
Appendix

I – Wellhead Protection Plan Amendment and Scoping Document – Part 1

II – Scoping Document – Part 2

III – PCSI map and database, DWSMA Parcel List

IV – Inner Wellhead Management Zone Potential Contaminant Sources

V– DNR Water Supply Plan

VI – City of Melrose Public Utility Maps

VII – 2013 Consumer Confidence Report and Nitrate Testing Results

VIII – Old Municipal Well Table

IX – MNDOT Vehicle Spill Response Protocol

X – Implementation Schedule

XI – Glossary of Terms and Acronyms

Amendment to the Wellhead Protection Plan

Part I

**Delineation of Wellhead Protection Area
Drinking Water Supply Management Area Delineation
Well and Drinking Water Supply Management Area Vulnerability Assessments**

Prepared for

City of Melrose

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City of Melrose WHPP Part II - Appendix I

Table of Contents

	Page
Glossary of Terms.....	i
Acronyms.....	ii
1. Introduction.....	1
2. Assessment of the Data Elements.....	1
3. General Descriptions	3
3.1 Description of the Water Supply System.....	3
3.2 Description of the Hydrogeologic Setting	3
4. Delineation of the Wellhead Protection Area.....	4
4.1 Delineation Criteria	4
4.2 Method Used to Delineate the Wellhead Protection Area.....	8
4.3 Results of Model Calibration and Sensitivity Analysis	9
4.3.1. Calibration	9
4.3.2. Sensitivity Analysis	9
4.4 Addressing Model Uncertainty.....	10
4.5 Conjunctive Delineation	11
5. Delineation of the Drinking Water Supply Management Area	11
6. Vulnerability Assessments.....	11
6.1 Assessment of Well Vulnerability	11
6.2 Assessment of the Drinking Water Supply Management Area Vulnerability.....	12
7. Selected References.....	13

List of Tables

Table 1: Water Supply Well Information	1
Table 2: Assessment of Data Elements.....	2
Table 3: Description of the Hydrogeologic Setting	4
Table 4: Description of WHPA Delineation Criteria.....	5
Table 5: Annual Volume of Water Discharged from Water Supply Wells	6
Table 6: Other Permitted High-Capacity Wells within Two Miles	7

City of Melrose WHPP Part II - Appendix I

Table of Contents - Continued

List of Figures

	Page
Figure 1: Wellhead Protection and 2013 Drinking Water Supply Management Area	15
Figure 2: Modeled Groundwater Flow Field	16
Figure 3: Cross-Section Locations.....	17
Figure 4a: Cross-Section A-A'	18
Figure 4b: Cross-Section B-B'	19
Figure 5: Sensitivity of the 10-Year Capture Zone to Hydraulic Conductivity	20
Figure 6: Surface Water Contribution Area.....	21
Figure 7: Drinking Water Supply Management Area Vulnerability	22

Glossary of Terms

Data Element. A specific type of information required by the Minnesota Department of Health to prepare a wellhead protection plan.

Drinking Water Supply Management Area (DWSMA). The area delineated using identifiable landmarks that reflects the scientifically calculated wellhead protection area boundaries as closely as possible (Minnesota Rules, part 4720.5100, subpart 13).

Drinking Water Supply Management Area Vulnerability. An assessment of the likelihood that the aquifer within the DWSMA is subject to impact from land and water uses within the wellhead protection area. It is based upon criteria that are specified under Minnesota Rules, part 4720.5210, subpart 3.

Emergency Response Area (ERA). The part of the wellhead protection area that is defined by a one-year time of travel within the aquifer that is used by the public water supply well (Minnesota Rules, part 4720.5250, subpart 3). It is used to set priorities for managing potential contamination sources within the DWSMA.

Inner Wellhead Management Zone (IWMZ). The land that is within 200 feet of a public water supply well (Minnesota Rules, part 4720.5100, subpart 19). The public water supplier must manage the IWMZ to help protect it from sources of pathogen or chemical contamination that may cause an acute health effect.

Wellhead Protection (WHP). A method of preventing well contamination by effectively managing potential contamination sources in all or a portion of the well's recharge area.

Wellhead Protection Area (WHPA). The surface and subsurface area surrounding a well or well field that supplies a public water system, through which contaminants are likely to move toward and reach the well or well field (Minnesota Statutes, part 103I.005, subdivision 24).

Well Vulnerability. An assessment of the likelihood that a well is at risk to human-caused contamination, either due to its construction or indicated by criteria that are specified under Minnesota Rules, part 4720.5550, subpart 2.

Acronyms

CWI - County Well Index

DNR - Minnesota Department of Natural Resources

EPA - United States Environmental Protection Agency

FSA - Farm Security Administration

MDA - Minnesota Department of Agriculture

MDH - Minnesota Department of Health

MGS - Minnesota Geological Survey

MnDOT - Minnesota Department of Transportation

MnGEO - Minnesota Geospatial Information Office

MPCA - Minnesota Pollution Control Agency

NRCS - Natural Resource Conservation Service

QBAA – Quaternary Buried Artesian Aquifer

QBUA - Quaternary Buried Unconfined Aquifer

QWTA - Quaternary Water Table Aquifer

SWCD - Soil and Water Conservation District

UMN - University of Minnesota

USDA - United States Department of Agriculture

USGS - United States Geological Survey

City of Melrose WHPP Part II - Appendix I

1. Introduction

The Minnesota Department of Health (MDH) developed Part I of the wellhead protection (WHP) plan at the request of the city of Melrose (public water supply identification number 1730016). The work was performed in accordance with the Minnesota Wellhead Protection Rule, parts 4720.5100 to 4720.5590. This work represents an amendment to the previous wellhead protection plan for Melrose that was approved in 2005.

This report presents delineations of the wellhead protection area (WHPA) and drinking water supply management area (DWSMA), and the vulnerability assessments for the public water supply well and DWSMA. Figure 1 shows the boundaries for the WHPA and the DWSMA. The WHPA is defined by a 10-year time of travel. Figure 1 also shows the emergency response area (ERA), which is defined by a one-year time of travel. Definitions of rule-specific terms used are provided in the “Glossary of Terms.”

This report also documents the technical information that was required to prepare this portion of the WHP plan in accordance with the Minnesota Wellhead Protection Rule. Additional technical information is available from MDH.

The wells included in the WHP plan are listed in Table 1.

**Table 1 - Water Supply Well Information
City of Melrose**

Local Well ID	Unique Number	Use/ Status ¹	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Aquifer	Well Vulnerability
Well 4	215113	P	16	98	128	1967	QWTA	Vulnerable
Well 5	180122	P	16	62	87	1981	QWTA	Vulnerable
Well 7	486430	P	16	83	105	1991	QBUA	Vulnerable
Well 8	608438	P	16	75	100	1998	QWTA	Vulnerable
Well 9	608424	P	16	67	85	1998	QWTA	Vulnerable

Note: ¹ Primary (P) Well

2. Assessment of the Data Elements

MDH staff met with representatives of the public water supplier on October 20, 2011, for a scoping meeting that identified the data elements required to prepare Part I of the WHP plan. Table 2 presents the assessment of these data elements relative to the present and future implications of planning items specified in Minnesota Rules, part 4720.5210.

City of Melrose WHPP Part II - Appendix I

Table 2 - Assessment of Data Elements

Data Element	Present and Future Implications				Data Source
	Use of the Wells	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Precipitation					
Geology					
Maps and geologic descriptions	M	H	H	H	MGS
Subsurface data	M	H	H	H	MGS, MDH, CWI
Borehole geophysics	M	H	H	H	MGS
Surface geophysics	L	L	L	L	Not Available
Maps and soil descriptions					
Eroding lands					
Water Resources					
Watershed units					
List of public waters					
Shoreland classifications					
Wetlands map					
Floodplain map					
Land Use					
Parcel boundaries map	L	H	L	L	Stearns County
Political boundaries map	L	L	L	L	
PLS map	L	H	L	L	MDH
Land use map and inventory					
Comprehensive land use map					
Zoning map					
Public Utility Services					
Transportation routes and corridors					
Storm/sanitary sewers and PWS system map					
Oil and gas pipelines map					
Public drainage systems map/list					
Records of well construction, maintenance, and use	H	H	H	H	City of Melrose, CWI, MDH
Surface Water Quantity					
Stream flow data					
Ordinary high water mark data					
Permitted withdrawals					
Protected levels/flows					
Water use conflicts					
Groundwater Quantity					
Permitted withdrawals	H	H	H	H	DNR, City of Melrose
Groundwater use conflicts	L	L	L	L	DNR
Water levels	H	H	H	H	CWI, MDH

City of Melrose WHPP Part II - Appendix I

Data Element	Present and Future Implications				Data Source
	Use of the Wells	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Surface Water Quality					
Stream and lake water quality management classification					
Monitoring data summary					
Groundwater Quality					
Monitoring data	H	H	H	H	MDH
Isotopic data	H	H	H	H	MDH
Tracer studies	H	H	H	H	Not Available
Contamination site data	M	M	M	M	Not Available
Property audit data from contamination sites					
MPCA and MDA spills/release reports					

Definitions Used for Assessing Data Elements:

- High (H) - the data element has a direct impact
- Moderate (M) - the data element has an indirect or marginal impact
- Low (L) - the data element has little if any impact
- Shaded - the data element was not required by MDH for preparing the WHP plan

Acronyms used in this report are listed on page ii, after the “Glossary of Terms.”

3. General Descriptions

3.1 Description of the Water Supply System

The city of Melrose obtains its drinking water supply from five primary wells. Table 1 summarizes information regarding them.

3.2 Description of the Hydrogeologic Setting

The hydrologic setting for the glacial outwash aquifer is described in the 2002 WHPA Part 1 report (Soule, 2002). The description of this hydrogeologic setting at the city wells is presented in Table 3.

Figures 3, 4a, and 4b show the distribution of the aquifer and its stratigraphic relationships with adjacent geologic materials. They were prepared using well record data that is contained in the County Well Index (CWI) database. The geological maps and studies used to further define local hydrogeologic conditions are provided in the “Selected References” section of this report.

City of Melrose WHPP Part II - Appendix I

Table 3 - Description of the Hydrogeologic Setting

Attribute	Descriptor	Data Source
Aquifer Material	Outwash Sand and Gravel	Meyer and others (1995).
Porosity Type and Value	Primary Porosity: 0.25	Freeze and Cherry (1979).
Aquifer Thickness	Approximately 145 feet	Interpreted from well records found in the CWI database.
Stratigraphic Top Elevation	Approximately 1,195 feet (as defined by water table; unsaturated sands extend higher)	Interpreted from well records found in the CWI database.
Stratigraphic Bottom Elevation	Approximately 1,050 feet	Interpreted from well records found in the CWI database.
Hydraulic Confinement	None	Interpreted from well records found in the CWI database and inferred from information contained in the county geologic atlas (Meyer and Knaeble, 1995).
Transmissivity	Reference Value: 4,940 ft ² /day Range of Values: 1,970 – 22,960 ft ² /day	A range of transmissivity values was used to reflect changes in aquifer composition and thickness, as well as uncertainties related to the quality of existing aquifer test data.
Hydraulic Conductivity	Reference Value: 56 ft/day or Range of Values: 36 to 259 ft/day	The reference value was obtained from the reference transmissivity value. The range of values was derived using specific capacity data obtained from well records and/or from additional aquifer test results listed in the “Selected References” section of this report.
Groundwater Flow Field	See Figure 2	Defined by using static water level elevations from well records in the CWI database and a calibrated groundwater model. Model results are in accordance with those published in the <i>Geologic atlas of Stearns County</i> (Zhang, 1998).

4. Delineation of the Wellhead Protection Area

4.1 Delineation Criteria

The boundaries of the WHPA for the city of Melrose are shown in Figure 1. Table 4 describes how the delineation criteria specified under Minnesota Rules, part 4720.5510, were addressed.

City of Melrose WHPP Part II - Appendix I

Table 4 - Description of WHPA Delineation Criteria

Criterion	Descriptor	How the Criterion was Addressed
Flow Boundary	Surface water features	The aquifer used by the city is mostly shallow and unconfined and is therefore, in connection with surface water features, such as the Sauk River, surrounding wetlands, and small unnamed lakes
Flow Boundary	Aquifer Geometry	The aquifer used by the city is an outwash channel that generally tracks with the current course of the Sauk River.
Flow Boundary	Other High-Capacity Wells (Table 6)	The pumping amounts were determined based on the averaged 2001 - 2010 pumped volumes. The pumping amounts of these high-capacity wells were included in the methods used for the delineation.
Daily Volume of Water Pumped	See Table 5	Pumping information was obtained from the Minnesota Department of Natural Resources (DNR) Groundwater Appropriations Permit 1975-3210. The annual pumped volumes were converted to a daily volume pumped by a well.
Groundwater Flow Field	See Figure 2	The model calibration process addressed the relationship between the calculated versus observed groundwater flow field.
Aquifer Transmissivity	Reference Value: 4,940 ft ² /day	The aquifer test plan was approved on December 30, 2011, and T was determined from specific capacity testing. Uncertainty regarding aquifer transmissivity was addressed as described in Section 4.4.
Time of Travel	10 years	The public water supplier selected a 10-year time of travel.

Information provided by the city of Melrose was used to identify the maximum volume of water pumped annually by each well over the previous five-year period, as shown in Table 5. No increase in water use is expected in the next five years. Previous pumping values have been reported to the DNR, as required by Groundwater Appropriation Permit 1975-3210. The maximum daily volume of discharge, used as an input parameter in the groundwater model, was calculated by dividing the greatest annual pumping volume by 365 days.

City of Melrose WHPP Part II - Appendix I

Table 5 - Annual Volume of Water Discharged from Water Supply Wells

Well Name	Unique Number	Total Annual Withdrawal (gal/yr) Permit Number: 1975-3210					Maximum Withdrawal 2008 - 2012 (gallons/year)	Withdrawal used in WHPA (gallons/year)	WHPA Withdrawal Instantaneous Pumping Rate (m ³ /day)
		2008	2009	2010	2011	2012			
Well 4	215113	131,088,000	142,054,000	117,118,005	116,540,000	143,100,000	143,100,000	143,100,000	1483.1
Well 5	180122	89,828,000	101,612,000	135,555,008	125,958,000	132,000,000	135,555,008	135,555,008	1404.9
Well 7	486430	189,135,000	105,867,000	125,503,995	102,403,000	98,800,000	189,135,000	189,135,000	1960.2
Well 8	608438	171,873,000	187,143,000	170,668,005	181,687,000	156,000,000	187,143,000	187,143,000	1939.5
Well 9	608424	134,921,000	115,860,000	111,706,995	106,850,000	107,000,000	134,921,000	134,921,000	1398.3
Totals		716,845,000	652,536,000	660,552,008	633,438,000	636,900,000	789,854,008	789,854,008	8,186.0

Source: The DNR State Water Use Database System (SWUDS) Permit Number 1970-1386.

¹Source: City of Melrose. Bolding indicates greatest annual pumping volume.

City of Melrose WHPP Part II - Appendix I

Table 6 - Other Permitted High-Capacity Wells within Two Miles

Unique Number	Well Name	DNR Permit Number	Aquifer	Use	2001 -2010 Average Annual Volume of Water Pumped (gallons)	Q (m ³ /day)
132422	TOENIES, HAROLD	1977-3565	QWTA	Major Crop Irrigation	820,000	8.50
132426	MEYER, ROGER & SHARON	1977-3634	QBAA	Major Crop Irrigation	655,000	6.79
453408	SPAETH, RICK	1988-3263	QBAA	Sod farm	127,000	1.32
453408	SPAETH, RICK	1988-3263	QBAA	Major Crop Irrigation	29,000	0.30
501494	HINNENKAMP, LUVERNE	1990-3088	QBAA	Major Crop Irrigation	317,000	3.29
242888	MEADOWLARK COUNTRY CLUB	1990-3423	QWTA	Golf Course Irrigation	1,283,000	13.30
433388	MEADOWLARK COUNTRY CLUB	1990-3423	QWTA	Golf Course Irrigation	836,000	8.66

4.2 Method Used to Delineate the Wellhead Protection Area

Figure 1 shows the WHPA delineated for the city of Melrose. The WHPA is a composite of all the areas identified using the methods described below that likely contribute recharge to the aquifer used by the public water supply wells within a 10-year time of travel.

The WHPA for the city of Melrose was determined using a regional MODFLOW Model that was specially developed for this project. MODFLOW is a 3D, cell-centered, finite difference, saturated flow model developed by the U.S. Geological Survey (McDonald and Harbaugh, 1988; Harbaugh et al., 2000).

The city wells draw from glacial outwash consisting of sand, gravel and cobbles deposited in a channel eroded into clay till and granitic bed rock. South of the well field is an uplands where the coarse glacial sediments are overlain in many areas by thin deposits of clayey glacial till. The Melrose model was constructed using two-layers that represent the major aquifer and aquitard in the area. These layers represent from top to bottom, the following units: (1) surficial aquifer of glacial outwash deposits and/or upper clayey till unit and (2) Quaternary Buried Artesian Aquifer or deep glacial outwash deposits within the erosional channel.

The different creeks, rivers, and lakes within the active area of the model, were represented by river conductance cells. Wetlands were modeled using the MODFLOW drain module and represented by drain cells with prescribed conductance. Vertical recharge to the aquifer was applied to the model to represent potential leakage through the overlying till materials to the buried drift aquifer. Groundwater recharge values published by Delin and Falteisek (2007) were used in the model. Pumping wells from the SWUDS database were incorporated in the model using their locations from the CWI database. The average pumping rates for the period 2001 - 2010 were used.

The model grid was refined around the Melrose wells. Variable grid spacing was used, ranging from one meter near the Melrose wells to 250 meters at the edge of the grid. This refinement was required for an accurate computation of the particle flow paths for determining the WHPA delineation.

Prior to their use in the delineations, the following modifications were incorporated in the refined models:

- Local areas of modified horizontal conductivity were included in the model to reflect the transmissivities in the Melrose well area.
- The pumping rates to be used in the WHPA were assigned to the Melrose wells.

The delineation, using the particle tracking MODPATH Code, was performed by backtracking particles from the well to a 10-year time of travel. A series of 50 particles were launched at each well. A porosity of 25 percent was used for the glacial outwash deposits.

4.3 Results of Model Calibration and Sensitivity Analysis

Model quality is commonly evaluated by three different measures: calibration, sensitivity, and uncertainty analyses. Model calibration is a procedure that compares the results of a model based on estimated input values to measured or “known” values. This procedure is used to define model validity over a range of input values. The result of calibration is an assessment of the general quality of the model and the confidence that may be placed in the model results. As a matter of practice, groundwater flow models usually are calibrated using groundwater elevation and flow (if available). Sensitivity analysis quantifies the differences in model results produced by the natural variability of a particular parameter. Uncertainty analysis addresses the effects of poor data quality (lack of local detailed information or deficiencies in the data) on the model results. Together, sensitivity and uncertainty analyses are commonly used to evaluate the effects that natural variability and uncertainties in the hydrogeologic data have on the size and shape of the capture zones. In regards to the WHPA delineation, these analyses are used to document that the delineation is optimal, conservative, and protective of public health based on existing information.

4.3.1. Calibration

Model calibration is a procedure that compares the results of a model based on estimated input values to measured or known values. This procedure can be used to define model validity over a range of input values, or to help determine the level of confidence with which model results may be used. As a matter of practice, groundwater flow models are usually calibrated using water elevation or flux.

The Melrose model was calibrated to the CWI database water level targets. The calibration was performed by manually adjusting the recharge rates and hydraulic conductivity values and comparing modeled piezometric heads against measured values at observation well locations, until a satisfactory fit is obtained. A quantitative measure by which to evaluate the success obtained during calibration is to compare the root mean square of the residuals (RMSE, or standard deviation of the model prediction error), and the maximum observed head difference across the model. A usually accepted calibration target is a RMSE that represents less than 10 percent of the total head change across the modeled area. For the present calibration, the standard deviation of the model prediction error represented less than 8 percent of the total change in measured heads across the model domain.

4.3.2. Sensitivity Analysis

Sensitivity is the amount of change in model results caused by the variation of a particular input parameter. Because of the relative simplicity of the model, the direction and extent of the modeled capture zone may be very sensitive to any of the input parameters:

The **pumping rate** directly affects the volume of the aquifer that contributes water to the well. An increase in pumping rate leads to an equivalent increase in the volume of aquifer and an expanded capture zone, proportional to the porosity of the aquifer materials.

Results - The pumping rate defined by WHP rule requirements is the highest rate that can be expected under normal water demand. Therefore, with respect to the delineation of the WHPA, the sensitivity of the capture zone to variations in the pumping rate is minimized.

The **direction of groundwater flow** determines the orientation of the capture zone. Variations in the direction of groundwater flow will not affect the size of the capture zone but are important for defining the areas that are contributing water to the well.

City of Melrose WHPP Part II - Appendix I

Results - The ambient groundwater flow field defined in Figure 2 provides the basis for determining the extent to which each model run reflects the conceptual understanding of the orientation of the capture area for a well. The regional model has been calibrated to hydraulic heads, and the local refined model calibration was verified. The sensitivity of the WHPA to the direction of groundwater flow should not be significant, given the current knowledge of hydraulic head distribution in the aquifer.

The **hydraulic gradient** (along with aquifer transmissivity) determines the rate at which water moves through the aquifer materials.

Results - The regional model has been calibrated to hydraulic heads. The local refined model calibration was verified. The sensitivity of the WHPA to the hydraulic gradient should not be significant, given the current knowledge of hydraulic head distribution in the aquifer.

The **horizontal hydraulic conductivity** influences the size and shape of the capture zone. In the base-case scenario, the hydraulic conductivity of the glacial outwash was estimated from the geometric mean of horizontal hydraulic conductivities estimated from step drawdown tests conducted in neighboring wells screened in the same aquifer. This value was used in the groundwater model to delineate the 10-year time of travel capture zone. Because no pumping test was conducted in the Melrose wells, the uncertainty of the hydraulic conductivity can be great. Several runs were performed for the range of hydraulic conductivity values derived from the specific capacity tests. The range of hydraulic conductivity considered in the sensitivity analysis runs is given in Table 3.

Results – An increase in the hydraulic conductivity of the glacial outwash aquifer elongates the capture zone while reducing its width. It also shifts the direction of the capture zone (Figure 5).

The aquifer **porosity** influences the size and shape of the capture zone.

Results - Decreasing porosity causes a linear, proportional increase in the areal extent of the capture zone.

4.4 Addressing Model Uncertainty

Using computer models to simulate groundwater flow involves representing a complicated natural system in a simplified manner. Local geologic conditions may vary within the capture area of the Melrose wells, but existing information is not sufficiently detailed to define this degree of variability. In addition, the available groundwater flow modeling techniques may not represent the natural flow system exactly, however, the results are valid within a range defined by the reasonable variation of input parameters.

