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| Minnesota Pollution Control Agency (MPCA), 520 Lafayette Road North, St. Paul, MN 55155-4194 | Monitoring report  Petroleum Remediation Program  Guidance document 4-08  Doc Type: Investigative Monitoring Report |

Instructions:Complete this report annually following submittal of an [Investigation report](https://www.pca.state.mn.us/sites/default/files/c-prp4-06.docx). Under some circumstances, the Minnesota Pollution Control Agency (MPCA) may request submittal on an alternate schedule (e.g., quarterly, semi-annually). All site monitoring results and additional work activities requested by the MPCA must be included and used to support the site management decision. Include any additional information that is important for making the site management decision. Do not revise or delete any text from this report. Attach all applicable figures, tables, and appendices, and indicate those that have been updated during this reporting period. All data provided must be cumulative.

**Note:** All documents with hyperlinks in this form are available on the MPCA’s Cleanup guidance website at <https://www.pca.state.mn.us/waste/cleanup-guidance>.

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| **MPCA Site ID:** | LS00 | **Date (mm/dd/yyyy):** |  |

Responsible party information

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| Individual or corporate name: | | | |  | | | | | |
| Mailing address: | | |  | | | | | | |
| City: |  | | | | | State: |  | Zip code: |  |
| Email: | |  | | | | | | Phone: |  |
| Alternative contact name (if any): | | | | |  | | | Phone: |  |

Leak site information

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| Name: | |  | | | | | Phone: |  | |
| Leak site address: | | | |  | | | | | |
| City: |  | | | | State: |  | Zip code: | |  |
| County: | | |  | |  | | |  | |

Confirmation of report content

Reports are insufficient if unsigned, altered, not on most recent format, or components are missing. Below are the most commonly missed components in the [Investigation report](https://www.pca.state.mn.us/sites/default/files/c-prp4-06.docx). If applicable items are missing, the report will not be accepted for review unless the MPCA project manager has been notified prior to report submittal. **Double click checkboxes to select *Checked* and select *OK*.**

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|  | Underground storage tank(s) (USTs), aboveground storage tank(s) (ASTs), transfer areas, piping, dispensers, and remote fill pipe locations are depicted on a site map (Section 4: Figure 3) |
|  | Properties located within 500 feet of the release source identified in Table 15 correspond to labeled properties on the receptor map (Section 4: Figure 11) |
|  | Location of end points for all geologic cross sections are on site map (Section 4: Figure 3) |
|  | Two geologic cross-sections are included (Section 4: Figure 9) |
|  | Utilities identified in Table 18 are located on the receptor map (Section 4: Figure 11) and geologic cross-sections (Section 4: Figure 9) |
|  | Chromatograms provided at a reasonable scale for positive analytical results of gasoline range organics (GRO) and/or diesel range organics (DRO) (Section 6: Appendix A) |
|  | Pre and post cleanup analytical results if DRO silica gel cleanup was performed (Section 6: Appendix A) |
|  | Documentation of field activities, collection of field data, sampling information forms, and equipment calibration sheets (Section 6: Appendix D) |
|  | Record the amount of time borings left open for attempting groundwater collection in both the water level measurement and depth table (Section 5: Table 6) and on boring logs (Section 6: Appendix C) |
|  | Updated groundwater contour maps from each monitoring event since the previous report (Section 4: Figure 10) |
|  | Hydrographs are included (Section 4: Figure 16), as well as graph(s) (time series plots) (Section 4: Figure 17) |
|  | [Field work notification](https://www.pca.state.mn.us/waste/field-work-notifications) copy of record(s) from MPCA’s [e-Services](https://www.pca.state.mn.us/data/e-services) (Section 6: Appendix I) |
|  | Submission of EQuIS electronic data deliverables (EDDs), and include email confirmation (Section 6: Appendix J) |

