March 2015 Vapor Intrusion Investigation Report for the Helena Solvent Site

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Prepared by the Montana Department of Environmental Quality
Groundwater Remediation Program

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Section 1.0 Introduction/ Background

The Helena Solvent Site (HSS) consists of an area in Helena where chlorinated solvents are known to be present in groundwater at various depths (see the Project Map, which is Figure 1 and the most recent groundwater plume map, which is Figure 2, in Appendix A). The highest known concentrations (with tetrachloroethylene [PCE] as high as 3,050 micrograms per liter [ug/L] in June 2008) of chlorinated solvents in shallow groundwater are generally located in an area within National Avenue to the East, Montana Avenue to the West, Argyle Street to the North, and Boulder Avenue to the South. This area has one former drycleaner (Danny's Cleaners at 1100 Lyndale Ave.), and another drycleaner (Mr. Wise Cleaners at 1118 Helena Ave., Hustad Center). Mr. Wise Cleaners ceased drycleaning operations in approximately 2011, but continues to be a drop-off location for drycleaning (items to be drycleaned are taken to the Mr. Wise Cleaners in Great Falls). In terms of groundwater flow direction, Mr. Wise Cleaners is located immediately up-gradient of Danny's Cleaners. Montana Department of Environmental Quality (DEQ) vapor intrusion investigations in the winters of 2010 and 2011 showed that vapor intrusion is occurring as a result of subsurface contamination. In 2010 and 2011, several indoor air concentrations exceeded applicable EPA Regional Screening Levels. While the HSS consists of a larger area in Helena, DEQ's focus in 2010 and 2011 was on the area of highest solvent concentrations shown in Figure 1, based on available data. The 2010 and 2011 vapor intrusion investigations were conducted in a commercial/industrial part of Helena, and none of the structures within this area were residences.

In the fall of 2013, DEQ installed 10 groundwater monitoring wells, and sampled these new wells and additional existing wells (monitoring wells and residential/irrigation wells) to better define the extent and magnitude of the HSS solvent plume. The results of this work showed, in part, that elevated levels of PCE are present in groundwater at the intersection of Phoenix Avenue and Cooke Street, just north of the Helena rail yard. Groundwater from monitoring well HS-MW6 (a newly-installed monitoring well) had PCE at 107 micrograms per liter (ug/L), which is higher than the Circular DEQ-7 Montana Numeric Water Quality Standard (DEQ-7 Standard) of 5 ug/L. Monitoring well HS-MW6 is located near a divide in land use, with residences to the north and commercial/industrial uses to the south.

The results of the 2013 investigations show that elevated PCE levels in the groundwater may be following the City of Helena storm sewer that runs from the Mr. Wise area (at the intersection of Montana, Lyndale, and Helena Avenues) north northwest under Montana Avenue and the rail yard, and then north up Cooke Street to Cedar Street. There may also be other sources of PCE in the area. DEQ has previously conducted vapor intrusion investigations south of the rail yard in 2010 and 2011 and found vapor intrusion to be an issue in three structures. Given the new information about contaminated groundwater in HS-MW6, DEQ determined that a vapor intrusion investigation was necessary north of the rail yard, predominantly in structures adjacent to the storm sewer. The winter 2014 vapor intrusion investigation focused on residential structures and the school located adjacent to Cooke Street and between Phoenix and Aspen Avenues. DEQ also sampled some additional structures outside of this area, but also along the storm sewer, south of the rail yard in commercial buildings where DEQ had not previously conducted sampling.

During the winter 2014 vapor intrusion investigation, 9 residential properties, 5 commercial properties, and Lincoln school, were sampled. The results of the investigation indicated that, at the Lincoln school campus, PCE vapor intrusion may be occurring, but at levels that are well below building-specific screening levels that DEQ calculated (see Table 1B for school results). None of the residential properties had exceedances of indoor air EPA residential regional screening levels (RSLs), however several structures had elevated concentrations of PCE in the subslab air, and 5 properties were scheduled for resampling in 2015. None of the 5 commercial properties had indoor air exceedances of EPA commercial RSLs, however two properties had elevated concentrations of chlorinated solvents in the subslab, and were scheduled for resampling in 2015.

The objectives of the winter 2015 air sampling event were to resample selected buildings from 2014 event, expand the investigation to previously unsampled buildings along the Cooke Street storm sewer, and sample the Mergenthaler building to determine the effectiveness of its vapor mitigation system.

The February 2014 Helena Solvent Site Vapor Intrusion Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) (DEQ, 2014) outlined the procedures that were followed to collect indoor air and subslab samples from structures within and near the chlorinated solvent groundwater plume. This SAP identified structures that fall within the area DEQ planned to sample. However, the actual structures sampled depended upon access and professional judgment. Sampling was conducted per the February 2014 SAP/QAPP and also followed DEQ's Montana Vapor Intrusion Guidance Document (DEQ, 2011).

Section 2.0 Sampling Activities and Problems Encountered

This investigation was conducted during the month of March, 2015, in an attempt to sample during periods when temperatures were low and the ground was still frozen. In accordance with various vapor intrusion guidance, including DEQ 2011, this vapor intrusion investigation investigated the potential contaminants at their expected highest concentrations, or during the "worst case" scenario. The frozen ground acts like a cap, limiting the ability of subsurface vapors to migrate up to the atmosphere through the ground, therefore creating a greater potential for vapors to migrate through the warmer ground under structures. In addition, vapors are expected to reach their highest concentrations in the winter months as a result of buildings being less ventilated because windows and doors are kept shut in an effort to keep structures warm.

For the March 2015 work, DEQ sampled for vapor intrusion at 15 structures. Seven residential buildings were sampled: Four were single-family homes and three were multi-family units. Eight commercial buildings were sampled. The list of buildings sampled is included in Table 1 in Appendix B. The locations of properties sampled in March 2015 are highlighted in pink on Figure 3.

In the SAP/QAPP, DEQ had anticipated the collection of residential samples at significantly more residential properties in 2014 and 2015. However, access issues prevented DEQ from sampling in the planned number of homes. In the middle of February, 2014, DEQ sent "access letters" (a generic access letter is included in Appendix D to 25 residential property owners

(addresses based upon information in the Montana Cadastral property database) and to tenants at the property address, and only a handful of residents responded. For the second phase of the investigation in 2015, DEQ attempted to reach a great number of residents and expanded area of investigation. Therefore, in February 2015, DEQ sent access letters to over 50 residential property owners and tenants. Very few people responded to the access letters. DEQ personnel then attempted to make contact with property owners and/or tenants by telephone. Telephone contact was only somewhat successful due to the large percentage of people with unlisted numbers and cellular phones. In 2014, DEQ staff prepared information/notice packets and went door-to-door. Where the residents were not at home, DEQ left an information packet. Overall, access in this area was complicated by the number of rental properties where landlords were reluctant to allow DEQ access (because they did not want their tenants disturbed), where tenants did not wish to be disturbed, and where tenants/residents were not concerned about vapor intrusion issues because of the short-term nature of their occupancy of a particular rental unit. In general, DEQ did not have problems gaining access to commercial buildings or single-family homes where the owners live in the home. Although DEQ has the legal authority, DEQ decided not to require or order access at HSS during the 2014 or 2015 sampling events, because no one structure provided data that was critical to the investigation and DEQ's limited resources could be directed towards future sampling where the property owner voluntarily grants access.

At those buildings where the property owner and/or tenant granted access, DEQ conducted an initial visit to the property to visit with the building occupants about the investigation, plan where samples would be collected, schedule the sampling event, and assist with filling out the vapor intrusion questionnaires.

Photographs taken are in the photo log, which is in Appendix E.

Upon completion of subslab sampling at a location, each borehole was filled with concrete and smoothed flush to the surface of the slab. Photographs were taken of each patched borehole to document repair of the slab. Upon completion of indoor air sampling, DEQ provided each property owner with a sample receipt.

Ambient air samples were collected in central locations in places where people were likely to be working and within the breathing zone (approximately 3-5 feet above the ground).

The following field measurement equipment and supplies were used for the sampling:

- Helium Leak Detector: Model MGD-2002
- Helium Regulator: Model 105L
- Ultra High Purity Helium

DEQ rented a helium leak detector from U.S. Environmental Equipment Rental Corporation (USRental) and the meter was calibrated prior to shipping to DEQ (see below for problems with the helium meter). The helium gas and helium regulator were obtained from American Welding and Gas located in Helena, MT.

DEQ staff conducted the sampling, filled out Chain of Custody forms and sample labels. DEQ also coordinated with and mailed samples to the Eurofins Air Toxics, LTD.

After receipt and evaluation of sample results, DEQ send a results letter and a copy of individual sample results to each property owner and tenant. Copies of the results letters can be found in Appendix D.

Section 2.1 SAP Deviations

This vapor intrusion investigation was performed in general accordance with the February 2014 SAP/QAPP. Deviations from the SAP and any effects on the sampling results are described in this section.

DEQ experienced difficulties with the helium meter provided by US Rental. The meter is used during the leak-check of the subslab sample probes. The helium meter would not maintain a charge during the collection of some samples, and required charging during subslab sample collection on several occasions. The quality of the subslab samples was not affected by the inability of the helium meter to maintain a charge, because DEQ charged the helium meter during the sampling and was able to collect measurements.

Section 3.0 QA/QC Issues

TriHydro Corporation (TriHydro) performed an independent level III data validation on all data collected during this investigation. Most laboratory QC data met appropriate criteria, and the validation report indicates that the data is usable for the purposes of this investigation. Specific details can be found in the data validation report in Appendix C. Holding times for all the sample canisters were met (air in canister less than 30 days). Canister vacuum readings before and after sampling were acceptable, except for sample 1236HELENA-IA-01, which was found to be leaking upon arrival at Eurofins. Data from this sample was qualified UJ and are considered to be estimated values. Some laboratory blanks did have detections of PCE, TCE, 1,1,2,2-tetrachloroethane and trans-1,2-dichloroethene. 3 data points were qualified as estimates due to detections in the method blanks, and were assigned the JB qualifier flag.

DEQ collected 11 subslab samples (including one duplicate) and conducted a leak check on each. According to the SAP, a concentration of helium in the subslab sample above 10% of that inside the sample shroud indicates a leak in the sampling train and that indoor air has mixed with subslab air. Eight subslab samples passed the leak test based upon subslab helium (as measured by ALS Laboratory) and shroud helium (as measured by the helium detector). The subslab samples collected at 1230 Poplar Street, 1212 Helena Avenue, and 1200 Bozeman Street did not pass their leak checks (see Table 2). Subslab air in the 1230 Poplar and 1212 Helena samples contained detectable levels of PCE and TCE, which were below the residential screening levels. The results are likely biased low because the indoor likely mixed with the subslab air that was being sampled. At 1200 Bozeman Street, subslab air contained PCE above the commercial screening level, despite results which are likely biased low. TCE was also detected in the sample at levels below the residential screening level. To address the issue of failed leak checks, DEQ will resample these three locations.

In some subslab samples, the presence of high concentrations of PCE caused elevated detection limits of other target compounds, with many "non-detects." Some elevated detection limits were above indoor air screening levels. Although DEQ does not directly compare subslab air contaminant concentrations to indoor air screening levels or utilize a generic attenuation factor, without low enough detection limits, it is not possible to determine whether that compound is present. In the March 2015 sampling results, the indoor air samples had detection limits lower than screening levels, so DEQ was able to determine whether the VI pathway was complete or not based upon indoor air results.

Section 4.0 Site Specific Screening Levels

DEQ has determined that site-specific screening levels (SSSLs) for PCE and TCE are appropriate for the HSS, and that sufficient data exists to justify the adoption of the same SSSLs for these compounds that were calculated for the Burlington Northern Livingston Shop Complex (BNLV), a State Superfund facility. At BNLV, the indoor air SSSLs are based on the presence of only two major vapor intrusion contaminants of concern: PCE and TCE (see the attached Final Task I Risk Assessment Amendment Number 2, August 2012, in Appendix F). Sampling of soil, groundwater, and air at the HSS has also shown that PCE and TCE are the only contaminants found above screening levels. that are also associated with the drycleaning operations that are present in the soil, groundwater, and air. Daughter products of PCE and TCE have not been detected in groundwater, and are rarely detected in air samples. Because the chlorinated solvent VI-related contaminants are the same at BNLV and HSS, DEQ has adopted the BNLV SSSLs for the HSS. These levels have been calculated for residential and commercial/industrial exposure scenarios. More detailed information and discussion is provided in Appendix F, and a summary table is provided below:

Contaminants of Concern	**Residential SSSL (ug/m^3)**	**Commercial SSSL (ug/m^3)**
Tetrachloroethylene (PCE)	42	105
Trichloroethylene (TCE)	2	7

In the event that any daughter products are detected, DEQ will screen the concentrations using the applicable EPA Regional Screening Levels for those compounds.

Note that for the Lincoln campus buildings, DEQ calculated building-specific screening levels for teachers and students. More information about those screening levels can be found in DEQ's 2014 Helena Solvent Vapor Intrusion Investigation Report, and the building-specific screening levels are shown in Table 1B.

Section 5.0 Results

All laboratory data can be found in the data validation report in Appendix C. Table 1 summarizes the results and compares the results to the applicable screening levels. Table 1 also summarizes the results of the ambient air samples.

Provided below is a discussion of PCE results for the buildings that were sampled.

Section 5.1 Residential Structures

As previously mentioned, 7 residential buildings were sampled. Each is discussed briefly, below. Analytical results for each building are found in Table 1.

1230 Poplar: This property is a single family home. It is a two story home on a basement, which has concrete floors. DEQ collected two indoor air samples (one from the main floor and one from the second floor), one basement air sample, and one subslab sample. PCE and TCE were not detected in any of the indoor air or basement air samples. PCE was detected in the subslab at 14 ug/m^3, which is below the residential SSSL of 42 ug/m^3. TCE was also detected in the subslab at 0.74 ug/m^3, which is below the residential SSSL of 2 ug/m^3. Vapor intrusion does not appear to be occurring at this time. DEQ may sample this property in the future, to verify the concentrations below the slab, and also verify that vapor intrusion is not occurring. Because vapor intrusion does not appear to be occurring and even the subslab sample was well below the indoor air screening level, DEQ will need to evaluate whether additional sampling should be prioritized at this building, given DEQ's limited resources for this investigation.

1306 & 1308 Poplar: This is a single story residence that is part of a duplex. It is built above a crawlspace with both exposed dirt and some concrete flooring. One indoor air and one crawlspace sample were taken for the property at 1306 Poplar. There were no detections in either sample. DEQ does not plan to sample this property in the future. At 1308 Poplar, one indoor air and one crawlspace sample were taken. All results were less than site-specific screening levels. PCE was detected in indoor air at 0.29 ug/m^3, which is below the screening level of 42 ug/m^3. TCE was detected in indoor air, also at 0.29 ug/m^3, which is below the screening level of 2 ug/m^3. Given that the indoor air concentrations are below screening levels by an order of magnitude or more, and that no detections were observed in the crawlspace, DEQ does not plan to sample this property in the future.

1228 Walnut: This is a multi-family rental property. There is a partial basement with dirt floors, a crawlspace, and two levels of living space above. DEQ sampled this property in 2014, and found soil vapor concentrations of PCE which exceeded generic screening levels. In 2015, DEQ collected one basement air sample, and one main level air sample (in the communal laundry area). The basement and indoor air samples both had PCE results below the residential screening levels, at 0.99 and 2 ug/m^3, respectively. Although vapor intrusion may be occurring at this property, it does not appear to be occurring at levels exceeding screening levels. DEQ does not plan to sample this property in the future.

1310 Walnut: This is a one-level, single-family home with a crawlspace. DEQ collected one crawlspace air and one main-level air sample. The crawlspace and the main-level samples contained PCE at 0.56 and 0.43 ug/m^3, respectively. Both values are less than the SSSL of 42 ug/m^3. As the crawlspace air sample was only slightly greater than the indoor air sample, and both samples were nearly an order of magnitude less than the residential screening level, DEQ does not plan to sample this location in the future.

1328 and 1330 Walnut: This is a multi-family rental property. There is a basement with partial concrete floors and two levels of living space above. The basement and first floor were unoccupied at the time; however a common laundry area is located on the first floor. Due to the basement floor concrete being unfinished, DEQ did not collect a soil vapor sample. DEQ collected one basement air sample, one main-level air sample, and one upstairs air sample. All results were below residential screening levels. Basement air contained PCE at 1.1 ug/m^3, main level air contained PCE at 0.42 ug/m^3, and upstairs air contained PCE at 0.18 ug/m^3, all of which are below the SSSL of 42 ug/m^3. Additional sampling may be warranted at this location given that it appears that vapor intrusion may be occurring (albeit at a level that does not currently appear to be causing indoor air PCE levels above screening levels). Should the homeowner complete the basement slab floor, DEQ may elect to sample below the slab in the next round of sampling. Because vapor intrusion does not appear to be occurring and even the basement air sample was well below the indoor air screening level, DEQ will need to evaluate whether additional sampling should be prioritized at this building, given DEQ's limited resources for this investigation.

1334 Walnut: This is a single-family residence located south of Lincoln School. The house has a full basement with a concrete foundation and slab, and a single-level living area upstairs. DEQ collected one subslab sample, one basement air sample, and one main level air sample. The subslab sample contained PCE at 8,200 ug/m^3, which is elevated, and greatly exceeds the residential indoor air screening level of 42 ug/m^3. The basement air sample contained PCE at 3.9 ug/m^3, and the main level air sample had PCE at 2.1 ug/m^3, both of which are less than the residential SSSL. TCE was also detected in the subslab at 29 ug/m^3, which greatly exceeds the screening level of 2 ug/m^3. It was also detected in the main floor air at 0.17 ug/m^3. The results at this home warrant follow-up sampling to verify that vapor intrusion is not contaminating indoor air at levels that exceed residential screening levels. If the second round of sampling demonstrates continued high levels of PCE in the subslab, DEQ will also need to evaluate whether measures to protect the slab are necessary to prevent movement of additional PCE into the indoor air. Elevated levels of PCE in the subslab were not expected at this property, given its distance from both the storm sewer system and the extent of the known plume boundaries.

1308 Phoenix: This is a single-family rental home located one lot to the east of Cooke Street. The house has a full basement with a concrete foundation and slab, and a single-level living area upstairs. DEQ sampled air at this home in 2014 and 2015, and the results from the two sampling events were very similar. In 2015, DEQ collected one subslab sample, two basement air samples, and one main level air sample. The subslab sample had PCE at 1,500 ug/m^3, which greatly exceeds the residential SSSL of 42 ug/m^3. The two basement air samples contained PCE at 0.77 and 0.78 ug/m^3, and the upstairs air sample had PCE at 0.67 ug/m^3. The subslab air also

contained TCE at 2.4 ug/m^3, which exceeds the residential SSSL of 2 ug/m^3. Consecutive rounds of sampling suggest that, despite elevated levels of PCE in the subslab, vapor intrusion does not appear to be occurring in exceedance of the screening levels. DEQ has provided recommendations to the property owner regarding steps that may be taken to help mitigate any potential risk from vapor intrusion at this property. Based on the available information, DEQ does not plan to sample this property in the future.

Section 5.2 Commercial Properties

As previously mentioned, 8 commercial buildings were sampled. Each is discussed briefly, below. Analytical results for each building are found in Table 1.

1225 Cedar Street: This building is currently occupied by DEQ's Remediation Division. There are two separate basements, east and west, a main floor and a small attic storage space. According to the building owner, it was constructed with a vapor barrier. In order to avoid puncturing or otherwise damaging the vapor barrier, DEQ did not collect subslab samples. DEQ collected two indoor air samples from the main floor, three samples from the east basement (one of which was a sample duplicate) and two samples from the west basement. All samples contained detections of PCE, however all samples were all well below both residential and commercial SSSLs. The highest PCE detection was 0.11 ug/m^3, in the east basement. Given the extremely low levels detected in indoor air, and the presence of a vapor barrier, DEQ does not plan to sample this property in the future.

1200 Bozeman: This is a single-level, slab-on-grade warehouse-type property, and has a partial basement. The business at this location manufactures and distributes cleaning chemicals. The building is located adjacent to a storm sewer, and within 100 feet of a monitoring well with PCE that has contained 144 ug/L PCE. DEQ sampled the air in this building in 2011. In 2015, DEQ collected two subslab samples, one in the partial basement, and one in the main level. DEQ also collected two air samples in the partial basement, and one in the main warehouse area. The basement subslab sample contained 5,000 ug/m^3 PCE, and the main floor subslab sample contained 120 ug/m^3, both of which exceed the commercial indoor air PCE screening level of 105 ug/m^3. In addition to PCE, both subslab samples had trichloroethylene (TCE) at concentrations of 29 and 1 ug/m^3, respectively. The commercial indoor air screening level for TCE is 7 ug/m^3. The basement air samples contained PCE at 63 and 64 ug/m^3, and both samples contained TCE at 1.3 ug/m^3. The main level indoor air sample contained PCE at 27 ug/m^3 and TCE at 5 ug/m^3. These results are consistent with samples taken in 2011. Despite elevated concentrations of PCE and TCE in the subslab, contaminants do not appear to be impacting indoor air in exceedance of commercial screening levels at this time. DEQ has provided recommendations to the property owner regarding steps that may be taken to help mitigate any potential risk from vapor intrusion at this property. DEQ may collect additional samples from this property in the future.

1232 Bozeman: This is a single-level, slab-on-grade warehouse-type property. It is located one lot west of a storm sewer, and within 300 feet of a monitoring well that has contained 94 ug/L PCE. DEQ collected one subslab sample and one duplicate subslab sample, and two indoor air

samples. The subslab samples had 53 and 55 ug/m^3 PCE, which do not exceed the commercial indoor air PCE screening level of 105 ug/m^3. Indoor air did not have detectable PCE. These results are consistent with results from 2014. It does not appear that vapor intrusion is occurring at the property at this time, and DEQ has no plans to sample this property in the future.

1212 Helena Avenue: This building is part of the Family Outreach Partnership. It is a two-level commercial office space, consisting of a main level and a walk-out basement. DEQ collected two indoor air samples on the main level, three indoor air samples on the basement level (including a duplicate sample), and one subslab sample. The subslab sample had PCE at 1.1 ug/m^3, and TCE at 1.4 ug/m^3, both of which are below the residential and commercial screening levels. All the indoor air samples had detections of PCE and TCE, however the highest levels were 0.73 and 0.25 ug/m^3, respectively, and no sample exceeded commercial or residential screening levels. The PCE and TCE levels are higher in the main level than in the basement, which suggests that there may be an indoor air PCE source. Vapor intrusion may be occurring at this property, but at levels well below both residential and commercial screening levels. DEQ may collect additional samples from this property in the future.

1236 Helena Avenue: This building is part of the Family Outreach Partnership. It is a two-level commercial office space, consisting of a main level and a walk-out basement. DEQ collected two indoor air samples on the main level, two indoor air samples on the basement level, and one subslab sample. The subslab sample had PCE at 25 ug/m^3, and TCE at 0.56 ug/m^3, both of which are below the residential and commercial screening levels. All the indoor air samples had detections of PCE and TCE; however, the highest levels were 5 and 0.71 ug/m^3, respectively, and no sample exceeded commercial or residential screening levels. The PCE and TCE levels are higher in the main level than in the basement, which suggests that there may be an indoor air PCE source. Vapor intrusion may be occurring at this property, but at levels well below both residential and commercial screening levels. DEQ may collect additional samples from this property in the future.

1400 N Montana Ave: This location currently houses the Mergenthaler's warehouses and Ocean Beauty (a seafood distributor). It is a large warehouse complex, which lies immediately downgradient of Mr. Wise Cleaners and the former Danny's cleaners, within the center of the Helena Solvent Site plume. In previous investigations in 2010 and 2011, DEQ determined that vapor intrusion was occurring at this building at levels greater than screening levels. The owners of the building installed a vapor mitigation system. DEQ sampled this building in March 2015 to determine whether the mitigation system was effectively lowering PCE levels inside the building. DEQ collected samples from the following locations:

- Mergenthaler:
    - Main level front office
    - Main level IT office
    - Main level warehouse
    - 2nd floor break room
- Ocean Beauty:
    - Basement (and duplicate)

- Ocean Beauty main office

All samples collected contained PCE. The samples collected at Mergenthaler also contained TCE at detectable levels. All samples in the Mergenthaler offices and warehouse were below residential and commercial screening levels. The sample and duplicate in the Ocean Beauty basement contained PCE at 130 and 120 ug/m^3, which exceeds the commercial SSSL of 105 ug/m^3. The Ocean Beauty office air sample contained PCE at 44 ug/m^3, which exceeds the residential screening level, but not the commercial screening level. The results suggest that the mitigation system is functioning appropriately and has reduced indoor air PCE levels to less than applicable screening levels. However, indoor air in the Ocean Beauty basement still exceeds commercial screening levels. DEQ notes that the basement beneath Ocean Beauty is used primarily for cold storage and is not currently used as a work space (it is not heated, there are no restrooms) so worker exposure is expected to be short term and infrequent. DEQ has provided recommendations to the property owner for reducing contaminant concentrations in indoor air. DEQ plans to sample this property again in the future to better understand indoor air concentrations.

1118 and 1120 Helena Avenue: 1118 is the location of the Mr. Wise Cleaners building and the 1120 address is the adjacent, vacant, commercial unit, both of which are located in the Hustad Center. A vapor mitigation system has been installed at the property, and Hustad LLC conducts quarterly indoor air sampling as part of ongoing investigations at the site. The most recent round of indoor air sampling (March 2015) (HydroSolutions 2015) showed that indoor air PCE levels ranged between 40 to 247 ug/m^3. Previous sampling events have showed that PCE levels fluctuate above and below the commercial screening level of 105 ug/m^3 for PCE. Indoor air levels of TCE have historically been less than the screening level of 7 ug/m^3. Some of the PCE in the indoor air at the Hustad Center may be a result of off-gassing of PCE-laden materials inside the building (for example, ceiling tiles, carpets, and drop-off drycleaning). In 2015, DEQ collected subslab samples from each of the 1118 and 1120 Helena units. PCE was detected in both samples at 500,000 ug/m^3 (Mr. Wise Cleaners), and 9,100 ug/m^3 (vacant property). TCE was also detected at 370 and 14 ug/m^3, respectively; however these values are estimated due to elevated detection limits for the samples. Concentrations of subslab contaminants appear to have decreased slightly since the last sampling event in 2010, prior to the installation of the mitigation system. DEQ may sample these properties in the future, to monitor the concentrations of contaminants in the subsurface.

Section 5.3 Ambient (Outdoor) Air Sample Results

DEQ collected 7 ambient air samples during the March 2015 sampling event. At least one ambient air sample was collected to document outside air quality on the day that any indoor air sample was either commenced or collected. The objective of collecting ambient air samples is to document the concentrations of contaminants in the outdoor air, for comparison to indoor air sample results, and to determine the potential contribution of outdoor sources. Most ambient air samples did not have detectable concentrations of PCE, TCE or the other analytes, with the following exceptions:

- The ambient air sample collected outside of 1212 Helena contained PCE at 0.069 ug/m^3, which is well below the residential indoor air screening level of 42 ug/m^3. It also contained TCE at 0.021 ug/m^3, which is well below the residential indoor air screening level of 2 ug/m^3.
- The ambient air sample collected outside of 1414 N Montana Avenue contained PCE at 0.043 ug/m^3.
- The ambient air sample collected at 1200 Bozeman Street contained PCE at 0.043 ug/m^3.
- The ambient air sample collected outside 1330 Walnut Street contained PCE at 0.022 ug/m^3 and TCE at <0.013 ug/m^3.

Section 5.4 Weather Data

The average mean temperature for March 2015 was 45 degrees Fahrenheit. The month started out with temperatures below freezing, however, after the first week of March, the daily low temperature only dropped below freezing 5 times, and the average temperature was well above freezing. Weather information during sampling was collected from the NOAA weather website. Details regarding temperature and barometric pressure for each day of sampling can be found on the field log forms (Appendix E). Even given these weather conditions, the 2015 sampling event fell within the winter timeframe considered to represent worst-case conditions for vapor intrusion (DEQ 2011). The ground may still have been partially frozen, and buildings were being actively heated, which likely maintained the "chimney" effect.

Section 6.0 Conclusions and Recommendations

DEQ's conclusions and recommendations are based upon the March 2014 and March 2015 vapor intrusion sampling results, previous vapor intrusion sampling events, recent groundwater quality data, outdoor air data, and other lines of evidence, as outlined in DEQ's Vapor Intrusion guidance document (DEQ, 2011). In the spring of 2014, DEQ installed additional monitoring wells to better define the PCE plume and its relationship to the storm sewer. Figure 3 shows the most recent shallow groundwater quality data. The conclusion and recommendations, below, are based upon a composite of the available data for the HSS.

- Installation of monitoring wells and groundwater sampling in the spring of 2014 showed that PCE appears to follow the storm sewer. The PCE concentration at the intersection of Cooke and Phoenix (well HSMW-12) in spring 2014 was 113 ug/L, which is similar to the winter 2013 concentration of 107 ug/L.
- Elevated concentrations of PCE (i.e., PCE concentrations higher than the SSSL for residential indoor air) were found in subslab air and soil vapor in seven of the 29 structures sampled in 2014 and 2015, one of which was the Hustad building that houses Mr. Wise Cleaners. The subslab PCE concentrations tended to be highest in buildings located at or close to the source area (Mr. Wise Cleaner and the former Danny's Cleaners buildings), and/or within one or two lots of the storm sewer that runs from the intersection of Lyndale and Dodge (near Mr. Wise Cleaners) north and east across Montana Avenue, under the rail yard, and then north up Cooke Street.

- All residential structures sampled in 2014 and 2015 had indoor air PCE and TCE levels less than the residential SSSLs of 42 and 2 ug/m^3 respectively. Three of the residences had elevated PCE concentrations in subslab air. One of these homes has been sampled twice, and the data indicates that vapor intrusion is not occurring. There are two homes with elevated subslab PCE that DEQ has sampled one time, and DEQ plans to resample these homes in the late fall of 2015 or the winter of 2016. Overall, the data suggests that residential indoor air PCE and TCE levels are well below the SSSLs.
- Of the commercial/industrial properties DEQ sampled, only the unoccupied cold storage space at the Mergenthaler's warehouse had indoor air with PCE concentrations higher than the commercial SSSL of 105 ug/m^3. The PCE concentrations in this building were less in 2015 than in previous sampling events, which suggests that the building's vapor mitigation system may be lowering indoor air PCE levels. At the Hustad/Mr. Wise building, indoor air samples collected by the Hustad's consultant in March 2015 showed that some of the office spaces had PCE levels higher than the screening level, while some of the spaces had PCE levels less than the screening level. Overall, the results indicate that commercial indoor air PCE and TCE levels are less than the SSSLs at properties located outside of the source area.
- DEQ's vapor intrusion guidance generally recommends at least two rounds of vapor intrusion sampling before a determination can be made that vapor intrusion is not occurring, so several of these buildings are slated for resampling (DEQ, 2011).
- DEQ Vapor Intrusion guidance recommends evaluation of vapor intrusion within 300 feet of a media contaminated with PCE, or the PCE "source." The storm sewer that runs north up Cooke Street appears to be a preferential pathway for PCE migration, and is a contaminated media and source as defined in the DEQ Vapor Intrusion guidance. It is important to note that not every structure within 300 feet of a source must be sampled, but a representative number of buildings of different construction types should be sampled. As mentioned above, indoor air PCE and TCE concentrations have been less than SSSLs in buildings along the storm sewer west of Montana Avenue. At this time, DEQ does not plan to sample previously unsampled buildings to investigate vapor intrusion in the area along the storm sewer. DEQ will conduct a second round of air sampling in several buildings during the next period of frozen ground to verify first round results.
- DEQ sampled subslab vapors at the Hustad building in March 2015, at locations that DEQ previously sampled in March 2010. The subslab PCE levels in 2010 were 790,000 and 22,000 ug/m3, and in 2015, the PCE levels were 500,000 and 9,100 ug/m3 in the same respective locations. While limited, the results suggest that subslab PCE concentrations have decreased at the Hustad/Mr. Wise building. Reasons for the apparent decrease may be speculative, but could be a result of the solvent withdrawal from the subsurface by the mitigation system, discontinued addition of solvents to the subsurface (when Mr. Wise stopped drycleaning in 2011), or other factors. Sampling of this building's indoor air by the Hustad LLC has shown overall decreases in PCE and TCE concentrations, although more work is needed to bring the levels consistently below the SSSLs. Some of the indoor air PCE and TCE concentrations may not be due to vapor intrusion, but may be a result of solvents off-gassing from structural materials (carpet, ceiling tiles, walls), off-gassing from dry-cleaned clothing dropped off from the Mr. Wise Cleaners operation in Great Falls, and possibly from spot-cleaning supplies used in the laundry process.

- DEQ sampled indoor air at the Mergenthaler warehouse to determine whether indoor air PCE levels had declined following installation of a vapor mitigation system in 2012/2013. PCE levels in indoor air in 2015 were consistently less than levels measured in 2010 and 2011 in the same locations. In 2015, the basement under Ocean Beauty was the only area in Mergenthaler's with PCE levels higher than the SSSL. As mentioned previously, this space is used only for cold storage and is accessed infrequently. When this basement is accessed, it is via a large garage-style door that is typically left open, which increases ventilation of the space.
- Since vapor intrusion sampling started in 2010 at the HSS, the highest subslab PCE levels (in the 10,000-1,000,000 ug/m3 range) have been found at the Hustad building that houses Mr. Wise Cleaners and at the Mergenthaler warehouse. The indoor air PCE levels in these buildings have also been elevated. These two buildings both have indoor air mitigation systems, and sampling has shown that indoor air PCE concentrations have decreased. Continued monitoring of indoor air in these buildings will be needed to ensure that the mitigation systems are working effectively. At the Mr. Wise building, the building owner has been monitoring indoor air levels. At the Mergenthaler building, DEQ may collect air samples periodically.

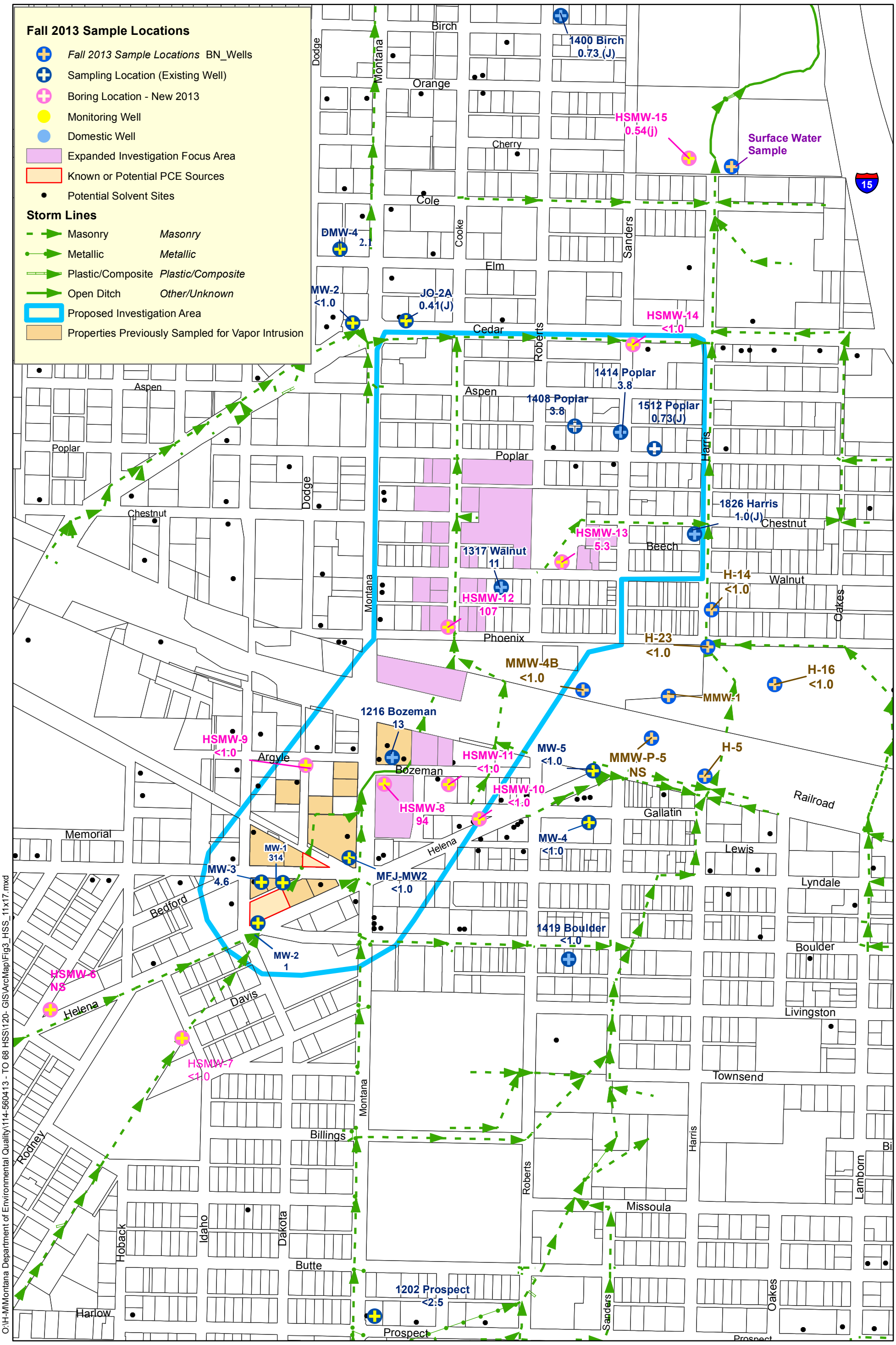
Section 7.0 References

DEQ, 2011, Montana Vapor Intrusion Guide, April

DEQ, 2014, Sampling and Analysis Plan Helena Solvent Site Vapor Intrusion Investigation Helena, Montana. February

HydroSolutions, 2015, Fourth Quarter 2014 Indoor Air Monitoring and Mitigation System As-Built Report, April

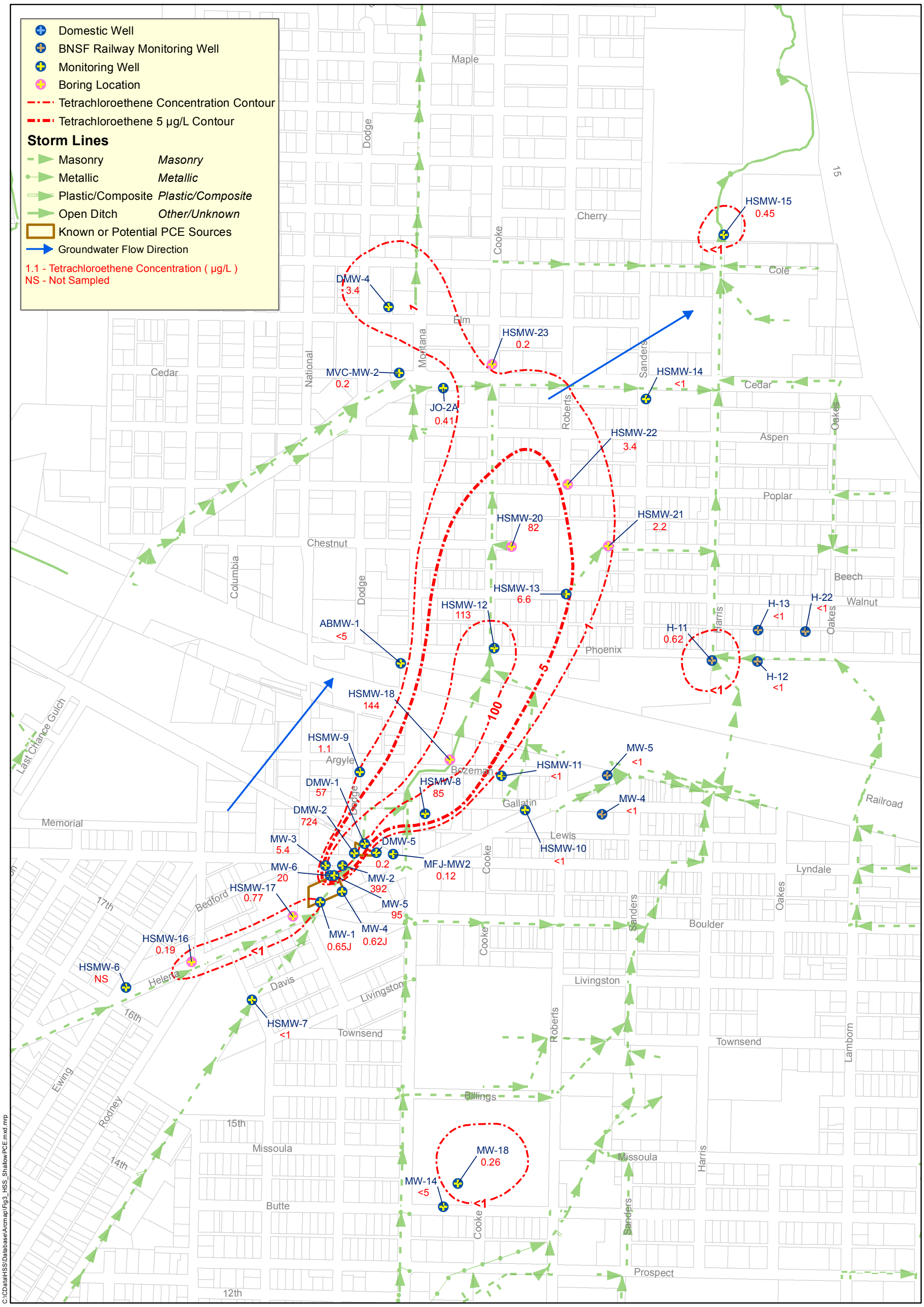
Appendix A –Figures



Project Map January 2014
Helena, Montana
Helena Solvent Site

Note: Values shown under sample locations are Tetrachloroethene concentrations in microrgrams per liter (ug/L) from Fall 2013

