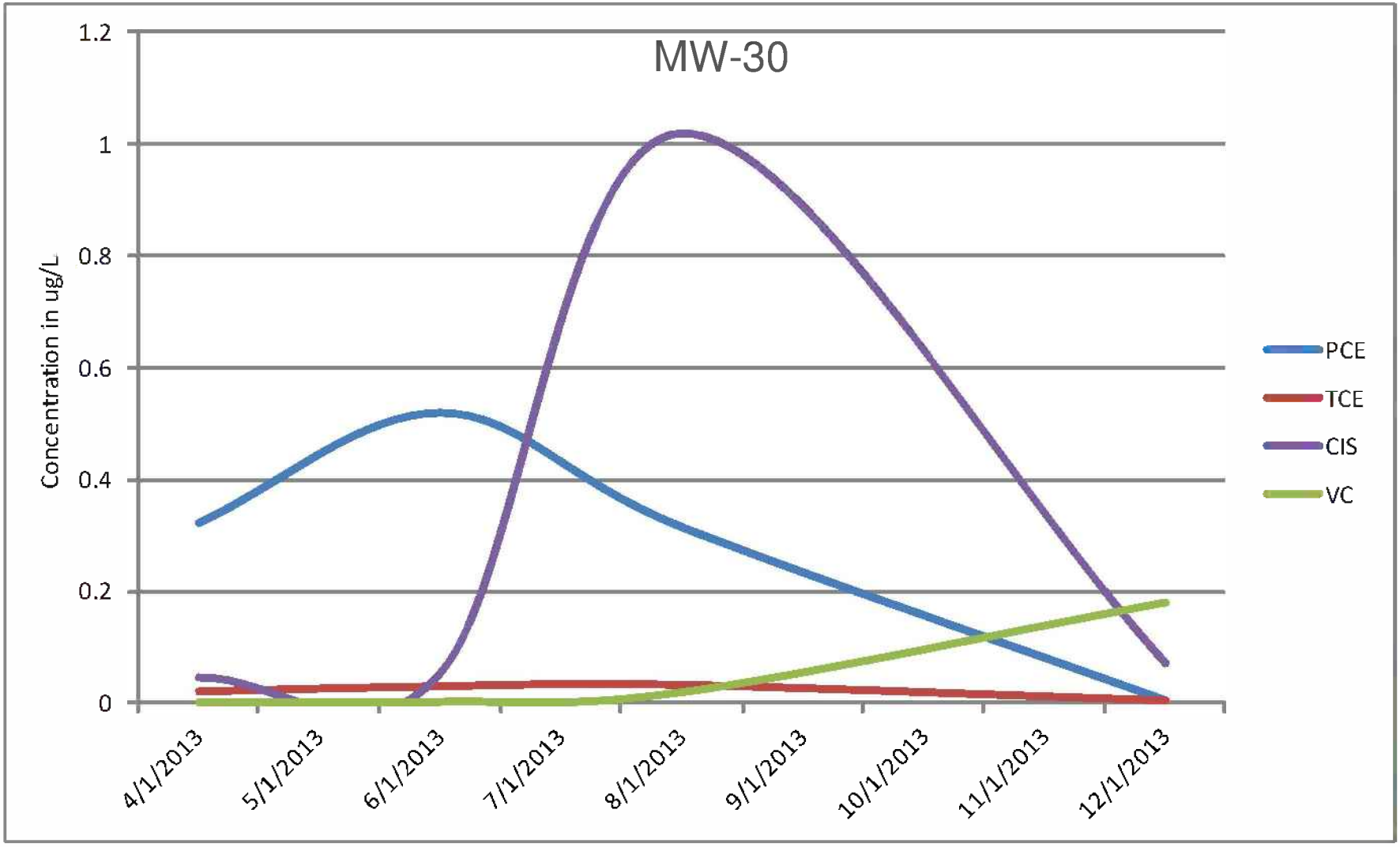
MW-14 CVOC Trend Graph

Indiana Machine Works
135 East Harrison Street
Mooresville, IN

Project Number:	95.05
Drawing File:	Site Map
Date:	January 16, 2014
Scale:	N/A
Drawn By: MR	*Checked by:* JO

TROY RISK INC.

Figure: 6



Data from groundwater sampling events on:
4/24/2013, 6/18/2013, 8/1/2013, and 12/18/2013

PCE: Tetrachloroethene
TCE: Trichloroethene

CIS: cis-1,2-Dichloroethene
VC: Vinyl Chloride

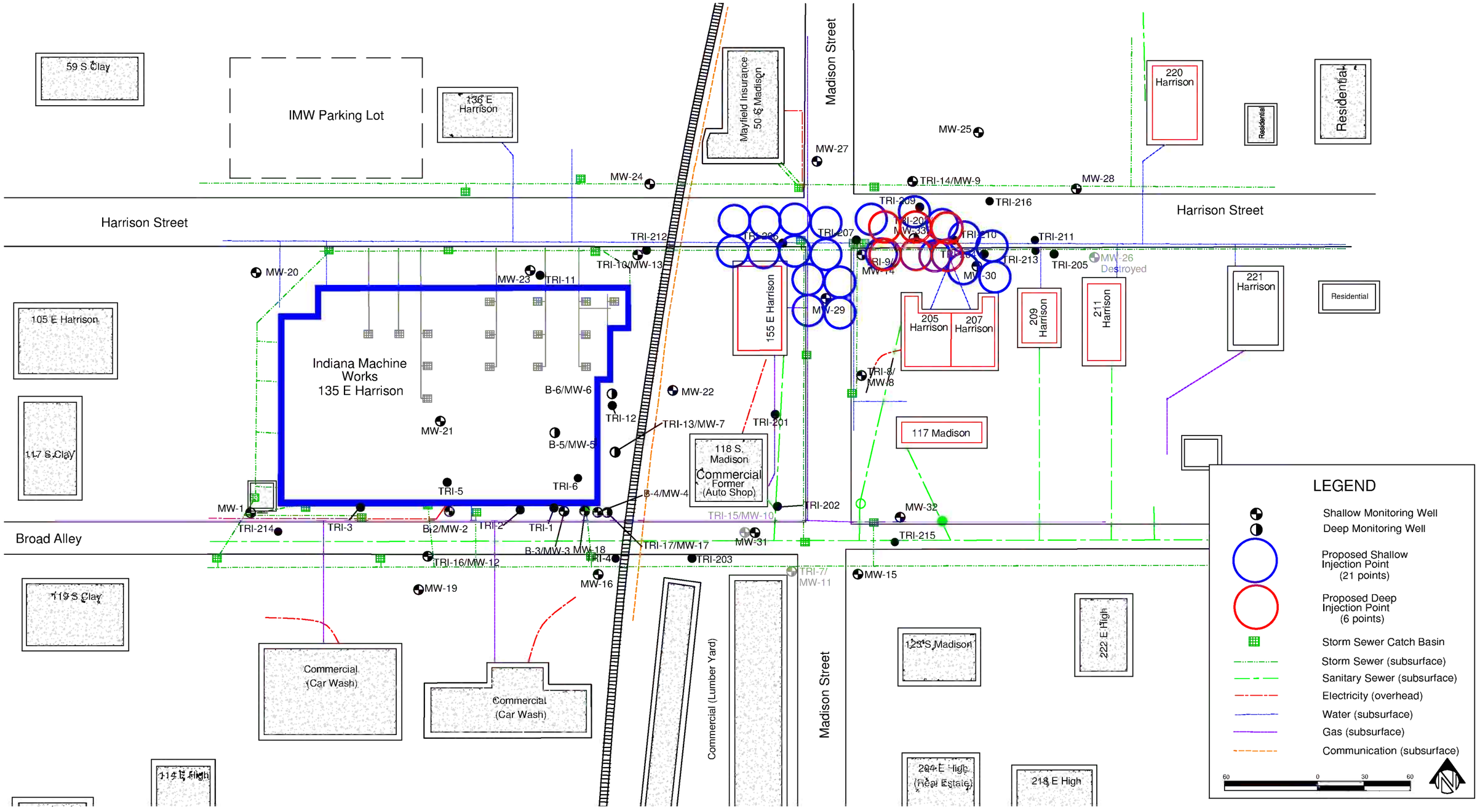
MW-30 CVOC Trend Graph

Indiana Machine Works
135 East Harrison Street
Mooresville, IN

Project Number:	95.05
Drawing File:	Site Map
Date:	January 16, 2014
Scale:	N/A
Drawn By: MR *Checked by:* JO	

TROY RISK INC.

Figure: 7



Plume 2 Proposed Full-Scale Treatment Plan

Indiana Machine Works
135 East Harrison Street
Mooresville, IN

Project Number:	95.05
Drawing File:	*Figures*
Date:	January 21, 2014
Scale:	1"= 60'
Drawn By: MR	*Checked by:* DN

TROY DESIGN INC.

Figure: 8

TABLES

Table 1. Groundwater Gauging Data
Indiana Machine Works
135 East Harrison Street, Mooresville, IN

Well ID	Top of Casing (ft)	Gauging Date	Depth to Water (ft)	Water Elevation (ft)	Screened Interval (ft bgs)
MW 1	94.68	7/19/2007	6.93	87.75	10-20
		11/5/2008	7.03	87.65	
		5/6/2009	6.48	88.20	
		5/1/2012	6.78	87.90	
MW 2	93.67	7/19/2007	5.34	88.33	10-20
		11/5/2008	5.44	88.23	
		5/6/2009	4.66	89.01	
		5/1/2012	5.04	88.63	
MW 3	93.55	7/19/2007	6.06	87.49	10-20
		11/5/2008	6.23	87.32	
		5/6/2009	4.88	88.67	
		5/1/2012	5.63	87.92	
MW 4	94.19	7/19/2007	6.86	87.33	10-20
		11/5/2008	6.32	87.87	
		5/6/2009	5.40	88.79	
		5/1/2012	5.92	88.27	
MW 5	94.12	7/19/2007	26.04	68.08	20-30
		11/5/2008	27.10	67.02	
		5/6/2009	22.37	71.75	
		5/1/2012	24.80	69.32	
		11/16/2012	25.21	68.91	
MW 6	94.05	7/19/2007	26.00	68.05	20-30
		11/5/2008	27.48	66.57	
		5/6/2009	25.28	68.77	
		5/1/2012	27.03	67.02	
		11/16/2012	25.22	68.83	
MW 7	94.11	7/19/2007	26.34	67.77	35-40
		11/5/2008	26.28	67.83	
		5/6/2009	22.73	71.38	
		5/1/2012	25.32	68.79	
		11/16/2012	25.54	68.57	
MW 8	91.28	7/19/2007	8.57	82.71	5-15
		11/5/2008	8.46	82.82	
		5/6/2009	4.85	86.43	
		5/1/2012	7.03	84.25	
		11/16/2012	7.15	84.13	
MW 9	91.07	7/19/2007	6.34	84.73	5-15
		11/5/2008	6.50	84.57	
		5/6/2009	4.23	86.84	
		5/1/2012	5.86	85.21	
		11/16/2012	5.28	85.79	
		4/24/2013	1.50	89.57	
		6/18/2013	5.39	85.68	
		8/1/2013	6.08	84.99	
		12/18/2013	5.86	85.21	
MW 10	92.94	7/19/2007	7.11	85.83	5-15
		11/5/2008	7.25	85.69	
		5/6/2009	5.65	87.29	
MW 11	92.38	7/19/2007	7.03	85.35	5-15

Table 1. Groundwater Gauging Data
Indiana Machine Works
135 East Harrison Street, Mooresville, IN

Well ID	Top of Casing (ft)	Gauging Date	Depth to Water (ft)	Water Elevation (ft)	Screened Interval (ft bgs)
MW-12	94.17	7/19/2007	5.65	88.52	5-15
		11/5/2008	5.45	88.72	
		5/6/2009	5.28	88.89	
		5/1/2012	5.48	88.69	
MW 13	93.87	7/19/2007	6.73	87.14	5-15
		11/5/2008	6.85	87.02	
		5/6/2009	3.49	90.38	
		5/1/2012	3.48	90.39	
MW 14	91.16	11/5/2008	9.03	82.13	5-15
		5/6/2009	5.10	86.06	
		5/1/2012	7.10	84.06	
		11/16/2012	7.23	83.93	
		4/24/2013	2.15	89.01	
		6/18/2013	6.56	84.60	
		8/1/2013	7.80	83.36	
		12/18/2013	7.18	83.98	
MW 15	91.48	11/5/2008	7.16	84.32	5-15
		5/6/2009	6.26	85.22	
		5/1/2012	6.70	84.78	
MW 16	94.19	11/5/2008	6.70	87.49	5-15
		5/6/2009	5.86	88.33	
		5/1/2012	6.13	88.06	
MW 17	93.15	11/5/2008	25.55	67.60	27-32
		5/6/2009	22.10	71.05	
		5/1/2012	27.04	66.11	
MW 18	92.63	11/5/2008	5.52	87.11	5-15
		5/6/2009	3.45	89.18	
		5/1/2012	4.25	88.38	
MW 19	95.015	11/5/2008	6.66	88.36	5-15
		5/6/2009	6.04	88.98	
		5/1/2012	6.33	88.69	
MW 20	95.515	11/5/2008	6.38	89.14	5-15
		5/6/2009	3.32	92.20	
		5/1/2012	5.02	90.50	
MW 21	94.125	11/5/2008	6.19	87.94	5-15
		5/6/2009	4.40	89.73	
		5/1/2012	5.49	88.64	
MW 22	93.35	11/5/2008	7.33	86.02	5-15
		5/6/2009	4.79	88.56	
		5/1/2012	7.56	85.79	
MW 23	94.845	8/27/2009	5.75	89.10	4.5-14.5
		5/1/2012	5.35	89.50	
MW 24	95.475	8/27/2009	7.11	88.37	5-15
		5/1/2012	6.45	89.03	
MW 25	90.92	8/27/2009	8.79	82.13	5-15
		5/1/2012	9.08	81.84	
		11/16/2012	5.45	85.47	
MW 26	88.525	8/27/2009	6.75	81.78	5-15
		5/1/2012	7.15	81.38	
		11/16/2012	1.9*	*	
MW-26R	89.68	4/24/2013	2.60	87.08	5-15
		6/18/2013	6.55	83.13	
		8/1/2013	7.92	81.76	
		12/18/2013	8.49	81.19	
MW-27	91.86	9/21/2012	5.53	86.33	3-13
		11/16/2012	5.38	86.48	
		4/24/2013	2.02	89.84	
		6/18/2013	5.45	86.41	
		8/1/2013	6.20	85.66	

Table 1. Groundwater Gauging Data
Indiana Machine Works
135 East Harrison Street, Mooresville, IN

Well ID	Top of Casing (ft)	Gauging Date	Depth to Water (ft)	Water Elevation (ft)	Screened Interval (ft bgs)
MW-28	90.21	9/21/2012	Dry	Dry	3-13
		11/16/2012	8.05	82.16	
		4/24/2013	2.71	87.50	
		6/18/2013	7.13	83.08	
		8/1/2013	8.52	81.69	
MW-29	91.69	9/21/2012	6.21	85.48	3-13
		11/16/2012	5.90	85.79	
		4/24/2013	2.29	89.40	
		6/18/2013	6.00	85.69	
		8/1/2013	6.78	84.91	
		12/18/2013	6.30	85.39	
MW-30	90.57	9/21/2012	8.02	82.55	3-13
		11/16/2012	7.57	83.00	
		4/24/2013	2.44	88.13	
		6/18/2013	6.99	83.58	
		8/1/2013	8.11	82.46	
		12/18/2013	8.18	82.39	
MW-31	92.66	9/21/2012	6.5	86.16	3-13
		11/16/2012	6.36	86.30	
MW-32	90.87	9/21/2012	7.49	83.38	3-13
		11/16/2012	7.05	83.82	
MW-33D	91.04	11/16/2012	20.76	70.28	22-27
		12/18/2013	21.21	69.83	

* Resident of the property destroyed this well

Table 2. Groundwater Analytical Data
Pilot Test Results
Indiana Machine Works
135 East Harrison Street, Mooresville, IN

Sample ID	Screen Interval	Date	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Tetrachloroethene	Trichloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,2,4-Trimethylbenzene	Vinyl Chloride	Xylene
MW-9	5-15	4/24/2013	**0.00559**	<0.005	<0.005	<0.005	<0.0014	**0.0158**	<0.005	<0.005	<0.005	<0.005	<0.002	<0.010
		6/18/2013	<0.005	<0.005	<0.005	<0.005	<0.0014	**0.0214**	<0.005	<0.005	<0.005	<0.005	<0.002	<0.010
		8/1/2013	<0.005	<0.005	<0.005	<0.005	<0.0014	**0.0356**	<0.005	<0.005	<0.005	<0.005	<0.002	<0.010
		12/18/2013	<0.005	<0.005	<0.005	<0.010	<0.0014	**0.0425**	<0.005	<0.005	<0.005	<0.005	<0.002	<0.010
MW-14	5-15	4/24/2013	**0.047**	<0.005	<0.005	<0.005	<0.0014	**0.245**	**0.0294**	**0.0165**	<0.005	<0.005	<0.002	<0.010
		6/18/2013	**0.799**	<0.100	<0.100	<0.100	<0.028	**0.661**	**0.109**	<0.100	<0.100	<0.100	<0.040	<0.200
		8/1/2013	**0.480**	<0.100	<0.100	<0.100	<0.028	<0.100	<0.100	<0.100	<0.100	<0.100	**0.790**	<0.200
		12/18/2013	<0.005	<0.005	<0.005	<0.010	<0.0014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.010
MW-26R	5-15	4/24/2013	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
		6/18/2013	<0.005	<0.005	<0.005	<0.005	<0.0014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.010
		8/1/2013	<0.005	<0.005	<0.005	<0.005	<0.0014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.010
		12/18/2013	<0.005	<0.005	<0.005	<0.010	<0.0014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.010
MW-29	3-13	4/24/2013	**0.017**	<0.005	<0.005	<0.005	<0.0014	**0.423**	**0.00818**	**0.00609**	**0.0247**	<0.005	<0.002	<0.010
		6/18/2013	**0.052**	<0.050	<0.050	<0.050	<0.0014	**0.858**	<0.050	<0.050	<0.050	<0.050	<0.020	<0.100
		8/1/2013	**0.0508**	<0.005	<0.005	<0.005	<0.0014	**0.927**	**0.0209**	**0.0295**	<0.005	<0.005	<0.002	<0.010
		12/18/2013	**0.0736**	<0.005	<0.005	<0.010	<0.0014	**1.010**	**0.0209**	**0.0275**	<0.005	<0.005	<0.002	<0.010
MW-30	3-13	4/24/2013	**0.0457**	<0.005	**0.036**	**0.058**	**0.022**	**0.323**	**0.0219**	**0.00879**	<0.005	**0.0098**	<0.002	**0.0148**
		6/18/2013	**0.0538**	<0.005	<0.005	<0.005	<0.0014	**0.520**	**0.0319**	**0.0117**	**0.0392**	<0.005	**0.00272**	<0.010
		8/1/2013	**1.02**	0.0096	<0.005	<0.005	<0.0014	**0.315**	**0.0343**	**0.00995**	<0.005	<0.005	**0.00325**	<0.010
		12/18/2013	**0.0708**	**0.0151**	<0.005	<0.010	<0.0014	<0.005	<0.005	**0.0085**	<0.005	<0.005	**0.179**	<0.010
MW-33D	22-27	11/16/2012	**0.0668**	<0.005	<0.005	<0.005	<0.0014	**0.192**	**0.0414**	**0.0886**	<0005	<0.005	<0.002	<0.010
		12/18/2013	**0.0500**	<0.005	<0.005	<0.010	<0.0014	**0.252**	**0.0522**	**0.0491**	<0.005	<0.005	<0.002	<0.010
RISC RDCL			**0.07**	**0.1**	**N/A**	**N/A**	**0.0083**	**0.005**	**0.005**	**0.2**	**0.005**	**0.016**	**0.002**	**10**
RISC IDCL			***1.0***	**2.0**	**N/A**	**N/A**	**2.0**	**0.055**	**0.031**	**29.0**	**0.050**	**5.1**	**0.004**	**20**
RCG RVEGWSL			***N/A***	**N/A**	**N/A**	**N/A**	**0.1**	**0.11**	**0.0091**	**13.0**	**0.011**	**N/A**	**0.002**	**N/A**