Traditional numerical groundwater models were used to delineate the capture zone for the porous media aquifer that contributes water to the public water supply well. The steps employed for this delineation to address model uncertainty were:

- Pumping Rate - For the well, a maximum historical (five-year) pumping rate or an engineering estimate of future pumping, whichever is greater (Minnesota Rules, part 4720.5510, subpart 4).
- Horizontal hydraulic conductivity - The WHPA for the Melrose wells consists of a composite of the porous media aquifer delineations for the different input parameters used in the sensitivity analysis (Table 3).

Capture areas were developed for a range of aquifer horizontal hydraulic conductivities and a time of travel of 10 years (Figure 5). As the model code uses constant input values for each run, several runs

were required to include all variations in input parameters. The WHPA for the city of Melrose wells consists of a composite of the porous media aquifer delineations for the different input parameters used in the sensitivity analysis. This provides a conservative approach to addressing model uncertainty and produces a WHPA that will be most protective of public health.

4.5 Conjunctive Delineation

A conjunctive delineation involves the consideration of a surface water contribution area in the delineation of the wellhead protection area. The need for a conjunctive delineation was assessed for Melrose because of the high vulnerability area within the groundwater capture zone (Figure 7). A county ditch runs within the high vulnerability portion of the groundwater capture zone. This ditch is underlain by organic deposits (Figure 6). These organic deposits serve as an assimilative capacity boundary, attenuating and/or altering the composition of contaminants that may enter a public water supply well. Therefore, the watershed for this ditch was not included in the surface water contribution area. However, high grounds that may yield runoff to the high vulnerability area of the capture zone were delineated and included in the surface water contribution area depicted in Figure 6.

5. Delineation of the Drinking Water Supply Management Area

The boundaries of the DWSMA were defined by the public water supplier using the following features (Figure 1):

- Property or fence lines,
- Roads, and
- Public Land Survey coordinates.

6. Vulnerability Assessments

The Part I wellhead protection plan includes the vulnerability assessments for the public water supply wells and DWSMA. These vulnerability assessments are used to help define potential contamination sources within the DWSMA and to select appropriate measures for reducing the risk they present to the public water supply.

6.1 Assessment of Well Vulnerability

MDH has developed a database of community and non-community, non-transient public water supply wells in Minnesota that stores information pertinent to well vulnerability and rates the vulnerability of individual wells. A score is calculated for each well based on factors such as well construction, geology at the well site and chemical data. A higher score correlates to a greater perceived vulnerability. A numeric cutoff is used to identify vulnerable from non-vulnerable wells (MDH, 1997). Vulnerable wells are also identified based on the presence of contamination, such as nitrate-nitrogen in excess of 10 mg/l, or young (post-1953) water, as indicated by the presence of 1 tritium unit or greater in the well water. The results of this assessment for city wells are described below.

The vulnerability assessment for each well used by the city of Melrose is listed in Table 1. All city of Melrose wells are vulnerable. This assessment is based upon the following conditions:

City of Melrose WHPP Part II - Appendix I

- 1) Well construction meets current State Well Code specifications (Minnesota Rules, part 4725) and the wells themselves do not provide a pathway for contaminants to enter the aquifer used by the public water supplier.
- 2) The geologic conditions at the well sites do not include a cover of clay-rich geologic materials over the aquifer that is sufficient to retard or prevent the vertical movement of contaminants.
- 3) The results of routine chemical monitoring of water samples from the water treatment plant and city wells conducted by MDH over the period 1993–2013, showed indications of well vulnerability, but no violations of any parameters monitored under the Safe Drinking Water Act. Nitrate-nitrogen is a commonly cited indicator of human-caused impacts on water quality. Nitrate-nitrogen has been detected at moderate levels (<1 – 14 mg/l). Some samples have historically been above the drinking water standard of 10 mg/l, but monthly monitoring insures that the MCL is not regularly exceeded. Additional sampling has shown that pesticides and volatile organic compounds have not been detected in the water.
- 4) Water samples were collected from Well 5 (180122) in 1997 and from Well 7 (486430) in May 2011, and were analyzed for tritium. Tritium was found at 10.7 tritium unit (TU) in the sample from Well 5 (180122) and at 7.5 TU in the sample from Well 7 (486430).

6.2 Assessment of the Drinking Water Supply Management Area Vulnerability

The vulnerability of the DWSMA is moderate to high (Figure 6) and is based upon the following information:

- 1) Isotopic data and water chemistry from wells located within the DWSMA indicate the aquifer contains water that has detectable levels of tritium or human-caused contamination.
- 2) Review of the geologic logs contained in the CWI database, geological maps, and reports indicate the aquifer exhibits a low to high geologic sensitivity throughout the DWSMA. The L-scores from wells within or close to the DWSMA vary from 0 to 3, indicating that up to 30 feet of clayey material overlies glacial outwash aquifer (Figure 7). Therefore, the glacial outwash aquifer within the eroded channel near Melrose is highly vulnerable to potential sources of contamination that 1) are located directly over the aquifer or 2) may introduce contaminants to surface water runoff that may recharge the aquifer from higher topographic elevations.

7. Selected References

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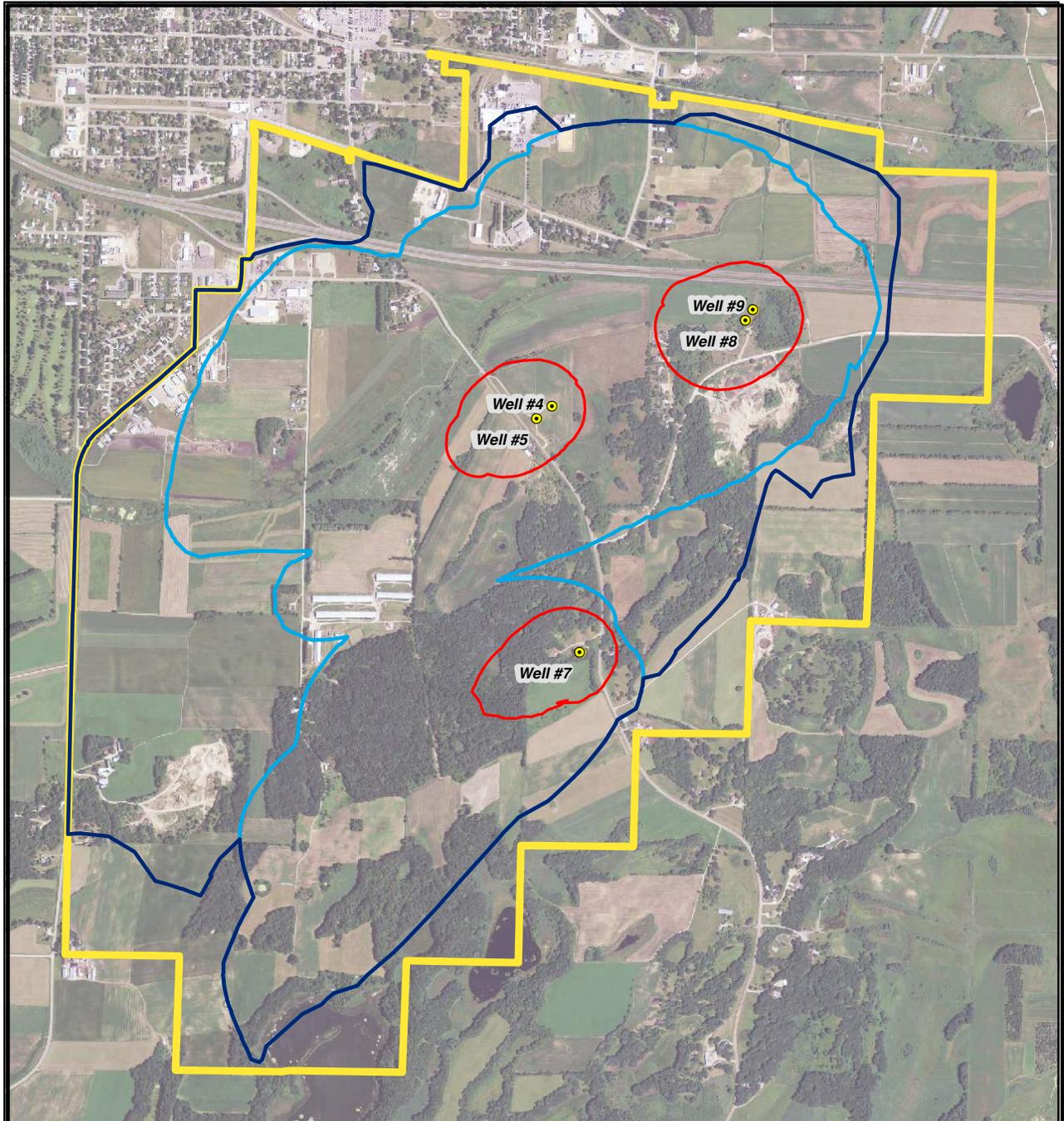
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Figures



- Primary Well
- Groundwater Capture Zone
- Wellhead Protection Area
- Emergency Response Area
- 2013 Drinking Water Supply Management Area

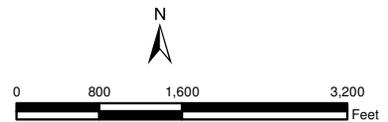
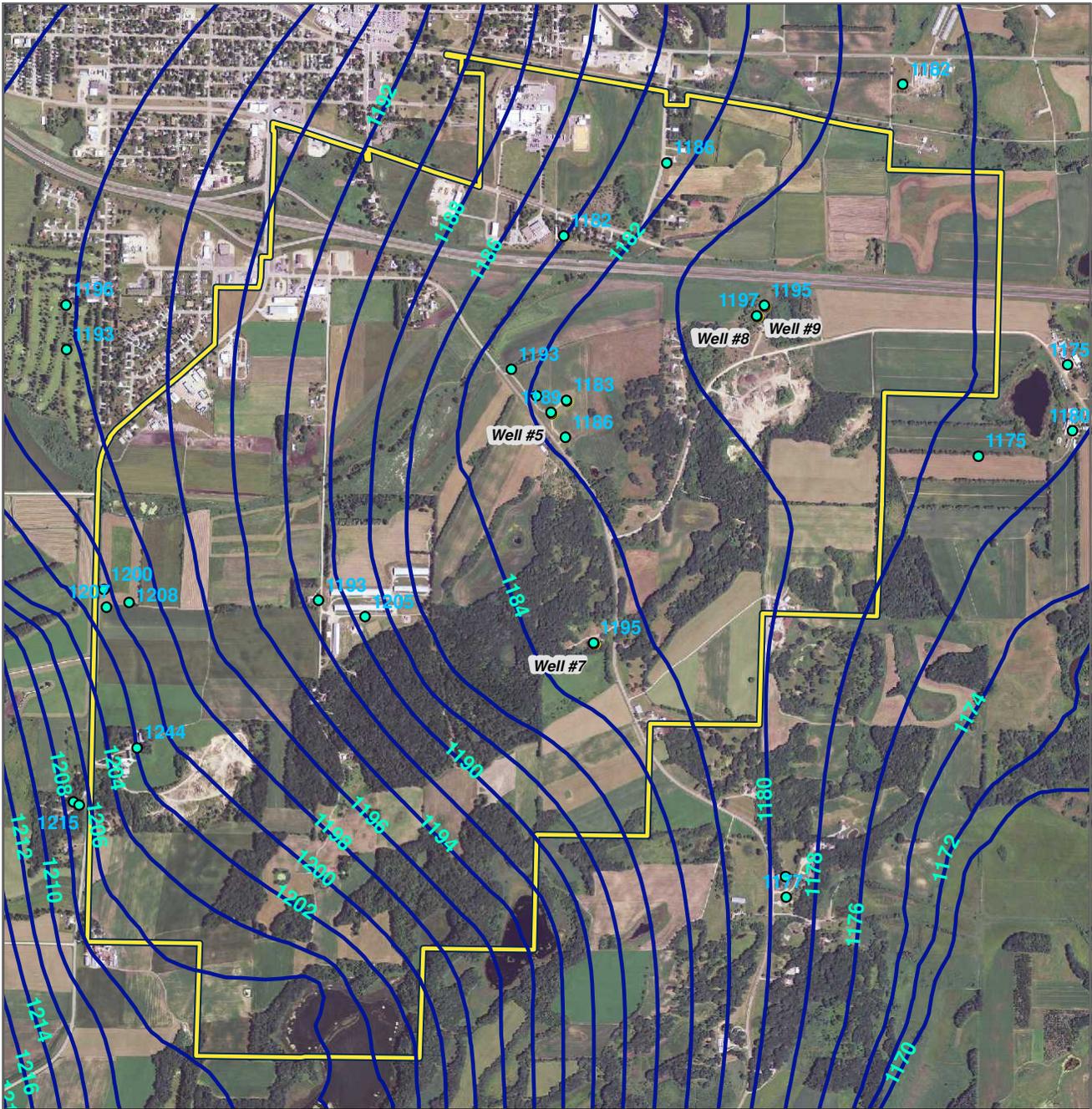


Figure 1
Wellhead Protection and
2013 Drinking Water Supply Management Area
City of Melrose

O:\DwpSwp\Project\County\73_Stearns\Melrose\GIS\ArcMap\1730016 - Melrose - Figure 1 - DWSMA.mxd (29 Jul 2013)



QBAA Wells (with observed water Levels in feet)

- QBAA Wells (with observed water Levels in feet)
- Primary Well
- Modeled Hydraulic Head Contours (in feet MSL)

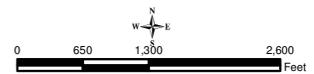
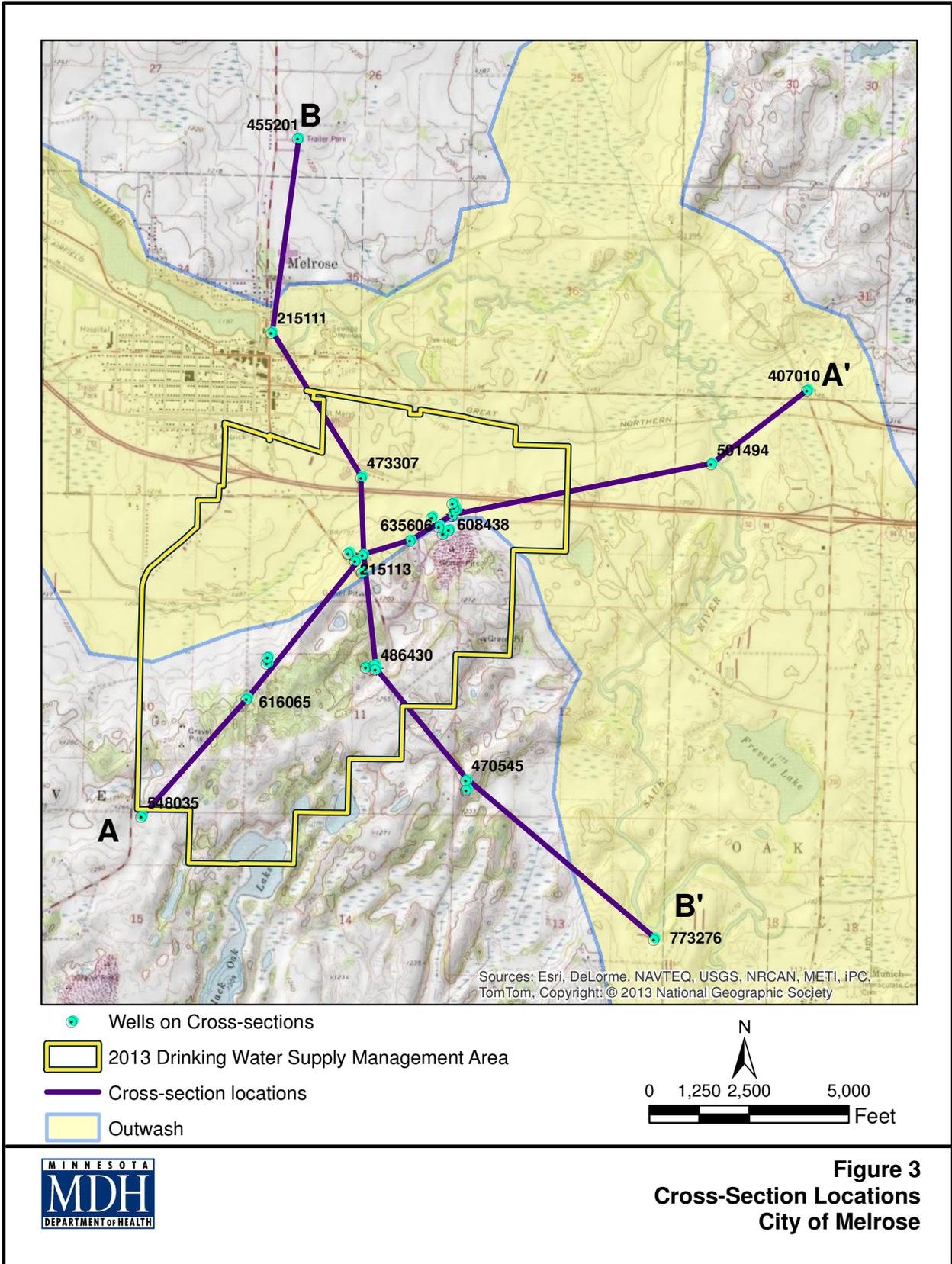


