

DATA ELEMENTS INFORMATION TABLE

This table is intended to be used in addition to the Scoping 2 Decision Notice and Potential Contaminant Source Inventory Instructions to assist in the development of the Wellhead Protection Plan. This table contains links to information and ways to evaluate that information for inclusion into the Wellhead Protection Plan. It is not a complete list of all sources.

Wellhead Protection Data Elements – PHYSICAL ENVIRONMENT

<i>Data Elements</i>	Where to Find	When Element Applies In Terms of Vulnerability	Purpose In Part 2 Plan
<p>Precipitation</p> <p><i>Past 5 years data</i></p>	<p>Minnesota Climatology Working Group https://climateapps.dnr.state.mn.us/index.htm Minnesota Natural Resource Atlas https://mnatlas.org/gis-tool/ Minnesota Watershed Health Assessment Framework https://www.dnr.state.mn.us/whaf/index.html</p>	<p>Surface water contribution area DWSMA only (Required to be discussed)</p>	<p>The tables can indicate times of the year of greatest precipitation which may correlate with increased likelihood of infiltration or surface runoff of contaminants from the land surface. These tables could also suggest when water quality monitoring would provide the most meaningful results.</p>
<p>Geology</p> <p><i>Existing maps, reports, and studies</i></p> <p><i>Records of wells and test borings</i></p> <p><i>Surface geophysical studies</i></p>	<p style="text-align: center;">Part 1 and related references</p>	<p>All settings (Part 1) (Required to be discussed)</p>	<p>Summarize or refer back to Part 1 for a description of geologic setting and vulnerability assessment. This information should be used in Part 2 to identify the types of land uses and potential contaminant sources that are of greatest concern because of increased risk of contamination to the PWS' aquifer due to the presence or absence of confining units. The geology itself may present issues for aquifer management when protective layers could be removed because of mining or in areas with karst features (sinkholes and losing streams) which provide preferential flow paths to the aquifer.</p>
<p>Soil Conditions</p> <p><i>Map of soils and infiltration characteristics</i></p> <p><i>Description or map of known eroding lands that cause sedimentation problems</i></p>	<p>USDA NRCS Soil Survey http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx Minnesota Natural Resource Atlas (mnatlas.org) https://mnatlas.org/gis-tool/ Minnesota Watershed Health Assessment Framework https://www.dnr.state.mn.us/whaf/index.html Minnesota Geospatial Commons https://gisdata.mn.gov/dataset/geos-statsgo2 https://gisdata.mn.gov/dataset/geos-ssurgo</p>	<p>Surface water contribution area and highly vulnerable DWSMAs (Submit in plan)</p>	<p>Use to prioritize areas for land management based on soil permeability. When there is a surface water contribution area, an area of high erosion can result in contaminants moving into areas of recharge.</p>

Water Resources			
<i>Shoreland classifications of public waters</i>	<p>County and city ordinances</p> <p>Minnesota Geospatial Commons https://gisdata.mn.gov/dataset/water-mn-public-waters</p>		
<i>Map of wetlands</i>	<p>National Wetland Inventory http://www.fws.gov/wetlands/ https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014 https://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html</p> <p>Circular 39 Wetland Classifications https://bwsr.state.mn.us/sites/default/files/2018-12/WETLANDS_delin_Circular_39_MN.pdf</p> <p>Cowardin Wetland Classifications https://www.fws.gov/wetlands/documents/classification-of-wetlands-and-deepwater-habitats-of-the-united-states.pdf</p> <p>Minnesota Natural Resource Atlas (mnatlas.org) https://mnatlas.org/gis-tool/</p> <p>Minnesota Watershed Health Assessment Framework https://www.dnr.state.mn.us/whaf/index.html</p>	<p>Surface water contribution area, DWSMA only</p> <p>(Required to be discussed)</p>	<p>Surface water features can be regulated under several different government rules and programs. These regulations and programs can be used as drinking water protection management tools for controlling land use and potential contaminant sources where these surface water features exist and overlap the DWSMA.</p>
<i>Map and list of public waters and public drainage ditches</i>	<p>Minnesota Geospatial Commons https://gisdata.mn.gov/ http://www.dnr.state.mn.us/waters/water_mgmt_section/pwi/maps.html and county records</p> <p>Minnesota Natural Resource Atlas https://mnatlas.org/gis-tool/</p> <p>Minnesota Watershed Health Assessment Framework https://www.dnr.state.mn.us/whaf/index.html</p>		
<i>Maps of major and minor watershed units</i>	<p>Minnesota Geospatial Commons https://gisdata.mn.gov/dataset/geos-dnr-watersheds & MPCA</p>		<p>Identification of the major and minor watersheds provides public water supply with information needed to connect to county and watershed planning efforts such as One Watershed One Plan</p>