Environmental professional information

*By signing this document, I/we acknowledge that we are submitting this document on behalf of and as agents of the responsible person or volunteer for this leak site. I/we acknowledge that if information in this document is inaccurate or incomplete, it will delay the completion of remediation and may harm the environment and may result in a reduction in Petrofund reimbursement. In addition, I/we acknowledge on behalf of the responsible person or volunteer for this leak site that if this document is determined to contain a false material statement, representation, or certification, or if it omits material information, the responsible person or volunteer may be found to be in violation of Minn. Stat. § 115.075 or Minn. R. 7000.0300 (Duty of Candor), and that the responsible person or volunteer may be liable for civil penalties.*

***By typing/signing my name below,*** *I certify the above statements to be true and correct, to the best of my knowledge, and that this information can be used for the purpose of processing this form.*

### Signatures

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| **Report author(s)** | | | |  | **Report reviewer(s)** | | | |
| Signature: | |  | |  | Signature | |  | |
|  | | *(This document has been electronically signed.)* | |  |  | | *(This document has been electronically signed.)* | |
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| --- | --- |
| Name(s) of field technician(s): |  |

### Company information:

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| Name: | |  | | | | | Phone: | |  |
| Mailing address: | | |  | | | | | | |
| City: |  | | | State: |  | Zip code: | |  | |

**Project manager information**:

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| Name: |  | | |
| Phone: |  | Email: |  |

Section 1: Work completed

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| **1.1** | Describe all site work completed since the [Investigation report](https://www.pca.state.mn.us/sites/default/files/c-prp4-06.docx) or the last [Monitoring report](https://www.pca.state.mn.us/sites/default/files/c-prp4-08.docx) was submitted.This should include both field and non-field activities. |
| **1.2** | If additional work requested in the most recent MPCA correspondence has not been completed, explain why. |
| **1.3** | Were [field work notifications](https://www.pca.state.mn.us/waste/field-work-notifications) submitted prior to completing field work? Include [e-Services](https://www.pca.state.mn.us/data/e-services) copy of record(s) in Section 6, Appendix J.  *Yes  No* **If *No***, explain. |

Section 2: Monitoring results

|  |  |
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| **2.1** | **Groundwater**  Discuss the cumulative groundwater monitoring results, water level measurements, and plume characteristics with respect to identified receptors. |
| **2.2** | **Field-detectable vapors**  Discuss the results of any additional follow-up field vapor monitoring. Include a description of each vapor monitoring location and an explanation of monitoring methods and instruments used, such as a photoionization detector, explosimeter, etc. Interpret the cumulative results as related to the identified receptors. |
| **2.3** | **Vapor intrusion**  Discuss the results of any follow-up vapor intrusion assessment (VIA) activities including a description of each VIA sampling location and an interpretation of the results with respect to receptors. |
| **2.4** | **Light non-aqueous phase liquid (LNAPL)**  If mobile LNAPL is present, discuss what activities are being completed to measure and recover it. Describe the effectiveness of the recovery efforts and LNAPL trends over the course of the investigation. Complete Table 14 and discuss the data compiled to date. If mobile LNAPL was first reported during this monitoring period, include the [Light non-aqueous phase liquid recovery report](https://www.pca.state.mn.us/sites/default/files/c-prp2-03.docx) in Section 6. |
| **2.5** | **Other** (e.g., surface water, contaminated surface soil, etc.)  Discuss the results of any additional monitoring, subsurface investigation, or risk evaluation conducted during this reporting period. Identify all monitoring locations on an attached Site Map (Figure 3) by labeling each location. A description of sampling methods, including the instruments used, must be included in Section 6. |
| **2.6** | **Conceptual site model**  Discuss any changes to the overall conceptual site model (CSM) that has altered the current site management decision based upon the information presented in this report. If closure is being recommended in Section 3 based on previous petroleum leak site closure(s), the CSM must include a comprehensive comparison of historical data and current site data for all sampled media. Please make sure to include information related to changes to land use, as well as information related to nearby receptors, as part of the development of the CSM. |

Section 3: Site management decision

Base the site management decision on the Petroleum Remediation Program’s policies described in [Risk evaluation and site management decision at petroleum release sites](https://www.pca.state.mn.us/sites/default/files/c-prp4-02.pdf).