Results reported in mg/L
Bold results exceed method detection limit
Yellow highlighted results exceed their RISC RDCL
Orange highlighted results exceed their RISC IDCL
RISC RDCL = Risk Integrated System of Closure Residential Default Closure Level
RISC IDCL = Risk Integrated System of Closure Industrial/Commercial Default Closure Level
RCG RVEGWSL = Remediation Closure Guide Residential Vapor Exposure Groundwater Screening Level

Table 3. Groundwater Volatile Fatty Acids and Other Data
Indiana Machine Works
135 East Harrison Street, Mooresville, IN

Sample ID	Screen Interval	Date	Lactic	Acetic	Propionic	Formic	Butyric	Pyruvic	i-Pentanoic	Pentanoic	i-Hexanoic	Hexanoic	Methane	Ethane	Ethene	Dissolved Iron	Total Iron
MW-9	5-15	4/24/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.5**	<0.2	<0.2	**200**	**4,600**
		6/18/2013	<0.10	<0.070	<0.050	<0.10	<0.050	<0.15	<0.15	<0.070	<0.10	<0.50	**0.73**	<0.20	<0.20	<100	**6,400**
		8/1/2013	<0.10	<0.070	**0.083**	<0.10	<0.050	<0.15	<0.15	<0.070	<0.10	<0.50	<0.20	<0.20	<0.20	<100	**1,800**
		12/18/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<10.0	<10.0	<10.0	NA	NA
MW-14	5-15	4/24/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	<0.2	<0.2	**130**	**1,800**
		6/18/2013	<100	**1,800**	**13,000**	<100	**440**	**51**	**40**	**82**	<10	<50	**44**	**1.6**	**4.2**	**98,000**	**123,000**
		8/1/2013	**1,100**	**2,900**	**9,900**	**180**	**350**	**67**	**54**	**120**	**2.7**	**5.5**	**2,900**	**2.6**	**240**	**77,000**	**160,000**
		12/18/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**28,100**	<10.0	**46.0**	NA	NA
MW-26R	5-15	4/24/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		6/18/2013	<0.10	<0.070	<0.050	<0.10	<0.050	<0.15	<0.15	<0.070	<0.10	<0.50	**0.29**	<0.20	<0.20	**170**	**13,000**
		8/1/2013	<0.10	<0.070	<0.050	<0.10	<0.050	<0.15	<0.15	<0.070	<0.10	<0.50	<0.20	<0.20	<0.20	**240**	**30,000**
		12/18/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<10.0	<10.0	<10.0	NA	NA
MW-29	3-13	4/24/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	<0.2	<0.2	**110**	**3,500**
		6/18/2013	<0.15	**0.073**	<0.050	**0.15**	<0.050	<0.15	<0.15	<0.070	<0.10	<0.50	**8**	<0.20	<0.20	**112**	**7,800**
		8/1/2013	<0.10	**0.18**	**0.38**	<0.10	**0.061**	<0.15	<0.15	<0.070	<0.10	<0.50	**18**	<0.20	<0.20	<100	**6,800**
		12/18/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**16.9**	<10.0	<10.0	NA	NA
MW-30	3-13	4/24/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2,800**	**4.2**	**0.24**	<100	**3,800**
		6/18/2013	<0.10	<0.070	<0.050	**0.12**	<0.050	<0.15	<0.15	<0.070	<0.10	<0.50	**4,200**	**3.4**	**0.24**	<100	**7,700**
		8/1/2013	<0.10	<0.070	<0.050	<0.10	<0.050	<0.15	<0.15	<0.070	<0.10	<0.50	**2,200**	**1.9**	**0.9**	**100**	**4,000**
		12/18/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**16,400**	<10.0	**1,930**	NA	NA
MW-33D	22-27	12/18/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**68.1**	<10.0	<10.0	NA	NA
Residential Tap																**11,000**	**N/A**
Residential VEGWSL																**N/A**	**N/A**

Volatile Fatty Acid and Total Iron results reported in mg/L
Iron, Methane, Ethane, Ethene reported in ug/L
Bold results exceed the method detection limit
Yellow highlighted results exceed their residential tap water screening level

Table 4. Groundwater Chemistry Data
Indiana Machine Works
135 East Harrison Street, Mooresville, IN

Well	Date	pH (Std. Units) meter: Horiba		Spec. Conductivity (mS/cm) meter: Horiba		Redox Potential (mv) meter: Horiba		Dissolved Oxygen mg/l meter: Horiba		Turbidity (NTU) meter: Hanna		Temperature °C meter: Horiba	
		Reading	Δ	Reading	Δ	Reading	Δ	Reading	Δ	Reading	Δ	Reading	Δ
MW-9	4/24/2013	6.23		0.749		249.00		14.76		478.00		12.51	
	6/18/2013	7.55	1.32	1.19	0.44	138.00	-111.00	5.47	-9.29	931.00	453.00	22.88	10.37
	8/1/2013	7.78	0.23	1.36	0.17	61.00	-77.00	11.29	5.82	560.00	-371.00	25.00	2.12
	12/18/2013	8.29	0.51	0.958	-0.40	208.00	147.00	5.10	-6.19	344.00	-216.00	11.33	-13.67
MW-14	4/24/2013	6.98		2.65		223.00		7.19		567.00		11.74	
	6/18/2013	6.96	-0.02	13.7	11.05	-115.00	-338.00	4.76	-2.43	483.00	-84.00	21.30	9.56
	8/1/2013	7.47	0.51	13.2	-0.50	-145.00	-30.00	8.13	3.37	0.45	-482.55	20.31	-0.99
	12/18/2013	8.29	0.82	5.48	-7.72	-56.00	89.00	4.01	-4.12	390.00	389.55	10.57	-9.74
MW-26R	4/24/2013	NA		NA		NA		NA		NA		NA	
	6/18/2013	7.71		0.67		124		5.74		352.00		18.63	
	8/1/2013	7.75	0.04	0.644	-0.03	146	22.00	4.90	-0.84	595.00	243.00	19.60	0.97
	12/18/2013	8.4	0.65	0.764	0.12	103	-43.00	9.49	4.59	519.00	-76.00	11.97	-7.63
MW-29	4/24/2013	6.55		1.21		232.00		4.39		805.00		11.90	
	6/18/2013	7.51	0.96	0.982	-0.23	154.00	-78.00	10.28	5.89	786.00	-19.00	20.86	8.96
	8/1/2013	7.84	0.33	1.05	0.07	88.00	-66.00	7.82	-2.46	913.00	127.00	22.39	1.53
	12/18/2013	8.03	0.19	1.2	0.15	193.00	105.00	9.10	1.28	403.00	-510.00	12.37	-10.02
MW-30	4/24/2013	6.83		1.16		236.00		10.13		621.00		11.34	
	6/18/2013	7.19	0.36	1.62	0.46	101.00	-135.00	2.93	-7.20	867.00	246.00	21.90	10.56
	8/1/2013	6.83	-0.36	1.30	-0.32	91.00	-10.00	11.55	8.62	NA		20.61	-1.29
	12/18/2013	8.14	1.31	1.91	0.61	-106.00	-197.00	3.62	-7.93	375.00		12.38	-8.23
MW-33D	12/18/2013	8.39		1.36		240.00		4.42		665.00		14.43	

Table 5. Historical Soil Analytical Data
Indiana Machine Works
135 East Harrison Street, Mooresville, IN

Boring ID	Depth	Date	Chloroform	Chloromethane	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene Chloride	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl Chloride
TRI-207	8-10	9/17/2012	<0.006	<0.006	<0.006	<0.006	**0.08**	<0.006	<0.024	**13.9**	**0.0249**	**0.107**	<0.002
TRI-207PT	8-10	7/31/2013	<0.006	<0.006	<0.006	<0.006	**0.0739**	<0.006	<0.022	**49.3**	**0.0537**	**0.038**	<0.002
TRI-207	18-20	9/17/2012	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.023	<0.006	<0.006	<0.006	<0.002
TRI-208	4-6	9/17/2012	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.024	**0.109**	<0.006	<0.006	<0.002
TRI-208PT	4-6	7/31/2013	<0.006	<0.006	<0.006	<0.006	**0.0094**	<0.006	<0.024	**0.0267**	<0.006	<0.006	<0.002
TRI-208	26-28	9/17/2012	<0.006	<0.006	<0.006	<0.006	**0.0152**	<0.006	<0.024	**0.866**	**0.0112**	**0.0452**	<0.002
TRI-208A	14-16	11/9/2012	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.022	<0.005	<0.005	<0.005	<0.002
TRI-208A	26-28	11/9/2012	<0.006	<0.006	<0.006	<0.006	**0.0165**	<0.006	<0.023	**2.19**	**0.0144**	**0.0672**	<0.002
Duplicate	26-28	11/9/2012	<0.006	<0.006	<0.006	<0.006	**0.0191**	<0.006	<0.023	**2.04**	**0.0236**	**0.0661**	<0.002
TRI-208A	30-32	9/17/2012	<0.006	<0.006	<0.006	<0.006	**0.00607**	<0.006	<0.024	<0.006	**0.0495**	**0.0975**	<0.002
RISC RDCL			**0.47**	**NE**	**5.6**	**0.058**	**0.4**	**0.68**	**0.023**	**0.058**	**1.9**	**0.057**	**0.013**
RISC IDCL			**4.7**	**NE**	**58**	**42**	**5.8**	**14**	**1.8**	**0.640**	**280**	**0.350**	**0.027**

All results reported in mg/kg
RISC RDCL = Risk Integrated System of Closure Residential Default Closure Level
RISC IDCL = Risk Integrated System of Closure Industrial/Commercial Default Closure Level
Bold results exceed the method detection limit
Yellow highlighted results exceed their RDCL
Orange highlighted results exceed their IDCL

Table 6
ISCR Pilot Test Vapor Intrusion Analytical Data
Indiana Machine Works

Location ID	Sample ID	Sample Type	Date	Tetrachloroethene	Trichloroethylene	Vinyl Chloride	cis-Dichloroethene
155 E Harrison St	155IA	Indoor Air	4/24/2012	ND	ND	ND	ND
	DUP	IA Duplicate	4/24/2012	ND	ND	ND	ND
	155:IA	Indoor Air	12/18/2013	ND	ND	ND	ND
	155C	Crawl Space	4/24/2012	ND	ND	ND	ND
	155:CS	Crawl Space	12/18/2013	ND	ND	ND	ND
205 E Harrison St	205IA	Indoor Air	6/8/2011	**1.5**	ND	ND	ND
	DUP	IA Duplicate	6/8/2011	**1.4**	ND	ND	ND
	205IA	Indoor Air	4/24/2012	**12.20**	**47.70**	ND	ND
	205IA	Indoor Air	5/11/2012	**19.10**	**33.60**	ND	ND
	205:IA	Indoor Air	12/18/2013*	NS	NS	NS	NS
	205C	Crawl Space	6/8/2011	**16.0**	ND	ND	ND
	205C	Crawl Space	4/24/2012	**24.90**	**10.40**	ND	ND
	205C	Crawl Space	5/11/2012	**18.90**	**3.60**	ND	ND
	205 CRAWL	Crawl Space	6/18/2013	**7.26**	**30.30**	ND	ND
	205 CRAWL	Crawl Space	8/1/2013	**10.9**	**20.90**	ND	ND
	205:CS	Crawl Space	12/18/2013	**7.1**	**3.20**	ND	ND
207 E Harrison St	207IA	Indoor Air	6/8/2011	ND	ND	ND	ND
	207IA	Indoor Air	4/24/2012	**61.0**	ND	ND	ND
	207IA	Indoor Air	5/11/2012	**12.4**	ND	ND	ND
	DUPLICATE	IA Duplicate	5/11/2012	**13.2**	ND	ND	ND
	207:IA	Indoor Air	12/18/2013	**12**	ND	ND	ND
	207C	Crawl Space	6/8/2011	**4.6**	ND	ND	ND
	207C	Crawl Space	4/24/2012	**16.9**	ND	ND	ND
	207C	Crawl Space	5/11/2012	**13.2**	ND	ND	ND
	207 CRAWL	Crawl Space	6/18/2013	**11.0**	**9.35**	ND	ND
	207 CRAWL	Crawl Space	8/1/2013	**15.7**	**6.18**	ND	ND
	207:CS	Crawl Space	12/18/2013	**14**	ND	ND	ND
Ambient Air	AMB	Ambient	6/18/2013	ND	ND	ND	ND
Ambient Air	Ambient	Ambient	8/1/2013	ND	ND	ND	ND
Ambient Air	AMB	Ambient	12/18/2013	ND	ND	ND	ND
RCG RVEIASL				**42**	**2.1**	**1.61**	NA

Results shown in µg/m3
ND = Not Detected at Method Detection Limit
RCG RVEIASL = Remediation Closure Guide Residential Vapor Exposure Indoor Air Screening Level
Bold results exceed the Laboratory MDL
Yellow highlighted results **e**xceed their IDEM RCG RVEIASL
* Resident was not available for an indoor air sample to be collected

Table 7
Field Readings
Indiana Machine Works
135 East Harrison Street, Mooresville, IN

Location ID	Date	Methane	Oxygen	Carbon Monoxide
155 E Harrison St Crawl Space	12/1/2013	0	21.3%	0.1
205 E Harrison St Crawl Space	6/17/2013	30	20.1%	0
	8/1/2013	0	20.9%	0
	12/18/2013	0	21.4%	0.1
207 E Harrison St Crawl Space	6/17/2013	65	20.1%	0
	8/1/2013	0	20.9%	0
	12/18/2013	0	21.5%	0.1
Point 1 (West)	5/3/2013	1200	18.8%	0
	6/18/2013	310	17.9%	0
	8/1/2013	170	18.9%	0
	12/18/2013	0	21.1%	0.3
Point 2 (Middle)	5/3/2013	1800	17.1%	85
	6/17/2013	310	19.1%	0
	8/1/2013	120	20.0%	0
	12/18/2013	0	21.4%	0.1
Point 3 (East)	5/3/2013	1950	19.2%	107
	6/17/2013	110	13.2%	0
	8/1/2013	0	13.1%	0
	12/18/2013	0	18.9%	0.7

Methane and carbon monoxide results shown in parts per million (ppm)

APPENDIX A

07-Jan-2014

Jeff Okeefe
Troy Risk, Inc.
7466 Shadeland Station Way
Indianapolis, IN 46256-3925

Tel: (314) 570-6732
Fax: (317) 570-6731

Re: IMW Work Order: **1312613**

Dear Jeff,

ALS Environmental received 6 samples on 20-Dec-2013 04:11 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 13.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Chris Gibson

Electronically approved by: Chris Gibson

Chris Gibson
Project Manager

ALS Environmental

Date: 07-Jan-14

Client: Troy Risk, Inc.
Project: IMW
Work Order: **1312613**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1312613-01	AMB	Air		12/18/2013 14:00	12/20/2013 16:11	☐
1312613-02	155:IA	Air		12/18/2013 15:00	12/20/2013 16:11	☐
1312613-03	155:CS	Air		12/18/2013 15:30	12/20/2013 16:11	☐
1312613-04	207:IA	Air		12/18/2013 15:40	12/20/2013 16:11	☐
1312613-05	207:CS	Air		12/18/2013 15:50	12/20/2013 16:11	☐
1312613-06	205:CS	Air		12/18/2013 15:55	12/20/2013 16:11	☐

ALS Environmental

Date: 07-Jan-14

Client: Troy Risk, Inc.
Project: IMW
Work Order: 1312613

Case Narrative

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

ALS Environmental

Date: *07-Jan-14*

Client: Troy Risk, Inc.
Project: IMW
Sample ID: AMB
Collection Date: 12/18/2013 02:00 PM

Work Order: 1312613
Lab ID: 1312613-01
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
cis-1,2-Dichloroethene	ND		0.50	ppbv	1	12/26/2013 02:50 PM
Tetrachloroethene	ND		0.50	ppbv	1	12/26/2013 02:50 PM
trans-1,2-Dichloroethene	ND		0.50	ppbv	1	12/26/2013 02:50 PM
Trichloroethene	ND		0.20	ppbv	1	12/26/2013 02:50 PM
Vinyl chloride	ND		0.50	ppbv	1	12/26/2013 02:50 PM
Surr: Bromofluorobenzene	*101*		*60-140*	*%REC*	1	12/26/2013 02:50 PM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
cis-1,2-Dichloroethene	ND		2.0	µg/m3	1	12/26/2013 02:50 PM
Tetrachloroethene	ND		3.4	µg/m3	1	12/26/2013 02:50 PM
trans-1,2-Dichloroethene	ND		2.0	µg/m3	1	12/26/2013 02:50 PM
Trichloroethene	ND		1.1	µg/m3	1	12/26/2013 02:50 PM
Vinyl chloride	ND		1.3	µg/m3	1	12/26/2013 02:50 PM
Surr: Bromofluorobenzene	*101*		*60-140*	*%REC*	1	12/26/2013 02:50 PM

Note:

ALS Environmental

Date: *07-Jan-14*

Client: Troy Risk, Inc.
Project: IMW
Sample ID: 155:IA
Collection Date: 12/18/2013 03:00 PM

Work Order: 1312613
Lab ID: 1312613-02
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
cis-1,2-Dichloroethene	ND		0.50	ppbv	1	12/26/2013 03:34 PM
Tetrachloroethene	ND		0.50	ppbv	1	12/26/2013 03:34 PM
trans-1,2-Dichloroethene	ND		0.50	ppbv	1	12/26/2013 03:34 PM
Trichloroethene	ND		0.20	ppbv	1	12/26/2013 03:34 PM
Vinyl chloride	ND		0.50	ppbv	1	12/26/2013 03:34 PM
Surr: Bromofluorobenzene	*102*		*60-140*	*%REC*	1	12/26/2013 03:34 PM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
cis-1,2-Dichloroethene	ND		2.0	µg/m3	1	12/26/2013 03:34 PM
Tetrachloroethene	ND		3.4	µg/m3	1	12/26/2013 03:34 PM
trans-1,2-Dichloroethene	ND		2.0	µg/m3	1	12/26/2013 03:34 PM
Trichloroethene	ND		1.1	µg/m3	1	12/26/2013 03:34 PM
Vinyl chloride	ND		1.3	µg/m3	1	12/26/2013 03:34 PM
Surr: Bromofluorobenzene	*102*		*60-140*	*%REC*	1	12/26/2013 03:34 PM

Note:

ALS Environmental

Date: *07-Jan-14*

Client: Troy Risk, Inc.
Project: IMW
Sample ID: 155:CS
Collection Date: 12/18/2013 03:30 PM

Work Order: 1312613
Lab ID: 1312613-03
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
cis-1,2-Dichloroethene	ND		0.50	ppbv	1	12/27/2013 04:37 PM
Tetrachloroethene	ND		0.50	ppbv	1	12/27/2013 04:37 PM
trans-1,2-Dichloroethene	ND		0.50	ppbv	1	12/27/2013 04:37 PM
Trichloroethene	ND		0.20	ppbv	1	12/27/2013 04:37 PM
Vinyl chloride	ND		0.50	ppbv	1	12/27/2013 04:37 PM
Surr: Bromofluorobenzene	*102*		*60-140*	*%REC*	1	12/27/2013 04:37 PM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
cis-1,2-Dichloroethene	ND		2.0	µg/m3	1	12/27/2013 04:37 PM
Tetrachloroethene	ND		3.4	µg/m3	1	12/27/2013 04:37 PM
trans-1,2-Dichloroethene	ND		2.0	µg/m3	1	12/27/2013 04:37 PM
Trichloroethene	ND		1.1	µg/m3	1	12/27/2013 04:37 PM
Vinyl chloride	ND		1.3	µg/m3	1	12/27/2013 04:37 PM
Surr: Bromofluorobenzene	*102*		*60-140*	*%REC*	1	12/27/2013 04:37 PM

Note:

ALS Environmental

Date: *07-Jan-14*

Client: Troy Risk, Inc.
Project: IMW
Work Order: 1312613
Sample ID: 207:IA
Lab ID: 1312613-04
Collection Date: 12/18/2013 03:40 PM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
cis-1,2-Dichloroethene	ND		0.50	ppbv	1	12/26/2013 04:15 PM
Tetrachloroethene	**1.8**		**0.50**	**ppbv**	1	12/26/2013 04:15 PM
trans-1,2-Dichloroethene	ND		0.50	ppbv	1	12/26/2013 04:15 PM
Trichloroethene	ND		0.20	ppbv	1	12/26/2013 04:15 PM
Vinyl chloride	ND		0.50	ppbv	1	12/26/2013 04:15 PM
Surr: Bromofluorobenzene	*104*		*60-140*	*%REC*	1	12/26/2013 04:15 PM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
cis-1,2-Dichloroethene	ND		2.0	µg/m3	1	12/26/2013 04:15 PM
Tetrachloroethene	**12**		**3.4**	**µg/m3**	1	12/26/2013 04:15 PM
trans-1,2-Dichloroethene	ND		2.0	µg/m3	1	12/26/2013 04:15 PM
Trichloroethene	ND		1.1	µg/m3	1	12/26/2013 04:15 PM
Vinyl chloride	ND		1.3	µg/m3	1	12/26/2013 04:15 PM
Surr: Bromofluorobenzene	*104*		*60-140*	*%REC*	1	12/26/2013 04:15 PM

Note:

ALS Environmental

Date: *07-Jan-14*

Client: Troy Risk, Inc.
Project: IMW
Sample ID: 207:CS
Collection Date: 12/18/2013 03:50 PM

Work Order: 1312613
Lab ID: 1312613-05
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
cis-1,2-Dichloroethene	ND		0.50	ppbv	1	12/27/2013 05:18 PM
Tetrachloroethene	**2.1**		**0.50**	**ppbv**	1	12/27/2013 05:18 PM
trans-1,2-Dichloroethene	ND		0.50	ppbv	1	12/27/2013 05:18 PM
Trichloroethene	ND		0.20	ppbv	1	12/27/2013 05:18 PM
Vinyl chloride	ND		0.50	ppbv	1	12/27/2013 05:18 PM
Surr: Bromofluorobenzene	*105*		*60-140*	*%REC*	1	12/27/2013 05:18 PM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
cis-1,2-Dichloroethene	ND		2.0	µg/m3	1	12/27/2013 05:18 PM
Tetrachloroethene	**14**		**3.4**	**µg/m3**	1	12/27/2013 05:18 PM
trans-1,2-Dichloroethene	ND		2.0	µg/m3	1	12/27/2013 05:18 PM
Trichloroethene	ND		1.1	µg/m3	1	12/27/2013 05:18 PM
Vinyl chloride	ND		1.3	µg/m3	1	12/27/2013 05:18 PM
Surr: Bromofluorobenzene	*105*		*60-140*	*%REC*	1	12/27/2013 05:18 PM

Note:

ALS Environmental

Date: *07-Jan-14*

Client: Troy Risk, Inc.
Project: IMW
Work Order: 1312613
Sample ID: 205:CS
Lab ID: 1312613-06
Collection Date: 12/18/2013 03:55 PM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
cis-1,2-Dichloroethene	ND		0.50	ppbv	1	12/27/2013 05:59 PM
Tetrachloroethene	**1.0**		**0.50**	**ppbv**	1	12/27/2013 05:59 PM
trans-1,2-Dichloroethene	ND		0.50	ppbv	1	12/27/2013 05:59 PM
Trichloroethene	**0.59**		**0.20**	**ppbv**	1	12/27/2013 05:59 PM
Vinyl chloride	ND		0.50	ppbv	1	12/27/2013 05:59 PM
Surr: Bromofluorobenzene	*100*		*60-140*	*%REC*	1	12/27/2013 05:59 PM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
cis-1,2-Dichloroethene	ND		2.0	µg/m3	1	12/27/2013 05:59 PM
Tetrachloroethene	**7.1**		**3.4**	**µg/m3**	1	12/27/2013 05:59 PM
trans-1,2-Dichloroethene	ND		2.0	µg/m3	1	12/27/2013 05:59 PM
Trichloroethene	**3.2**		**1.1**	**µg/m3**	1	12/27/2013 05:59 PM
Vinyl chloride	ND		1.3	µg/m3	1	12/27/2013 05:59 PM
Surr: Bromofluorobenzene	*100*		*60-140*	*%REC*	1	12/27/2013 05:59 PM

Note:

ALS Environmental

Date: 07-Jan-14

Client: Troy Risk, Inc.

Work Order: 1312613

Project: IMW

QC BATCH REPORT

Batch ID: **R104629** Instrument ID **VMS3** Method: **ETO-15**

MBLK Sample ID **mblk-R104629** Units: **ppbv** Analysis Date: **12/27/2013 11:49 AM**

Client ID: Run ID: **VMS3_131227A** SeqNo: **741086** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	ND	0.50								
Tetrachloroethene	ND	0.50								
trans-1,2-Dichloroethene	ND	0.50								
Trichloroethene	ND	0.20								
Vinyl chloride	ND	0.50								
Surr: Bromofluorobenzene	10.31	0	*10*	0	*103*	*60-140*	0			

LCS Sample ID **lcs-R104629** Units: **ppbv** Analysis Date: **12/27/2013 11:08 AM**

Client ID: Run ID: **VMS3_131227A** SeqNo: **741085** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	10.71	0.50	10	0	107	60-140	0			
Tetrachloroethene	10.26	0.50	10	0	103	60-140	0			
trans-1,2-Dichloroethene	10.99	0.50	10	0	110	60-140	0			
Trichloroethene	10.42	0.20	10	0	104	60-140	0			
Vinyl chloride	11.39	0.50	10	0	114	60-140	0			
Surr: Bromofluorobenzene	10.96	0	*10*	0	*110*	*60-140*	0			

The following samples were analyzed in this batch: 1312613-03A 1312613-05A 1312613-06A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Troy Risk, Inc.
Work Order: 1312613
Project: IMW

QC BATCH REPORT

Batch ID: **R104630** Instrument ID **VMS3** Method: **ETO-15**

MBLK Sample ID **mblk-R104630** Units: **ppbv** Analysis Date: **12/26/2013 10:26 AM**
Client ID: Run ID: **VMS3_131226A** SeqNo: **741100** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	ND	0.50								
Tetrachloroethene	ND	0.50								
trans-1,2-Dichloroethene	ND	0.50								
Trichloroethene	ND	0.20								
Vinyl chloride	ND	0.50								
Surr: Bromofluorobenzene	10.15	0	*10*	0	*102*	*60-140*	0			

LCS Sample ID **lcs-R104630** Units: **ppbv** Analysis Date: **12/26/2013 09:45 AM**
Client ID: Run ID: **VMS3_131226A** SeqNo: **741099** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	10.94	0.50	10	0	109	60-140	0			
Tetrachloroethene	10.74	0.50	10	0	107	60-140	0			
trans-1,2-Dichloroethene	11.18	0.50	10	0	112	60-140	0			
Trichloroethene	10.67	0.20	10	0	107	60-140	0			
Vinyl chloride	11.87	0.50	10	0	119	60-140	0			
Surr: Bromofluorobenzene	10.79	0	*10*	0	*108*	*60-140*	0			

The following samples were analyzed in this batch: 1312613-01A 1312613-02A 1312613-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Troy Risk, Inc.
Project: IMW
WorkOrder: 1312613

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
µg/m3	
none	
ppbv	

ALS Environmental

Sample Receipt Checklist

Client Name: **TROY RISK-INDIANAPOLIS** Date/Time Received: **20-Dec-13 16:11**

Work Order: **1312613** Received by: **SAW**

Checklist completed by ShildnGreenwald 20-Dec-13 Reviewed by: ChrisGibson 23-Dec-13

eSignature Date eSignature Date

Matrices:

Carrier name: Courier

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):			
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

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(317)228-3100

January 03, 2014

Mr. Jeff OKeefe
Troy Risk, Inc.
7466 Shadeland Station Way
Indianapolis, IN 46256

RE: Project: IMW
Pace Project No.: 5091613

Dear Mr. OKeefe:
Enclosed are the analytical results for sample(s) received by the laboratory on December 19, 2013. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Donna S. Spyker

Donna Spyker

donna.spyker@pacelabs.com
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: IMW
Pace Project No.: 5091613

Indiana Certification IDs
7726 Moller Road, Indianapolis, IN 46268
Illinois Certification #: 200074
Indiana Certification #: C-49-06
Kansas Certification #: E-10247
Kentucky UST Certification #: 0042
Louisiana/NELAP Certification #: 04076
Ohio VAP Certification #: CL-0065
Pennsylvania Certification #: 68-04991
West Virginia Certification #: 330

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: IMW
Pace Project No.: 5091613

Lab ID	Sample ID	Matrix	Date Collected	Date Received
5091613001	**MW29**	Water	12/18/13 14:00	12/19/13 15:12
5091613002	**MW14**	Water	12/18/13 12:10	12/19/13 15:12
5091613003	**MW33D**	Water	12/18/13 11:30	12/19/13 15:12
5091613004	**MW30**	Water	12/18/13 11:30	12/19/13 15:12
5091613005	**MW26R**	Water	12/18/13 13:20	12/19/13 15:12
5091613006	**MW9**	Water	12/18/13 14:40	12/19/13 15:12
5091613007	**DUP**	Water	12/18/13 08:00	12/19/13 15:12
5091613008	**Trip Blank**	Water	12/18/13 08:00	12/19/13 15:12

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SAMPLE ANALYTE COUNT

Project: IMW
Pace Project No.: 5091613

Lab ID	Sample ID	Method	Analysts	Analytes Reported
5091613001	**MW29**	RSK 175 Modified	PTH	3
		EPA 8260	ALA	75
5091613002	**MW14**	RSK 175 Modified	PTH	3
		EPA 8260	ALA	75
5091613003	**MW33D**	RSK 175 Modified	PTH	3
		EPA 8260	ALA	75
5091613004	**MW30**	RSK 175 Modified	PTH	3
		EPA 8260	ALA	75
5091613005	**MW26R**	RSK 175 Modified	PTH	3
		EPA 8260	ALA	75
5091613006	**MW9**	RSK 175 Modified	PTH	3
		EPA 8260	ALA	75
5091613007	**DUP**	EPA 8260	ALA	75
5091613008	**Trip Blank**	EPA 8260	ALA	75

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: MW29 **Lab ID: 5091613001** Collected: 12/18/13 14:00 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		12/23/13 18:45	74-84-0	N2
Ethene	ND	ug/L	10.0	1		12/23/13 18:45	74-85-1	N2
Methane	**16.9**	ug/L	10.0	1		12/23/13 18:45	74-82-8	N2
8260 MSV Indiana	Analytical Method: EPA 8260							
Acetone	ND	ug/L	100	1		01/01/14 17:06	67-64-1	
Acrolein	ND	ug/L	50.0	1		01/01/14 17:06	107-02-8	
Acrylonitrile	ND	ug/L	100	1		01/01/14 17:06	107-13-1	
Benzene	ND	ug/L	5.0	1		01/01/14 17:06	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		01/01/14 17:06	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		01/01/14 17:06	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		01/01/14 17:06	75-27-4	
Bromoform	ND	ug/L	5.0	1		01/01/14 17:06	75-25-2	
Bromomethane	ND	ug/L	5.0	1		01/01/14 17:06	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		01/01/14 17:06	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		01/01/14 17:06	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		01/01/14 17:06	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		01/01/14 17:06	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		01/01/14 17:06	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		01/01/14 17:06	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		01/01/14 17:06	108-90-7	
Chloroethane	ND	ug/L	5.0	1		01/01/14 17:06	75-00-3	
Chloroform	ND	ug/L	5.0	1		01/01/14 17:06	67-66-3	
Chloromethane	ND	ug/L	5.0	1		01/01/14 17:06	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 17:06	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 17:06	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		01/01/14 17:06	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		01/01/14 17:06	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		01/01/14 17:06	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 17:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 17:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 17:06	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		01/01/14 17:06	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		01/01/14 17:06	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		01/01/14 17:06	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		01/01/14 17:06	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		01/01/14 17:06	75-35-4	
cis-1,2-Dichloroethene	**73.6**	ug/L	5.0	1		01/01/14 17:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		01/01/14 17:06	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 17:06	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		01/01/14 17:06	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 17:06	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		01/01/14 17:06	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 17:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 17:06	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		01/01/14 17:06	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		01/01/14 17:06	97-63-2	

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: MW29 **Lab ID: 5091613001** Collected: 12/18/13 14:00 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 8260							
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		01/01/14 17:06	87-68-3	
n-Hexane	ND	ug/L	5.0	1		01/01/14 17:06	110-54-3	N2
2-Hexanone	ND	ug/L	25.0	1		01/01/14 17:06	591-78-6	
Iodomethane	ND	ug/L	10.0	1		01/01/14 17:06	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/01/14 17:06	98-82-8	
p-Isopropyltoluene	ND	ug/L	5.0	1		01/01/14 17:06	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		01/01/14 17:06	75-09-2	
1-Methylnaphthalene	ND	ug/L	5.0	1		01/01/14 17:06	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		01/01/14 17:06	91-57-6	N2
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		01/01/14 17:06	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		01/01/14 17:06	1634-04-4	
Naphthalene	ND	ug/L	1.4	1		01/01/14 17:06	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		01/01/14 17:06	103-65-1	
Styrene	ND	ug/L	5.0	1		01/01/14 17:06	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 17:06	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 17:06	79-34-5	
Tetrachloroethene	**1010**	ug/L	50.0	10		01/01/14 17:39	127-18-4	
Toluene	ND	ug/L	5.0	1		01/01/14 17:06	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 17:06	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 17:06	120-82-1	
1,1,1-Trichloroethane	**27.5**	ug/L	5.0	1		01/01/14 17:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		01/01/14 17:06	79-00-5	
Trichloroethene	**20.9**	ug/L	5.0	1		01/01/14 17:06	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		01/01/14 17:06	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		01/01/14 17:06	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 17:06	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 17:06	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		01/01/14 17:06	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		01/01/14 17:06	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		01/01/14 17:06	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	105	%.	79-116	1		01/01/14 17:06	1868-53-7	
4-Bromofluorobenzene (S)	97	%.	80-114	1		01/01/14 17:06	460-00-4	
Toluene-d8 (S)	93	%.	81-110	1		01/01/14 17:06	2037-26-5	

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: MW14 **Lab ID: 5091613002** Collected: 12/18/13 12:10 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		12/23/13 19:04	74-84-0	N2
Ethene	**46.0**	ug/L	10.0	1		12/23/13 19:04	74-85-1	N2
Methane	**28100**	ug/L	50.0	5		12/24/13 13:10	74-82-8	N2
8260 MSV Indiana	Analytical Method: EPA 8260							
Acetone	ND	ug/L	100	1		01/01/14 18:12	67-64-1	
Acrolein	ND	ug/L	50.0	1		01/01/14 18:12	107-02-8	
Acrylonitrile	ND	ug/L	100	1		01/01/14 18:12	107-13-1	
Benzene	ND	ug/L	5.0	1		01/01/14 18:12	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		01/01/14 18:12	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		01/01/14 18:12	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		01/01/14 18:12	75-27-4	
Bromoform	ND	ug/L	5.0	1		01/01/14 18:12	75-25-2	
Bromomethane	ND	ug/L	5.0	1		01/01/14 18:12	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		01/01/14 18:12	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		01/01/14 18:12	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		01/01/14 18:12	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		01/01/14 18:12	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		01/01/14 18:12	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		01/01/14 18:12	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		01/01/14 18:12	108-90-7	
Chloroethane	ND	ug/L	5.0	1		01/01/14 18:12	75-00-3	
Chloroform	ND	ug/L	5.0	1		01/01/14 18:12	67-66-3	
Chloromethane	ND	ug/L	5.0	1		01/01/14 18:12	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 18:12	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 18:12	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		01/01/14 18:12	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		01/01/14 18:12	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		01/01/14 18:12	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 18:12	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 18:12	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 18:12	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		01/01/14 18:12	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		01/01/14 18:12	75-71-8	
1,1-Dichloroethane	**6.0**	ug/L	5.0	1		01/01/14 18:12	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		01/01/14 18:12	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		01/01/14 18:12	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		01/01/14 18:12	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		01/01/14 18:12	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 18:12	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		01/01/14 18:12	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 18:12	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		01/01/14 18:12	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 18:12	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 18:12	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		01/01/14 18:12	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		01/01/14 18:12	97-63-2	

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: MW14 **Lab ID: 5091613002** Collected: 12/18/13 12:10 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 8260							
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		01/01/14 18:12	87-68-3	
n-Hexane	ND	ug/L	5.0	1		01/01/14 18:12	110-54-3	N2
2-Hexanone	ND	ug/L	25.0	1		01/01/14 18:12	591-78-6	
Iodomethane	ND	ug/L	10.0	1		01/01/14 18:12	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/01/14 18:12	98-82-8	
p-Isopropyltoluene	ND	ug/L	5.0	1		01/01/14 18:12	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		01/01/14 18:12	75-09-2	
1-Methylnaphthalene	ND	ug/L	5.0	1		01/01/14 18:12	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		01/01/14 18:12	91-57-6	N2
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		01/01/14 18:12	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		01/01/14 18:12	1634-04-4	
Naphthalene	ND	ug/L	1.4	1		01/01/14 18:12	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		01/01/14 18:12	103-65-1	
Styrene	ND	ug/L	5.0	1		01/01/14 18:12	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 18:12	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 18:12	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		01/01/14 18:12	127-18-4	
Toluene	ND	ug/L	5.0	1		01/01/14 18:12	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 18:12	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 18:12	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		01/01/14 18:12	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		01/01/14 18:12	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		01/01/14 18:12	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		01/01/14 18:12	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		01/01/14 18:12	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 18:12	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 18:12	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		01/01/14 18:12	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		01/01/14 18:12	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		01/01/14 18:12	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	120	%.	79-116	1		01/01/14 18:12	1868-53-7	S0
4-Bromofluorobenzene (S)	98	%.	80-114	1		01/01/14 18:12	460-00-4	
Toluene-d8 (S)	94	%.	81-110	1		01/01/14 18:12	2037-26-5	

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: MW33D **Lab ID: 5091613003** Collected: 12/18/13 11:30 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		12/23/13 19:23	74-84-0	N2
Ethene	ND	ug/L	10.0	1		12/23/13 19:23	74-85-1	N2
Methane	**68.1**	ug/L	10.0	1		12/23/13 19:23	74-82-8	N2
8260 MSV Indiana	Analytical Method: EPA 8260							
Acetone	ND	ug/L	100	1		01/01/14 18:45	67-64-1	
Acrolein	ND	ug/L	50.0	1		01/01/14 18:45	107-02-8	
Acrylonitrile	ND	ug/L	100	1		01/01/14 18:45	107-13-1	
Benzene	ND	ug/L	5.0	1		01/01/14 18:45	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		01/01/14 18:45	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		01/01/14 18:45	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		01/01/14 18:45	75-27-4	
Bromoform	ND	ug/L	5.0	1		01/01/14 18:45	75-25-2	
Bromomethane	ND	ug/L	5.0	1		01/01/14 18:45	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		01/01/14 18:45	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		01/01/14 18:45	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		01/01/14 18:45	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		01/01/14 18:45	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		01/01/14 18:45	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		01/01/14 18:45	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		01/01/14 18:45	108-90-7	
Chloroethane	ND	ug/L	5.0	1		01/01/14 18:45	75-00-3	
Chloroform	ND	ug/L	5.0	1		01/01/14 18:45	67-66-3	
Chloromethane	ND	ug/L	5.0	1		01/01/14 18:45	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 18:45	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 18:45	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		01/01/14 18:45	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		01/01/14 18:45	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		01/01/14 18:45	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 18:45	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 18:45	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 18:45	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		01/01/14 18:45	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		01/01/14 18:45	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		01/01/14 18:45	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		01/01/14 18:45	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		01/01/14 18:45	75-35-4	
cis-1,2-Dichloroethene	**50.0**	ug/L	5.0	1		01/01/14 18:45	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		01/01/14 18:45	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 18:45	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		01/01/14 18:45	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 18:45	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		01/01/14 18:45	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 18:45	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 18:45	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		01/01/14 18:45	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		01/01/14 18:45	97-63-2	