Figure 2
Modeled Groundwater Flow Field
Melrose, MN

City of Melrose WHPP Part II - Appendix I



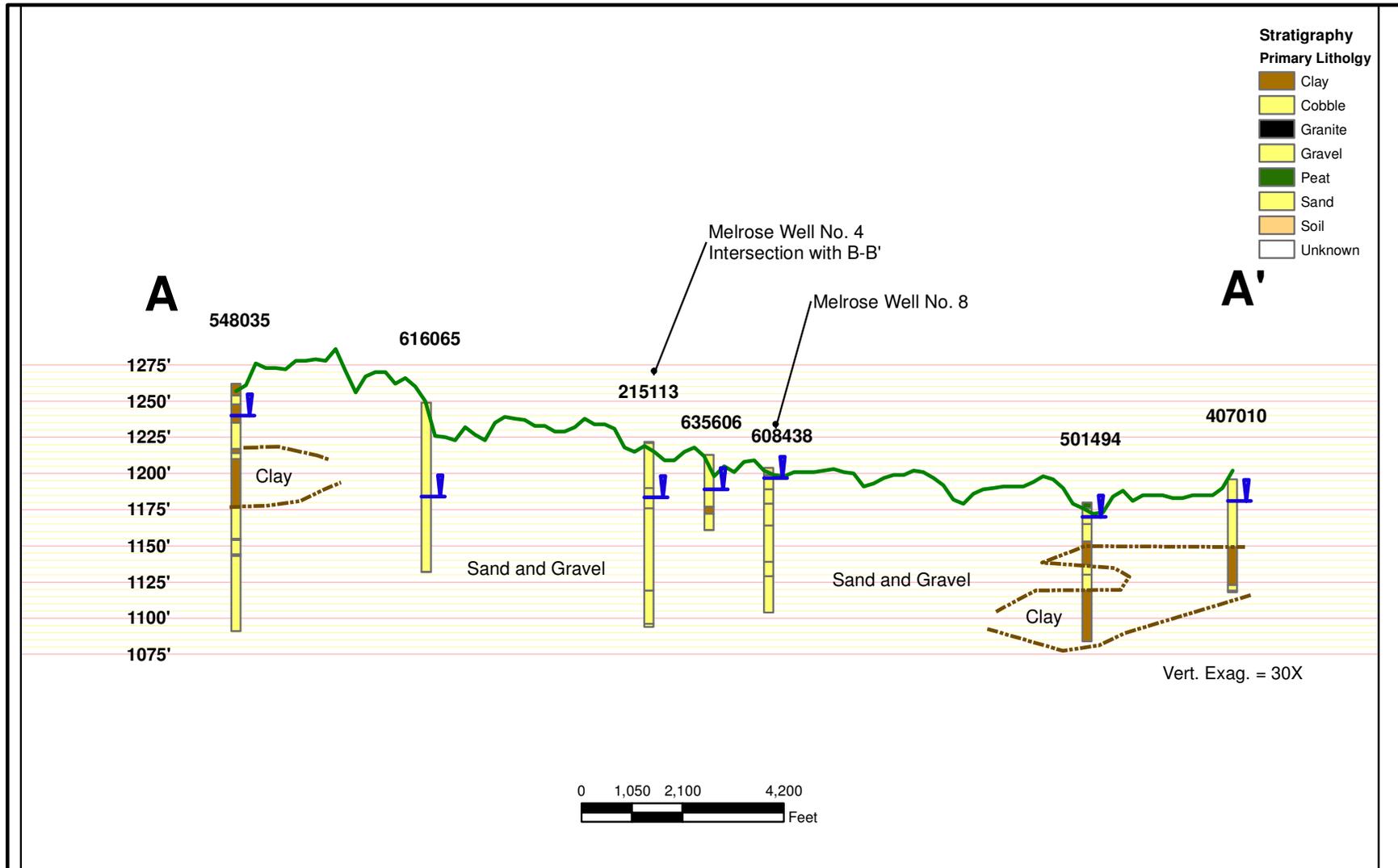


Figure 4a
Cross-Section A-A'
City of Melrose



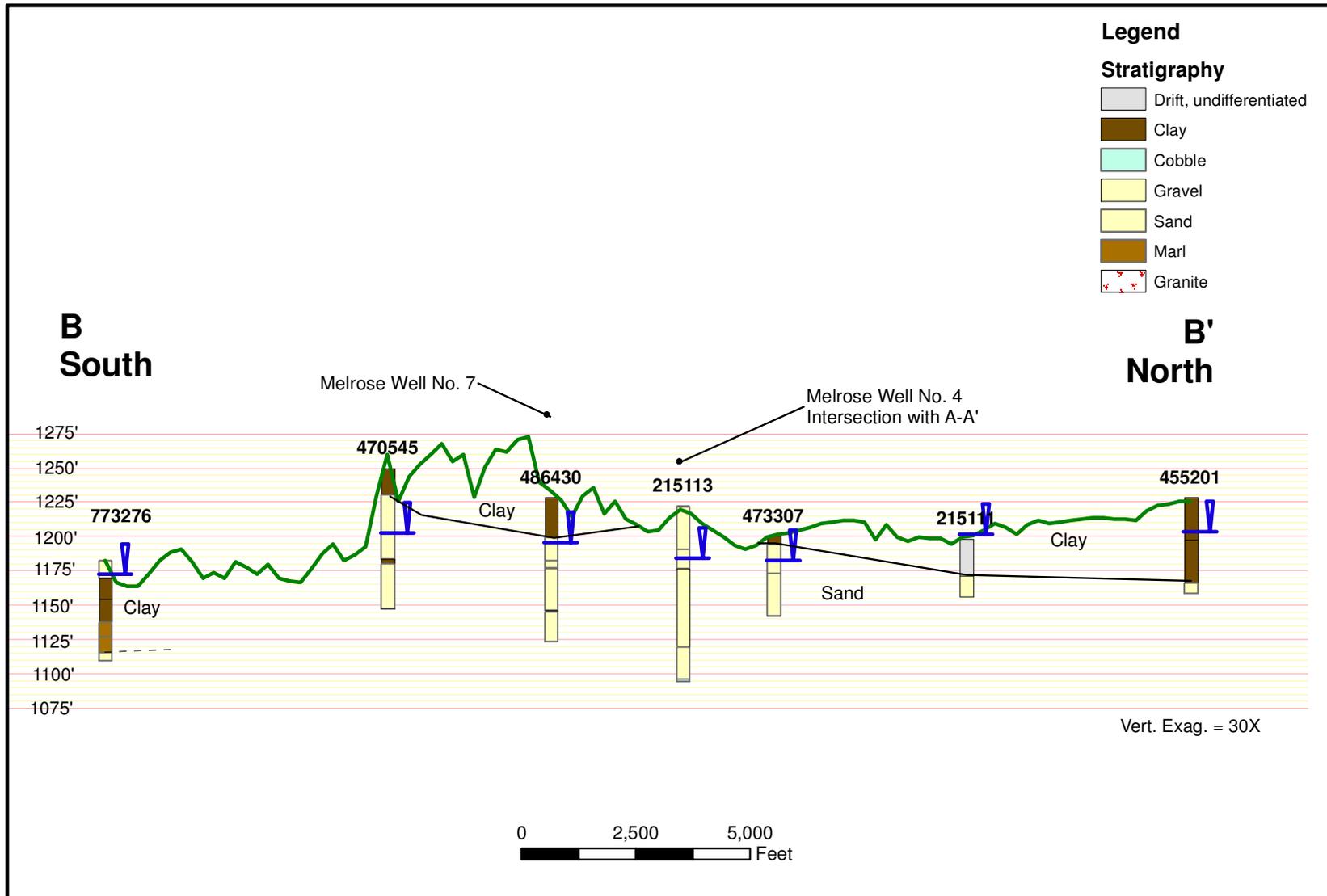


Figure 4b
Cross Section B-B'
City of Melrose

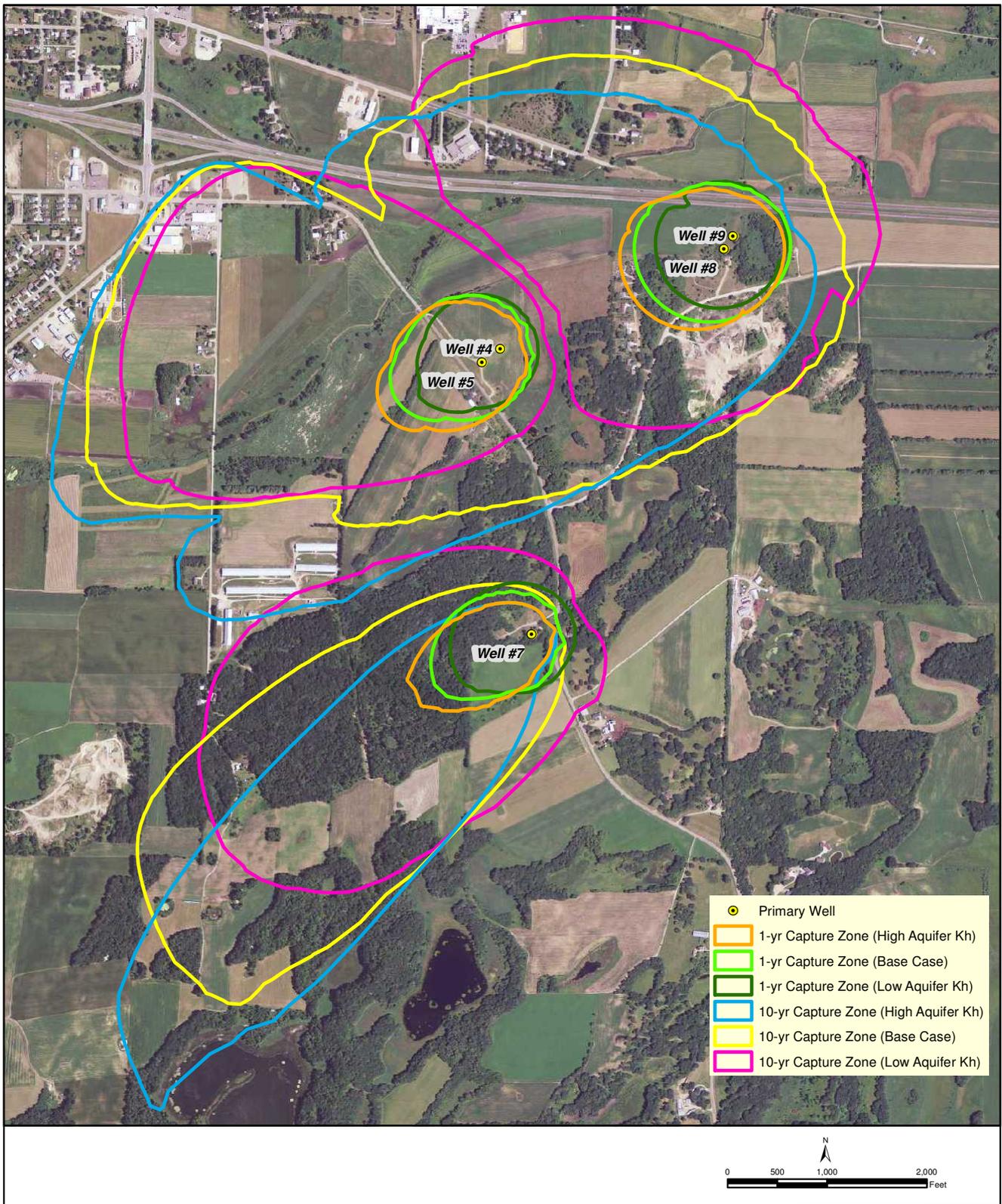


Figure 5
Sensitivity of the 10-Year Capture Zone to Hydraulic Conductivity
City of Melrose

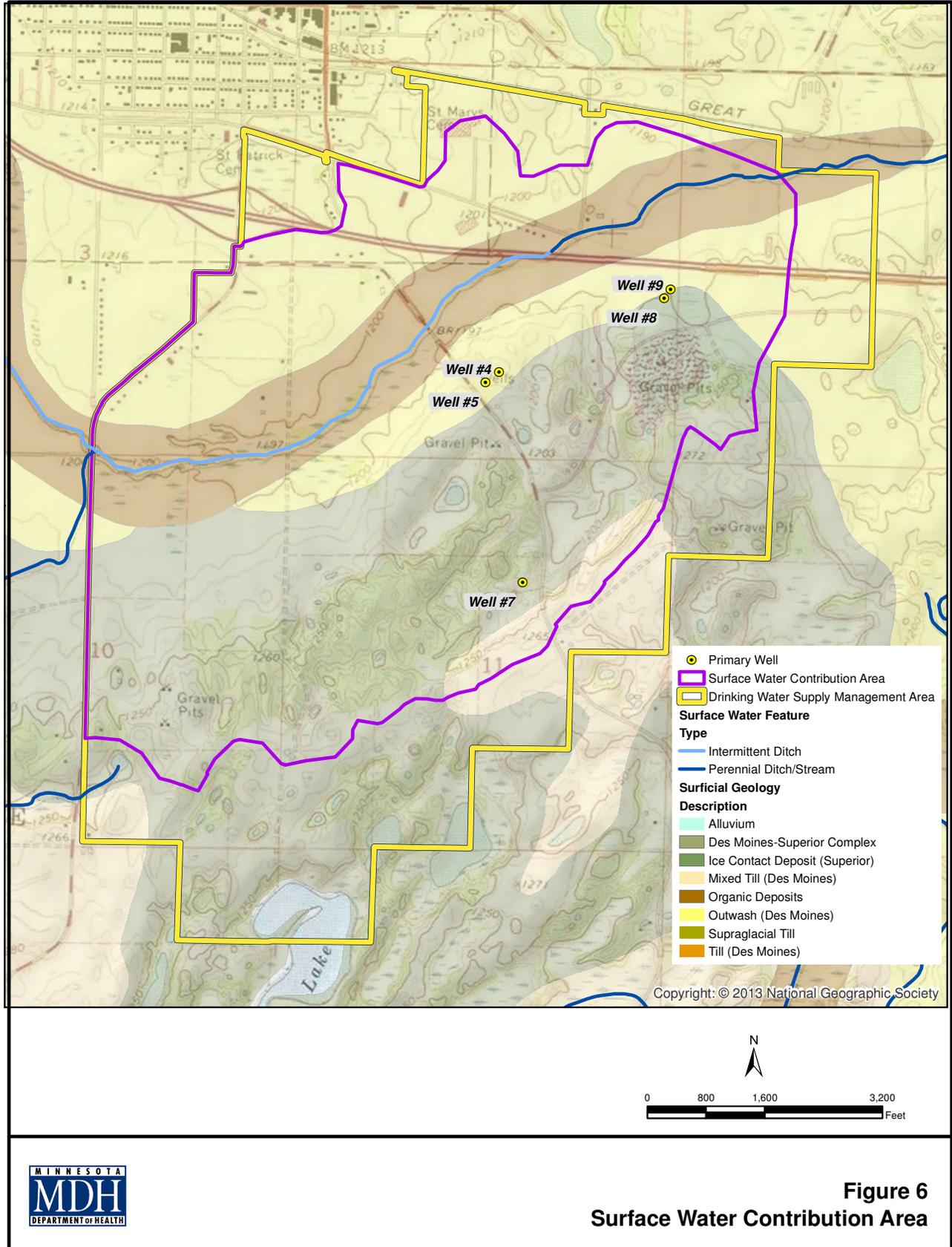
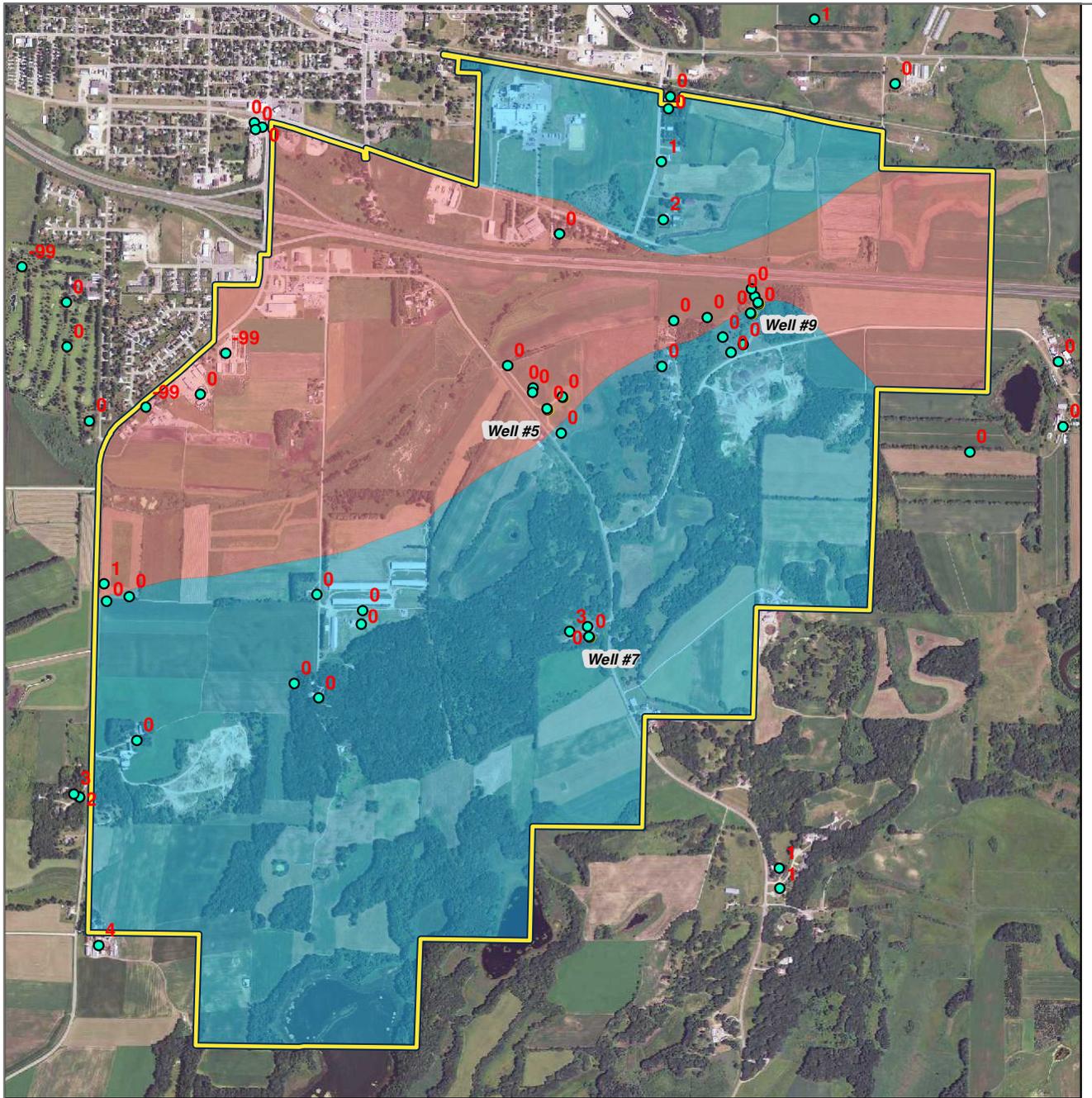


Figure 6
Surface Water Contribution Area



- 3 ● CWI Wells with L-scores
 - Primary Well
 - ▭ 2013 Drinking Water Supply Management Area
- 2013 DWSMA Vulnerability**
- DWS_VUL**
- High
 - Moderate

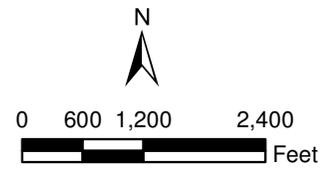


Figure 7
Drinking Water Supply Management Area Vulnerability
Melrose, MN

City of Melrose WHPP Part II - Appendix I

SCOPING DECISION NOTICE No. 1

The purpose for the first Scoping Meeting, as required by Minnesota Rules, part 4720.5310, is to discuss the information necessary for preparing the Part I Report of a Wellhead Protection Plan. The Part I Report identifies the area that provides the source of drinking water for the public water supply (PWS) so that the PWS can develop land use or management practices to protect their groundwater resource from contamination. Specifically, the Part I Report documents the delineation of the wellhead protection area (WHPA), the delineation of the drinking water supply management area (DWSMA), and assesses the vulnerability of the PWS wells and DWSMA.

The wellhead rule (Minnesota Rules, part 4720.5310) refers to the information required for wellhead planning as data elements. This form lists the data elements that are stated in Minnesota Rules, part 4750.5400. The Minnesota Department of Health (MDH) uses this form to designate which data elements are needed to prepare the Part I Report, based on the hydrogeological setting, vulnerability of the wells, and aquifer information known at the time of the Scoping 1 Meeting.

Name of Public Water Supply		Date	
City of Melrose (PWSID = 1730016)		November 7, 2011	
Name of the Wellhead Protection Manager			
Mr. Scott Gilbertson, Water Supervisor, City of Melrose			
Address		City	Zip
225 First Street Northeast		Melrose	56352
Unique Well Numbers		Phone	
215113 (Well 4), 180122 (Well 5), 486430 (Well 7), 608438 (Well 8), 608424 (Well 9)		320-492-6787	

Instructions for Completing the Scoping No. 1 Form

N	D	V	S	N = If this box is checked with an "X," this data element is NOT necessary for the Part I Report of your Wellhead Protection Plan. This data element may be identified later at the Scoping 2 Meeting and used for the Part 2 Report. Please go to the next data element.
X				

N	D	V	S	D = If this box is checked with an "X," the preparer of the Part I Report is required to use this information for the DELINEATION of the WHPA or the DWSMA. If there is no check in the "S" box, this information is available in the public domain or is on-file at MDH.
	X			

N	D	V	S	V = If this box is checked with an "X," the preparer of the Part I Report is required to use this information for the VULNERABILITY assessment of the PWS well(s) or the DWSMA. If there is no check in the "S" box, this information is available in the public domain or is on-file at MDH.
		X		

N	D	V	S	S = If this box is checked with an "X," the PWS must SUBMIT the information to the MDH.
			X	

City of Melrose WHPP Part II - Appendix I

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT

A. PRECIPITATION				
N	D	V	S	A.1: An existing map or list of local precipitation gauging stations.
	X			
Technical Assistance Comments: Precipitation values can be used to determine the local recharge in the groundwater model. The map can be used to determine the closest gauging station. The locations of the gauging stations are available in the public domain.				
N	D	V	S	A.2: An existing table showing the average monthly and annual precipitation, in inches, for the preceding five years.
	X		X	
Technical Assistance Comments: This information may be used for determining local recharge for the groundwater model. This information may be available in the public domain if there is a local gauging station, or may be obtained from the local wastewater treatment plant.				
B. GEOLOGY				
N	D	V	S	B.1: An existing geologic map and a description of the geology, including aquifers, confining layers, recharge areas, discharge areas, sensitive areas as defined in Minnesota Statutes, section 103H.005, subdivision 13, and groundwater flow characteristics.
	X	X	X	
Technical Assistance Comments: Information of this type is required to characterize the geologic and hydrogeologic setting of the PWS well fields. This information is used to define aquifer geometry, location and magnitude of the recharge and discharge areas, and groundwater flow information. Aquifer tests or alternatives listed in MN Rules, part 4720.5510, subpart 6, can be used to help characterize flow in the aquifer. Reference all information used to develop the conceptual model of the geologic setting and submit to MDH only the information that is not available in the public domain.				
N	D	V	S	B.2: Existing records of the geologic materials penetrated by wells, borings, exploration test holes, or excavations, including those submitted to the department.
	X	X	X	
Technical Assistance Comments: Information of this type may be useful to refine the understanding of the geologic and hydrogeologic setting on a local basis. Submit only if the PWS or city has information of test drilling or site investigations conducted by the city that is not available in the public domain.				
N	D	V	S	B.3: Existing borehole geophysical records from wells, borings, and exploration test holes.
	X	X	X	
Technical Assistance Comments: Information from geophysical records may provide additional information about aquifer thickness, well construction, and water level information at a local scale. Submit only if the information is not available in the public domain.				
N	D	V	S	B.4: Existing surface geophysical studies.
	X	X	X	
Technical Assistance Comments: Information from geophysical studies may be useful to refine the understanding of the geology on a local basis. Submit only if the information is not available in the public domain.				
C. SOILS				
N	D	V	S	C.1: Existing maps of the soils and a description of soil infiltration characteristics.
	X	X		
Technical Assistance Comments: This information is in the public domain and can be used to delineate the WHPA and assess the vulnerability of the DWSMA because it indicates the underlying geology.				
N	D	V	S	C.2: A description or an existing map of known eroding lands that are causing sedimentation problems.
X				
Technical Assistance Comments:				

City of Melrose WHPP Part II - Appendix I

D. WATER RESOURCES				
N	D	V	S	D.1: An existing map of the boundaries and flow directions of major watershed units and minor watershed units.
	X			
Technical Assistance Comments: This information is in the public domain and may be used to delineate the surface water contribution area of the WHPA.				
N	D	V	S	D.2: An existing map and a list of public waters as defined in Minnesota Statutes, section 103G.005, subdivision 15, and public drainage ditches.
	X	X		
Technical Assistance Comments: This information is in the public domain and may be used to delineate the surface water contribution area of the WHPA and determine the vulnerability of the DWSMA.				
N	D	V	S	D.3: The shoreland classifications of the public waters listed under sub-item (2), pursuant to part 6120.3000 and Minnesota Statutes, sections 103F.201 to 103F.221.
X				
Technical Assistance Comments:				
N	D	V	S	D.4: An existing map of wetlands regulated under Chapter 8420 and Minnesota Statutes, section 103G.221 to 103G.2373.
X				
Technical Assistance Comments:				
N	D	V	S	D.5: An existing map showing those areas delineated as floodplain by existing local ordinances.
X				
Technical Assistance Comments:				

DATA ELEMENTS ABOUT THE LAND USE

E. LAND USE				
N	D	V	S	E.1: An existing map of parcel boundaries.
	X		X	
Technical Assistance Comments: This information may be helpful in delineating the DWSMA, if available. If this information is provided, identification numbers must be provided for each parcel. An electronic format for the map is preferable.				
N	D	V	S	E.2: An existing map of political boundaries.
	X		X	
Technical Assistance Comments: Please provide this information if the boundaries have been updated/changed. This information may be helpful in delineating the DWSMA. An electronic format for the map is preferable.				
N	D	V	S	E.3: An existing map of public land surveys, including township, range, and section.
	X			
Technical Assistance Comments: This information is available in the public domain and may be helpful in delineating the DWSMA.				
N	D	V	S	E.4: A map and an inventory of the current and historical agricultural, residential, commercial, industrial, recreational, and institutional land uses and potential contaminant sources.
X				
Technical Assistance Comments:				

City of Melrose WHPP Part II - Appendix I

N	D	V	S	E.5: An existing, comprehensive land-use map.
X				
Technical Assistance Comments:				
N	D	V	S	E.6: Existing zoning map.
X				
Technical Assistance Comments:				
F. PUBLIC UTILITY SERVICES				
N	D	V	S	F.1: An existing map of transportation routes or corridors.
	X			
Technical Assistance Comments: This information is available in the public domain and may be helpful in delineating the DWSMA.				
N	D	V	S	F.2: An existing map of storm sewers, sanitary sewers, and the public water supply systems.
	X		X	
Technical Assistance Comments: Do not submit a map of the storm sewers and sanitary sewers. Describe the difference in how much water is pumped and how much is sold. The difference is the leakage that may be used as recharge in the groundwater model.				
N	D	V	S	F.3: An existing map of gas and oil pipelines used by gas and oil suppliers.
X				
Technical Assistance Comments:				
N	D	V	S	F.4: An existing map or list of public drainage systems.
	X	X		
Technical Assistance Comments: This information is available in the public domain and may be helpful in delineating the DWSMA.				
N	D	V	S	F.5: An existing record of construction, maintenance, and use of the public water supply well(s) and other wells within the DWSMA.
	X	X	X	
Technical Assistance Comments: If the information is different than that on-file with MDH, please provide 1) the pumping rates for the current and previous years, and the projected annual pumping rates for the next five years for each well in the PWS; and 2) well record(s) for the PWS well(s). Information about the PWS well(s) may affect the vulnerability assessment due to rehabilitation/reconstruction of a well or changes in pumping rates.				