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| **3.1** | Recommendation for site: | Site closure  Additional groundwater monitoring  Additional field-detectable vapor monitoring  Additional soil or groundwater investigation  Additional soil gas/vapor intrusion investigation  Corrective action |
|  | If corrective action is recommended, contact the MPCA prior to submitting this report to determine whether a [Conceptual corrective action design (CCAD) report](https://www.pca.state.mn.us/sites/default/files/c-prp7-02.docx) should be prepared and included in Section 6. See [Corrective action design and implementation](https://www.pca.state.mn.us/sites/default/files/c-prp7-01.pdf) for more information on the corrective action design approval process. | |
| **3.2** | If closure is recommended, summarize significant investigative events and describe how the site-specific exposure pathways identified in the conceptual site model have been adequately addressed. If closure is being recommend based on previous closed petroleum leak site(s), include all historical data and information that supports this recommendation. | |
| **3.3** | If additional groundwater or field-detectable vapor monitoring is recommended, indicate the proposed monitoring locations, sampling frequency, and target analytes. Conduct quarterly groundwater monitoring and sampling until the MPCA responds to this report*.* | |
| **3.4** | If additional soil or groundwater investigation is recommended, provide details of proposed activities such as locations for additional soil borings and monitoring wells, proposed monitoring well construction, or targeted sampling media and analytes. | |
| **3.5** | If additional vapor intrusion investigation is recommended, provide details of proposed activities such as completing an indoor building survey, sub-slab vapor sampling, indoor air sampling, or locations for additional soil gas sampling. | |

Section 4: Figures

All figures must include a north arrow, scale, and legend. Approximate scales are not acceptable. Distinguish sequential elements of investigations by dates, symbols, etc. in the legend, if applicable. Utilize aerial photographs as the basis of site figures with caution since the height of buildings and structures may skew and misrepresent the apparent location due to camera angle. Attach all required figures in the following order. Indicate figures included in this report by marking the check box. **Double click checkboxes to select *Checked* and select *OK*.**

|  |  |
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|  | Figure 1: Site location map using a U.S. Geological Survey 7.5 minute quadrangle map. |
|  | Figure 2: Aerial photos and Sanborn Fire Insurance Maps™ (if available) of the immediate area. |
|  | Figure 3: Site map showing structures, location of utilities, all past and present petroleum storage tanks, piping, dispensers and transfer areas, boring and monitoring well locations, any water supply wells on site and location of end-points for all geological cross sections. |
|  | Figure 4: Extent of soil excavation using Site map (Figure 3) as base map (if applicable). |
|  | Figure 5: Extent of contaminated surface soil using site map (Figure 3) as base map (if applicable). |
|  | Figure 6: Horizontal extent of LNAPL using site map (Figure 3) as base map (if applicable). |
|  | Figure 7: Horizontal extent of soil contamination using site map (Figure 3) as base map. |
|  | Figure 8: Horizontal extent of groundwater contamination using site map (Figure 3) as base map. |
|  | Figure 9: At least two (2) geologic cross sections depicting stratigraphy, soil headspace results, petroleum sheen test results, laboratory analytical results, water table elevation, and underground utilities. |
|  | Figure 10: Groundwater gradient contour maps using water level elevations from each monitoring event since the last report. Show all wells at the site, and differentiate wells constructed in different aquifers. Label groundwater contours and elevations at each data point used for contouring. |
|  | Figure 11: Receptor map (scale 1 inch = 50 to 100 feet) centered on the release area, showing property boundaries and roads, and receptors such as buildings, water supply wells, underground utilities (distinguish between water, storm sewer, and sanitary sewer), surface water, ditches, and any other pertinent items within 500 feet of the release source. |
|  | Figure 12: Well receptor survey map showing one-half mile radius, 500-foot radius, water supply wells, and other potential sources of contamination on a U.S. Geological Survey 7.5 minute quadrangle map or aerial photograph. |
|  | Figure 13: Surface water map showing potential pathways that lead to surface water receptors within one-quarter mile of site. |
|  | Figure 14: Vapor survey map showing utilities and buildings with basements and monitoring locations within 500 feet (if a survey was required). If the survey area has been expanded beyond 500 feet, adjust the map to encompass the entire surveyed area. |
|  | Figure 15: Vapor intrusion assessment map showing all vapor intrusion samples and receptors at and within the 100 foot preliminary assessment area. If the assessment area has been expanded beyond 100 feet, adjust the map to encompass the entire assessment area. |
|  | Figure 16: Hydrograph for all monitoring and recovery wells. |
|  | Figure 17: Graph(s) (time series plots) showing contaminant concentrations over time for all monitoring and recovery wells where contamination is present. Plot water levels on the secondary y-axis. |