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: MW33D **Lab ID: 5091613003** Collected: 12/18/13 11:30 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 8260							
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		01/01/14 18:45	87-68-3	
n-Hexane	ND	ug/L	5.0	1		01/01/14 18:45	110-54-3	N2
2-Hexanone	ND	ug/L	25.0	1		01/01/14 18:45	591-78-6	
Iodomethane	ND	ug/L	10.0	1		01/01/14 18:45	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/01/14 18:45	98-82-8	
p-Isopropyltoluene	ND	ug/L	5.0	1		01/01/14 18:45	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		01/01/14 18:45	75-09-2	
1-Methylnaphthalene	ND	ug/L	5.0	1		01/01/14 18:45	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		01/01/14 18:45	91-57-6	N2
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		01/01/14 18:45	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		01/01/14 18:45	1634-04-4	
Naphthalene	ND	ug/L	1.4	1		01/01/14 18:45	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		01/01/14 18:45	103-65-1	
Styrene	ND	ug/L	5.0	1		01/01/14 18:45	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 18:45	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 18:45	79-34-5	
Tetrachloroethene	**252**	ug/L	5.0	1		01/01/14 18:45	127-18-4	
Toluene	ND	ug/L	5.0	1		01/01/14 18:45	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 18:45	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 18:45	120-82-1	
1,1,1-Trichloroethane	**49.1**	ug/L	5.0	1		01/01/14 18:45	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		01/01/14 18:45	79-00-5	
Trichloroethene	**52.2**	ug/L	5.0	1		01/01/14 18:45	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		01/01/14 18:45	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		01/01/14 18:45	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 18:45	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 18:45	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		01/01/14 18:45	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		01/01/14 18:45	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		01/01/14 18:45	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	113	%.	79-116	1		01/01/14 18:45	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	80-114	1		01/01/14 18:45	460-00-4	
Toluene-d8 (S)	94	%.	81-110	1		01/01/14 18:45	2037-26-5	

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: MW30 **Lab ID: 5091613004** Collected: 12/18/13 11:30 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		12/23/13 19:42	74-84-0	N2
Ethene	**1930**	ug/L	10.0	1		12/23/13 19:42	74-85-1	N2
Methane	**16400**	ug/L	10.0	1		12/23/13 19:42	74-82-8	N2
8260 MSV Indiana	Analytical Method: EPA 8260							
Acetone	ND	ug/L	100	1		01/01/14 19:18	67-64-1	
Acrolein	ND	ug/L	50.0	1		01/01/14 19:18	107-02-8	
Acrylonitrile	ND	ug/L	100	1		01/01/14 19:18	107-13-1	
Benzene	ND	ug/L	5.0	1		01/01/14 19:18	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		01/01/14 19:18	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		01/01/14 19:18	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		01/01/14 19:18	75-27-4	
Bromoform	ND	ug/L	5.0	1		01/01/14 19:18	75-25-2	
Bromomethane	ND	ug/L	5.0	1		01/01/14 19:18	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		01/01/14 19:18	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		01/01/14 19:18	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		01/01/14 19:18	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		01/01/14 19:18	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		01/01/14 19:18	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		01/01/14 19:18	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		01/01/14 19:18	108-90-7	
Chloroethane	ND	ug/L	5.0	1		01/01/14 19:18	75-00-3	
Chloroform	ND	ug/L	5.0	1		01/01/14 19:18	67-66-3	
Chloromethane	ND	ug/L	5.0	1		01/01/14 19:18	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 19:18	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 19:18	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		01/01/14 19:18	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		01/01/14 19:18	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		01/01/14 19:18	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 19:18	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 19:18	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 19:18	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		01/01/14 19:18	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		01/01/14 19:18	75-71-8	
1,1-Dichloroethane	**5.1**	ug/L	5.0	1		01/01/14 19:18	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		01/01/14 19:18	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		01/01/14 19:18	75-35-4	
cis-1,2-Dichloroethene	**70.8**	ug/L	5.0	1		01/01/14 19:18	156-59-2	
trans-1,2-Dichloroethene	**15.1**	ug/L	5.0	1		01/01/14 19:18	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 19:18	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		01/01/14 19:18	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 19:18	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		01/01/14 19:18	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 19:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 19:18	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		01/01/14 19:18	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		01/01/14 19:18	97-63-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: MW30 **Lab ID: 5091613004** Collected: 12/18/13 11:30 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 8260							
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		01/01/14 19:18	87-68-3	
n-Hexane	ND	ug/L	5.0	1		01/01/14 19:18	110-54-3	N2
2-Hexanone	ND	ug/L	25.0	1		01/01/14 19:18	591-78-6	
Iodomethane	ND	ug/L	10.0	1		01/01/14 19:18	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/01/14 19:18	98-82-8	
p-Isopropyltoluene	ND	ug/L	5.0	1		01/01/14 19:18	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		01/01/14 19:18	75-09-2	
1-Methylnaphthalene	ND	ug/L	5.0	1		01/01/14 19:18	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		01/01/14 19:18	91-57-6	N2
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		01/01/14 19:18	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		01/01/14 19:18	1634-04-4	
Naphthalene	ND	ug/L	1.4	1		01/01/14 19:18	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		01/01/14 19:18	103-65-1	
Styrene	ND	ug/L	5.0	1		01/01/14 19:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 19:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 19:18	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		01/01/14 19:18	127-18-4	
Toluene	ND	ug/L	5.0	1		01/01/14 19:18	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 19:18	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 19:18	120-82-1	
1,1,1-Trichloroethane	**8.5**	ug/L	5.0	1		01/01/14 19:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		01/01/14 19:18	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		01/01/14 19:18	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		01/01/14 19:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		01/01/14 19:18	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 19:18	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 19:18	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		01/01/14 19:18	108-05-4	
Vinyl chloride	**179**	ug/L	2.0	1		01/01/14 19:18	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		01/01/14 19:18	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	121	%.	79-116	1		01/01/14 19:18	1868-53-7	S0
4-Bromofluorobenzene (S)	98	%.	80-114	1		01/01/14 19:18	460-00-4	
Toluene-d8 (S)	95	%.	81-110	1		01/01/14 19:18	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: MW26R **Lab ID: 5091613005** Collected: 12/18/13 13:20 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		12/23/13 20:00	74-84-0	N2
Ethene	ND	ug/L	10.0	1		12/23/13 20:00	74-85-1	N2
Methane	ND	ug/L	10.0	1		12/23/13 20:00	74-82-8	N2
8260 MSV Indiana	Analytical Method: EPA 8260							
Acetone	ND	ug/L	100	1		01/01/14 19:51	67-64-1	
Acrolein	ND	ug/L	50.0	1		01/01/14 19:51	107-02-8	
Acrylonitrile	ND	ug/L	100	1		01/01/14 19:51	107-13-1	
Benzene	ND	ug/L	5.0	1		01/01/14 19:51	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		01/01/14 19:51	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		01/01/14 19:51	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		01/01/14 19:51	75-27-4	
Bromoform	ND	ug/L	5.0	1		01/01/14 19:51	75-25-2	
Bromomethane	ND	ug/L	5.0	1		01/01/14 19:51	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		01/01/14 19:51	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		01/01/14 19:51	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		01/01/14 19:51	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		01/01/14 19:51	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		01/01/14 19:51	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		01/01/14 19:51	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		01/01/14 19:51	108-90-7	
Chloroethane	ND	ug/L	5.0	1		01/01/14 19:51	75-00-3	
Chloroform	ND	ug/L	5.0	1		01/01/14 19:51	67-66-3	
Chloromethane	ND	ug/L	5.0	1		01/01/14 19:51	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 19:51	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 19:51	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		01/01/14 19:51	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		01/01/14 19:51	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		01/01/14 19:51	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 19:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 19:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 19:51	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		01/01/14 19:51	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		01/01/14 19:51	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		01/01/14 19:51	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		01/01/14 19:51	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		01/01/14 19:51	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		01/01/14 19:51	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		01/01/14 19:51	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 19:51	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		01/01/14 19:51	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 19:51	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		01/01/14 19:51	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 19:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 19:51	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		01/01/14 19:51	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		01/01/14 19:51	97-63-2	

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: MW26R **Lab ID: 5091613005** Collected: 12/18/13 13:20 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 8260							
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		01/01/14 19:51	87-68-3	
n-Hexane	ND	ug/L	5.0	1		01/01/14 19:51	110-54-3	N2
2-Hexanone	ND	ug/L	25.0	1		01/01/14 19:51	591-78-6	
Iodomethane	ND	ug/L	10.0	1		01/01/14 19:51	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/01/14 19:51	98-82-8	
p-Isopropyltoluene	ND	ug/L	5.0	1		01/01/14 19:51	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		01/01/14 19:51	75-09-2	
1-Methylnaphthalene	ND	ug/L	5.0	1		01/01/14 19:51	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		01/01/14 19:51	91-57-6	N2
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		01/01/14 19:51	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		01/01/14 19:51	1634-04-4	
Naphthalene	ND	ug/L	1.4	1		01/01/14 19:51	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		01/01/14 19:51	103-65-1	
Styrene	ND	ug/L	5.0	1		01/01/14 19:51	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 19:51	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 19:51	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		01/01/14 19:51	127-18-4	
Toluene	ND	ug/L	5.0	1		01/01/14 19:51	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 19:51	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 19:51	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		01/01/14 19:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		01/01/14 19:51	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		01/01/14 19:51	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		01/01/14 19:51	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		01/01/14 19:51	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 19:51	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 19:51	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		01/01/14 19:51	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		01/01/14 19:51	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		01/01/14 19:51	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	114	%.	79-116	1		01/01/14 19:51	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	80-114	1		01/01/14 19:51	460-00-4	
Toluene-d8 (S)	95	%.	81-110	1		01/01/14 19:51	2037-26-5	

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: MW9 **Lab ID: 5091613006** Collected: 12/18/13 14:40 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		12/23/13 21:33	74-84-0	N2
Ethene	ND	ug/L	10.0	1		12/23/13 21:33	74-85-1	N2
Methane	ND	ug/L	10.0	1		12/23/13 21:33	74-82-8	N2
8260 MSV Indiana	Analytical Method: EPA 8260							
Acetone	ND	ug/L	100	1		01/01/14 21:31	67-64-1	
Acrolein	ND	ug/L	50.0	1		01/01/14 21:31	107-02-8	
Acrylonitrile	ND	ug/L	100	1		01/01/14 21:31	107-13-1	
Benzene	ND	ug/L	5.0	1		01/01/14 21:31	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		01/01/14 21:31	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		01/01/14 21:31	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		01/01/14 21:31	75-27-4	
Bromoform	ND	ug/L	5.0	1		01/01/14 21:31	75-25-2	
Bromomethane	ND	ug/L	5.0	1		01/01/14 21:31	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		01/01/14 21:31	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		01/01/14 21:31	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		01/01/14 21:31	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		01/01/14 21:31	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		01/01/14 21:31	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		01/01/14 21:31	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		01/01/14 21:31	108-90-7	
Chloroethane	ND	ug/L	5.0	1		01/01/14 21:31	75-00-3	
Chloroform	ND	ug/L	5.0	1		01/01/14 21:31	67-66-3	
Chloromethane	ND	ug/L	5.0	1		01/01/14 21:31	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 21:31	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 21:31	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		01/01/14 21:31	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		01/01/14 21:31	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		01/01/14 21:31	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 21:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 21:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 21:31	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		01/01/14 21:31	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		01/01/14 21:31	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		01/01/14 21:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		01/01/14 21:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		01/01/14 21:31	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		01/01/14 21:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		01/01/14 21:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 21:31	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		01/01/14 21:31	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 21:31	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		01/01/14 21:31	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 21:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 21:31	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		01/01/14 21:31	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		01/01/14 21:31	97-63-2	

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7726 Moller Road
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(317)228-3100

ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: MW9 **Lab ID: 5091613006** Collected: 12/18/13 14:40 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 8260							
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		01/01/14 21:31	87-68-3	
n-Hexane	ND	ug/L	5.0	1		01/01/14 21:31	110-54-3	N2
2-Hexanone	ND	ug/L	25.0	1		01/01/14 21:31	591-78-6	
Iodomethane	ND	ug/L	10.0	1		01/01/14 21:31	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/01/14 21:31	98-82-8	
p-Isopropyltoluene	ND	ug/L	5.0	1		01/01/14 21:31	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		01/01/14 21:31	75-09-2	
1-Methylnaphthalene	ND	ug/L	5.0	1		01/01/14 21:31	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		01/01/14 21:31	91-57-6	N2
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		01/01/14 21:31	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		01/01/14 21:31	1634-04-4	
Naphthalene	ND	ug/L	1.4	1		01/01/14 21:31	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		01/01/14 21:31	103-65-1	
Styrene	ND	ug/L	5.0	1		01/01/14 21:31	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 21:31	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 21:31	79-34-5	
Tetrachloroethene	**42.5**	ug/L	5.0	1		01/01/14 21:31	127-18-4	
Toluene	ND	ug/L	5.0	1		01/01/14 21:31	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 21:31	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 21:31	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		01/01/14 21:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		01/01/14 21:31	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		01/01/14 21:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		01/01/14 21:31	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		01/01/14 21:31	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 21:31	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 21:31	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		01/01/14 21:31	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		01/01/14 21:31	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		01/01/14 21:31	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	110	%.	79-116	1		01/01/14 21:31	1868-53-7	
4-Bromofluorobenzene (S)	98	%.	80-114	1		01/01/14 21:31	460-00-4	
Toluene-d8 (S)	93	%.	81-110	1		01/01/14 21:31	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: DUP **Lab ID: 5091613007** Collected: 12/18/13 08:00 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 8260							
Acetone	ND	ug/L	100	1		01/01/14 22:04	67-64-1	
Acrolein	ND	ug/L	50.0	1		01/01/14 22:04	107-02-8	
Acrylonitrile	ND	ug/L	100	1		01/01/14 22:04	107-13-1	
Benzene	ND	ug/L	5.0	1		01/01/14 22:04	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		01/01/14 22:04	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		01/01/14 22:04	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		01/01/14 22:04	75-27-4	
Bromoform	ND	ug/L	5.0	1		01/01/14 22:04	75-25-2	
Bromomethane	ND	ug/L	5.0	1		01/01/14 22:04	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		01/01/14 22:04	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		01/01/14 22:04	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		01/01/14 22:04	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		01/01/14 22:04	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		01/01/14 22:04	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		01/01/14 22:04	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		01/01/14 22:04	108-90-7	
Chloroethane	ND	ug/L	5.0	1		01/01/14 22:04	75-00-3	
Chloroform	ND	ug/L	5.0	1		01/01/14 22:04	67-66-3	
Chloromethane	ND	ug/L	5.0	1		01/01/14 22:04	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 22:04	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 22:04	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		01/01/14 22:04	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		01/01/14 22:04	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		01/01/14 22:04	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 22:04	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 22:04	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 22:04	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		01/01/14 22:04	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		01/01/14 22:04	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		01/01/14 22:04	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		01/01/14 22:04	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		01/01/14 22:04	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		01/01/14 22:04	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		01/01/14 22:04	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 22:04	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		01/01/14 22:04	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 22:04	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		01/01/14 22:04	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 22:04	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 22:04	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		01/01/14 22:04	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		01/01/14 22:04	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		01/01/14 22:04	87-68-3	
n-Hexane	ND	ug/L	5.0	1		01/01/14 22:04	110-54-3	N2
2-Hexanone	ND	ug/L	25.0	1		01/01/14 22:04	591-78-6	
Iodomethane	ND	ug/L	10.0	1		01/01/14 22:04	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/01/14 22:04	98-82-8	

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: DUP **Lab ID: 5091613007** Collected: 12/18/13 08:00 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		01/01/14 22:04	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		01/01/14 22:04	75-09-2	
1-Methylnaphthalene	ND	ug/L	5.0	1		01/01/14 22:04	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		01/01/14 22:04	91-57-6	N2
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		01/01/14 22:04	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		01/01/14 22:04	1634-04-4	
Naphthalene	ND	ug/L	1.4	1		01/01/14 22:04	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		01/01/14 22:04	103-65-1	
Styrene	ND	ug/L	5.0	1		01/01/14 22:04	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 22:04	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 22:04	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		01/01/14 22:04	127-18-4	
Toluene	ND	ug/L	5.0	1		01/01/14 22:04	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 22:04	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 22:04	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		01/01/14 22:04	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		01/01/14 22:04	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		01/01/14 22:04	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		01/01/14 22:04	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		01/01/14 22:04	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 22:04	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 22:04	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		01/01/14 22:04	108-05-4	
Vinyl chloride	**3.0**	ug/L	2.0	1		01/01/14 22:04	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		01/01/14 22:04	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	116	%.	79-116	1		01/01/14 22:04	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	80-114	1		01/01/14 22:04	460-00-4	
Toluene-d8 (S)	95	%.	81-110	1		01/01/14 22:04	2037-26-5	

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: Trip Blank **Lab ID: 5091613008** Collected: 12/18/13 08:00 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 8260							
Acetone	ND	ug/L	100	1		01/01/14 22:37	67-64-1	
Acrolein	ND	ug/L	50.0	1		01/01/14 22:37	107-02-8	
Acrylonitrile	ND	ug/L	100	1		01/01/14 22:37	107-13-1	
Benzene	ND	ug/L	5.0	1		01/01/14 22:37	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		01/01/14 22:37	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		01/01/14 22:37	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		01/01/14 22:37	75-27-4	
Bromoform	ND	ug/L	5.0	1		01/01/14 22:37	75-25-2	
Bromomethane	ND	ug/L	5.0	1		01/01/14 22:37	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		01/01/14 22:37	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		01/01/14 22:37	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		01/01/14 22:37	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		01/01/14 22:37	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		01/01/14 22:37	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		01/01/14 22:37	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		01/01/14 22:37	108-90-7	
Chloroethane	ND	ug/L	5.0	1		01/01/14 22:37	75-00-3	
Chloroform	ND	ug/L	5.0	1		01/01/14 22:37	67-66-3	
Chloromethane	ND	ug/L	5.0	1		01/01/14 22:37	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 22:37	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		01/01/14 22:37	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		01/01/14 22:37	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		01/01/14 22:37	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		01/01/14 22:37	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 22:37	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 22:37	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		01/01/14 22:37	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		01/01/14 22:37	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		01/01/14 22:37	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		01/01/14 22:37	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		01/01/14 22:37	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		01/01/14 22:37	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		01/01/14 22:37	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		01/01/14 22:37	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 22:37	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		01/01/14 22:37	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		01/01/14 22:37	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		01/01/14 22:37	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 22:37	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		01/01/14 22:37	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		01/01/14 22:37	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		01/01/14 22:37	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		01/01/14 22:37	87-68-3	
n-Hexane	ND	ug/L	5.0	1		01/01/14 22:37	110-54-3	N2
2-Hexanone	ND	ug/L	25.0	1		01/01/14 22:37	591-78-6	
Iodomethane	ND	ug/L	10.0	1		01/01/14 22:37	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/01/14 22:37	98-82-8	

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ANALYTICAL RESULTS

Project: IMW
Pace Project No.: 5091613

Sample: Trip Blank **Lab ID: 5091613008** Collected: 12/18/13 08:00 Received: 12/19/13 15:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		01/01/14 22:37	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		01/01/14 22:37	75-09-2	
1-Methylnaphthalene	ND	ug/L	5.0	1		01/01/14 22:37	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		01/01/14 22:37	91-57-6	N2
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		01/01/14 22:37	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		01/01/14 22:37	1634-04-4	
Naphthalene	ND	ug/L	1.4	1		01/01/14 22:37	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		01/01/14 22:37	103-65-1	
Styrene	ND	ug/L	5.0	1		01/01/14 22:37	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 22:37	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		01/01/14 22:37	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		01/01/14 22:37	127-18-4	
Toluene	ND	ug/L	5.0	1		01/01/14 22:37	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 22:37	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		01/01/14 22:37	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		01/01/14 22:37	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		01/01/14 22:37	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		01/01/14 22:37	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		01/01/14 22:37	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		01/01/14 22:37	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 22:37	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/01/14 22:37	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		01/01/14 22:37	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		01/01/14 22:37	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		01/01/14 22:37	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	116	%.	79-116	1		01/01/14 22:37	1868-53-7	
4-Bromofluorobenzene (S)	98	%.	80-114	1		01/01/14 22:37	460-00-4	
Toluene-d8 (S)	93	%.	81-110	1		01/01/14 22:37	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: IMW
Pace Project No.: 5091613

QC Batch: GCV/17549 Analysis Method: RSK 175 Modified
QC Batch Method: RSK 175 Modified Analysis Description: RSK 175 HEADSPACE
Associated Lab Samples: 5091613001, 5091613002, 5091613003, 5091613004, 5091613005, 5091613006

METHOD BLANK: 1032582 Matrix: Water
Associated Lab Samples: 5091613001, 5091613002, 5091613003, 5091613004, 5091613005, 5091613006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	12/23/13 18:08	N2
Ethene	ug/L	ND	10.0	12/23/13 18:08	N2
Methane	ug/L	ND	10.0	12/23/13 18:08	N2