City of Melrose WHPP Part II - Appendix I

DATA ELEMENTS ABOUT WATER QUANTITY

G. SURFACE WATER QUANTITY				
N	D	V	S	G.1: An existing description of high, mean, and low flows on streams.
	X	X		
Technical Assistance Comments: This information is available in the public domain and may be used to determine hydraulic connections between surface water bodies and the aquifer(s) of concern.				
N	D	V	S	G.2: An existing list of lakes where the state has established ordinary high water marks.
	X			
Technical Assistance Comments: This information is available in the public domain. The information may be used to determine the WHPA.				
N	D	V	S	G.3: An existing list of permitted withdrawals from lakes and streams, including source, use, and amounts withdrawn.
	X	X	X	
Technical Assistance Comments: Only required if different from the DNR database. Surface water bodies may be in direct hydraulic connection with the aquifer(s) of concern and withdrawals may affect water levels in both the surface water and adjacent groundwater systems.				
N	D	V	S	G.4: An existing list of lakes and streams for which state protected levels or flows have been established.
	X			
Technical Assistance Comments: This information is available in the public domain and may be used to determine hydraulic connections between surface water bodies and the aquifer(s) of concern.				
N	D	V	S	G.5: An existing description of known water-use conflicts, including those caused by groundwater pumping.
	X	X	X	
Technical Assistance Comments: Please notify MDH of surface water/well interference problems of which the PWS is aware. Conflicts between use of groundwater resources and surface water bodies would indicate a hydrologic boundary that would need to be considered in delineating the WHPA.				
H. GROUNDWATER QUANTITY				
N	D	V	S	H.1: An existing list of wells covered by state appropriation permits, including amounts of water appropriated, type of use, and aquifer source.
	X	X	X	
Technical Assistance Comments: Please submit this information for wells that are not permitted by the DNR because this information may be useful in identifying the hydrologic boundary conditions that could affect the size and shape of the WHPA boundaries.				
N	D	V	S	H.2: An existing description of known well interference problems and water-use conflicts.
	X	X	X	
Technical Assistance Comments: Please notify MDH of well interference problems of which the PWS is aware. Interference problems with other wells, if present, likely indicate a hydrologic boundary that would need to be considered in making the WHPA delineation.				
N	D	V	S	H.3: An existing list of state environmental boreholes, including unique well number, aquifer measured, years of record, and average monthly levels.
	X	X	X	
Technical Assistance Comments: Only submit monthly water level measurements (with unique well numbers and dates) that are not in the public domain.				

City of Melrose WHPP Part II - Appendix I

DATA ELEMENTS ABOUT WATER QUALITY

I. SURFACE WATER QUALITY				
N	D	V	S	I.1: An existing map or list of the state water quality management classification for each stream and lake.
X				
Technical Assistance Comments:				
N	D	V	S	I.2: An existing summary of lake and stream water quality monitoring data, including: 1. bacteriological contamination indicators; 4. sedimentation; 2. inorganic chemicals; 5. dissolved oxygen; and 3. organic chemicals; 6. excessive growth or deficiency of aquatic plants.
		X	X	
Technical Assistance Comments: This information can be used to evaluate surface water/groundwater interactions and aquifer water quality. Submit if the PWS has information that is not available in the public domain.				
J. GROUNDWATER QUALITY				
N	D	V	S	J.1: An existing summary of water quality data, including: 1) bacteriological contamination indicators; 2) inorganic chemicals; and 3) organic chemicals.
	X	X	X	
Technical Assistance Comments: Submit if the PWS has information that is not available in the public domain because the information may help explain groundwater flow paths.				
N	D	V	S	J.2: An existing list of water chemistry and isotopic data from wells, springs, or other groundwater sampling points.
	X	X	X	
Technical Assistance Comments: Submit if the PWS has information that is not available in the public domain because the information may help explain groundwater flow paths.				
N	D	V	S	J.3: An existing report of groundwater tracer studies.
	X	X	X	
Technical Assistance Comments: Submit if the PWS has information that is not available in the public domain because the information may help explain groundwater flow paths.				
N	D	V	S	J.4: An existing site study and well water analysis of known areas of groundwater contamination.
		X	X	
Technical Assistance Comments: Submit if the PWS has information on contaminant sources not available in the public domain because these reports may contain additional geologic or hydrogeologic information.				
N	D	V	S	J.5: An existing property audit identifying contamination.
X				
Technical Assistance Comments:				
N	D	V	S	J.6: An existing report to the Minnesota Department of Agriculture and the Minnesota Pollution Control Agency of contaminant spills and releases.
	X	X		
Technical Assistance Comments: Notify MDH of reports on spills or contaminant releases that are on-file with the PWS or city but are not in the public domain. These reports do not need to be submitted but MDH staff would like to review reports.				

City of Melrose WHPP Part II - Appendix I

Summary of Data Request Specific Data to be Provided to MDH by City of Melrose

As discussed during the first Scoping Meeting on October 20, 2011, the city of Melrose (PWS) will supply the following information for Part I of their Wellhead Protection Plan to the Minnesota Department of Health. The number of the data element that refers to the information needed to prepare the Part I Report is listed in the parenthesis at the end of each request.

- 1) PWS well information: Use Tables 1 and 2, the well records for the PWS wells, and a map showing the locations of all the PWS wells, to review the accuracy of 1) all PWS well construction, 2) well locations, and 3) pumping information. (F.5)

Table 1 lists well use and construction for each of the PWS wells. Have you reconstructed any wells? Are there well records for reconstructed wells?

The enclosed map shows the locations of the primary public water supply wells. You verified that the locations are correct at the scoping meeting. These locations must be used to delineate your wellhead protection areas.

Table 2 shows the available pumping information and indicates what information the PWS needs to provide for the delineation of the capture zone. Please provide 1) the pumping data for 2011 that will be sent to the Minnesota Department of Natural Resources in early 2012, 2) whether this rate was measured or estimated, and 3) the projected annual pumping amounts for the next five years.

- 2) Please provide a copy of any aquifer test or specific capacity information for the PWS wells that was obtained during well construction, maintenance, or repair. (B.1)
- 3) Is there an existing map of parcel and/or political boundaries that could be used for defining the Drinking Water Supply Management Area (DWSMA)? If you wish to use parcel lines, please provide the parcel identification number for each parcel boundary along with the map. Have the city boundaries changed? If the city boundaries have changed, please provide the new boundaries. The boundaries of the DWSMA may be larger if political boundaries are used instead of the parcel boundaries. (E.1 and E.2)
- 4) If there are private well records, soil boring reports, geophysical studies, or water level measurements in your files that MDH staff did not identify at the scoping meeting and that would be available for MDH staff to review and copy, please notify MDH. (B.2, B.3, B.4, and H.3)
- 5) Please identify reports that you have on-file relating to leaks/contamination sites that may be a concern to your drinking water supply that MDH may review and copy. (J.4)
- 6) If your files contain water chemistry data, such as bacteria, virus, inorganic, organic, or isotopic results from wells or other groundwater sampling points, that are not currently available to MDH that MDH may review and copy, please notify MDH. (J.1 and J.2)
- 7) Please identify reports that you have in your files relating to groundwater tracer studies that have been conducted. (J.3)

City of Melrose WHPP Part II - Appendix I

Summary of Data Request

Page 2

- 8) Please provide information about other high-capacity wells in your area that may not be permitted and are not listed on the attached Table 3. (H.1)
- 9) Please describe any conflicts over water use that the PWS has been involved with, such as
1) private wells that went dry (or well interference) or 2) springs or wetlands that were affected.
Was the Department of Natural Resources involved in resolving the conflict? (G.5 and H.2)
- 10) Please describe the annual amount of water that is lost due to leaks in the distribution system. Can you identify specific parts of the distribution system where this loss occurs? (F.2)
- 11) If local precipitation information is not available in the public domain within a couple of miles and in the same geomorphic setting, please provide average monthly precipitation values from the wastewater treatment facility during the preceding five years. (A.2)
- 12) Please identify any other reports about surface water withdrawals or surface water monitoring data from lakes, streams, or wetlands that are not in the public domain that MDH staff could review and copy (e.g., the creek study carried out by the city). (G.3 and I.2)

City of Melrose WHPP Part II - Appendix I

Table 1
Municipal Water Supply Well Information
Melrose, Minnesota

Local Well Name	Unique Number	Use/Status ¹	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/Reconstructed	Well Vulnerability	Aquifer
2	215114	I, NIU		76	106	1957	Vulnerable	QWTA
4	215113	A, P	16	98	128	1967	Vulnerable	QWTA
5	180122	A, P	16	62	87	1981	Vulnerable	QWTA
6	436032	I, S		51	76	1987		
7	486430	A, P	16	83	105	1991	Vulnerable	QBUA
8	608438	A, P	16	75	100	1998	Vulnerable	QWTA
9	608424	A, P	16	67	85	1998	Vulnerable	QWTA

Note: 1. Active (A), Inactive (I), Not-in-use (NIU), Primary (P) or Sealed (S) Well

Table 2
Annual Volume of Water Pumped from City Wells
(millions of gallons)

Well Name/Number	2007	2008	2009	2010	2011*	Projected* 2016
W2 (215114)						
W4 (215113)	146.1	131.1	142.1	117.1		
W5 (180122)	114.2	89.8	101.6	135.6		
W7 (486430)	151.5	189.1	105.9	125.5		
W8 (608438)	162.9	171.9	187.1	170.7		
W9 (608424)	146.1	134.9	115.9	111.7		

Source: The DNR State Water Use Database System Permit No. 1975-3210.

* Data to be provided by the city.

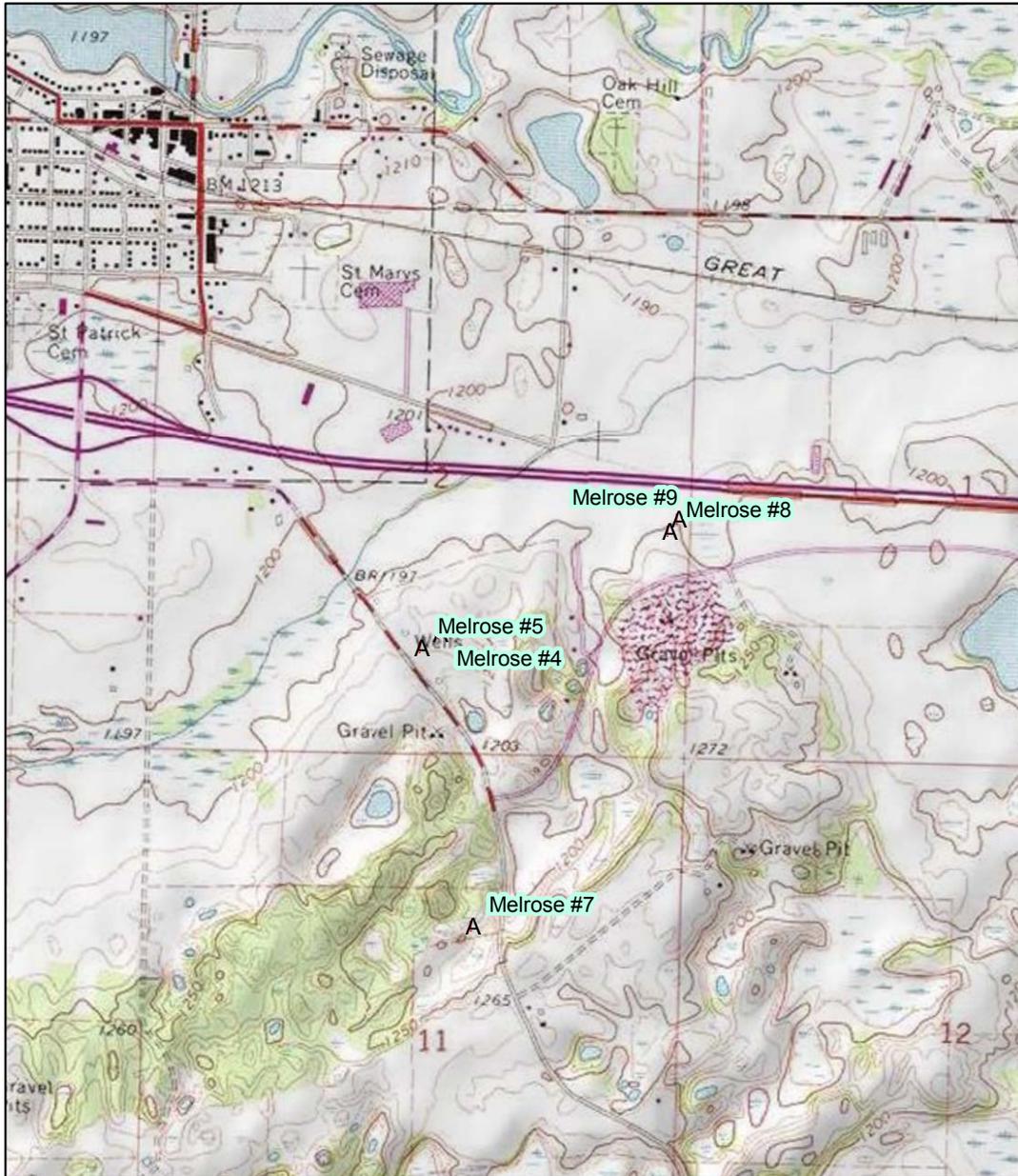
City of Melrose WHPP Part II - Appendix I

Table 3
Permitted High-Capacity Wells
 DNR State Water Use Database System

Unique Number	Well Name	DNR Permit Number	Aquifer	Use	Annual Volume of Water Pumped (Gallons)
132426	Meyer, Roger and Sharon	1977-3634	QBAA	Major Crop Irrigation	2007-2009 Average: 7.4
132427	Meyer, Roger and Sharon	1977-3634	QBAA	Major Crop Irrigation	2007-2009 Average: 0.0
453408	Spaeth, Rick	1988-3263	QBAA	Major Crop Irrigation	2007-2009 Average: 0.0
453408	Spaeth, Rick	1988-3263	QBAA	Non-Crop Irrigation	2007-2009 Average: 1.97
242888	Meadowlark Golf Club	1990-3423	QWTA	Non-Crop Irrigation	2007-2009 Average: 13.7
132422	Toenies, Harold	1977-3565	QWTA	Major Crop Irrigation	2007-2009 Average: 10.7
501494	Hinnenkamp, Luverne	1990-3088	QBAA	Major Crop Irrigation	2007-2009 Average: 7.67

City of Melrose WHPP Part II - Appendix I

Map of Well Locations



0 500 1,000 2,000 3,000
Feet



**Well Locations
City of Melrose**

City of Melrose WHPP Part II - Appendix II

March 20, 2014

The Honorable Tim Vogel
Mayor, City of Melrose
225 First Street Northeast
Melrose, Minnesota 56352

Dear Mayor Vogel:

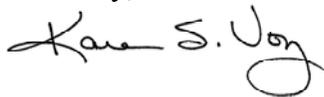
Subject: Scoping 2 Decision Notice and Meeting Summary – City of Melrose – PWSID 1730016

This letter provides notice of the results of a scoping meeting held with you, Michael Brethorst, City Administrator, and Aaron Meyer, Minnesota Rural Water Association (MRWA), on February 24, 2014, at the Melrose City Hall regarding wellhead protection (WHP) planning. During the meeting, we discussed the data elements that must be included and used to prepare the part of the WHP plan related to the management of potential contaminants in the approved drinking water supply management area. The enclosed Scoping 2 Decision Notice lists the data elements that were discussed at the meeting. We also discussed a summary of planning issues that were identified during the Part I WHP Plan development process which should be considered for inclusion in your Part II WHP Plan.

The city of Melrose has met the requirement to distribute copies of the first part of the WHP plan to local units of government. The city of Melrose has not met the requirement to hold an informational meeting for the public. The city of Melrose will have until June 30, 2016, to complete its WHP plan.

If a data element is marked on the enclosed notice as a data element that must be used and it does not exist, it is helpful if your plan notes this. MDH understands a consultant will be working with you to develop a draft of the remainder of the WHP plan. I will be contacting you to review the progress of the development of Part II of your plan. If you have any questions regarding the enclosed notice, contact me by email at karen.s.voz@state.mn.us or by phone at 320/223-7322.

Sincerely,



Karen S. Voz, Principal Planner
Source Water Protection Unit
Environmental Health Division
3333 West Division Street - Suite 212
St. Cloud, Minnesota 56301

KSV:ds-b
Enclosures

cc: Kim Anding Larsen, MDH Engineer, St. Cloud District Office
Michael Brethorst, City Administrator, City of Melrose
Aaron Meyer, Minnesota Rural Water Association
Ron Struss, Minnesota Department of Agriculture

City of Melrose WHPP Part II - Appendix II

SCOPING 2 DECISION NOTICE Variable Vulnerable DWSMA

Remainder of the Wellhead Protection Plan

Name of Public Water Supply:		Date:
City of Melrose	PWSID 1730016	March 20, 2014
Name of the Wellhead Protection Manager:		
Tim Vogel, Mayor		
Address:	City:	Zip:
225 First Street Northeast	Melrose	56352
Unique Well Numbers:		Phone:
215113 (Well 4), 180122 (Well 5), 486430 (Well 7) 608438 (Well 8), 608424 (Well 9)		(320) 256-4278

Instructions for Completing the Scoping 2 Form

N	R	S	N = Not required. If this box is checked, this data element is NOT necessary for your wellhead protection plan because it is not needed or it has been included in the first scoping decision notice. Please go to the next data element.
X			

N	R	S	R = Required for the remainder of the plan. If this box is checked, this data MUST be used for the "remainder of the plan."
	X		

N	R	S	S = Submit to MDH. If this box is checked, this data element MUST be included in your wellhead protection plan and submitted to MDH.
		X	
If there is NO check mark in the "S" box but there is an "X" in the "R" box, this data element MUST be included in your plan, but should NOT be submitted to MDH. This box will only be checked if MDH does not have access to this data element. This will help to reduce the cost by reducing the amount of paper and time to reproduce the data element.			

Note: Any data elements required in the first scoping decision notice must also be used to complete the remainder of the wellhead protection plan.

City of Melrose WHPP Part II - Appendix II

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT

PRECIPITATION			
N	R	S	An existing map or list of local precipitation gauging stations.
	X	X	
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing table showing the average monthly and annual precipitation in inches for the preceding five years.
	X	X	
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
GEOLOGY			
N	R	S	An existing geologic map and a description of the geology, including aquifers, confining layers, recharge areas, discharge areas, sensitive areas as defined in Minnesota Statutes, section 103H.005, subdivision 13, and groundwater flow characteristics.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
N	R	S	Existing records of the geologic materials penetrated by wells, borings, exploration test holes, or excavations, including those submitted to the department.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
N	R	S	Existing borehole geophysical records from wells, borings, and exploration test holes.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect the geology of the areas.			
N	R	S	Existing surface geophysical studies.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect the geology of the areas.			
SOILS			
N	R	S	Existing maps of the soils and a description of soil infiltration characteristics.
	X	X	
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	A description or an existing map of known eroding lands that are causing sedimentation problems.
	X	X	
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			

City of Melrose WHPP Part II - Appendix II

WATER RESOURCES			
N	R	S	An existing map of the boundaries and flow directions of major watershed units and minor watershed units.
	X		
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing map and a list of public waters as defined in Minnesota Statutes, section 103G.005, subdivision 15, and public drainage ditches.
	X		
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	The shoreland classifications of the public waters listed under subitem (2), pursuant to part 6120.3000 and Minnesota Statutes, sections 103F.201 to 103F.221.
	X		
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing map of wetlands regulated under Chapter 8420 and Minnesota Statutes, section 103G.221 to 103G.2373.
	X		
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing map showing those areas delineated as floodplain by existing local ordinances.
	X		
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			

DATA ELEMENTS ABOUT THE LAND USE

LAND USE			
N	R	S	An existing map of parcel boundaries.
	X	X	
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing map of political boundaries.
	X	X	
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing map of public land surveys including township, range, and section.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			

City of Melrose WHPP Part II - Appendix II

N	R	S	A map and an inventory of the current and historical agricultural, residential, commercial, industrial, recreational, and institutional land uses and potential contaminant sources.
	X	X	
<p>Technical Assistance Comments: The inventory, mapping and management of land uses and potential sources of contamination for all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements, as follows:</p> <p style="padding-left: 40px;"><u>Mixed Vulnerability</u> - 1) All potential contaminant sources and facility designations as listed on the attachments, 2) a land use/land cover map and table, and 3) an inventory of the Inner Wellhead Management Zone (IWMZ).</p> <p>As a starting point, MDH will provide a 2006 land cover map and table from federal data bases. This data set must be used unless an alternative electronic data set that is more current and detailed is available.</p> <p>Management strategies must be developed for all land uses and potential sources of contamination.</p>			
	R	S	An existing comprehensive land-use map.
	X	X	
<p>Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.</p>			
N	R	S	Existing zoning map.
	X	X	
<p>Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.</p>			
PUBLIC UTILITY SERVICES			
N	R	S	An existing map of transportation routes or corridors.
	X		
<p>Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.</p>			
N	R	S	An existing map of storm sewers, sanitary sewers, and public water supply systems.
	X	X	
<p>Technical Assistance Comments: It is not necessary to include a map of your public water supply system in your plan if you feel it would pose a threat to the security of your system. An existing map of the storm sewers and sanitary sewers in the Drinking Water Supply Management Area(s) must be included in the wellhead protection plan and must also be submitted to the MDH as part of the approval.</p>			
N	R	S	An existing map of the gas and oil pipelines used by gas and oil suppliers.
	X	X	
<p>Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.</p>			
N	R	S	An existing map or list of public drainage systems.
	X	X	
<p>Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.</p>			

City of Melrose WHPP Part II - Appendix II

N	R	S	An existing record of construction, maintenance, and use of the public water supply well and other wells within the drinking water supply management area.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			

DATA ELEMENTS ABOUT WATER QUANTITY

SURFACE WATER QUANTITY			
N	R	S	An existing description of high, mean, and low flows on streams.
	X		
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing list of lakes where the state has established ordinary high water marks.
	X		
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing list of permitted withdrawals from lakes and streams, including source, use, and amounts withdrawn.
	X		
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing list of lakes and streams for which state protected levels or flows have been established.
	X		
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing description of known water-use conflicts, including those caused by groundwater pumping.
	X	X	
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
GROUNDWATER QUANTITY			
N	R	S	An existing list of wells covered by state appropriation permits, including amounts of water appropriated, type of use, and aquifer source.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing description of known well interference problems and water-use conflicts.
	X	X	
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			

City of Melrose WHPP Part II - Appendix II

N	R	S	An existing list of state environmental bore holes, including unique well number, aquifer measured, years of record, and average monthly levels.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			

DATA ELEMENTS ABOUT WATER QUALITY

SURFACE WATER QUALITY			
N	R	S	An existing map or list of the state water quality management classification for each stream and lake.
	X		

Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.