Section 5: Tables

Attach all tables from the [Investigation report](https://www.pca.state.mn.us/sites/default/files/c-prp4-06.docx) and indicate those that have been updated during this reporting period by marking the check box below. **Tables must include all cumulative data.**

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| **Updated** | **Table number and name** |
|  | Table 1. Tank information |
|  | Table 2. Results of soil headspace screening |
|  | Table 3. Analytical results of soil samples |
|  | Table 4. Other contaminants detected in soil samples (petroleum or non-petroleum derived) |
|  | Table 5. Surface soil assessment results |
|  | Table 6. Water level measurements and depths of water samples collected from borings |
|  | Table 7. Analytical results of water samples collected from borings |
|  | Table 8. Other contaminants detected in water samples collected from borings (petroleum or non-petroleum derived) |
|  | Table 9. Monitoring well completion and location information |
|  | Table 10. Water level measurements in wells |
|  | Table 11. Analytical results of water samples collected from wells |
|  | Table 12. Other contaminants detected in water samples collected from wells (petroleum or non-petroleum derived) |
|  | Table 13. Field parameters and natural biodegradation parameters |
|  | Table 14. Light non-aqueous phase liquid (LNAPL) recovery |
|  | Table 15. Properties located within 500 feet of the release source |
|  | Table 16. Water supply wells located within 500 feet of the release source and municipal or industrial wells within one-half mile |
|  | Table 17. Surface water receptor information |
|  | Table 18. Utility receptor information |
|  | Table 19. Vapor survey results |
|  | Table 20. Results of soil gas sampling for vapor intrusion screening |

Section 5: Tables (Add additional rows as needed by placing cursor in last row in the last column and clicking Tab key. Copy an entire table if more columns are needed.)

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| Table 1  Tank information | | | | | | | | |
| Tank # | Tank material | UST or AST | Capacity (gallons) | Contents (product type) | Year installed | Tank status1 | Tank removal/ abandoned date | Tank condition |
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1 Indicate: removed, abandoned in place, or currently in use.

**Notes:**

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| Table 2  Results of soil headspace screening | | | | | | | | | | | | | | | |
| **Depth (ft)** | **Soil boring ID** | | | | | | | | | | | | | | |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
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List in Section 6 the instruments used and discuss field methods and procedures.

**Notes:**

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| Table 3  Analytical results of soil samples1 | | | | | | | | | | | | | |
| **Boring ID** | **Sample depth (ft)** | **Sample date** | **Benzene** | **Toluene** | **Ethyl-benzene** | **Xylenes** | **MTBE** | **1,2,4-Trimethyl-benzene** | **1,3,5-Trimethyl-benzene** | **Naph-thalene** | **GRO** | **DRO** | **Lab Type2** |
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1 Report results in mg/kg. Use less than symbols to show the report level.

2 Indicate “mobile” or “fixed” in the lab type column.

**Notes:**

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| Table 4  Other contaminants detected in soil samples (petroleum or non-petroleum derived)1 | | | | | | | | | | | | | |
| **Boring ID** | **Sample depth (ft)** | **Sample date** |  |  |  |  |  |  |  |  |  |  | **Lab Type2** |
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1 Report results in mg/kg. Use less than symbols to show the report level.