Montana Department of Environmental Quality



C:\CData\HSS\Database\Arcmap\Fig3_HSS_ShallowPCE.mxd.mrp

Figure 2

Shallow Aquifer Tetrachloroethene Concentrations
May / June 2014 Sampling
Helena Solvent Site
Helena, Montana

Figure 3:
Properties Sampled March 2014 and 2015 for Vapor Intrusion

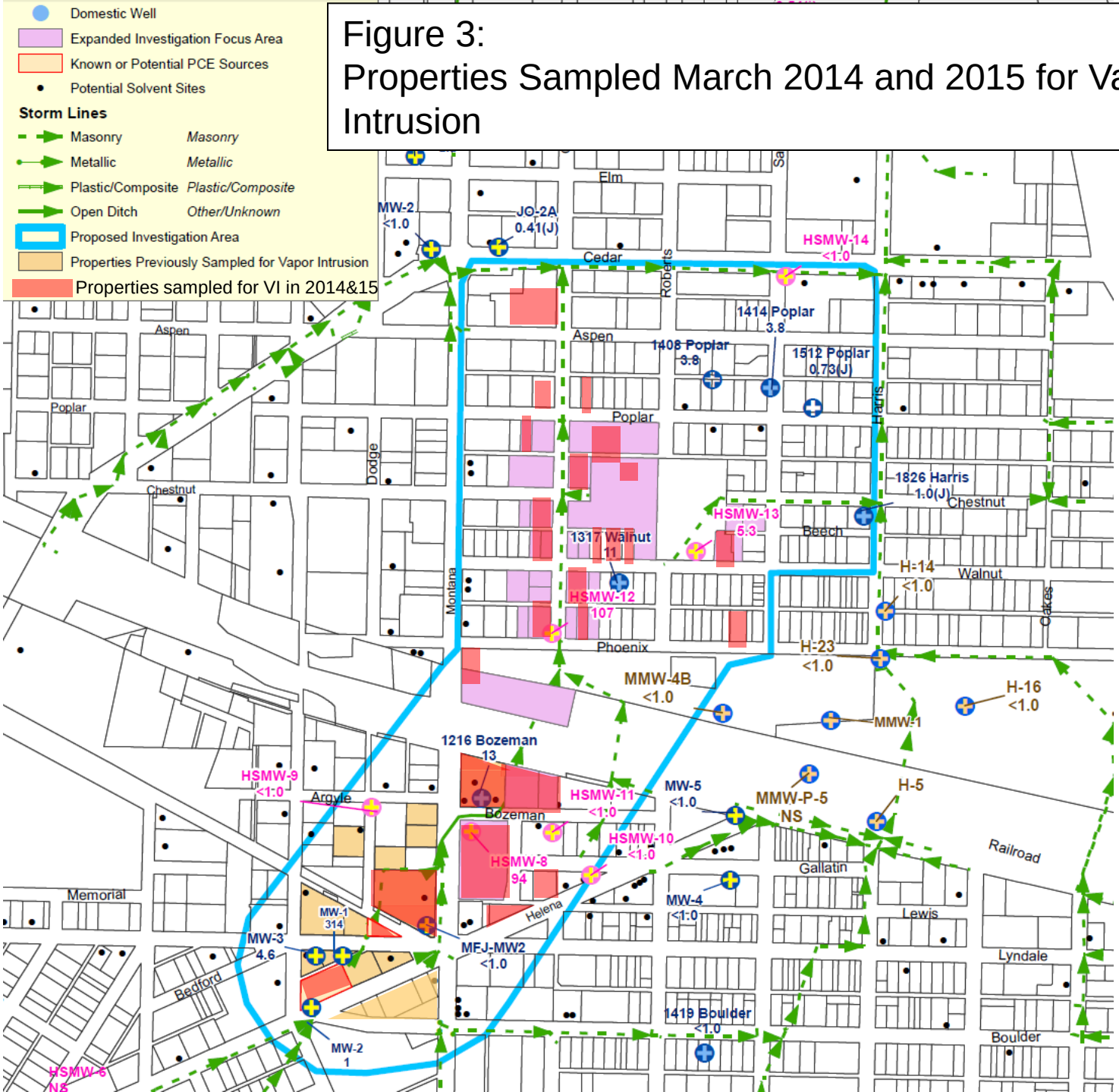


Figure 4:
Properties Sampled March 2014 and 2015 for Vapor Intrusion with elevated PCE in subslab or crawlspace air

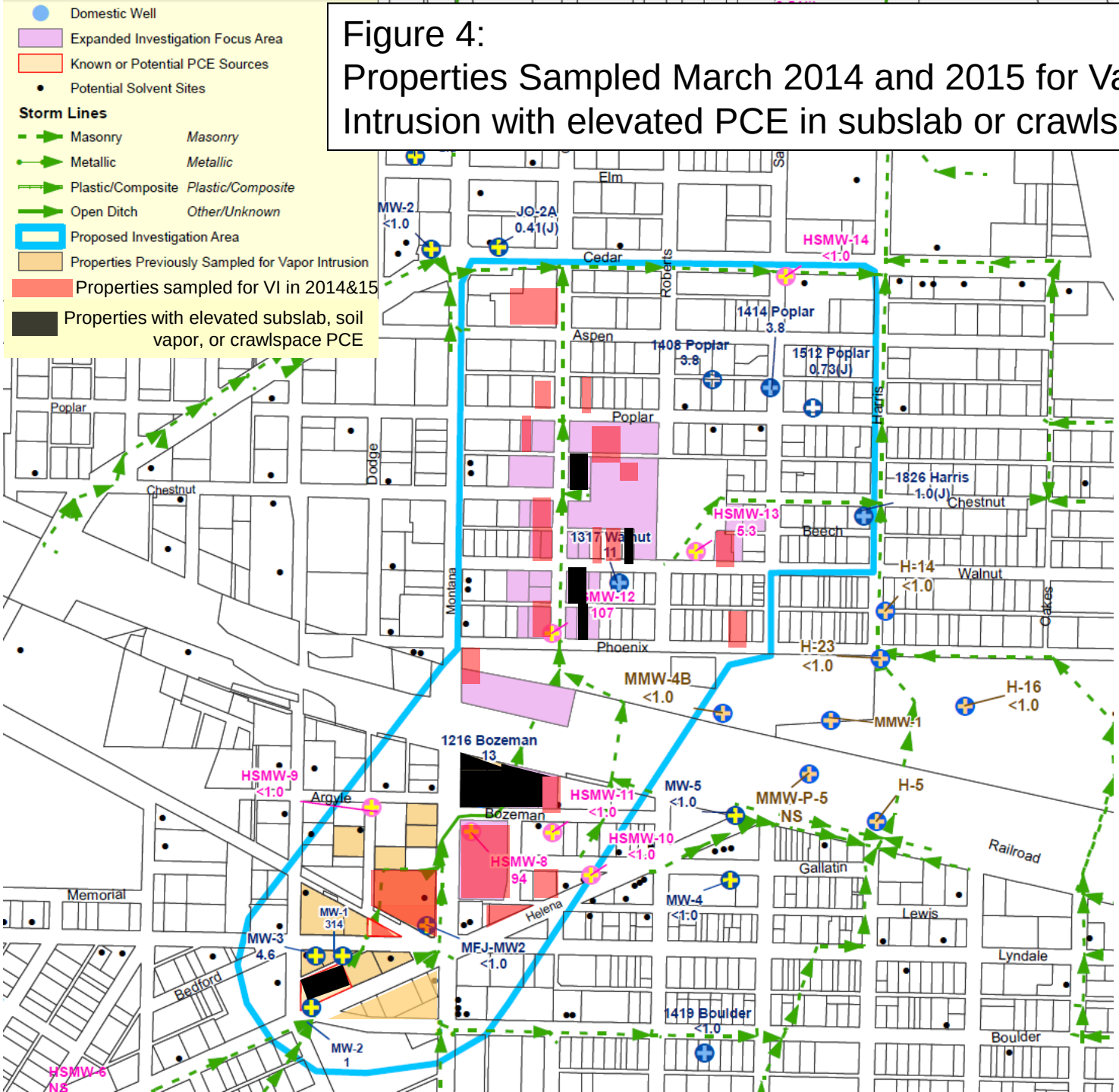
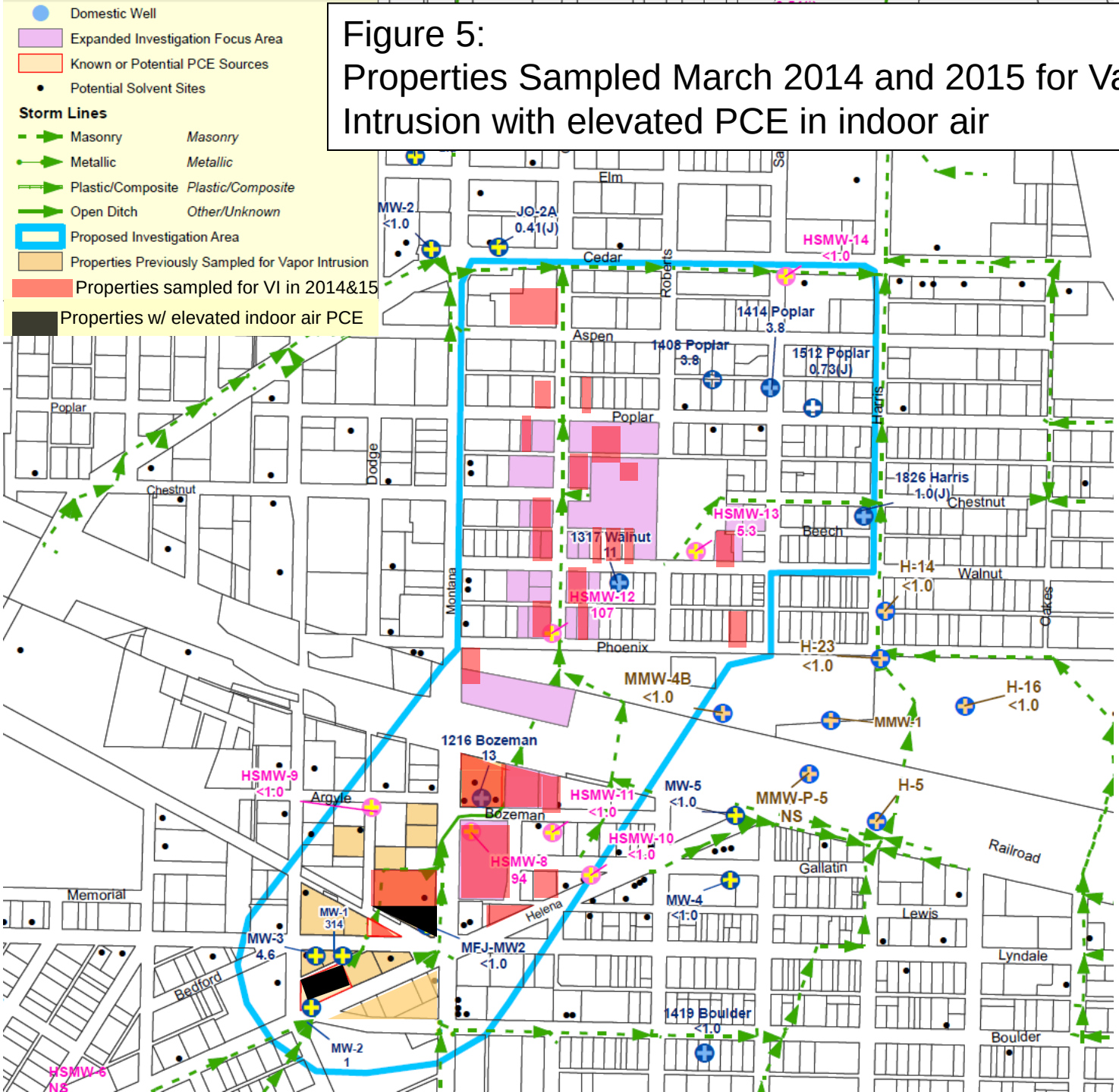


Figure 5:
Properties Sampled March 2014 and 2015 for Vapor Intrusion with elevated PCE in indoor air



Appendix B – Tables

Table 1A: Air Sample Results Collected During the 2014-2015 Vapor Instrusion Investigation of the Helena Solvent Site, and Selected Sample Results from Previous Years

Residential, Commercial, Vacant	Property Address	Date Collected	Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Trans-1,2-Dichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	1,1,2,2-Tetrachloro-ethane (ug/m3)
Site Specific Screening Level- Residential				**42**	**2**	**0.17**	**NA**	**NA**	**0.048**
Site Specific Screening Level- Commercial				**105**	**7**	**2.8**	**NA**	**NA**	**0.21**
Commercial	1212 Helena Avenue	3/7/2015	1212Helena-IA-02	**0.025 J**	**0.11 J**	<0.0056	<0.012	<0.015	<0.045
		3/7/2015	1212Helena-IA-01	**0.73**	**0.25**	**0.0056 J**	**0.013 J**	<0.012	**0.051 J**
		3/7/2015	1212Helena-BA-01	**0.064 J**	**0.063 J**	<0.0054	**0.017 J**	<0.014	<0.044
		3/7/2015	1212Helena-BA-02	**0.057 J**	**0.15 J**	<0.0042	**0.012 J**	<0.011	<0.034
		3/7/2015	1212Helena-BA-03	**0.057 J**	**0.19**	<0.0042	**0.010 J**	<0.011	<0.034
		3/7/2015	1212Helena-SS-01	**1.1**	**1.4**	**0.0070 J**	<0.011	**0.015 J**	<0.041
		3/7/2015	1212Helena-AMB	**0.069 J**	**0.021 J**	<0.0051	<0.011	<0.014	<0.041
Commercial	1236 Helena Avenue	3/7/2015	1236Helena-IA-01	**5**	**0.71**	<0.0036	**0.044 J**	<0.0097	<0.030
		3/7/2015	1236Helena-IA-02	**0.074 J**	**0.13 J**	<0.0056	**0.012 J**	<0.015	<0.045
		3/7/2015	1236Helena-BA-01	**0.081 J**	**0.23**	<0.0045	**0.011 J**	<0.012	<0.037
		3/7/2015	1236Helena-BA-02	**0.3**	**0.15 J**	<0.0054	<0.012	<0.014	<0.044
		3/7/2015	1236Helena-SS-01	**25**	**0.56**	<0.0052	<0.011 U	**0.015 J**	<0.042
		3/7/2015	1212Helena-AMB	**0.069 J**	**0.021 J**	<0.0051	<0.011	<0.014	<0.041
Commercial	1225 Cedar Street	3/8/2015	1225Cedar-EBA-01	**0.073 J**	**0.019 J**	<0.0053	**0.032 J**	<0.014	<0.043
		3/8/2015	1225Cedar-EBA-02	**0.10 J**	<0.049 U	<0.0053	<0.030 U	<0.014	<0.043
		3/8/2015	1225Cedar-EBA-03	**0.11 J**	<0.025 U	<0.0053	<0.040 U	<0.014	<0.043
		3/8/2015	1225Cedar-WBA-01	**0.060 J**	<0.020 U	<0.0053	<0.024 U	<0.014	<0.043
		3/8/2015	1225Cedar-WBA-02	**0.040 J**	<0.015 U	<0.0041	<0.012 U	<0.011	<0.033
		3/8/2015	1225Cedar-IA-01	**0.071 J**	<0.017 U	<0.0052	<0.022 U	<0.014	<0.042
		3/8/2015	1225Cedar-IA-02	**0.064 J**	<0.020 U	<0.0054	<0.020 U	<0.014	<0.044
		3/8/2015	1212Helena-AMB	**0.069 J**	**0.021 J**	<0.0051	<0.011	<0.014	<0.041
Residential	1234 Phoenix Road	3/11/2014	1234-Phoenix-IA01	**1.5**	<0.033	<0.033	<0.033	<0.033	<0.033
		3/11/2014	1234-Phoenix-BA01	**0.44**	**0.045**	<0.034	<0.034	<0.034	<0.034
		3/11/2014	1234-Phoenix-AMB01	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049
Residential	1230 Poplar Street	3/17/2015	1230-2IA-01	<0.068 U	<0.028 U	<0.014	<0.017	<0.023	<0.018
		3/17/2015	1230Poplar-IA-01	<0.10 U	<0.033 U	<0.012	**0.016 J**	<0.020	<0.015
		3/17/2015	1230Poplar-BA-01	<0.25 U	<0.025 U	<0.015	<0.017	<0.024	<0.018
		3/17/2015	1230Poplar-SS-1	**14**	**0.74**	<0.014	<0.016	<0.022	0.075 JB
		3/17/2015	1230Poplar-AMB	<0.039 U	<0.013 U	<0.012	<0.014	<0.020	<0.015
Residential	1306 Poplar Street	3/12/2015	1306Poplar-IA-01	<0.22 U	<0.028 U	<0.013	<0.022 U	<0.022	<0.017
		3/12/2015	1306Polar-CR-01	<0.14 U	<0.021 U	<0.014	<0.017	<0.024	<0.018
		3/11/2015	1232Bozeman-AMB	**0.075 J**	**0.020 J**	<0.014	**0.026 J**	<0.024	<0.069
Residential	1308 Poplar Street	3/12/2015	1308Poplar-IA-01	**0.29**	**0.29**	<0.016	<0.019	<0.026	<0.020
		3/12/2015	1308Poplar-CR--1	<0.11 U	<0.028 U	<0.015	<0.018	<0.024	<0.019
		3/11/2015	1232Bozeman-AMB	**0.075 J**	**0.020 J**	<0.014	**0.026 J**	<0.024	<0.069
Residential	1310 Walnut Street	3/10/2015	1310Walnut-CR-01	**0.56**	<0.018 U	<0.011	<0.032 U	<0.018	<0.014
		3/10/2015	1310Walnut-IA-01	**0.43**	<0.017 U	<0.013	<0.55 U	<0.021	<0.016
		3/11/2015	1232Bozeman-AMB	**0.075 J**	**0.020 J**	<0.014	**0.026 J**	<0.024	<0.069
Residential	1330 Walnut Street	3/5/2015	1330Walnut-IA-01	**0.42**	**0.012 J**	<0.0040	<0.0085	<0.011	<0.032
	1328 Walnut Street	3/5/2015	1330Walnut-BA-01	**1.1**	**0.019 J**	<0.0052	<0.011	<0.014	<0.042
		3/5/2015	1330Walnut-2IA-01	**0.18 J**	**0.015 J**	<0.0058	<0.012	<0.016	<0.047
		3/5/2015	1330Walnut-AMB	**0.022 J**	**<0.013**	<0.0053	<0.011	<0.014	<0.043
Residential	1334 Walnut Street	3/15/2015	1334Walnut-IA-01	**2.1**	**0.17**	<0.11	<0.014 U	<0.018	<0.014
		3/15/2015	1334Walnut-BA-01	**3.9**	<0.19 U	<0.014	<0.019 U	<0.024	<0.018
		3/15/2015	1334Walnut-SS-01	**8200**	**29**	<2.2	<3.7	<3.8	<2.2
		3/15/2015	1334Walnut-AMB	<0.096 U	**<0.019 U**	<0.013	<0.024 U	<0.021	<0.016
Residential	1227 Poplar Street	3/11/2014	1227-Poplar-IA01	**0.048**	<0.031	<0.031	<0.031	<0.031	<0.031
		3/11/2014	1227-Poplar-BA01	**0.048**	<0.046	<0.046	<0.046	<0.046	<0.046
		3/11/2014	1227-Poplar-BA02	<0.048	<0.048	<0.048	<0.048	<0.048	<0.048
		3/11/2014	1227-Poplar-SS01	**0.3**	<0.21	<0.21	<0.21	<0.21	<0.21
Commercial	1415 N Montana Avenue	3/11/2014	1415-NMT-IA01	<0.048	<0.048	<0.048	<0.048	<0.048	<0.048
		3/11/2014	1415-NMT-IA02	<0.054	<0.054	<0.054	<0.054	<0.054	<0.054
		3/11/2014	1415-NMT-IA03	**0.054**	<0.043	<0.043	<0.043	<0.043	<0.043
		3/11/2014	1415-NMT-AMB01	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051
Commercial	1232 Bozeman Avenue	3/11/2014	1232-Bozeman-IA01	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085
		3/11/2014	1232-Bozeman-SS01	**49**	<0.036	<0.036	<0.036	<0.036	<0.036
		3/11/2015	1232-Bozeman-IA-01	<0.090 U	<0.043 U	<0.022	<0.020 U	<0.025	<0.019
		3/11/2015	1232-Bozeman-IA-02	<0.068 U	<0.057 U	<0.011	<0.013	<0.018	<0.014
		3/11/2015	1232-Bozeman-SS-01	**53**	<0.037 U	<0.013	<0.015	<0.021	**0.084 JB**
		3/11/2015	1232-Bozeman-SS-02	**55**	<0.011	<0.013	<0.015	<0.021	**0.09 JB**
		3/11/2015	1232-Bozemand-AMB	<0.075 U	<0.020 U	<0.014	<0.026 U	<0.024	<0.069
Residential	1231 Chestnut	3/11/2014	1231-Chestnut-IA01	**0.08**	**0.054**	<0.044	<0.044	<0.044	<0.044
		3/11/2014	1231-Chestnut-CR01	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045
Residential, 3-family	1228 Walnut Street	3/14/2014	1228-Walnut-IA-01	**1.6**	<0.044	<0.044	<0.044	<0.044	<0.044
		3/14/2014	1228-Walnut-BA-01	**1.2**	<0.040	<0.040	<0.040	<0.040	<0.040
		3/14/2014	1228-Walnut-CR-01	**1.1**	<0.036	<0.036	<0.036	<0.036	<0.036
		3/14/2014	1228-Walnut-AMB-01	**0.035**	<0.035	<0.035	<0.035	<0.035	<0.035
		3/14/2014	1228-Walnut-SP01	**12**	<0.074	<0.074	<0.074	<0.074	<0.074
		3/20/2015	1228Walnut-IA-01	**2**	<0.018	<0.0058	<0.0072	<0.0062	<0.071 U
		3/20/2015	1228Walnut-BA-01	**0.99**	**0.089 J**	<0.0041	<0.0050	<0.0043	<0.0076
		3/19/2015	1414NMT-AMB	**0.043 J**	**0.015 J**	<0.014	<0.017	<0.023	<0.018
Residential, 2-family	1232 Walnut Street	3/14/2014	1232-Walnut-IA01	**0.058**	<0.048	<0.048	<0.048	<0.048	<0.048
		3/14/2014	1232-Walnut-BA01	**3.3**	<0.050	<0.050	<0.050	<0.050	<0.050
Residential	1301 Walnut Street	3/17/2014	1301-Walnut-IA01	**0.18**	<0.042	<0.042	<0.042	<0.042	<0.042
		3/17/2014	1301-Walnut-BA01	**0.92**	<0.035	<0.035	<0.035	<0.035	<0.035
		3/17/2014	1301-Walnut-BA02	**0.82**	<0.042	<0.042	<0.042	<0.042	<0.042
		3/17/2014	1301-Walnut-SS01	**1600**	**2.1**	<0.39	<0.39	<0.39	<0.39
		3/17/2014	1301-Walnut-AMB01	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033

Table 1A: Air Sample Results Collected During the 2014-2015 Vapor Instrusion Investigation of the Helena Solvent Site, and Selected Sample Results from Previous Years

Residential, Commercial, Vacant	Property Address	Date Collected	Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Trans-1,2-Dichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	1,1,2,2-Tetrachloro-ethane (ug/m3)
Site Specific Screening Level- Residential				**42**	**2**	**0.17**	**NA**	**NA**	**0.048**
Site Specific Screening Level- Commercial				**105**	**7**	**2.8**	**NA**	**NA**	**0.21**
Commercial	1645 Montana Avenue	3/16/2014	1645-NMT-IA01	**1.6**	<0.035	<0.035	<0.035	<0.035	<0.035
		3/16/2014	1645-NMT-IA02	**1.9**	<0.034	<0.034	<0.034	<0.034	<0.034
		3/16/2014	1645-NMT-AMB01	**0.054**	<0.046	<0.046	<0.046	<0.046	<0.046
		3/16/2014	1645-NMT-SS01	**0.11**	<0.039	<0.039	<0.039	<0.039	<0.039
Commercial	1228 Bozeman Street	3/18/2014	1228-Bozeman-IA-01	**1.5**	**0.18**	<0.046	<0.046	<0.046	<0.046
		3/18/2014	1228-Bozeman-SS-01	**410**	**3.7**	<0.037	<0.037	<0.037	<0.037
		3/18/2014	1228-Bozeman-SS-01	**57**	**8.2**	<0.039	<0.039	<0.039	<0.039
Residential	1308 Phoenix Avenue	3/20/2014	1308-Phoenix-IA02 (orgininally mislabled - BA02)	**0.65**	<0.047	<0.047	<0.047	<0.047	<0.047
		3/20/2014	1308-Phoenix-BA01	**0.76**	<0.035	<0.035	<0.035	<0.035	<0.035
		3/20/2014	1308-Phoenix-SS01	**1400**	**1.7**	<0.72	<0.72	<0.72	<0.72
		3/17/2015	1308-Phoenix-IA-01	**0.67**	<0.018 U	<0.013	<0.016	<0.022	<0.017
		3/17/2015	1308Phoenix-BA-01	**0.78**	<0.015 U	<0.014	<0.016	<0.023	<0.018
		3/17/2015	1308Phoenix-BA-02	**0.77**	<0.013 U	<0.013	<0.015	<0.021	<0.016
		3/17/2015	1308Phoenix-SS-01	**1500**	**2.4**	<0.11	<0.13	<0.17	<0.13
		3/17/2015	1230Poplar-AMB	**0.039 J**	**0.013 J**	<0.012	<0.014	<0.020	<0.015
Residential	1430 Phoenix	3/21/2014	1430-Phoenix-IA01	<0.067	<0.067	<0.067	<0.067	<0.067	<0.067
		3/21/2014	1430-Phoenix-BA01	**0.059**	<0.046	<0.046	<0.046	<0.046	<0.046
		3/21/2014	1430-Phoenix-SS01	**0.31**	<0.076	<0.076	<0.076	<0.076	<0.076
		3/21/2014	1430-Phoenix-SS02	**0.31**	<0.041	<0.041	<0.041	**0.051**	<0.041
Residential	1422 Walnut Street	3/20/2014	1422-Walnut-IA01	**0.12**	<0.039	<0.039	<0.039	<0.039	<0.039
		3/20/2014	1422-Walnut-BA01	**0.17**	<0.036	**0.037**	<0.036	<0.036	<0.036
		3/20/2014	1422-Walnut-AMB01	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045
Commercial	1200 Bozeman Street	3/10/2011	10-FA2-031011	**30**	**2.1**	<0.049	<0.76	<0.15	<0.26
		3/10/2011	10-FA1-031011	**19**	**0.21**	<0.046	<0.71	<0.14	<0.24
		3/10/2011	10-BA-031011	**49**	**1.5**	<0.050	<0.78	<0.16	<0.27
		3/11/2011	10-SS1-031111	**4200**	**24**	<0.89	<14	<2.8	<4.8
		3/11/2011	10-SS2-031111	**200**	<0.20	<0.047	<0.72	<0.14	<0.25
		3/24/2015	1200Bozeman-BA-01	**64**	**1.3**	<0.016	<0.018	<0.025	<0.020
		3/24/2015	1200Bozeman-BA-02	**63**	**1.3**	<0.014	<0.017	<0.023	<0.018
		3/24/2015	1200Bozeman-IA-01	**27**	**5**	**0.014 J**	<0.013	<0.018	<0.014
		3/24/2015	1200Bozeman-SS-01	**120**	**1**	<0.014	<0.016	**0.042 J**	<0.017
		3/24/2015	1200Bozeman-SS-02	**5000**	**29**	<2.3	<3.4	<4.4	<3.2
		3/24/2015	1200Bozeman-AMB	**0.043 J**	<0.030 U	<0.012	<0.014	<0.019	<0.014
Commercial	1414 North Montana Avenue	2/24/2010	11-CL-FA1-022410	**68**	**0.61**	<0.053	<0.82	<0.16	<0.28
		2/24/2010	11-CL-FA2-022410	**32**	**0.4**	<0.045	<0.69	<0.14	<0.24
		2/24/2010	11-CL-SS1-22410	**250000**	**710**	<220	<350	<350	<600
		2/24/2010	11-CL-SS2-22410	**350,000**	**1,000**	**370**	<580	<580	<1000
		2/24/2010	11-CL-SS3-22410	**120000**	<190	<92	<140	<140	<240
		3/7/2011	11-UP1-030711	**38**	**0.39**	<0.054	<0.78	<0.16	<0.27
		3/7/2011	11-FA1-030711	<0.29	<0.23	<0.054	<0.84	<0.17	<0.29
		3/7/2011	41-FA1-030711	**64**	**0.57**	<0.048	<0.74	<0.15	<0.26
		3/7/2011	11-FA2-030711	**35**	**0.43**	<0.051	<0.80	<0.16	<0.28
		3/7/2011	11-FA3-030711	**110**	**0.88**	<0.051	<0.80	<0.16	<0.28
		3/7/2011	11-FA4-030711	**33**	**0.38**	<0.050	<0.78	<0.16	<0.27
		3/7/2011	11-FA5-030711	**31**	**0.53**	<0.047	<0.72	<0.14	<0.25
		3/8/2011	11-SS1-030811	**820000**	**8800**	<920	<1400	<1400	<2400
		3/10/2011	11-SS2-031011	**37000**	**91**	<41	<64	<64	<110
		3/10/2011	41-SS2-031011	**37000**	**91**	<41	<64	<64	<110
		3/7/2011	15-FA-030711	**470**	<0.43	<0.10	<1.6	<0.32	<0.55
		3/7/2011	15-BA-030711	**670**	<0.16	<0.66	<2.4	<0.48	<0.84
		3/8/2011	15-SS-030811	190	**0.2**	<0.048	<0.74	<0.15	<0.26
		3/19/2015	1414NMT-2IA-01	**8.2**	**0.81**	<0.014	<0.017	<0.023	<0.018
		3/19/2015	1414NMT-IA-01	**11**	**0.63**	<0.014	<0.017	<0.023	<0.018
		3/19/2015	1414NMT-IA-02	**8**	**0.32**	<0.014	<0.016	<0.022	<0.017
		3/19/2015	1414NMT-IA-03	**29**	**0.32**	<0.011	<0.013	<0.018	<0.014
		3/19/2015	1414NMT-BA-01	**130**	<0.064 U	<0.014	<0.016	<0.022	<0.017
		3/19/2015	1414NMT-BA-02	**120**	<0.056 U	<0.012	<0.014	<0.019	<0.015
		3/19/2015	1410NMT-IA-01	**44**	<0.081 U	<0.014	<0.016	<0.022	<0.017
		3/19/2015	1414NMT-AMB	**0.043 J**	<0.015 U	<0.014	<0.017	<0.023	<0.018
Commercial	1118 Helena Avenue	3/3/2010	4-CL-SS1-3310	**790,000**	**840**	<310	<480	<480	<840
	1120 Helena Avenue	3/3/2010	6-CL-SS1-3310	**22,000**	<50	<50	<24	<37	<0.71
	1118 Helena Avenue	3/25/2015	1118Helena-SS-01	**500,000**	**370 J**	<130	<150	<140	<160
	1120 Helena Avenue	3/25/2015	1120Helena-SS-01	**9100**	**14 J**	<4.5	<6.6	<8.6	<6.2
Commercial	1100 East Lyndale Avenue	3/19/2014	1100ELyndale-IA01	**1.8**	<0.040	<0.040	<0.040	<0.040	<0.040
	1100 East Lyndale Avenue	3/19/2014	1100ELyndale-BA01	**1.8**	<0.042	<0.042	<0.042	<0.042	**0.19**
	1000 East Lyndale Avenue	3/19/2014	1000ELyndale-AMB01	**0.28**	**0.083**	<0.047	<0.047	<0.047	<0.047

ug/m3 = micrograms per cubic meter
Bolded values were detected above the method reporting limit
Yellow highlighted values exceed the residential screening level
Orange highlighted values exceed both residential and commercial screening levels
Light grey highlight indicates the reporting limit exceeds a screening level
J means the value is an estimated concentration below the laboratory's reporting limit
U means that the data validation process determined the value was not detected

AMB means ambient/outdoor air
CR means crawlspace
SS mean subslab
IA means indoor air
NA means "not available"
B means that this compound was also found in the method blank
EBA means "east basement air"
WBA means "west basement air"

Table 1B: 2014 Air Sample Results From Central-Lincoln Campus Buildings
Collected by the Montana Department of Environmental Quality

Property Address	Sample Date	Sample Location	Sample ID	PCE (ug/m^3)	TCE (ug/m^3)	Vinyl Chloride (ug/m^3)	Trans-1,2-Dichloro-ethene (ug/m^3)	cis-1,2-Dichloro-ethene (ug/m^3)	1,1,2,2-Tetrachloro-ethane (ug/m^3)
		Main School Building							
	3/2/2014	Hallway East end	CLS-Main-IA01	**0.051**	<0.48	<0.48	<0.48	<0.48	<0.48
	3/2/2014	Hallway outside library door	CLS-Main-IA02	<0.055	<0.055	<0.055	<0.055	<0.055	<0.055
	3/2/2014	Cafeteria counter	CLS-Main-IA03	0.056	<0.040	<0.040	<0.040	<0.040	<0.040
	3/2/2014	Hallway outside 3A (NW corner)	CLS-Main-IA04	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045
	3/2/2014	Inside class "1" center of room	CLS-Main-IA05	<0.046	<0.046	<0.046	<0.046	<0.046	<0.046
	3/2/2014	Mechanics room basement	CLS-Main-BA01	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035
Central	3/2/2014	Mechanics room crawlspace-center	CLS-Main-CR01	**0.07**	<0.041	<0.041	<0.041	<0.041	<0.041
School	3/2/2014	Mechanics room crawlspace-far end	CLS-Main-CR02	**0.073**	<0.052	<0.052	<0.052	<0.052	<0.052
at	3/2/2014	Mechanics stair crawlspace-center	CLS-Main-CR03	**0.053**	<0.044	<0.044	<0.044	**0.05**	<0.044
Lincoln	3/2/2014	Mechanics stair crawlspace-far end	CLS-Main-CR04	**0.057**	<0.044	<0.044	<0.044	<0.044	<0.044
Campus	3/2/2014	Mechanics room subslab sample	CLS-Main-SS01	**0.21**	<0.039	<0.039	<0.039	<0.039	<0.039
		Music Annex							
1325 Poplar	3/2/2014	Music Annex- center of room	CLS-Music-IA01	**0.15**	<0.035	<0.035	<0.035	<0.035	<0.035
	3/2/2014	Duplicate of IA01	CLS-Music-IA02	**0.17**	<0.035	<0.035	<0.035	<0.035	<0.035
	3/2/2014	Crawlspace of music annex	CLS-Music-CR01	<0.031	<0.031	<0.031	<0.031	<0.031	<0.031
		New Pod Building- First Sample Set							
	3/2/2014	New "pod" hallway south end	CLS-Newpod-IA01	**58**	<0.035	<0.035	<0.035	<0.035	<0.035
	3/2/2014	New "pod" hallway north end	CLS-Newpod-IA02	**63**	<0.036	<0.036	<0.036	<0.036	<0.036
	3/2/2014	New "pod" building crawlspace	CLS-Newpod-CR01	**23**	<0.038	<0.038	<0.038	<0.038	<0.038
		New Pod Building- Second Sample Set							
	3/27/2014	New "pod" hallway south end	CLS-Newpod-IA01	**3.3**	<0.049	<0.049	<0.049	<0.049	<0.049
	3/27/2014	New "pod" hallway north end	CLS-Newpod-IA02	**3.7**	<0.054	<0.054	<0.054	<0.054	<0.054
	3/27/2014	New "pod" hallway middle	CLS-Newpod-IA03	**3.5**	<0.046	<0.046	<0.046	<0.046	<0.046
	3/27/2014	Crawlspace south end	CLS-Newpod-CR01	**2.6**	<0.040	<0.040	<0.040	<0.040	<0.040
	3/27/2014	Crawlspace north/central	CLS-Newpod-CR02	**2.4**	<0.080	<0.080	<0.080	<0.080	<0.080
	3/27/2014	Duplicate of CR03	CLS-Newpod-CR03	**3.4**	<0.035	<0.035	<0.035	<0.035	<0.035
		New Pod Building- Third Sample Set							
	8/23/2014	New "pod" hallway south end	CLS-Pod-IA01	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051
	8/23/2014	New "pod"hallway north end	CLS-Pod-IA02	**0.057**	<0.052	<0.052	<0.052	<0.052	<0.052
	8/23/2014	Crawlspace central	CLS-Pod-CR01	**1.1**	<0.048	<0.048	<0.048	<0.048	<0.048
	8/23/2014	Crawlspace central (duplicate)	CLS-Pod-CR02	**1.1**	<0.050	<0.050	<0.050	<0.050	<0.050
		Outside/Ambient Air							
	3/2/2014	West side of music annex	CLS-AMB-01	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
	3/27/2014	West side of New Pod building	CLS-NewPod-AMB01	**0.13**	<0.034	<0.034	<0.034	<0.034	<0.034
	8/23/2014	Ambient air on north side of Pod building	CLS-Pod-AMB	<0.048	<0.048	<0.048	<0.048	<0.048	<0.048
DEQ-calculated screening level for the New Pod: Students				*324*	*NC*	*NC*	*NC*	*NC*	*NC*
DEQ-calculated screening level for the New Pod: Teachers				*238*	*NC*	*NC*	*NC*	*NC*	*NC*
*Typical Montana Indoor Air Levels**				*0.14*	*<0.048*	*<0.042*	*<0.83*	*<0.83*	*NA*

ug/m3 = micrograms per cubic meter

**As presented in DEQ's August 2012 report of Typical Indoor Air Concentrations of Volatile Organic Compounds in Non-Smoking Residences Not Impacted by Vapor Intrusion*

Bolded values were detected above the method reporting limit

Yellow highlighted values exceed the residential screening level

Orange highlighted values exceed both residential and commercial screening levels

CLS is short for Central-Lincoln School

NC means "not calculated"

AMB means ambient/outdoor air

CR means crawlspace

SS mean subslab

IA means indoor air

NA means "not available"

Table 2: Helium Leak Check Results for March 2015 Subslad Samples

Sample ID	Helium in sample (measured by lab)	Helium in shroud (max)	Helium in shroud (min)	Max Leak	Min Leak	Leak Check comments***
units	%	%	%	%	%	
1236Helena-SS-01	0.2	43	20.4	1.0	0.5	
1212Helena-SS-01	12	46.1	32	37.5	26.0	Results from this sample indicate a leak in the seal or sample train. PCE results from this sample are expected to be biased low. This building will be resampled.
1232Bozeman-SS-01	0.025	33.8	24	0.1	0.1	
1232Bozeman-SS-02	0.014	33.8	24	0.1	0.0	
1334Walnut-SS-01	0.04	35.8	21.2	0.2	0.1	
1230Poplar-SS-01	3.6	33.5	31.5	11.4	10.7	
1308Phoenix-SS-01	0.32	47.5	22.5	1.4	0.7	
1200Bozeman-SS-01	3.4	40	30	11.3	8.5	
1200BozemanSS-02	0.2	51.6	32	0.6	0.4	
1118Helena-SS-01	0.016	56.4	38	0.0	0.0	
1120Helena-SS-01	0.36	60	24.5	1.5	0.6	

***DEQ considers a concentration of helium in the subsamp sample above 10% of that inside the sample shroud to indicate a leak in the sampling train where subslab air has mixed with indoor air.