	<p>https://www.pca.state.mn.us/business-with-us/watershed-information</p> <p>Minnesota Natural Resource Atlas https://mnatlas.org/gis-tool/</p> <p>Minnesota Watershed Health Assessment Framework https://www.dnr.state.mn.us/whaf/index.html</p> <p>MPCA Watersheds website https://www.pca.state.mn.us/water/watersheds</p>		<p>(1W1P), Watershed Restoration and Protection Strategies (WRAPS), and/or Groundwater Restoration and Protection Strategies (GRAPS).</p> <p>Public water supply wells that are located within designated floodplain areas should be evaluated to determine whether impacts from flood events are of concern.</p>
<p><i>Map of floodplain areas that are covered by ordinance</i></p>	<p>Minnesota Geospatial Commons https://gisdata.mn.gov/dataset/water-dnr-fema-dfirm</p> <p>FEMA Flood Map Service Center http://msc.fema.gov/portal</p> <p>Minnesota Natural Resource Atlas (mnatlas.org) https://mnatlas.org/gis-tool/</p> <p>Minnesota Watershed Health Assessment Framework https://www.dnr.state.mn.us/whaf/index.html</p>	<p>Surface water contribution area, high, moderate, and low vulnerability DWSMAs</p> <p>(Required to be discussed)</p>	

Wellhead Protection Data Elements — LAND USE

<i>Data Elements</i>	Where to Find	When Element Applies In Terms of Vulnerability	Purpose in Part 2 Plan
Land Use			
<i>Map of parcel boundaries</i>	County land use departments and Minnesota Geospatial Commons https://gisdata.mn.gov/	All settings (Submit, except parcel boundaries are required to be discussed)	The location and numbers of potential contaminant sources and land uses past and present identifies what are the greatest potential risks to the well and the aquifer. This is subsequently used to develop and prioritize actions or measures. The land ownership information and political and public land surveys helps to locate potential contaminant sources. Those land owners and government units identified in the DWSMA can assist with implementing management strategies and actions. Land cover and land use maps along with comprehensive land use and zoning maps provide the background for evaluating current and future land uses and the compatibility of these with protecting the PWS wells and aquifer.
<i>Map of public land surveys with township, range, and section (TRS)</i>	Minnesota Geospatial Commons https://gisdata.mn.gov/dataset/plan-mndnr-public-land-survey		
<i>Map of political boundaries</i>	Minnesota Geospatial Commons https://gisdata.mn.gov/dataset/bdry-mn-city-township-unorg		
<i>Comprehensive land-use map</i>	City and county planning departments		
<i>Zoning map</i>	City and county planning departments		
<i>Map and inventory of the current and historical agricultural, residential, commercial, industrial, recreational, and institutional land uses and potential contaminant sources</i> <i>As listed in the Scoping 2 Notice; a map and list of potential contaminant sources, land use/land cover map, and Inner Well Management Zone-Potential Contaminant Source IWMZ PCSI Report(s).</i>	MDH can provide Fisher, Sanborn, and land cover maps and will work with the PWS to generate an IWMZ-PCSI. National Land Cover Database at: https://www.mrlc.gov/card/nlcd-2019-products-now-available PCSI from various sources - Inventory depends on vulnerability and sources that need to be inventoried are identified in the Scoping 2 attachment.		
Public Utility Services			
<i>Map of transportation routes or corridors</i>	Minnesota Geospatial Commons https://gisdata.mn.gov/dataset/trans-roads-centerlines https://gisdata.mn.gov/dataset/trans-rail-lines	Surface water contribution area, high, and moderate vulnerability DWSMA	All of the utility data elements, except the PWS distribution system, can affect land and water uses because they can be potential sources of contamination. As such, they may limit future land- and groundwater uses because of historical contamination releases or the risk that they may present to public health. Construction and maintenance records on wells within the DWSMA provides information on whether these wells may serve as pathways for contaminants into the aquifer.
<i>Map of storm sewers, sanitary sewers, and the public water supply systems</i>	Provided by the municipality or Auditor Infrastructure Stress Transparency Tool https://www.osa.state.mn.us/reports-data-analysis/data/infrastructure-stress-transparency-tool/infrastructure-stress-transparency-tool-map/infrastructure-stress-transparency-tool/	Submit map of storm sewers, sanitary sewers and public water supply system (optional), gas and oil pipelines maps, and map or list of public drainage systems.	
<i>Map of gas and oil pipelines used by gas and oil suppliers</i>	National Pipeline Mapping System https://www.npms.phmsa.dot.gov/PublicViewer/	Public drainage system map does not need to be submitted in moderately vulnerable settings.	