2 Indicate “mobile” or “fixed” in the lab type column.

**Notes:**

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| Table 5  Surface soil assessment results | | | | | | |
| **Sample ID** | **Sample depth (ft)** | **Soil headspace 10 ppmv or greater1 (Y/N)** | **Petroleum saturated (Y/N)** | **Stained**  **(Y/N)** | **GRO**  **(mg/kg)2** | **DRO**  **(mg/kg)2** |
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1 As measured with a photoionization detector (PID).

2 Use less than symbols to show the report level.

**Notes:**

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| Table 6  Water level measurements and depths of water samples collected from borings | | | | | | | | | | | | | | | |
|  | **Soil boring** | | | | | | | | | | | | | | |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| **Static water level depth1 (ft)** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Measurement duration2 (hh:mm)** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Sample depth3 (ft)** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Sampling method4** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

1 Describe in Section 6 the methods used to measure water levels in borings.

2 Indicate the elapsed time between soil boring completion and measurement of the static water level.

3 Indicate the screened interval depth.

4 Refer to [Groundwater sample collection and analysis procedures](https://www.pca.state.mn.us/sites/default/files/c-prp4-05.pdf) for acceptable groundwater sampling methods.

**Notes:**

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| Table 7  Analytical results of water samples collected from borings1 | | | | | | | | | | | | | |
| **Boring ID** | **Sample date** | **Sample depth (ft)** | **Benzene** | **Toluene** | **Ethyl- benzene** | **Xylenes** | **MTBE** | **1,2,4-Trimethyl-benzene** | **1,3,5-Trimethyl-benzene** | **Naph-thalene** | **GRO** | **DRO** | **Lab Type2** |
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1 Report results in µg/L. Use less than symbols to show the report level.

2 Indicate “mobile” or “fixed” in the lab type column.

3 See the Minnesota Department of Health (MDH) website at <http://www.health.state.mn.us/divs/eh/risk/guidance/gw/table.html> for a list of current HRLs.

**Notes:**

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| Table 8  Other contaminants detected in water samples collected from borings (petroleum or non-petroleum derived)1 | | | | | | | | | | | | | |
| **Boring ID** | **Sample date** | **Sample depth (ft)** | **1,2-Dichloro-ethane** | **1,2-Dibromo-ethane** |  |  |  |  |  |  |  |  | **Lab Type2** |
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1 Report results in µg/L. Use less than symbols to show the report level.

2 Indicate “mobile” or “fixed” in the lab type column.

3 See the MDH website at <http://www.health.state.mn.us/divs/eh/risk/guidance/gw/table.html> for a list of current HRLs.

**Notes:**

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| Table 9  Monitoring well completion and location information1 | | | | | | | | | | | |
| **Well number** | **MDH unique well number** | **Well location2** | | **Date installed** | **Surface elevation  (ft amsl)4** | **Top of riser**  **elevation  (ft amsl)4** | **Bottom**  **of well**  **elevation  (ft amsl)4** | **Depth to top of screen from surface (ft)** | **Depth to bottom of screen from surface (ft)** | **Screen slot size (inches)** | **Well stickup (ft)5** |
| **X Coordinate3** | **Y Coordinate3** |
| *Ex 1* | *123456* | *123456* | *1234567* | *1/1/17* | *1023.6* | *1025.6* | *1003.6* | *10* | *20* | *0.01* | *2* |
|  |  |  |  |  |  |  |  |  |  |  |  |
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1 Include well construction diagrams and MDH well logs in Section 6.

2 Well locations should preferably be provided in Universal Transverse Mercator (UTM) coordinates (meters) to the nearest meter, but geographic coordinates (Lat-Long) are acceptable using decimal degrees with precision to six decimal places.Refer to [Spatial data collection at petroleum remediation sites](https://www.pca.state.mn.us/sites/default/files/c-prp1-03.pdf) for more information.