Appendix C – Data Validation/Laboratory Results

Appendix D – Generic Access Letter and Results Letters

June 15, 2015

Tom Joeler
Diamond Products
1200 Bozeman Avenue
Helena, MT 59601

Re: Indoor air sampling results associated with the Helena Solvent Site: 1200 Bozeman Avenue

Dear Mr. Joeler:

On March 25, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from your property located at **1200 Bozeman Avenue** in Helena, Montana. This is the location of Diamond Products. One indoor air sample was collected from the central main floor area where 55-gallon drums are stored, and another was taken from the basement area. In the basement, DEQ also collected a duplicate air sample for quality assurance purposes. DEQ collected two subslab vapor samples: one from beneath the slab of the basement and one from beneath the concrete slab of the ground floor. In addition, an outdoor air sample was collected from within the fenced area on the northwest side of the Diamond Products building. All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ.

The air samples from your property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

DEQ has validated the sampling data, and found it to be of acceptable quality for the purposes of this investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Please find enclosed a table summarizing the analytical results from 1200 Bozeman compared to site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA). The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. Copies of the laboratory data sheets are also enclosed.

Please note that the DEQ has provided two different screening levels, one for residential indoor air and one for commercial indoor air. DEQ has provided the two screening levels because the future use of the building cannot be guaranteed at this time, even if the current and past uses of the building are commercial/industrial. The screening levels are based on long-term (25-30 years) exposures.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for higher levels of contamination than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

PCE and TCE were detected in indoor air samples at concentrations below commercial screening levels, but above residential screening levels. PCE and TCE were found at higher concentrations in subslab vapor, with the highest levels found under the basement slab. While subslab vapor is not considered "indoor air," it is important to note that the PCE and TCE concentrations under the building are higher than the concentrations in indoor air and exceed commercial indoor air screening levels. The results from 2015 were remarkably consistent with the results from air sampling DEQ conducted in 2011 (please see the enclosed table).

Based on a review of the evidence, subsurface PCE and TCE vapors appear to be migrating into indoor air at the Diamond Products building at concentrations above the site-specific residential screening levels but less than the site-specific commercial screening levels.

Based upon a review of the evidence, DEQ proposes the following:

- In order to minimize the opportunity for vapors to migrate into the building, DEQ strongly recommends that Diamond Products seal the portions of the basement that are not concrete and that are open to the ground underneath. Also, DEQ recommends inspecting the foundation of the building for cracks and other places where air from beneath the building might the building. DEQ recommends sealing of any such cracks or openings with a sealant that does not contain chlorinated solvents.
- DEQ may conduct additional air sampling next winter to gather additional data to better understand indoor air contaminant concentrations.
- Diamond Products may wish to explore options to increase ventilation of the basement.
- If any other structures are built on this property, DEQ strongly recommends the installation of a vapor mitigation system (which is the same technology as a radon mitigation system) or other technology to prevent vapor intrusion. If a residential use were proposed on the property, DEQ would require a vapor mitigation system. These systems can be very reasonable to install in new construction and generally are effective at addressing vapor intrusion. Because of the high levels of PCE and TCE in the sub-slab, a future structure that is built without a vapor mitigation system may have unacceptable levels of PCE and TCE in the indoor air. Please provide a copy of this letter to any purchaser or developer of the property

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the

Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal

Encl.

June 15, 2015

Mike Mahoney
1236 Helena Ave
Helena, MT 59601

Re: Indoor air sampling results associated with the Helena Solvent Site: 1212 Helena Avenue

Dear Mr. Mahoney:

On March 7, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from Family Outreach Partnership property located at **1212 Helena Avenue** in Helena, Montana. Two indoor air samples were collected from the upper level, in the east side office supply area and the west side break area. Three samples were collected from the basement, in the east side kitchen area (along with a duplicate), and the west side. A subslab air sample was collected from beneath the slab in the closet under the stairs. All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ.

The air samples from your property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

Please find enclosed a table summarizing the analytical results from 1212 Helena compared to site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA). The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. Copies of the laboratory data sheets are also enclosed.

Please note that the DEQ has provided two different screening levels, one for residential indoor air and one for commercial indoor air. DEQ has provided the two screening levels because the future use of the building cannot be guaranteed at this time, even if the current and past uses of the building are commercial/industrial. The screening levels are based on long-term (25-30 years) exposures.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for higher levels of contamination than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

PCE and TCE were detected in all indoor air samples and the subslab sample, but the concentrations were all below site-specific screening levels. In most cases, the results were low-level, estimated detections (indicated with a "J" flag on the attached table). The subslab air sample had detections of PCE and TCE at higher levels than in indoor air, but the subslab concentrations were also below screening levels. Of note is the occurrence of PCE, TCE, vinyl chloride, and 1,1,2,2-Tetrachloroethane at higher levels in the upper floor's air (west side break area) than in the lower floor's air, which suggests that there may be an indoor-air source of chlorinated solvents (although all below the residential screening levels, except for 1,1,2,2-Tetrachloroethane). Based on a review of the evidence, subsurface PCE and TCE vapors may be migrating into 1212 Helena at detectable concentrations, but those concentrations in indoor air are below the residential and commercial screening levels. **If resources are available, DEQ may resample at 1212 Helena next winter to verify whether or not contaminant levels in indoor air are consistently below screening levels.**

In addition to PCE and TCE, the analysis looked for four other chlorinated solvents (see the enclosed table). None of these solvents were detected in concentrations which exceeded screening levels or background, except for 1,2,2,2-Tetrachloroethane, which slightly exceeded the residential screening level in one sample. The detection of 1,2,2,2-Tetrachloroethane appears to be an indoor air source, since it was only found in the upstairs break area air, and it was not detected in any other samples including the subslab sample.

DEQ has validated the sampling data, and found it of acceptable quality for the purposes of this investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal

Encl.

June 15, 2015

Mark Esponda
Dick Anderson Construction
3424 Highway 12 East
Helena, MT 59601

Re: Indoor air sampling results associated with the Helena Solvent Site: 1225 Cedar

Dear Mark:

On March 8, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from the building at **1225 Cedar Street**, Helena, Montana. This building is currently occupied by the DEQ Remediation Division. Indoor air samples were collected from the following locations:

- East basement conference room
- East basement office space (a duplicate sample was also collected in this location)
- West basement file storage room
- West basement office space
- Ground level east side legal file room
- Ground level west side office space

All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ.

The air samples from your property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

Please find enclosed a table summarizing the analytical results from 1225 Cedar compared to site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA) and typical indoor air contaminant concentrations in Montana. The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. Copies of the laboratory data sheets are also enclosed.

The screening levels that apply at this time to 1225 Cedar are the commercial levels. The residential screening levels, which are the most protective screening levels, are included for your information.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for higher levels of contamination

than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

PCE was detected in all indoor air samples at low concentrations, none of which exceed the commercial or residential screening levels. The highest concentration was detected in the East basement at 0.11 $\mu g/m^3$ which is well below the residential and commercial site-specific screening levels of 42 and 105 $\mu g/m^3$, respectively. PCE was detected in the outside air sample at 0.069 $\mu g/m^3$, which was similar to the indoor air concentrations and, in some instances, was higher than the indoor air concentrations. **Based on the fact that the building has a vapor barrier, the levels of PCE are below residential screening levels, the PCE levels are less than typical Montana background indoor air concentrations, and the indoor air values are not different than outside air, DEQ does not plan to conduct any additional actions related to vapor intrusion at this time at the 1225 Cedar Street property.**

In addition to PCE, the analysis looked for five other chlorinated solvents (see the enclosed table). With the exception of one sample that detected Trans1,2-Dichloroethene below the residential screening level and two samples that detected TCE below the residential screening level, none of the other solvents were detected.

DEQ has validated the sampling data, and found the data to be of acceptable quality for the purposes of this investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal, (w/out attachments)
Jenny Chamber, DEQ Remediation Division Administrator
Larry Alheim, DEQ Safety Director
Peggy McEwan, DEQ Human Resources

Encl.

June 15, 2015

Chris and Judy Moyer
1218 Walnut Street
Helena, MT 59601-0953

Re: Indoor air sampling results associated with the Helena Solvent Site: 1228 Walnut

Dear Chris and Judy:

On March 20, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from your property at **1228 Walnut Street**, Helena, Montana. This building is comprised of several rental units. One indoor air sample was collected from the first floor communal laundry room, and a second indoor air sample was collected in the basement. All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ.

The air samples from your property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

Please find enclosed a table summarizing the analytical results from 1228 Walnut compared to indoor air site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA).and typical indoor air contaminant concentrations in Montana. The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. Copies of the laboratory data sheets are also enclosed. The screening levels that apply to 1228 Walnut are the residential levels, and these are the most protective screening levels. The commercial/industrial screening levels are included for your information.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for higher levels of contamination than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

PCE was detected in indoor air samples at 2.0 $\mu g/m^3$ in the main level laundry room and 0.99 $\mu g/m^3$ in the basement air. These levels are less than the residential screening level of 42 $\mu g/m^3$. The occurrence of PCE at a higher concentration in the laundry room air than in the basement air suggests there may be an indoor air source of PCE in the laundry area. PCE was detected in the outside air sample at 0.043 $\mu g/m^3$. TCE was detected at 0.089 $\mu g/m^3$ in the basement air, and was not detected in the laundry room. The TCE level is less than the residential screening level of 2 $\mu g/m^3$. Based on a review of the evidence, DEQ has determined that subsurface PCE vapors may be migrating into 1228 Walnut, but at concentrations well below the site-specific residential screening level. The results from 2015 are consistent the results from 2014.

Based upon the evidence for your property, at this time, DEQ does not plan to conduct any additional actions related to vapor intrusion at 1228 Walnut Street.

In addition to PCE and TCE, the analysis looked for four other chlorinated solvents (see the enclosed table). None of these solvents were detected in the indoor or outdoor air samples.

DEQ validated the sampling results, and found the data quality is consistent with the purposes of the investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal, (w/out attachments)

Encl.

June 15, 2015

Carol E Synness
1230 Poplar Street
Helena, MT 59601

Re: Indoor air sampling results associated with the Helena Solvent Site: 1230 Poplar Street

Dear Carol:

On March 17, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from your property at **1230 Poplar Street** in Helena, Montana. One indoor air sample on the ground level was collected from the TV room, one indoor air sample was collected from the second floor bedroom, one sample was collected from the basement, and a subslab air sample was collected from under the concrete of the basement floor. All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ.

The air samples from this property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

Please find enclosed a table summarizing the analytical results from 1230 Poplar compared to indoor air site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA) and typical indoor air contaminant concentrations in Montana. The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. Copies of the laboratory data sheets are also enclosed. The screening levels that apply to 1230 Poplar are the residential levels, and these are the most protective screening levels. The commercial/industrial screening levels are included for your information.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for

higher levels of contamination than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

Neither PCE nor TCE was detected in any of the indoor air samples in your home. The subslab air sample had PCE at 14 $\mu g/m^3$, which is lower than the residential screening level of 42 $\mu g/m^3$. TCE was detected in the subslab air sample at 0.74 $\mu g/m^3$, which is less than the residential screening level of 2 $\mu g/m^3$. 1,1,2,2-Tetrachloroethane was detected in the subslab air at an estimated value of 0.075 $\mu g/m^3$ (this value is estimated because the same compound was found in the laboratory's "blank" sample) which exceeds the residential screening level of 0.048 $\mu g/m^3$, but was not detected in indoor air.

This data indicates there is a concentration gradient that would support intrusion of PCE and TCE into the home. However, DEQ has determined that it is unlikely that PCE or TCE have the potential to migrate into inside air at levels that would exceed residential screening levels because:

- Subslab PCE and TCE levels are less than residential indoor air screening levels,
- It is not possible for contaminants in the subslab air to intrude into indoor air at levels higher than those in subslab air,
- The 2015 air sampling event occurred during the "worst case" time of year for vapor intrusion, so it is unlikely that the concentrations found in 2015 would be significantly worse in the future.

In addition to PCE, TCE, and 1,1,2,2-Tetrachloroethane, the analysis looked for three other chlorinated solvents (see the enclosed table). None of these solvents were detected above screening levels or background air quality levels.

Based upon the evidence for your home, DEQ will not conduct any additional actions at this time related to vapor intrusion on your property.

DEQ has validated the sampling data, and found it to be of acceptable quality for the purposes of this investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal, (w/out attachments)

Encl.

June 15, 2015

John Horne
Capitol Transfer and Storage
1316 Bozeman Avenue
Helena, MT 59601

Re: Indoor air sampling results associated with the Helena Solvent Site: 1232 Bozeman Avenue

Dear Mr. Horne:

On March 11, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from your property located at **1232 Bozeman Avenue** in Helena, Montana. One indoor air sample was collected from the main warehouse area and another was taken from the south office area. A subslab air sample and a duplicate were collected from beneath the slab of the warehouse. All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ.

The air samples from your property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

Please find enclosed a table summarizing the analytical results from 1232 Bozeman compared to indoor air site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA) and typical indoor air contaminant concentrations in Montana. . The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. Copies of the laboratory data sheets are also enclosed.

Please note that the DEQ has provided two different screening levels, one for residential indoor air and one for commercial indoor air. DEQ has provided the two screening levels because the future use of the building cannot be guaranteed at this time, even if the current and past uses of the building are commercial/industrial. The screening levels are based on long-term (25-30 years) exposures.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for higher levels of contamination than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

PCE, TCE and other chlorinated compounds were not detected in indoor air samples, and the detection limits were less than the residential screening levels. PCE was detected in the subslab air at 55 $\mu g/m^3$. TCE was detected in the subslab air at 0.037 $\mu g/m^3$. Tetrachloroethane was also detected in the subslab air at 0.09 $\mu g/m^3$, which is greater than the residential screening level, but below the commercial screening level of 0.21 $\mu g/m^3$. The 2015 results are consistent with the results of air sampling DEQ conducted in 2014. Based on a review of the evidence, subsurface chlorinated solvent vapors do not appear to be migrating into 1232 Bozeman at concentrations above the residential screening levels. **Based upon the evidence for your property, at this time DEQ does not plan to conduct any further actions related to vapor intrusion at 1232 Bozeman Avenue.**

DEQ has validated the sampling data, and found it to be of acceptable quality for the purposes of this investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal

Encl.

June 15, 2015

Mike Mahoney
1236 Helena Ave
Helena, MT 59601

Re: Indoor air sampling results associated with the Helena Solvent Site: 1236 Helena Avenue

Dear Mr. Mahoney:

On March 7, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from Family Outreach Partnership property located at **1236 Helena Avenue** in Helena, Montana. Two indoor air samples were collected from the upper level, in the east side conference room and the west side hallway. Two samples were collected from the basement, in the east side IT office and the west side. A subslab air sample was collected from beneath the slab in the "telephone room." All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ.

The air samples from your property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

Please find enclosed a table summarizing the analytical results from 1236 Helena compared to indoor air site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA) and typical indoor air contaminant concentrations in Montana. The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. Copies of the laboratory data sheets are also enclosed.

Please note that the DEQ has provided two different screening levels, one for residential indoor air and one for commercial indoor air. DEQ has provided the two screening levels because the future use of the building cannot be guaranteed at this time, even if the current and past uses of the building are commercial/industrial. The screening levels are based on long-term (25-30 years) exposures.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for higher levels of contamination than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

PCE and TCE were detected in all indoor air samples collected in this building, but at concentrations less than the commercial and residential screening levels. The highest PCE was found in the upper level in the west side hallway (5.0 $\mu g/m^3$), but this concentration does not exceed the residential screening level (42 $\mu g/m^3$) or the commercial screening level (108 $\mu g/m^3$). PCE in the subslab (25 $\mu g/m^3$) was higher than in indoor air, but still less than screening levels. Of note is the occurrence of PCE and TCE at higher concentrations in the upper level west side hallway than in the basement (although all levels were below screening levels), which suggests the presence of an indoor air source of chlorinated solvents. Based on a review of the evidence, subsurface PCE and TCE vapors may be migrating into 1236 Helena at detectable concentrations, but those concentrations in indoor air are below the applicable screening levels. **If resources are available, DEQ may resample at 1236 Helena next winter to verify whether or not contaminant levels in indoor air are consistently below screening levels.**

In addition to PCE and TCE, the analysis looked for four other chlorinated solvents (see the enclosed table). None of these solvents were detected in concentrations which exceeded screening levels or background.

DEQ has validated the sampling data and found it to be of acceptable quality for the purposes of this investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal

Encl.

June 15, 2015

David and Charla Taylor
1365 Cayuse Road
Helena, MT 59602

Re: Indoor air sampling results associated with the Helena Solvent Site: 1306 Poplar

Dear David and Charla:

On March 12, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from your property at **1306 Poplar Street**, Helena, Montana. This building is a duplex rental unit. One indoor air sample was collected from the central living area, and a second indoor air sample was collected in the crawlspace. All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ.

The air samples from your property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

Please find enclosed a table summarizing the analytical results from 1306 Poplar compared to indoor air site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA)and typical indoor air contaminant concentrations in Montana. The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. Copies of the laboratory data sheets are also enclosed. The screening levels that apply to 1306 Poplar are the residential levels, and these are the most protective screening levels. The commercial/industrial screening levels are included for your information.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for higher levels of contamination than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

No chlorinated solvents were detected in the indoor air or crawlspace air of 1306 Poplar, and the detection limits were all less than applicable residential screening levels. PCE was detected in the outside air sample at 0.075 $\mu g/m^3$. Given that:

- All indoor air analyte levels were not detected well below the residential screening levels or background levels
- All crawlspace analyte levels were not detected well below the residential screening levels or background levels
- The concentrations in the crawl space level were also less than the indoor air concentrations
- The samples were collected at a "worst case" time of year
- The sample results at 1306 Poplar are consistent with the results from the attached rental unit (1308 Poplar)
- There is no evidence to suggest that vapor intrusion is occurring at this location

Based upon the evidence for your home, DEQ will not conduct any additional actions at this time related to vapor intrusion on your property.
DEQ validated the sampling data, and found it to be of adequate quality for the purposes of this investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal, (w/out attachments)
Resident, 1306 Poplar, Helena MT, 59601

Encl.

June 15, 2015

Vincent J Zimmerman Revocable Trust
1011 S Valentia Street Unit 75
Denver, CO 80247-6815

Terry Zimmerman
357 Mill Road
Helena, MT 59602-6935

Cody Rogers
1308 Phoenix Avenue
Helena, MT 59601

Re: Indoor air sampling results associated with the Helena Solvent Site: 1308 Phoenix Avenue

Dear Interested Parties:

On March 17, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from the property at **1308 Phoenix Avenue** in Helena, Montana. One indoor air sample on the ground level was collected from a bedroom off the kitchen, one indoor air sample was collected in the basement back room, one sample was collected in the basement laundry area, and a sub slab air sample was collected from under the concrete floor of the basement. All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ.

The air samples from this property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

Please find enclosed a table summarizing the analytical results from 1308 Phoenix compared to indoor air site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA) and typical indoor air contaminant concentrations in Montana. The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. Copies of the laboratory data sheets are also enclosed. The screening levels that apply to 1308 Phoenix are the residential levels, and these are the most protective screening levels. The commercial/industrial screening levels are included for your information.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for higher levels of contamination than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

PCE was detected in the main level indoor air sample at 0.67 $\mu g/m^3$, in the basement back room at 0.77 $\mu g/m^3$, and in the basement laundry room at 0.78 $\mu g/m^3$. These levels are less than the residential screening level of 42 $\mu g/m^3$. PCE was detected in the outside air sample at 0.039 $\mu g/m^3$, and since this level is less than that found in indoor air, it is not likely that an outdoor source of PCE would be causing the indoor air levels. Importantly, the sub-slab air sample showed PCE in the soil vapor at 1,500 $\mu g/m^3$, which is an elevated concentration. TCE was not detected in any of the indoor air samples. The sub-slab air sample also showed a detection of TCE at 2.4 $\mu g/m^3$, which is greater than the residential screening level of 2 $\mu g/m^3$ The data indicate there is a concentration gradient that would support intrusion of PCE and TCE into the home. DEQ notes that the results from 2015 are consistent with the sample results from 2014.

Based on a review of the evidence, DEQ has determined that subsurface PCE vapors may be migrating into 1308 Phoenix, but at concentrations below the residential screening level. The 1308 Phoenix property is located only 75-100 feet away from groundwater known to be contaminated with PCE, so the presence of PCE in the subslab air is not unexpected. **At this time, due to consecutive rounds of sampling with indoor air contaminants below screening levels, DEQ does not intend to perform additional sampling at 1308 Phoenix. At this time, it appears that your property's construction may be preventing vapor intrusion. Given the high levels of contamination under the property, changes to the slab could result in vapor intrusion occurring in the future. DEQ recommends that the foundation of the home be inspected for cracks or other places where air from beneath the slab might enter the home. DEQ recommends sealing of any such cracks with a sealant that does not contain chlorinated solvents. The elevated levels of contaminants under the home may justify the installation of a mitigation system (which is the same technology as a radon mitigation system) to prevent the possibility of vapor intrusion in the future, especially if conditions change. A mitigation system would also protect indoor air from radon, and there are high levels of radon throughout the Helena valley.**

If any other structures are built on this property, DEQ strongly recommends the installation of a vapor mitigation system (which is the same technology as a radon mitigation system) or other technology to prevent vapor intrusion. These systems can be very reasonable to install in new

construction and generally are effective at addressing vapor intrusion. Because of the high levels of PCE and TCE in the sub-slab, a future structure that is built without a vapor mitigation system may have unacceptable levels of PCE and TCE in the indoor air. Please provide a copy of this letter to any purchaser or developer of the property.

In addition to PCE and TCE, the analysis looked for four other chlorinated solvents (see the enclosed table). None of these four solvents were detected in the air samples.

DEQ has validated the sampling data, and found them acceptable for the purposes of this investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal, (w/out attachments)

Encl.

June 15, 2015

David and Charla Taylor
1365 Cayuse Road
Helena, MT 59602

Re: Indoor air sampling results associated with the Helena Solvent Site: 1308 Poplar

Dear David and Charla:

On March 12, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from your property at **1308 Poplar Street**, Helena, Montana. This building is part of a duplex rental unit. One indoor air sample was collected from the central living area, and a second indoor air sample was collected in the crawlspace. All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ.

The air samples from your property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

Please find enclosed a table summarizing the analytical results from 1308 Poplar compared to indoor air site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA)and typical indoor air contaminant concentrations in Montana. The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. Copies of the laboratory data sheets are also enclosed. The screening levels that apply to 1308 Poplar are the residential levels, and these are the most protective screening levels. The commercial/industrial screening levels are included for your information.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for higher levels of contamination than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

PCE was detected in indoor air samples at 0.29 $\mu g/m^3$ in the central living area and was not detected (<0.11 $\mu g/m^3$) in the crawlspace air. These levels are less than the residential screening level of 42 $\mu g/m^3$. PCE was detected in the outside air sample at 0.075 $\mu g/m^3$. TCE was detected at 0.29 $\mu g/m^3$ in the central living area, and was not detected (<0.028 $\mu g/m^3$) in the crawlspace. The TCE level in the central living area was less than the residential screening level of 2 $\mu g/m^3$. TCE was detected in the outside air sample at 0.020 $\mu g/m^3$. Given that the PCE and TCE concentrations in the crawlspace are lower than the concentrations in the central living area, the PCE and TCE do not appear to be a result of vapor intrusion. Rather, it appears there may be an indoor air source of these contaminants. However, because the detections of PCE and TCE were well below site-specific screening levels, and because neither PCE nor TCE were present in the crawlspace air, **DEQ does not plan to conduct any additional actions related to vapor intrusion at 1308 Poplar.**

In addition to PCE and TCE, the analysis looked for four other chlorinated solvents (see the enclosed table). None of these solvents were detected in the indoor air samples. Trans-1,2-dichloroethene was detected at 0.026 $\mu g/m^3$ in outdoor air.

DEQ has validated the sampling data, and found it to of adequate quality for the purposes of this investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal, (w/out attachments)
Resident, 1308 Poplar, Helena, MT 59601

Encl.

June 15, 2015

Janis Carter
1310 Walnut Street
Helena, MT 59601

Re: Indoor air sampling results associated with the Helena Solvent Site: 1310 Walnut Street

Dear Janis:

On March 10, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from your property at **1310 Walnut Street** in Helena, Montana. One indoor air sample was collected from the living room southeast corner, and one air sample was collected from within the crawlspace. All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ.

The air samples from this property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

Please find enclosed a table summarizing the analytical results from 1310 Walnut compared to indoor air site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA) and typical indoor air contaminant concentrations in Montana. The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. Copies of the laboratory data sheets are also enclosed. The screening levels that apply to 1310 Walnut are the residential levels, and these are the most protective screening levels. The commercial/industrial screening levels are included for your information.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for higher levels of contamination than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a

person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

PCE was detected in the living room indoor air sample at 0.43 $\mu g/m^3$, and in the crawlspace at 0.56 $\mu g/m^3$. These levels are well below the residential screening level of 42 $\mu g/m^3$. PCE in the crawlspace was only slightly higher than PCE in the indoor air, and the results are inconclusive regarding whether or not the PCE is a result of vapor intrusion. **At this time, DEQ does not plan to conduct additional actions related to vapor intrusion at 1310 Walnut.**

In addition to PCE, the analysis looked for five other chlorinated solvents (see the enclosed table). None of these solvents were detected in your indoor or crawlspace air.

DEQ has validated the sampling data, and found the results to be of adequate quality for the purposes of this investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal, (w/out attachments)

Encl.

June 15, 2015

Big Bear Properties
P.O. Box 920
Helena, MT 59624

Re: Indoor air sampling results associated with the Helena Solvent Site: 1330 and 1328 Walnut Street

To Whom It May Concern:

On March 5, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from your property at **1330 and 1328 Walnut Street**, Helena, Montana. This building is a duplex comprised of a main level unit (1330 Walnut mailing address) and a second story unit (1328 Walnut mailing address). The building has a large basement that is primarily for storage. The basement floor is partial concrete, with some exposed dirt. One indoor air sample was collected from the main floor apartment living room, a second indoor air sample was collected in the basement, and a third indoor air sample was collected in the upstairs apartment. All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ.

The air samples from your property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

Please find enclosed a table summarizing the analytical results from 1330 Walnut compared to indoor air site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA) and typical indoor air contaminant concentrations in Montana. The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. The screening levels that apply to 1330 Walnut are the residential levels, and these are the most protective screening levels. The commercial/industrial screening levels are included for your information.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for higher levels of contamination than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

PCE was detected in indoor air samples at 0.42 $\mu g/m^3$ in the main level apartment, 1.1 $\mu g/m^3$ in the basement air, and 0.18 $\mu g/m^3$ in the upstairs apartment. These levels are less than the residential screening level of 42 $\mu g/m^3$. PCE was detected in the outside air sample at 0.022 $\mu g/m^3$. TCE was detected at 0.012 $\mu g/m^3$ in the main floor apartment, 0.019 $\mu g/m^3$ in the basement air, and 0.015 $\mu g/m^3$ in the upstairs apartment. The TCE levels are less than the residential screening level of 2 $\mu g/m^3$. Based on a review of the evidence, DEQ has determined that subsurface PCE vapors may be migrating into 1330 and 1328 Walnut, but at concentrations below the residential screening level. **If resources are available, DEQ may resample at 1330 Walnut next winter to verify whether PCE levels in indoor air are consistently below screening levels. Note that DEQ did not attempt to collect a soil vapor sample from underneath the concrete foundation during 2015 due to the fact that the basement floor is only partially concrete. If you finish the basement with a full concrete floor, DEQ may opt to collect a subslab sample during the next round of sampling.**

In addition to PCE and TCE, the analysis looked for four other chlorinated solvents (see the enclosed table). None of these four solvents were detected in the indoor or outdoor air samples.

DEQ has validated the sampling data, and found it to be of acceptable quality for the purposes of this investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal, (w/out attachments)
Resident, 1330 Walnut Street, Helena MT 59601
Resident, 1228 Walnut Street, Helena, MT 59601

Encl.

June 15, 2015

George Rider
P.O. Box 4363
Helena, MT 59604

Re: Indoor air sampling results associated with the Helena Solvent Site: 1334 Walnut

Dear George:

On March 13, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from your property at **1334 Walnut Street**, Helena, Montana. This building is a single family dwelling consisting of a main floor and a basement. One indoor air sample was collected from the main floor dining area, a second indoor air sample was collected in the basement, and a subslab sample was collected from underneath the concrete in the approximate center of the basement. All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ.

The air samples from your property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

Please find enclosed a table summarizing the analytical results from 1334 Walnut compared to indoor air site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA) and typical indoor air contaminant concentrations in Montana. The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. Copies of the laboratory data sheets are also enclosed. The screening levels that apply to 1334 Walnut are the residential levels, and these are the most protective screening levels. The commercial/industrial screening levels are included for your information.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for higher levels of contamination than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are

impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

PCE was detected in indoor air samples at 2.1 $\mu g/m^3$ in the main level dining area, and 3.9 $\mu g/m^3$ in the basement living space. The indoor air PCE levels are below the residential screening level of 42 $\mu g/m^3$. PCE was detected at 8,200 $\mu g/m^3$ in the subslab vapor. The subslab vapor concentration exceeds the residential screening level of 42 $\mu g/m^3$. TCE was detected at 0.17 $\mu g/m^3$ in the main level dining area, but was not detected (<0.19 $\mu g/m^3$) in basement living space, and 29 $\mu g/m^3$ in the subslab vapor. The subslab vapor TCE levels exceed the residential screening level of 2 $\mu g/m^3$. These data suggest a concentration gradient exists that would support vapor intrusion of PCE and TCE into your home.

Based on a review of the evidence, DEQ has determined that subsurface PCE and TCE vapors may be migrating into 1334 Walnut, but at concentrations below the residential screening levels. **Given the elevated levels of sub-slab PCE and TCE, DEQ plans to conduct follow-up air sampling at your home next winter to verify that PCE and TCE concentrations in indoor air are below screening levels. The sampling proposed for the coming winter will provide additional information for determining appropriate next steps at your home.**

In addition to PCE and TCE, the analysis looked for four other chlorinated solvents (see the enclosed table). None of these solvents were detected in the indoor or outdoor air samples.

DEQ has validated the sampling data, and found the data to be of acceptable quality for the purposes of this investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal, (w/out attachments)

Encl.

June 15, 2015

Art Villa
Mergenthaler Transport and Storage
1414 North Montana Avenue
Helena, MT 59601

Re: Indoor air sampling results associated with the Helena Solvent Site: 1200 Bozeman Avenue

Dear Mr. Villa:

On March 19, 2015, personnel from the Montana Department of Environmental Quality (DEQ) collected samples from the Mergenthaler Transport and Storage offices and warehouse as well as the Ocean Beauty Seafood space located at 1414 North Montana Avenue in Helena, Montana. All sampling was performed in accordance with the February 2014 *Sampling and Analysis Plan for the Helena Solvent Site Vapor Intrusion Investigation* prepared by DEQ. DEQ collected indoor air samples from the following locations:

- Mergenthaler's second floor break room
- Mergenthaler's main level office dispatch area (a duplicate sample was also collected here)
- Mergenthaler's warehouse (on shelf 7B)
- Mergenthaler's information technology office
- Ocean Beauty's office
- The basement storage space under Ocean Beauty (a duplicate sample was also collected here)
- An outdoor air sample was collected in the fenced area outside of ProBuild

The air samples from your property were collected as part of the investigation of the Helena Solvent Site (the Site). DEQ required that the samples be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), and the breakdown products of these compounds. PCE and TCE are chlorinated solvents that are contaminants of concern associated with the Site. Solvent contamination from the Site has the potential to migrate through the subsurface and to move as vapors into buildings. Summary information about these compounds can be found on the enclosed fact sheets. You can find more information online at the Agency for Toxic Substances and Disease Registry (ATSDR) website: http://www.atsdr.cdc.gov/.

DEQ sampled air at this location in 2010 and 2011. Based on the results of that sampling, Mergenthaler installed a vapor mitigation system in the structure. One objective of the 2015 air sampling event was to determine whether the mitigation system had lowered the levels of PCE and TCE in indoor air in the building.

DEQ has validated the sampling data, and found it to be of acceptable quality for the purposes of this investigation. Data validation is a standardized review process for judging the analytical quality and usefulness of a discrete set of chemical data and is necessary to ensure that data of known and documented quality are used in making environmental decisions.

Please find enclosed a table summarizing the analytical results from this property compared to indoor air screening levels. The table also includes the concentrations of compounds found in outdoor air on the day the indoor air samples were collected. Copies of the laboratory data sheets are also enclosed. At this time, DEQ is comparing the indoor air results to site-specific screening levels developed by DEQ using toxicity information and guidance from the U.S. Environmental Protection Agency (EPA).

Please note that the DEQ has provided two different screening levels, one for residential indoor air and one for commercial indoor air. DEQ has provided the two screening levels because the future use of the building cannot be guaranteed at this time, even if the current and past uses of the building are commercial/industrial. The screening levels are based on long-term (25-30 years) exposures.

DEQ has determined that the use of site-specific screening levels is appropriate at the Helena Solvent Site, and has adopted site-specific screening levels that have already been developed and approved for a site with the same contamination issues. The commercial screening levels allow for higher levels of contamination than the residential screening levels. This difference is a result of the different exposure assumptions for residential and commercial scenarios. For example, residential exposure assumes that a person lives in a house for 30 years, 350 days per year, for 24 hours per day whereas the commercial exposure assumes that a person works at a location for 25 years, 250 days per year, for eight hours per day.

DEQ evaluated multiple lines of evidence associated with the vapor intrusion sampling conducted on your property and elsewhere in Helena to determine whether subsurface vapors associated with the Site are impacting your property. The lines of evidence DEQ looks at include, among other things, the concentrations detected in the samples from your property, whether indoor or outdoor sources may have impacted the air in your building, the building's construction, proximity to the groundwater contamination, and evidence from other structures sampled in the area.

The following bullets summarize the results of the 2015 sampling event, and also compare the 2015 results to previous results:

- PCE was detected in all indoor air samples, and was also found in outside air. The outside air concentrations was much lower than the levels inside the building, so DEQ does not believe that outside air is influencing PCE levels inside Mergenthalers building. PCE levels were highest in the basement air under Ocean Beauty (130 $\mu g/m^3$) and exceed the commercial/industrial site-specific indoor air screening level of 105 $\mu g/m^3$. The Ocean Beauty main office had PCE at 44 $\mu g/m^3$, which does not exceed the commercial indoor air screening level, but is higher than the residential indoor air screening level (42 $\mu g/m^3$).
- TCE was not detected in the Ocean Beauty office or basement. TCE was detected other indoor air samples, but at concentrations less than the residential indoor air screening level of 2 $\mu g/m^3$.
- A comparison of indoor air results from the same or similar locations over time show that PCE levels have decreased from 2010/2011 to 2015. For example, PCE in the second floor break room fell from 38 $\mu g/m^3$ in 2011 to 8.2 $\mu g/m^3$ in 2015. The information technology office PCE level dropped from 110 $\mu g/m^3$ in 2011 to 29 $\mu g/m^3$ in 2015. The Ocean Beauty basement air PCE level dropped from 670 $\mu g/m^3$ in 2011 to 130 $\mu g/m^3$ in 2015. This decrease maybe attributable to the installation and operation of the building's mitigation system (post-2011).
- TCE indoor air concentrations do not appear to have changed over time.
- In 2015, the only location where indoor exceeded the commercial screening level was the basement storage area under Ocean Beauty.

DEQ proposes the following to continue to address air contamination at Mergethalers building:

- Please continue to maintain and operate the building's mitigation system.

- In addition, DEQ strongly suggests that Mergenthaler evaluate adjusting the mitigation system in and/or increased ventilation of the Ocean Beauty basement to further reduce indoor air PCE levels, and prevent PCE from migrating into the upstairs Ocean Beauty operation.
- DEQ understands that the Ocean Beauty basement is a cold storage space, and that employees do not routinely work in the space. If changes are proposed that will have employees working in the Ocean Beauty basement, then the indoor air contamination must be addressed to bring PCE and TCE levels to below applicable screening levels.
- Please provide a copy of this letter to any employees who use the Ocean Beauty basement and post the results in the Ocean Beauty basement, and please respond in writing to this letter confirming that Mergenthaler has taken these actions.
- DEQ plans to conduct additional air sampling next winter. This sampling will provide additional data to better understand indoor air contaminant concentrations.
- If any other structures are built on this property, DEQ strongly recommends the installation of a vapor mitigation system (which is the same technology as a radon mitigation system) or other technology to prevent vapor intrusion. These systems can be very reasonable to install in new construction and generally are effective at addressing vapor intrusion. Because of the high levels of PCE and TCE in the sub-slab, a future structure that is built without a vapor mitigation system may have unacceptable levels of PCE and TCE in the indoor air. Please provide a copy of this letter to any purchaser or developer of the property

Thank you for your cooperation with the DEQ's investigation of the Helena Solvent Site. If you have specific questions about risks posed by the indoor air contaminants, I would be happy to contact the Agency for Toxic Substances and Disease Registry (ATSDR) on your behalf. If you have any questions or concerns, please do not hesitate to contact me at (406) 444-0212 or lalvey@mt.gov.

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal

Encl.