<p><i>Map or list of public drainage systems</i></p>	<p>County records, 1W1P, DNR altered waters</p> <p>https://gisdata.mn.gov/dataset/water-public-drainage-systems</p> <p>https://gisdata.mn.gov/dataset/water-mn-public-waters</p>	<p>In low vulnerability settings only records of wells need to be addressed.</p>	
<p><i>Records of construction, maintenance, and use of the public water supply well(s) and other wells within the DWSMA</i></p>	<p>PWS records, MDH records, County Well Index, EPA private wells</p> <p>https://mnwellindex.web.health.state.mn.us</p> <p>https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=7ffe9ca0a2044e9c8e2b8f256c99525f</p>		

Wellhead Protection Data Elements — WATER QUANTITY

Data Elements	Where to Find	When Element Applies In Terms of Vulnerability	Purpose in Part 2 Plan
Surface Water Quantity			
<i>Existing description of high, mean, and low flows on streams</i>	http://www.dnr.state.mn.us/waters/surface_water_section/stream_hydro/protectedflow.html Stream Flow reports	For high vulnerability DWSMA description of water-use conflicts is Part 1. For surface water contribution area DWSMA all listed are Part 1.	Characteristics of surface water flows, protected flows, ordinary high water mark on lakes, and permitted withdrawals provide information to assess the response of the aquifer to various flow and water level regimes. The impact of water well pumping can affect the flow rate of local streams or the water level in nearby lakes or wetlands. Therefore, pumping restrictions may be warranted to reduce negative impacts on surface water and to reduce recharge of contaminated surface water to the water supply aquifer.
<i>Existing list of lakes where the state has established ordinary high water marks</i>	http://www.dnr.state.mn.us/waters/surface_water_section/hydrographics/ohw.html Contact area MDNR Hydrologist		
<i>Existing list of permitted withdrawals from lakes and streams, including source, use, and amounts withdrawn</i>	http://www.dnr.state.mn.us/waters/water_mgmt_section/appropriations/wateruse.html		
<i>Existing list of lakes and streams for which state protected levels or flows have been established</i>	http://www.dnr.state.mn.us/waters/surface_water_section/stream_hydro/protectedflow.html		
<i>Existing description of known water-use conflicts, including those caused by groundwater pumping</i>	MNDNR Regional Hydro and knowledge of PWS staff		
Groundwater Quantity			
<i>Existing list of wells covered by state appropriation permits, including amounts of water appropriated, type of use, and aquifer source</i>	MNDNR Regional Hydro http://www.dnr.state.mn.us/waters/water_mgmt_section/appropriations/wateruse.html	All settings (Part 1)	Pumping of high capacity wells may affect the movement of contamination toward or away from another well and should be considered when managing contamination already in an aquifer. The continued use of a contaminated well or how much an uncontaminated well can be pumped before it affects the movement of contamination to other wells needs to be considered in managing the DWSMA. Pumping may impact groundwater levels when recharge is less than withdrawal such as during times of drought. Therefore, pumping may impact water use within the DWSMA and may impact land uses such as for agricultural purposes or minerals extraction. The pumping limits for most community public water supply wells are set under the DNR appropriations permit.
<i>Existing description of known well interference problems and water-use conflicts</i>	MNDNR Regional Hydro and knowledge of PWS staff		
<i>Existing list of state environmental bore holes, including unique well number, aquifer measured, years of record, and average monthly levels</i>	https://www.dnr.state.mn.us/waters/cgm/index.html https://mnatlas.org/gis-tool/ Also, PWS staff if they are collecting water level data		