3 X Coordinate is the easting coordinate and the Y Coordinate is the northing coordinate. The method of obtaining the coordinates must be indicated in the table footnotes; for example: classical surveying, GPS, map interpolation, photo interpolation, or other interpolation.

4 The method of obtaining the elevation must be indicated in the table footnotes; for example: classical surveying, GPS (indicate equipment type). AMSL stands for above mean sea level.

5 If the top of riser is below grade (at-grade well), indicate the well stickup as a negative value.

**Notes:** (location and elevation of benchmark, coordinate collection method, elevation collection method)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 10  Water level measurements in wells1 | | | | | | |
| **Well number** | **Sample date** | **Depth to water from top of riser** | **LNAPL thickness (ft)** | **Depth to water below grade** | **Relative groundwater elevation** | **Water level above screen (Y/N)** |
| MW-1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| MW-2 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| MW-3 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

1 Describe in Section 6 the methods used to measure water levels.

**Notes:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 11  Analytical results of water samples collected from wells1 | | | | | | | | | | | | |
| **Well number** | **Sample date** | **Benzene** | **Toluene** | **Ethyl-benzene** | **Xylenes** | **MTBE** | **1,2,4-Trimethyl-benzene** | **1,3,5-Trimethyl-benzene** | **Naph-thalene** | **GRO** | **DRO** | **Lab Type2** |
| MW-1 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| MW-2 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| MW-3 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| MW-4 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Trip Blank |  |  |  |  |  |  |  |  |  |  |  |  |
| Equip. Blank |  |  |  |  |  |  |  |  |  |  |  |  |
| Lab Blank |  |  |  |  |  |  |  |  |  |  |  |  |
| HRL3 |  |  |  |  |  |  |  |  |  |  |  |  |

1 Report results in µg/L. Use less than symbols to show the report level.

2 Indicate “mobile” or “fixed” in the lab type column.

3 See the MDH website at <http://www.health.state.mn.us/divs/eh/risk/guidance/gw/table.html> for a list of current HRLs.

**Notes:**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 12  Other contaminants detected in water samples collected from wells (petroleum or non-petroleum derived)1 | | | | | | | | | | | | |
| **Well number** | **Sample date** | **1,2-Dichloro-ethane** | **1,2-Dibromo-ethane** |  |  |  |  |  |  |  |  | **Lab Type2** |
| MW-1 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| MW-2 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| MW-3 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| MW-4 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Trip Blank |  |  |  |  |  |  |  |  |  |  |  |  |
| Equip. Blank |  |  |  |  |  |  |  |  |  |  |  |  |
| Lab Blank |  |  |  |  |  |  |  |  |  |  |  |  |
| HRL3 |  |  |  |  |  |  |  |  |  |  |  |  |

1 Report results in µg/L. Use less than symbols to show the report level.

2 Indicate “mobile” or “fixed” in the lab type column.

3 See the MDH website at <http://www.health.state.mn.us/divs/eh/risk/guidance/gw/table.html> for a list of current HRLs.

**Notes:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 13  Field parameters and natural biodegradation parameters | | | | | | | | | |
| **Well number** | **Sample date** | **Specific conductance** | **Temp. °C** | **pH** | **Dissolved oxygen (mg/L)** | **Redox potential** | **Nitrate (mg/L)** | **(Fe II) (mg/L)** | **(H2S, HS-) (mg/L)** |
| MW-1 |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| MW-2 |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| MW-3 |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| MW-4 |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

Describe in Section 6 the methods and procedures used.