Appendix E – Photo Log, Field Forms, Weather Data

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

Climatological Report (Monthly)

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CLIMATE REPORT
NATIONAL WEATHER SERVICE GREAT FALLS MT
153 PM MDT WED APR 1 2015

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...THE HELENA MT CLIMATE SUMMARY FOR THE MONTH OF MARCH 2015...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 1866 TO 2015

WEATHER          OBSERVED          NORMAL  DEPART  LAST YEAR`S
                  VALUE   DATE(S)  VALUE   FROM    VALUE  DATE(S)
                                           NORMAL
.............................................................
TEMPERATURE (F)
RECORD
 HIGH               78   03/30/2004
 LOW               -30   03/25/1955
HIGHEST             76   03/27        52      24       65  03/16
LOWEST               3   03/04        19     -16      -12  03/02
                                                           03/01
AVG. MAXIMUM      57.3               48.2     9.1     45.0
AVG. MINIMUM      32.0               24.3     7.7     24.7
MEAN              44.7               36.3     8.4     34.9
DAYS MAX >= 90       0                0.0     0.0        0
DAYS MAX <= 32       1                2.8    -1.8        3
DAYS MIN <= 32      11               25.4   -14.4       25
DAYS MIN <= 0        0                0.9    -0.9        2

PRECIPITATION (INCHES)
RECORD
 MAXIMUM          2.39   1898
 MINIMUM             T   1881
TOTALS            0.15               0.59   -0.44     0.80
DAYS >= .01          2                7.7    -5.7
DAYS >= .10          1                2.0    -1.0
DAYS >= .50          0                0.0     0.0
DAYS >= 1.00         0                0.0     0.0
GREATEST
 24 HR. TOTAL     0.13   03/17 TO 03/17