N	R	S	An existing summary of lake and stream water quality monitoring data, including: 1. bacteriological contamination indicators; 4. sedimentation; 2. inorganic chemicals; 5. dissolved oxygen; and 3. organic chemicals; 6. excessive growth or deficiency of aquatic plants.
	X		

Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.

GROUNDWATER QUALITY

N	R	S	An existing summary of water quality data, including: 1. bacteriological contamination indicators; 2. inorganic chemicals; and 3. organic chemicals.
	X		

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element. Be sure to include the Nitrate Probability Mapping Study and use it to guide the management of the Drinking Water Supply Management Area(s).

N	R	S	An existing list of water chemistry and isotopic data from wells, springs, or other groundwater sampling points.
	X		

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.

N	R	S	An existing report of groundwater tracer studies.
	X		

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.

N	R	S	An existing site study and well water analysis of known areas of groundwater contamination.
	X		

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.

N	R	S	An existing property audit identifying contamination.
	X		

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.

N	R	S	An existing report to the Minnesota Department of Agriculture and the Minnesota Pollution Control Agency of contaminant spills and releases.
	X		

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.

City of Melrose WHPP Part II - Appendix II
Melrose Scoping 2 Meeting
Wellhead Protection (WHP) Planning Issues Summary

Drinking Water Protection Issues Identified to Date:

- (1) Uncertain as to the connection between the stream and the aquifer.
- (2) Nitrates trends were not looked at. It is thought that the wells should be monitored and have regular source samples collected to monitor nitrates.
- (3) Gravel pits within the DWMSA will be treated as Highly Vulnerable.

Water Quality Detections and Implications:

- (1) Collect quarterly stable isotopes from the public supply wells (Wells 8 and 9) and the stream to help determine the connection between the stream and the aquifer.
- (2) Develop a system by working cooperatively with MDH to collect raw water samples and analyze for nitrate levels.

Old Municipal Well Information:

The Minnesota Department of Health has compiled historical information for use in the planning process.

Sanborn Maps:

- Sanborn Maps are available for this area
 Sanborn Maps are not available for this area.

Recommended WHP Measures:

- (1) Collect stable isotopes from the public supply wells (Wells 8 and 9) and the stream to help determine the connection between the stream and the aquifer.
- (2) Develop a system by working cooperatively with MDH to collect raw water samples and analyze for nitrate levels

Other:

*This document is intended to be a summary of issues identified to date and is **not intended to replace the required data elements identified in the Scoping 2 Decision Notice** nor is it intended to be an exhaustive list of all potential drinking water issues.*

Potential Contaminants Located within the City of Melrose DWSMA

MAP LOCATION	PCS MATERIAL CODE	FACILITY CODE	PARCEL ID	MPCA_ID	OWNERS NAME	PROPERTY ADDRESS	ACTIVITY	DWSMA Vulnerability	STATUS	
51	SROUT	3000	66.37009.0741	MNRNE37XT	Proliant Dairy Ingredients Inc	1010 Kraft Dr SE	Industrial Stormwater Permit	MOD	Active	
52	NPDES	3000	66.37009.0740	Multiple Activities	Melrose Dairy Proteins LLC	1000 Kraft Dr SE	Hazardous Waste, Small to Minimal QG, Ind Stormwater, NPDES, WW Discharge	MOD	Active	
53	HWG	2400	12.07236.0000	MND985719848	Wheels Enterprise, LLC	37276 County Road 13	Hazardous Waste, Small to Minimal QG	HIGH	Active	
54	SPL	3000	66.37009.0740	8080	Melrose Dairy Proteins LLC	1000 Kraft Dr SE	Leak Site	MOD	Inactive	
55	HWG	4310	66.36401.0000	MND006961528	Stearns Electric Association	900 Kraft Dr SE	Hazardous Waste, Small to Minimal QG	HIGH	Active	
56	SWMS	8000	12.07238.0000	PBR000428	Mayers Inc PBR	37264 County Road 13	Solid Waste, Permit By Rule	HIGH	Active	
57	SLDG	4340	12.06924.0000		Gerald Sonnen Farm	37457 County Road 173	Biosolid application site	HIGH	Active	
58	SWMS	8000	12.06912.0000	PBR000819	Mayers Inc 2 PBR	37264 County Road 13	Solid Waste, Permit By Rule	MOD	Active	
59	SPL	2000	66.36434.0000	4772	Jose & Ana Hernandez	207 County Road 173 SE	Leak Site	HIGH	Inactive	
60	HWG	2000	12.06929.0000	WCERT1001930	David Weinker	37364 County Road 13	Hazardous Waste, Small to Minimal QG	HIGH	Active	
61	SPL AST-F000	4310	66.36401.0000	Multiple Activities	Stearns Electric Association	900 Kraft Dr SE	HWG (Inactive), Leak Site (I), Tanks (6)(A)	HIGH	Active	
62	HWG	2700	66.36887.0004		Leedstone Veterinary Clinic	222 County Road 173 SE	Hazardous Waste, Small to Minimal QG	HIGH	Active	
67	PIT	8000	12.06990.0000	Mining	Roger Meyer Gravel Pit	36408 County Rd 13	Gravel Pit	MOD (HIGH)	Active	
68	PIT	8000	12.06912.0000	Mining	Mayers Inc Gravel Pit	37264 County Road 13	Gravel Pit	MOD (HIGH)	Active	
69	PIT	8000	12.06904.0050	Mining	Dennis Thielen Gravel Pit	32318 Riverview Rd	Gravel Pit	MOD (HIGH)	Active	
221	ISTS	1100-01	12.06925.0000	SSTS	Luverne & Jean Ritter	37133 County Road 173	Sub Surface Sewage Treatment System	HIGH	Unknown	
223	ISTS	1100-01	12.06933.0000	SSTS	Rick Spaeth	272 Meadowlark LN SW	Sub Surface Sewage Treatment System	HIGH	Unknown	
225	ISTS	1100-01	12.06929.0000	SSTS	David Weinker	33672 343rd Ave	Sub Surface Sewage Treatment System	HIGH	NonComp	
232	ISTS	1100-01	12.06938.0000	SSTS	Dennis Rakotz	37249 335th Ave	Sub Surface Sewage Treatment System	HIGH	Comp	
240	ISTS	1100-01	12.07236.0000	SSTS	Richard & Margaret Hellermann	37276 CR 13 PO Box 37	Sub Surface Sewage Treatment System	HIGH	NonComp	
241	ISTS	1100-01	12.07260.0004	SSTS	Joseph & Jacqueline Tschida	37325 Spring Haven Rd	Sub Surface Sewage Treatment System	HIGH	Unknown	
242	ISTS	1100-01	12.07240.0000	SSTS	Robert Mayers	37264 County Road 13	Sub Surface Sewage Treatment System	HIGH	Unknown	
244	ISTS	1100-01	12.07245.0000	SSTS	Rick & Cathryn Spaeth	272 Meadowlark LN SW	Sub Surface Sewage Treatment System	HIGH	Unknown	
245	ISTS	1100-01	12.07242.0000	SSTS	Rick Spaeth	272 Meadowlark LN SW	Sub Surface Sewage Treatment System	HIGH	Unknown	
249	ISTS	1100-01	12.07202.0000	SSTS	Paul Grussing	37319 Springhaven Rd	Sub Surface Sewage Treatment System	HIGH	Unknown	
251	ISTS	1100-01	12.07243.0000	SSTS	Rick Spaeth	272 Meadowlark LN SW	Sub Surface Sewage Treatment System	HIGH	Unknown	
252	ISTS	1100-01	12.06937.0000	SSTS	Sylvester & Kathryn Bauer	37217 335th Ave	Sub Surface Sewage Treatment System	HIGH	Unknown	
253	ISTS	1100-01	12.06924.0000	SSTS	Gerald Sonned	37457 County Road 173	Sub Surface Sewage Treatment System	HIGH	Unknown	
65	AFL	9000-01	12.06937.0000	145-102441	Sylvester K & Kathryn Bauer Farm	37165 335th Ave	Feedlot	HIGH	Active	
66	AFL	9000-01	12.06924.0000	145-73871	Gerald Sonnen Farm	37457 County Road 173	Feedlot	HIGH	Active	
MAP LOCATION	PCS MATERIAL CODE	FACILITY CODE	PARCEL ID	UNIQUE WELL NO	OWNERS NAME	PROPERTY ADDRESS	DEPTH FT	USE	DWSMA Vulnerability	STATUS
1	WEL	4330	12.06924.0500	215113	Melrose #4	225 1st St NE	128	Public Water Supply	HIGH	Active
2	WEL	4330	12.06924.0500	180122	Melrose #5	225 1st St NE	88	Public Water Supply	HIGH	Active
3	WEL	4000	12.06999.0020	486430	Melrose #7	225 1st St NE	105	Public Water Supply	MOD	Active
4	WEL	4000	66.37025.0502	608438	Melrose #8	225 1st St NE	100	Public Water Supply	MOD	Active
5	WEL	4330	66.37025.0502	608424	Melrose #9	225 1st St NE	85	Public Water Supply	HIGH	Active
7	WEL	1100-01	12.06933.0000	00453408	Rick Spaeth	No Property Address	58	Irrigation	HIGH	Active
8	WEL	2000	66.37025.0502	00782360	John Waldorf	No Property Address	50	Domestic	MOD	Active
9	WEL	1100-01	12.07206.0000	00654682	Jm Althman	37181 Springhaven Rd	61	Domestic	MOD	Active

Potential Contaminants Located within the City of Melrose DWSMA

MAP LOCATION	PCS MATERIAL CODE	FACILITY CODE	PARCEL ID	UNIQUE WELL NO	OWNERS NAME	PROPERTY ADDRESS	DEPTH FT	USE	DWSMA Vulnerability	STATUS
10	WEL	1100-01	12.07203.0000	00654930	Bob Anderson	37291 Springhaven Rd	60	Domestic	MOD	Active
11	WEL	1100-01	12.06904.0050	00635646	Dennis Thielen	32318 Riverview Rd	76	Domestic	HIGH	Active
12	WEL	1100-01	66.36420.0062	00700443	Rick Boyer	318 12th Ave SE	36	Irrigation	MOD	Active
13	WEL	2110	12.06990.0000	00438531	Archie Meemken/Sharon Meyer	36408 County Road 13	41	Irrigation	MOD	Active
14	WEL	2114	66.37025.0502	00579504	Joe Tschida	No Property Address	60	Domestic	HIGH	Active
15	WEL	2000	66.36420.0062	00579507	Jay Petermeier	318 12th Ave SE	36	Domestic	MOD	Active
16	WEL	9000	66.36420.0070	00500358	Orville Rieland	620 12th Ave SE	62	Domestic	MOD	Active
17	WEL	9000	12.06990.0000	00132429	Archie Meemken #2	36408 County Road 13	38	Irrigation	MOD	Active
18	WEL	2116	12.06989.0010	00407003	Frank Maleska	36801 335th Ave	58	Domestic	MOD	Active
19	WEL	1100	12.07203.0000	00635606	Carl & Kathleen Melling	37291 Springhaven Rd	52	Domestic	MOD	Active
20	WEL	2000	12.06933.0000	00592541	Paul Spaeth	No Property Address	30	Irrigation	HIGH	Active
21	WEL	1100	12.06998.0010	00616052	Chad Vanbeck	36543 335th Ave	105	Domestic	MOD	Active
22	WEL	1100	66.36420.0051	00473307	Virgil Primus	1114 Kraft Dr SE	58	Domestic	HIGH	Active
23	WEL	9000	12.06990.0000	00132426	Archie Meemken #1	36408 County Road 13	38	Irrigation	MOD	Active
24	WEL	1100	12.07006.0000	00621538	Black Oak Turkey	36748 335th Ave	66	Domestic	MOD	Active
25	WEL	1100	66.36420.0068	00438212	Gary Toenyon	420 12th Ave SE	38	Domestic	MOD	Active
26	WEL	1100	12.07006.0000	00419177	Black Oak Turkey	36748 335th Ave	56	Domestic	MOD	Active
27	WEL	9000	12.06990.0000	00132427	Archie Meemken #3	36408 County Road 13	40	Irrigation	HIGH	Active
28	WEL	2000	12.06929.0000	00261529	Melrose Implement	37364 County Road 13	Unk	Public/non-community	HIGH	Active
29	WEL	1100	12.07005.0000	00616065	Mike Klein	36556 335th Ave	117	Domestic	MOD	Active
30	WEL	1100	66.36713.0000	NA	Donna Frank (Sandpoint)	307 County Rd 173 SE	Unk	Irrigation	HIGH	Unknown
31	WEL	1100	66.36713.0000	NA	Donna Frank (Sandpoint)	307 County Rd 173 SE	Unk	Irrigation	HIGH	Unknown
32	WEL	1100	12.07004.0020	Unknown	Black Oak Turkey	No Property Address	Unk	Domestic	MOD	Unknown
33	WEL	1100	66.36420.0062	Unknown	Rick Boyer	318 12th Ave SE	Unk	Domestic	MOD	Unknown
34	WEL	2000	12.07236.0000	803294	Jamie Wieling	37276 County Road 13	Unk	Domestic	HIGH	Unknown
35	WEL	1100	12.07272.0001	Unknown	Alcuin Sand	37168 County Road 13	38	Unk	HIGH	Unknown
36	WEL	1100	12.07242.0000	Unknown	Rick Spaeth	37228 County Road 13	Unk	Unk	HIGH	Unknown
37	WEL	1100	12.07240.0000	Unknown	Robert Mayers	37254 County Road 13	Unk	Unk	HIGH	Unknown
38	WEL	1100	12.07244.0000	Unknown	Rick Spaeth	No Property Address	Unk	Unk	HIGH	Unknown
39	WEL	1100	12.06924.0000	Unknown	Gerald Sonnen	37457 County Road 173	Unk	Unk	HIGH	Unknown
40	WEL	1100	12.06994.0000	Unknown	Joel Imdieke	36008 County Road 13	Unk	Unk	MOD	Unknown
41	WEL	1100	12.06990.0000	Unknown	Roger Meyer	36408 County Road 13	Unk	Unk	MOD	Unknown
42	WEL	1100	12.07008.0010	Unknown	Christopher Bauer	36540 335th Ave	Unk	Unk	MOD	Unknown
43	WEL	1100	12.06999.0000	Unknown	Thomas Fischbach	36504 County Road 173	Unk	Unk	MOD	Unknown
44	WEL	1100	12.07012.0000	Unknown	Jason Bauer	36556 County Road 173	Unk	Unk	MOD	Unknown
45	WEL	1100	12.07000.0000	Unknown	Gustavo Martinez Chavez	36678 County Road 173	Unk	Unk	MOD	Unknown
46	WEL	1100	12.07207.0000	Unknown	Lonnie Waldvogel	32702 Riverview Road	Unk	Unk	MOD	Unknown
47	WEL	1100	12.07205.0000	Unknown	Jason Honkomp	37221 Springhaven Rd	Unk	Unk	MOD	Unknown
48	WEL	1100	12.07204.0000	Unknown	Mark Dierkising	37247 Springhaven Rd	Unk	Unk	MOD	Unknown
49	WEL	1100	12.07202.0000	Unknown	Paul Grussing	37319 Springhaven Rd	Unk	Unk	HIGH	Unknown
50	WEL	1100	12.07272.0003	Unknown	Michael Linn	37146 County Road 13	Unk	Unk	HIGH	Unknown

City of Melrose WHPP Part II - Appendix III

Parcels located within the City of Melrose DWSMA

ID	GISPARCEL	OWNER	OWNER_ADDR	OWNER_CITY	DEED_AC
1	12.07035.0000	JOEL IMDIEKE	36008 COUNTY ROAD 13	MELROSE MN 56352	62.00
2	66.36420.0062	RICHARD J JR & CAROL A BOYER	318 12TH AVE SE	MELROSE MN 56352	2.45
3	12.07034.0000	CHRISTOPHER BAUER	37217 335TH AVE	MELROSE MN 56352	15.85
4	12.07008.0000	CHRISTOPHER BAUER	37217 335TH AVE	MELROSE MN 56352	70.00
5	12.06998.0010	JONATHAN KLAPHAKE	36543 335TH AVE	MELROSE MN 56352	3.12
6	66.36417.0000	CARLEEN A LEUKAM	655 5TH ST SE	MELROSE MN 56352-1475	0.31
7	66.36420.0053	LEON W FELDEWERD	1106 KRAFT DR SE	MELROSE MN 56352-8237	0.46
8	66.36420.0052	SHIRLEY A HILTNER	1148 KRAFT DR SE	MELROSE MN 56352	0.46
9	66.36416.0000	BERNARD E & DIANE NATHE	523 5TH AVE SE	MELROSE MN 56352-1143	7.17
10	12.07012.0000	JASON BAUER	36556 COUNTY ROAD 173	MELROSE MN 56352	179.85
11	66.36420.0051	VIRGIL A PRIMUS	1114 KRAFT DR SE	MELROSE MN 56352-8237	0.46
12	12.06926.0000	GERALD J SONNEN	37457 COUNTY ROAD 173	MELROSE MN 56352-8140	19.02
13	12.06994.0000	JOEL IMDIEKE	36008 COUNTY ROAD 13	MELROSE MN 56352	108.23
14	12.06925.0000	LUVERNE & JEAN RITTER	37133 COUNTY ROAD 173	MELROSE MN 56352-8140	0.75
15	66.36420.0000	GREG KEMPER	647 5TH AVE SE	MELROSE MN 56352	0.38
16	12.06924.0000	GERALD J SONNEN	37457 COUNTY ROAD 173	MELROSE MN 56352-8140	217.27
17	12.06924.0500	CITY OF MELROSE	225 1ST ST NE	MELROSE MN 56352	3.86
18	12.06904.0000	MARVIN J & JUDY V THIELEN	31856 RIVERVIEW RD	MELROSE MN 56352-8141	297.06
19	12.06933.0000	RICK A SPAETH	272 MEADOWLARK LN SW	MELROSE MN 56352-1507	42.47
20	12.06997.0000	JOEL IMDIEKE	36008 COUNTY ROAD 13	MELROSE MN 56352	20.00
21	12.06996.0000	CHRISTOPHER BAUER	37217 335TH AVE	MELROSE MN 56352	20.00
22	12.06904.0050	DENNIS THIELEN	32318 RIVERVIEW RD	MELROSE MN 56352-8174	22.94
23	12.06932.0000	CLARENCE & MARY ANN WENKER	418 1ST ST SW	MELROSE MN 56352-1244	1.07
24	66.36420.0057	PAULETTE R SWANSON	1140 KRAFT DR SE	MELROSE MN 56352	0.44
25	66.36420.0058	ROBERT J & CHERYL L BRETH	1158 KRAFT DR SE	MELROSE MN 56352-8237	1.43
26	12.06929.0000	DAVID R WENKER	33672 343RD AVE	MELROSE MN 56352-8151	10.47
27	12.06924.0505	CITY OF MELROSE	225 1ST ST NE	MELROSE MN 56352	7.98
28	12.06912.0000	MAYERS INC	37264 COUNTY ROAD 13	MELROSE MN 56352-8602	33.56
29	12.06999.0000	THOMAS V & SANDRA FISCHBACH	36504 COUNTY ROAD 173	MELROSE MN 56352-8139	159.40
30	12.06906.0006	OCI(N) CORP	PO BOX 865	ST CLOUD MN 56302	2.15
31	66.36420.0056	RAFAEL & MARIELA BARRAGAN	1134 KRAFT DR SE	MELROSE MN 56352	0.41
32	66.36414.0006	MELROSE POST 101 AMER LEGION	PO BOX 152	MELROSE MN 56352	2.27
33	66.36420.0055	MYRVIN SECORD	1126 KRAFT DR SE	MELROSE MN 56352	0.51
34	12.06937.0000	SYLVESTER K & KATHRYN BAUER	37217 335TH AVE	MELROSE MN 56352-8144	7.10
35	66.36415.0000	DUANE M & SHELLY E KEMPER	663 5TH AVE SE	MELROSE MN 56352-1475	0.31
36	12.06937.0010	SYLVESTER K & KATHRYN BAUER	37217 335TH AVE	MELROSE MN 56352-8144	9.40
37	12.06998.0000	ROGER F & SHARON LEE MEYER	36408 COUNTY ROAD 13	MELROSE MN 56352-8102	36.88
38	12.06918.0000	ISAAC J WINTERS	15252 COUNTY ROAD 2	OSAKIS MN 56360	23.38
39	66.36434.0000	JOSE & ANA R HERNANDEZ	207 COUNTY ROAD 173 SE	MELROSE MN 56352	0.88
40	66.36420.0054	GERALD B & JOYCE RADEMACHER	1120 KRAFT DR SE	MELROSE MN 56352-8237	0.46
41	12.06999.0020	CITY OF MELROSE	225 1ST ST NE	MELROSE MN 56352	16.25
42	66.36414.0001	GERALD J SONNEN	37457 COUNTY ROAD 173	MELROSE MN 56352-8140	2.30
43	12.06905.0030	ERVIN H MAYERS REV TRUST	PO BOX 23	MELROSE MN 56352	35.01
44	12.06935.0000	MAYERS INC	37264 COUNTY ROAD 13	MELROSE MN 56352-8602	2.23
45	66.36414.0002	J-T OF MELROSE INC	222 COUNTY ROAD 173 SE PO BOX 219	MELROSE MN 56352-1602	1.27
46	12.06989.0000	SYLVESTER K & KATHRYN BAUER	37217 335TH AVE	MELROSE MN 56352-8144	37.19
47	66.36401.0000	STEARNS COOP ELECTRIC ASSN	PO BOX 40	MELROSE MN 56352-1455	25.65
48	12.07000.0000	GUSTAVO MARTINEZ CHAVEZ	36678 COUNTY ROAD 173	MELROSE MN 56352	5.01
49	12.06999.0002	JOHN M GOERDT	32797 RIVERVIEW RD	MELROSE MN 56352	10.03
50	66.36420.0070	ISAAC J WINTERS	15252 COUNTY ROAD 2	OSAKIS MN 56360	9.54
51	12.06999.0010	THOMAS V & SANDRA FISCHBACH	36504 COUNTY ROAD 173	MELROSE MN 56352-8139	7.78
52	12.06939.0000	SYLVESTER K & KATHRYN BAUER	37217 335TH AVE	MELROSE MN 56352-8144	5.49
53	12.06938.0000	DENNIS RAKOTZ	37249 335TH AVE	MELROSE MN 56352	0.49
54	12.07005.0000	THOMAS J GIESKE	PO BOX 142	MELROSE MN 56352-8144	5.00
55	66.36431.0000	BERNARD E & DIANE NATHE	523 5TH AVE SE	MELROSE MN 56352-1143	0.49
56	12.07004.0020	BLACK ADLEY INC	PO BOX 201	MELROSE MN 56352	32.30
57	12.06991.0000	ELISABETH A KUHNS	36254 COUNTY ROAD 13	MELROSE MN 56352-8102	9.00
58	12.06990.0000	ROGER F & SHARON LEE MEYER	36408 COUNTY ROAD 13	MELROSE MN 56352-8102	174.00
59	12.07004.0000	SYLVESTER K & KATHRYN BAUER	37217 335TH AVE	MELROSE MN 56352-8144	10.72