LABORATORY CONTROL SAMPLE: 1032583

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethane	ug/L	1980	1950	99	70-130	N2
Ethene	ug/L	2250	2220	99	70-130	N2
Methane	ug/L	1980	2130	108	70-130	N2

SAMPLE DUPLICATE: 1032584

Parameter	Units	5091613005 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	ND		20	N2
Ethene	ug/L	ND	ND		20	N2
Methane	ug/L	ND	ND		20	N2

REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

Project: IMW
Pace Project No.: 5091613

QC Batch: MSV/60761 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV
Associated Lab Samples: 5091613001, 5091613002, 5091613003, 5091613004, 5091613005, 5091613006, 5091613007, 5091613008

METHOD BLANK: 1035112 Matrix: Water
Associated Lab Samples: 5091613001, 5091613002, 5091613003, 5091613004, 5091613005, 5091613006, 5091613007, 5091613008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	5.0	01/01/14 14:54	
1,1,1-Trichloroethane	ug/L	ND	5.0	01/01/14 14:54	
1,1,2,2-Tetrachloroethane	ug/L	ND	5.0	01/01/14 14:54	
1,1,2-Trichloroethane	ug/L	ND	5.0	01/01/14 14:54	
1,1-Dichloroethane	ug/L	ND	5.0	01/01/14 14:54	
1,1-Dichloroethene	ug/L	ND	5.0	01/01/14 14:54	
1,1-Dichloropropene	ug/L	ND	5.0	01/01/14 14:54	
1,2,3-Trichlorobenzene	ug/L	ND	5.0	01/01/14 14:54	
1,2,3-Trichloropropane	ug/L	ND	5.0	01/01/14 14:54	
1,2,4-Trichlorobenzene	ug/L	ND	5.0	01/01/14 14:54	
1,2,4-Trimethylbenzene	ug/L	ND	5.0	01/01/14 14:54	
1,2-Dibromoethane (EDB)	ug/L	ND	5.0	01/01/14 14:54	
1,2-Dichlorobenzene	ug/L	ND	5.0	01/01/14 14:54	
1,2-Dichloroethane	ug/L	ND	5.0	01/01/14 14:54	
1,2-Dichloropropane	ug/L	ND	5.0	01/01/14 14:54	
1,3,5-Trimethylbenzene	ug/L	ND	5.0	01/01/14 14:54	
1,3-Dichlorobenzene	ug/L	ND	5.0	01/01/14 14:54	
1,3-Dichloropropane	ug/L	ND	5.0	01/01/14 14:54	
1,4-Dichlorobenzene	ug/L	ND	5.0	01/01/14 14:54	
1-Methylnaphthalene	ug/L	ND	5.0	01/01/14 14:54	N2
2,2-Dichloropropane	ug/L	ND	5.0	01/01/14 14:54	
2-Butanone (MEK)	ug/L	ND	25.0	01/01/14 14:54	
2-Chlorotoluene	ug/L	ND	5.0	01/01/14 14:54	
2-Hexanone	ug/L	ND	25.0	01/01/14 14:54	
2-Methylnaphthalene	ug/L	ND	10.0	01/01/14 14:54	N2
4-Chlorotoluene	ug/L	ND	5.0	01/01/14 14:54	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	25.0	01/01/14 14:54	
Acetone	ug/L	ND	100	01/01/14 14:54	
Acrolein	ug/L	ND	50.0	01/01/14 14:54	
Acrylonitrile	ug/L	ND	100	01/01/14 14:54	
Benzene	ug/L	ND	5.0	01/01/14 14:54	
Bromobenzene	ug/L	ND	5.0	01/01/14 14:54	
Bromochloromethane	ug/L	ND	5.0	01/01/14 14:54	
Bromodichloromethane	ug/L	ND	5.0	01/01/14 14:54	
Bromoform	ug/L	ND	5.0	01/01/14 14:54	
Bromomethane	ug/L	ND	5.0	01/01/14 14:54	
Carbon disulfide	ug/L	ND	10.0	01/01/14 14:54	
Carbon tetrachloride	ug/L	ND	5.0	01/01/14 14:54	
Chlorobenzene	ug/L	ND	5.0	01/01/14 14:54	
Chloroethane	ug/L	ND	5.0	01/01/14 14:54	
Chloroform	ug/L	ND	5.0	01/01/14 14:54	
Chloromethane	ug/L	ND	5.0	01/01/14 14:54	
cis-1,2-Dichloroethene	ug/L	ND	5.0	01/01/14 14:54	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: IMW
Pace Project No.: 5091613

METHOD BLANK: 1035112 Matrix: Water
Associated Lab Samples: 5091613001, 5091613002, 5091613003, 5091613004, 5091613005, 5091613006, 5091613007, 5091613008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,3-Dichloropropene	ug/L	ND	5.0	01/01/14 14:54	
Dibromochloromethane	ug/L	ND	5.0	01/01/14 14:54	
Dibromomethane	ug/L	ND	5.0	01/01/14 14:54	
Dichlorodifluoromethane	ug/L	ND	5.0	01/01/14 14:54	
Ethyl methacrylate	ug/L	ND	100	01/01/14 14:54	
Ethylbenzene	ug/L	ND	5.0	01/01/14 14:54	
Hexachloro-1,3-butadiene	ug/L	ND	5.0	01/01/14 14:54	
Iodomethane	ug/L	ND	10.0	01/01/14 14:54	
Isopropylbenzene (Cumene)	ug/L	ND	5.0	01/01/14 14:54	
Methyl-tert-butyl ether	ug/L	ND	4.0	01/01/14 14:54	
Methylene Chloride	ug/L	ND	5.0	01/01/14 14:54	
n-Butylbenzene	ug/L	ND	5.0	01/01/14 14:54	
n-Hexane	ug/L	ND	5.0	01/01/14 14:54	N2
n-Propylbenzene	ug/L	ND	5.0	01/01/14 14:54	
Naphthalene	ug/L	ND	1.4	01/01/14 14:54	
p-Isopropyltoluene	ug/L	ND	5.0	01/01/14 14:54	
sec-Butylbenzene	ug/L	ND	5.0	01/01/14 14:54	
Styrene	ug/L	ND	5.0	01/01/14 14:54	
tert-Butylbenzene	ug/L	ND	5.0	01/01/14 14:54	
Tetrachloroethene	ug/L	ND	5.0	01/01/14 14:54	
Toluene	ug/L	ND	5.0	01/01/14 14:54	
trans-1,2-Dichloroethene	ug/L	ND	5.0	01/01/14 14:54	
trans-1,3-Dichloropropene	ug/L	ND	5.0	01/01/14 14:54	
trans-1,4-Dichloro-2-butene	ug/L	ND	100	01/01/14 14:54	
Trichloroethene	ug/L	ND	5.0	01/01/14 14:54	
Trichlorofluoromethane	ug/L	ND	5.0	01/01/14 14:54	
Vinyl acetate	ug/L	ND	50.0	01/01/14 14:54	
Vinyl chloride	ug/L	ND	2.0	01/01/14 14:54	
Xylene (Total)	ug/L	ND	10.0	01/01/14 14:54	
4-Bromofluorobenzene (S)	%.	97	80-114	01/01/14 14:54	
Dibromofluoromethane (S)	%.	114	79-116	01/01/14 14:54	
Toluene-d8 (S)	%.	95	81-110	01/01/14 14:54	

LABORATORY CONTROL SAMPLE: 1035113

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	57.4	115	61-135	
1,1,1-Trichloroethane	ug/L	50	56.1	112	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	44.6	89	66-126	
1,1,2-Trichloroethane	ug/L	50	49.5	99	77-130	
1,1-Dichloroethane	ug/L	50	47.3	95	75-130	
1,1-Dichloroethene	ug/L	50	52.2	104	68-127	
1,1-Dichloropropene	ug/L	50	49.9	100	78-130	
1,2,3-Trichlorobenzene	ug/L	50	50.8	102	70-130	
1,2,3-Trichloropropane	ug/L	50	46.1	92	58-142	

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QUALITY CONTROL DATA

Project: IMW
Pace Project No.: 5091613

LABORATORY CONTROL SAMPLE: 1035113

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/L	50	50.0	100	68-131	
1,2,4-Trimethylbenzene	ug/L	50	48.5	97	69-127	
1,2-Dibromoethane (EDB)	ug/L	50	51.4	103	76-125	
1,2-Dichlorobenzene	ug/L	50	47.2	94	75-123	
1,2-Dichloroethane	ug/L	50	50.4	101	75-128	
1,2-Dichloropropane	ug/L	50	45.5	91	74-121	
1,3,5-Trimethylbenzene	ug/L	50	48.8	98	70-126	
1,3-Dichlorobenzene	ug/L	50	46.6	93	74-122	
1,3-Dichloropropane	ug/L	50	49.2	98	74-123	
1,4-Dichlorobenzene	ug/L	50	45.7	91	76-120	
1-Methylnaphthalene	ug/L		ND			N2
2,2-Dichloropropane	ug/L	50	61.2	122	50-137	
2-Butanone (MEK)	ug/L	250	208	83	58-139	
2-Chlorotoluene	ug/L	50	46.9	94	74-122	
2-Hexanone	ug/L	250	212	85	54-140	
2-Methylnaphthalene	ug/L	50	49.1	98	54-151	N2
4-Chlorotoluene	ug/L	50	48.7	97	77-123	
4-Methyl-2-pentanone (MIBK)	ug/L	250	217	87	58-138	
Acetone	ug/L	250	267	107	49-150	
Acrolein	ug/L	1000	881	88	41-200	
Acrylonitrile	ug/L	1000	988	99	63-137	
Benzene	ug/L	50	46.3	93	74-122	
Bromobenzene	ug/L	50	48.2	96	72-127	
Bromochloromethane	ug/L	50	45.6	91	63-132	
Bromodichloromethane	ug/L	50	58.6	117	62-136	
Bromoform	ug/L	50	59.0	118	44-134	
Bromomethane	ug/L	50	47.6	95	22-181	
Carbon disulfide	ug/L	100	117	117	59-132	
Carbon tetrachloride	ug/L	50	62.9	126	56-137	
Chlorobenzene	ug/L	50	49.9	100	78-123	
Chloroethane	ug/L	50	66.4	133	60-144	
Chloroform	ug/L	50	52.5	105	78-126	
Chloromethane	ug/L	50	46.3	93	42-134	
cis-1,2-Dichloroethene	ug/L	50	48.9	98	75-122	
cis-1,3-Dichloropropene	ug/L	50	53.3	107	64-126	
Dibromochloromethane	ug/L	50	58.0	116	58-128	
Dibromomethane	ug/L	50	50.2	100	73-125	
Dichlorodifluoromethane	ug/L	50	60.6	121	35-181	
Ethyl methacrylate	ug/L	200	189	95	69-133	
Ethylbenzene	ug/L	50	47.9	96	66-133	
Hexachloro-1,3-butadiene	ug/L	50	48.5	97	59-145	
Iodomethane	ug/L	100	86.3	86	21-170	
Isopropylbenzene (Cumene)	ug/L	50	54.6	109	69-124	
Methyl-tert-butyl ether	ug/L	100	85.3	85	69-122	
Methylene Chloride	ug/L	50	59.5	119	68-132	
n-Butylbenzene	ug/L	50	47.7	95	70-126	
n-Hexane	ug/L	50	41.9	84	51-125	N2
n-Propylbenzene	ug/L	50	49.2	98	71-122	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: IMW
Pace Project No.: 5091613

LABORATORY CONTROL SAMPLE: 1035113

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Naphthalene	ug/L	50	44.5	89	68-127	
p-Isopropyltoluene	ug/L	50	51.4	103	72-132	
sec-Butylbenzene	ug/L	50	50.6	101	70-128	
Styrene	ug/L	50	52.7	105	74-126	
tert-Butylbenzene	ug/L	50	44.5	89	51-118	
Tetrachloroethene	ug/L	50	54.7	109	69-130	
Toluene	ug/L	50	47.2	94	72-122	
trans-1,2-Dichloroethene	ug/L	50	47.2	94	72-124	
trans-1,3-Dichloropropene	ug/L	50	58.8	118	64-121	
trans-1,4-Dichloro-2-butene	ug/L	200	215	107	56-133	
Trichloroethene	ug/L	50	49.2	98	76-126	
Trichlorofluoromethane	ug/L	50	69.1	138	76-149	
Vinyl acetate	ug/L	200	209	104	45-151	
Vinyl chloride	ug/L	50	65.9	132	59-126	L0
Xylene (Total)	ug/L	150	153	102	70-124	
4-Bromofluorobenzene (S)	%.			103	80-114	
Dibromofluoromethane (S)	%.			106	79-116	
Toluene-d8 (S)	%.			97	81-110	

MATRIX SPIKE SAMPLE: 1035027

Parameter	Units	5091706007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	50	51.9	104	50-132	
1,1,1-Trichloroethane	ug/L	ND	50	55.3	111	60-138	
1,1,2,2-Tetrachloroethane	ug/L	ND	50	38.7	77	55-128	
1,1,2-Trichloroethane	ug/L	ND	50	43.3	87	61-139	
1,1-Dichloroethane	ug/L	ND	50	45.5	91	57-147	
1,1-Dichloroethene	ug/L	ND	50	55.1	110	55-145	
1,1-Dichloropropene	ug/L	ND	50	49.8	100	55-147	
1,2,3-Trichlorobenzene	ug/L	ND	50	47.0	94	31-141	
1,2,3-Trichloropropane	ug/L	ND	50	41.9	84	58-133	
1,2,4-Trichlorobenzene	ug/L	ND	50	44.2	88	25-143	
1,2,4-Trimethylbenzene	ug/L	ND	50	45.8	92	18-149	
1,2-Dibromoethane (EDB)	ug/L	ND	50	45.6	91	63-129	
1,2-Dichlorobenzene	ug/L	ND	50	43.5	87	38-136	
1,2-Dichloroethane	ug/L	ND	50	47.8	96	62-138	
1,2-Dichloropropane	ug/L	ND	50	41.7	83	59-130	
1,3,5-Trimethylbenzene	ug/L	ND	50	45.8	92	20-147	
1,3-Dichlorobenzene	ug/L	ND	50	42.4	85	28-141	
1,3-Dichloropropane	ug/L	ND	50	44.7	89	62-127	
1,4-Dichlorobenzene	ug/L	ND	50	42.4	85	30-139	
1-Methylnaphthalene	ug/L	ND		43.7			N2
2,2-Dichloropropane	ug/L	ND	50	21.5	43	37-139	
2-Butanone (MEK)	ug/L	ND	250	187	75	37-156	
2-Chlorotoluene	ug/L	ND	50	43.6	87	27-142	
2-Hexanone	ug/L	ND	250	188	75	44-143	
2-Methylnaphthalene	ug/L	ND	50	41.8	84	24-151	N2

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: IMW
Pace Project No.: 5091613

MATRIX SPIKE SAMPLE: 1035027

Parameter	Units	5091706007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
4-Chlorotoluene	ug/L	ND	50	45.2	90	27-144	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	250	186	74	46-144	
Acetone	ug/L	ND	250	240	96	39-156	
Acrolein	ug/L	ND	1000	779	78	33-200	
Acrylonitrile	ug/L	ND	1000	909	91	48-149	
Benzene	ug/L	ND	50	44.9	90	62-129	
Bromobenzene	ug/L	ND	50	44.8	90	39-140	
Bromochloromethane	ug/L	ND	50	41.6	83	49-142	
Bromodichloromethane	ug/L	ND	50	55.5	111	50-142	
Bromoform	ug/L	ND	50	51.2	102	36-125	
Bromomethane	ug/L	ND	50	44.9	90	13-179	
Carbon disulfide	ug/L	ND	100	116	116	45-142	
Carbon tetrachloride	ug/L	ND	50	62.9	126	46-142	
Chlorobenzene	ug/L	ND	50	47.7	95	49-136	
Chloroethane	ug/L	ND	50	68.6	137	47-160	
Chloroform	ug/L	ND	50	51.7	103	54-150	
Chloromethane	ug/L	ND	50	51.0	102	30-148	
cis-1,2-Dichloroethene	ug/L	ND	50	48.2	96	60-135	
cis-1,3-Dichloropropene	ug/L	ND	50	40.8	82	52-123	
Dibromochloromethane	ug/L	ND	50	52.4	105	48-125	
Dibromomethane	ug/L	ND	50	47.4	95	59-134	
Dichlorodifluoromethane	ug/L	ND	50	63.6	127	24-197	
Ethyl methacrylate	ug/L	ND	200	168	84	55-139	
Ethylbenzene	ug/L	ND	50	45.4	91	28-153	
Hexachloro-1,3-butadiene	ug/L	ND	50	45.3	91	10-176	
Iodomethane	ug/L	ND	100	86.1	86	17-157	
Isopropylbenzene (Cumene)	ug/L	ND	50	51.1	102	18-152	
Methyl-tert-butyl ether	ug/L	ND	100	78.9	79	63-130	
Methylene Chloride	ug/L	ND	50	56.8	114	45-156	
n-Butylbenzene	ug/L	ND	50	43.6	87	10-161	
n-Hexane	ug/L	ND	50	33.8	68	33-144	N2
n-Propylbenzene	ug/L	ND	50	46.4	93	16-150	
Naphthalene	ug/L	ND	50	40.0	80	39-140	
p-Isopropyltoluene	ug/L	ND	50	47.2	94	10-163	
sec-Butylbenzene	ug/L	ND	50	47.5	95	10-160	
Styrene	ug/L	ND	50	48.8	98	36-139	
tert-Butylbenzene	ug/L	ND	50	42.7	85	12-134	
Tetrachloroethene	ug/L	ND	50	51.5	103	33-151	
Toluene	ug/L	ND	50	45.4	91	50-132	
trans-1,2-Dichloroethene	ug/L	ND	50	47.5	95	40-153	
trans-1,3-Dichloropropene	ug/L	ND	50	44.3	89	48-122	
trans-1,4-Dichloro-2-butene	ug/L	ND	200	138	69	32-139	
Trichloroethene	ug/L	ND	50	47.7	95	50-143	
Trichlorofluoromethane	ug/L	ND	50	73.3	147	60-175	
Vinyl acetate	ug/L	ND	200	91.7	46	17-142	
Vinyl chloride	ug/L	ND	50	69.0	138	44-145	
Xylene (Total)	ug/L	ND	150	144	96	29-145	
4-Bromofluorobenzene (S)	%.				100	80-114	

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QUALITY CONTROL DATA

Project: IMW
Pace Project No.: 5091613

MATRIX SPIKE SAMPLE: 1035027

Parameter	Units	5091706007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Dibromofluoromethane (S)	%.				109	79-116	
Toluene-d8 (S)	%.				95	81-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1035114 1035115

