Current stormwater management policies encourage, when appropriate, maximizing the infiltration of stormwater to reduce the volume of runoff discharging to surface waters. In addition to reducing runoff volume, stormwater infiltration helps reduce stormwater pollutant loading to surface waters.

Infiltration is not encouraged or may be prohibited when contaminants in soil or groundwater are mobilized by infiltrating stormwater. The Minnesota Pollution Control Agency (MPCA) developed a checklist for evaluating the likelihood that contaminants are present at a site and may be mobilized by stormwater infiltration. This document provides guidance for answering the questions in the checklist, which is contained in an Excel spreadsheet called ***Contamination screening checklist for stormwater infiltration.xlsx***.

**Overview of the checklist**

The checklist provides a simple method for assessing the likelihood that contaminants are present at a site and may be mobilized by stormwater infiltration. The approach requires an assessment of the site but does not require rigorous analysis such as sampling. The assessment requires visual inspection of the site, utilizing readily accessible sources of information, and performing some simple calculations. A conservative approach is utilized in which infiltration may be determined inappropriate even though actual contamination has not been verified at a site.

The checklist and accompanying guidance do not consider local standards, rules, or methodologies that may be applicable. There may be other site constraints that prevent or limit the ability to infiltrate stormwater (e.g. [shallow depth to bedrock](http://stormwater.pca.state.mn.us/index.php/Shallow_soils_and_shallow_depth_to_bedrock), [soils with low infiltration rates](http://stormwater.pca.state.mn.us/index.php/Soils_with_low_infiltration_capacity), [presence of karst](http://stormwater.pca.state.mn.us/index.php/Karst), [shallow depth to water](http://stormwater.pca.state.mn.us/index.php/Shallow_groundwater)).

**NOTE**: For [Construction Stormwater permittees](http://stormwater.pca.state.mn.us/index.php/III._STORMWATER_DISCHARGE_DESIGN_REQUIREMENTS#III.D._PERMANENT_STORMWATER_MANAGEMENT_SYSTEM), infiltration is prohibited when the infiltration system will be constructed in areas where high levels of contaminants in soil or groundwater will be mobilized by the infiltrating stormwater.

**Step I: Determine if the site has known contaminated soil or groundwater**

This step includes Box 1 from the checklist.

* *Box 1 – Does the site have known soil or groundwater contamination?*
	+ If No, proceed to Box 2.
	+ **If yes, Stop**. There is sufficient information to suggest that contaminants may be mobilized by infiltration. For Construction Stormwater permittees, infiltration is prohibited when the infiltration system will be constructed in areas where high levels of contaminants in soil or groundwater will be mobilized by the infiltrating stormwater. SEE FOOTNOTE.

If a site has contaminated soil or groundwater, there is sufficient information to suggest that contaminants may be mobilized by infiltration. Sites with known contamination include Brownfield sites, Superfund sites, petroleum leak sites, or other sites where contamination is known to exist. Tank sites, solid waste sites, and hazardous waste sites do not necessarily have contamination and additional information should be sought to determine if these sites have contaminated soil or groundwater. Available tools include USEPA’s [EnviroMapper](http://www.epa.gov/emefdata/em4ef.home) or the MPCA’s [What’s in My Neighborhood](https://www.pca.state.mn.us/data/whats-my-neighborhood) (recommended). What’s in My Neighborhood includes contact information for individual sites.

**Step II: Assess the site and proposed location of the BMP**

This step involves a historical and visual assessment of the site and the specific location on the site for the infiltration Best Management Practice (BMP).

* Box 2 - Does the site have a history of soil or groundwater contamination?
	+ If yes, proceed to Box 3.
	+ If No proceed to Box 4.
* Box 3 – If the answer to Box 2 is yes, has the contaminated soil or groundwater been remediated to acceptable levels?
	+ If yes, proceed to Box 4.
	+ **If no or unknown, Stop.** There is sufficient information to suggest that contaminants may be mobilized by infiltration. For Construction Stormwater permittees, infiltration is prohibited when the infiltration system will be constructed in areas where high levels of contaminants in soil or groundwater will be mobilized by the infiltrating stormwater. SEE FOOTNOTE

Boxes 2 and 3 are designed to determine if a site was contaminated in the past but has been remediated to acceptable levels. If the site has been contaminated (Yes to Box 2) and the contamination has not been remediated or it cannot be verified that the contamination has been remediated, there is sufficient information to suggest that contaminants may be present at the site and will be mobilized by infiltration.

The section called ***Information for conducting a screening assessment*** provides information and resources for conducting a site assessment. The assessment can, in most cases, be conducted without hiring a professional consultant or without conducting a Phase 1 investigation.

Defining an “acceptable level” of remediation may be difficult. The following represent acceptable levels of remediation.