City of Melrose WHPP Part II - Appendix III

Parcels located within the City of Melrose DWSMA

ID	GISPARCEL	OWNER	OWNER_ADDR	OWNER_CITY	DEED_AC
60	12.07008.0010	CHRISTOPHER G BAUER	36540 335TH AVE	MELROSE MN 56352	10.00
61	12.06989.0010	THOMAS J & JOAN T MALESKA	36801 335TH AVE	MELROSE MN 56352-8144	2.81
62	12.07007.0000	GERALD J SONNEN	37457 COUNTY ROAD 173	MELROSE MN 56352-8140	250.74
63	12.07006.0000	BLACK ADLEY INC	PO BOX 201	MELROSE MN 56352	36.40
64	12.07031.0000	CHRISTOPHER BAUER	37217 335TH AVE	MELROSE MN 56352	31.71
65	66.36420.0068	GARY J & SANDRA K TOENYAN	420 12TH AVE SE	MELROSE MN 56352	1.75
66	66.36443.0000	LAWRENCE & SANDRA THOM	30977 410TH ST	MELROSE MN 56352-8036	1.02
67	12.06906.0000	ERVIN H MAYERS REV TRUST	PO BOX 23	MELROSE MN 56352	37.85
68	66.36887.0001	J-T OF MELROSE INC	222 COUNTY ROAD 173 SE PO BOX 219	MELROSE MN 56352-1602	0.00
69	12.07236.0000	RICHARD & MARGARET HELLERMANN	37276 COUNTY ROAD 13 PO BOX 37	MELROSE MN 56352-0037	0.00
70	66.36713.0010	SCOTT G & MICHELLE A RITTER	329 COUNTY ROAD 173 SE	MELROSE MN 56352-1600	0.00
71	66.36713.0000	DONNA M FRANK	307 COUNTY ROAD 173 SE	MELROSE MN 56352-1600	0.00
72	66.37010.0410	BERNARD E & DIANE NATHE	523 5TH AVE SE	MELROSE MN 56352-1143	0.00
73	12.07260.0004	JOSEPH B & JACQUELINE TSCHIDA	37325 SPRING HAVEN RD	MELROSE MN 56352-8143	1.00
74	66.37010.0400	FRED N OREEL	215 SHADOW MOUNTAIN DR	SEDONA AZ 86336-3406	0.00
75	66.37011.0010	THREE HEAT INC	231 COUNTY ROAD 173 SE	MELROSE MN 56352	0.00
76	12.07240.0000	ROBERT E MAYERS	37264 COUNTY ROAD 13	MELROSE MN 56352	0.00
77	12.07237.0000	RALPH INDERRIEDEN	PO BOX 53	MELROSE MN 56352-0053	0.00
78	66.37009.0500	MEADOWLARK PROPERTIES LLP	PO BOX 187	MELROSE MN 56352	0.00
79	12.07272.0003	MICHAEL G & DENISE M LINN	PO BOX 103	SAINT MICHAEL MN 55376-0103	0.00
80	12.07239.0000	MARK H MAYERS	37264 COUNTY ROAD 13	MELROSE MN 56352	0.00
81	12.07238.0000	MAYERS INC	37264 COUNTY ROAD 13	MELROSE MN 56352-8602	0.00
82	66.36887.0004	J-T OF MELROSE INC	PO BOX 219	MELROSE MN 56352-1143	0.00
83	66.36960.0110	J-T OF MELROSE INC	222 COUNTY ROAD 173 SE PO BOX 219	MELROSE MN 56352-1602	0.00
84	66.37068.0000	MELROSE STATE BANK	220 E KRAFT DR PO BOX 10	MELROSE MN 56352-1380	0.00
85	66.36960.0100	J-T OF MELROSE INC	222 COUNTY ROAD 173 SE PO BOX 219	MELROSE MN 56352-1602	0.00
86	66.37025.0502	CITY OF MELROSE	225 1ST ST NE	MELROSE MN 56352	0.00
87	12.07206.0000	JAMES L & ROSALYN M ATHMANN	37181 SPRINGHAVEN RD	MELROSE MN 56352-8143	0.00
88	12.07245.0000	RICK A & CATHRYN R SPAETH	272 MEADOWLARK LN	MELROSE MN 56352	0.00
89	12.07242.0000	RICK A SPAETH	272 MEADOWLARK LN SW	MELROSE MN 56352-1507	0.00
90	12.07244.0000	RICK A SPAETH	272 MEADOWLARK LN SW	MELROSE MN 56352-1507	0.00
91	12.07207.0000	LONNIE F & JUDY E WALDVOGEL	32702 RIVERVIEW RD	MELROSE MN 56352-8142	0.00
92	12.07272.0001	ALCUIN SAND	37174 COUNTY ROAD 13	MELROSE MN 56352-8602	0.36
93	12.07205.0000	JASON L HONKOMP	37221 SPRINGHAVEN RD	MELROSE MN 56352	0.00
94	66.37009.0741	PROLIANT DAIRY INC	2425 SE OAK CT	ANKENY IA 50021	0.00
95	66.36960.0105	J-T OF MELROSE INC	222 COUNTY ROAD 173 SE PO BOX 219	MELROSE MN 56352-1602	0.00
96	12.07203.0000	EARL J PUNDSACK	37291 SPRINGHAVEN RD	MELROSE MN 56352	0.00
97	66.37009.0740	MELROSE DAIRY PROTEINS LLC	1000 KRAFT DR SE	MELROSE MN 56352	0.00
98	12.07202.0000	PAUL D GRUSSING	37319 SPRINGHAVEN RD	MELROSE MN 56352	0.00
99	12.07204.0000	MARK & DEANNE DIERKHISING	37247 SPRINGHAVEN RD	MELROSE MN 56352-8143	0.00
100	12.07243.0000	RICK A SPAETH	272 MEADOWLARK LN SW	MELROSE MN 56352-1507	0.00
101	66.37025.0500	CITY OF MELROSE	225 1ST ST NE	MELROSE MN 56352	0.00
102	66.37009.0504	J-T OF MELROSE INC	222 COUNTY ROAD 173 SE PO BOX 219	MELROSE MN 56352-1602	0.00
103	66.37009.0502	J-T OF MELROSE INC	222 COUNTY ROAD 173 SE PO BOX 219	MELROSE MN 56352-1602	0.00
	0 44				0.00
	0 55				0.00
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City of Melrose WHPP Part II - Appendix IV

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1730016	COMMUNITY
NAME	Melrose	
ADDRESS	Melrose Water Superintendent, 225 First Street NE, P.O. Box 216, Melrose, MN 56352	

FACILITY (WELL) INFORMATION

NAME	Well #4	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE? <input type="checkbox"/> YES (Please attach a copy) <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED
FACILITY ID	S02	
UNIQUE WELL NO.	215113	
COUNTY	Stearns	

PWS ID / FACILITY ID	1730016 S02	UNIQUE WELL NO.	215113
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well ¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				

Agricultural Related

*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well ² (Class V well - illegal ³)	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		

SSTS Related

AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well) ²	50/300/150 ⁴	50/300/150 ⁴	100/600/300 ⁴	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal) ²	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal) ²	illegal	illegal		N		

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID	1730016 S02	UNIQUE WELL NO.	215113
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well ¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well ² (Class V well - illegal ³)	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		Y	200	N
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well) ²	illegal ³	illegal ³		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID

1730016 S02

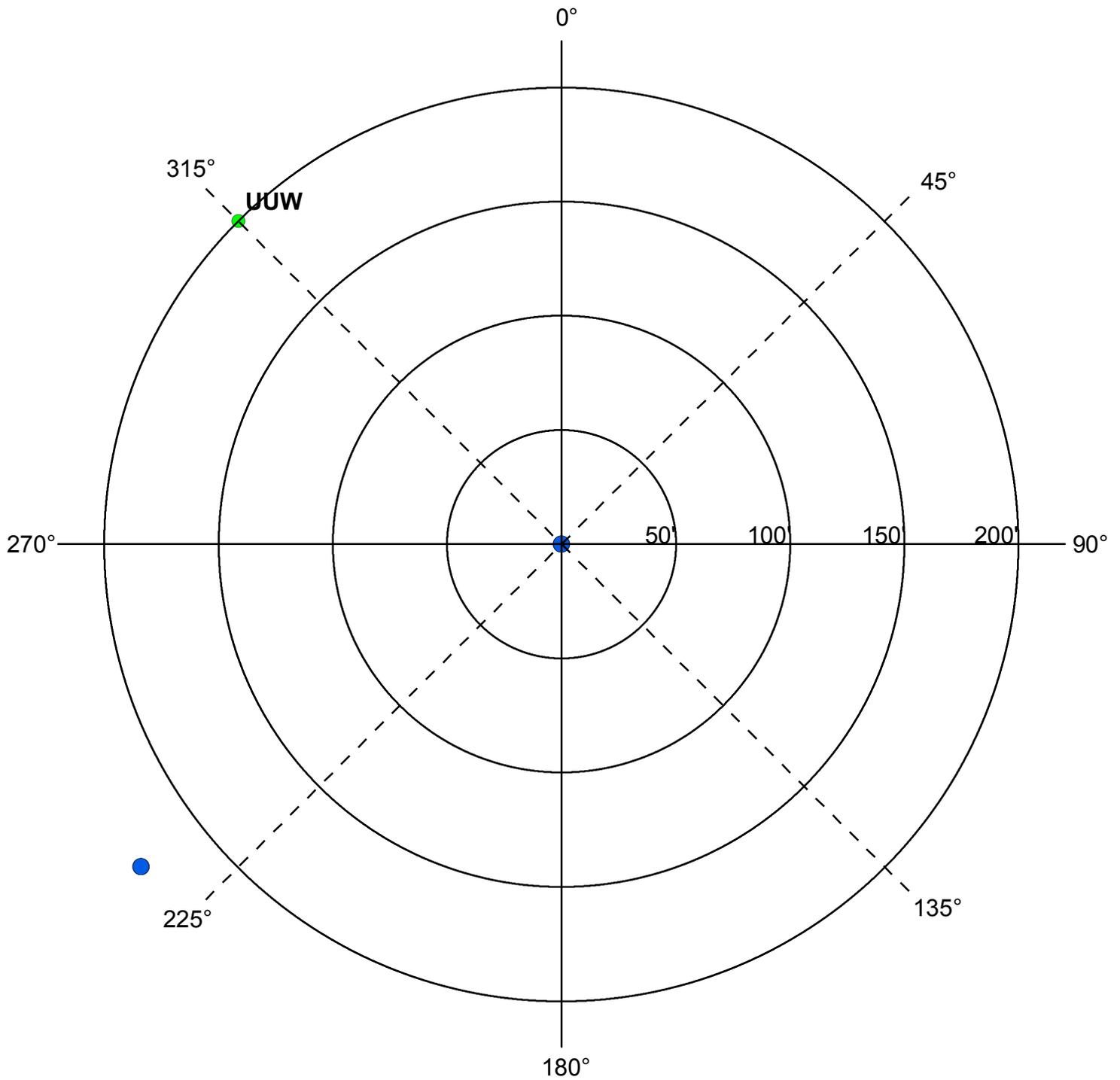
UNIQUE WELL NO.

215113

SETBACK DISTANCES

All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?	X		
Is the system monitoring existing nonconforming sources of contamination?			X

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR

Meyer, Aaron

DATE

7 - 30 - 2014

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID	1730016 S02	UNIQUE WELL NO.	215113
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RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
City staff feel the identified unused unsealed well has been sealed and are looking for sealing records. The unused well could not be located on site.		
The unused, unsealed well located on the property should be sealed in accordance with Minn. Rules 4725.3850 and 4725.3875 by a properly licensed well contractor. Unused wells that have not been properly sealed can provide a direct pathway for contaminants to enter the drinking water source.		

COMMENTS
<p>9/7/2003 - Location for PCSI Type BLD (bearing = 0, distance = 0 , inventory date: 4/28/1999) could not be determined. 9/7/2003 - Location for PCSI Type GPR (bearing = 0, distance = 0 , inventory date: 4/28/1999) could not be determined.</p>

For further information, please contact:

**Minnesota Department of Health
 Drinking Water Protection Section
 Source Water Protection Unit
 P.O. Box 64975
 St. Paul, Minnesota 55164-0975**

**Section Receptionist: 651-201-4700
 Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000**

City of Melrose WHPP Part II - Appendix IV

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1730016	COMMUNITY
NAME	Melrose	
ADDRESS	Melrose Water Superintendent, 225 First Street NE, P.O. Box 216, Melrose, MN 56352	

FACILITY (WELL) INFORMATION

NAME	Well #5	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE? <input type="checkbox"/> YES (Please attach a copy) <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED
FACILITY ID	S03	
UNIQUE WELL NO.	180122	
COUNTY	Stearns	

PWS ID / FACILITY ID	1730016 S03	UNIQUE WELL NO.	180122
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well ¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				

Agricultural Related

*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well ² (Class V well - illegal ³)	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		

SSTS Related

AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well) ²	50/300/150 ⁴	50/300/150 ⁴	100/600/300 ⁴	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal) ²	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal) ²	illegal	illegal		N		

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID	1730016 S03	UNIQUE WELL NO.	180122
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well ¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well ² (Class V well - illegal ³)	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well) ²	illegal ³	illegal ³		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

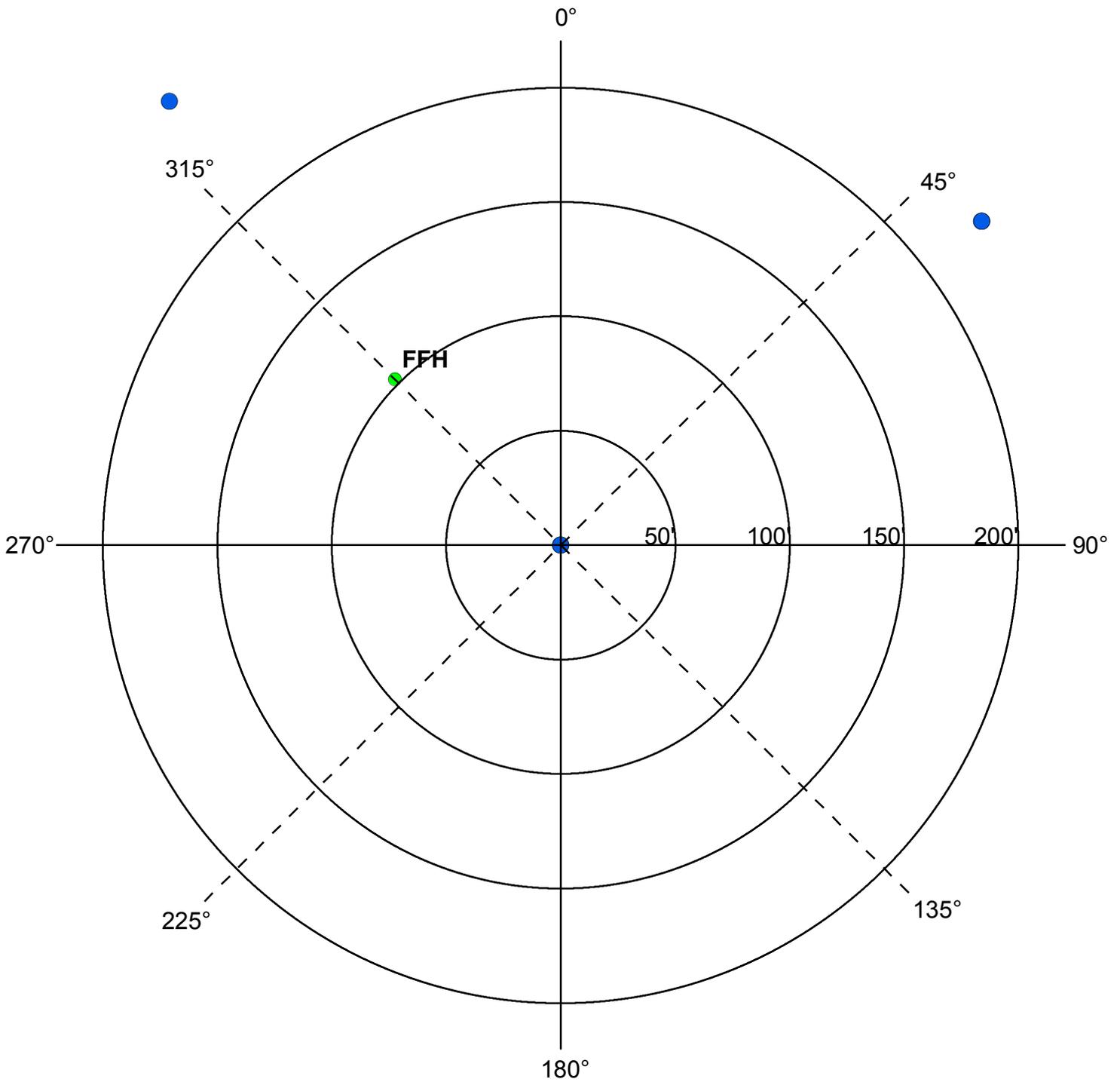
City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID 1730016 S03

UNIQUE WELL NO. 180122

SETBACK DISTANCES All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?	X		
Is the system monitoring existing nonconforming sources of contamination?			X

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR

Meyer, Aaron

DATE

7 - 30 - 2014

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID	1730016 S03	UNIQUE WELL NO.	180122
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RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS
<p>9/7/2003 - Location for PCSI Type BLD (bearing = 0, distance = 0 , inventory date: 4/28/1999) could not be determined.</p>

For further information, please contact:

**Minnesota Department of Health
 Drinking Water Protection Section
 Source Water Protection Unit
 P.O. Box 64975
 St. Paul, Minnesota 55164-0975**

**Section Receptionist: 651-201-4700
 Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000**

City of Melrose WHPP Part II - Appendix IV

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1730016	COMMUNITY
NAME	Melrose	
ADDRESS	Melrose Water Superintendent, 225 First Street NE, P.O. Box 216, Melrose, MN 56352	

FACILITY (WELL) INFORMATION

NAME	Well #7	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE? <input type="checkbox"/> YES (Please attach a copy) <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED
FACILITY ID	S05	
UNIQUE WELL NO.	486430	
COUNTY	Stearns	

PWS ID / FACILITY ID	1730016 S05	UNIQUE WELL NO.	486430
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well ¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				

Agricultural Related

*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well ² (Class V well - illegal ³)	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		

SSTS Related

AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well) ²	50/300/150 ⁴	50/300/150 ⁴	100/600/300 ⁴	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal) ²	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal) ²	illegal	illegal		N		

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID	1730016 S05	UNIQUE WELL NO.	486430
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well ¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well ² (Class V well - illegal ³)	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		Y	65	Y
MON	Monitoring well	record dist.	record dist.		Y	122	
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well) ²	illegal ³	illegal ³		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		

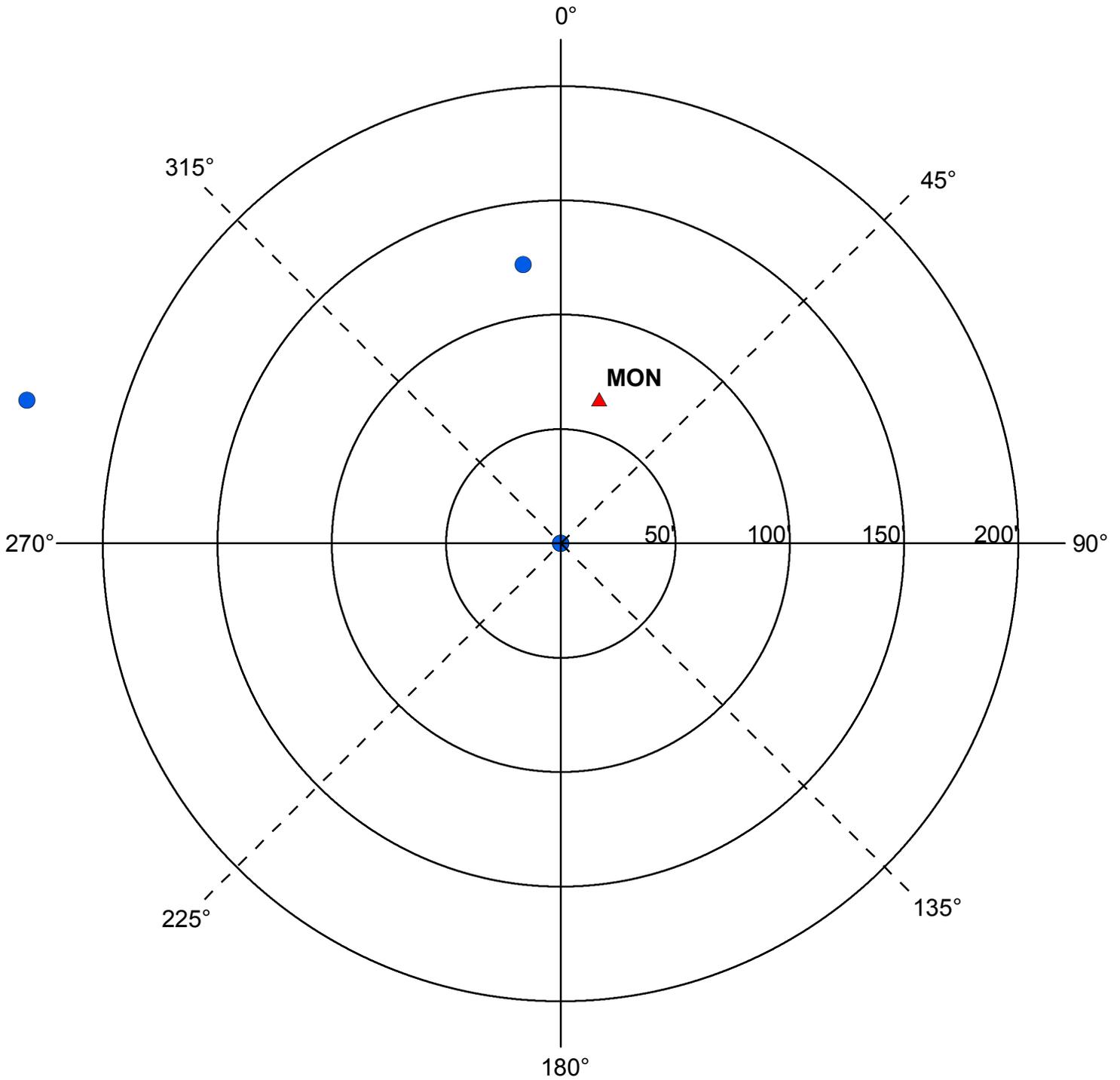
City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID 1730016 S05

UNIQUE WELL NO. 486430

SETBACK DISTANCES All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



Y	N	N/A
X		
		X

Were the isolation distances maintained for the new sources of contamination?