**Notes:**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 14  Light non-aqueous phase liquid (LNAPL) recovery | | | | | | | | | | | |
| **Recovery location**  **ID** | **Recovery date** | **Pre-recovery measurements** | | | | **Recovery method** | **Event recovery2** | | **Cumulative recovery3** | | **Comments** |
| **Depth to LNAPL**  **(ft)** | **Depth to GW1**  **(ft)** | **LNAPL thickness**  **(ft)** | **LNAPL volume**  **(gal)** | **LNAPL**  **(gal)** | **GW**  **(gal)** | **LNAPL**  **(gal)** | **GW**  **(gal)** |
| MW-1 |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| MW-2 |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| MW-3 |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| MW-4 |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |

1 GW = Groundwater

2 Volume recovered during individual recovery event for that location.

3 Cumulative volume recovered at each recovery location (i.e., keep a running total for each recovery point).

Describe in Section 6 the methods and procedures used.

**Notes:**

| Table 15  Properties located within 500 feet of the release source | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Distance from release source**  **(ft)** | **Water supply well** | | | **Public water supply** | | **Base-ment (Y/N)** | **Sump**  **(Y/N)** | **Possible petroleum sources (Y/N)** | **Comments (including property use)** |
| **Prop ID1** | **Property address** | **Well present (Y/N)** | **How determined2** | **Well use3** | **Utilized (Y/N)** | **Confirmed**  **by city**  **(Y/N)** |
| 1 |  |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |  |  |  |  |  |
| 10 |  |  |  |  |  |  |  |  |  |  |  |
| 11 |  |  |  |  |  |  |  |  |  |  |  |
| 12 |  |  |  |  |  |  |  |  |  |  |  |
| 13 |  |  |  |  |  |  |  |  |  |  |  |
| 14 |  |  |  |  |  |  |  |  |  |  |  |
| 15 |  |  |  |  |  |  |  |  |  |  |  |
| 16 |  |  |  |  |  |  |  |  |  |  |  |
| 17 |  |  |  |  |  |  |  |  |  |  |  |
| 18 |  |  |  |  |  |  |  |  |  |  |  |
| 19 |  |  |  |  |  |  |  |  |  |  |  |
| 20 |  |  |  |  |  |  |  |  |  |  |  |

1 Property IDs should correspond to labeled properties on the receptor map in Section 4.

2 The first attempt at contact should be in person. If personal contact is unsuccessful, follow up with a visual observation, telephone call, email, or returned postcard.

3 For example, domestic, industrial, municipal, livestock, lawn/gardening, irrigation.

**Notes:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 16  Water supply wells located within 500 feet of the release source and municipal or industrial wells within one-half mile | | | | | | | | | |
| **Property ID1** | **MDH unique well number** | **Surface elevation** | **Total depth (ft)** | **Base of casing (ft)** | **Static elevation** | **Aquifer** | **Use** | **Owner** | **Distance and direction from source**  **(ft)** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
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1 Property IDs should correspond to properties listed in Table 15 and labeled properties in the receptor map (Figure 11) if known or applicable.

**Notes:**

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| --- | --- | --- | --- |
| Table 17  Surface water receptor information | | | |
| **Map ID1** | **Name and type2** | **Distance and direction from plume edge**  **(ft)** | **Clean boring/well between?3**  **(Y or N)** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
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1 Map ID should correspond to a surface water receptor ID on the surface water map (Figure 13).

2 Type includes, but is not limited to, lake, retention pond, infiltration pond, ditch, intermittent stream, river, creek, rain garden, etc.

3 If the surface water receptor is upgradient or cross-gradient from the site, indicate so with “NA” for not applicable.

**Notes:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 18  Utility receptor information | | | | | | | | |
| **Utility ID1** | **Description** | **Construction material** | **Depth to top of structure** | **Diameter** | **Flow direction (for liquids)** | **Year installed** | **Backfill material** | **Distance to water table** |
| *Ex 1* | *Sanitary sewer main between Main St and 1st Ave* | *PVC* | *7 ft* | *2 ft* | *West* | *1984* | *Sand* | *Top of structure at water table* |
| *Ex 2* | *Water main between Main St and 1st Ave* | *Polyethylene* | *8 ft* | *4 in* | *West* | *1996* | *Sand* | *1 ft below water table* |
| *Ex 3* | *On-site water service line* | *Copper* | *6 ft* | *2 in* | *South* | *1980* | *Native soils* | *1 ft above water table* |
| 1 |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |  |  |
| 10 |  |  |  |  |  |  |  |  |