* Soils that meet residential Soil Reference Values. See Soil-human pathway documents on [MPCA’s Risk-based site evaluation guidance web page](https://www.pca.state.mn.us/waste/risk-based-site-evaluation-guidance).
* Groundwater concentrations that meet Health Risk Levels (HRLs), Health-Based Values (HBVs), and Maximum Contaminant Levels (MCLs). See Groundwater pathway documents on [MPCA’s Risk-based site evaluation guidance web page](https://www.pca.state.mn.us/waste/risk-based-site-evaluation-guidance).
* Soils that meet soil-to-groundwater leaching pathway concentrations. See Soil to groundwater leaching pathway documents on [MPCA’s Risk-based site evaluation guidance web page](https://www.pca.state.mn.us/waste/risk-based-site-evaluation-guidance).

The MPCA provides closure letters at leaksites that pose no risk to receptors on- or off-site at the time the letter was sent. A closure letter does not guarantee that contamination has been completely removed from a site. To determine how to answer Box 3, apply the following.

* If a closure letter was sent by the MPCA for the site in question, determine if contamination still exists at the property. This may be done by reviewing reports and other information for the site or by contacting the MPCA. If it cannot be determined that contamination has been remediated to an acceptable level, answer No to Box 3.
* If a closure letter was sent by the MPCA for an adjacent property, answer Yes to Box 3 and proceed to Box 4. There may still be contamination on the adjacent property but this is addressed in Step III of the checklist.

The MPCA provides assurance letters at Brownfield sites that pose no risk to receptors on-site. If the MPCA has issued an assurance letter, answer Yes to Box 3 and proceed to Box 4. Although an assurance letter provides no guarantees for off-site contamination, this will be addressed in Step III of the checklist.

It may be possible to answer Box 2 [without conducting a Phase 1 Site Assessment](http://stormwater.pca.state.mn.us/index.php/Minnesota_Stormwater_Manual_test_page_1#Is_a_Phase_1_Environmental_Site_Assessment_needed.3F). Available tools include USEPA’s [EnviroMapper](http://www.epa.gov/emefdata/em4ef.home) or the MPCA’s [What’s in My Neighborhood](https://www.pca.state.mn.us/data/whats-my-neighborhood) (recommended). What’s in My Neighborhood includes contact information for individual sites. If an initial screening of the site history does not answer the question, it may be advisable to [hire a professional consultant](http://stormwater.pca.state.mn.us/index.php/Minnesota_Stormwater_Manual_test_page_1#Retaining_a_professional_consultant) and conduct a [Phase 1 site Assessment](http://stormwater.pca.state.mn.us/index.php/Minnesota_Stormwater_Manual_test_page_1#Phase_1_Environmental_Site_Assessment).

* Box 4 - For Boxes 5 through 13, check each box in which the item occurs on the site with the proposed BMP?
	+ Box 5 – Underground storage tank vent(s) or fill port(s)
	+ Box 6 – Monitoring well(s)
	+ Box 7 – Soil pile(s) covered with plastic sheeting or tarp(s)
	+ Box 8 – Staining of soil(s) and/or dead vegetation
	+ Box 9 – Unusual odor(s)
	+ Box 10 – Mismanaged drum(s) or chemical container(s)
	+ Box 11 – Excavation(s) that is/are not backfilled with clean material
	+ Box 12 – Presence of debris that may indicate presence of structure(s) or activity(ies) that could result in contamination
	+ Box 13 – Site is a confirmed stormwater hotspot
* Box 14 - Are there any potential sources identified (checked) in Boxes 5 through 13? If Yes, proceed to Box 15; if no proceed to Box 16.
* Box 15 - For all potential sources identified (checked) in Boxes 5 through 13, can adequate separation be achieved?
	+ If yes, proceed to Box 16.
	+ **If no, Stop.** There is sufficient information to suggest that contaminants may be mobilized by infiltration. For Construction Stormwater permittees, infiltration is prohibited when the infiltration system will be constructed in areas where high levels of contaminants in soil or groundwater will be mobilized by the infiltrating stormwater. SEE FOOTNOTE

Boxes 5 through 13 are based on visual observations at the site. Each of these may indicate the presence of contaminated soil or groundwater. For additional information and discussion, link here.

If any of these items is present at a site, they need to be further assessed. To answer the question in Box 15, rather than conduct sampling to determine if contamination exists, it is simplest to assume contamination exists and determine if adequate separation between the BMP and contamination can be achieved. This can be done by calculating the extent of a groundwater mound that develops beneath the infiltration BMP and then locating the BMP so that the mound will not intersect contaminants in soil or groundwater. An easy-to-use mounding calculator, developed by the United States Geologic Survey, can be utilized. Guidance on using this calculator at sites with potential or known contamination is found here. Additional information on this mounding calculator is found [at this link](http://stormwater.pca.state.mn.us/index.php/Stormwater_infiltration_and_groundwater_mounding), including links to the [calculator](http://pubs.usgs.gov/sir/2010/5102/) and [example calculations](http://stormwater.pca.state.mn.us/index.php/Stormwater_infiltration_and_groundwater_mounding#Example_mound_calculations).