Is the system monitoring existing nonconforming sources of contamination?

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR Meyer, Aaron

DATE 7 - 30 - 2014

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID	1730016 S05	UNIQUE WELL NO.	486430
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RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
The well on your property that does not provide drinking water to the public should be properly managed. Management practices include: locating potential sources of contamination away from the well, sealing unused wells, maintaining the well casing and cap in good repair, and testing the water periodically. Additional information can be found at www.health.state.mn.us/divs/eh/wells .		

COMMENTS
<p>9/7/2003 - Location for PCSI Type BLD (bearing = 0, distance = 0 , inventory date: 4/28/1999) could not be determined.</p> <p>9/7/2003 - Location for PCSI Type FFH Well 470653 has been sealed per conversations with city staff. (bearing = 0, distance = 45 , inventory date: 4/28/1999) could not be determined.</p> <p>9/7/2003 - Location for PCSI Type GPR (bearing = 0, distance = 30 , inventory date: 4/28/1999) could not be determined.</p>

For further information, please contact:

**Minnesota Department of Health
 Drinking Water Protection Section
 Source Water Protection Unit
 P.O. Box 64975
 St. Paul, Minnesota 55164-0975**

**Section Receptionist: 651-201-4700
 Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000**

City of Melrose WHPP Part II - Appendix IV

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1730016	COMMUNITY
NAME	Melrose	
ADDRESS	Melrose Water Superintendent, 225 First Street NE, P.O. Box 216, Melrose, MN 56352	

FACILITY (WELL) INFORMATION

NAME	Well #8	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE? <input type="checkbox"/> YES (Please attach a copy) <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED
FACILITY ID	S07	
UNIQUE WELL NO.	608438	
COUNTY	Stearns	

PWS ID / FACILITY ID	1730016 S07	UNIQUE WELL NO.	608438
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well ¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				

Agricultural Related

*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well ² (Class V well - illegal ³)	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		

SSTS Related

AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well) ²	50/300/150 ⁴	50/300/150 ⁴	100/600/300 ⁴	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal) ²	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal) ²	illegal	illegal		N		

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID	1730016 S07	UNIQUE WELL NO.	608438
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well ¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well ² (Class V well - illegal ³)	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		Y	195	Y**
MON	Monitoring well	record dist.	record dist.		Y	170	Y
WEL	Operating well	record dist.	record dist.		Y	153	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		Y	130	N**
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well) ²	illegal ³	illegal ³		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID

1730016 S07

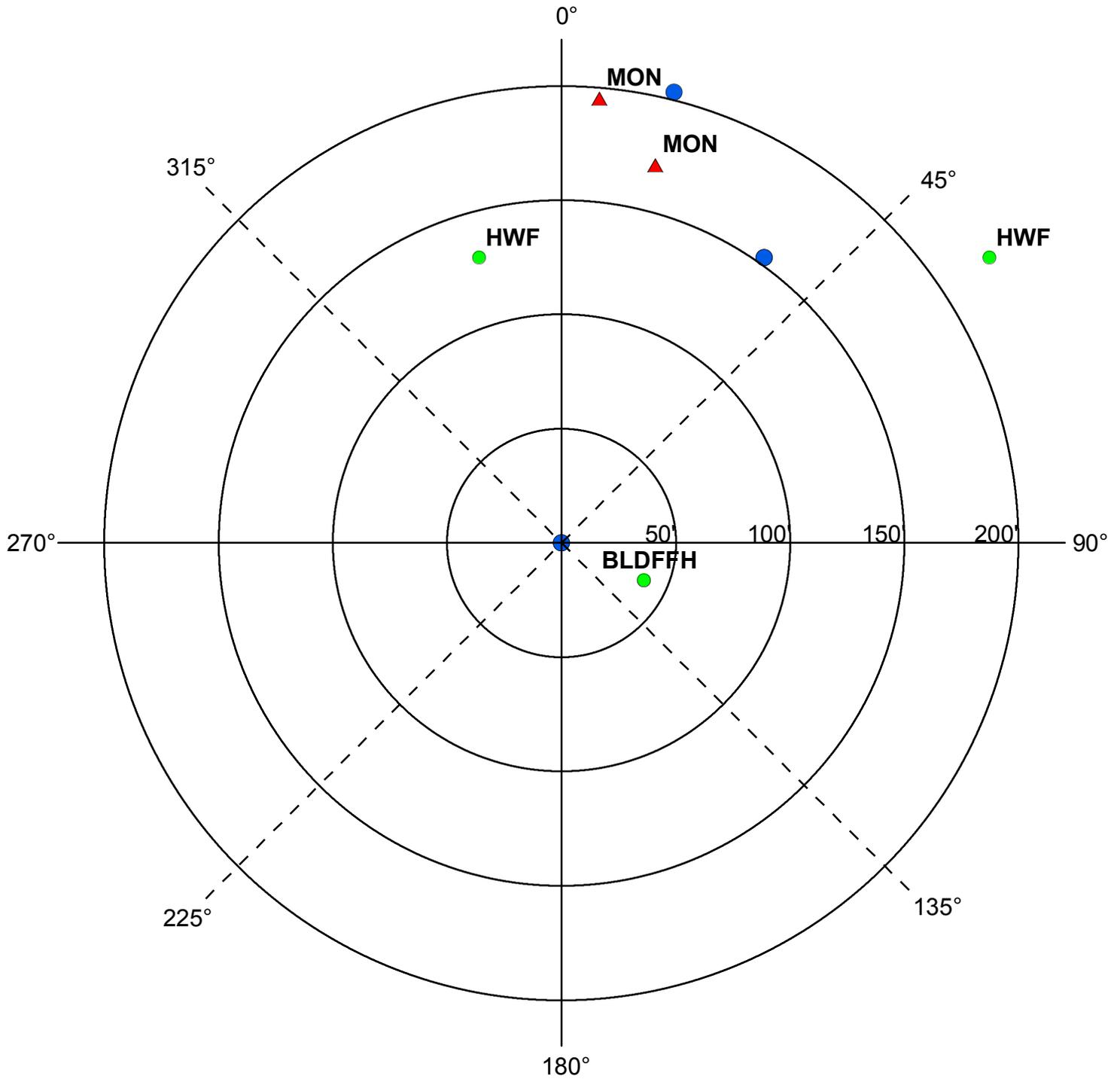
UNIQUE WELL NO.

608438

SETBACK DISTANCES

All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?	X		
Is the system monitoring existing nonconforming sources of contamination?			X

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR

Meyer, Aaron

DATE

7 - 30 - 2014

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID	1730016 S07	UNIQUE WELL NO.	608438
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RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
The well on your property that does not provide drinking water to the public should be properly managed. Management practices include: locating potential sources of contamination away from the well, sealing unused wells, maintaining the well casing and cap in good repair, and testing the water periodically. Additional information can be found at www.health.state.mn.us/divs/eh/wells .		

COMMENTS

For further information, please contact:

**Minnesota Department of Health
 Drinking Water Protection Section
 Source Water Protection Unit
 P.O. Box 64975
 St. Paul, Minnesota 55164-0975**

**Section Receptionist: 651-201-4700
 Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000**

City of Melrose WHPP Part II - Appendix IV

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1730016	COMMUNITY
NAME	Melrose	
ADDRESS	Melrose Water Superintendent, 225 First Street NE, P.O. Box 216, Melrose, MN 56352	

FACILITY (WELL) INFORMATION

NAME	Well #9	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE? <input type="checkbox"/> YES (Please attach a copy) <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED
FACILITY ID	S08	
UNIQUE WELL NO.	608424	
COUNTY	Stearns	

PWS ID / FACILITY ID	1730016 S08	UNIQUE WELL NO.	608424
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well ¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				

Agricultural Related

*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well ² (Class V well - illegal ³)	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		

SSTS Related

AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well) ²	50/300/150 ⁴	50/300/150 ⁴	100/600/300 ⁴	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal) ²	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal) ²	illegal	illegal		N		

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID	1730016 S08	UNIQUE WELL NO.	608424
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well ¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well ² (Class V well - illegal ³)	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		Y	62	Y**
MON	Monitoring well	record dist.	record dist.		Y	100	Y
WEL	Operating well	record dist.	record dist.		Y	82	
WEL	Operating well	record dist.	record dist.		Y	153	
WEL	Operating well	record dist.	record dist.		Y	182	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		Y	125	N
HWF	Highest water or flood level	50	N/A		Y	100	N
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well) ²	illegal ³	illegal ³		N		

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID	1730016 S08	UNIQUE WELL NO.	608424
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well ¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50 ⁵	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		

Additional Sources (If there is more than one source listed above, please indicate here).

Potential Contamination Sources and Codes Based on Previous Versions of this Form

BLD	Building (does not contain any actual or potential contaminant sources.)	3	3		Y	150	N
FFH	Fire or flushing hydrant	10	N/A		Y	150	N

* New potential contaminant source.

** This number is the estimated distance that this potential source is from this well even though it was identified during an inventory for an adjacent well.

¹ A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

² These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

³ These sources are classified as illegal by Minnesota Rules, Chapter 4725.

⁴ Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

⁵ A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID

1730016 S08

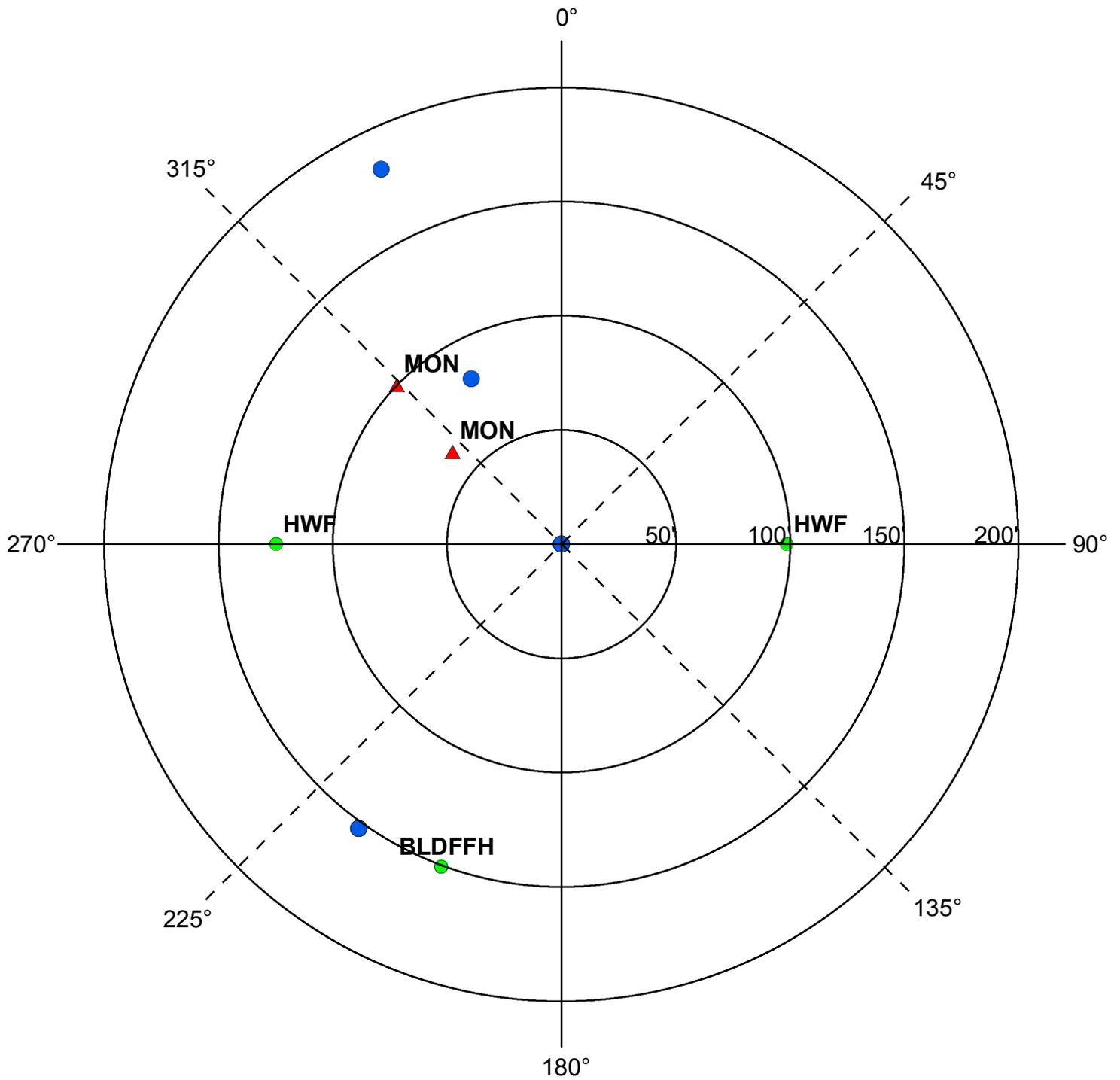
UNIQUE WELL NO.

608424

SETBACK DISTANCES

All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?	X		
Is the system monitoring existing nonconforming sources of contamination?			X

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR

Meyer, Aaron

DATE

7 - 30 - 2014

City of Melrose WHPP Part II - Appendix IV

PWS ID / FACILITY ID	1730016 S08	UNIQUE WELL NO.	608424
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RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
The well on your property that does not provide drinking water to the public should be properly managed. Management practices include: locating potential sources of contamination away from the well, sealing unused wells, maintaining the well casing and cap in good repair, and testing the water periodically. Additional information can be found at www.health.state.mn.us/divs/eh/wells .		

COMMENTS
Two wells (592579, 596436) have been identified on previous IWMZ forms however after inspecting the site and talking with city staff the wells are not located within the IMWZ. 9/7/2003 - Location for PCSI Type BLD (bearing = 0, distance = 0 , inventory date: 4/28/1999) could not be determined. 9/7/2003 - Location for PCSI Type PLE (bearing = 90, distance = 0 , inventory date: 4/28/1999) could not be determined.

For further information, please contact:

**Minnesota Department of Health
 Drinking Water Protection Section
 Source Water Protection Unit
 P.O. Box 64975
 St. Paul, Minnesota 55164-0975**

**Section Receptionist: 651-201-4700
 Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000**

City of Melrose WHPP Part II - Appendix V

CERTIFICATION OF ADOPTION WATER EMERGENCY AND CONSERVATION PLAN

City or Water System Name: City of Melrose

Name of Person Authorized to Sign
Certification on Behalf of the System: John Harren

Title: Public Works Director

Address: 225 East First Street North, P.O. Box 216, Melrose MN 56352

Telephone: 320-256-4278 Fax: 320-256-7766

E-mail: jharren@cityofmelrose.com

I certify that the Water Emergency and Conservation Plan approved by the Department of Natural Resources has been adopted by the city council or utility board that has authority over water supply services.

Signed:



Date: July 9, 2007

Fax (651/772-7922) or mail this certification to: **DNR Waters
1200 Warner Road
St. Paul, MN 55106**

RECEIVED

JUL 16 2007

DNR
Waters

City of Melrose WHPP Part II - Appendix V



Minnesota Department of Natural Resources
Central Region Waters - 1200 Warner Road, St. Paul, MN 55106-6793
Telephone: (651) 772-7910 Fax: (651) 772-7977

May 31, 2007

City of Melrose
John Harren, Public Works Director
116 North 8th Ave East
Melrose, MN 56352

Dear Mr. Harren:

RE: WATER EMERGENCY AND CONSERVATION PLAN APPROVAL, CITY OF MELROSE, STEARNS COUNTY

Our office has completed the review of your Emergency and Conservation Plan for public water supply authorized under DNR Permit 1975-3210. Minor plan changes were submitted during the review process concerning Part II. Emergency Response Procedures. Triggers for allocation and demand reduction actions have been identified for all of the triggers identified, including water demand.

As a result of these changes, I am pleased to advise you that in accordance with Minnesota Statutes, Section 103G.291, Subdivision 3, and on behalf of the Commissioner of Natural Resources, I hereby approve your plan. This approval is effective upon the Department's receipt of a completed copy of the attached "Certification of Adoption" form. Please return the form to my office as soon as the City Council officially adopts the plan and changes that were submitted during the review process.

An optional administrative amendment for additional water supply and wells authorized under Permit 1975-3210 was not requested during the water emergency and conservation plan approval process. As such, all terms and conditions of your existing permit shall remain in effect.

Thank you for efforts in planning for the future of the City of Melrose water supply and for conserving the water resources of the State of Minnesota. If you have any questions or need additional assistance with your water appropriation permit, please contact Area Hydrologist Dan Lais at 320-255-2976, in our Sauk Rapids area office.

Sincerely,

A handwritten signature in black ink that reads "Dale E. Homuth".

Dale E. Homuth
Regional Hydrologist

Enclosures

c: Dan Lais, Area Hydrologist
Stearns County SWCD
Jim Japs, Assistant Director
Laurel Reeves, Water Appropriation Program Manager

DNR Information: 651-296-6157 • 1-888-646-6367 • TTY: 651-296-5484 • 1-800-657-3929



City of Melrose WHPP Part II - Appendix V

Water Emergency and Conservation Plan Review Checklist

All sections of the plan must be completed in order for the plan to be approved.
If an item is not needed or applicable, check "Compliant". May 2006 Version

NAME OF WATER SUPPLIER:	City of Melrose		
DATE PLAN RECEIVED BY DNR:	October 13, 2006 (St. Paul)	DATE OF REVIEW:	11/27/06
NAME OF REVIEWER:	Dan Lais		
PLAN DUE DATE:	October 15, 2006		

Part I. Water Supply System Description and Evaluation

Compliant	Changes Needed	Section	Description	Comments / Changes Needed in Bold
<i>Analysis of Water Demand</i>				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Introduction	DNR Permit # Listed	1975-3210 /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Introduction	Utility Contact Info.	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, A	Table 1 Historic Water Demand (table completed?)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, A	Water Use Trends (discussion)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>		Table 2. Large Volume Users (are top 10 large users listed?)	Jennie-O Turkey and Melrose Dairy Proteins consume 85% of water supply /
<i>Treatment and Storage Capacity</i>				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, B	Table 3 (A) Water Treatment (capacity of system listed?)	No treatment plant /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, B	Table 3 (B) Storage capacity and structures (is table completed?)	Two structures, 1MG each for a total of 2MG of storage /
<i>Water Sources</i>				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, C	Table 4 (A) Total Water Source Capacity for System	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, C	Table 4 (B) Groundwater Sources (all wells & info. on them is listed?)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, C	Water Well Records and Maintenance Records (included as attachment?)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, C	Table 4 (C) Surface Water Sources (source and capacity listed?)	None /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, C	Table 4 (D) Wholesale or Retail Interconnection Sources (are they listed or explained?)	None /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, C	Table 4 (E) Emergency Interconnection Sources (are they listed or explained?)	None, population is less than 3,300 /
<i>Demand Projections</i>				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, D	Table 5 Demand Projections (is 10 year table complete?)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, D	Projection Method (is it described?)	Water system plan completed by consultant /
<i>Resource Sustainability</i>				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, E	* Monitoring Plan (as attachment, if needed)	Daily SCADA measurements taken for each well /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, E	Table 6 Monitoring Wells (are they listed or described?)	No monitoring wells are listed beyond the production wells. Discussed this with Evan Drivas and there does not appear to be a present need for any additional monitoring wells. /

City of Melrose WHPP Part II - Appendix V

<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, E	Water level data summary (graph or table should be included)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, E	* Natural Resource Impacts (must be described)	Although none were described, Evan and I did discuss the likelihood of resource impacts from the wells. Based upon a review of the geology, pumping history and surface hydrology, there does not appear to be significant resource impacts that are likely as a result of the current wells and appropriation. /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, E	* Sustainability (must be some discussion)	Although sustainability was not discussed at length by the city, Evan and I reviewed the pumping data and aquifer characteristics. There have not been any documented well interference problems with the city wells, nor have there been any resource impacts. Also noteworthy is the volume of water required by the city has been declining or staying static. There does not appear to be any major increases in supply within the foreseeable future. As a result, there does not appear to be any significant sustainability issues at this time. /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, E	Source Water Protection Plans (table must be completed)	Well Head Plan adopted 7-1-2003 /
<i>Capital Improvement Plan (CIP)</i>				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, F	Adequacy of Water Supply System (yes, or no with explanation.)	Water supply installations are adequate /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, F	* Proposed Water Sources (no, or yes with explanation)	Possible future well near existing well #7 /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, F	* Water Source Alternatives (must include some discussion on alternatives)	Since there does not appear to be any significant resource or sustainability issues with the current city water supply, alternative sources of water are not likely a significant capital improvement plan requirement. In addition, neighboring municipal water sources are not located nearby. The Sauk River is a potential surface water source, but the cost of constructing a treatment plant to comply with water quality standards is cost prohibitive at this time. /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part I, F	* Preventative Maintenance (must contain some discussion)	The city has provided a 5 year capital improvement plan that includes the production system, distribution system and lab equipment. Preventative maintenance is discussed at length within the plan. /
General Comments on System: Water supply system appears adequate. Alternative water supply is very limited, which makes the city vulnerable to significant water contamination emergencies.				