Parameter	Units	5091613005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	50	50	55.4	52.7	111	105	50-132	5	20	
1,1,1-Trichloroethane	ug/L	ND	50	50	59.7	55.9	119	112	60-138	7	20	
1,1,2,2-Tetrachloroethane	ug/L	ND	50	50	44.7	39.0	89	78	55-128	13	20	
1,1,2-Trichloroethane	ug/L	ND	50	50	49.4	44.3	99	89	61-139	11	20	
1,1-Dichloroethane	ug/L	ND	50	50	48.1	44.4	96	89	57-147	8	20	
1,1-Dichloroethene	ug/L	ND	50	50	55.9	52.7	112	105	55-145	6	20	
1,1-Dichloropropene	ug/L	ND	50	50	52.9	49.5	106	99	55-147	7	20	
1,2,3-Trichlorobenzene	ug/L	ND	50	50	46.0	42.0	92	84	31-141	9	20	
1,2,3-Trichloropropane	ug/L	ND	50	50	47.3	41.8	95	84	58-133	13	20	
1,2,4-Trichlorobenzene	ug/L	ND	50	50	44.9	41.4	90	83	25-143	8	20	
1,2,4-Trimethylbenzene	ug/L	ND	50	50	47.1	43.4	94	87	18-149	8	20	
1,2-Dibromoethane (EDB)	ug/L	ND	50	50	51.7	47.1	103	94	63-129	9	20	
1,2-Dichlorobenzene	ug/L	ND	50	50	46.7	42.2	93	84	38-136	10	20	
1,2-Dichloroethane	ug/L	ND	50	50	53.3	48.7	107	97	62-138	9	20	
1,2-Dichloropropane	ug/L	ND	50	50	47.8	ND	96	0	59-130		20	
1,3,5-Trimethylbenzene	ug/L	ND	50	50	46.5	43.8	93	88	20-147	6	20	
1,3-Dichlorobenzene	ug/L	ND	50	50	44.5	41.0	89	82	28-141	8	20	
1,3-Dichloropropane	ug/L	ND	50	50	50.2	45.4	100	91	62-127	10	20	
1,4-Dichlorobenzene	ug/L	ND	50	50	45.0	41.7	90	83	30-139	8	20	
1-Methylnaphthalene	ug/L	ND			47.2	ND						N2
2,2-Dichloropropane	ug/L	ND	50	50	57.7	52.3	115	105	37-139	10	20	
2-Butanone (MEK)	ug/L	ND	250	250	235	199	94	79	37-156	17	20	
2-Chlorotoluene	ug/L	ND	50	50	45.7	42.7	91	85	27-142	7	20	
2-Hexanone	ug/L	ND	250	250	228	199	91	79	44-143	14	20	
2-Methylnaphthalene	ug/L	ND	50	50	45.2	39.0	90	78	24-151	15	20	N2
4-Chlorotoluene	ug/L	ND	50	50	48.4	43.1	97	86	27-144	12	20	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	250	250	231	199	92	79	46-144	15	20	
Acetone	ug/L	ND	250	250	288	252	115	101	39-156	13	20	
Acrolein	ug/L	ND	1000	1000	1190	1030	119	103	33-200	15	20	
Acrylonitrile	ug/L	ND	1000	1000	1090	957	109	96	48-149	13	20	
Benzene	ug/L	ND	50	50	48.4	44.4	97	89	62-129	9	20	
Bromobenzene	ug/L	ND	50	50	47.2	44.1	94	88	39-140	7	20	
Bromochloromethane	ug/L	ND	50	50	44.1	37.5	88	75	49-142	16	20	
Bromodichloromethane	ug/L	ND	50	50	61.4	55.7	123	111	50-142	10	20	
Bromoform	ug/L	ND	50	50	58.4	53.2	117	106	36-125	9	20	
Bromomethane	ug/L	ND	50	50	34.9	44.0	70	88	13-179	23	20	R1
Carbon disulfide	ug/L	ND	100	100	120	114	120	114	45-142	6	20	
Carbon tetrachloride	ug/L	ND	50	50	65.9	60.1	132	120	46-142	9	20	
Chlorobenzene	ug/L	ND	50	50	49.2	46.5	98	93	49-136	6	20	
Chloroethane	ug/L	ND	50	50	72.4	67.4	145	135	47-160	7	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Columbus, OH 43215
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Pace Analytical Services, Inc.
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: IMW
Pace Project No.: 5091613

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1035114 1035115

Parameter	Units	5091613005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloroform	ug/L	ND	50	50	56.6	51.3	113	103	54-150	10	20	
Chloromethane	ug/L	ND	50	50	56.7	54.4	113	109	30-148	4	20	
cis-1,2-Dichloroethene	ug/L	ND	50	50	52.1	47.6	104	95	60-135	9	20	
cis-1,3-Dichloropropene	ug/L	ND	50	50	51.9	47.0	104	94	52-123	10	20	
Dibromochloromethane	ug/L	ND	50	50	59.0	53.2	118	106	48-125	10	20	
Dibromomethane	ug/L	ND	50	50	53.5	48.3	107	97	59-134	10	20	
Dichlorodifluoromethane	ug/L	ND	50	50	69.3	61.6	139	123	24-197	12	20	
Ethyl methacrylate	ug/L	ND	200	200	193	175	96	87	55-139	10	20	
Ethylbenzene	ug/L	ND	50	50	46.9	44.6	94	89	28-153	5	20	
Hexachloro-1,3-butadiene	ug/L	ND	50	50	45.6	41.5	91	83	10-176	9	20	
Iodomethane	ug/L	ND	100	100	84.1	96.6	84	97	17-157	14	20	
Isopropylbenzene (Cumene)	ug/L	ND	50	50	53.1	50.3	106	101	18-152	5	20	
Methyl-tert-butyl ether	ug/L	ND	100	100	90.4	79.9	90	80	63-130	12	20	
Methylene Chloride	ug/L	ND	50	50	64.0	56.8	128	114	45-156	12	20	
n-Butylbenzene	ug/L	ND	50	50	44.1	40.7	88	81	10-161	8	20	
n-Hexane	ug/L	ND	50	50	40.7	37.4	81	75	33-144	9	20	N2
n-Propylbenzene	ug/L	ND	50	50	47.8	44.4	96	89	16-150	7	20	
Naphthalene	ug/L	ND	50	50	43.2	38.6	86	77	39-140	11	20	
p-Isopropyltoluene	ug/L	ND	50	50	47.5	44.7	95	89	10-163	6	20	
sec-Butylbenzene	ug/L	ND	50	50	48.9	45.5	98	91	10-160	7	20	
Styrene	ug/L	ND	50	50	50.0	47.5	100	95	36-139	5	20	
tert-Butylbenzene	ug/L	ND	50	50	43.8	41.4	88	83	12-134	6	20	
Tetrachloroethene	ug/L	ND	50	50	57.2	53.7	107	100	33-151	6	20	
Toluene	ug/L	ND	50	50	47.7	44.6	95	89	50-132	7	20	
trans-1,2-Dichloroethene	ug/L	ND	50	50	51.2	46.3	102	93	40-153	10	20	
trans-1,3-Dichloropropene	ug/L	ND	50	50	56.3	50.2	113	100	48-122	11	20	
trans-1,4-Dichloro-2-butene	ug/L	ND	200	200	215	189	107	95	32-139	12	20	
Trichloroethene	ug/L	ND	50	50	52.6	48.0	105	96	50-143	9	20	
Trichlorofluoromethane	ug/L	ND	50	50	76.1	69.5	152	139	60-175	9	20	
Vinyl acetate	ug/L	ND	200	200	191	166	95	83	17-142	14	20	
Vinyl chloride	ug/L	ND	50	50	68.5	69.1	137	138	44-145	1	20	
Xylene (Total)	ug/L	ND	150	150	149	142	100	95	29-145	5	20	
4-Bromofluorobenzene (S)	%.						101	100	80-114			
Dibromofluoromethane (S)	%.						109	107	79-116			
Toluene-d8 (S)	%.						94	96	81-110			

REPORT OF LABORATORY ANALYSIS

QUALIFIERS

Project: IMW
Pace Project No.: 5091613

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
N2	The lab does not hold TNI accreditation for this parameter.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.

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(317)228-3100

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: IMW
Pace Project No.: 5091613

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
5091613001	**MW29**	RSK 175 Modified	GCV/17549		
5091613002	**MW14**	RSK 175 Modified	GCV/17549		
5091613003	**MW33D**	RSK 175 Modified	GCV/17549		
5091613004	**MW30**	RSK 175 Modified	GCV/17549		
5091613005	**MW26R**	RSK 175 Modified	GCV/17549		
5091613006	**MW9**	RSK 175 Modified	GCV/17549		
5091613001	**MW29**	EPA 8260	MSV/60761		
5091613002	**MW14**	EPA 8260	MSV/60761		
5091613003	**MW33D**	EPA 8260	MSV/60761		
5091613004	**MW30**	EPA 8260	MSV/60761		
5091613005	**MW26R**	EPA 8260	MSV/60761		
5091613006	**MW9**	EPA 8260	MSV/60761		
5091613007	**DUP**	EPA 8260	MSV/60761		
5091613008	**Trip Blank**	EPA 8260	MSV/60761		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of 002149

Section A Required Client Information:

Company: Troy Risk
Address: 7466 Shadeland Station Way Indianapolis, IN 46256
Email To: jokeefe@troyrisk.com
Phone: 3175206730 Fax: 3175706731
Requested Due Date/TAT: STD

Section B Required Project Information:

Report To: J Okeefe
Copy To:
Purchase Order No.:
Project Name: 1 MW
Project Number:

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START GRAB DATE	COLLECTED COMPOSITE START GRAB TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zink Acetate & NaOH	Other	Requested Analysis Filtered (Y/N) Y/N	Analysis Test: VOC (8260)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 5091613
1	MW29	WT	G	12/18/13	1400				3				X						X		001
2	MW14				1210				3												002
3	MW33D				1130				3												003
4	MW30				1240				3												004
5	MW26R				1320				9												005
6	MW9				1440				3												006
7	DUP								3												007
8	TRIP BLANK								3												008
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
MW26R is MS/MSD	TKI	12/19/13	11:00		12/19/13	11:00am				
	Pace	12/31/1	1512	Colette Weaver / PACE	12/19/13	1512	5.1C	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: George Mohr
SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 12/18/13

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of 1258905

Section A Required Client Information:

Company: Troy Risk
Address: 7466 Shadeland Station Way
Indianapolis, IN 46256
Email To: jokeefe@troyrisk.com
Phone: 3175706730 Fax: 3175706731
Requested Due Date/TAT: STD

Section B Required Project Information:

Report To: j okeefe
Copy To:
Purchase Order No.:
Project Name: IMW
Project Number:

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY
☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER
Site Location STATE:

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START GRAB DATE	COLLECTED COMPOSITE START GRAB TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Requested Analysis Filtered (Y/N): Ethene/Ethane/Methane method RSK175	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW29	WT	G	12/19/13	1400				2								X		X		001
2	MW14				1210																002
3	MW33D				1130																003
4	MW30				1240																004
5	MW26R				1320																005
6	MW9				1440																006
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	JOP JRL	12/19/13	1200		12/19/13	11:10 am				
		12/19/13	1511	Celeste Weaver/PACE	12/19/13	1511	4.8c	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: George Nolen
SIGNATURE of SAMPLER:
DATE Signed (MM/DD/YY): 12/18/13

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt

Pace Analytical

Client Name: Tray Risk

Project # 5091613

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals Intact: ☐ yes ☑ no

Date/Time 5035A kits placed in freezer: _____

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other _____

Thermometer Used 1 2 3 4 6 A B C D E

Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature (Corrected, if applicable) 4.8 5.1

Ice Visible in Sample Containers: ☐ yes ☑ no

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 12/19/13 JJ

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	5.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	6.
Containers Intact:	☑Yes ☐No ☐N/A	7.
Sample Labels match COC: -Includes date/time/ID/Analysis	☑Yes ☐No ☐N/A	8.
All containers needing acid/base pres. have been checked? exceptions: VOA, coliform, TOC, O&G	☐Yes ☐No ☑N/A	9. (Circle) HNO3 H2SO4 NaOH HCl
All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.		
Headspace in VOA Vials (>6mm):	☑Yes ☐No ☐N/A	10. 1=MW14, 1=MW9, 1=Dup
Trip Blank Present:	☑Yes ☐No ☐N/A	11.
Trip Blank Custody Seals Present	☐Yes ☑No ☐N/A	
Project Manager Review		
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	12.
Sufficient Volume:	☑Yes ☐No ☐N/A	13.
Correct Containers Used:	☑Yes ☐No ☐N/A	14.

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: 12/20/13

Form F-IN-Q-290-rev.05, 10Sep2013

Sample Container Count

CLIENT: Troy Rich

COC PAGE 1 of 12 BE 12/26/13

COC ID# 200 002149

Project # 5009613

Sample Line Item	DG9H	AG1U	WGFU	AG0U	R	4/6	BP2N	BP2U	BP2S	BP3N	BP3U	BP3S	AG3S	AG1H	VG9H		pH <2	pH>12	Comments
1															3				
2															3				
3															3				
4															3				
5															9				
6															3				
7															3				
8															3				
9																			
10																			
11																			
12																			

Container Codes

DG9H	40mL HCL amber voa vial	AG0U	100mL unpreserved amber gl	BP1N	1 liter HNO3 plastic	DG9P	40mL TSP amber vial
AG1U	1liter unpreserved amber gla	AG1H	1 liter HCL amber glass	BP1S	1 liter H2SO4 plastic	DG9S	40mL H2SO4 amber vial
WGFU	4oz clear soil jar	AG1S	1 liter H2SO4 amber glass	BP1U	1 liter unpreserved plastic	DG9T	40mL Na Thio amber vial
R	terra core kit	AG1T	1 liter Na Thiosulfate amber g	BP1Z	1 liter NaOH, Zn, Ac	DG9U	40mL unpreserved amber vial
BP2N	500mL HNO3 plastic	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	I	Wipe/Swab
BP2U	500mL unpreserved plastic	AG2S	500mL H2SO4 amber glass	BP2O	500mL NaOH plastic	JGFU	4oz unpreserved amber wide
BP2S	500mL H2SO4 plastic	AG2U	500mL unpreserved amber g	BP2Z	500mL NaOH, Zn Ac	U	Summa Can
BP3N	250mL HNO3 plastic	AG3U	250mL unpreserved amber g	AF	Air Filter	VG9H	40mL HCL clear vial
BP3U	250mL unpreserved plastic	BG1H	1 liter HCL clear glass	BP3C	250mL NaOH plastic	VG9T	40mL Na Thio. clear vial
BP3S	250mL H2SO4 plastic	BG1S	1 liter H2SO4 clear glass	BP3Z	250mL NaOH, Zn Ac plastic	VG9U	40mL unpreserved clear vial
AG3S	250mL H2SO4 glass amber	BG1T	1 liter Na Thiosulfate clear gl	C	Air Cassettes	VSG	Headspace septa vial & HCL
AG1S	1 liter H2SO4 amber glass	BG1U	1 liter unpreserved glass	DG9B	40mL Na Bisulfate amber vial	WGFX	4oz wide jar w/hexane wipe
BP1U	1 liter unpreserved plastic	BP1A	1 liter NaOH, Asc Acid plasti	DG9M	40mL MeOH clear vial	ZPLC	Ziploc Bag

Sample Container Count

CLIENT: Troy Risk

COC PAGE 1 of 1 12/20/13

COC ID# 1258905

Project # 5091613

Sample Line Item	DG9H	AG1U	WGFU	AG0U	R	4/6	BP2N	BP2U	BP2S	BP3N	BP3U	BP3S	AG3S	AG1H	6N		pH <2	pH>12	Comments
1															2				
2															2				
3															2				
4															2				
5															2				
6															2				
7																			
8																			
9																			
10																			
11																			
12																			

Container Codes

DG9H	40mL HCL amber voa vial	AG0U	100mL unpreserved amber gl	BP1N	1 liter HNO3 plastic	DG9P	40mL TSP amber vial
AG1U	1liter unpreserved amber gla	AG1H	1 liter HCL amber glass	BP1S	1 liter H2SO4 plastic	DG9S	40mL H2SO4 amber vial
WGFU	4oz clear soil jar	AG1S	1 liter H2SO4 amber glass	BP1U	1 liter unpreserved plastic	DG9T	40mL Na Thio amber vial
R	terra core kit	AG1T	1 liter Na Thiosulfate amber	BP1Z	1 liter NaOH, Zn, Ac	DG9U	40mL unpreserved amber vial
BP2N	500mL HNO3 plastic	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	I	Wipe/Swab
BP2U	500mL unpreserved plastic	AG2S	500mL H2SO4 amber glass	BP2O	500mL NaOH plastic	JGFU	4oz unpreserved amber wide
BP2S	500mL H2SO4 plastic	AG2U	500mL unpreserved amber g	BP2Z	500mL NaOH, Zn Ac	U	Summa Can
BP3N	250mL HNO3 plastic	AG3U	250mL unpreserved amber g	AF	Air Filter	VG9H	40mL HCL clear vial
BP3U	250mL unpreserved plastic	BG1H	1 liter HCL clear glass	BP3C	250mL NaOH plastic	VG9T	40mL Na Thio. clear vial
BP3S	250mL H2SO4 plastic	BG1S	1 liter H2SO4 clear glass	BP3Z	250mL NaOH, Zn Ac plastic	VG9U	40mL unpreserved clear vial
AG3S	250mL H2SO4 glass amber	BG1T	1 liter Na Thiosulfate clear gl	C	Air Cassettes	VSG	Headspace septa vial & HCL
AG1S	1 liter H2SO4 amber glass	BG1U	1 liter unpreserved glass	DG9B	40mL Na Bisulfate amber vial	WGFX	4oz wide jar w/hexane wipe
BP1U	1 liter unpreserved plastic	BP1A	1 liter NaOH, Asc Acid plastic	DG9M	40mL MeOH clear vial	ZPLC	Ziploc Bag

APPENDIX B

Creating a Reducing Environment

Since reductive dechlorination only occurs in the absence of oxygen, the initial step is to remove oxygen from the groundwater environment. An oxygen scavenger will be introduced to the subsurface so that this process occurs immediately. Sodium sulfite was used as an oxygen scavenger in the pilot test and will be used during remediation to further remove oxygen.

Zero Valent Iron (ZVI) will also aid in creating a reducing environment. Injected, colloidal reactive iron is a promising technology that may be applied synergistically with other compatible technologies. ZVI is the product of positively charged metal ions receiving electrons to become an electrically neutral pure metal. Since the term "reduction" is applied to any chemical reaction that adds electrons to an element, ZVI is a reduced material. In a similar manner, the term "oxidation" refers to any chemical reaction that removes electrons from a material. For a material to be reduced, some other material must be oxidized. ZVI is oxidized during the reduction of a chlorinated compound. ZVI-enhanced abiotic degradation of CVOCs is a reductive dechlorination process that uses granular cast iron as the reducing agent and produces final degradation products such as ethane, ethene, and chloride ions. The corrosion of iron by water dominates this chemical process and results in ferrous ion, hydroxyl ion, and hydrogen gas generation. The result is a decrease in oxidation-reduction potential (ORP) as reducing conditions are produced and an increase in pH. Accordingly, the end products of this reaction are ferrous iron, chloride ions, and the dehalogenated compound (e.g., ethene).

Providing a Hydrogen Donor

Hydrogen gas can be used to promote reductive dechlorination by the following reaction:

$$H_2 + X\text{-}Cl = X\text{-}H + H^+ + Cl^- \quad \text{(where X stands for a CVOC)}$$

The proposed remediation plan incorporates a variety of organic hydrogen donors, each selected and dosed based on the hydrogen release profile (time frame) of the individual compounds. Slowly fermented substrates producing lower H_2 levels are more effective and persistent "selective" stimulators of dechlorination than rapidly fermented substrates producing higher H_2 levels. Maintaining and extending a low hydrogen release profile as a result of a single injection event is a focus of this program. The mixed organic hydrogen donors promote this condition using varied concentrations of the substrates based on loading and the individual long-term treatment objective. The general release profile of the organic hydrogen donors for the proposed remediation program are:

Propionate:	0 to 100 days
Hydrolyzed Kelp:	60 to 500 days
Yeast Extract:	150 to 365 days
EHC®:	365 to 1500 days

Propionate
Some electron donors are more efficient than others at producing the hydrogen necessary for dehalogenation. Various groups of microorganisms compete for hydrogen, and dehalogenating microorganisms can survive better than others at very low hydrogen concentrations. On this basis, the slug addition of a compound such as formate, ethanol, or glucose is not as effective for dehalogenation as propionate because the former compounds are converted rapidly to hydrogen and acetate and propionate is not. The rapid conversion is a result of more favorable thermodynamics for hydrogen formation and places hydrogen in a concentration range where methanogens and sulfate reducers can compete effectively with dehalogenators.

Hydrolyzed Kelp
Seaweed is brown alga that is widely available in both the wild and through cultivation. The best-known species of seaweed is *Ascophyllum nodosum*, which is native to the northern Atlantic and has a wide variety of important nutrients beneficial to anaerobic processes. *A. nodosum* contains sulfate uronic acids, mannitol, laminaran, fucoidin, ascorbic acid, tocopherols, carotenes, niacin, biotin, folic acid, riboflavine, and thiamine. The species also has an assortment of elements including sulfur, potassium, chlorine, sodium, magnesium, calcium, phosphorous, bromine, cobalt, copper, iron, iodine, zinc, nickel and vitamin B12 and vitamin K. When emplaced in groundwater and soil impacted by chlorinated compounds, the micro-dried seaweed provides all the components needed for effective and rapid remediation of tetrachloroethane, PCE, trichloroethane, TCE, carbon tetrachloride, and their anaerobic daughter products.