1 ID should correspond to an identified utility line on the receptor map (Figure 11).

**Notes:**

|  |  |
| --- | --- |
| **Utility ID1** | **Name, title, and telephone number for public entity contacted to obtain information or other source of information** |
| *Ex 1, 2* | *Mary Smith, City Engineer, XXX-XXX-XXXX* |
| *Ex 3* | *Site owner* |
|  |  |
|  |  |

1 IDs should correspond to the same IDs in the above table.

**Notes:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 19  Vapor survey results | | | | |
| **Location ID1** | **Description2** | **Monitoring date** | **PID reading**  **(ppmv)** | **Percent of the LEL3** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
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1 Location IDs must match labeled locations on the vapor survey map (Figure 14).

2 Provide a brief description of the monitoring point (e.g., sump, basement corner, sanitary sewer manhole, storm sewer basin, etc.). If sampling at multiple depths at the same location, indicate the sampling depth in the Description field.

3 LEL = Lower Explosive Limit.

**Notes:**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 20  Results of soil gas sampling for vapor intrusion screening1 | | | | | | | | | | | | | |
| **Sample ID2** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Sample date** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Sample depth (feet)** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **PID reading (ppmv)** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Compounds** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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1 Report results in µg/m3. Use less than symbols to show report level. Bold or highlight results that exceed a vapor intrusion screening value. The intrusion screening values can be found on the MPCA’s [Cleanup guidance](https://www.pca.state.mn.us/waste/cleanup-guidance) webpage.

2 Sample IDs should correspond to labeled locations on the vapor intrusion assessment map (Figure 15).

**Notes:**

Section 6: Appendices

Attach all required or applicable appendices in the following order. Indicate those appendices that are included in this report by marking the check box. The appendix section of the report contains sufficient information to document all activities completed since the last report. All reproduced data must be legible. **Double click checkboxes to select *Checked* and select *OK*.**

|  |  |  |
| --- | --- | --- |
|  | *Appendix A* | Copies of most recent laboratory analytical reports for soil, soil gas/sub-slab vapor/indoor air/ambient air, and groundwater samples, along with a copy of the chain of custody. Include laboratory QA/QC data, chromatograms, and laboratory certification number. Include pre and post analytical results if DRO silica gel method was performed. |
|  | *Appendix B* | Methodologies and procedures, including field screening of soil, other field analyses, soil boring, soil sampling, soil gas/sub-slab/indoor air/ambient air sampling, well installation, and water sampling. |
|  | *Appendix C* | Geologic logs of additional soil borings and wells installed. Include construction diagrams of temporary and permanent wells and copies of the Minnesota Department of Health well record for new wells. Record on the boring log the amount of time the boring was left open to allow measurement of the water level. |
|  | *Appendix D* | Field or sampling data forms (sampling forms, field crew notes, etc.), and equipment calibration sheets. |
|  | *Appendix E* | [Light non-aqueous phase liquid recovery report](https://www.pca.state.mn.us/sites/default/files/c-prp2-03.docx) |
|  | *Appendix F* | [Release information worksheet](https://www.pca.state.mn.us/sites/default/files/c-prp2-05.docx) (if not previously submitted) |
|  | *Appendix G* | [Conceptual corrective action design (CCAD) report](https://www.pca.state.mn.us/sites/default/files/c-prp7-02.docx) |
|  | *Appendix H* | Copies of site photographs, if available. |
|  | *Appendix I* | [Field work notification](https://www.pca.state.mn.us/waste/field-work-notifications) copy of record(s) from MPCA’s [e-Services](https://www.pca.state.mn.us/data/e-services). |
|  | *Appendix J* | Documentation of EQuIS electronic data deliverables (EDDs) submission to the MPCA. See the MPCA’s [EQuIS](https://www.pca.state.mn.us/data/environmental-quality-information-system-equis) website for more details. |