If one or more of these items is present on a site and adequate separation cannot be established between the potential contaminant source and the proposed BMP, there is sufficient information to suggest that contaminants may be mobilized by infiltration.

**Step III: Assessing adjacent properties**

If the answer to Box 14 was no or the answer to Box 15 was yes, the next step is to assess adjacent properties. The primary concern on adjacent properties is contaminated groundwater or contaminated soil that is very close to the water table and would be intersected by a mound beneath the BMP.

* Box 16 - For Boxes 17 through 26, check each box in which the feature occurs within the influence zone of the site property
	+ Box 17 - Known groundwater or soil contamination on adjacent property
	+ Box 18 – Underground storage tank vent(s) or fill port(s)
	+ Box 19 – Monitoring well(s)
	+ Box 20 – Soil pile(s) covered with plastic sheeting or tarp(s)
	+ Box 21 – Staining of soil(s) and/or dead vegetation
	+ Box 22 – Unusual odor(s)
	+ Box 23 – Mismanaged drum(s) or chemical container(s)
	+ Box 24 – Excavation(s) that are not backfilled with clean material
	+ Box 25 – Presence of debris that may indicate presence of structure(s) or activity(ies) that could result in contamination
	+ Box 26 – Site is a confirmed stormwater hotspot

The influence zone is the distance from the property boundary at which a groundwater plume from the BMP would not intersect contamination on an adjacent property. For example, using the table below, if the soil beneath the BMP was fine sand and the underlying aquifer was coarse sand, the influence zone would be 75 feet. This means during the site visit you would look for the features in Boxes 17 through 26 within 75 feet of your property boundary. Any feature detected beyond 75 feet would not be considered a concern for mobilizing contamination as a result of stormwater infiltration. The default influence zone is 500 feet, meaning if you do not know the soil and aquifer material at the site, you would search for the above features within 500 feet of your property boundary.

|  |  |  |
| --- | --- | --- |
| **Soil beneath BMP** | **Aquifer material** | **Influence zone distance (feet)** |
| Default | 500 |
| Any soil | Fine sand or finer | 75 |
| Any soil  | Unknown | 500 |
| Coarse sand | Coarse sand | 150 |
| Coarse sand | Gravel | 800 |
| Fine sand | Coarse sand | 75 |
| Fine sand | Gravel | 500 |
| Silt or finer | Coarse sand or finer | 75 |
| Silt or finer | Gravel | 150 |
| Unregulated fill | Coarse sand | 75 |
| Unregulated fill | Gravel | 500 |

* Box 27 - Are there any potential sources identified (checked) in Boxes 17 through 26? If No, **infiltration is appropriate at the site**. If Yes, proceed to Box 28.
* Box 28 - For all potential sources identified (checked) in Boxes 17 through 26, can adequate separation be achieved? If yes, **infiltration is appropriate at the site** . If no, proceed to Box 29.
* Box 29 – **If Box 28 is No, Stop**. There is sufficient information to suggest that contaminants may be mobilized by infiltration. For Construction Stormwater permittees, infiltration is prohibited when the infiltration system will be constructed in areas where high levels of contaminants in soil or groundwater will be mobilized by the infiltrating stormwater. SEE FOOTNOTE

The mounding calculation(s) used in Step II can be utilized to determine if adequate separation exists between the proposed BMP and the feature(s) of concern. If one or more of these items is present on adjacent property(ies) and adequate separation cannot be established between the potential contaminant source and the proposed BMP, there is sufficient information to suggest that contaminants may be mobilized by infiltration.

**FOOTNOTE**

If infiltration is pursued, additional investigation, such as a Phase 1 or Phase 2 Environmental Site Assessment, is highly recommended.

The above procedure does not confirm the presence or absence of contaminants. The STOP points indicate points at which there is sufficient information to suggest that contaminants may be mobilized by infiltration. It is appropriate to choose not to infiltrate. However infiltration may be deemed appropriate if either of the following conditions occur.

* Further investigation reveals no contamination on site or adjacent properties.
* Further investigation reveals contamination but allows the BMP to be located such that it will not mobilize contaminants.

NOTE: Failure to verify contamination at a site and subsequent mobilization of contamination as a result of [stormwater infiltration is a permit violation](http://stormwater.pca.state.mn.us/index.php/III._STORMWATER_DISCHARGE_DESIGN_REQUIREMENTS#III.D._PERMANENT_STORMWATER_MANAGEMENT_SYSTEM) and may result in liability issues.

Guidance for addressing sites with known or suspected contamination can be found here.