SNOWFALL (INCHES)
RECORDS
 TOTAL            26.6   1888
```

24 HR TOTAL	MM			
TOTALS	T	6.2	-6.2	3.8
SINCE 7/1	24.3	33.5	-9.2	
SNOWDEPTH AVG.	0			
DAYS >= TRACE	3	5.0	-2.0	
DAYS >= 1.0	0	1.9	-1.9	
GREATEST				
SNOW DEPTH	0 MM			
24 HR TOTAL	MM			

DEGREE_DAYS				
HEATING TOTAL	621	891	-270	928
SINCE 7/1	5629	6452	-823	6444
COOLING TOTAL	0	0	0	0
SINCE 1/1	0	0	0	0

.....

WIND (MPH)

AVERAGE WIND SPEED	8.0		
HIGHEST WIND SPEED/DIRECTION	41/280	DATE	03/28
HIGHEST GUST SPEED/DIRECTION	57/280	DATE	03/28

SKY COVER

AVERAGE SKY COVER 0.30

AVERAGE RH (PERCENT) 47

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	0	MIXED PRECIP	0
HEAVY RAIN	0	RAIN	0
LIGHT RAIN	2	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	0
HEAVY SNOW	0	SNOW	0
LIGHT SNOW	3	SLEET	0
FOG	3	FOG W/VIS <= 1/4 MILE	0
HAZE	3		

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

&&

SUMMARY...MARCH STARTED OUT BELOW NORMAL DUE TO AN UPPER LEVEL TROUGH OF LOW PRESSURE OVER THE WESTERN US. HOWEVER...THE GENERAL THEME FOR MUCH OF THE MONTH WAS ABOVE TO WELL-ABOVE NORMAL TEMPERATURES AND BELOW NORMAL PRECIPITATION AS A SEMI-PERSISTENT UPPER LEVEL HIGH DOMINATED THE WEATHER ACROSS THE WESTERN US. SEVERAL DAILY RECORD HIGHS WERE BROKEN. THE HIGHEST RECORD OCCURRED ON THE 27TH WHEN THE TEMPERATURE REACHED 76 DEGREES. MARCH 2015 ENDED UP BEING THE 2ND WARMEST MARCH ON RECORD. WITH THE DRY CONDITIONS...SNOWFALL WAS WELL BELOW NORMAL AS WELL. THE TRACE OF SNOW RECORDED WAS THE 2ND LOWEST ON RECORD FOR MARCH.

Sub Slab Air Sampling Field Form

*Fill out one form per subslab sample

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1334 WALNUT - SS-01
George Rida

Project Name: Helena Solvent Site VI 2015

PID (made/model/serial #): NA

Sample location: 1334 Walnut St

Helium Detector (model/serial #): MGD-2002 /

Date: 3/13/2015

Weather: clear

Field Personnel: Laura Alvey, Syris Trehan

Air Temp: outside = 53 - 38

Recorded by: Laura Alvey

Atmospheric Pressure: 30.43"

Slab Data

Surface/slab Type: Concrete

Surface/slab Thickness (inches): 4", 7" Hole

Slab/subsurface substrate comments: dry, powdery

Length of probe (feet): 4.0 feet

Volume to purge (ml): 3 tubing volumes x 10 ml/ft x #ft =
3 x 4' x 10 = 120 ml

Helium Tracer Leak Test Field Data

Date	Time	Cumulative volume purged (ml)	Helium Beneath Shroud (%) min	Helium Beneath Shroud (%) max	Helium in Probe (ppm or %)
3/13/15	10:47	120	49.1	60.4	
	10:55	↓			0/100/150
	10:57				125 ppm
	10:58	120			25 ppm
				leak check OK	

Helium Beneath Shroud during sample collection (%) (note min and max)

Time	%
11:09	35.8
11:20	25.5
11:26	21.7
11:35	21.2

Conversion: 1.0% = 100,000 ppm

At 20% He, there should be no more than 2 % (200,000 ppm) He in sample train

Canister Information

Date	Time	Sample ID	Cannister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum
3/13/15	11:06		14013	30755		-26.1	
	11:35				~~-5.25~~		-5.25

Comments: SS-01 is located in basement utility room

Sub Slab Air Sampling Field Form

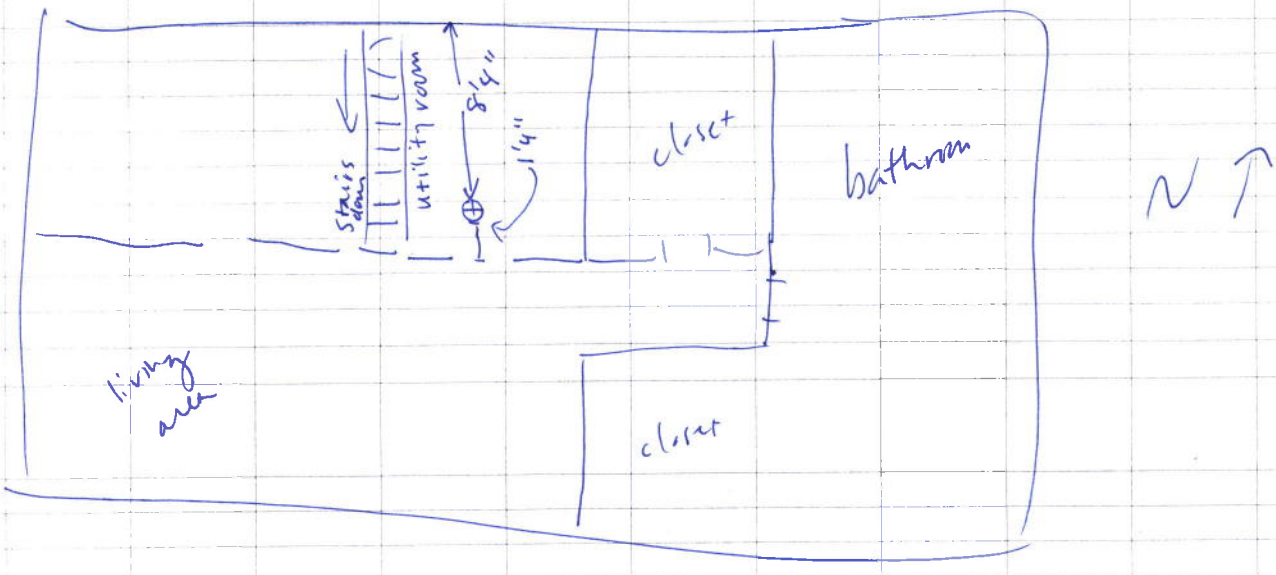
Project Name: Helena Solvent Site VI 2015

Sample Location/ ID: 1334 WALNUT -SS01

Date: 3/13/2015

Location Description: Include floor type/construction, location of probe, fuel sources, sumps, stored chemicals, drains, etc.

Location Sketch



Indoor Air Sampling Field Form

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1334 WALNUT
George Rider
Project Name: Helena Solvent Site VI sampling 2015
Sample location: 1334 Walnut
Date: 3/12/14
Field Personnel: Laura Alvey, Syri's Trehan
Recorded by: Laura Alvey

PID (made/model/serial #):
Weather: Warm, breezy, partly cloudy
Air Temp:
Atmospheric Pressure:

Canister and Sample Information

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Pre-Sample Atmospheric Pressure	Post-Sample Atmospheric Pressure	Pre-Sample Air Temp	Post-Sample Air Temp
3/12/15	14:06	3/13/15	9:59	1334WALNUT-IA-01	31422	40519	—	-27.6	0	30.26	30.44	70°	70°
↓	14:11	↓	10:00	1334WALNUT-BA-01	35992	40319		-25.8	-7.0	↓	↓	70°	70°
↓	14:19	↓	10:05	1334WALNUT-AMB	96100	100098		-26.2	-5.1	↓	↓	57°	38°

Comments: 1334WALNUT-IA01 = dining area in main living area
BA-01: central area in basement
AMB - on deck on N. side of house.

Indoor Air Sampling Field Form

Description of Sample Locations (s):

Location Sketch:

www.weather.gov

National Weather Service Forecast Office

Great Falls, MT

Home News Organization FAQ Share Search

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Forecast by "City, St" or ZIP

Enter location ...

Go

XML RSS Feeds

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Watches / Warnings
Outlooks
Submit Report
MT Hazards

Current Conditions
Observations
Radar
Satellite
Precipitation
Reports & Summaries
Cameras

Forecasts
Forecast Discussion
Local Area
Activity Planner
Aviation Weather
Fire Weather
Severe Weather
Hurricane Center
User Defined Area
Travel
Recreation/Mtn Snow

Hydrology
Rivers and Lakes
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Climate
Local
National
Drought
More...
Climate portal

Weather Safety
Preparedness
Weather Radio
SkyWarn™
Storm Ready

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Items of Interest
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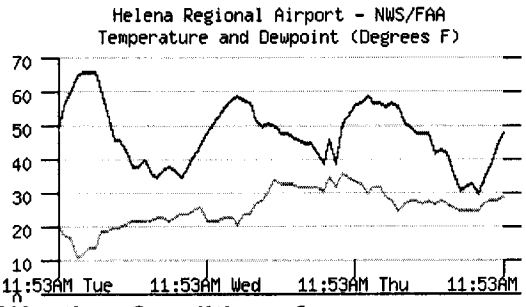
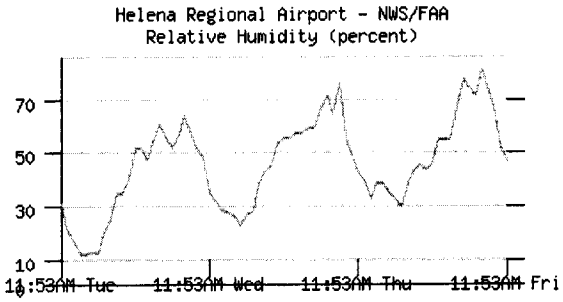
Show 7 Days Printable Version Show Raw Observations For Information Regarding the Accuracy of This Data: MesoWest Disclaimer and FAQ





Weather Conditions for:

Helena Regional Airport, MT (KHLN)

Elev: 3874 ft; Latitude: 46.60445; Longitude: -111.98920

Current time: Fri, 13 Mar 12:21 pm (MDT)

Most Recent Observation: Fri, 13 Mar 11:53 am MDT (MDT) Explanation of Wx and Clouds columns.

Time (MDT)	Temp. (f)	Dew Point (f)	Relative Humidity (%)	Wind Direction	Wind Speed (mph)	Visibility (miles)	WX	Clouds	Sea Level Pressure (mb)	Altimeter Setting (inches)	Station Pressure (inches)	6 Hr Max Temp	6 Hr Min Temp	24 Hr Max Temp	24 Hr Min Temp	Quality Control
13 Mar 11:53 am MDT	48	29	47	SE	3	10.00		CLR	1032.6	30.43	26.425	49	27			OK
13 Mar 10:53 am MDT	44	28	53	N	3	10.00		CLR	1033.4	30.45	26.442					OK
13 Mar 9:53 am MDT	38	28	67	WNW	3	10.00		CLR	1033.9	30.44	26.434					OK
13 Mar 8:53 am MDT	34	27	75	CALM		10.00		CLR	1033.9	30.44	26.434					OK
13 Mar 7:53 am MDT	30	25	81	WSW	3	10.00		CLR	1034.2	30.44	26.434					OK
13 Mar 6:53 am MDT	33	25	72	W	3	10.00		CLR	1033.1	30.43	26.425					OK
13 Mar 5:53 am MDT	32	25	75	ENE	3	10.00		CLR	1032.9	30.43	26.425	48	31			OK
13 Mar 4:53 am MDT	31	25	78	CALM		10.00		CLR	1032.5	30.41	26.407					OK
13 Mar 3:53 am MDT	36	26	67	CALM		10.00		CLR	1031.7	30.40	26.398					OK
13 Mar 2:53 am MDT	42	27	55	SSW	6	10.00		CLR	1030.8	30.39	26.389					OK
13 Mar 1:53 am MDT	43	28	55	S	3	10.00		CLR	1030.2	30.38	26.380					OK
13 Mar 12:53 am MDT	42	27	55	W	5	10.00		CLR	1030.4	30.38	26.380			60	37	OK
12 Mar 11:53 pm MDT	48	28	46	W	14	10.00		CLR	1029.9	30.38	26.380	57	46			OK
12 Mar 10:53 pm MDT	48	27	44	W	9	10.00		CLR	1029.6	30.36	26.362					OK
12 Mar 9:53 pm MDT	48	28	46	W	8	10.00		CLR	1029.5	30.36	26.362					OK
12 Mar 8:53 pm MDT	50	28	43	WNW	16	10.00		CLR	1029.7	30.33	26.335					OK
12 Mar 7:53 pm MDT	51	27	39	W	13	10.00		CLR	1027.9	30.30	26.309					OK
12 Mar 6:53 pm MDT	56	25	30	W	13G18	10.00		CLR	1027.2	30.28	26.291					OK
12 Mar 5:53 pm MDT	57	28	33	WNW	12	10.00		CLR	1026.8	30.28	26.291	60	56			OK
12 Mar 4:53 pm MDT	56	29	35	WNW	16**G21**	10.00		CLR	1026.5	30.27	26.282					OK
12 Mar 3:53 pm MDT	57	32	39	W	15**G22**	10.00		FEW060	1026.4	30.27	26.282					OK
12 Mar 2:53 pm MDT	57	32	39	W	15	10.00		CLR	1026.3	30.27	26.282					OK
12 Mar 1:53 pm MDT	59	30	33	WSW	17**G26**	10.00		[illegible]	1026.0	30.27	26.282					OK
12 Mar 12:53 pm MDT	57	33	40	W	13**G24**	10.00		[illegible]	1026.1	30.27	26.282					OK
12 Mar 11:53 am MDT	56	34	43	W	12	10.00		[illegible]	1026.7	30.29	26.300	56	37			OK
12 Mar 10:53 am MDT	53	35	50	W	13	10.00		[illegible]	1026.3	30.27	26.282					OK
12 Mar 9:53 am MDT	51	36	56	WSW	9	10.00		FEW060	1026.0	30.26	26.273					OK
12 Mar 8:53 am MDT	39	32	76	CALM		10.00		BKN110	1025.9	30.23	26.246					OK
12 Mar 7:53 am MDT	46	35	65	CALM		10.00		SCT080	1024.0	30.19	26.211					OK
12 Mar 6:53 am MDT	39	31	72	CALM		10.00		SCT040	1023.6	30.17	26.193					OK
12 Mar 5:53 am MDT	42	32	67	N	3	10.00		BKN050	1022.4	30.15	26.175	49	41			OK
12 Mar 4:53 am MDT	45	32	60	W	7	10.00		CLR	1021.2	30.13	26.157					OK
12 Mar 3:53 am MDT	45	32	60	WSW	6	10.00		CLR	1020.8	30.12	26.148					OK
12 Mar 2:53 am MDT	46	32	58	SW	7	10.00		BKN055	1020.8	30.11	26.139					OK
12 Mar 1:53 am MDT	47	33	58	WSW	8	10.00		FEW050	1020.5	30.10	26.130					OK
12 Mar 12:53 am MDT	48	33	56	W	6	10.00		OVC055	1020.3	30.09	26.121			60	33	OK
11 Mar 11:53 pm MDT	48	33	56	W	7	10.00		FEW080	1020.0	30.07	26.104	60	48			OK
11 Mar 11:00 pm MDT	50	34	54	W	10	10.00		CLR		30.05	26.086					OK
11 Mar 10:53 pm MDT	50	34	54	W	16	10.00		CLR	1019.4	30.05	26.086					OK
11 Mar 9:53 pm MDT	51	31	46	WSW	**24G31**	10.00		OVC100	1018.2	30.01	26.050					OK

11 Mar 8:53 pm MDT	50	28	43	W	9	10.00	OVC110	1018.4	30.01	26.050						OK
11 Mar 7:53 pm MDT	52	27	38	WNW	6	10.00	BKN110	1017.3	29.97	26.014						OK
11 Mar 6:53 pm MDT	57	24	28	NNW	5	10.00	OVC110	1015.7	29.94	25.988						OK
11 Mar 5:53 pm MDT	58	24	27	W	7	10.00	SCT100	1014.9	29.93	25.979	59	48				OK
11 Mar 4:53 pm MDT	59	21	23	ESE	3	10.00	CLR	1015.0	29.93	25.979						OK
11 Mar 3:53 pm MDT	58	23	26	NW	3	10.00	FEW110	1015.1	29.93	25.979						OK
11 Mar 2:53 pm MDT	56	23	28	N	7	10.00	SCT110	1015.7	29.94	25.988						OK
11 Mar 1:53 pm MDT	53	22	29	CALM		10.00	OVC110	1016.5	29.97	26.014						OK
11 Mar 12:53 pm MDT	51	22	32	NW	5	10.00	FEW120	1017.0	29.97	26.014						OK
11 Mar 11:53 am MDT	48	22	35	N	3	10.00	CLR	1017.9	29.99	26.032	48	34				OK
11 Mar 10:53 am MDT	44	26	49	CALM		10.00	CLR	1018.1	30.00	26.041						OK
11 Mar 9:53 am MDT	41	25	52	CALM		9.00	CLR	1017.6	29.98	26.023						OK
11 Mar 8:53 am MDT	38	24	57	CALM		10.00	CLR	1017.8	29.98	26.023						OK
11 Mar 7:53 am MDT	35	24	64	CALM		10.00	CLR	1017.2	29.98	26.023						OK
11 Mar 6:53 am MDT	37	23	56	CALM		10.00	CLR	1016.3	29.97	26.014						OK
11 Mar 5:53 am MDT	38	22	52	CALM		10.00	CLR	1015.4	29.96	26.006	40	33				OK
11 Mar 4:53 am MDT	37	23	56	CALM		10.00	CLR	1015.6	29.97	26.014						OK
11 Mar 3:53 am MDT	35	23	61	CALM		10.00	CLR	1016.0	29.97	26.014						OK
11 Mar 2:53 am MDT	36	22	56	NW	3	10.00	CLR	1016.4	29.98	26.023						OK
11 Mar 1:53 am MDT	40	22	48	SW	3	10.00	CLR	1016.7	29.99	26.032						OK
11 Mar 12:53 am MDT	38	22	52	CALM		10.00	CLR	1017.3	29.99	26.032			68	29		OK
10 Mar 11:53 pm MDT	38	22	52	CALM		10.00	CLR	1017.8	29.99	26.032	66	38				OK
10 Mar 10:53 pm MDT	43	21	41	CALM		10.00	CLR	1017.9	29.99	26.032						OK
10 Mar 9:53 pm MDT	46	20	35	CALM		10.00	CLR	1017.4	29.97	26.014						OK
10 Mar 8:53 pm MDT	46	20	35	VRBL	3	10.00	CLR	1017.1	29.95	25.997						OK
10 Mar 7:53 pm MDT	54	19	25	SW	8	10.00	CLR	1016.3	29.94	25.988						OK
10 Mar 6:53 pm MDT	61	19	20	SSE	6	10.00	CLR	1015.2	29.93	25.979						OK
10 Mar 5:53 pm MDT	66	14	13	ENE	3	10.00	CLR	1014.9	29.93	25.979	68	48				OK
10 Mar 4:53 pm MDT	66	14	13	SSE	8	10.00	CLR	1014.4	29.94	25.988						OK
10 Mar 3:53 pm MDT	66	12	12	W	10	10.00	CLR	1013.9	29.94	25.988						OK
10 Mar 2:53 pm MDT	65	11	12	W	13**G25**	10.00	CLR	1015.7	29.98	26.023						OK
10 Mar 1:53 pm MDT	60	17	18	VRBL	6	10.00	CLR	1016.9	30.01	26.050						OK
10 Mar 12:53 pm MDT	56	18	22	VRBL	3	10.00	CLR	1017.8	30.03	26.068						OK

Webmaster
US Dept of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Great Falls Weather Forecast Office
5324 Tri-Hill Frontage Rd
Great Falls, MT 59404-4933

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Indoor Air Sampling Field Form

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1225CEDAR

Project Name: Helena Solvent Site VI sampling 2015
Sample location: 1225CEDAR - DEQ new office
Date: 3/7/15 - 3/8/2015
Field Personnel: Laura Alvey and Dan Norris
Recorded by: Laura Alvey

PID (made/model/serial #): Not Applicable
Weather: cool, partly cloudy
Air Temp: outside: 50's daytime, 30's nighttime
Atmospheric Pressure: start: 26.130 "Hg, end: 26.130"

Canister and Sample Information

Start Date	Start Time	End Date	End Time *	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Pre-Sample Atmospheric Pressure "	Post-Sample Atmospheric Pressure	inside Pre-Sample Air Temp	inside Post-Sample Air Temp
3/7/15	15:30	3/8/15	12:46	1225CEDAR-EBA-01	3741	40570		-26.5	-6.1	26.130	26.130	70°	70°
	15:39		13:50	1225CEDAR-EBA-02	25274	40539		-26.1	-5.75				
	15:39		13:51	1225CEDAR-EBA-03	12940	40370		-26.0	-5.75				
	15:48		14:07	1225CEDAR-WBA-01	34202	30644		-26.5	-6.5				
	15:53		11:49	1225CEDAR-WBA-02	6L0027	40364		-25.7	0				
	16:02		11:15	1225CEDAR-IA-01	21004	40369		-26.0	-5.7				
	16:08		14:14	1225CEDAR-IA-02	36038	30598		-26.2	-6.0				

Comments: 1225CEDAR-EBA-01 → in large conference room in east-end basement in ~ center of conference room (the Ponderosa Room)

East Basement: 1225CEDAR-EBA-02 + 03 are duplicates: located on black metal file cabinet outside of ~~Rebecca Rideout's~~ Staci Stolpe's office

West Basement: 1225CEDAR-WBA-01 = West basement - located in central portion of PTS files (sign on door says "Electrical Room, Fire Alarm")
1225CEDAR-WBA-02 = West basement. On Shannon Cobb's desk (in NW corner of basement)

1225CEDAR-IA-01 = East side main level in "Legal File Room."
1225CEDAR-IA-02 = West side main level in admin area by Joe Griffin's cubicle.

* The end-hour is based on ~~yesterd~~ the previous-day's time (Daylight Savings Time). The hour the canisters were shut down reflect Daylight savings time so that there is an accurate accounting of hours the canisters were collecting sample.

Indoor Air Sampling Field Form

Description of Sample Locations (s):

Location Sketch:

Patrick
406-459-3958

Indoor Air Sampling Field Form

Mike M - 431-6641
Marla Duncan - 422-3014

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID:

Project Name: Helena Solvent Site VI sampling 2015
PID (made/model/serial #): NA
Sample location: 1212 Helena
Date: 3/6/2015
Weather: Cool, cloudy, breezy
Field Personnel: Laura Alvey + Dan Norris
Air Temp: outside = 54°F, inside = 70°F
Recorded by: Laura Alvey
Atmospheric Pressure: 26.237" (station pressure)

Canister and Sample Information

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Pre-Sample Atmospheric Pressure	Post-Sample Atmospheric Pressure	Pre-Sample Air Temp	Post-Sample Air Temp
~~3/6~~	~~13:47~~			~~1212 HELENA-IA-01~~	~~92~~ 94303	40407	→	this can had -2 Hg vacuum. Will not use!					
3/6/15	13:55	↑	10:24	1212 HELENA-IA-02	924	30455		-25.2	-7.0			70°F	
3/6/15	13:53	3/7/15	9:01	1212 HELENA-IA-01	35245	30641		-26.0	-6.5				
	~~13:55~~												
3/6/15	14:17		11:29	1212 HELENA-BA-01	35141	40180		-27.0	-7.1				
14:27	~~14:17~~		9:03	1212 HELENA-BA-02	02327	40229		-26.2	0				
	14:27		9:03	1212 HELENA-BA-03	34717	320893		-26.2	0				
	14:47		9:11	1236 HELENA-IA-01	5692	40074		-23.5	-3.5				
	14:48		12:29	1236 HELENA-IA-02	34032	30670		-27.2	-8.0				
~~X~~	~~14:56~~			~~1236 HELENA-BA-01~~	~~30841~~	~~40132~~		~~-13.5~~	Vacuum not sufficient. Reject canister				
	15:07		9:08	1236 HELENA-BA-02	4344	40330		-25.6	0				
	15:10		10:17	1236 HELENA-BA01	33992	40445		-25.5	-7.5				
	15:38		12:55	1212 HELENA-AMB	33932	40442		-26.7	-5.8			54°F	

Comments: On can # 94303 the entire mechanism shifted when Dan tried to open the nut. nut is on way too tight!
1212 IA01 - in W. side break area (central location in W. half of upstairs level)
1212 IA02 - in East side main level office supply area (central location in E half of upstairs level).
1212 BA01 - on W side of basement in central area
1212 BA02 } duplicate samples. on E side of building in central / kitchen area
1212 BA03 }
1236 ~~HE~~ IA01 + IA02 are on West + East sides of building, respectively
IA01 in hallway + IA02 in conference rm.

1236 BA02 - on E. side in IT office - central location
1236 BA01 - on W. side of office - central location.

1212 AMB on W. side of 1212 Helena w/ utilities.

Indoor Air Sampling Field Form

Description of Sample Locations (s):

Location Sketch:

Sub Slab Air Sampling Field Form

*Fill out one form per subslab sample

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1236HELENA-SS-01

Family Outreach

Project Name: Helena Solvent Site VI 2015
Sample location: 1236 Helena Ave
Date: 3/7/15
Field Personnel: Laura Alvey + Ben Norris
Recorded by: Laura Alvey

PID (made/model/serial #): NA
Helium Detector (model/serial #): MGD-2002 /
Weather:
Air Temp:
Atmospheric Pressure:

Slab Data

Surface/slab Type: 3.5" - concrete
Surface/slab Thickness (inches): 3.5", 9" hole depth
Slab/subsurface substrate comments: light grey, layer sand then soft sandy silt
Length of probe (feet):

Volume to purge (ml): 3 tubing volumes x 10 ml/ft x #ft =

Helium Tracer Leak Test Field Data

Date	Time	Cumulative volume purged (ml)	Helium Beneath Shroud (%) min	Helium Beneath Shroud (%) max	Helium in Probe (ppm or %)	
3/7/15	10:45	150	87	50	51.	ok

Helium Beneath Shroud during sample collection (%) (note min and max)

Time	%
11:46	38.0
11:55	23
11:56	43
12:17	20.4

Conversion: 1.0% = 100,000 ppm
At 20% He, there should be no more than 2 % (200,000 ppm) He in sample train

Canister Information

Date	Time	Sample ID	Cannister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum
3/7/15	11:44	~~31442~~	31442	20282		-25.0	
	12:15					~~-5.0~~	-5.0

Comments: Before sampling, LA puts more concrete around the base of the sample probe.
- Subslab sample is located in approx center of building in "telephone room" under the stairs area.

Sub Slab Air Sampling Field Form

Project Name: Helena Solvent Site VI 2015	Sample Location/ ID:
Date:	

Location Description: Include floor type/construction, location of probe, fuel sources, sumps, stored chemicals, drains, etc.

Location Sketch

Sub Slab Air Sampling Field Form

*Fill out one form per subslab sample

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1212 HELENA-SS-01

Project Name: Helena Solvent Site VI 2015
Sample location: 1212 Helena Ave - Family Outreach
Date: 3/7/15
Field Personnel: Laura Alvrg + Dan Norris
Recorded by:

PID (made/model/serial #): NA
Helium Detector (model/serial #): MGD-2002 /
Weather:
Air Temp:
Atmospheric Pressure:

Slab Data

Surface/slab Type: Concrete - exposed
Surface/slab Thickness (inches): 3.5", 9½ hole
Slab/subsurface substrate comments: Sandy silt
Length of probe (feet): 3.5'

Volume to purge (ml): 3 tubing volumes x 10 ml/ft x #ft =

Helium Tracer Leak Test Field Data

Date	Time	Cumulative volume purged (ml)	Helium Beneath Shroud (%) min	Helium Beneath Shroud (%) max	Helium in Probe (ppm or %)
3/7/15		180	37	43	~~39~~ 0

Helium Beneath Shroud during sample collection (%) (note min and max)

Time	% He
13:51	46.1
14:25	32

Conversion: 1.0% = 100,000 ppm
At 20% He, there should be no more than 2 % (200,000 ppm) He in sample train

Canister Information

Date	Time	Sample ID	Cannister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	
3/7/15	13:50		20941	30972	—	-25.5		
	14:26					-4.75		collect sample

Comments:
Sample is located is small closet under the stairs.

Sub Slab Air Sampling Field Form

Project Name: Helena Solvent Site VI 2015	Sample Location/ ID:
Date:	

Location Description: Include floor type/construction, location of probe, fuel sources, sumps, stored chemicals, drains, etc.

Location Sketch

www.weather.gov

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Great Falls, MT

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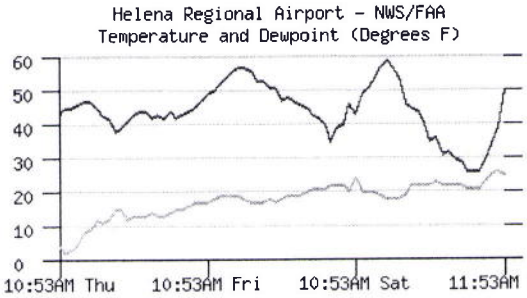
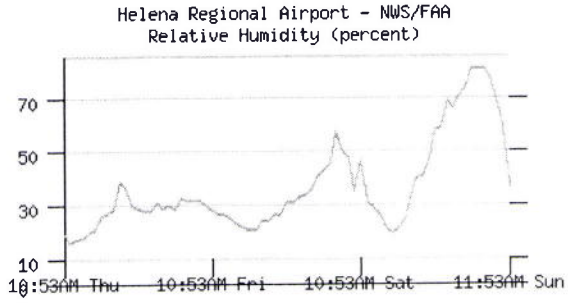
RAW 0 on Show 7 Days Printable Version Show Raw Observations For Information Regarding the Accuracy of This Data: MesoWest Disclaimer and FAQ





Weather Conditions for:

Helena Regional Airport, MT (KHLN)

Elev: 3874 ft; Latitude: 46.60445; Longitude: -111.98920

Current time: Sun, 08 Mar 12:07 pm (MDT)

Most Recent Observation: Sun, 08 Mar 11:53 am MDT (MDT) Explanation of Wx and Clouds columns.

Time (MDT)	Temp. (f)	Dew Point (f)	Relative Humidity (%)	Wind Direction	Wind Speed (mph)	Visibility (miles)	WX	Clouds	Sea Level Pressure (mb)	Altimeter Setting (inches)	Station Pressure (inches)	6 Hr Max Temp	6 Hr Min Temp	24 Hr Max Temp	24 Hr Min Temp	Quality Control
08 Mar 11:53 am MDT	50	25	37	VRBL	5	10.00		CLR	1021.9	30.10	26.130	50	24			OK
08 Mar 10:53 am MDT	39	26	59	VRBL	3	10.00		CLR	1023.5	30.13	26.157					OK
08 Mar 9:53 am MDT	34	25	69	VRBL	3	10.00		CLR	1023.9	30.14	26.166					OK
08 Mar 8:53 am MDT	29	23	78	CALM		10.00		CLR	1024.2	30.14	26.166					OK
08 Mar 7:53 am MDT	26	21	81	SW	5	10.00		CLR	1024.5	30.14	26.166					OK
08 Mar 6:53 am MDT	26	21	81	WNW	6	10.00		CLR	1023.5	30.13	26.157					OK
08 Mar 5:53 am MDT	26	21	81	NNE	5	10.00		CLR	1022.8	30.12	26.148	36	26			OK
08 Mar 4:53 am MDT	29	22	75	CALM		10.00		CLR	1022.4	30.12	26.148					OK
08 Mar 3:53 am MDT	30	22	71	CALM		10.00		CLR	1022.5	30.12	26.148					OK
08 Mar 1:53 am MST	32	22	66	CALM		10.00		CLR	1022.8	30.13	26.157					OK
08 Mar 12:53 am MST	31	22	69	CALM		10.00		CLR	1023.1	30.13	26.157					OK
07 Mar 11:53 pm MST	36	23	59	SW	7	10.00		CLR	1022.7	30.12	26.148			61	34	OK
07 Mar 10:53 pm MST	35	22	58	CALM		10.00		CLR	1023.3	30.12	26.148	57	34			OK
07 Mar 9:53 pm MST	40	22	48	VRBL	7	10.00		FEW095	1022.4	30.12	26.148					OK
07 Mar 8:53 pm MST	44	22	41	SW	6	10.00		OVC090	1022.6	30.11	26.139					OK
07 Mar 7:53 pm MST	45	22	40	NW	8	10.00		FEW095	1022.6	30.12	26.148					OK
07 Mar 6:53 pm MST	46	19	34	WNW	3	10.00		SCT100	1022.1	30.10	26.130					OK
07 Mar 5:53 pm MST	54	18	24	WNW	13	10.00		SCT095	1020.6	30.08	26.112					OK
07 Mar 4:53 pm MST	57	18	21	W	15	10.00		SCT090	1020.2	30.09	26.121	61	43			OK
07 Mar 3:53 pm MST	59	18	20	VRBL	5	10.00		BKN090	1020.3	30.10	26.130					OK
07 Mar 2:53 pm MST	57	19	22	NNE	8	10.00		OVC110	1020.8	30.11	26.139					OK
07 Mar 1:53 pm MST	53	20	27	NE	8	10.00		FEW110	1021.7	30.13	26.157					OK
07 Mar 12:53 pm MST	51	20	29	ENE	3	10.00		FEW110	1023.0	30.16	26.184					OK
07 Mar 11:53 am MST	49	20	31	ENE	3	10.00		FEW100	1023.6	30.18	26.202					OK
07 Mar 10:53 am MST	43	24	47	ENE	8	10.00		CLR	1024.5	30.19	26.211	46	35			OK
07 Mar 9:53 am MST	46	20	35	W	6	10.00		CLR	1024.2	30.20	26.219					OK
07 Mar 8:53 am MST	40	22	48	ENE	3	10.00		CLR	1025.1	30.21	26.228					OK
07 Mar 7:53 am MST	39	22	50	S	3	10.00		CLR	1024.7	30.20	26.219					OK
07 Mar 6:53 am MST	35	22	58	CALM		10.00		CLR	1025.2	30.20	26.219					OK
07 Mar 5:53 am MST	40	21	46	SW	5	10.00		CLR	1024.7	30.21	26.228					OK
07 Mar 4:53 am MST	42	21	43	CALM		10.00		CLR	1024.2	30.20	26.219	49	40			OK
07 Mar 3:53 am MST	43	21	41	CALM		10.00		CLR	1024.4	30.21	26.228					OK
07 Mar 2:53 am MST	45	20	36	VRBL	5	10.00		CLR	1024.8	30.23	26.246					OK
07 Mar 1:53 am MST	46	19	34	NW	3	10.00		FEW120	1025.5	30.24	26.255					OK
07 Mar 12:53 am MST	47	19	33	CALM		10.00		SCT120	1025.6	30.24	26.255					OK
06 Mar 11:53 pm MST	48	19	31	WNW	9	10.00		FEW120	1026.0	30.25	26.264			57	40	OK
06 Mar 10:53 pm MST	47	18	31	W	6	10.00		CLR	1026.4	30.26	26.273	57	47			OK
06 Mar 9:53 pm MST	51	17	26	WSW	3	10.00		CLR	1026.3	30.26	26.273					OK
06 Mar 8:53 pm MST	51	18	27	W	6	10.00		FEW120	1026.5	30.26	26.273					OK
06 Mar 7:53 pm MST	53	17	24	W	9	10.00		CLR	1025.8	30.24	26.255					OK

06 Mar 6:53 pm MST	53	17	24	WNW	10	10.00	CLR	1025.6	30.23	26.246					OK
06 Mar 5:53 pm MST	56	17	21	WNW	17**G25**	10.00	CLR	1025.0	30.22	26.237					OK
06 Mar 4:53 pm MST	57	18	21	WNW	13**G22**	10.00	CLR	1024.4	30.21	26.228	57	49			OK
06 Mar 3:53 pm MST	57	19	22	WNW	15**G23**	10.00	CLR	1024.7	30.22	26.237					OK
06 Mar 2:53 pm MST	56	19	23	NW	9	10.00	CLR	1024.8	30.22	26.237					OK
06 Mar 1:53 pm MST	54	19	25	WNW	18**G28**	10.00	CLR	1025.5	30.23	26.246					OK
06 Mar 12:53 pm MST	52	19	27	W	8G18	10.00	CLR	1026.3	30.25	26.264					OK
06 Mar 11:53 am MST	50	18	27	W	17	10.00	CLR	1026.5	30.25	26.264					OK
06 Mar 10:53 am MST	49	17	28	W	17	10.00	CLR	1027.1	30.26	26.273	49	40			OK
06 Mar 9:53 am MST	47	17	30	WNW	15**G23**	10.00	CLR	1027.7	30.27	26.282					OK
06 Mar 8:53 am MST	45	17	32	WNW	8	10.00	CLR	1028.1	30.27	26.282					OK
06 Mar 7:53 am MST	44	16	32	W	15**G22**	10.00	CLR	1027.5	30.25	26.264					OK
06 Mar 6:53 am MST	43	15	32	W	**22**	10.00	CLR	1026.7	30.24	26.255					OK
06 Mar 5:53 am MST	42	15	33	W	14	10.00	CLR	1026.8	30.24	26.255					OK
06 Mar 4:53 am MST	44	14	29	W	**21G30**	10.00	CLR	1025.6	30.22	26.237	45	41			OK
06 Mar 3:53 am MST	42	13	30	W	12	10.00	CLR	1025.9	30.23	26.246					OK
06 Mar 2:53 am MST	43	13	29	WSW	8	10.00	OVC085	1026.6	30.25	26.264					OK
06 Mar 1:53 am MST	42	14	31	W	7	10.00	SCT120	1026.5	30.24	26.255					OK
06 Mar 12:53 am MST	44	13	28	W	13	10.00	FEW120	1025.7	30.22	26.237					OK
05 Mar 11:53 pm MST	44	13	28	W	16**G25**	10.00	BKN110	1025.3	30.21	26.228			47	30	OK
05 Mar 10:53 pm MST	43	13	29			10.00	FEW120	1026.0	30.22	26.237	45	35			OK
05 Mar 9:53 pm MST	41	12	30	W	7	10.00	CLR	1026.2	30.21	26.228					OK
05 Mar 8:53 pm MST	39	15	37	CALM		10.00	CLR	1026.2	30.21	26.228					OK
05 Mar 7:53 pm MST	38	15	39	WSW	6	10.00	FEW120	1026.5	30.20	26.219					OK
05 Mar 6:53 pm MST	42	12	29	SSE	5	10.00	BKN100	1026.2	30.19	26.211					OK
05 Mar 5:53 pm MST	43	11	27	CALM		10.00	BKN110	1026.0	30.19	26.211					OK
05 Mar 4:53 pm MST	45	12	26	NE	5	10.00	FEW120	1025.2	30.18	26.202	47	43			OK
05 Mar 3:53 pm MST	47	9	21	W	5	10.00	SCT100	1025.1	30.18	26.202					OK
05 Mar 2:53 pm MST	47	8	20	WNW	5	10.00	BKN110	1025.4	30.18	26.202					OK
05 Mar 1:53 pm MST	46	5	18	W	10	10.00	OVC100	1025.4	30.19	26.211					OK
05 Mar 12:53 pm MST	45	3	17	W	15**G24**	10.00	BKN100	1025.8	30.20	26.219					OK
05 Mar 11:53 am MST	45	2	16	W	15	10.00	SCT120	1026.2	30.21	26.228					OK

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US Dept of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Great Falls Weather Forecast Office
5324 Tri-Hill Frontage Rd
Great Falls, MT 59404-4933

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Indoor Air Sampling Field Form

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1330WALNUT

Project Name: Helena Solvent Site VI sampling
PID (made/model/serial #): NA
Sample location: 1330WALNUT
Date: 3/4/2015
Weather: cold, sunny, clear, calm
Field Personnel: Laura Alvey, Dan Norris
Air Temp: 29°F, ~~B~~ 41°F
Recorded by: Laura Alvey
Atmospheric Pressure: 30.15"

Canister and Sample Information

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Pre-Sample Atmospheric Pressure	Post-Sample Atmospheric Pressure	Pre-Sample Air Temp	Post-Sample Air Temp
3/4/15	12:29	~~4/4~~ ↑	9:04	1330WALNUT-IA-01	33779	40568		-29.5	0	30.15"	30.21"	60°F	55°
3/4/15	12:38	3/5/15	9:16	1330WALNUT-BA-01	4352	30826		-26.8	-6.8	↓	↓	60°F	55°
3/4/15	12:55		9:45	1330WALNUT-2IA-01	10798	40288		-26.5	-7.0			75°F	76°
3/4/15	13:09	↓	9:22	1330WALNUT-AMB	34309	40139		-26.0	-7.2			29°F	41

Comments: 1330WALNUT-IA-01 is on first floor in the middle of the living room
1330 WALNUT -BA-01 is in basement in approx center of basement.
1330 WALNUT -2IA-01 is in 2nd floor living space-living room
1330WALNUT-AMB is outside on 2nd level porch on W. side of home

Basement + first floor are completely empty.
Basement is dirt + concrete floor. Damp. Rock foundation walls.

Renter: (upper level)
~~Sta~~ Sean Connell
403-5248
1328 Walnut
problem w/ mold.
Would like results

Indoor Air Sampling Field Form

Description of Sample Locations (s):

Location Sketch:

Indoor Air Sampling Field Form

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1228WALNUT

Project Name: Helena Solvent Site VI sampling 2015

PID (made/model/serial #):

Sample location: 1228 Walnut - basement + laundry

Date: 3/19/15

Weather: Warm, breezy

Field Personnel: Laura Alvey

Air Temp:

Recorded by: Laura Alvey

Atmospheric Pressure:

Canister and Sample Information

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Pre-Sample Atmospheric Pressure	Post-Sample Atmospheric Pressure	Pre-Sample Air Temp	Post-Sample Air Temp
3/19/15	15:48	3/20/15	11:39	1228WALNUT-IA01	4359	40575	~~-26.0~~	-26.0	-7.6				
3/19/15	15:53	3/20/15	11:37	1228WALNUT-BA01	3321	40246	~~-25.6~~	-25.6	0				

Comments:

Indoor Air Sampling Field Form

Description of Sample Locations (s):

Location Sketch:

www.weather.gov

National Weather Service Forecast Office

Great Falls, MT

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Severe Weather
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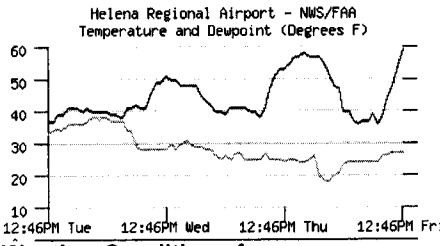

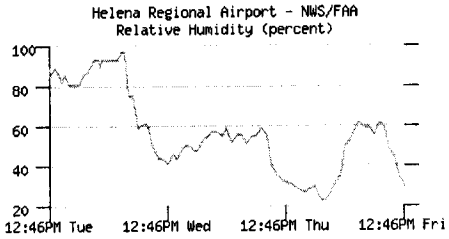

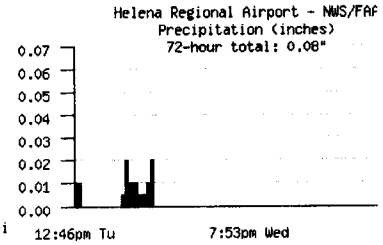

Weather Conditions for:

Helena Regional Airport, MT (KHLN)

Elev: 3874 ft; Latitude: 46.60445; Longitude: -111.98920

Current time: Fri, 20 Mar 1:38 pm (MDT)

Most Recent Observation: Fri, 20 Mar 12:53 pm MDT (MDT) Explanation of Wx and Clouds columns.

Time (MDT)	Temp. (f)	Dew Point (f)	Relative Humidity (%)	Wind Chill (f)	Wind Direction	Wind Speed (mph)	Visibility (miles)	WX	Clouds	Sea Level Pressure (mb)	Altimeter Setting (inches)	Station Pressure (inches)	Precip 1 hour (inches)	Precip 3 hour (inches)	Precip 6 hour (inches)	Precip 24 hour (inches)	6 Hr Max Temp	6 Hr Min Temp	24 Hr Max Temp	24 Hr Min Temp	Quality Control
20 Mar 12:53 pm MDT	59	27	29		NE	6	10.00		CLR	1019.7	30.07	26.104									OK
20 Mar 11:53 am MDT	54	27	35		CALM		10.00		CLR	1020.4	30.10	26.130					54	35			OK
20 Mar 10:53 am MDT	48	27	44		CALM		10.00		CLR	1021.3	30.11	26.139									OK
20 Mar 9:53 am MDT	44	26	49		CALM		10.00		CLR	1021.1	30.10	26.130									OK
20 Mar 8:53 am MDT	39	26	59		CALM		10.00		CLR	1020.9	30.09	26.121									OK
20 Mar 7:53 am MDT	36	24	62		VRBL	3	10.00		CLR	1020.6	30.08	26.112									OK
20 Mar 6:53 am MDT	39	24	55		W	3	10.00		CLR	1019.9	30.07	26.104									OK
20 Mar 5:53 am MDT	37	24	59		VRBL	3	10.00		CLR	1020.1	30.07	26.104					47	34			OK
20 Mar 4:53 am MDT	37	24	59		E	8	10.00		CLR	1019.4	30.05	26.086									OK
20 Mar 3:53 am MDT	36	24	62		NW	3	10.00		CLR	1020.1	30.07	26.104									OK
20 Mar 2:53 am MDT	37	24	59	**30**	W	9	10.00		CLR	1020.1	30.07	26.104									OK
20 Mar 1:53 am MDT	40	24	53	**34**	ENE	9G16	10.00		CLR	1020.1	30.07	26.104									OK
20 Mar 12:53 am MDT	40	23	50		W	6	10.00		CLR	1019.7	30.06	26.095							60	37	OK
19 Mar 11:53 pm MDT	47	21	35		S	6	10.00		FEW085	1018.6	30.04	26.077					57	46			OK
19 Mar 10:53 pm MDT	48	20	32		W	3	10.00		CLR	1018.1	30.03	26.068									OK
19 Mar 9:53 pm MDT	52	18	26		SW	6	10.00		CLR	1018.0	30.03	26.068									OK
19 Mar 8:53 pm MDT	55	18	23		SW	6	10.00		CLR	1017.4	30.00	26.041									OK
19 Mar 7:53 pm MDT	57	20	23		WSW	10	10.00		CLR	1016.8	29.98	26.023									OK
19 Mar 6:53 pm MDT	57	26	30		CALM		10.00		CLR	1017.3	30.00	26.041									OK
19 Mar 5:53 pm MDT	57	25	29		ESE	3	10.00		CLR	1017.4	30.00	26.041					60	52			OK
19 Mar 4:53 pm MDT	58	24	27		ESE	6	10.00		CLR	1017.6	30.01	26.050									OK
19 Mar 3:53 pm MDT	57	24	28		VRBL	5	10.00		FEW120	1018.7	30.04	26.077									OK
19 Mar 2:53 pm MDT	57	25	29		SE	3	10.00		CLR	1019.8	30.07	26.104									OK
19 Mar 1:53 pm MDT	55	25	31		E	6	10.00		CLR	1021.1	30.10	26.130									OK
19 Mar 12:53 pm MDT	53	24	32		VRBL	7	10.00		CLR	1021.9	30.12	26.148									OK
19 Mar 11:53 am MDT	53	25	33		WSW	13G17	10.00		CLR	1022.6	30.14	26.166					53	37			OK
19 Mar 10:53 am MDT	51	25	36		W	**14G20**	10.00		CLR	1023.4	30.16	26.184									OK
19 Mar 9:53 am MDT	47	25	42		W	10	10.00		CLR	1024.1	30.17	26.193									OK
19 Mar 8:53 am MDT	41	27	56		CALM		10.00		CLR	1024.8	30.18	26.202									OK
19 Mar 7:53 am MDT	38	25	59		SW	5	10.00		CLR	1024.5	30.17	26.193									OK
19 Mar 6:53 am MDT	40	25	55		WSW	8	10.00		CLR	1024.2	30.17	26.193									OK
19 Mar 5:53 am MDT	40	25	55	**34**	W	10	10.00		CLR	1024.0	30.17	26.193					42	38			OK
19 Mar 4:53 am MDT	41	25	52		WSW	12	10.00		CLR	1023.8	30.17	26.193									OK
19 Mar 3:53 am MDT	41	27	56		W	12	10.00		CLR	1024.0	30.17	26.193									OK
19 Mar 2:53 am MDT	41	27	56		W	15	10.00		SCT070	1023.5	30.16	26.184									OK
19 Mar 1:53 am MDT	41	25	52		W	13	10.00		CLR	1023.3	30.16	26.184									OK
19 Mar 12:53 am MDT	39	26	59		W	7	10.00		CLR	1023.5	30.16	26.184							51	38	OK
18 Mar 11:53 pm MDT	40	25	55		W	8	10.00		CLR	1022.9	30.14	26.166					49	39			OK
18 Mar 10:53 pm MDT	40	26	57		W	6	10.00		CLR	1022.7	30.13	26.157									OK
18 Mar 9:53 pm MDT	42	28	57		W	6	10.00		CLR	1022.4	30.12	26.148									OK
18 Mar 8:53 pm MDT	43	28	55		W	7	10.00		FEW050	1022.2	30.10	26.130									OK
18 Mar 7:53 pm MDT	45	29	53		WNW	8	10.00		FEW049 FEW090	1021.4	30.09	26.121									OK
18 Mar 6:53 pm MDT	48	29	47		WNW	**10G21**	10.00		SCT065 BKN090	1020.4	30.07	26.104									OK
18 Mar 5:53 pm MDT	48	30	49		WNW	14	10.00		BKN090	1020.3	30.06	26.095					51	47			OK
18 Mar 4:53 pm MDT	48	31	51		W	15	10.00		OVC080	1019.9	30.06	26.095									OK
18 Mar 3:53 pm MDT	48	30	49		WNW	**23G33**	10.00		SCT049 BKN065 OVC080	1020.0	30.05	26.086									OK
18 Mar 2:53 pm MDT	50	28	43		WNW	**24G31**	10.00		FEW055 OVC090	1019.1	30.03	26.068									OK
18 Mar 1:53 pm MDT	50	30	46		W	**17G26**	10.00		FEW040 BKN050 OVC065	1019.3	30.04	26.077									OK
18 Mar 12:53 pm MDT	51	28	41		W	**20G29**	10.00		BKN120	1018.9	30.03	26.068									OK
18 Mar 11:53 am MDT	49	28	44		W	10	10.00		SCT050 OVC100	1019.3	30.04	26.077					49	40			OK
18 Mar 10:53 am MDT	49	28	44		VRBL	7	10.00		FEW055 SCT065	1019.3	30.04	26.077									OK
18 Mar 9:53 am MDT	46	28	49		VRBL	3	10.00		BKN050	1019.6	30.04	26.077									OK
18 Mar 8:53 am MDT	41	28	61		CALM		10.00		CLR	1019.7	30.03	26.068									OK
18 Mar 7:53 am MDT	41	28	61		SW	7	10.00		BKN055	1019.7	30.03	26.068									OK
18 Mar 6:53 am MDT	42	29	59		W	13	10.00		CLR	1019.5	30.03	26.068									OK
18 Mar 5:53 am MDT	41	34	75		W	7	10.00		FEW048 OVC080	1019.4	30.02	26.059			0.02	0.12	42	38			OK
18 Mar 4:53 am MDT	41	34	75		WSW	5	10.00		FEW060	1019.0	30.01	26.050									OK
18 Mar 4:13 am MDT	38	37	97		S	3	3.00 BR		SCT002 BKN047 BKN065		30.00	26.041									OK
18 Mar 4:00 am MDT	38	37	97		N	3	2.50 BR		FEW002 BKN047 BKN060		30.00	26.041									OK
18 Mar 3:53 am MDT	38	37	97		WNW	5	1.75 BR		SCT002 SCT043 OVC054	1019.0	30.00	26.041									OK

18 Mar 3:36 am MDT	38	37	97	N	5	1.75	BR	FEW002 OVC080		29.99	26.032										OK
18 Mar 3:29 am MDT	38	37	97	ENE	3	2.50	BR	OVC065		29.99	26.032										OK
18 Mar 2:53 am MDT	39	37	93	WNW	5	5.00	BR	BKN045 BKN050 OVC065	1018.3	29.98	26.023		0.02								OK
18 Mar 1:53 am MDT	39	37	93	E	6	6.00	BR	FEW032 BKN090 OVC110	1017.9	29.96	26.006										OK
18 Mar 12:53 am MDT	40	38	93	SE	5	9.00		SCT048 SCT065 OVC080	1017.7	29.96	26.006	0.02						42	32		OK
17 Mar 11:53 pm MDT	40	38	93	CALM		7.00	-RA	OVC035	1017.8	29.96	26.006	0.01		0.05		42	40				OK
17 Mar 11:37 pm MDT	40	38	93	CALM		7.00	-RA	SCT017 OVC035		29.96	26.006	T									OK
17 Mar 11:09 pm MDT	40	37	89	W	5	8.00	-RA	OVC016		29.96	26.006	T									OK
17 Mar 10:53 pm MDT	40	38	93	W	3	9.00		OVC014	1018.0	29.96	26.006	0.01									OK
17 Mar 9:53 pm MDT	40	38	93	CALM		8.00	-RA	OVC012	1018.0	29.96	26.006	0.01									OK
17 Mar 8:53 pm MDT	41	37	87	CALM		6.00	-RA BR	BKN013 OVC043	1018.1	29.96	26.006	0.02	0.02								OK
17 Mar 7:53 pm MDT	40	36	86	WNW	7	10.00	-RA	OVC013	1018.3	29.96	26.006	T									OK
17 Mar 6:53 pm MDT	41	36	81	NNW	5	10.00		OVC013	1018.3	29.96	26.006										OK
17 Mar 5:53 pm MDT	41	36	81	CALM		10.00		OVC013	1019.1	29.99	26.032			0.01		41	35				OK
17 Mar 4:53 pm MDT	41	36	81	W	5	10.00		BKN014 OVC023	1019.8	30.01	26.050										OK
17 Mar 4:31 pm MDT	40	35	83	W	6	10.00		BKN014 OVC021		30.02	26.059										OK
17 Mar 4:24 pm MDT	40	35	83	WNW	6	10.00		SCT014 OVC021		30.02	26.059										OK
17 Mar 3:53 pm MDT	39	35	86	W	6	10.00		OVC011	1020.5	30.03	26.068										OK
17 Mar 3:15 pm MDT	39	34	82	W	8	10.00		OVC010		30.04	26.077										OK
17 Mar 2:53 pm MDT	39	35	86	W	5	10.00		OVC009	1021.4	30.05	26.086		0.01								OK
17 Mar 1:53 pm MDT	37	34	89	NW	3	10.00		OVC008	1022.7	30.09	26.121										OK

Webmaster
US Dept of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Great Falls Weather Forecast Office
5324 Tri-Hill Frontage Rd
Great Falls, MT 59404-4933

Tel: (406) 453-2081

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Indoor Air Sampling Field Form

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1414NMT
(1414 North Montana Avenue)