Wellhead Protection Data Elements — WATER QUALITY

<i>Data Elements</i>	Where to Find	When Element Applies In Terms of Vulnerability	Purpose in Part 2 Plan
Surface Water Quality		<p>Only surface water contribution area DWSMA for information summarizing lake and stream water quality monitoring.</p> <p style="text-align: center;">(Part 1)</p>	<p>Surface water chemistry data provides information about contaminant risks to the aquifer when there is a surface water contribution area or a situation where the wells are under the direct influence of a surface water feature. Surface water quality monitoring provides a basis for evaluating the interconnectivity between surface water and the aquifer by comparing contaminants or isotopic signatures that are found in surface water and the aquifer. When a strong interconnectivity between a surface water feature and the PWS aquifer has been established, the WHP plan must identify management strategies to reduce the risk of contamination to the aquifer from this source.</p>
<i>Information summarizing lake and stream water quality monitoring</i>	<p>https://webapp.pca.state.mn.us/surface-water/search</p> <p>https://www.pca.state.mn.us/business-with-us/watershed-information</p>		
Groundwater Quality		<p>All DWSMAs, except in low vulnerability settings only summary of water quality data, list of water chemistry data, and groundwater tracer studies.</p> <p style="text-align: center;">(Part 1)</p>	<p>Groundwater quality data indicates the presence of human-caused contaminants in groundwater. This data is used to evaluate the current water quality condition and sustainability of the PWS aquifer, and to identify potential sources of contamination or land uses that pose greater risk to the PWS aquifer. These potential sources of contamination or land uses should receive higher priority when assigning management strategies in the plan. Groundwater quality information throughout the DWSMA can be used to assess the pathways of recharge to the aquifer and therefore provides information for prioritizing areas within the DWSMA that need land management measures.</p> <p>The extent that groundwater quality may already be impaired by previous land and groundwater use practices can be indicated in studies, spill reports, and property audits. This information can assist in developing priority actions for managing land and groundwater uses within the DWSMA. These reports and studies may also indicate the rate that a contamination plume is moving towards or into the aquifer used by the PWS, as well as the likelihood that the PWS may need to consider implementing water treatment methods in the future.</p>
<i>Summary of groundwater quality data</i>	<p>PWS records, MPCA, or contact MDH staff for assistance with MDH databases</p> <p>https://mnccr.web.health.state.mn.us/index.faces</p> <p>http://www.pca.state.mn.us/index.php/data/groundwater.html</p> <p>https://mnatlas.org/gis-tool/</p>		
<i>List of water chemistry and isotopic data from wells, springs, or other groundwater sampling points</i>	Same as above		
<i>Reports of groundwater tracer studies</i>	<p style="text-align: center;">County Geologic Atlases</p> <p>https://www.dnr.state.mn.us/waters/groundwater_section/mapping/index.html</p> <p>https://www.dnr.state.mn.us/waters/programs/gw_section/springs/dtr-list.html</p>		
<i>Existing site studies and well water investigations of known areas of groundwater contamination</i>	<p>Refer to MPCA What's in my Neighborhood and MDA What's in my Neighborhood Ag Interactive Mapping</p> <p>https://www.pca.state.mn.us/about-mpca/whats-in-my-neighborhood</p> <p>https://www.mda.state.mn.us/chemicals/spills/incidentresponse/neighborhood</p> <p>https://gisdata.mn.gov/dataset/env-my-neighborhood</p>		

<i>Existing property audit identifying contamination</i>	Refer to MPCA What's in my Neighborhood and MDA What's in my Neighborhood Ag Interactive Mapping and also PWS files		
<i>Existing reports to MDA and MPCA of contaminant spill and releases</i>	Refer to MPCA What's in my Neighborhood and MDA What's in my Neighborhood Ag Interactive Mapping		