The use of kelp as an additive that not only provides a variety of organic carbon and hydrogen sources, but also provides a source of nutrients and vitamins. When anaerobic bacteria digest sugars and carbohydrates, they convert the sugars and carbohydrates into gases, most commonly hydrogen. By containing a variety of very soluble kelp sources, the injected substances will provide a long-lasting source of vitamins, nutrients, organic carbon, organic hydrogen sources, buffering capacity, and essential nutrients for sustained, biologically mediated anaerobic dechlorination.

Yeast Extract
Yeast extract provides a variety of organic hydrogen donors capable of slow release profiles, as well as significant biological components not available through other media. In particular, yeast extract is an abundant source of the priming ATPase enzyme. A full discussion of the enzymatic benefits of yeast extract is beyond the scope of this work plan.

EHC®
EHC® contains ZVI to uniquely elicit ISCR reactions and is composed of a hydrophilic, solid and complex carbon source so that generates little or no methane (< 5 mg/L). EHC® will last in the subsurface for at least 3 to 5 years, and the pH buffering from iron on EHC® may also decrease the probability of methane generation by suppressing the activity of methanogens that are more active at the more acidic pHs resulting from various fermentation processes. The hydrophilic organic component of EHC®, which is composed of cellulose and hemicellulose, may be treated during the manufacturing process so that the components more easily hydrolyze to glucose while maintaining an overall longevity of 3 to 5 years. Hydrogen gas is produced

during glucose fermentation via several enzymatic pathways, depending on site conditions and microbial assemblages. EHC® also contains ZVI, which, as it corrodes, also serves as a source of hydrogen. Water corrosion of granular iron produces hydrogen and hydroxide resulting in an increase in pH and decline in ORP.

Nutrients

Sufficient bio-available nutrients are critical to sustained microbial activity and general microbial health. Nitrogen and o-PO_4 have been incorporated into the remediation program such that organelle and ATP-ADP formation is not limited throughout the microbial respiratory process.

Vitamins

Recent studies suggest that metal–containing coenzymes found in certain types of anaerobic microorganisms can reductively dechlorinate one- and two-carbon solvents. In the biological systems, the rate-limiting step to complete dechlorination to ethene is the last stage conversion of vinyl chloride. The rate of that process has been found to be significantly enhanced by the presence of vitamin B12, which acts as an electron carrier.

Innovative Environmental Technologies, Inc.

Technology Discussion and Data Evaluation

to

Troy Risk

For

IMW
Mooresville, IN

September 2013

Innovative Environmental Technologies, Inc.
6151 Kellers Church Road
Pipersville, PA 18947
(888) 721-8283

"A Resource for Environmental Professionals Seeking Innovative Alternative Technologies"

Data Analysis for the Indiana Machine Works facility

Innovative Environmental Technologies, Inc. (IET) has reviewed the August 2013 data provided regarding the IMW facility, located in Mooresville, IN, as the approximately 90 days sampling event. The following discussion concerns the continued efficacy of the remedial event that was implemented in May 1st, 2013.

The injection program at the IMW facility consisted of one treatment area encompassing approximately 1,766 square feet and required 9 direct push points from depths of 5-15 feet below ground surface (bgs). The remedial mixture was designed in order to reduce source area concentrations and limit plume migration, as well as promote anaerobic conditions in the groundwater favorable to anaerobic bacteria that degrade CVOCs. The remedial materials injected in the treatment area, included 370 lbs of ZVI, 300 lbs sodium sulfite, 1,000 lbs of EHC, 150 lbs yeast extract, 150 lbs nutrient, 999 lbs calcium propionate, 220 pounds of Hydrolyzed Kelp, 1,881.3 grams vitamin B2 and 271 grams vitamin B12.

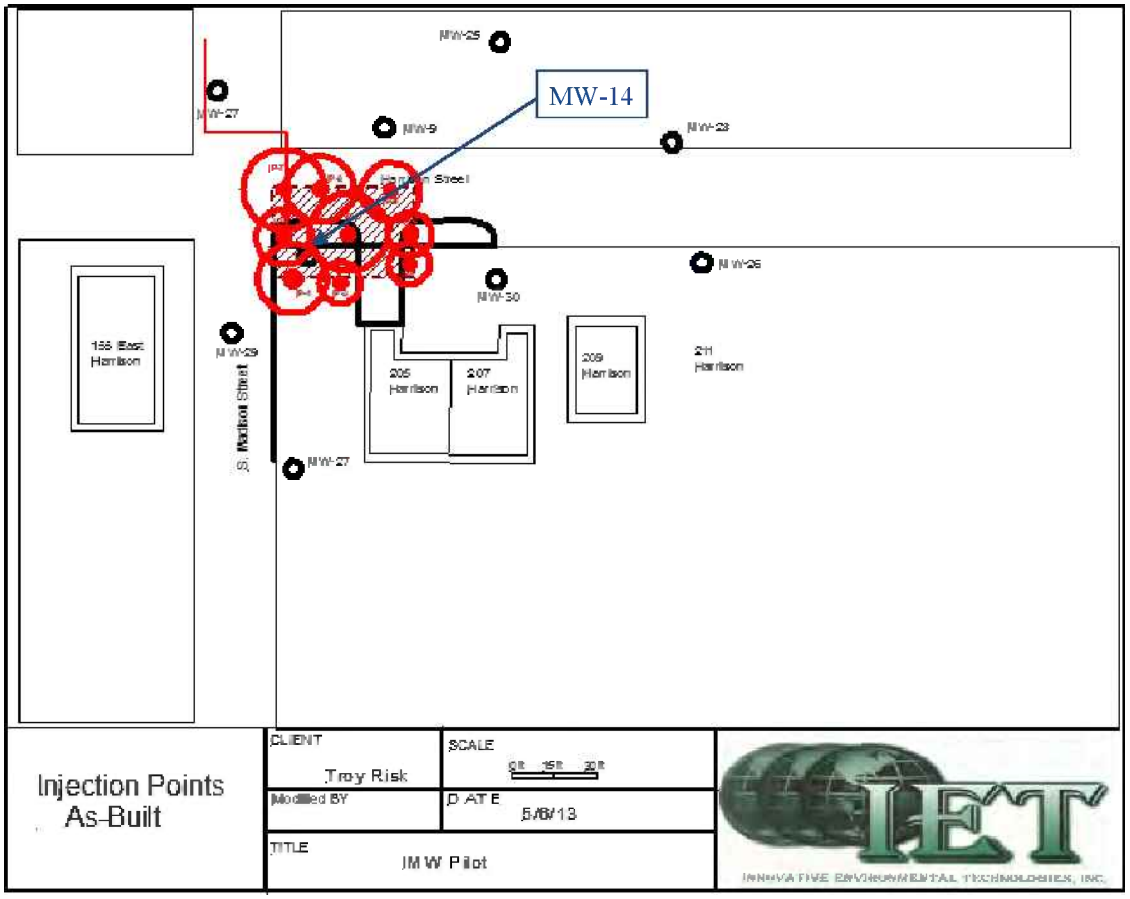


Figure 1. Injection Area

Monitoring Wells

MW-14 was the only monitoring well directly targeted by the injection event in May 2013. An additional four more monitoring wells (MW-9, MW-26R, MW-29, and MW-30) are located outside of the treatment area and were sampled during the August 2013 sampling event.

MW-14

Monitoring well MW-14 is located inside the remedial treatment area and was directly affected by the remedial injection of May 2013. Based on the analytical CVOC data from the August 2013 sampling event, it appears that the concentrations of the parent compounds PCE and TCE were significantly decreased and reached values below the laboratory detection limits. At the same time the concentrations of daughter compounds 1,2-DCE and vinyl chloride have increased compared to their pre-injection concentration values. As the concentrations of the parent compounds decrease the concentrations of the daughter products tend to temporarily increase. However all the field parameters and geochemical data indicate that the subsurface conditions are favorable for reductive dechlorination; therefore cis-1,2-DCE and vinyl chloride concentrations are expected to decrease during the subsequent sampling events.

Table 1. CVOC Data for MW-14 (µg/L).

MW-14				
Sampling Date	**PCE**	**TCE**	**cis-1,2-DCE**	**VC**
April 2013	245	29.4	47	ND
June 2013	661	109	799	ND
August 2013	<100	<100	480	790

The field parameter data continues to strongly indicate that the subsurface has been positively affected by the May 2013 injection event. The redox potential continues to decrease and turn more reducing from +223 mV in April 2013 to -115 mV in June 2013 and to -145 mV in August 2013. The pH values have remained neutral measuring at 7.47 pH units. The decrease in ORP values and the neutral pH values indicate that anaerobic conditions are currently establishing favorable conditions in the vicinity of monitoring well MW-14 and thus reductive dechlorination is expected to continue in the area during the upcoming sampling events.

Total and dissolved iron concentrations remain highly elevated at 160 and 77 mg/L respectively, while dissolved gases concentrations also appear to be elevated during the August 2013 sampling event. More specifically methane, ethane and ethene concentrations were all highly increased compared to their June 2013 values and measured at 2,900, 2.6 and 240 µg/L, respectively during the August 2013 sampling event. The presence of dissolved gases indicates that reductive dechlorination is currently occurring in the vicinity of MW-14 and further decreases in the CVOCs concentrations should be expected based on the high concentration of the reduced form of iron, ferrous, present at high concentrations.

Volatile fatty acids (VFAs) were also present in MW-14, indicating that the remedial materials were successfully emplaced in the vicinity of MW-14 and the metabolic processes that occur during the reductive dechlorination procedure have begun to accelerate. More specifically, acetic acid and lactic

acid concentrations increased compared to the June 2013 sampling event and reached values of 2,900 and 1,100 mg/L respectively. That increase can be attributed to the effect of the organic hydrogen donors and the fermentation of the kelp, propionate, yeast, and EHC which all form volatile fatty acids. Propionic acid also remained highly elevated at 9,900 mg/L, while butyric, pyruvic, and pentanoic fatty acids were also remained elevated during the August 2013 sampling event.

Table 2. Field Parameters and Geochemical Data for MW-14.

MW-14								
Sampling Date	pH	ORP (mV)	DO (mg/L)	Total Iron (µg/L)	Dissolved Iron (µg/L)	Methane (µg/L)	Ethane (µg/L)	Ethene (µg/L)
April 2013	6.98	+223	7.19	1,800	130	<0.2	<0.2	<0.2
June 2013	6.96	-115	4.76	123,000	98,000	44	1.6	4.2
August 2013	7.47	-145	8.13	160,000	77,000	2,900	2.6	240

Table 3. Volatile Fatty Acid Data for MW-14 (mg/L).

MW-14							
Sampling Date	Acetic	Propionic	Butyric	Pyruvic	i-Pentanoic	Pentanoic	Lactic
April 2013	NA	NA	NA	NA	NA	NA	NA
June 2013	1,800	13,000	440	51	40	82	<100
August 2013	2,900	9,900	350	67	54	120	1,100

NA: Not Analyzed

Monitoring Wells Outside the Treatment Area

MW-9

Monitoring well MW-9 is located on the northern part outside the source treatment area that was targeted by the May 2013 injection event. The analytical results from monitoring well MW-9, as well as the field parameters, indicate that MW-9 was not significantly affected by the injection event. The concentrations of almost all CVOCs remained below the laboratory detection limits. The only chlorinated compounds measured above the detection limit during the pre-injection sampling event were PCE and cis-1,2-DCE. PCE concentration slightly increased during the first two post-injection sampling events from 15.8 µg/L in April 2013 to 21.4 µg/L in June 2013 and to 35.6 µg/L in August 2013. The concentration of cis-1,2-DCE slightly decreased from 5.59 µg/L in April 2013 to below the laboratory detection limit of 5 µg/L since the June 2013 sampling event.

Table 4. CVOC Data for MW-9 (µg/L).

MW-9				
Sampling Date	**PCE**	**TCE**	**cis-1,2-DCE**	**VC**
April 2013	15.8	ND	5.59	ND
June 2013	21.4	ND	ND	ND
August 2013	35.6	ND	ND	ND

The subsurface conditions in the vicinity of MW-9 have not significantly changed since the pre-injection sampling event; however there appears to be a positive influence from the injection event to all measured field parameters. The ORP values also decreased from +249 mV in April to +138 mV

in June 2013 and eventually to +61 mV in August 2013; however they remained oxidative. At the same time the pH values in the vicinity of MW-9 remained neutral at 7.78 pH units.

Total and dissolved iron as well as dissolved gases concentrations remained approximately the same during the first two post-injection sampling events, while all volatile fatty acids, with the exception of propionic acid (0.083 mg/L) remained below the laboratory detection limits.

Table 5. Field Parameters and Geochemical Data for MW-9.

MW-9								
Sampling Date	pH	ORP (mV)	DO (mg/L)	Total Iron (µg/L)	Dissolved Iron (µg/L)	Methane (µg/L)	Ethane (µg/L)	Ethene (µg/L)
April 2013	6.23	+249	14.76	4,600	200	1.5	<0.2	<0.2
June 2013	7.55	+138	5.47	6,400	<100	0.73	<0.2	<0.2
August 2013	7.78	+61	11.29	1,800	<100	<0.2	<0.2	<0.2

MW-26R

Monitoring well MW-26R is located on the eastern part of the source treatment area that was targeted by the May 2013 injection event. Similar to monitoring well MW-9, the analytical results and the field parameters from monitoring well MW-26R indicate that the well was not affected by the May 2013 injection event. All CVOC concentrations remained below the laboratory detection limits during the August 2013 sampling event. Monitoring well MW-26R was not sampled during the April 2013 pre-injection sampling event, thus there is no data to compare the post-injection field parameters. However compared to the June 2013 sampling event data, it appears that MW-26R has maintained an oxidative redox potential at +146 mV, has slightly decreased dissolved oxygen concentrations at 4.90 mg/L and has sustained a neutral pH at 7.75 pH units. All volatile fatty acids remained below the laboratory detection limits as of June 2013 and only total iron concentrations appear to be elevated at 13 mg/L.

MW-29

Monitoring well MW-29 is located on the southwestern part outside the source treatment area that was targeted by the May 2013 injection event. The analytical CVOC data of the August 2013 sampling event indicates that the concentrations of PCE, TCE and 1,1,1-TCA increased compared to the June 2013 sampling event. More specifically, PCE concentrations reached 927 µg/L, TCE was measured at 20.9 µg/L, while 1,1,1-TCA was 29.5 µg/L in August 2013.

Table 6. CVOC Data for MW-29 (µg/L).

MW-29					
Sampling Date	**PCE**	**TCE**	**cis-1,2-DCE**	**VC**	**1,1,1-TCA**
April 2013	423	8.2	17	ND	6.1
June 2013	858	ND	52	ND	ND
August 2013	927	20.9	50.8	ND	29.5

The subsurface conditions in the vicinity of MW-29 have not significantly changed from the pre-injection sampling event. Dissolved oxygen concentrations showed a slight decrease from 10.28 mg/L in June 2013 to 7.82 mg/L in August 2013. The ORP decreased from +232 mV in April to

+154 mV in June 2013 and to +88 mV in August 2013; however they remained oxidative. At the same time the pH values in the vicinity of MW-29 remained neutral at 7.84 pH units.

Total iron concentrations remain slightly elevated at 6.8 mg/L during the August 2013 sampling event. Also, dissolved iron concentrations showed a slight increase from 170 µg/L in June 2013 to 240 µg/L in August 2013. Dissolved gases concentrations have remained low with ethane and ethene concentrations measured below the laboratory detection limit and methane just above at 18 µg/L. At the same time, most of the volatile fatty acids concentrations remained not detected with the exception of acetic propionic and butyric acids that measured slightly above the laboratory detection limit at 180, 380 and 61 µg/L, respectively in August 2013.

Table 7. Field Parameters and Geochemical Data for MW-29.

MW-29								
Sampling Date	pH	ORP (mV)	DO (mg/L)	Total Iron (µg/L)	Dissolved Iron (µg/L)	Methane (µg/L)	Ethane (µg/L)	Ethene (µg/L)
April 2013	6.55	+232	4.39	3,500	NA	<0.2	<0.2	<0.2
June 2013	7.51	+154	10.28	7,800	170	8	<0.2	<0.2
August 2013	7.84	+88	7.82	6,800	240	18	<0.2	<0.2

Table 8. Volatile Fatty Acid Data for MW-29 (mg/L).

MW-29						
Sampling Date	Acetic	Propionic	Butyric	Pyruvic	Formic	Pentanoic
April 2013	NA	NA	NA	NA	NA	NA
June 2013	0.073	<0.050	<0.050	<0.150	0.150	<0.070
August 2013	0.18	0.38	0.061	<0.150	0.100	<0.070

NA: Not Analyzed

Overall it appears that MW-29 was also not significantly affected by the remedial program of May 2013. The slight increases in PCE, TCE and 1,1,1-TCA concentrations can most likely be attributed to the mobilization of the contaminants in the subsurface during the injection event. It is estimated that in the subsequent sampling events the CVOC concentrations in the vicinity of MW-29 will return to their pre-injection values and will have the potential to decrease as reductive dechlorination progresses.

MW-30

Monitoring well MW-30 is located on the southeastern part of the source treatment area that was targeted by the May 2013 injection event. The analytical CVOC data of the August 2013 sampling event indicates that the concentrations of PCE was decreased by 39% since the June 2013 sampling, returning to their pre-injection values. The concentrations of TCE and vinyl chloride have remained unchanged compared to the previous sampling event. However cis-1,2-DCE concentrations have increased significantly exceeding concentrations of 1 mg/L. That increase can most likely be attributed to the degradation pathway of the parent compound PCE to the daughter compounds. However that temporary increase is expected to eventually be followed by the return of the CVOC concentrations of pre-injection levels.

Table 9. CVOC Data for MW-30 (µg/L).

MW-30				
Sampling Date	**PCE**	**TCE**	**cis-1,2-DCE**	**VC**
April 2013	323	21.9	45.7	ND
June 2013	520	31.9	53.8	2.72
August 2013	315	34.3	1,020	3.25

The field parameter data indicates that the subsurface was positively influenced from the May 2013 injection event; however the extent of the positive effect is still in progress. The redox potential was significantly decreased from +236 mV in April to +101 mV in June 2013 to +91 mV in August 2013. The pH values remained neutral at 6.83 pH units. The decrease in ORP values along with the neutral pH are promising indications that favorable conditions are developing in the vicinity of monitoring well MW-30.

Total iron concentrations appear to be slightly elevated at 4 mg/L, while dissolved iron concentrations increased just slightly above the laboratory detection limits. Dissolved gases concentrations have remained relatively stable throughout the sampling events.

Table 10. Field Parameters and Geochemical Data for MW-30.

MW-30								
Sampling Date	pH	ORP (mV)	DO (mg/L)	Total Iron (µg/L)	Dissolved Iron (µg/L)	Methane (µg/L)	Ethane (µg/L)	Ethene (µg/L)
April 2013	6.83	+236	10.13	3,800	<100	2,800	4.2	0.24
June 2013	7.19	+101	2.93	7,700	<100	4,200	3.4	0.24
August 2013	6.83	+91	11.55	4,000	100	2,200	1.9	0.9

Conclusions and Recommendations

As the 90-day sampling data indicates the geochemistry and biochemistry has continued to transition towards reductive dechlorination favorable conditions. The field parameters, geochemical and volatile fatty acid data from the August 2013 sampling event indicate that the remedial event continues to successfully influence the subsurface of the targeted monitoring well MW-14. The concentrations of the parent compounds in the vicinity of the well have decreased during the last sampling event and despite the expected subsequent increase in daughter products concentrations it is projected that these concentrations will also decrease during the upcoming sampling events. PCE concentrations in the vicinity of monitoring well MW-30, which is the monitoring well outside of the treatment area that recorded the highest total CVOC concentrations during the April 2013 baseline sampling event have also decreased and further reduction in daughter product and PCE concentrations is also expected as well. The ORP values are decreasing in the vicinities of these two wells, pH values remain neutral, while total and dissolved iron concentrations as well as dissolved gases concentrations are currently elevated. The appearance specifically of ethane and ethane 90 days after the completion of the injection event supports the current and on-going reductive dechlorination processes.

As mentioned above, the field parameters and geochemical data appear to be very promising in MW-14 for reductive dechlorination to continue to occur and the remaining CVOC concentrations are

expected to decrease during subsequent sampling events. Initial results indicate that the remedial event was successful in decreasing the source area CVOC concentrations.

APPENDIX C

Troy Risk, Inc.