Project Name: Helena Solvent Site VI sampling 2015
PID (made/model/serial #):
Sample location: Mergenthaler's Warehouse
Date: 3/18/15
Weather: Unsettled, cool, breezy, scattered rain
Field Personnel: Laura Alvey + Bill Hammer
Air Temp:
Recorded by:
Atmospheric Pressure:

Meet with Marie Lewis, ~~office~~ general manager

Canister and Sample Information

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Pre-Sample Atmospheric Pressure	Post-Sample Atmospheric Pressure	Pre-Sample Air Temp	Post-Sample Air Temp
3/18/15	13:05	3/19/15	10:13	~~1400~~ 1414NMT-2IA-01	5748	40636		-25.9	-5.0				
	13:09		10:15	1414NMT-IA-01	13672	40219		-26.9	-6.4				
	13:13		10:19	1414NMT-IA-02	13653	40601		-26.5	-6.8				
	13:17		10:18	1414NMT-IA-03	33573	40041		-25.3	0				
	13:25		10:25	1414NMT-BA-01	33944	40240		-26.7	-7.1				
	13:26		10:24	1414NMT-BA-02	33531	40665		-25.3	-2.0				
	13:30		10:32	1410NMT-IA-01	94144	40361		-26.6	-5.5				
	13:47		10:41	1414NMT-AMB	34277	40469		-27.6	-7.1				

Comments:
1414NMT-2IA01 = In upstairs break room
IA 01: In dispatch room in center of office area
IA-02: In warehouse on "7B"
IA-03: In mergenthaler's ~~labor~~ IT department office
BA-01: Basement of Ocean Beauty } Duplicate samples
BA-02 = Basement of Ocean Beauty }
1410NMT-IA-01 = Ocean Beauty office
1414NMT-AMB = in fenced area outside Pro Build. * Can smell paint fumes.

Indoor Air Sampling Field Form

Description of Sample Locations (s):

Location Sketch:

www.weather.gov

National Weather Service Forecast Office
Great Falls, MT

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Forecast by "City, ST" or ZIP
Enter location ...
Go

Current Hazards
Watches / Warnings
Outlooks
Storm Report
MT Hazards
Current Conditions
Obs Map
Radar
Satellite
Precipitation
Reports & Summaries
Cameras
Forecasts
Forecast Discussion
Local Area
Activity Planner
Aviation Weather
Fire Weather
Severe Weather
Hurricane Center
User Defined Area
Tenzel
Recreation/Min Snow
Hydrology
Rivers and Lakes
Local Info
Climate
Local
National
Drought
More ...
Climate portal
Weather Safety
Preparedness
Weather Radio
SkyWarn
Storm Ready
Additional Info
Items of Interest
Other Offices/Links
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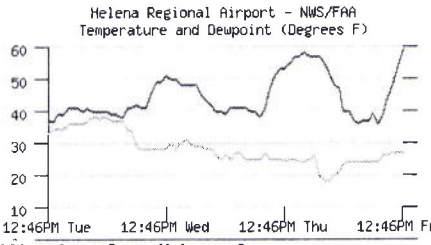
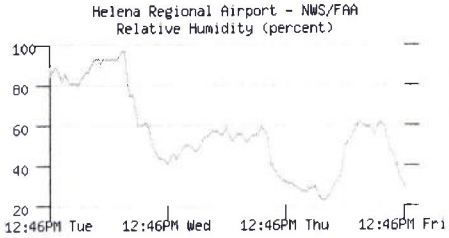
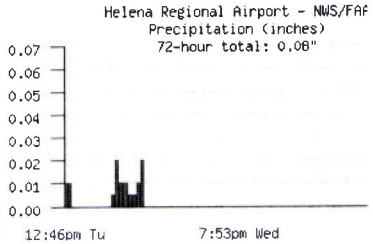
Show 7 Days Printable Version Show Raw Observations For Information Regarding the Accuracy of This Data: MesoWest Disclaimer and FAQ







Weather Conditions for:

Helena Regional Airport, MT (KHLN)

Elev: 3874 ft; Latitude: 46.60445; Longitude: -111.98920

Current time: Fri, 20 Mar 1:38 pm (MDT)

Most Recent Observation: Fri, 20 Mar 12:53 pm MDT (MDT) Explanation of Wx and Clouds columns.

Time (MDT)	Temp (f)	Dew Point (f)	Relative Humidity (%)	Wind Chill (f)	Wind Direction	Wind Speed (mph)	Visibility (miles)	WX	Clouds	Sea Level Pressure (mb)	Altimeter Setting (inches)	Station Pressure (inches)	Precip 1 hour (inches)	Precip 3 hour (inches)	Precip 6 hour (inches)	Precip 24 hour (inches)	6 Hr Max Temp	6 Hr Min Temp	24 Hr Max Temp	24 Hr Min Temp	Quality Control
20 Mar 12:53 pm MDT	59	27	29		NE	6	10.00		CLR	1019.7	30.07	26.104									OK
20 Mar 11:53 am MDT	54	27	35		CALM		10.00		CLR	1020.4	30.10	26.130					54	35			OK
20 Mar 10:53 am MDT	48	27	44		CALM		10.00		CLR	1021.3	30.11	26.139									OK
20 Mar 9:53 am MDT	44	26	49		CALM		10.00		CLR	1021.1	30.10	26.130									OK
20 Mar 8:53 am MDT	39	26	59		CALM		10.00		CLR	1020.9	30.09	26.121									OK
20 Mar 7:53 am MDT	36	24	62		VRBL	3	10.00		CLR	1020.6	30.08	26.112									OK
20 Mar 6:53 am MDT	39	24	55		W	3	10.00		CLR	1019.9	30.07	26.104									OK
20 Mar 5:53 am MDT	37	24	59		VRBL	3	10.00		CLR	1020.1	30.07	26.104					47	34			OK
20 Mar 4:53 am MDT	37	24	59		E	8	10.00		CLR	1019.4	30.05	26.086									OK
20 Mar 3:53 am MDT	36	24	62		NW	3	10.00		CLR	1020.1	30.07	26.104									OK
20 Mar 2:53 am MDT	37	24	59	**30**	W	9	10.00		CLR	1020.1	30.07	26.104									OK
20 Mar 1:53 am MDT	40	24	53	**34**	ENE	9G16	10.00		CLR	1020.1	30.07	26.104									OK
20 Mar 12:53 am MDT	40	23	50		W	6	10.00		CLR	1019.7	30.06	26.095							60	37	OK
19 Mar 11:53 pm MDT	47	21	35		S	6	10.00		FEW085	1018.6	30.04	26.077					57	46			OK
19 Mar 10:53 pm MDT	48	20	32		W	3	10.00		CLR	1018.1	30.03	26.068									OK
19 Mar 9:53 pm MDT	52	18	26		SW	6	10.00		CLR	1018.0	30.03	26.068									OK
19 Mar 8:53 pm MDT	55	18	23		SW	6	10.00		CLR	1017.4	30.00	26.041									OK
19 Mar 7:53 pm MDT	57	20	23		WSW	10	10.00		CLR	1016.8	29.98	26.023									OK
19 Mar 6:53 pm MDT	57	26	30		CALM		10.00		CLR	1017.3	30.00	26.041									OK
19 Mar 5:53 pm MDT	57	25	29		ESE	3	10.00		CLR	1017.4	30.00	26.041					60	52			OK
19 Mar 4:53 pm MDT	58	24	27		ESE	6	10.00		CLR	1017.6	30.01	26.050									OK
19 Mar 3:53 pm MDT	57	24	28		VRBL	5	10.00		FEW120	1018.7	30.04	26.077									OK
19 Mar 2:53 pm MDT	57	25	29		SE	3	10.00		CLR	1019.8	30.07	26.104									OK
19 Mar 1:53 pm MDT	55	25	31		E	6	10.00		CLR	1021.1	30.10	26.130									OK
19 Mar 12:53 pm MDT	53	24	32		VRBL	7	10.00		CLR	1021.9	30.12	26.148									OK
19 Mar 11:53 am MDT	53	25	33		WSW	13G17	10.00		CLR	1022.6	30.14	26.166					53	37			OK
19 Mar 10:53 am MDT	51	25	36		W	**14G20**	10.00		CLR	1023.4	30.16	26.184									OK
19 Mar 9:53 am MDT	47	25	42		W	10	10.00		CLR	1024.1	30.17	26.193									OK
19 Mar 8:53 am MDT	41	27	56		CALM		10.00		CLR	1024.8	30.18	26.202									OK
19 Mar 7:53 am MDT	38	25	59		SW	5	10.00		CLR	1024.5	30.17	26.193									OK
19 Mar 6:53 am MDT	40	25	55		WSW	8	10.00		CLR	1024.2	30.17	26.193									OK
19 Mar 5:53 am MDT	40	25	55	**34**	W	10	10.00		CLR	1024.0	30.17	26.193					42	38			OK
19 Mar 4:53 am MDT	41	25	52		WSW	12	10.00		CLR	1023.8	30.17	26.193									OK
19 Mar 3:53 am MDT	41	27	56		W	12	10.00		CLR	1024.0	30.17	26.193									OK
19 Mar 2:53 am MDT	41	27	56		W	15	10.00		SCT070	1023.5	30.16	26.184									OK
19 Mar 1:53 am MDT	41	25	52		W	13	10.00		CLR	1023.3	30.16	26.184									OK
19 Mar 12:53 am MDT	39	26	59		W	7	10.00		CLR	1023.5	30.16	26.184							51	38	OK
18 Mar 11:53 pm MDT	40	25	55		W	8	10.00		CLR	1022.9	30.14	26.166					49	39			OK
18 Mar 10:53 pm MDT	40	26	57		W	6	10.00		CLR	1022.7	30.13	26.157									OK
18 Mar 9:53 pm MDT	42	28	57		W	6	10.00		CLR	1022.4	30.12	26.148									OK
18 Mar 8:53 pm MDT	43	28	55		W	7	10.00		FEW050	1022.2	30.10	26.130									OK
18 Mar 7:53 pm MDT	45	29	53		WNW	8	10.00		FEW049 FEW090	1021.4	30.09	26.121									OK
18 Mar 6:53 pm MDT	48	29	47		WNW	10**G21**	10.00		SCT065 BKN090	1020.4	30.07	26.104									OK
18 Mar 5:53 pm MDT	48	30	49		WNW	14	10.00		BKN090	1020.3	30.06	26.095					51	47			OK
18 Mar 4:53 pm MDT	48	31	51		W	15	10.00		OVC080	1019.9	30.06	26.095									OK
18 Mar 3:53 pm MDT	48	30	49		WNW	**23G33**	10.00		SCT049 BKN055 OVC080	1020.0	30.05	26.086									OK
18 Mar 2:53 pm MDT	50	28	43		WNW	**24G31**	10.00		FEW055 OVC090	1019.1	30.03	26.068									OK
18 Mar 1:53 pm MDT	50	30	46		W	**17G26**	10.00		FEW040 BKN050 OVC065	1019.3	30.04	26.077									OK
18 Mar 12:53 pm MDT	51	28	41		W	**20G29**	10.00		BKN120	1018.9	30.03	26.068									OK
18 Mar 11:53 am MDT	49	28	44		W	10	10.00		SCT050 OVC100	1019.3	30.04	26.077					49	40			OK
18 Mar 10:53 am MDT	49	28	44		VRBL	7	10.00		FEW055 SCT065	1019.3	30.04	26.077									OK
18 Mar 9:53 am MDT	46	28	49		VRBL	3	10.00		BKN060	1019.6	30.04	26.077									OK
18 Mar 8:53 am MDT	41	28	61		CALM		10.00		CLR	1019.7	30.03	26.068									OK
18 Mar 7:53 am MDT	41	28	61		SW	7	10.00		BKN055	1019.7	30.03	26.068									OK
18 Mar 6:53 am MDT	42	29	59		W	13	10.00		CLR	1019.5	30.03	26.068									OK
18 Mar 5:53 am MDT	41	34	75		W	7	10.00		FEW048 OVC060	1019.4	30.02	26.059			0.02	0.12	42	38			OK
18 Mar 4:53 am MDT	41	34	75		WSW	5	10.00		FEW060	1019.0	30.01	26.050									OK
18 Mar 4:13 am MDT	38	37	97		S	3	3.00	BR	SCT002 BKN060 BKN065		30.00	26.041									OK
18 Mar 4:00 am MDT	38	37	97		N	3	2.50	BR	FEW002 BKN060 BKN060		30.00	26.041									OK
18 Mar 3:53 am MDT	38	37	97		WNW	5	1.75	BR	SCT002 SCT043 OVC060	1019.0	30.00	26.041									OK

18 Mar 3:36 am MDT	38	37	97	N	5	1.75	BR	FEW002 OVC080		29.99	26.032										OK
18 Mar 3:29 am MDT	38	37	97	ENE	3	2.50	BR	OVC045		29.99	26.032										OK
18 Mar 2:53 am MDT	39	37	93	WNW	5	6.00	BR	BKN045 BKN050 OVC065	1018.3	29.98	26.023		0.02								OK
18 Mar 1:53 am MDT	39	37	93	E	6	6.00	BR	FEW032 BKN090 OVC110	1017.9	29.96	26.006										OK
18 Mar 12:53 am MDT	40	38	93	SE	5	9.00		SCT048 SCT065 OVC080	1017.7	29.96	26.006	0.02							42	32	OK
17 Mar 11:53 pm MDT	40	38	93	CALM		7.00	-RA	OVC035	1017.8	29.96	26.006	0.01		0.05		42	40				OK
17 Mar 11:37 pm MDT	40	38	93	CALM		7.00	-RA	SCT017 OVC037		29.96	26.006	T									OK
17 Mar 11:09 pm MDT	40	37	89	W	5	8.00	-RA	OVC016		29.96	26.006	T									OK
17 Mar 10:53 pm MDT	40	38	93	W	3	9.00		OVC014	1018.0	29.96	26.006	0.01									OK
17 Mar 9:53 pm MDT	40	38	93	CALM		8.00	-RA	OVC012	1018.0	29.96	26.006	0.01									OK
17 Mar 8:53 pm MDT	41	37	87	CALM		6.00	-RA BR	BKN013 OVC043	1018.1	29.96	26.006	0.02	0.02								OK
17 Mar 7:53 pm MDT	40	36	86	WNW	7	10.00	-RA	OVC013	1018.3	29.96	26.006	T									OK
17 Mar 6:53 pm MDT	41	36	81	NNW	5	10.00		OVC013	1018.3	29.96	26.006										OK
17 Mar 5:53 pm MDT	41	36	81	CALM		10.00		OVC013	1019.1	29.99	26.032			0.01		41	35				OK
17 Mar 4:53 pm MDT	41	36	81	W	5	10.00		BKN014 OVC023	1019.8	30.01	26.050										OK
17 Mar 4:31 pm MDT	40	35	83	W	6	10.00		BKN014 OVC021		30.02	26.059										OK
17 Mar 4:24 pm MDT	40	35	83	WNW	6	10.00		SCT014 OVC021		30.02	26.059										OK
17 Mar 3:53 pm MDT	39	35	86	W	6	10.00		OVC011	1020.5	30.03	26.068										OK
17 Mar 3:15 pm MDT	39	34	82	W	8	10.00		OVC010		30.04	26.077										OK
17 Mar 2:53 pm MDT	39	35	86	W	5	10.00		OVC009	1021.4	30.05	26.086		0.01								OK
17 Mar 1:53 pm MDT	37	34	89	NW	3	10.00		OVC008	1022.7	30.09	26.121										OK

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5324 Tri-Hill Frontage Rd
Great Falls, MT 59404-4933

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Indoor Air Sampling Field Form

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1200 BOZEMAN
Tom Joeler, Allen
Project Name: Helena Solvent Site VI sampling 2015
PID (made/model/serial #):
Sample location: 1200 Bozeman
Date: 3/23/15
Weather: cool, overcast
Field Personnel: Laura Alvey
Air Temp:
Recorded by: Laura Alvey
Atmospheric Pressure:

Canister and Sample Information

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Pre-Sample Atmospheric Pressure	Post-Sample Atmospheric Pressure	Pre-Sample Air Temp	Post-Sample Air Temp
3/23/15	13:54	3/24/15	9:20	1200 BOZEMAN-BA-01	34181	40313	—	-26.8	-8.9				
	13:55		9:18	1200 BOZEMAN-BA-02	1594	30814		-25.5	-6.5				
	14:15		9:05	1200 BOZEMAN-IA-01	9408	40039*		-25.6	0				
				~~1200 BOZEMAN-IA-02~~	~~24479~~	~~40125~~		-9.5 **	DID NOT USE				
	14:38		9:10	1200 BOZEMAN-AMB	32113	40634		-26.8	0				

Comments: 1200 BOZEMAN-BA-01 + BA-02 are duplicates. located in the south east central part of the basement.
* the window on the pressure gauge on #40039 was broken + had popped off
IA01 = in warehouse room with barrels off of main office
** Canister 24479 had initial vacuum of -9.5. Not sufficient for use. There is another indoor air canister for this level so ok.

Indoor Air Sampling Field Form

Description of Sample Locations (s):

Location Sketch:

Sub Slab Air Sampling Field Form

*Fill out one form per subslab sample

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1200 BOZEMAN-SS01
Diamond Products
Project Name: Helena Solvent Site VI 2015
Sample location: 1200 Bozeman Ave
Date: 3/24/15
Field Personnel: Bill Hammer, Laura Alvey, Sarah Ricard
Recorded by: Laura Alvey

PID (made/model/serial #): NA
Helium Detector (model/serial #): MGD-2002 /
Weather:
Air Temp:
Atmospheric Pressure:

Slab Data

Surface/slab Type: Concrete
Surface/slab Thickness (inches): 10" , hole = 12"
Slab/subsurface substrate comments:
Length of probe (feet): 4'

Volume to purge (ml): 3 tubing volumes x 10 ml/ft x #ft =
3x10x4 = 120

* We redrilled the same hole from 2011

Helium Tracer Leak Test Field Data

Date	Time	Cumulative volume purged (ml)	Helium Beneath Shroud (%) min	Helium Beneath Shroud (%) max	Helium in Probe (ppm or %)	Helium Beneath Shroud during sample collection (%) (note min and max)
3/24/15	9:41			58.7		9:08 40%
	9:43			47.6	0ppm good!	10:18 30%
	9:46			40.54	0ppm	10:19 40%
						31.3%

Conversion: 1.0% = 10,000 ppm
At 20% He, there should be no more than 2 % (200,000 ppm) He in sample train

Canister Information

Date	Time	Sample ID	Cannister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum
	9:51		34759	20348		-25.0	
	10:25					~~-5.0~~	-5.0

Comments: the He meter lost charge before the sample can was cracked. We filled up the shroud w/ helium - it was probably 50-60% He. We charged the helium meter. When the meter was charged the he in the shroud read 40%.

Sub Slab Air Sampling Field Form

Project Name: Helena Solvent Site VI 2015 Date:	Sample Location/ ID:

Location Description: Include floor type/construction, location of probe, fuel sources, sumps, stored chemicals, drains, etc.

Location Sketch

Sub Slab Air Sampling Field Form

*Fill out one form per subslab sample

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1200 Bozeman - SS-02 Diamond Products
Project Name: Helena Solvent Site VI 2015
Sample location: 1200 BOZEMAN - SS - 02
Date: 3/24/2015
Field Personnel: Laura Alvey, Bill Hamme, Sarah Ricard
Recorded by: Laura Alvey

PID (made/model/serial #): NA
Helium Detector (model/serial #): MGD-2002 /
Weather:
Air Temp:
Atmospheric Pressure:

Basement of Diamond Products
same hole as 2011

Slab Data

Surface/slab Type: Concrete
Surface/slab Thickness (inches): 6", then void space
Slab/subsurface substrate comments: gravel
Length of probe (feet): 4'

Volume to purge (ml): 3 tubing volumes x 10 ml/ft x #ft =
4 X 3 X 10 = 120 ml

*Redrilled same hole as in 2011, there was a rubber mat over the hole
took a lot of sand to fill subsurface void

Helium Tracer Leak Test Field Data

Date	Time	Cumulative volume purged (ml)	Helium Beneath Shroud (%) min	Helium Beneath Shroud (%) max	Helium in Probe (ppm or %)
	10:44	0		68	
	10:48	120		56	
	10:49			54	0 ppm ok!

Helium Beneath Shroud during sample collection (%) (note min and max)

10:58 51.6
11:02 39.5
11:03 32.0
11:04 55.6
11:16 34 → helium meter battery died again

Conversion: 1.0% = 100,000 ppm
At 20% He, there should be no more than 2 % (200,000 ppm) He in sample train

Canister Information

Date	Time	Sample ID	Cannister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum
	10:55		34458	20217		-26.9	
	11:25					~~-5.0~~	-5.0

Comments:

Sub Slab Air Sampling Field Form

Project Name: Helena Solvent Site VI 2015	Sample Location/ ID:
Date:	

Location Description: Include floor type/construction, location of probe, fuel sources, sumps, stored chemicals, drains, etc.

Location Sketch

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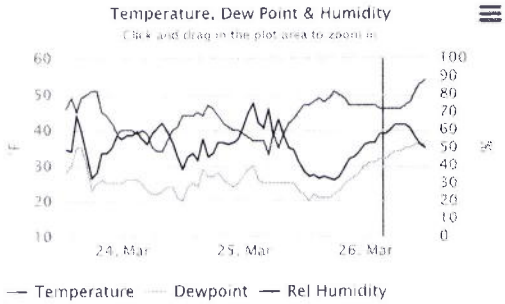

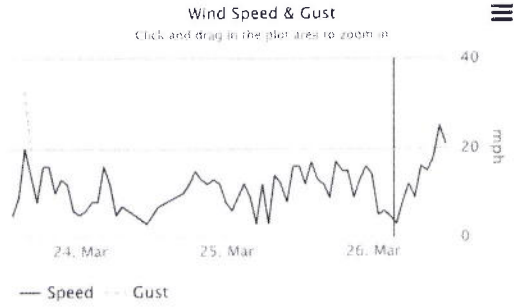

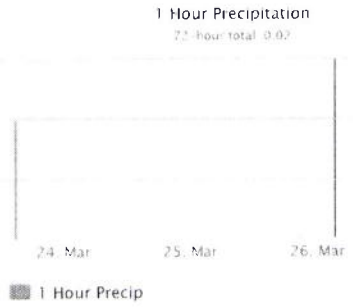

Weather Conditions for:
Helena Regional Airport, MT (KHLN)
Elev: 3874 ft; Latitude: 46.60445; Longitude: -111.98920

Current time: Thu, 26 Mar 12:26 pm (MDT)
Most Recent Observation: Thu, 26 Mar 11:53 am MDT (MDT)

Explanation of Wx and Clouds columns.

Time (MDT)	Temp. (f)	Dew Point (f)	Relative Humidity (%)	Wind Chill (f)	Wind Direction	Wind Speed (mph)	Visibility (miles)	WX	Clouds	Sea Level Pressure (mb)	Altimeter Setting (inches)	Station Pressure (inches)	Precip 1 hour (inches)	Precip 3 hour (inches)	Precip 6 hour (inches)	Precip 24 hour (inches)	6 Hr Max Temp	6 Hr Min Temp	24 Hr Max Temp	24 Hr Min Temp	Quality Control
26 Mar 11:53 am MDT	54	36	50		W	21	10.00			1025.7	30.25	26.264					54	46			OK
26 Mar 10:53 am MDT	53	36	52		W	25G33	10.00		FEW045	1025.7	30.25	26.264									OK
26 Mar 9:53 am MDT	51	36	56		W	18	10.00		FEW038	1025.7	30.24	26.255									OK
26 Mar 8:53 am MDT	48	35	61		WSW	15G23	10.00			1025.9	30.24	26.255									OK
26 Mar 7:53 am MDT	47	35	63		W	16	10.00			1025.9	30.24	26.255									OK
26 Mar 6:53 am MDT	46	34	63		WSW	9	10.00			1025.9	30.24	26.255									OK
26 Mar 5:53 am MDT	46	34	63		WSW	12	10.00			1025.8	30.24	26.255					47	46			OK
26 Mar 4:53 am MDT	46	33	60		W	8	10.00		SCT047	1026.1	30.25	26.264									OK
26 Mar 3:53 am MDT	46	32	58		WSW	3	10.00		OVC070	1026.2	30.24	26.255									OK
26 Mar 2:53 am MDT	46	32	58		CALM		10.00			1026.0	30.24	26.255									OK
26 Mar 1:53 am MDT	47	31	53		WSW	6	10.00		OVC095	1025.7	30.23	26.246									OK
26 Mar 12:53 am MDT	47	31	53		WNW	5	10.00			1026.3	30.25	26.264							51	31	OK
25 Mar 11:53 pm MDT	47	30	52		W	14	10.00		SCT045 OVC095	1026.0	30.24	26.255					51	46			OK
25 Mar 10:53 pm MDT	47	28	48		W	16G25	10.00		FEW049	1025.3	30.21	26.228									OK
25 Mar 9:53 pm MDT	47	27	45		W	13	10.00			1025.1	30.20	26.219									OK
25 Mar 8:53 pm MDT	47	26	44		W	9	10.00		BKN110	1024.7	30.19	26.211									OK
25 Mar 7:53 pm MDT	49	25	39		WNW	15	10.00		BKN080 OVC095	1024.7	30.19	26.211									OK
25 Mar 6:53 pm MDT	50	23	34		W	15	10.00		FEW060 OVC110	1024.0	30.16	26.184									OK
25 Mar 5:53 pm MDT	51	22	32		W	17G24	10.00			1023.4	30.16	26.184					51	47			OK
25 Mar 4:53 pm MDT	49	21	33		W	9	10.00			1024.9	30.18	26.202									OK
25 Mar 3:53 pm MDT	48	21	34		W	12	10.00		OVC100	1025.0	30.19	26.211									OK
25 Mar 2:53 pm MDT	49	21	33		W	13	10.00		FEW065 BKN100	1025.3	30.20	26.219									OK
25 Mar 1:53 pm MDT	48	22	35		W	17	10.00		FEW060 BKN110	1026.0	30.22	26.237									OK
25 Mar 12:53 pm MDT	47	20	34		W	12G24	10.00			1026.5	30.23	26.246									OK
25 Mar 11:53 am MDT	47	22	37		W	16	10.00			1026.9	30.24	26.255					48	35			OK
25 Mar 10:53 am MDT	45	23	42		WNW	16	10.00			1026.9	30.25	26.264									OK
25 Mar 9:53 am MDT	43	25	49		W	8G17	10.00			1027.1	30.25	26.264									OK
25 Mar 8:53 am MDT	42	25	50		WSW	12	10.00		CLR	1026.7	30.23	26.246									OK
25 Mar 7:53 am MDT	39	25	57	31	WSW	14	10.00		CLR	1026.3	30.22	26.237									OK
25 Mar 6:53 am MDT	35	25	66		VRBL	3	10.00		CLR	1026.3	30.21	26.228									OK
25 Mar 5:53 am MDT	39	25	57	32	W	12	10.00			1024.9	30.19	26.211					39	31			OK
25 Mar 4:53 am MDT	33	25	72		VRBL	3	10.00			1025.0	30.18	26.202									OK
25 Mar 3:53 am MDT	37	25	61	30	W	9	10.00		CLR	1024.4	30.16	26.184									OK
25 Mar 2:53 am MDT	37	26	64	29	W	12	10.00		FEW049	1023.6	30.14	26.166									OK
25 Mar 1:53 am MDT	37	30	75		CALM		10.00			1023.4	30.13	26.157									OK
25 Mar 12:53 am MDT	38	29	70		N	6	10.00			1022.7	30.11	26.139							47	31	OK
24 Mar 11:53 pm MDT	39	27	62		W	8	10.00			1021.9	30.10	26.130					46	39			OK
24 Mar 10:53 pm MDT	40	25	55	33	WNW	12G20	10.00			1020.8	30.06	26.095									OK
24 Mar 9:53 pm MDT	40	24	53	32	W	13	10.00		CLR	1019.9	30.03	26.068									OK
24 Mar 8:53 pm MDT	41	25	52		W	12	10.00		OVC090	1019.2	30.00	26.041									OK
24 Mar 7:53 pm MDT	42	26	53		W	13	10.00		FEW048	1018.5	29.97	26.014									OK
24 Mar 6:53 pm MDT	44	28	53		WSW	15	10.00			1016.9	29.94	25.988									OK
24 Mar 5:53 pm MDT	46	27	47		WSW	12	10.00		FEW045 OVC085	1015.7	29.91	25.961					47	42			OK
24 Mar 4:53 pm MDT	47	27	45		W	10	10.00		BKN090	1015.0	29.90	25.952									OK
24 Mar 3:53 pm MDT	44	29	55		CALM		10.00		SCT033 OVC070	1015.0	29.90	25.952									OK
24 Mar 2:53 pm MDT	45	24	43		CALM		10.00		OVC055	1014.5	29.88	25.934									OK
24 Mar 1:53 pm MDT	44	25	47		CALM		10.00			1014.4	29.88	25.934									OK
24 Mar 12:53 pm MDT	44	24	45		W	7	10.00		SCT040	1014.4	29.88	25.934									OK
24 Mar 11:53 am MDT	44	20	38		VRBL	5	10.00		BKN080	1014.4	29.88	25.934					44	31			OK
24 Mar 10:53 am MDT	41	21	45		NW	3	10.00		OVC100	1015.0	29.89	25.943									OK
24 Mar 9:53 am MDT	40	24	53		CALM		10.00		SCT120	1014.8	29.89	25.943									OK
24 Mar 8:53 am MDT	37	24	59		NE	5	10.00		FEW120	1015.3	29.90	25.952									OK
24 Mar 7:53 am MDT	34	23	64		CALM		10.00		CLR	1015.8	29.91	25.961									OK
24 Mar 6:53 am MDT	34	22	61		SW	7	10.00		CLR	1015.1	29.91	25.961									OK
24 Mar 5:53 am MDT	35	22	58		W	5	10.00		FEW050	1015.4	29.92	25.970				0.02	41	33			OK
24 Mar 4:53 am MDT	39	23	52	32	W	12	10.00		FEW055	1014.9	29.91	25.961									OK
24 Mar 3:53 am MDT	40	25	55	32	WSW	16	10.00		CLR	1015.0	29.91	25.961									OK
24 Mar 2:53 am MDT	39	26	59		WSW	8	10.00		CLR	1015.5	29.91	25.961									OK
24 Mar 1:53 am MDT	40	26	57		SW	8	10.00		FEW045 SCT065	1014.8	29.91	25.961									OK
24 Mar 12:53 am MDT	40	26	57		W	6	10.00		CLR	1015.2	29.91	25.961							51	34	OK
23 Mar 11:53 pm MDT	40	25	55		NW	5	10.00		CLR	1015.2	29.90	25.952					51	38			OK

23 Mar 10:53 pm MDT	39	25	57	W	6	10.00	CLR	1015.2	29.90	25.952						OK
23 Mar 9:53 pm MDT	42	25	50	W	12	10.00	CLR	1014.4	29.88	25.934						OK
23 Mar 8:53 pm MDT	44	25	47	W	13	10.00	CLR	1013.1	29.84	25.899						OK
23 Mar 7:53 pm MDT	45	26	47	W	10	10.00	CLR	1012.9	29.83	25.890						OK
23 Mar 6:53 pm MDT	51	25	36	WNW	16	10.00	FEW070	1011.2	29.80	25.863						OK
23 Mar 5:53 pm MDT	51	23	33	W	16	10.00	FEW065	1010.6	29.78	25.845			0.02	51	44	OK
23 Mar 4:53 pm MDT	50	30	46	W	8	10.00	BKN120	1010.6	29.78	25.845						OK
23 Mar 3:53 pm MDT	49	35	59	WSW	14G20	10.00	OVC095	1010.6	29.78	25.845						OK
23 Mar 2:53 pm MDT	45	35	68	WSW	20G33	10.00	OVC055	1010.4	29.77	25.836	0.02	0.02				OK
23 Mar 1:53 pm MDT	49	30	48	SE	9	10.00	FEW021 BKN095 OVC120	1008.2	29.72	25.792						OK
23 Mar 12:53 pm MDT	46	28	49	ESE	5	10.00	FEW055	1009.0	29.74	25.809	T					OK

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Sub Slab Air Sampling Field Form

*Fill out one form per subslab sample

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1118 HELENA-SS-01
Mr. Wise Cleaners
Project Name: Helena Solvent Site VI 2015
Sample location: 1118 Helena Ave
Date: 3/25/2015
Field Personnel: Laura Alvey, Dan Norris,
Recorded by: Laura Alvey

PID (made/model/serial #): NA
Helium Detector (model/serial #): MGD-2002 /
Weather:
Air Temp:
Atmospheric Pressure:

We redrilled the subslab hole from 2010/2011

Slab Data

Surface/slab Type: Concrete
Surface/slab Thickness (inches): ~~6~~ " hole = 6 1/4
Slab/subsurface substrate comments:
Length of probe (feet): 4'

Volume to purge (ml): 3 tubing volumes x 10 ml/ft x #ft =
3x4 x 10 = 120 ml

Helium Tracer Leak Test Field Data

Date	Time	Cumulative volume purged (ml)	Helium Beneath Shroud (%) ~~min~~ max	Helium Beneath Shroud (%) ~~max~~ min	Helium in Probe (ppm or %)	
3/25/15	13:55	120	~~56~~ 56.1	38	100 ppm	OK

Helium Beneath Shroud during sample collection (%) (note min and max)

14:08	49.9	
14:14	56.4	
14:31	38%	Battery died on the meter

Conversion: 1.0% = 100,000 ppm
At 20% He, there should be no more than 2 % (200,000 ppm) He in sample train

Canister Information

Date	Start Time	~~Sample ID~~ end time	Cannister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum
3/25/15	14:06	14:45	12047	20343	—	-26.0	-5.0

Comments:

Sub Slab Air Sampling Field Form

Project Name: Helena Solvent Site VI 2015	Sample Location/ ID:
Date:	

Location Description: Include floor type/construction, location of probe, fuel sources, sumps, stored chemicals, drains, etc.

Location Sketch

Sub Slab Air Sampling Field Form

*Fill out one form per subslab sample

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1120 HELENA -SS-01
former Blommers Floral - now vacant
Project Name: Helena Solvent Site VI 2015
Sample location:
Date: 3/25/2015
Field Personnel: Laura Alvey, Dan Norris
Recorded by:

PID (made/model/serial #): NA
Helium Detector (model/serial #): MGD-2002 /
Weather:
Air Temp:
Atmospheric Pressure:

A Redrilled old probe hole from 2010/2011
* Rye Svingen from HydroSolutions is here to provide oversight for Hustads

Slab Data

Surface/slab Type: concrete
Surface/slab Thickness (inches): 5", hole = 6½-7"
Slab/subsurface substrate comments: drilled into sand from previous sampling
Length of probe (feet): 5'

Volume to purge (ml): 3 tubing volumes x 10 ml/ft x #ft =
45' x 3 x 10 = 150

Helium Tracer Leak Test Field Data

Date	Time	Cumulative volume purged (ml)	Helium Beneath Shroud (%) min	Helium Beneath Shroud (%) max	Helium in Probe (ppm or %)
3/25/15	9:14	180	~~35~~ 40	75	200 ppm

Helium Beneath Shroud during sample collection (%) (note min and max)

	%		%
9:43	30.2	9:57	29.0
9:44	57	10:06	24.5
9:46	31.7		
9:50	25		
9:52	60		

Conversion: 1.0% = 100,000 ppm
At 20% He, there should be no more than 2 % (200,000 ppm) He in sample train

Canister Information

Date	Time	Sample ID	Cannister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum
3/25/15	9:27	1120 Helena-SS-01	36031	30971	—	-26.5	
	10:09					-5.0	

Comments: needed vice grips to open the valve on the canister. The helium meter battery died right before we started sampling. We flood shroud w/ He ~~+ to take~~ reading before the end of the sample.

Sub Slab Air Sampling Field Form

Project Name: Helena Solvent Site VI 2015 Sample Location/ ID:

Date:

Location Description: Include floor type/construction, location of probe, fuel sources, sumps, stored chemicals, drains, etc.

Location Sketch

NATIONAL WEATHER SERVICE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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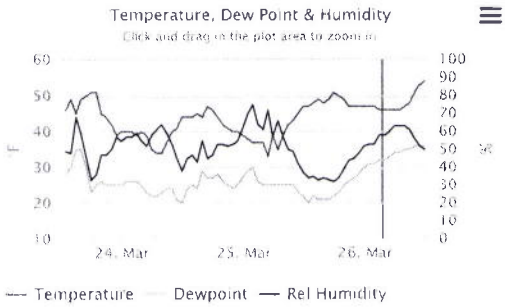

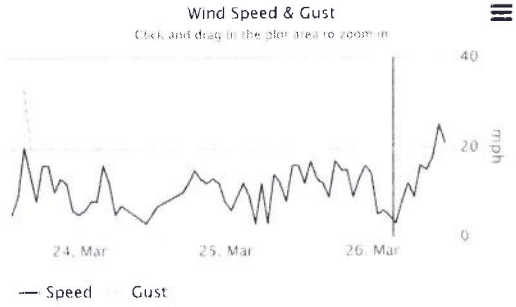

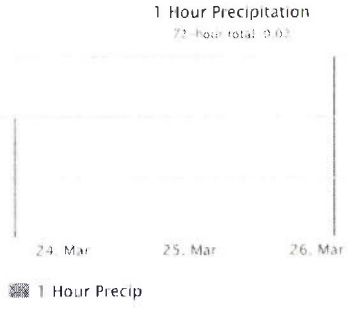

Weather Conditions for:
Helena Regional Airport, MT (KHLN)

Elev: 3874 ft; Latitude: 46.60445; Longitude: -111.98920

Current time: Thu, 26 Mar 12:26 pm (MDT)
Most Recent Observation: Thu, 26 Mar 11:53 am MDT (MDT)

Explanation of Wx and Clouds columns.

Time (MDT)	Temp. (f)	Dew Point (f)	Relative Humidity (%)	Wind Chill (f)	Wind Direction	Wind Speed (mph)	Visibility (miles)	WX	Clouds	Sea Level Pressure (mb)	Altimeter Setting (inches)	Station Pressure (inches)	Precip 1 hour (inches)	Precip 3 hour (inches)	Precip 6 hour (inches)	Precip 24 hour (inches)	6 Hr Max Temp	6 Hr Min Temp	24 Hr Max Temp	24 Hr Min Temp	Quality Control
26 Mar 11:53 am MDT	54	36	50		W	21	10.00			1025.7	30.25	26.264					54	46			OK
26 Mar 10:53 am MDT	53	36	52		W	25G33	10.00		FEW045	1025.7	30.25	26.264									OK
26 Mar 9:53 am MDT	51	36	56		W	18	10.00		FEW038	1025.7	30.24	26.255									OK
26 Mar 8:53 am MDT	48	35	61		WSW	15G23	10.00			1025.9	30.24	26.255									OK
26 Mar 7:53 am MDT	47	35	63		W	16	10.00			1025.9	30.24	26.255									OK
26 Mar 6:53 am MDT	46	34	63		WSW	9	10.00			1025.9	30.24	26.255									OK
26 Mar 5:53 am MDT	46	34	63		WSW	12	10.00			1025.8	30.24	26.255					47	46			OK
26 Mar 4:53 am MDT	46	33	60		W	8	10.00		SCT047	1026.1	30.25	26.264									OK
26 Mar 3:53 am MDT	46	32	58		WSW	3	10.00		OVC070	1026.2	30.24	26.255									OK
26 Mar 2:53 am MDT	46	32	58		CALM		10.00			1026.0	30.24	26.255									OK
26 Mar 1:53 am MDT	47	31	53		WSW	6	10.00		OVC095	1025.7	30.23	26.246									OK
26 Mar 12:53 am MDT	47	31	53		WNW	5	10.00			1026.3	30.25	26.264							51	31	OK
25 Mar 11:53 pm MDT	47	30	52		W	14	10.00		SCT045 OVC095	1026.0	30.24	26.255					51	46			OK
25 Mar 10:53 pm MDT	47	28	48		W	16G25	10.00		FEW049	1025.3	30.21	26.228									OK
25 Mar 9:53 pm MDT	47	27	45		W	13	10.00			1025.1	30.20	26.219									OK
25 Mar 8:53 pm MDT	47	26	44		W	9	10.00		BKN110	1024.7	30.19	26.211									OK
25 Mar 7:53 pm MDT	49	25	39		WNW	15	10.00		BKN080 OVC095	1024.7	30.19	26.211									OK
25 Mar 6:53 pm MDT	50	23	34		W	15	10.00		FEW060 OVC110	1024.0	30.16	26.184									OK
25 Mar 5:53 pm MDT	51	22	32		W	17G24	10.00			1023.4	30.16	26.184					51	47			OK
25 Mar 4:53 pm MDT	49	21	33		W	9	10.00			1024.9	30.18	26.202									OK
25 Mar 3:53 pm MDT	48	21	34		W	12	10.00		OVC100	1025.0	30.19	26.211									OK
25 Mar 2:53 pm MDT	49	21	33		W	13	10.00		FEW065 BKN100	1025.3	30.20	26.219									OK
25 Mar 1:53 pm MDT	48	22	35		W	17	10.00		FEW060 BKN110	1026.0	30.22	26.237									OK
25 Mar 12:53 pm MDT	47	20	34		W	12G24	10.00			1026.5	30.23	26.246									OK
25 Mar 11:53 am MDT	47	22	37		W	16	10.00			1026.9	30.24	26.255					48	35			OK
25 Mar 10:53 am MDT	45	23	42		WNW	16	10.00			1026.9	30.25	26.264									OK
25 Mar 9:53 am MDT	43	25	49		W	8G17	10.00			1027.1	30.25	26.264									OK
25 Mar 8:53 am MDT	42	25	50		WSW	12	10.00		CLR	1026.7	30.23	26.246									OK
25 Mar 7:53 am MDT	39	25	57	31	WSW	14	10.00		CLR	1026.3	30.22	26.237									OK
25 Mar 6:53 am MDT	35	25	66		VRBL	3	10.00		CLR	1026.3	30.21	26.228									OK
25 Mar 5:53 am MDT	39	25	57	32	W	12	10.00			1024.9	30.19	26.211					39	31			OK
25 Mar 4:53 am MDT	33	25	72		VRBL	3	10.00			1025.0	30.18	26.202									OK
25 Mar 3:53 am MDT	37	25	61	30	W	9	10.00		CLR	1024.4	30.16	26.184									OK
25 Mar 2:53 am MDT	37	26	64	29	W	12	10.00		FEW049	1023.6	30.14	26.166									OK
25 Mar 1:53 am MDT	37	30	75		CALM		10.00			1023.4	30.13	26.157									OK
25 Mar 12:53 am MDT	38	29	70		N	6	10.00			1022.7	30.11	26.139							47	31	OK
24 Mar 11:53 pm MDT	39	27	62		W	8	10.00			1021.9	30.10	26.130					46	39			OK
24 Mar 10:53 pm MDT	40	25	55	33	WNW	12G20	10.00			1020.8	30.06	26.095									OK
24 Mar 9:53 pm MDT	40	24	53	32	W	13	10.00		CLR	1019.9	30.03	26.068									OK
24 Mar 8:53 pm MDT	41	25	52		W	12	10.00		OVC090	1019.2	30.00	26.041									OK
24 Mar 7:53 pm MDT	42	26	53		W	13	10.00		FEW048	1018.5	29.97	26.014									OK
24 Mar 6:53 pm MDT	44	28	53		WSW	15	10.00			1016.9	29.94	25.988									OK
24 Mar 5:53 pm MDT	46	27	47		WSW	12	10.00		FEW045 OVC085	1015.7	29.91	25.961					47	42			OK
24 Mar 4:53 pm MDT	47	27	45		W	10	10.00		BKN090	1015.0	29.90	25.952									OK
24 Mar 3:53 pm MDT	44	29	55		CALM		10.00		SCT033 OVC070	1015.0	29.90	25.952									OK
24 Mar 2:53 pm MDT	45	24	43		CALM		10.00		OVC055	1014.5	29.88	25.934									OK
24 Mar 1:53 pm MDT	44	25	47		CALM		10.00			1014.4	29.88	25.934									OK
24 Mar 12:53 pm MDT	44	24	45		W	7	10.00		SCT040	1014.4	29.88	25.934									OK
24 Mar 11:53 am MDT	44	20	38		VRBL	5	10.00		BKN080	1014.4	29.88	25.934					44	31			OK
24 Mar 10:53 am MDT	41	21	45		NW	3	10.00		OVC100	1015.0	29.89	25.943									OK
24 Mar 9:53 am MDT	40	24	53		CALM		10.00		SCT120	1014.8	29.89	25.943									OK
24 Mar 8:53 am MDT	37	24	59		NE	5	10.00		FEW120	1015.3	29.90	25.952									OK
24 Mar 7:53 am MDT	34	23	64		CALM		10.00		CLR	1015.8	29.91	25.961									OK
24 Mar 6:53 am MDT	34	22	61		SW	7	10.00		CLR	1015.1	29.91	25.961									OK
24 Mar 5:53 am MDT	35	22	58		W	5	10.00		FEW050	1015.4	29.92	25.970				0.02	41	33			OK
24 Mar 4:53 am MDT	39	23	52	32	W	12	10.00		FEW055	1014.9	29.91	25.961									OK
24 Mar 3:53 am MDT	40	25	55	32	WSW	16	10.00		CLR	1015.0	29.91	25.961									OK
24 Mar 2:53 am MDT	39	26	59		WSW	8	10.00		CLR	1015.5	29.91	25.961									OK
24 Mar 1:53 am MDT	40	26	57		SW	8	10.00		FEW045 SCT065	1014.8	29.91	25.961									OK
24 Mar 12:53 am MDT	40	26	57		W	6	10.00		CLR	1015.2	29.91	25.961							51	34	OK
23 Mar 11:53 pm MDT	40	25	55		NW	5	10.00		CLR	1015.2	29.90	25.952					51	38			OK

23 Mar 10:53 pm MDT	39	25	57	W	6	10.00	CLR	1015.2	29.90	25.952						OK
23 Mar 9:53 pm MDT	42	25	50	W	12	10.00	CLR	1014.4	29.88	25.934						OK
23 Mar 8:53 pm MDT	44	25	47	W	13	10.00	CLR	1013.1	29.84	25.899						OK
23 Mar 7:53 pm MDT	45	26	47	W	10	10.00	CLR	1012.9	29.83	25.890						OK
23 Mar 6:53 pm MDT	51	25	36	WNW	16	10.00	FEW070	1011.2	29.80	25.863						OK
23 Mar 5:53 pm MDT	51	23	33	W	16	10.00	FEW065	1010.6	29.78	25.845			0.02	51	44	OK
23 Mar 4:53 pm MDT	50	30	46	W	8	10.00	BKN120	1010.6	29.78	25.845						OK
23 Mar 3:53 pm MDT	49	35	59	WSW	14G20	10.00	OVC095	1010.6	29.78	25.845						OK
23 Mar 2:53 pm MDT	45	35	68	WSW	20G33	10.00	[illegible] OVC055	1010.4	29.77	25.836	0.02	0.02				OK
23 Mar 1:53 pm MDT	49	30	48	SE	9	10.00	FEW021 BKN095 OVC120	1008.2	29.72	25.792						OK
23 Mar 12:53 pm MDT	46	28	49	ESE	5	10.00	FEW055 [illegible]	1009.0	29.74	25.809	T					OK

US Dept of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Great Falls Weather Forecast Office
5324 Tri-Hill Frontage Rd, Great Falls, MT 59404-4933
(406) 453-2081
Webmaster's Email: w-tfx.webmaster@noaa.gov

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Indoor Air Sampling Field Form

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1230 POPLAR
Carol Synness
Project Name: Helena Solvent Site VI sampling 2015
Sample location: 1230 Poplar
Date: 3/16/2015
Field Personnel: Laura Alvey, Dan Norris
Recorded by: Laura Alvey

PID (made/model/serial #):
Weather: Cool, overcast, breezy
Air Temp:
Atmospheric Pressure:

Canister and Sample Information

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Pre-Sample Atmospheric Pressure	Post-Sample Atmospheric Pressure	Pre-Sample Air Temp	Post-Sample Air Temp
3/16/15	15:04	3/17/15	12:04	1230POPLAR-BA-01	14038	41311	-	-26.2	-5.5	26.318	26.18	72°	75°
↓	15:09		11:56	1230POPLAR-IA-01	33565	40593		-27.0	-5.1	↓	↓	75°	75°
↓	15:12		11:59	1230POPLAR-2IA-01	33930	40108		-26.2	-6.0	↓	↓	65°	65°
↓	15:19		12:01	1230POPLAR-AMB	14120	40271		-25.5	-3.6	↓	↓	42°	35°F

Comments:
BA-01 - Approx Center of basement
IA-01 - In TV room (the center of house) on a table/shelf at base of staircase
2IA-01 - In 2nd floor bedroom (there is only one room on 2nd floor)
AMB - on east side of house at base of large tree.

Indoor Air Sampling Field Form

Description of Sample Locations (s):

Location Sketch:

Sub Slab Air Sampling Field Form

*Fill out one form per subslab sample

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1230POPLAR-SS-01

Project Name: Helena Solvent Site VI 2015
Sample location:
Date: 3/17/15
Field Personnel: Laura Alvey, Bill Hamm
Recorded by:

PID (made/model/serial #): NA
Helium Detector (model/serial #): MGD-2002 /
Weather: Cold, sleeting
Air Temp: 35°F
Atmospheric Pressure:

Slab Data

Surface/slab Type: Concrete
Surface/slab Thickness (inches): 4" slab, 6" hole
Slab/subsurface substrate comments: gravely, dry
Length of probe (feet): 4'

Volume to purge (ml): 3 tubing volumes x 10 ml/ft x #ft =
3 x 4 x 10 = 120 ml

Helium Tracer Leak Test Field Data

Date	Time	Cumulative volume purged (ml)	Helium Beneath Shroud (%) min	Helium Beneath Shroud (%) max	Helium in Probe (ppm or %)		Helium Beneath Shroud during sample collection (%) (note min and max)
3/17/15	12:59	120	49%	54.5	~~[illegible]~~ 2,600	ok	* He meter batteries died. He in shroud is inflated in bag - should be >20%. 13:30 33.5%, 13:38 31.5

Conversion: 1.0% = 100,000 ppm
At 20% He, there should be no more than 2 % (200,000 ppm) He in sample train

Canister Information

Date	Time	Sample ID	Cannister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum
3/17/15	13:09 13:43		3573			-25.2	-4.75

Comments: Concrete drilled easily + not very thick. Surface of concrete has lots of pathes where the surface is rough. May not be possible to get a good seal
* Helium meter batteries died when starting the sampling. 13:13 Bill goes back to office for He-meter battery charger
* Bill get charger twice charge the meter.

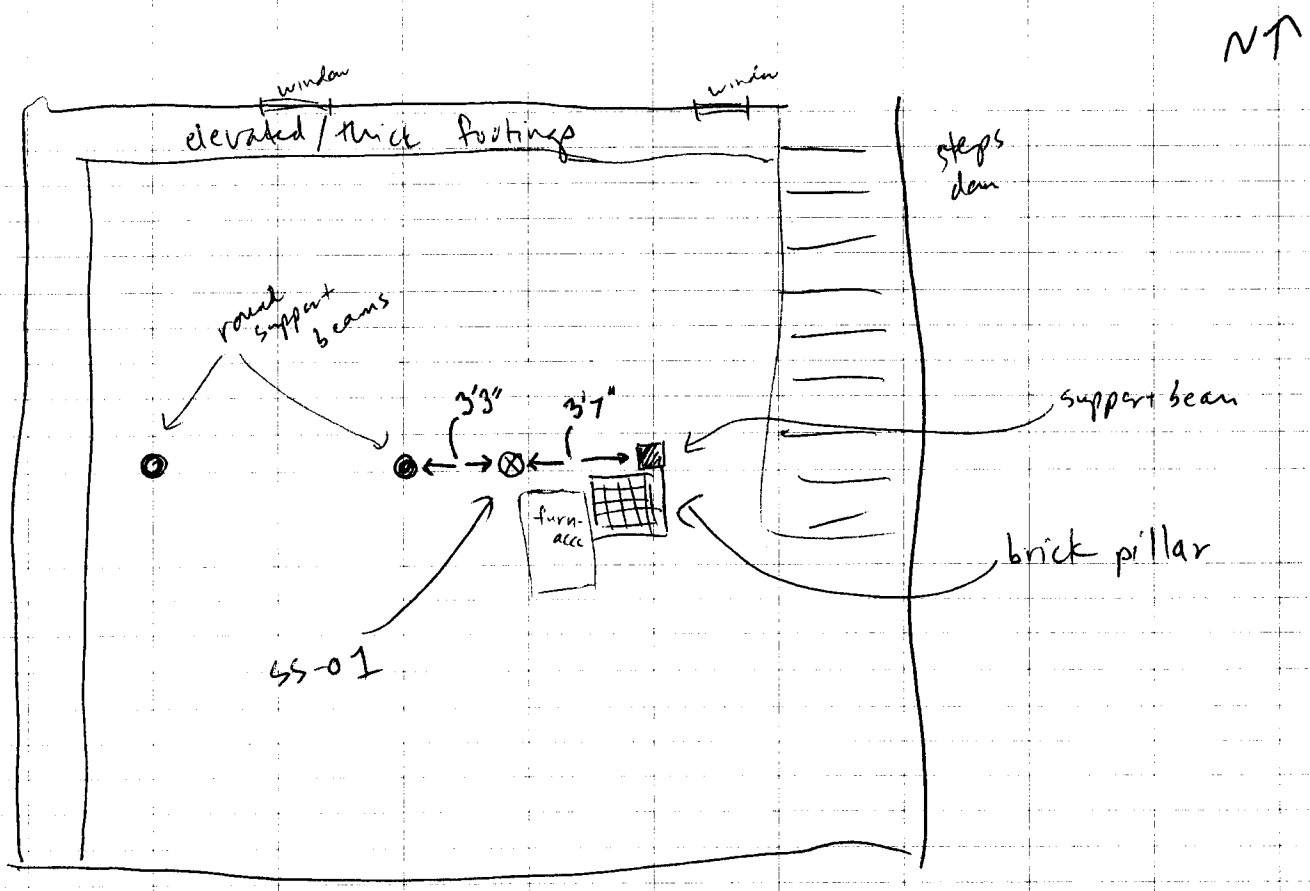
Sub Slab Air Sampling Field Form

Project Name: Helena Solvent Site VI 2015 Sample Location/ ID:

Date:

Location Description: Include floor type/construction, location of probe, fuel sources, sumps, stored chemicals, drains, etc.

Location Sketch



Sub Slab Air Sampling Field Form

*Fill out one form per subslab sample

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1308 PHOENIX -SS-01

Project Name: Helena Solvent Site VI 2015
Sample location:
Date: 3/17/15
Field Personnel: Laura Alvey, Kevin Wilkinson, Scott Owen
Recorded by:

PID (made/model/serial #): NA
Helium Detector (model/serial #): MGD-2002 /
Weather:
Air Temp:
Atmospheric Pressure:

Slab Data

Surface/slab Type: Concrete
Surface/slab Thickness (inches): 10.25"
Slab/subsurface substrate comments:
Length of probe (feet): 4'

Volume to purge (ml): 3 tubing volumes x 10 ml/ft x #ft =

Helium Tracer Leak Test Field Data

Date	Time	Cumulative volume purged (ml)	Helium Beneath Shroud (%) min	Helium Beneath Shroud (%) max	Helium in Probe (ppm or %)
3/17/15	10:00		60		
	10:04		40		1500 ppm
					2150 ppm

Helium Beneath Shroud during sample collection (%) (note min ~~and max~~) %

10:33	45.7
10:37	22.5
10:38	47.5
11:00	23.2

Conversion: 1.0% = 100,000 ppm
At 20% He, there should be no more than 2 % (20,000 ppm) He in sample train

Canister Information

Date	Time	Sample ID	Cannister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum
3/17/15	10:27		34461			-27.0	-5.1
	11:00						

Comments:

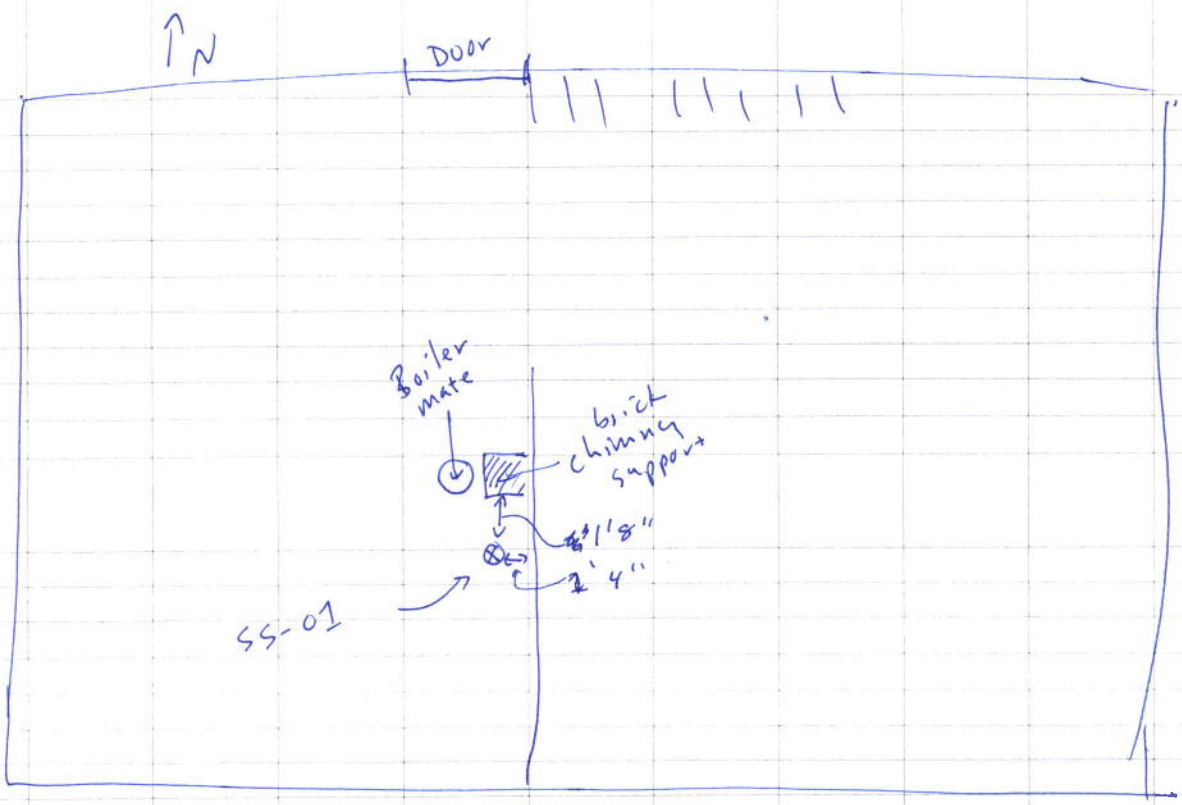
Sub Slab Air Sampling Field Form

Project Name: Helena Solvent Site VI 2015 | Sample Location/ ID:

Date:

Location Description: Include floor type/construction, location of probe, fuel sources, sumps, stored chemicals, drains, etc.

Location Sketch



Indoor Air Sampling Field Form

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1308 Phoenix
Cody Rodger 781-1638
Project Name: Helena Solvent Site VI sampling 2015
Sample location: 1308 Phoenix
Date: 3/16/2014
Field Personnel: Laura Alvey, Kevin Wilkinson
Recorded by: L. Alvey

PID (made/model/serial #): —
Weather: Cool, breezy, cloudy
Air Temp: 40°F outside
Atmospheric Pressure: 30.30"

Canister and Sample Information

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Pre-Sample Atmospheric Pressure	Post-Sample Atmospheric Pressure	Pre-Sample Air Temp	Post-Sample Air Temp
3/16/15	11:04	3/17/15	9:54	1308PHOENIX-BA-01	33988	40460		-26.8	-7.5	30.30"		70°F	
3/16/15	11:03	↓	9:11	1308PHOENIX-BA-02	1559	40516		-26.1	-2.0	↓		↓	
3/16/15	11:01	↓	9:10	1308PHOENIX-IA-01	33588	30515		-27.4	-5.6	↓		↓	

Comments: Cody has a big dog that might bite, so he let LA + KW into the basement through the back door. To do the main level air sample, LA opened the can in the basement + then Cody took it upstairs to the same room as last year.

Indoor Air Sampling Field Form

Description of Sample Locations (s):

Location Sketch:

www.weather.gov

National Weather Service Forecast Office
Great Falls, MT

Enter location ... Go

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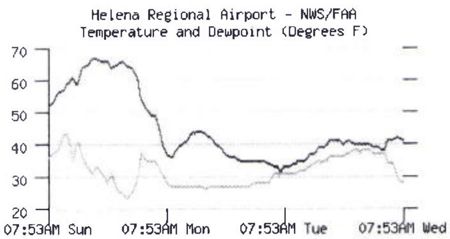

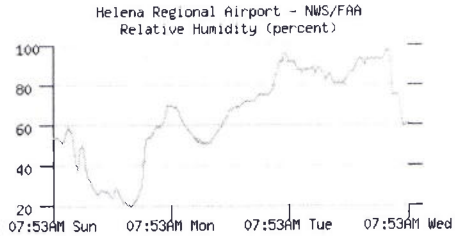

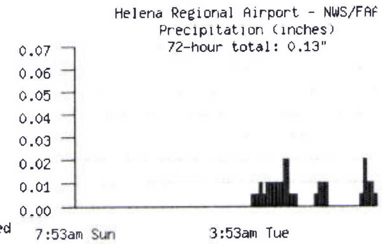

Weather Conditions for:
Helena Regional Airport, MT (KHLN)
Elev: 3874 ft; Latitude: 46.60445; Longitude: -111.98920

Current time: Wed, 18 Mar 8:51 am (MDT)
Most Recent Observation: Wed, 18 Mar 7:53 am MDT (MDT)

Explanation of Wx and Clouds columns.

Time (MDT)	Temp (f)	Dew Point (f)	Relative Humidity (%)	Wind Chill (f)	Wind Direction	Wind Speed (mph)	Visibility (miles)	Wx	Clouds	Sea Level Pressure (mb)	Altimeter Setting (inches)	Station Pressure (inches)	Precip 1 hour (inches)	Precip 3 hour (inches)	Precip 6 hour (inches)	Precip 24 hour (inches)	6 Hr Max Temp	6 Hr Min Temp	24 Hr Max Temp	24 Hr Min Temp	Quality Control
18 Mar 7:53 am MDT	41	28	61		SW	7	10.00		BKN055	1019.7	30.03	26.068									OK
18 Mar 6:53 am MDT	42	29	59		W	13	10.00		CLR	1019.5	30.03	26.068									OK
18 Mar 5:53 am MDT	41	34	75		W	7	10.00		FEW048 OVC060	1019.4	30.02	26.059			0.02	0.12	42	38			OK
18 Mar 4:53 am MDT	41	34	75		WSW	5	10.00		FEW060	1019.0	30.01	26.050									OK
18 Mar 4:13 am MDT	38	37	97		S	3	3.00	BR	SCT002 BKN042 BKN065		30.00	26.041									OK
18 Mar 4:00 am MDT	38	37	97		N	3	2.50	BR	FEW002 BKN041 BKN060		30.00	26.041									OK
18 Mar 3:53 am MDT	38	37	97		WNW	5	1.75	BR	SCT002 SCT043 OVC050	1019.0	30.00	26.041									OK
18 Mar 3:36 am MDT	38	37	97		N	5	1.75	BR	FEW002 OVC050		29.99	26.032									OK
18 Mar 3:29 am MDT	38	37	97		ENE	3	2.50	BR	OVC0[illegible]		29.99	26.032									OK
18 Mar 2:53 am MDT	39	37	93		WNW	5	5.00	BR	BKN045 BKN050 OVC065	1018.3	29.98	26.023		0.02							OK
18 Mar 1:53 am MDT	39	37	93		E	6	6.00	BR	FEW032 BKN090 OVC110	1017.9	29.96	26.006									OK
18 Mar 12:53 am MDT	40	38	93		SE	5	9.00		SCT048 SCT065 OVC080	1017.7	29.96	26.006	0.02						42	32	OK
17 Mar 11:53 pm MDT	40	38	93		CALM		7.00	-RA	OVC0[illegible]	1017.8	29.96	26.006	0.01		0.05		42	40			OK
17 Mar 11:37 pm MDT	40	38	93		CALM		7.00	-RA	SCT017 OVC0[illegible]		29.96	26.006	T								OK
17 Mar 11:09 pm MDT	40	37	89		W	5	8.00	-RA	OVC016		29.96	26.006	T								OK
17 Mar 10:53 pm MDT	40	38	93		W	3	9.00		OVC014	1018.0	29.96	26.006	0.01								OK
17 Mar 9:53 pm MDT	40	38	93		CALM		8.00	-RA	OVC012	1018.0	29.96	26.006	0.01								OK
17 Mar 8:53 pm MDT	41	37	87		CALM		6.00	-RA BR	BKN013 OVC043	1018.1	29.96	26.006	0.02	0.02							OK
17 Mar 7:53 pm MDT	40	36	86		WNW	7	10.00	-RA	OVC013	1018.3	29.96	26.006	T								OK
17 Mar 6:53 pm MDT	41	36	81		NNW	5	10.00		OVC013	1018.3	29.96	26.006									OK
17 Mar 5:53 pm MDT	41	36	81		CALM		10.00		OVC013	1019.1	29.99	26.032			0.01		41	35			OK
17 Mar 4:53 pm MDT	41	36	81		W	5	10.00		BKN014 OVC023	1019.8	30.01	26.050									OK
17 Mar 4:31 pm MDT	40	35	83		W	6	10.00		BKN014 OVC021		30.02	26.059									OK
17 Mar 4:24 pm MDT	40	35	83		WNW	6	10.00		SCT014 OVC021		30.02	26.059									OK
17 Mar 3:53 pm MDT	39	35	86		W	6	10.00		OVC011	1020.5	30.03	26.068									OK
17 Mar 3:15 pm MDT	39	34	82		W	8	10.00		OVC010		30.04	26.077									OK
17 Mar 2:53 pm MDT	39	35	86		W	5	10.00		OVC009	1021.4	30.05	26.086		0.01							OK
17 Mar 1:53 pm MDT	37	34	89		NW	3	10.00		OVC008	1022.7	30.09	26.121									OK
17 Mar 12:53 pm MDT	37	33	85		CALM		10.00		OVC008	1023.8	30.12	26.148	0.01								OK
17 Mar 12:46 pm MDT	36	33	89		CALM		10.00		OVC008		30.12	26.148	0.01								OK
17 Mar 11:53 am MDT	35	32	88		CALM		6.00	UP BR	OVC010	1025.2	30.15	26.175	0.01		0.04		36	32			OK
17 Mar 11:21 am MDT	35	32	88		CALM		6.00	UP BR	OVC010		30.17	26.193	T								OK
17 Mar 10:53 am MDT	35	32	88		CALM		7.00		BKN008 OVC015	1026.0	30.17	26.193									OK
17 Mar 10:23 am MDT	35	31	85		CALM		10.00		BKN009 OVC016		30.18	26.202									OK
17 Mar 10:13 am MDT	34	31	88		NNW	3	10.00		SCT008 OVC016		30.18	26.202									OK
17 Mar 9:53 am MDT	34	31	88		N	3	10.00		OVC008	1026.6	30.19	26.211									OK
17 Mar 9:20 am MDT	34	31	88		CALM		10.00		BKN008 BKN013 OVC021		30.20	26.219									OK
17 Mar 8:53 am MDT	33	31	92		CALM		10.00		FEW006 OVC014	1027.0	30.20	26.219	T	0.03							OK
17 Mar 8:46 am MDT	33	31	92		CALM		10.00		SCT006 OVC014		30.20	26.219	T								OK
17 Mar 7:53 am MDT	33	31	92		CALM		7.00		OVC007	1027.5	30.22	26.237	0.02								OK
17 Mar 7:41 am MDT	33	31	92		CALM		4.00	-SN BR	BKN007 OVC020		30.22	26.237	0.02								OK
17 Mar 7:11 am MDT	32	31	96		CALM		2.00	-SN BR	BKN005 BKN014 OVC025		30.22	26.237	0.01								OK
17 Mar 7:04 am MDT	32	31	96		WNW	3	1.75	-SN BR	SCT005 BKN014 OVC025		30.22	26.237	0.01								OK
17 Mar 6:53 am MDT	32	31	96		WNW	6	2.00	-SN BR	FEW005 SCT012 OVC027	1027.8	30.23	26.246	0.01								OK
17 Mar 6:50 am MDT	32	30	93		WNW	3	1.75	-SN BR	BKN012 OVC027		30.23	26.246	0.01								OK
17 Mar 6:42 am MDT	32	31	96		WNW	5	2.00	-SN BR	BKN010 OVC027		30.24	26.255	0.01								OK
17 Mar 6:25 am MDT	33	31	92		WNW	3	2.00	-SN BR	BKN009 OVC021		30.24	26.255	T								OK
17 Mar 5:53 am MDT	33	31	92		NW	5	4.00	-SN BR	BKN009 OVC046	1028.1	30.25	26.264	0.01		0.01	0.01	35	33			OK
17 Mar 4:53 am MDT	34	29	82		NW	3	6.00	-SN	FEW017 BKN034 OVC047	1028.3	30.26	26.273	T								OK
17 Mar 4:48 am MDT	34	28	80		CALM		7.00	-SN	SCT017 OVC0[illegible]		30.26	26.273	T								OK
17 Mar 3:53 am MDT	35	28	75		NNW	6	10.00		BKN017 BKN026 OVC035	1028.8	30.28	26.291									OK
17 Mar 3:38 am MDT	35	28	75		NNW	6	10.00		SCT016 BKN028 OVC060		30.28	26.291									OK
17 Mar 2:53 am MDT	35	28	75		N	6	10.00		SCT029 OVC060	1029.2	30.29	26.300									OK
17 Mar 1:53 am MDT	35	28	75		WNW	6	10.00		SCT031 OVC060	1029.6	30.31	26.318									OK
17 Mar 12:53 am MDT	35	27	72		W	6	10.00		BKN030 OVC070	1030.4	30.32	26.326							65	35	OK
16 Mar 11:53 pm MDT	35	27	72		W	6	10.00		SCT033 OVC070	1031.2	30.34	26.344					40	35			OK
16 Mar 10:53 pm MDT	35	27	72		W	8	10.00		OVC034	1031.2	30.34	26.344									OK
16 Mar 9:53 pm MDT	36	27	69	29	W	9	10.00		OVC035	1031.8	30.35	26.353									OK
16 Mar 8:53 pm MDT	36	27	69	29	WNW	9	10.00		SCT029 OVC060	1032.0	30.35	26.353									OK
16 Mar 7:53 pm MDT	37	27	67	30	WNW	9	10.00		SCT029 OVC060	1031.7	30.35	26.353									OK

16 Mar 6:53 pm MDT	39	27	62	**32**	NW	12	10.00	FEW030 [illegible] OVC070	1030.6	30.34	26.344							OK
16 Mar 5:53 pm MDT	40	27	59	**32**	NW	14	10.00	[illegible]	1029.5	30.33	26.335			45	40			OK
16 Mar 4:53 pm MDT	42	27	55		NNW	14	10.00	[illegible] OVC075	1028.8	30.32	26.326							OK
16 Mar 3:53 pm MDT	43	26	51		NNW	13	10.00	[illegible]	1028.5	30.31	26.318							OK
16 Mar 2:53 pm MDT	44	27	51		NNW	9	10.00	CLR	1028.0	30.31	26.318							OK
16 Mar 1:53 pm MDT	44	27	51		N	13**G22**	10.00	**BKN030**	1027.2	30.31	26.318							OK
16 Mar 1:33 pm MDT	43	27	53		NNW	13**G20**	10.00	**BKN030**		30.31	26.318							OK
16 Mar 1:26 pm MDT	44	27	51		NNW	10G18	10.00	**BKN029**		30.31	26.318							OK
16 Mar 1:06 pm MDT	43	27	53		N	12	10.00	SCT029		30.31	26.318							OK
16 Mar 12:53 pm MDT	43	27	53		NNW	14**G20**	10.00	**BKN029**	1027.1	30.30	26.309							OK
16 Mar 11:53 am MDT	41	27	56		NNW	14	10.00	**OVC026**	1027.2	30.30	26.309			49	36			OK
16 Mar 10:53 am MDT	40	27	59	**33**	NNW	12	10.00	**OVC028**	1027.0	30.30	26.309							OK
16 Mar 9:53 am MDT	38	27	64	**30**	NW	12	10.00	FEW028	1026.4	30.28	26.291							OK
16 Mar 8:53 am MDT	36	27	69	**27**	NNW	14	10.00	FEW026	1025.4	30.24	26.255							OK
16 Mar 7:53 am MDT	37	28	70	**28**	NNW	14	10.00	[illegible] BKN060	1023.6	30.20	26.219							OK
16 Mar 7:05 am MDT	40	31	70	**31**	N	18	10.00	[illegible]		30.16	26.184							OK
16 Mar 6:53 am MDT	42	31	64		N	20	10.00	[illegible] OVC050	1020.6	30.12	26.148							OK
16 Mar 5:53 am MDT	49	35	59		W	13	10.00	[illegible] OVC070	1018.6	30.08	26.112			65	49			OK
16 Mar 4:53 am MDT	49	35	59		W	12	10.00	[illegible]	1017.7	30.05	26.086							OK
16 Mar 3:53 am MDT	51	35	54		WNW	14	10.00	[illegible] OVC060	1016.4	30.01	26.050							OK
16 Mar 2:53 am MDT	54	37	53		NW	16	10.00	BKN100	1014.1	29.95	25.997							OK
16 Mar 1:53 am MDT	61	29	30		WNW	15**G23**	10.00	OVC100	1011.1	29.87	25.925							OK
16 Mar 12:53 am MDT	64	25	23		WSW	18**G26**	10.00	FEW110	1009.2	29.83	25.890					67	50	OK
15 Mar 11:53 pm MDT	65	23	20		SSW	8	10.00	FEW110	1008.5	29.81	25.872			67	64			OK
15 Mar 10:53 pm MDT	66	25	21		SSW	12**G25**	10.00	SCT110	1008.6	29.81	25.872							OK
15 Mar 9:53 pm MDT	65	26	23		W	13**G24**	10.00	BKN100 OVC120	1010.2	29.85	25.907							OK
15 Mar 8:53 pm MDT	64	31	29		SSW	18**G46**	10.00	FEW009 SCT095 BKN120	1010.7	29.86	25.916							OK
15 Mar 7:53 pm MDT	66	28	24		WSW	14**G29**	10.00	FEW080 OVC100	1010.4	29.85	25.907							OK
15 Mar 6:53 pm MDT	66	31	27		SW	**22G30**	10.00	BKN095	1010.3	29.86	25.916							OK
15 Mar 5:53 pm MDT	67	33	28		SSW	12**G23**	10.00	BKN100	1010.0	29.85	25.907			67	58			OK
15 Mar 4:53 pm MDT	67	31	26		SW	**25G38**	10.00	FEW120	1010.3	29.85	25.907							OK
15 Mar 3:53 pm MDT	65	33	30		SW	14**G26**	10.00	FEW110	1010.6	29.86	25.916							OK
15 Mar 2:53 pm MDT	64	36	35		WSW	13**G20**	10.00	FEW100	1011.8	29.89	25.943							OK
15 Mar 1:53 pm MDT	59	41	51		S	13**G24**	10.00	BKN100 BKN110	1012.7	29.91	25.961							OK
15 Mar 1:29 pm MDT	59	39	48		S	16**G22**	10.00	FEW070 OVC100		29.92	25.970							OK
15 Mar 12:53 pm MDT	61	35	38		W	16**G33**	9.00	FEW055 BKN090 OVC110	1013.3	29.94	25.988							OK
15 Mar 11:53 am MDT	59	43	55		VRBL	3	10.00	FEW050 SCT070 OVC110	1013.5	29.94	25.988			59	50			OK
15 Mar 10:53 am MDT	57	43	59		NNW	7	10.00	FEW055 BKN100	1013.8	29.94	25.988							OK
15 Mar 9:53 am MDT	56	38	51		W	5	10.00	[illegible]	1013.0	29.92	25.970							OK
15 Mar 8:53 am MDT	53	37	54		CALM		10.00	SCT080	1011.5	29.87	25.925							OK

Webmaster
US Dept of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Great Falls Weather Forecast Office
5324 Tri-Hill Frontage Rd
Great Falls, MT 59404-4933

Tel: (406) 453-2081

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Summa IA & CS Check list
3/11/2015, 1306 & 1308 Poplar

Handout "Occupied Dwelling Questionaire"
instruct to complete & collect tomorrow.
1306 Poplar (same for 1308 Poplar).
1) Check canister vacuum, open valve.
2) remove brass cap - put into clipboard.
3) record start time, initial vacuum on
IA sampling field form, and -
Record on
4) blue tag, both sides (start time, Initial, Date)
5) photograph each canister.

Photos, 3/11/2015 by: Bill Hammer

15:51,	43/49	Paintcans, CS, 1306 Poplar
15:51,	44/49	Canister, CS, 1306 Poplar
15:57,	45/49	Canister, IA Kitchen, 1306 Poplar
15:58,	46/49	Canister, IA Kitchen, 1306 Poplar
16:03,	47/49	Canister, CS, 1308 Poplar
16:04,	48/49	Crawlspace, 1308 Poplar
16:08,	49/49	Canister, Kitchen, 1308 Poplar

Bill Hammer

3/11/2015

Indoor Air Sampling Field Form

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1306 + 1308 POPLAR (Duplex)
Charla Taylor : 431-7174
Project Name: Helena Solvent Site VI sampling 2015
PID (made/model/serial #):
Sample location: 1306/1308 POPLAR STREET
Date: 3/11/2015 -
Weather:
Field Personnel: Jessica Smith & Bill Hammer
Air Temp:
Recorded by:
Atmospheric Pressure:

Canister and Sample Information

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Pre-Sample Atmospheric Pressure	Post-Sample Atmospheric Pressure	Pre-Sample Air Temp	Post-Sample Air Temp
3/11/15	4:02 PM	3/12/15	12:06	1306POPLAR-IA-01	34399	30782	—	-26.4	-5.6				
3/11/15	3:55 PM	↓	12:07	1306POPLAR-CR-01	33902	40403	—	-24.8	-5.5				
3/11/15	4:11 PM	↓	12:04	1308POPLAR-IA-01	14887	30830	—	-26.5	-9.4				
3/11/15	4:07 PM	3/12/15	12:01	1308POPLAR-CR-01	34418	30777	—	-25.2	-7.0				

Comments: 12:01

Indoor Air Sampling Field Form

Description of Sample Locations (s):

Location Sketch:

Indoor Air Sampling Field Form

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1232BOZEMAN
John Horne: 442-3970
Project Name: Helena Solvent Site VI sampling 2015
Sample location: 1232 BOZEMAN AVE
Date: 3/10/2015
Field Personnel: Laura Alvey, Syris Treham
Recorded by: Laura Alvey

PID (made/model/serial #):
Weather: Warm, windy, clear
Air Temp: 60° F outside
Atmospheric Pressure:

Canister and Sample Information

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum ~~Gauge #~~	Initial Vacuum	Final Vacuum	Pre-Sample Atmospheric Pressure	Post-Sample Atmospheric Pressure	Pre-Sample Air Temp	Post-Sample Air Temp
3/10/15	15:17	3/11/15	11:05	1232BOZEMAN-IA01	32127	40303	-27.25		-8.5	30.01"			
↓	15:20	~~10:23~~ ↓	10:23	1232BOZEMAN-IA02	34359	40640	-25.4		0	↓			
	15:27		10:36	1232BOZEMAN-AMB	4208	40438	-26.25		-7.1				

Comments: IA-~~E~~01 = located in approx center of warehouse area in north portion of building.
IA-02 = located in approx center of front office area in south part of building.
AMB = located on N. side of building on chain-linked fence.

Indoor Air Sampling Field Form

Description of Sample Locations (s):

Location Sketch:

Sub Slab Air Sampling Field Form

*Fill out one form per subslab sample

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1232 BOZEMAN
Capitol Transfer Storage / John Horne 442-3970
Project Name: Helena Solvent Site VI 2015
PID (made/model/serial #): NA
Sample location: 1232 BOZEMAN AVE
Helium Detector (model/serial #): MGD-2002 /
Date: 3/11/2015
Weather: cool, cloudy, overcast, calm
Field Personnel: Laura Alvey, Kevin Wilkinson, Syris Trehan
Air Temp: outside = 35° F
Recorded by: Laura Alvey
Atmospheric Pressure: 29.98"

Slab Data

Surface/slab Type: Concrete
Surface/slab Thickness (inches): 6-7"
Slab/subsurface substrate comments: brownish soil
Length of probe (feet):
15" hole

Volume to purge (ml): 3 tubing volumes x 10 ml/ft x #ft =
3 x 4' x 10 = 120 ml

Helium Tracer Leak Test Field Data

Date	Time	Cumulative volume purged (ml)	Helium Beneath Shroud (%) min	Helium Beneath Shroud (%) max	Helium in Probe (ppm or %)	Helium Beneath Shroud during sample collection (%) (note min and max)	He beneath shroud during sampling
3/11/15	11:55	120	40-43%	50-60%	0 ppm	11:53 50% 11:55 43% He during leak test	~~33~~ 12:07 33.8 12:22 24% 12:23 33.7% 12:40 26.9%

Conversion: 1.0% = ~~100~~ 10,000 ppm
At 20% He, there should be no more than 2 % (~~200~~ 20,000 ppm) He in sample train

Canister Information

Date	Time	Sample ID	Cannister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	End Time
3/11/15	12:04	1232-BOZEMAN-SS-01	33567			-25.5	-5.0	12:41
	12:03	1232-BOZEMAN-SS-02	6L0007			-25.6	-5.0	12:4

Comments: Building is rented to Pink Gloves Boxing for gym space. No changes in use since last year.

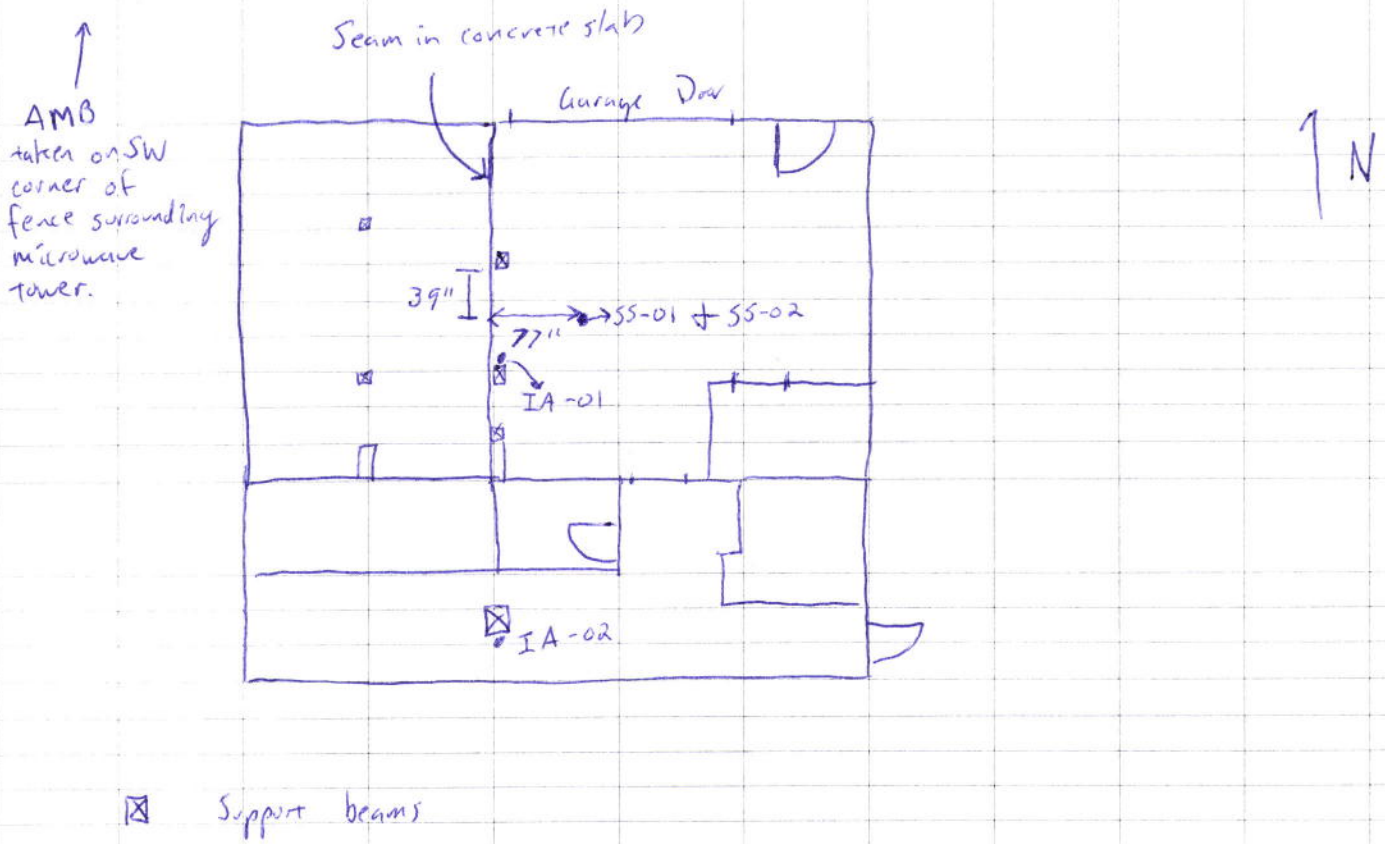
Sub Slab Air Sampling Field Form

Project Name: Helena Solvent Site VI 2015 | Sample Location/ ID:

Date:

Location Description: Include floor type/construction, location of probe, fuel sources, sumps, stored chemicals, drains, etc.

Location Sketch



Indoor Air Sampling Field Form

Montana Department of Environmental Quality
Remediation Division, Site Response Section

Sample ID: 1310 WALNUT

Project Name: Helena Solvent Site VI sampling 2015
PID (made/model/serial #): NA
Sample location: 1310 WALNUT - Janie Carter
Date: 3/9/2015
Weather: Warm (55°F), windy
Field Personnel: Laura Alvey + Dan Norris
Air Temp:
Recorded by: Laura Alvey
Atmospheric Pressure:

Canister and Sample Information

Start Date	Start Time	End Date	End Time	Sample ID	Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum	Final Vacuum	Pre-Sample Atmospheric Pressure	Post-Sample Atmospheric Pressure	Pre-Sample Air Temp	Post-Sample Air Temp
~~3/9/15~~	~~16:04~~			~~1310WALNUT-IA01~~	~~34250~~	~~40304~~	~~26.6~~						
3/9/15	16:04	3/10/15	12:02	1310WALNUT-CR-01	3730	30831	~~-26.5~~	-26.5	-0.6	29.92"		55°F	
3/9/15	16:11	3/10/15	12:07	1310WALNUT-IA-01	34250	40304	~~-27.0~~	-27.0	-4.7	↓		67°F	

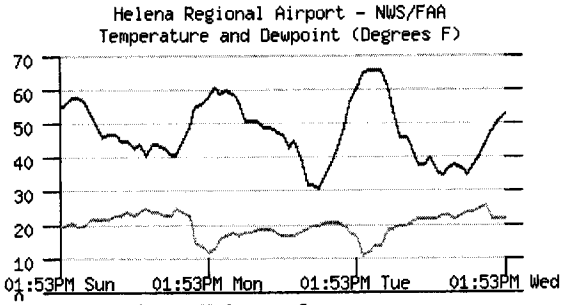
Comments: Janis closed windows
- Crawlspace sample is ~20 feet inside door that opens to crawlspace
- Indoor air sample is in living room in ~~SE~~ SE corner.

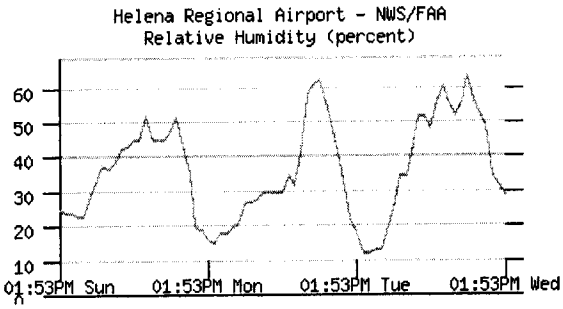
Indoor Air Sampling Field Form

Description of Sample Locations (s):

Location Sketch:

RAW 0 on Show 7 Days Printable Version Show Raw Observations For Information Regarding the Accuracy of This Data: MesoWest Disclaimer and FAQ





Weather Conditions for:

Helena Regional Airport, MT (KHLN)

Elev: 3874 ft; Latitude: 46.60445; Longitude: -111.98920

Current time: Wed, 11 Mar 2:41 pm (MDT)

Most Recent Observation: Wed, 11 Mar 1:53 pm MDT (MDT) Explanation of Wx and Clouds columns.

Time (MDT)	Temp. (f)	Dew Point (f)	Relative Humidity (%)	Wind Direction	Wind Speed (mph)	Visibility (miles)	WX	Clouds	Sea Level Pressure (mb)	Altimeter Setting (inches)	Station Pressure (inches)	6 Hr Max Temp	6 Hr Min Temp	24 Hr Max Temp	24 Hr Min Temp	Quality Control
11 Mar 1:53 pm MDT	53	22	29	CALM		10.00		OVC110	1016.5	29.97	26.014					OK
11 Mar 12:53 pm MDT	51	22	32	NW	5	10.00		FEW120	1017.0	29.97	26.014					OK
11 Mar 11:53 am MDT	48	22	35	N	3	10.00		CLR	1017.9	29.99	26.032	48	34			OK
11 Mar 10:53 am MDT	44	26	49	CALM		10.00		CLR	1018.1	30.00	26.041					OK
11 Mar 9:53 am MDT	41	25	52	CALM		9.00		CLR	1017.6	29.98	26.023					OK
11 Mar 8:53 am MDT	38	24	57	CALM		10.00		CLR	1017.8	29.98	26.023					OK
11 Mar 7:53 am MDT	35	24	64	CALM		10.00		CLR	1017.2	29.98	26.023					OK
11 Mar 6:53 am MDT	37	23	56	CALM		10.00		CLR	1016.3	29.97	26.014					OK
11 Mar 5:53 am MDT	38	22	52	CALM		10.00		CLR	1015.4	29.96	26.006	40	33			OK
11 Mar 4:53 am MDT	37	23	56	CALM		10.00		CLR	1015.6	29.97	26.014					OK
11 Mar 3:53 am MDT	35	23	61	CALM		10.00		CLR	1016.0	29.97	26.014					OK
11 Mar 2:53 am MDT	36	22	56	NW	3	10.00		CLR	1016.4	29.98	26.023					OK
11 Mar 1:53 am MDT	40	22	48	SW	3	10.00		CLR	1016.7	29.99	26.032					OK
11 Mar 12:53 am MDT	38	22	52	CALM		10.00		CLR	1017.3	29.99	26.032			68	29	OK
10 Mar 11:53 pm MDT	38	22	52	CALM		10.00		CLR	1017.8	29.99	26.032	66	38			OK
10 Mar 10:53 pm MDT	43	21	41	CALM		10.00		CLR	1017.9	29.99	26.032					OK
10 Mar 9:53 pm MDT	46	20	35	CALM		10.00		CLR	1017.4	29.97	26.014					OK
10 Mar 8:53 pm MDT	46	20	35	VRBL	3	10.00		CLR	1017.1	29.95	25.997					OK
10 Mar 7:53 pm MDT	54	19	25	SW	8	10.00		CLR	1016.3	29.94	25.988					OK
10 Mar 6:53 pm MDT	61	19	20	SSE	6	10.00		CLR	1015.2	29.93	25.979					OK
10 Mar 5:53 pm MDT	66	14	13	ENE	3	10.00		CLR	1014.9	29.93	25.979	68	48			OK
10 Mar 4:53 pm MDT	66	14	13	SSE	8	10.00		CLR	1014.4	29.94	25.988					OK
10 Mar 3:53 pm MDT	66	12	12	W	10	10.00		CLR	1013.9	29.94	25.988					OK
10 Mar 2:53 pm MDT	65	11	12	W	13	**G25**	10.00	CLR	1015.7	29.98	26.023					OK
10 Mar 1:53 pm MDT	60	17	18	VRBL	6	10.00		CLR	1016.9	30.01	26.050					OK
10 Mar 12:53 pm MDT	56	18	22	VRBL	3	10.00		CLR	1017.8	30.03	26.068					OK
10 Mar 11:53 am MDT	49	20	31	SW	3	10.00		CLR	1018.5	30.03	26.068	49	29			OK
10 Mar 10:53 am MDT	43	21	41	NNW	5	10.00		CLR	1019.5	30.05	26.086					OK
10 Mar 9:53 am MDT	38	21	50	NW	3	10.00		CLR	1019.6	30.04	26.077					OK
10 Mar 8:53 am MDT	35	21	56	CALM		10.00		CLR	1019.7	30.04	26.077					OK
10 Mar 7:53 am MDT	31	20	63	SSW	3	10.00		CLR	1019.7	30.03	26.068					OK
10 Mar 6:53 am MDT	32	20	61	WSW	5	10.00		CLR	1019.0	30.03	26.068					OK
10 Mar 5:53 am MDT	32	19	58	NW	3	10.00		CLR	1018.1	30.01	26.050	51	31			OK
10 Mar 4:53 am MDT	40	18	41	SW	7	10.00		CLR	1016.8	29.99	26.032					OK
10 Mar 3:53 am MDT	45	17	32	SW	7	10.00		CLR	1016.7	30.00	26.041					OK
10 Mar 2:53 am MDT	43	17	35	S	7	10.00		CLR	1016.8	30.00	26.041					OK
10 Mar 1:53 am MDT	47	17	30	WSW	5	10.00		CLR	1016.4	29.99	26.032					OK
10 Mar 12:53 am MDT	48	18	30	W	5	10.00		CLR	1016.4	29.99	26.032			62	37	OK
09 Mar 11:53 pm MDT	49	19	30	SW	7	10.00		CLR	1016.1	29.98	26.023	59	46			OK
09 Mar 10:53 pm MDT	49	19	30	W	8	10.00		CLR	1016.1	29.97	26.014					OK

09 Mar 9:53 pm MDT	51	19	28	SW	8	10.00	CLR	1015.2	29.93	25.979					OK
09 Mar 8:53 pm MDT	51	18	27	VRBL	3	10.00	CLR	1014.8	29.91	25.961					OK
09 Mar 7:53 pm MDT	51	18	27	W	6	10.00	CLR	1014.0	29.89	25.943					OK
09 Mar 6:53 pm MDT	57	17	21	WNW	15	10.00	CLR	1013.2	29.89	25.943					OK
09 Mar 5:53 pm MDT	59	18	20	W	15**G20**	10.00	CLR	1013.1	29.89	25.943	62	55			OK
09 Mar 4:53 pm MDT	60	17	18	W	**20**	10.00	CLR	1013.1	29.89	25.943					OK
09 Mar 3:53 pm MDT	59	16	18	W	17	10.00	CLR	1014.5	29.92	25.970					OK
09 Mar 2:53 pm MDT	61	13	15	W	14**G23**	10.00	CLR	1014.8	29.95	25.997					OK
09 Mar 1:53 pm MDT	58	12	16	WSW	13**G25**	10.00	CLR	1016.4	29.98	26.023					OK
09 Mar 12:53 pm MDT	56	14	19	W	**22G26**	10.00	CLR	1017.1	30.00	26.041					OK
09 Mar 11:53 am MDT	55	15	20	WSW	16	10.00	CLR	1017.9	30.02	26.059	55	37			OK
09 Mar 10:53 am MDT	49	23	36	ESE	7	10.00	CLR	1018.3	30.02	26.059					OK
09 Mar 9:53 am MDT	45	24	43	ENE	5	10.00	CLR	1019.3	30.04	26.077					OK
09 Mar 8:53 am MDT	41	25	52	CALM		10.00	CLR	1019.1	30.02	26.059					OK
09 Mar 7:53 am MDT	41	23	48	WNW	7	10.00	CLR	1018.6	30.02	26.059					OK
09 Mar 6:53 am MDT	43	23	45	SSE	6	10.00	CLR	1018.4	30.03	26.068					OK
09 Mar 5:53 am MDT	44	24	45	W	10**G21**	10.00	CLR	1017.8	30.02	26.059	47	39			OK
09 Mar 4:53 am MDT	44	24	45	W	12	10.00	CLR	1017.6	30.02	26.059					OK
09 Mar 3:53 am MDT	41	25	52	CALM		10.00	CLR	1018.0	30.02	26.059					OK
09 Mar 2:53 am MDT	44	24	45	W	13G17	10.00	CLR	1018.0	30.03	26.068					OK
09 Mar 1:53 am MDT	43	23	45	W	6	10.00	CLR	1018.1	30.02	26.059					OK
09 Mar 12:53 am MDT	45	24	43	WNW	8	10.00	CLR	1018.3	30.03	26.068			58	24	OK
08 Mar 11:53 pm MDT	45	23	42	W	10	10.00	CLR	1018.7	30.03	26.068	57	44			OK
08 Mar 10:53 pm MDT	47	23	39	W	13	10.00	CLR	1019.4	30.03	26.068					OK
08 Mar 9:53 pm MDT	47	22	37	W	12	10.00	CLR	1019.3	30.02	26.059					OK
08 Mar 8:53 pm MDT	46	22	38	W	5	10.00	CLR	1020.0	30.02	26.059					OK
08 Mar 7:53 pm MDT	49	22	34	W	16**G23**	10.00	CLR	1019.3	30.00	26.041					OK
08 Mar 6:53 pm MDT	53	22	29	WNW	13**G23**	10.00	CLR	1018.6	29.99	26.032					OK
08 Mar 5:53 pm MDT	57	20	23	W	**20**	10.00	CLR	1018.0	29.98	26.023	58	50			OK
08 Mar 4:53 pm MDT	58	20	23	W	18**G26**	10.00	CLR	1017.8	29.99	26.032					OK
08 Mar 3:53 pm MDT	58	21	24	W	**20G30**	10.00	CLR	1018.2	30.00	26.041					OK
08 Mar 2:53 pm MDT	56	20	24	WSW	18**G26**	10.00	CLR	1019.1	30.02	26.059					OK

Webmaster
US Dept of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Great Falls Weather Forecast Office
5324 Tri-Hill Frontage Rd
Great Falls, MT 59404-4933

Tel: (406) 453-2081

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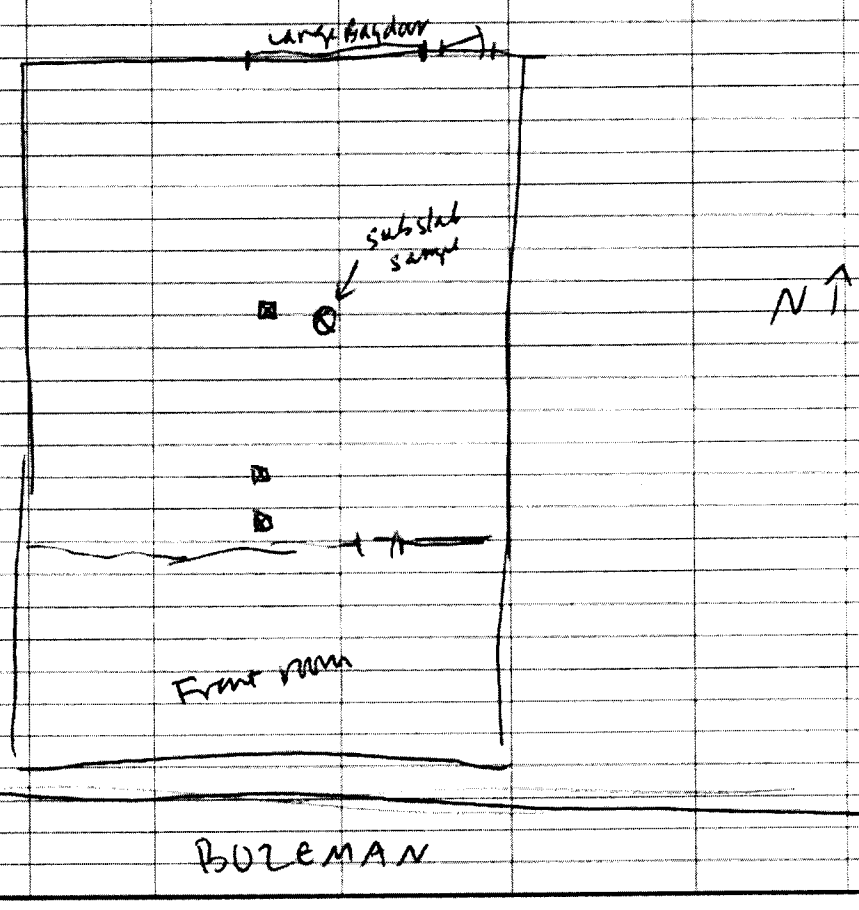
Sub-Slab Soil Vapor Sampling Field Data Sheet

Project Name: HSS	Sample Location/ ID: 1232 BOZEMAN-SS01
Date: 3/14/11	

Location Description: Include floor type/construction, location of probe, fuel sources, sumps, stored chemicals, drains, etc.

Exposed concrete floor. Many cracks + joints. We selected a location of concrete that was complete and - no cracks/joints but still central to the slab.

Location Sketch:



February 18, 2014

Helena, MT 59601

Re: Indoor air and subslab air sampling for investigation of the Helena Solvent Site

Dear :

This winter, the Montana Department of Environmental Quality (DEQ) will be collecting indoor air and subslab air samples at a number of properties near the Helena Solvent Site (Site). DEQ sampled indoor and subslab air during winter 2010 and 2011 at properties at or near the Site, and found elevated concentrations of tetrachloroethylene (PCE) in subslab and indoor air in some structures. PCE is a chlorinated solvent commonly used in drycleaning processes and historically used as a degreaser. The elevated concentrations found in the indoor and subslab air at the Site are associated with contaminated groundwater and, possibly, from other underground sources. Late in fall 2013, DEQ discovered that PCE-contaminated groundwater extends farther north than previously anticipated.

This winter, in response to the new groundwater information, DEQ plans to expand the sampling area to investigate other structures that may be impacted. DEQ is evaluating the Central-Linc Elementary school located on Poplar Street in Helena, Montana, for inclusion in the expanded sampling effort.

I will be calling you, or a designated representative, to discuss the investigation and set up a meeting with you at the property. During the meeting we will discuss how sampling will occur, look for indoor sources of solvents, identify potential sample locations, and fill out the attached Indoor Air Questionnaire. My contact information is at the end of this letter.

DEQ has not yet planned exact dates for this sampling event, but it will occur this winter. If DEQ selects your building for sampling, I will coordinate with you to determine a sampling time that works for you.

This remedial investigation is being conducted pursuant to §75-5-603, MCA of Montana's Water Quality Act. Personnel from DEQ, and potentially a DEQ contractor, will be conducting the work. The investigation will be conducted according to a DEQ-approved Sampling and Analysis Plan (SAP). DEQ will provide you a copy of the SAP at your request.

Pursuant to §75-5-603, MCA, DEQ and its authorized representatives are authorized to enter upon any private property at reasonable times to investigate conditions relating to the pollution of state waters. However, DEQ would like to conduct the planned activities in cooperation with you.

This work will be completed at no cost to you. DEQ will provide you (and tenants if applicable) with copies of the sample results. DEQ will compare the results of the air samples to the Environmental Protection Agency's Regional Screening Levels or other DEQ- approved screening levels.

Please note that you may request that a split (also called a "duplicate") sample to be collected during the investigation for you to have analyzed, however, any split sampling and analysis of split samples will be conducted at your expense.

DEQ sincerely appreciates your assistance with this investigation. Please feel free to call or email me with any questions or concerns you may have. My contact information is:

Laura Alvey
(406) 841-5062
Lalvey@mt.gov

PO Box 200901
Helena, MT 59620-0901

Sincerely,

Laura Alvey
Groundwater Remediation Program
Remediation Division

cc: Katherine Haque-Hausrath, DEQ Legal

Inside air sample, main level living area at 1328/1330 Walnut Street

3/5/2015

Photo by L. Alvey

Inside air sample, main level living area at 1328/1330 Walnut Street

3/5/2015

Photo by L. Alvey

Basement air sample at 1328/1330 Walnut. Note exposed dirt floor. Looking south.

3/5/2015

By Laura Alvey

Basement air sample at 1328/1330 Walnut. Note exposed dirt floor. Looking north.

3/5/2015

By Laura Alvey

Outside air sample at 1328/1330 Walnut. Second level porch. Looking north.

3/5/2015

Photo taken by Laura Alvey

Family Outreach Partnership

1212 Helena Ave

Upstairs air.

By Laura Alvey

Family Outreach Partnership

1212 Helena Ave
Upstairs air
3/7/2015

By Laura Alvey

Family Outreach Partnership

1212 Helena Ave
Basement air
3/7/2015

By Laura Alvey

Family Outreach Partnership

1212 Helena Ave
Basement air
Duplicate sample

3/7/2015
By Laura Alvey

Family Outreach Partnership

1212 Helena Ave
Basement air

Duplicate sample close up
3/7/2015
By Laura Alvey

Family Outreach Partnership

1236 Helena Ave

Upstairs air. Conference room.

3/7/2015

By Laura Alvey

Family Outreach Partnership

1236 Helena Ave

Upstairs air hallway

3/7/2015

By Laura Alvey

Family Outreach Partnership

1236 Helena Ave

Basement air

3/7/2015

By Laura Alvey

Family Outreach Partnership

1236 Helena Ave

Basement air

3/7/2015

By Laura Alvey

Family Outreach Partnership outdoor air sample location. Looking east.

1212 Helena Ave

West side of building

3/7/2015

By Laura Alvey

Family Outreach Partnership

1236 Helena Ave

subslab sample location in “phone room” prior to drilling hole.

3/7/2015

By Laura Alvey

Family Outreach Partnership.
1236 Helena Ave.
Slab prior to drilling hole closeup.

3/7/2015

By Laura Alvey

Family Outreach Partnership.
1236 Helena Ave.
Subslab sampling in “phone room.”

3/7/2015

By Laura Alvey

Family Outreach Partnership.
1236 Helena Ave.

Phone room subslab hole after sampling and grouting.

3/7/2015

By Laura Alvey

Family Outreach Partnership.

1212 Helena Ave.
Subslab sample location under stairs.

3/7/2015

By Laura Alvey

Family Outreach Partnership

1212 Helena Ave.

Subslab sample probe location under stairs.

3/7/2015

By Laura Alvey

Family Outreach Partnership

1212 Helena Ave.

Under stairs subslab sample during sampling.

3/7/2015

By Laura Alvey

Family Outreach Partnership

1212 Helena Ave.

Subslab sample under stairs location following grouting.

3/7/2015

By Laura Alvey

1225 Cedar Street. East basement conference room indoor air sample.

3/8/2015

By Laura Alvey

1225 Cedar Street. East basement indoor air. Duplicate sample.

3/8/2015

By Laura Alvey

1225 Cedar Street. East basement indoor air. Duplicate sample close up.

3/8/2015

By Laura Alvey

1225 Cedar Street. West basement indoor air.

3/8/2015

By Laura Alvey

1225 Cedar Street. West basement indoor air.

3/8/2015

By Laura Alvey

1225 Cedar Street. Upstairs air sample, west side of building.

3/8/3015

By Laura Alvey

1310 Walnut

Crawlspace access for crawlspace air sample.

3/10/2015

By Laura Alvey

1310 Walnut
Crawlspace air sample location.

3/10/2015

By Laura Alvey

1310 Walnut
Indoor air sample location.

3/10/2015

By Laura Alvey

1232 Bozeman. Outdoor air sample. Looking north.

3/11/2015

By Laura Alvey

1232 Bozeman. Drilling hole for subslab sample. Approx center of slab.

3/11/2015

By Laura Alvey

1232 Bozeman. Duplicate subslab sample. Approx center of slab.

3/11/2015

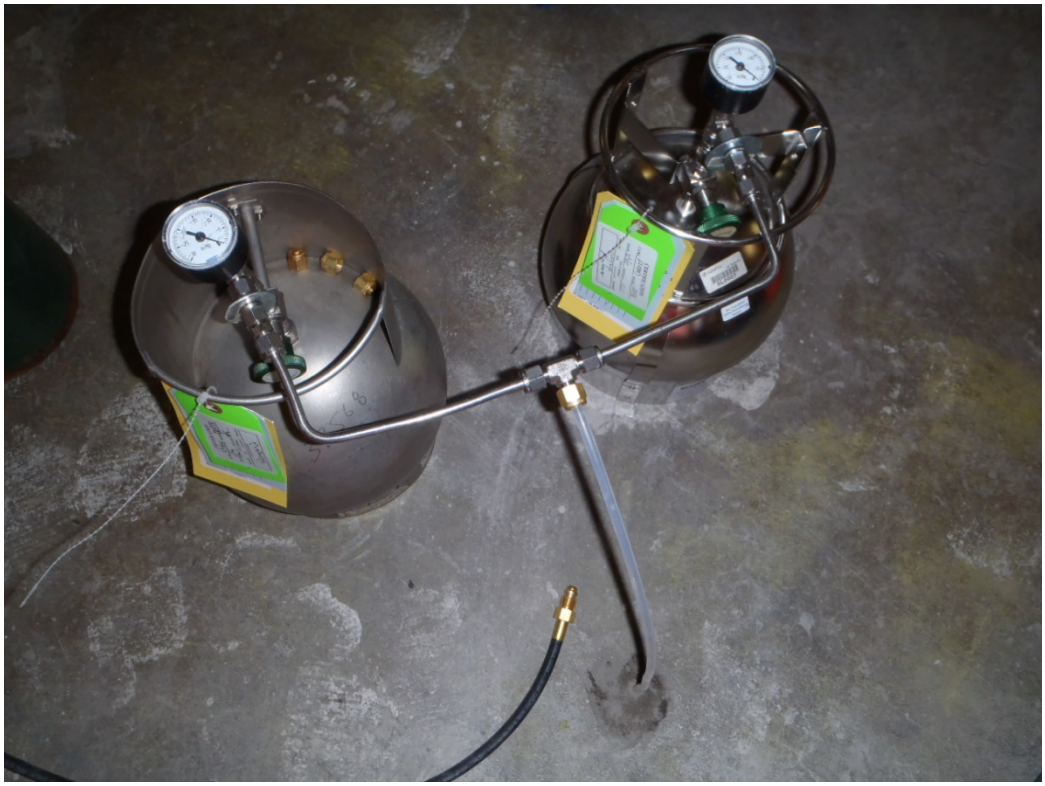
By Laura Alvey

1232 Bozeman. Duplicate subslab sample. Approx center of slab.

closeup

3/11/2015

By Laura Alvey



1232 Bozeman.

Post-grouting subslab sample. Approx center of slab.

3/11/2015

By Laura Alvey

1232 Bozeman.

Post-grouting subslab sample. Close-up.

3/11/2015

By Laura Alvey

1306 Poplar (connected basement crawlspace with 1308 Poplar)

Paint cans in basement.

3/11/2015

By Bill Hammer

1306 Poplar

Basement air /crawlspace sample location.

3/11/2015

By Bill Hammer

1306 Poplar

Indoor air sample in kitchen. Looking south.

3/11/2015

By Bill Hammer

1306 Poplar

Indoor air sample in kitchen. Looking north.

3/11/2015

By Bill Hammer

1308 Poplar

Basement/ crawlspace air sample location.

3/11/2015

By Bill Hammer

1308 Poplar

Photo of basement/ crawlspace.

3/11/2015

By Bill Hammer

1308 Poplar

Indoor air sample location in kitchen

3/11/2015

By Bill Hammer

1334 Walnut

Basement indoor air sample.

3/12/2015

By Laura Alvey

1334 Walnut

Ambient air sample on deck on north side of house.

3/12/2015

By Laura Alvey

1334 Walnut

Subslab sample location in basement utility room

3/13/2015

By Laura Alvey

1334 Walnut

Indoor air sample on main level in dining area.

3/12/2015

By Laura Alvey

1334 Walnut

Subslab probe repair at 1334 Walnut.

3/13/2015

1230 Poplar

Basement air sample location

3/17/2015

By Laura Alvey

1230 Poplar

Second floor bedroom indoor air sample.

3/17/2015

By Laura Alvey

1230 Poplar

First floor indoor air sample.

3/17/2015

By Laura Alvey

1308 Phoenix

Subslab probe repair

3/17/2015

1308 Phoenix

Subslab probe hole repair following sampling.

3/17/2015

By Laura Alvey

1230 Poplar

Subslab probe hole repair following sampling.

3/17/2015

By Laura Alvey

1000 East Lyndale

Ambient air sample in fenced area outside of ProBuild. Looking north

3/19/2015

By Laura Alvey

1000 East Lyndale

Ambient air sample in fenced area outside of ProBuild. Looking south south east.

3/19/2015

By Laura Alvey

1200 Bozeman

Basement air duplicate sample.

3/24/2015

By Laura Alvey

1200 Bozeman

Subslab probe repair in main level.

3/24/2015

By Laura Alvey

1200 Bozeman

Main level subslab hole repair closeup.

3/17/2015

By Laura Alvey

1200 Bozeman

Main level subslab sample location. Looking south.

3/17/2015

By Laura Alvey

1200 Bozeman

Subslab sampling
in basement.
Looking north.

3/17/2015

By Laura Alvey

1200 Bozeman

Subslab sampling
in basement.

Looking west.

3/17/2015

By Laura Alvey

1200 Bozeman

Subslab sampling in basement.

Looking southwest.

3/17/2015

By Laura Alvey

1200 Bozeman

Subslab probe repair in basement.

3/17/2015

By Laura Alvey

1200 Bozeman

Subslab probe hole repair.

3/17/2015

By Laura Alvey

1120 Helena Avenue (vacant office space at Hustad Center)

Subslab sampling location.

3/19/2015

By Laura Alvey

1120 Helena Avenue

Close up of subslab sampling.

3/19/2015

By Laura Alvey

1120 Helena Avenue

Subslab sample location repair.

3/19/2015

By Laura Alvey

1118 Helena Avenue

Subslab sample location at Mr. Wise Cleaners

3/19/2015

By Laura Alvey

1118 Helena Avenue

Close up of subslab sample location at Mr. Wise Cleaners.

3/19/2015

By Laura Alvey

1118 Helena Avenue

Subslab probe repair following sampling.

3/19/2015

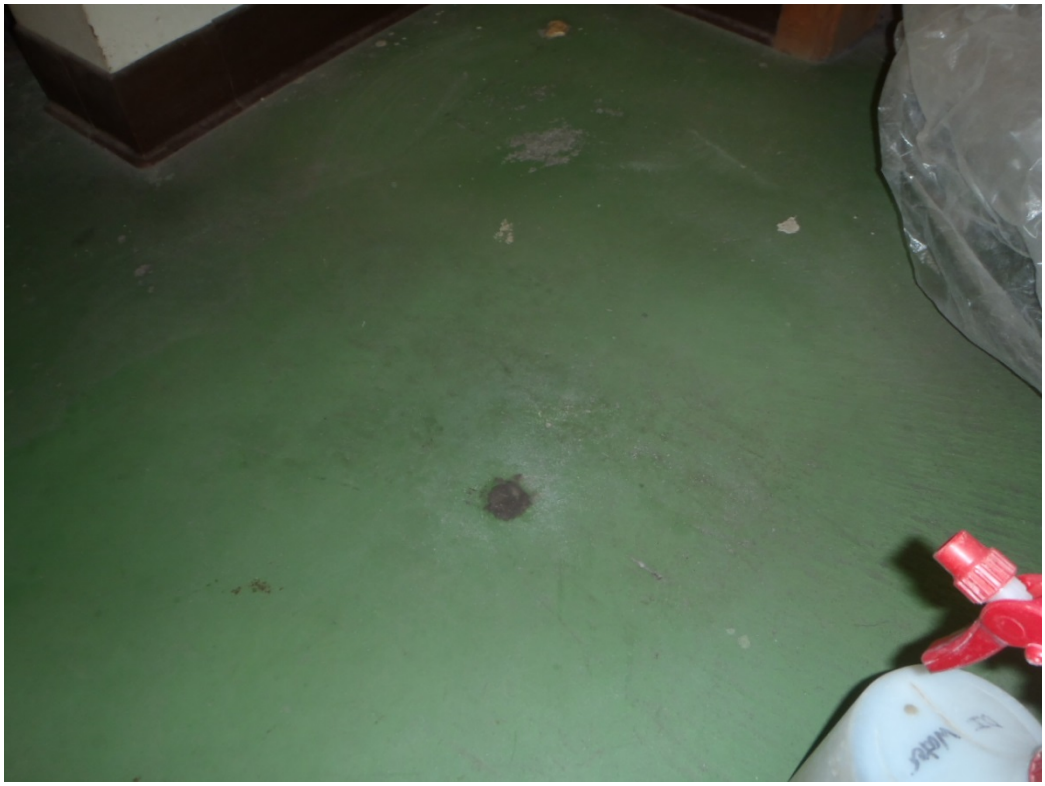
By Laura Alvey

1118 Helena Avenue

Close up of subslab probe repair.

3/19/2015

By Laura Alvey



Appendix F – Site Specific Screening Levels backup information

Final Task I Risk Assessment Amendment Number 2

Burlington Northern Livingston Shop Complex
Livingston, Montana

August 2012
Prepared by Montana Department of Environmental Quality (DEQ)

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1.0 Introduction

The purpose of this Final Risk Assessment Amendment Number 2 (Amendment 2) is to finalize the residential and commercial indoor air cleanup levels for inhabitable structures at the Burlington Northern Livingston Shop Complex Facility (Facility). It has been prepared in response to comments received during the public comment period on the Final Draft Amendment 2. Attachment 1 provides DEQ's responses to the comments received during the comment period.

The cleanup levels for two compounds, benzene and ethylbenzene, were provided in the January 2010 Final Task I Risk Assessment Amendment and Montana Department of Environmental Quality Approved Remedy For Newly Identified Contaminants of Concern in Indoor Air (January 2010 Amendment), DEQ, January 2010). These cleanup levels remain the same and will merely be mentioned in this document for completeness. DEQ is preparing this amendment because the United States Environmental Protection Agency (EPA) has recently released final toxicity criteria for tetrachloroethene (PCE; EPA 2012) and trichloroethene (TCE; EPA 2011) and because recent indoor air and soil vapor samples collected on the railyard indicate that some contaminants of concern (COCs) may be eliminated because they are not impacting indoor air at the Facility above screening levels.

2.0 Background