7466 Shadeland Station Way, Indianapolis, IN 46256

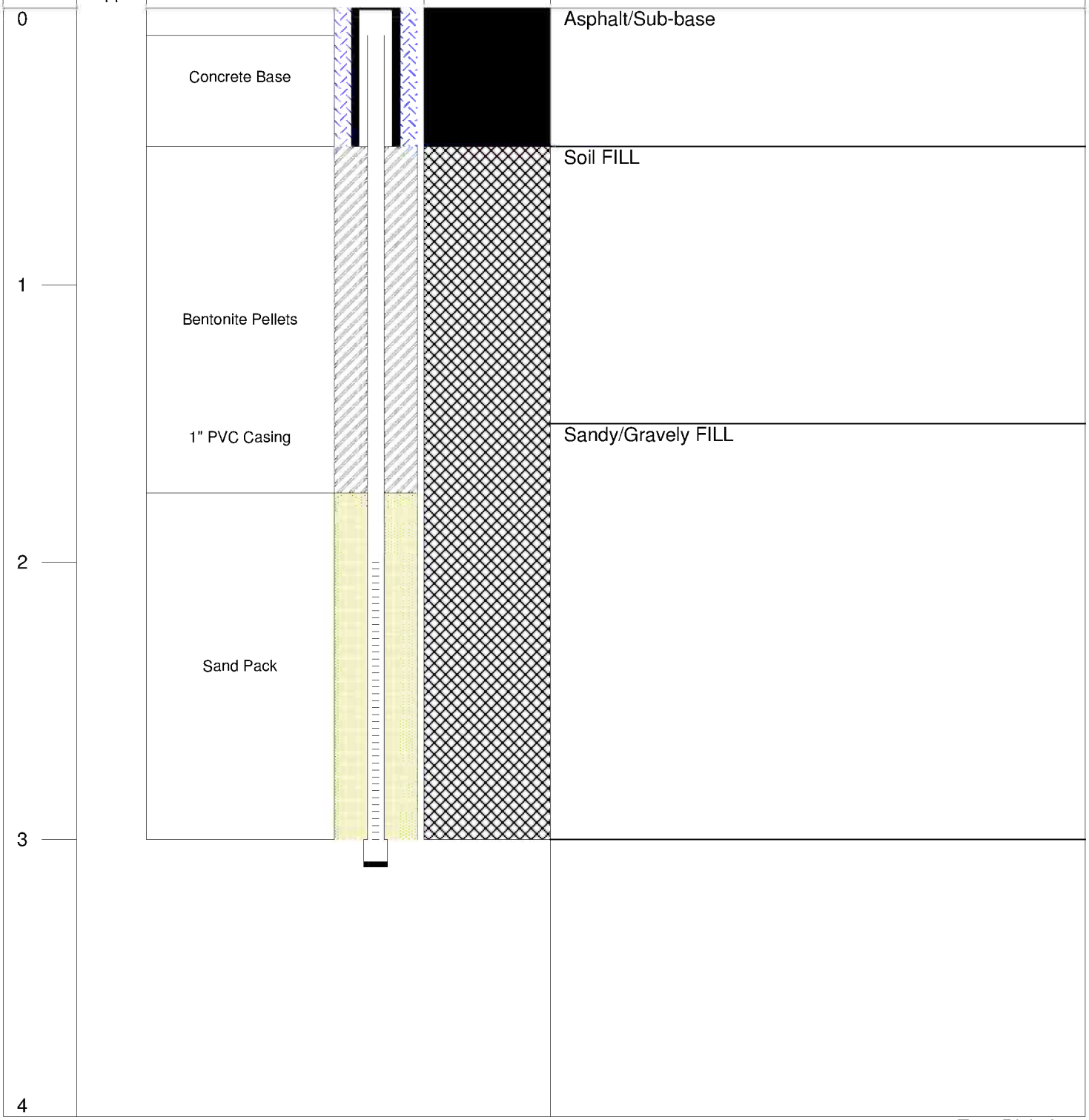
Client:	Indiana Machine Works
Site Name:	Indiana Machine Works
Address:	135 E Harrison St, Mooresville, IN

Well ID: VP-3

Geologist:	J. O'Keefe	**Water Well Driller License #:**	N/A
Driller:	N/A	**License #:**	N/A
Date Drilled:	5/2/13	**Borehole Dia.:**	2.25

UTM coordinates
Northing: NA Easting: NA

Drilling Method:	**Sampling Method(s):**	**Drilling Fluids:**
Hand Auger	N/A	None



Drilling Company: N/A

Soil Samples: N/A

Groundwater Sample: N/A

Troy Risk, Inc.

Project number 95.03.06

Troy Risk, Inc.

7466 Shadeland Station Way, Indianapolis, IN 46256

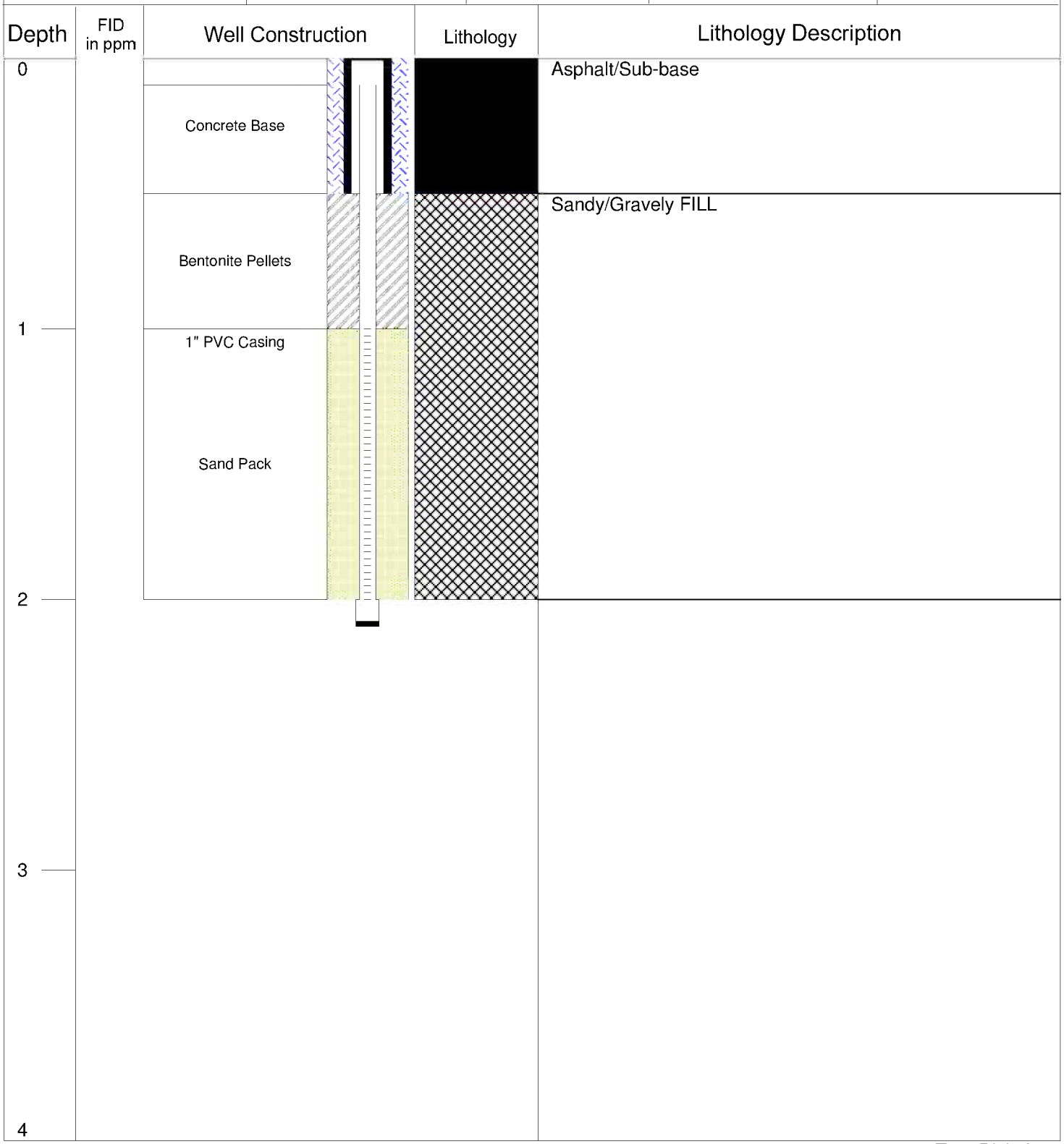
Client:	Indiana Machine Works
Site Name:	Indiana Machine Works
Address:	135 E Harrison St, Mooresville, IN

Well ID: VP-2

Geologist:	J. O'Keefe	**Water Well Driller License #:**	N/A
Driller:	N/A	**License #:**	N/A
Date Drilled:	5/2/13	**Borehole Dia.:**	2.25

UTM coordinates
Northing: NA Easting: NA

Drilling Method:	**Sampling Method(s):**	**Drilling Fluids:**
Hand Auger	N/A	None



Drilling Company: N/A

Soil Samples: N/A Groundwater Sample: N/A

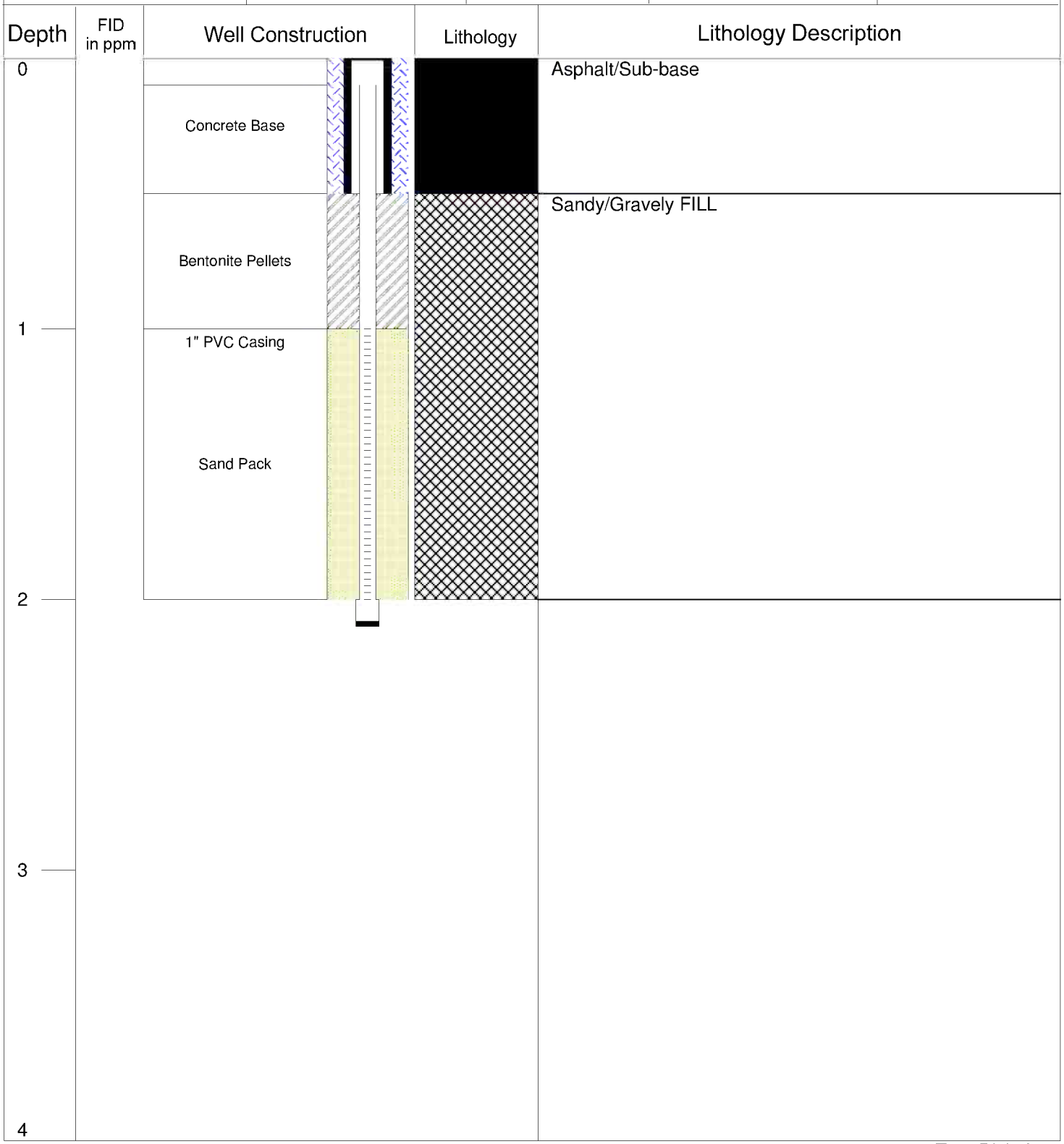
Troy Risk, Inc.

Project number 95.03.06

Troy Risk, Inc.

7466 Shadeland Station Way, Indianapolis, IN 46256

Client:	Indiana Machine Works	**Well ID:**	
Site Name:	Indiana Machine Works	**VP-1**	
Address:	135 E Harrison St, Mooresville, IN		
Geologist: J. O'Keefe	**Water Well Driller License #:** N/A	**UTM coordinates** Northing: NA Easting: NA	
Driller: N/A	**License #:** N/A	**Drilling Method:** Hand Auger	**Sampling Method(s):** N/A
Date Drilled: 5/2/13	**Borehole Dia.:** 2.25		**Drilling Fluids:** None



Drilling Company: N/A

Soil Samples: N/A

Groundwater Sample: N/A

Troy Risk, Inc.

Project number 95.03.06

Troy Risk, Inc.

7466 Shadeland Station Way, Indianapolis, IN 46256

Client:	Indiana Machine Works
Site Name:	Indiana Machine Works
Address:	135 E Harrison St, Mooresville, IN

Boring ID: TRI-207 PT

Geologist:	J. OKeefe
Driller:	Greg
Date Drilled:	7/31/13
Water Well Driller License #:	
License #:	2319
Borehole Dia.:	2.25

UTM coordinates
Northing: NA Easting: NA

Drilling Method:	**Sampling Method(s):**	**Drilling Fluids:**
Geoprobe	5035	None

Depth	FID in ppm	Recovery	Retrieval Time	Sample Time	Lithology	Lithology Description
0	190	3'	9:26			Asphalt with black Subbase
2	3					Slightly moist, yellowish brown (10YR 5/6), SILTY CLAY
4	9.9	4'	9:28			Moist, brown (10YR 4/3) SANDY CLAY LOAM
6	8.6					Wet, fine to medium SAND
8	4.3	2'	9:33			Wet, loose, brown (10YR 5/3), SANDY CLAY LOAM
10						End of boring at 10'
12						
14						
16						
18						
20						
22						
24						
26						
28						
30						

Drilling Company: EarthEx

Soil Samples: (8-10')

Groundwater Sample:

Troy Risk, Inc.

Project number 95.03.06

Troy Risk, Inc.

7466 Shadeland Station Way, Indianapolis, IN 46256

Client:	Indiana Machine Works	**Boring ID:**	
Site Name:	Indiana Machine Works		**TRI-208 PT**
Address:	135 E Harrison St, Mooresville, IN		
Geologist:	J. OKeefe	**Water Well Driller License #:**	
Driller:	Greg	**License #:**	2319
Date Drilled:	7/31/13	**Borehole Dia.:**	2.25

UTM coordinates
Northing: NA Easting: NA

Drilling Method:	**Sampling Method(s):**	**Drilling Fluids:**
Geoprobe	5035	None

Depth	FID in ppm	Recovery	Retrieval Time	Sample Time	Lithology	Lithology Description
0	NA	0'	10:20			No Recovery
2	NA					
4	4	2'	10:25			Moist, brown (10YR 4/3), SANDY CLAY
6						End of Boring at 6'
8						
10						
12						
14						
16						
18						
20						
22						
24						
26						
28						
30						

Drilling Company: EarthEx

Soil Samples: (4-6') Groundwater Sample:

Troy Risk, Inc.

Project number 95.03.06

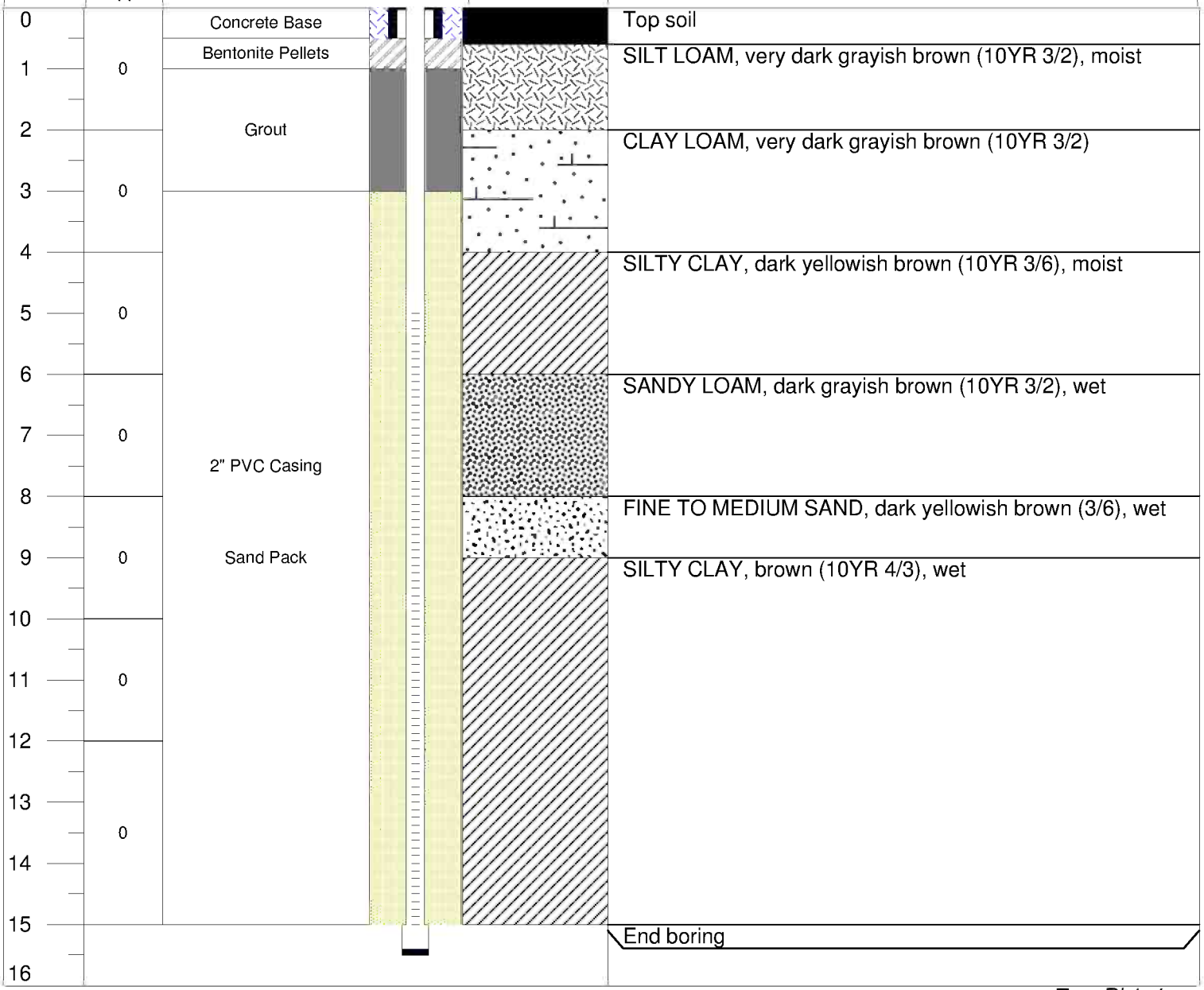
Troy Risk, Inc.

7466 Shadeland Station Way, Indianapolis, IN 46256

Client: Indiana Machine Works
Site Name: Indiana Machine Works
Address: 135 E Harrison St. Mooresville, IN

Well ID: MW-26R

Geologist: Nick Hosteng
Water Well Driller License #: N/A
UTM coordinates Northing: Easting:
Driller: Greg
License #: 2941
Drilling Method: Geoprobe
Sampling Method(s): 5035 and Grab
Drilling Fluids: None
Date Drilled: 7/23/2013
Borehole Dia.: 2.25 in.



Drilling Company: Earth Ex

Soil Samples: No samples taken

Groundwater Sample: Well Installed

Troy Risk, Inc.

Project number 95.09