The remedy for indoor air selected in DEQ's 2001 Record of Decision (ROD), which is outlined in greater detail in "Task I: Basement VOC Gas Investigation and Removal" of the August 2005 Spring Statement of Work (SOW), includes indoor air sampling at certain inhabitable structures to evaluate if these structures have indoor air concentrations of COCs above screening levels (SOW at 21, ROD at 47). If an exceedance of a screening level in an inhabitable structure is identified, the exceedance must be reproducible and reasonably attributable to vapor intrusion by volatile organic compounds (VOCs) migrating from the subsurface (SOW at 21, 23, 24, Figure 1 and Table 1 of Attachment 2). If the indoor air exceedance is reproducible and attributable, BNSF must conduct additional sampling, and implement mitigation systems to meet final site-specific cleanup levels, unless the VOCs in indoor air are not related to the Facility (SOW at 23, ROD at 47).

The procedures for ambient (outdoor) air sampling, indoor air sampling, and soil gas sampling at the Facility are described in the DEQ-approved *Final Task I Supplemental Investigation Work Plan for Indoor Air* (Kennedy/Jenks, 2005) and addenda thereto (DEQ, 2006a, 2007a, including February 2010 insert).

For the COCs that are identified in the ROD, this Task includes a provision for the development of alternate cleanup levels than those presented in the ROD (SOW at 21). BNSF previously developed site-specific screening levels that were included in the SOW and the SOW allows these screening levels to be used as cleanup levels. However, the SOW also allows for the development of alternate site-specific cleanup levels that comply with Attachment 2 of the SOW (SOW, Attachment 2, Section B).

In January 2009, BNSF requested that site-specific cleanup levels be developed for the Facility. DEQ developed cleanup levels that were based upon one of two things: (1) risk-based values derived to be protective of people who might be exposed to the contaminants; or (2) background concentrations of contaminants typically found in indoor air from sources not related to the railyard. The risk-based cleanup levels are calculated to meet the requirements in the ROD for the Facility and the SOW, as updated by the DEQ March 10, 2009 letter to BNSF. DEQ determined that it was necessary to update the parameters in the tables in Attachment 2 of the SOW, which must be used to calculate site-specific risk-based cleanup levels for indoor air at the Facility. These updated parameters, as well as an explanation as to why they must be used to calculate site-specific cleanup levels at the Facility, were provided in the January 2010 Amendment. DEQ is not updating these parameters in this Amendment 2. For completeness, DEQ has provided Tables 1 and 2, which have not been changed from the January 2010 Amendment. For contaminants like benzene and ethylbenzene that are typically found in indoor and outdoor air at concentrations greater than risk-based values for residential exposure, DEQ developed site-specific cleanup levels based upon background concentrations due to indoor and outdoor sources found in buildings with no contaminants in the soil gas beneath them. DEQ provided these cleanup levels in the January 2010 Amendment. DEQ will provide them in this document for completeness; however, these are the final cleanup levels for these compounds and DEQ is not soliciting comment on them.

In 2010, 2011, and 2012, BNSF collected additional indoor air, soil gas, and outdoor air samples at the Facility at DEQ's request. BNSF submitted these data to DEQ.

3.0 Selection of COCs

Five COCs were identified for indoor air in the ROD: PCE, TCE, cis-1,2-dichloroethene (DCE), vinyl chloride, and trans-1,2-DCE (ROD at 50). These were the five COCs identified in the SOW and BNSF developed site-specific screening levels for them (SOW at 22).

As outlined in its March 10, 2009 letter and January 10, 2010 Amendment, DEQ identified two additional COCs in indoor air for both residential structures and commercial/industrial structures located on the railyard: benzene and ethylbenzene, as well as three additional COCs for indoor air in commercial/industrial structures: chloroform, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene. DEQ also eliminated contaminants as COCs, including the two 1,2-DCE compounds, because their indoor air concentrations did not exceed their screening levels for indoor air anywhere at the Facility.

In accordance with the ROD and the SOW, DEQ has considered the data collected during investigations at the Facility between 2005 and 2012, and DEQ has determined that the COCs for residential indoor air are benzene and ethylbenzene, both with final cleanup levels based upon indoor air background concentrations, as well as PCE and TCE. Based upon the data collected in 2011 and 2012, DEQ has determined that these same four COCs are the only COCs for commercial/industrial exposure on the railyard.

DEQ was able to eliminate vinyl chloride as a COC for non-railyard structures at the Facility in the Interim Final Task I Risk Assessment Amendment Number 2 (DEQ, 2011) because all of the data through 2010 showed that there was not an exceedance of the vinyl chloride cleanup level or screening level in an inhabitable structure that was reproducible and reasonably attributable to vapor intrusion by VOCs migrating from the subsurface (SOW at 23, ROD at 47). The 2011 and 2012 data for railyard structures indicates that there are no exceedances of commercial/industrial screening levels for chloroform, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene in indoor air and therefore, DEQ will eliminate these compounds as COCs for the railyard structures.

It is possible that some contaminants may be present in indoor air due to indoor or outdoor sources. However, as provided in the SOW, a COC for indoor air is a contaminant that exceeds an indoor air screening level in an inhabitable structure, and the exceedance is reproducible and reasonably attributable to vapor intrusion by VOCs migrating from the subsurface (SOW at 23, ROD at 47). The following is the list of compounds that meet the criteria provided in the SOW to be considered a COC for indoor air in residential or commercial/industrial structures at the Facility. DEQ notes that the "ROD selected remedy requires all residences and businesses that have indoor air VOC concentrations from subsurface vapor intrusion above site-specific cleanup levels for indoor air to have a protection system installed at no cost to the owner, **unless the VOCs in indoor air are not related to the Facility** (SOW at 23) (emphasis added).

Indoor Air COCs
Tetrachloroethene
Trichloroethene
Benzene
Ethylbenzene

While DEQ generally requires that all COCs be considered in calculating cumulative human health risks under the Comprehensive Environmental Cleanup and Responsibility Act (CECRA), DEQ must also take into account concentrations of compounds that are not present due to an environmental spill or release but may be found in the environment either naturally or through anthropogenic (related to human activities) causes. For this reason, DEQ considered benzene and ethylbenzene separately from the other COCs in indoor air in non-railyard buildings. The cleanup levels for the benzene and ethylbenzene for indoor air in non-railyard buildings at the Facility are based upon typical indoor air concentrations found in Livingston, and are not revised in this Amendment 2. Please refer to the January 2010 Amendment for further information.

4.0 Exposure Assumptions

The human health risk-based cleanup levels for PCE and TCE are developed based upon the type and magnitude of potential current and future human exposures to the COCs (DEQ, 2005b). Exposure assumptions are combined with chemical-specific toxicity values to derive cleanup levels. Please refer to the January 2010 Amendment for more detail. DEQ is providing the information included in the January 2010 Amendment regarding the exposure assumptions in this Amendment 2. However, DEQ will not solicit additional public comment on these

assumptions, because these assumptions have not changed from the assumptions used in the January 2010 Amendment.

4.1 Exposure Assumptions for Residential Exposure to Indoor Air

The residential exposure assumptions are included in **Table 1**. These exposure assumptions were contained within Attachment 2 of the SOW as clarified by the March 10, 2009 DEQ letter. (DEQ, 2009c). As stated above, these assumptions have not changed from those used in the January 2010 Amendment.

Exposure Time – Residents are assumed to potentially be exposed to indoor air in their homes for 24 hours a day resulting in an exposure time of 24 out of a total of 24 hours per day and a ratio of 1. This is meant to be protective of sensitive populations that may include young children, adults who stay at home, home-schooled children, or the elderly.

Exposure Frequency – Residents are assumed to be exposed to indoor air in their homes for 350 days per year allowing for two weeks away from home per year.

Exposure Duration – Residents are assumed to potentially be living in a given home for 30 years starting when someone is a baby.

Averaging Time (Cancer) – Carcinogenic risks are averaged over a lifetime, which is assumed to be 75 years based upon research conducted by the EPA. Averaging time is expressed by multiplying 75 years by 365 days per year resulting in an averaging time of 27,375 days.

Averaging Time (Non-Cancer) – Non-carcinogenic exposures are averaged over the exposure duration. The assumed duration of exposure is 30 years. The calculated non-cancer averaging time is 30 years multiplied by 365 days per year resulting in an averaging time of 10,950 days.

4.2 Exposure Assumptions for Commercial/Industrial Workers Exposure to Indoor Air

The commercial/industrial worker exposure assumptions are included in **Table 2**. These exposure assumptions were contained within Attachment 2 of the SOW as clarified by the March 10, 2009 DEQ letter. (DEQ, 2009c). As stated above, these assumptions have not changed from those used in the January 2010 Amendment.

Exposure Time – Workers are assumed to potentially be exposed to indoor air at work for 8 hours a day resulting in an exposure time of 8 out of a total of 24 hours per day or a ratio of 0.33.

Exposure Frequency – Workers are assumed to be exposed to indoor air at work for 250 days per year allowing for a five day work week and two weeks vacation per year.

Exposure Duration – Workers in Livingston are assumed to potentially work at a given business for 30 years. This assumption is based upon railyard employee interviews indicating that a typical Livingston railyard worker may spend at least 30 years working at the railyard.

Averaging Time (Cancer) – Carcinogenic risks are averaged over a lifetime, which is assumed to be 75 years based upon research conducted by the EPA. Averaging time is expressed by multiplying 75 years by 365 days per year resulting in an averaging time of 27,375 days.

Averaging Time (Non-Cancer) – Non-carcinogenic exposures are averaged over the exposure duration. The assumed duration of exposure is 30 years. The calculated non-cancer averaging time is 30 years multiplied by 365 days per year resulting in an averaging time of 10,950 days.

5.0 Risk Levels

Site-specific risk-based cleanup levels are calculated for two types of health effects. Some compounds are known or thought to cause cancer with long term exposure. These compounds are referred to as carcinogens and they may also cause other negative health effects (U.S. EPA, 2009e). Other non-carcinogenic compounds are not likely to cause cancer but are known to cause other negative health effects (U.S. EPA, 2009e). DEQ must address both types of health effects that may be associated with compounds linked to the Facility. For compounds associated with both carcinogenic and non-carcinogenic effects, DEQ selects the lowest cleanup level that is protective of both types of effects. For non-carcinogens, DEQ selects cleanup levels that are protective of non-cancer health effects.

Long-term exposure to any concentration of a cancer-causing compound is assumed to have some risk so DEQ must choose concentrations that are very protective (U.S. EPA, 1989). The term "excess lifetime cancer risk" is used because all people have a risk of getting cancer due to genetics or other causes not related to the Facility (U.S. EPA, 1989). According to the SEER Cancer Statistics Review, American men have a 44% lifetime risk of being diagnosed with cancer, while American women have a 38% lifetime risk (NCI 2009). This is a little over a 1 in 3 chance (or 33% or 0.33) that a person will get some type of cancer at some time in his or her life. The "excess lifetime cancer risk" that is referred to here is additional risk that someone might have of getting cancer if that person is exposed to compounds linked to the Facility as described in the January 2010 Amendment and summarized above. DEQ considers an additional or excess 1 in 100,000 chance (or 0.001% or 0.00001 or 1×10^{-5}) allowable (the Montana Legislature has directed that 1×10^{-5} is an allowable risk for state water, § 75-5-301, MCA, and based on that level, DEQ has determined that 1×10^{-5} is an appropriate risk). DEQ derives the site-specific cleanup levels such that they do not result in a cumulative excess lifetime cancer risk greater than 1 in 100,000.

The term cumulative risk means that the risks from all the different carcinogens are added together and, for the cleanup levels to be protective, the total risk cannot exceed 1 in 100,000. Therefore, if there are ten carcinogenic compounds in indoor air at a facility, cleanup levels might be calculated so that each compound represents one-tenth or a 1 in 1,000,000 risk. That way if all ten compounds are present in the indoor air at the cleanup level, the risk would still not exceed 1 in 100,000. Similarly, if there are three carcinogenic compounds in indoor air at a facility, each one might represent one-third of the total risk. If only two carcinogenic compounds are present, each one might represent half the total risk.

For non-cancer health effects, there is a concentration of each compound at which negative health effects do not appear to occur (U.S. EPA, 1989). DEQ requires cleanup levels for each compound at the Facility that are designed to prevent negative health effects to any organ in the body or any bodily function even if someone is also exposed to other compounds linked to the

Facility that affect the same organ or bodily function. To do this DEQ uses a ratio, called a hazard index, to compare concentrations of contaminants at the Facility to concentrations that have not been found to cause negative health effects in scientific studies (U.S. EPA, 1989). A hazard index of 1 indicates that the concentrations at the Facility are no higher than those found to cause negative health effects (U.S. EPA, 1989). The same cumulative equations also apply to non-carcinogens. If two compounds affect the same organ of the body, each one may represent half of the total non-cancer risk for that organ.

The COCs for indoor air at the Facility, benzene, ethylbenzene, PCE, and TCE are known or thought to cause cancer with long term exposure and they all also have non-cancer effects. Each compound has a different non-cancer critical effect or target organ so cumulative non-cancer effects are not anticipated. Because benzene and ethylbenzene are typically present in indoor air at concentrations higher than residential screening levels, DEQ considered benzene and ethylbenzene separately from the other COCs in indoor air in non-railyard buildings. The cleanup levels for the benzene and ethylbenzene for indoor air in non-railyard buildings at the Facility are based upon typical indoor air concentrations found in Livingston, and are not revised in this Amendment 2. DEQ calculated site-specific health risk-based commercial/industrial cleanup levels for the railyard buildings at the Facility. Benzene and ethylbenzene are not typically present in indoor air at concentrations that are higher than site-specific risk-based commercial/industrial cleanup levels so it was not necessary for DEQ to base the commercial/industrial cleanup levels on typical indoor air concentrations. DEQ also used the recently released final toxicity criteria for PCE and TCE to recalculate residential and commercial/industrial health risk-based cleanup levels for these two compounds as well.

6.0 Toxicity Assessment

The SOW provided that DEQ would update the toxicity values as necessary, and DEQ would apply the hierarchy described in OSWER Directive 9285.7-53 Human Health Toxicity Values in Superfund Risk Assessments (December 2003) to the process of updating to the toxicity values. EPA has been evaluating the toxicity of PCE and TCE for many years. In 2011, in order to be protective of public health, safety and welfare, rather than finalizing the cleanup levels based upon proposed toxicity criteria, DEQ developed a range of cleanup levels to be used in the interim until the final EPA toxicity criteria were released (DEQ, 2011). EPA published its final Toxicological Reviews for TCE and PCE on the Integrated Risk Information System (IRIS) in September 2011 (EPA 2011) and February 2012 (EPA 2012), respectively. DEQ is now proposing final indoor air cleanup levels based upon these final toxicity criteria. **Tables 3 and 4** provide the toxicity values that DEQ used to develop its cleanup levels.

7.0 Derivation of Site-Specific Cleanup Levels for Indoor Air

For non-railyard buildings, DEQ calculated cleanup levels for indoor air for PCE and TCE based upon a cumulative excess lifetime cancer risk of 1 $x10^{-5}$ and protective of non-cancer effects using the equations presented in Table 1. For the railyard buildings, DEQ calculated cleanup levels for indoor air for PCE, TCE, benzene, and ethylbenzene based upon a cumulative excess lifetime cancer risk of 1 $x10^{-5}$ and protective of non-cancer effects also using the equations

presented in Table 2. DEQ chose either the level protective of cancer risk or that protective of non-cancer risk, whichever was lower for each of the calculated levels. In doing so, DEQ chose the levels that would be protective of both types of health effects. The following table provides a summary of the levels calculated for each compound for each type of health effect. The lowest levels for each compound are highlighted.

Contaminants of Concern	**Cleanup Levels Based Upon Residential Cancer Toxicity (µg/m^3)**	**Cleanup Levels Based Upon Residential Non-Cancer Toxicity (µg/m^3)**	**Cleanup Levels Based Upon Commercial Cancer Toxicity (µg/m^3)**	**Cleanup Levels Based Upon Commercial Non-Cancer Toxicity (µg/m^3)**
Tetrachloroethene (PCE)	50	**42**	**105**	175
Trichloroethene (TCE)	**2**	**2**	**7**	9
Benzene	**2.2***		**4**	131
Ethylbenzene	**2.3***		**11**	4,380

*Based upon typical residential indoor air concentrations in Livingston.

As provided in the SOW that BNSF agreed to follow, residential site-specific cleanup levels apply uniformly to all residential and off-railyard commercial/industrial structures with screening level exceedances due to subsurface vapor intrusion. DEQ and BNSF agreed in the SOW that commercial/industrial site-specific cleanup levels apply only to commercial/industrial structures located on the railyard. The ROD and the SOW, as updated by DEQ's March 10, 2009 letter, do not provide for the performance of building-specific risk assessments on specific properties sampled by BNSF. In addition, in making decisions about indoor air mitigation, DEQ does not allow building-specific risk assessment for vapor intrusion because of the extreme variability involved and the number of factors influencing indoor air concentrations. Rather, in order to be protective of public health, safety and welfare, and conservative, DEQ requires that screening or cleanup levels (sometimes referred to as target or action levels) be applied uniformly to buildings within a given facility.

The ROD selected remedy requires all residences and businesses that have indoor air VOC concentrations from subsurface vapor intrusion above site-specific cleanup levels for indoor air to have a protection system (mitigation system) installed at no cost to the owner, unless the VOCs in indoor air are not related to the Facility. In order to remain protective, these systems must be maintained until cleanup levels are continually met without operation of the system. BNSF shall install and maintain a mitigation system at all inhabitable residences and businesses that do not meet the site-specific cleanup levels in the ROD and developed as outlined in the SOW, at no cost to the owner.

8.0 References

Full citations to certain of the references cited herein can be found within the administrative record in Attachment 3 of the January 2010 Amendment. However, not all of the documents contained within the administrative record are specifically referenced within this document, because the administrative record also contains all documents DEQ relied upon or considered in

developing this document. Additional references specific to this document include the following:

Kennedy/Jenks Consultants (Kennedy/Jenks). June 2010. Task I – 2010 Soil Gas/Indoor Air Data Summary Report. June 24, 2010.

Montana Department of Environmental Quality (DEQ). January 2010. Final Task I Risk Assessment Amendment and Montana Department of Environmental Quality Approved Remedy For Newly Identified Contaminants of Concern in Indoor Air. January 2010.

DEQ. October 2010. Correspondence from Aimee Reynolds, project manager, DEQ, Helena, Montana, to BNSF Railway Company regarding BNSF Request to Recalculate Proposed Site-Specific Cleanup Levels for Indoor Air Included in the June 24, 2010 Task I – 2010 Soil Gas/Indoor Air Data Summary Report. October 25, 2010.

U.S. Environmental Protection Agency (U.S. EPA). December 2003. Human Health Toxicity Values in Superfund Risk Assessments. OSWER Directive 9285.7-53. December 2003.

U.S. EPA. September 2011. Toxicological Review of Trichloroethylene. September 2011.

U.S. EPA. February 2012. Toxicological Review of Tetrachloroethylene. February 2012.

TABLE 1
EXPOSURE ASSUMPTIONS FOR RESIDENTS - VOLATILES IN INDOOR AIR
BNSF Livingston Shop Complex Facility

Scenario Timeframe: Current & Future
Medium: Indoor Air
Exposure Medium: Indoor Air
Receptor Population: Resident
Receptor Age: Carcinogenic (Lifetime) Exposure - Age Adjusted Factor Approach
Noncarcinogenic exposure - 0-6 years

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name (EPA 2009)
	ET	Exposure Time	unitless	1	SOW 2005	
	EF	Exposure Frequency	days/year	350	EPA 2002, CDM 1993	
Inhalation of VOCs	ED	Exposure Duration (Total - Carcinogenic Exposure)	years	30	EPA 2002, CDM 1993	NCL = THQ*AT-N*CF
Migrating to Indoor	ED-A	Exposure Duration (Adult)	years	24	EPA 2002, CDM 1993	EF*ED*ET*1/RfC
Air from Subsurface	ED-C	Exposure Duration (Child)	years	6	EPA 2002	
	BW-A	Body Weight - Adult	kg	70	EPA 2002, CDM 1993	CCL = TR*AT-C
	BW-C	Body Weight - Child	kg	15	EPA 1997	EF*ED*ET*IUR
	AT-C	Averaging Time (Cancer)	days	27,375	EPA 1997	
	AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA 1989	
	IRA-A	Inhalation Rate (Adult)	m^3/day	15.2	EPA 1997	
	IRA-C	Inhalation Rate (Child)	m^3/day	7.5	EPA 1997	
	IRAadj	Age Adjusted Inhalation Rate Factor	m^3-y/kg-day	8.0	Calculated	

Sources:

CDM 1993. Final Report Baseline Risk Assessment Livingston Rail Yard, May.

EPA 1989. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual (Part A) Interim Final, December. EPA/540/1-89/002.

EPA 1997. Exposure Factors Handbook, August. EPA /600/P-95/002 Fa.

EPA 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, December. OSWER 9355.4-24.

EPA 2009. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)

NCL = Noncarcinogenic cleanup level

CCL - Carcinogenic cleanup level

CF = 1000 ug/mg

ET = 24 hours/day*1 day/24 hours (August 2005 Spring Scope of Work)

THQ = Target hazard quotient (1)

TR = Target cancer risk (1×10^{-5})

RfC = Reference concentration

IUR = Inhalation Unit Risk

TABLE 2

EXPOSURE ASSUMPTIONS FOR COMMERCIAL/INDUSTRIAL WORKER - VOLATILES IN INDOOR AIR

BNSF Livingston Shop Complex Facility

Scenario Timeframe: Current & Future

Medium: Indoor Air

Exposure Medium: Indoor Air

Receptor Population: Commercial/Industrial Worker

Receptor Age: Adults

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name (EPA 2009)
	ET	Exposure Time	unitless	0.33	SOW 2005	
	EF	Exposure Frequency	days/year	250	EPA 1991	NCL = THQ*AT-N*CF / EF*ED*ET*1/RfC
Inhalation of VOCs	ED	Exposure Duration	years	30	CDM 1993	
Migrating to Indoor	BW-A	Body Weight - Adult	kg	70	EPA 2002, CDM 1993	
Air from Subsurface	AT-C	Averaging Time (Cancer)	days	27,375	EPA 1997	CCL = TR*AT-C / EF*ED*ET*IUR
	AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA 1989	
	IRA-A	Inhalation Rate (Adult)	m^3/day	10.4	EPA 1997	

Sources:

CDM 1993. Final Report Baseline Risk Assessment Livingston Rail Yard, May.

EPA 1989. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual (Part A) Interim Final, December. EPA/540/1-89/002.

EPA 1991. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals) Interim, December. EPA/540/1-92/003.

EPA 1997. Exposure Factors Handbook, August. EPA /600/P-95/002 Fa.

EPA 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, December. OSWER 9355.4-24.

EPA 2009. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)

NCL = Noncarcinogenic cleanup level

CCL = Carcinogenic cleanup level

CF = 1000 ug/mg

ET = 8 hours/24 hours (August 2005 Spring Scope of Work)

THQ = Target hazard quotient (1)

TR = Target cancer risk (1×10^{-5})

RfC = Reference concentration

IUR = Inhalation Unit Risk

TABLE 3
CANCER TOXICITY DATA -- INHALATION
BNSF Livingston Shop Complex Facility

Chemical of Potential Concern	Inhalation Unit Risk	Units	Cancer Guideline Description	Source	Date
Benzene	7.80E-06	$(ug/m^3)^{-1}$	Class A	IRIS	2012
Ethylbenzene	2.50E-06	(ug/m3)-1	NA	CA EPA	2012
Tetrachloroethylene	2.60E-07	(ug/m3)-1	**liver cancer	IRIS	2012
Trichloroethylene	1.00E-06	(ug/m3)-1	*kidney cancer	IRIS	2012
Trichloroethylene	3.10E-06	(ug/m3)-1	*liver cancer	IRIS	2012
Trichloroethylene	3.10E-06	(ug/m3)-1	*lymphoma	IRIS	2012
Trichloroethylene	4.10E-06	(ug/m3)-1	*adult-only	IRIS	2012

NA = Not Applicable or Not Available

References

CA EPA = California EPA as referenced in the EPA Regional Screening Levels Table, April 2012

IRIS = EPA Integrated Risk Information System

EPA Group:

A - Human carcinogen

* - carcinogenic to humans

** - likely to be carcinogenic to humans

These toxicity data have been updated as of May 2012 following the hierarchy described in OSWER Directive 9285.7-53 Human Health Toxicity Values in Superfund Risk Assessments (December 2003). DEQ will update these toxicity data as necessary in the future, following the hierarchy described in OSWER Directive 9285.7-53 Human Health Toxicity Values in Superfund Risk Assessments (December 2003).

TABLE 4
NONCANCER TOXICITY DATA -- INHALATION
BNSF Livingston Shop Complex Facility

Chemical of Potential Concern	Inhalation Reference Concentration	Units	Primary Target Organ	Source	Date
Benzene	3.00E-02	mg/m^3	Decreased lymphocyte count	IRIS	2012
Ethylbenzene	1.00E+00	mg/m^3	Developmental toxicity	IRIS	2012
Tetrachloroethylene	4.00E-02	mg/m^3	Neurotoxicity	IRIS	2012
Trichloroethylene	2.00E-03	mg/m^3	Thymus/Cardiac	IRIS	2012

NA = Not Applicable or Not Available

References

IRIS = EPA Integrated Risk Information System

These toxicity data have been updated as of May 2012 following the hierarchy described in OSWER Directive 9285.7-53 Human Health Toxicity Values in Superfund Risk Assessments (December 2003). DEQ will update these toxicity data as necessary in the future, following the hierarchy described in OSWER Directive 9285.7-53 Human Health Toxicity Values in Superfund Risk Assessments (December 2003).

ATTACHMENT 1

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY FOR
FINAL DRAFT TASK I RISK ASSESSMENT AMENDMENT NUMBER 2

1.0 INTRODUCTION

The Montana Department of Environmental Quality (DEQ) solicited public comment on the June 2012 Final Draft Task I Risk Assessment Amendment Number 2 (Amendment 2) for the Burlington Northern Livingston Shop Complex Facility (Facility) during a public comment period that ran from July 27, 2012 to August 29, 2012. DEQ received written comments from one entity during the public comment period. DEQ also held a public meeting on August 9, 2012, in which DEQ discussed the proposed cleanup levels, as well as other issues related to the Facility, but did not accept oral public comment at the public meeting.

1.1 Community Involvement Background

It is the intent of DEQ that the citizens of Montana have the opportunity to be actively involved in the DEQ decision-making process with respect to state Superfund sites. The 2005 Spring Statement of Work (SOW) (DEQ, 2005) also provided for public comment on any risk assessment amendments.

1.2 Notification of Public Comment Period

Printed notices were published in the Bozeman Daily Chronicle and the Livingston Enterprise, daily newspapers, and on DEQ's website. DEQ sent notice of the public comment period and the August 9, 2012 meeting to the approximately 400 people on its mailing list for the Facility, including members of local government. DEQ also provided notice to the Associated Press and other state and local news organizations for media distribution. In addition, DEQ provided a copy of the document to the Park County Environmental Council for its review.

1.3 Explanation of Responsiveness Summary

All comments received during the public comment period on Amendment 2 have been reviewed and considered by DEQ in the decision-making process and are addressed in this Responsiveness Summary. To assist in developing responses, DEQ added its own numbering to comments where appropriate to add clarity. Each specific written comment is stated verbatim. In order to avoid duplication of some responses, similar comments are usually addressed only once for the first occurrence of the comment and thereafter referenced to the appropriate response. All documents cited, relied upon or considered in Amendment 2, including the Responsiveness Summary; or in the Final Task I Risk Assessment Amendment and Montana Department of Environmental Quality Approved Remedy for Newly Identified Contaminants of Concern in Indoor Air are part of the administrative record for Amendment 2.

2.0 COMMENTS AND RESPONSES

Kennedy/Jenks Consultants: As consultant to the BNSF Railway Company (BNSF), Kennedy/Jenks Consultants submitted the following comments on BNSF's behalf.

Comment 1: Overall, BNSF agrees with the exposure assumptions and toxicity criteria used by DEQ to derive the cleanup levels for indoor air, including the DEQ's use of IRIS as the primary source of toxicity values. BNSF also agrees that the cleanup levels for PCE and TCE should be based upon a cumulative excess lifetime cancer risk of 1 x 10-5 and a hazard index of 1. However, BNSF disagrees with apportioning the cumulative cancer risk and hazard index based on the number of contaminants of concern to derive the cleanup levels. The need for mitigation should be determined based on the cumulative excess lifetime cancer risk of 1 x 10-5 and a hazard index of 1, not on the apportioned cleanup levels.

Response: Comment noted. As DEQ has explained to BNSF on numerous occasions and as stated in Amendment 2, the ROD and the SOW, as updated by DEQ's March 10, 2009 letter, do not provide for the performance of building-specific risk assessments on specific properties sampled by BNSF. In addition, in making decisions about indoor air mitigation, DEQ does not allow building-specific risk assessment for vapor intrusion because of the extreme variability involved and the number of factors influencing indoor air concentrations. Rather, in order to be protective of public health, safety and welfare, and conservative, DEQ requires that screening or cleanup levels (sometimes referred to as target or action levels) be applied uniformly to buildings within a given facility. This comment does not require a change to Amendment 2.

Comment 2: BNSF continues to believe that benzene and ethylbenzene detected in both onsite and offsite structures are not reasonably attributable to vapor intrusion and that these compounds should not be included as COCs. The detailed basis for this comment is provided in the prior submittals by Kennedy/Jenks Consultants on behalf of BNSF dated 23 October 2009, 24 June 2010, and 23 November 2010.

Response: Comment noted. DEQ notes that BNSF's comments are not directly pertinent to Amendment 2 because Amendment 2 does not address the benzene or ethylbenzene indoor air cleanup levels. DEQ interprets BNSF's use of the terms "onsite" and "offsite" to mean "on the railyard" or "off the railyard," either of which may be part of the Facility if hazardous or deleterious substances have come to be located there. The basis for DEQ's determination that benzene and ethylbenzene are COCs for indoor air is provided in the January 2010 Final Task I Risk Assessment Amendment and Montana Department of Environmental Quality Approved Remedy For Newly Identified Contaminants of Concern, including the Responsiveness Summary; DEQ's October 25, 2010 comments on the Task I Soil Gas/ Indoor Air Data Summary Report dated June 24, 2010; and the March 2011 Interim Final Task I Risk Assessment Amendment Number 2. DEQ will not reiterate the determinations in these documents here. These DEQ documents were also responsive to the BNSF documents dated 23 October 2009, 24 June 2010, and 23 November 2010 referenced in BNSF's Comment 2. This comment does not require a change to Amendment 2.

Comment 3: In Section 7.0, DEQ should acknowledge that the indoor air data indicate that detections of chemicals in indoor air may be due to indoor sources.

Response: DEQ has made changes to Sections 2.0 and 3.0 of Amendment 2 in response to this comment. The potential contribution of secondary indoor sources is one of the multiple lines of evidence that DEQ evaluates to determine whether vapor intrusion is occurring at a structure. Section 7.0 of Amendment 2 provides the derivation of the cleanup levels, and does not apply the cleanup levels to specific structures at the Facility. An acknowledgment of the potential for indoor sources has been more appropriately included in Sections 2.0 and 3.0 of Amendment 2. DEQ has also included this information in its previous evaluations of vapor intrusion at the Facility, and DEQ will also include this information (as well as the other lines of evidence) in the analysis of vapor intrusion DEQ will conduct using the final cleanup levels in Amendment 2.

Comment 4: The last sentence of Section 7.0 should be revised to "…that **do not** meet the site-specific cleanup levels….".

Response: DEQ has made the requested change. Thank you for bringing this typographical error to DEQ's attention.

Comment 5: In closing, BNSF understands that the DEQ has determined vapor intrusion mitigation is not required at the Facility based on the application of the cleanup levels as proposed in the draft Amendment 2.

Response: DEQ has not yet made this determination. DEQ intends to compare all the vapor intrusion investigation data for each structure to the final indoor air cleanup levels and determine if any additional actions will be required. DEQ will inform BNSF of the results of its review. In addition, DEQ has already informed BNSF that it must continue to operate the soil vapor extraction systems in the Electric and Locomotive Shops as remediation systems and that BNSF may need to work with some property owners regarding institutional controls if residential cleanup levels cannot be met. This comment does not require a change to Amendment 2.