Part II. Emergency Planning and Response Procedures

Compliant	Changes Needed	Section	Description	Comments / Changes Needed in Bold
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Introduction	Community has a Federal Emergency Response Plan and has completed the contact information. If yes, skip to item II, D	Population is less than 3,300. There has not been a Federal Emergency Response Plan completed. /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Introduction	Operational Contingency Plan	/

City of Melrose WHPP Part II - Appendix V

<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part II, A	Emergency Telephone List	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part II, B	Current Water Sources and Service Area	Staff have maps and records that can be used. /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part II, C	Procedure for augmenting Supply: (include copies of Cooperative Agreements as attach.)	Please note comments under Part I, F. There are no practical options for augmenting the existing water supply. Demand reduction measures will be implemented appropriately. /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part II, C	Table 7 (A) Public Water Supply Emergency Inter-Connections listed	None listed /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part II, C	Table 7 (B) Private Water Sources available listed	None listed /
<i>Allocation and Demand Reduction Procedures</i>				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part II, D	Table 8 Water Use Priorities (must comply with statute)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part II, D	Triggers for Allocation and Demand Reduction Actions	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part II, D	Table 9 Demand Reduction Procedures completed	/ Additional reduction actions for water demand have been submitted as of April 30, 2007. Demand reduction procedures have been identified for all of the trigger allocations specified.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part II, D	Notification Procedures (must be explained)	/
<i>Enforcement</i>				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part II, E	Authority to Implement Water Emergency Responses (who has it?)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part II, E	Emergency Preparedness (complete if necessary)	/

Part III. Water Conservation Plan

Compliant	Changes Needed	Section	Description	Comments / Changes Needed in Bold
<i>Conservation Goals</i>				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, A	* Unaccounted Water (must include goals to reduce if over 10%)	Less than 4% /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, A	* Residential Per Capita (must include goals to reduce if over 75 GPCD)	Increase water rates and provide additional public education on water reduction measures. The City provided a copy of the official minutes whereby the council approved increasing the rates for residential water and providing for public education to encourage water conservation. /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, A	* Total Per Capita (must explain if increasing)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, A	* Peak Demands (must include goals to reduce if over 2.6)	/
<i>Water Conservation Programs</i>				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B1	Table 10 (A) Customer Meters completed	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B1	Unmetered Systems (describe and explain?)	None /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B1	Table 10 (B) Source Meters completed	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B2	Unaccounted Water	/

City of Melrose WHPP Part II - Appendix V

<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B2	* Reducing Unaccounted Water (must set timetable if over 10%)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B3	Conservation Water Rates (appropriate boxes checked)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B3	Current Water Rates (as attachment)	The base rates increase as the size of the meter increases. /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B3	* Non-conserving Rate Structures (discussed required)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B4	Regulations (as attachment)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B4	Types of Regulations (boxes checked)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B4	* Enforcement (yes or no, with explanation)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B5	Current Education Programs (list completed)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B5	Education Efforts for past 3 years (as attachment)	Noted in plan. Also, I have observed the City of Melrose participating in annual Water Festival activities for the past three years. /
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B5	* Proposed Education Programs (in discussion format)	/
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Part III, B6	* Retrofitting Programs (description)	/
General Comments on Water Conservation: Plan appears adequate. Conservation and demand reduction are likely the only immediate options for water supply and water quality emergencies.				

Part IV. Items for 7 County Metropolitan Area Public Suppliers

Compliant	Changes Needed	Section	Description	Comments / Changes Needed in Bold
<input type="checkbox"/>	<input type="checkbox"/>	Part IV	Policies (in statement format)	/
<input type="checkbox"/>	<input type="checkbox"/>	Part IV	Impact on the Local Comprehensive Plan (in statement format)	/
<input type="checkbox"/>	<input type="checkbox"/>	Part IV	Demand Projections (table completed: assure consistency with Met Council)	/
<input type="checkbox"/>	<input type="checkbox"/>	n.a.	Plan submitted to Met Council (7-County Metro area only – show date in comments)	/
<input type="checkbox"/>	<input type="checkbox"/>	n.a.	Plan submitted to adjacent communities (7-county metro area only – show date in comments)	/
General Comments on Metro Area Issues:				

City of Melrose WHPP Part II - Appendix V

Additional

YES	NO	Section	Description	Comments
<input type="checkbox"/>	<input checked="" type="checkbox"/>	n.a.	Is there enough information and commitment in the plan to approve it as a permit amendment? Note that items preceded by an * must be adequately addressed.	The city is not requesting an amendment at this time. Overall per capita per day volumes have been decreasing. Large increases in volume are not expected in the near future.

IS PLAN COMPLIANT?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
DATE THAT WATER SUPPLIER ADOPTED THE PLAN: 10-12-2006		

City of Melrose WHPP Part II - Appendix V

DEPARTMENT OF NATURAL RESOURCES - DIVISION OF WATERS and METROPOLITAN COUNCIL WATER EMERGENCY AND CONSERVATION PLANS

These guidelines are divided into four parts. The first three parts, Water Supply System Description and Evaluation, Emergency Response Procedures and Water Conservation Planning apply statewide. Part IV, relates to comprehensive plan requirements that apply only to communities in the Seven-County Twin Cities Metropolitan Area. If you have questions regarding water emergency and conservation plans, please call (651) 259-5703 or (651) 259-5647 or e-mail your question to wateruse@dnr.state.mn.us. Metro Communities can also direct questions to the Metropolitan Council at watersupply@metc.state.mn.us or (651) 602-1066.

DNR Water Appropriation Permit Number(s)	75-3210
Name of Water Supplier	City of Melrose
Address	116 North Eighth Avenue East Melrose, MN 56352
Contact Person	Scott Gilbertson/ John Harren
Title	Water Sup. / Public Works Dir.
Phone Number	320-256-1950 / 320-256-4278
E-Mail Address	sgilbertson@cityofmelrose.com jharren@cityofmelrose.com

PART I. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION

The first step in any water supply analysis is to assess the current status of demand and supplies. Information in Part I, can be used in the development of Emergency Response Procedures and Conservation Plans.

A. ANALYSIS OF WATER DEMAND.

Fill in Table 1 for the past 10 years water demand. If your customer categories are different than the ones listed in Table 1, please note the changes below.

TABLE 1 Historic Water Demand

Year	Total Population	Population Served	Total Connections	Residential Water Sold (MG)	C/I/I Water Sold (MG)	Wholesale Deliveries (MG)	Total Water Sold (MG)	Total Water Pumped (MG)	Percent Unmetered/Unaccounted	Average Demand (MGD)	Maximum Demand (MGD)	Residential gallons/capita/day	Total gallons/capita/day
1996	2722	2722	906	71.97	531.36	0	603.33	641	5.1%	1.76	3.1	72.4	607.3
1997	2741	2741	914	70.3	562.3	0	632.7	668.5	5.4%	1.83	3.3	70.3	632.4
1998	2781	2781	937	75.8	595.0	0	670.8	712.4	5.8%	1.95	3.2	74.6	660.8
1999	2786	2786	950	77.6	562.4	0	639.8	748.7	7.4%	2.05	3.4	76.3	629.1
2000	3091	3091	971	87.6	618.1	0	705.8	750.12	5.7%	2.06	3.5	77.6	625.6
2001	3115	3115	996	91.7	563.3	0	654.4	748.1	6.1%	2.05	3.06	80.6	576
2002	3144	3144	1012	83.5	585.6	0	668.9	693.7	3.5%	1.90	3.4	72.7	604.3
2003	3177	3177	1046	99.5	620.1	0	654.1	670.9	2.4%	1.83	3.5	71.8	564.4
2004	3256	3256	1086	85.4	569.2	0	654.6	670.36	2.4%	1.83	3.5	71.8	564.4
2005	3273	3273	1090	95.3	576.8	0	672.0	695.0	3.3%	1.90	3.6	79.7	582.0

MG -- Million Gallons MGD -- Million Gallons per Day C/I/I- Commercial, Industrial, Institutional

Residential. Water used for normal household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens.

Institutional. Hospitals, nursing homes, day care centers, and other facilities that use water for essential domestic requirements. This includes public facilities and public metered uses. You may want to maintain separate institutional water use records for emergency planning and allocation purposes.

Commercial. Water used by motels, hotels, restaurants, office buildings, commercial facilities, both civilian and military.

Industrial. Water used for thermoelectric power (electric utility generation) and other industrial uses such as steel, chemical and allied products, food processing, paper and allied products, minings, and petroleum refining.

Wholesale Deliveries. Bulk water sales to other public water suppliers.

Unaccounted. Unaccounted for water is the volume of water withdrawn from all sources minus the volume sold.

Residential Gallons per Capita per Day = total residential sales in gallons/population served/365 days **Total Gallons per Capita per Day** = total water withdrawals/population served/365 days

NOTE: Non-essential water uses defined by Minnesota Statutes 103G.291, include lawn sprinkling, vehicle washing, golf course and park irrigation and other non-essential uses. Some of the above categories also include non-essential uses of water.

City of Melrose WHPP Part II - Appendix V

Water Use Trends. Discuss factors that influence trends in water demand (i.e. growth, weather, industry, conservation). If appropriate, include a discussion of other factors that affect daily water use, such as use by non-resident commuter employees or large water consuming industry.

There are (2) major food industries on the water system that consume 85% of the water distributed.

TABLE 2 Large Volume Users - List the top 10 largest users.

Customer	Gallons per year	% of total annual use
Jennie-O Turkey Store	350,000,000	55%
Melrose Dairy Proteins	200,000,000	30%

B. TREATMENT AND STORAGE CAPACITY.

TABLE 3(A) Water Treatment

Water Treatment Plant Capacity	none	Gallons per day
Describe the treatment process used (i.e., softening, chlorination, fluoridation, Fe/Mn removal, reverse osmosis, coagulation, sedimentation, filtration, others). Also, describe the annual amount and method of disposal of treatment residuals, if any.		
No treatment plant.		

TABLE 3(B) Storage Capacity - List all storage structures and capacities.

Total Storage Capacity		Average Day Demand (average of last 5 years)	
2,000,000 Gallons		1,930,000 Gallons per day	
Type of Structure	Number of Structures	Gallons	
Elevated Storage	2	2 MG (1 million each)	
Ground Storage	none		
Other:	none		

City of Melrose WHPP Part II - Appendix V

C. WATER SOURCES. List all groundwater, surface water and interconnections that supply water to the system. Add or delete lines to the tables as needed.

TABLE 4(A) Total Water Source Capacity for System (excluding emergency connections)

Total Capacity of Sources	5,000	Gallons per minute
Firm Capacity (largest pump out of service)	3,800	Gallons per minute

TABLE 4(B) Groundwater Sources - Copies of water well records and well maintenance information should be included with the public water supplier's copy of the plan in Attachment . If there are more wells than space provided or multiple well fields, please use the List of Wells template (see Resources) and include as Attachment

Well # or name	Unique Well Number	Year Installed	Well & Casing Depth (ft)	Well Diameter (in)	Capacity (GPM)	Geologic Unit	Status
4	215113	1967	128	16	900	Drift/sand	Active
5	180122	1981	87	16	950	Drift/sand	Active
7	486430	1991	105	16	800	Drift/ sand	Active
8	608438	1998	100	16	1000	Drift/gravel	Active
9	608424	1998	85	16	900	Drift/gravel	Active

Status: Active use, Emergency, Standby, Seasonal, Peak use, etc. GPM – Gallons per Minute
 Geologic Unit: Name of formation(s), which supplies water to the well

TABLE 4(C) Surface Water Sources

Intake ID	Resource name	Capacity (GPM/MGD)
	NONE	

GPM – Gallons per Minute MGD – Million Gallons per Day

TABLE 4(D) Wholesale or Retail Interconnections - List interconnections with neighboring suppliers that are used to supply water on a **regular basis** either wholesale or retail.

Water Supply System	Capacity (GPM/MGD)	Wholesale or retail
	NONE	

GPM – Gallons per Minute MGD – Million Gallons per Day

TABLE 4(E) Emergency Interconnections - List interconnections with neighboring suppliers or private sources that can be used to supply water on an emergency or occasional basis. Suppliers that serve less than 3,300 people can leave this section blank, but must provide this information in Section II C.

Water Supply System	Capacity (GPM/MGD)	Note any limitations on use
	NONE	

City of Melrose WHPP Part II - Appendix V

GPM – Gallons per Minute MGD – Million Gallons per Day

D. DEMAND PROJECTIONS.

TABLE 5 Ten Year Demand Projections

Year	Population Served	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Projected Demand (MGY)
2003	3177	1.8	3.5	720
2005	3273	1.9	3.6	695
2011	4090	2.3	4.4	855
2020	5140	2.8	4.9	1040

MGD – Million Gallons per Day MGY – Million Gallons per Year

Projection Method. Describe how projections were made, (assumptions for per capita, per household, per acre or other methods used).

2003 Water System Plan- Bonestroo, Williamson, Kotsmith and Ass.

E. RESOURCE SUSTAINABILITY

Sustainable water use: use of water to provide for the needs of society, now and in the future, without unacceptable social, economic, or environmental consequences.

Monitoring. Records of water levels should be maintained for all production wells and source water reservoirs/basins. Water level readings should be taken monthly for a production well or observation well that is representative of the wells completed in each water source formation. **If water levels are not currently measured each year, a monitoring plan that includes a schedule for water level readings must be submitted as Attachment .**

TABLE 6 Monitoring Wells - List all wells being measured.

Unique well number	Type of well (production, observation)	Frequency of Measurement (daily, monthly etc.)	Method of Measurement (steel tape, SCADA etc.)
All Wells	Active	Daily (realtime)	SCADA (Transducer)

City of Melrose WHPP Part II - Appendix V

Water Level Data. Summarize water level data including seasonal and long-term trends for each ground and/or surface water source. If water levels are not measured and recorded on a routine basis then provide the static water level (SWL) when the well was constructed and a current water level measurement for each production well. Also include all water level data taken during well and pump maintenance.

Attachment #2: Provide monitoring data (graph or table) for as many years as possible. We have data on water levels for the last 10 years. Attached is our current method for water level measurements and Draw Down records.

Ground Water Level Monitoring – DNR Waters in conjunction with federal and local units of government maintain and measure approximately 750 observation wells around the state. Ground water level data are available online www.dnr.state.mn.us/waters. Information is also available by contacting the Ground Water Level Monitoring Manager, DNR Waters, 500 Lafayette Road, St. Paul, MN 55155-4032 or call (651) 259-5700.

Natural Resource Impacts. Indicate any natural resource features such as calcareous fens, wetlands, trout streams, rivers or surface water basins that are or could be influenced by water withdrawals from municipal production wells. Also indicate if resource protection thresholds have been established and if mitigation measures or management plans have been developed.

NONE

Sustainability. Evaluate the adequacy of the resource to sustain current and projected demands. Describe any modeling conducted to determine impacts of projected demands on the resource.

NONE

Source Water Protection Plans. The emergency procedures in this plan are intended to comply with the contingency plan provisions required in the Minnesota Department of Health's (MDH) Wellhead Protection (WHP) Plan and Surface Water Protection (SWP) Plan.

Date WHP Plan Adopted:	7-1-2003
Date for Next WHP Update:	2013
SWP Plan:	<input type="checkbox"/> In Process <input type="checkbox"/> Completed <input checked="" type="checkbox"/> Not Applicable

F. CAPITAL IMPROVEMENT PLAN (CIP)

Adequacy of Water Supply System. Are water supply installations, treatment facilities and distribution systems adequate to sustain current and projected demands? Yes No If no, describe any potential capital improvements over the next ten years and state the reasons for the proposed changes (CIP Attachment _____).

NA

Proposed Water Sources. Does your current CIP include the addition of new wells or intakes? Yes No If yes, list the number of new installations and projected water demands from each for the next ten years. Plans for new production wells must include the geologic source formation, well location, and proposed pumping capacity.

Possible new production well located by Well #7.

Water Source Alternatives. If new water sources are being proposed, describe alternative sources that were considered and any possibilities of joint efforts with neighboring communities for development of supplies.

NONE

Preventative Maintenance. Long-term preventative programs and measures will help reduce the risk of emergency situations. Identify sections of the system that are prone to failure due to age, materials or other problems. This information should be used to prioritize capital improvements, preventative maintenance, and to determine the types of materials (pipes, valves, couplings, etc.) to have in stock to reduce repair time.

Outline of these projects are detailed in our 10 year CIP.

City of Melrose WHPP Part II - Appendix V

PART II. EMERGENCY RESPONSE PROCEDURES

Water emergencies can occur as a result of vandalism, sabotage, accidental contamination, mechanical problems, power failures, drought, flooding, and other natural disasters. The purpose of emergency planning is to develop emergency response procedures and to identify actions needed to improve emergency preparedness. In the case of a municipality, these procedures should be in support of, and part of, an all-hazard emergency operations plan. If your community already has written procedures dealing with water emergencies we recommend that you use these guidelines to review and update existing procedures and water supply protection measures.

Federal Emergency Response Plan

Section 1433(b) of the Safe Drinking Water Act as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188, Title IV – Drinking Water Security and Safety) requires community water suppliers serving over 3,300 people to prepare an Emergency Response Plan. **Community water suppliers that have completed the Federal Emergency Response Plan and submitted the required certification to the U.S. Environmental Protection Agency have satisfied Part II, Sections A, B, and C of these guidelines and need only provide the information below regarding the emergency response plan and source water protection plan and complete Sections D (Allocation and Demand Reduction Procedures), and E (Enforcement).**

Provide the following information regarding your completed Federal Emergency Response Plan:

Emergency Response Plan	Contact Person	Contact Number
Emergency Response Lead	Scott Gilbertson	320-256-1950
Alternate Emergency Response Lead	John Harren	320-256-4278
Emergency Response Plan Certification Date	NONE	

Operational Contingency Plan. An operational contingency plan that describes measures to be taken for water supply mainline breaks and other common system failures as well as routine maintenance is recommended for all utilities. Check here **X** if the utility has an operational contingency plan. At a minimum a contact list for contractors and supplies should be included in a water emergency telephone list.

Communities that have completed Federal Emergency Response Plans should skip to Section D.

City of Melrose WHPP Part II - Appendix V

EMERGENCY RESPONSE PROCEDURES

- A. Emergency Telephone List.** A telephone list of emergency contacts must be included as Attachment 4 to the plan (complete template or use your own list). The list should include key utility and community personnel, contacts in adjacent communities, and appropriate local, state and federal emergency contacts. Please be sure to verify and update the contacts on the emergency telephone list on a regular basis (once each year recommended). In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Responsibilities and services for each contact should be defined.
- B. Current Water Sources and Service Area.** Quick access to concise and detailed information on water sources, water treatment, and the distribution system may be needed in an emergency. System operation, water well and maintenance records should be maintained in a central secured location so that the records are accessible for emergency purposes and preventative maintenance. A detailed map of the system showing the treatment plants, water sources, storage facilities, supply lines, interconnections, and other information that would be useful in an emergency should also be readily available. Check here if these records and maps exist and staff can access the documents in the event of an emergency.
- C. Procedure for Augmenting Water Supplies.** List all available sources of water that can be used to augment or replace existing sources in an emergency. In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Copies of cooperative agreements should be maintained with your copy of the plan and include in Attachment . Be sure to include information on any physical or chemical problems that may limit interconnections to other sources of water. Approvals from the MN Department of Health are required for interconnections and reuse of water.

TABLE 7 (A) Public Water Supply Systems – List interconnections with other public water supply systems that can supply water in an emergency.

Water Supply System	Capacity (GPM/MGD)	Note any limitations on use
NONE		

GPM – Gallons per Minute MGD – Million Gallons per Day

TABLE 7 (B) - Private Water Sources – List other sources of water available in an emergency.

Name	Capacity (GPM/MGD)	Note any limitations on use
NONE		

GPM – Gallons per Minute MGD – Million Gallons per Day

- D. Allocation and Demand Reduction Procedures.** The plan must include procedures to

City of Melrose WHPP Part II - Appendix V

address gradual decreases in water supply as well as emergencies and the sudden loss of water due to line breaks, power failures, sabotage, etc. During periods of limited water supplies public water suppliers are required to allocate water based on the priorities established in Minnesota Statutes 103G.261.

Water Use Priorities (Minnesota Statutes 103G.261)
<p>First Priority. Domestic water supply, excluding industrial and commercial uses of municipal water supply, and use for power production that meets contingency requirements.</p> <p style="margin-left: 40px;"><i>NOTE:</i> Domestic use is defined (MN Rules 6115.0630, Subp. 9), as use for general household purposes for human needs such as cooking, cleaning, drinking, washing, and waste disposal, and uses for on-farm livestock watering excluding commercial livestock operations which use more than 10,000 gallons per day or one million gallons per year.</p>
<p>Second Priority. Water uses involving consumption of less than 10,000 gallons per day.</p>
<p>Third Priority. Agricultural irrigation and processing of agricultural products.</p>
<p>Fourth Priority. Power production in excess of the use provided for in the contingency plan under first priority.</p>
<p>Fifth Priority. Uses, other than agricultural irrigation, processing of agricultural products, and power production.</p>
<p>Sixth Priority. Non-essential uses. These uses are defined by Minnesota Statutes 103G.291 as lawn sprinkling, vehicle washing, golf course and park irrigation, and other non-essential uses.</p>

List the statutory water use priorities along with any local priorities (hospitals, nursing homes, etc.) in Table 8. Water used for human needs at hospitals, nursing homes and similar types of facilities should be designated as a high priority to be maintained in an emergency. Local allocation priorities will need to address water used for human needs at other types of facilities such as hotels, office buildings, and manufacturing plants. The volume of water and other types of water uses at these facilities must be carefully considered. After reviewing the data, common sense should dictate local allocation priorities to protect domestic requirements over certain types of economic needs. In Table 8, list the priority ranking, average day demand and demand reduction potential for each customer category (modify customer categories if necessary).

Table 8 Water Use Priorities

Customer Category	Allocation Priority	Average Day Demand (GPD)	Demand Reduction Potential (GPD)
Residential	1	280,000	89,000
Institutional			
Commercial	2	90,000	10,000
Industrial	3	1,550,000	550,000
Irrigation	4	100,000	<1000
Wholesale	5	<1000	0
Non-essential	6		
	TOTALS	2,200,000	650,000

GPD – Gallons per Day

<p>Demand Reduction Potential. The demand reduction potential for residential use will typically be the base</p>

City of Melrose WHPP Part II - Appendix V

demand during the winter months when water use for non-essential uses such as lawn watering do not occur. The difference between summer and winter demands typically defines the demand reduction that can be achieved by eliminating non-essential uses. In extreme emergency situations lower priority water uses must be restricted or eliminated to protect first priority domestic water requirements. Short-term demand reduction potential should be based on average day demands for customer categories within each priority class.

Triggers for Allocation and Demand Reduction Actions. Triggering levels must be defined for implementing emergency responses, including supply augmentation, demand reduction, and water allocation. Examples of triggers include: water demand >100% of storage, water level in well(s) below a certain elevation, treatment capacity reduced 10% etc. Each trigger should have a quantifiable indicator and actions can have multiple stages such as mild, moderate and severe responses. Check each trigger below that is used for implementing emergency responses and for each trigger indicate the actions to be taken at various levels or stages of severity in Table 9.

- | | |
|--|--|
| <input type="checkbox"/> Water Demand
<input type="checkbox"/> Treatment Capacity
<input type="checkbox"/> Storage Capacity
<input type="checkbox"/> Groundwater Levels
<input type="checkbox"/> Surface Water Flows or Levels
<input type="checkbox"/> Pump, Booster Station or Well Out of Service
<input type="checkbox"/> Governor’s Executive Order – Critical Water Deficiency (required by statute) | <input type="checkbox"/> Water Main Break
<input type="checkbox"/> Loss of Production
<input type="checkbox"/> Security Breach
<input type="checkbox"/> Contamination
<input type="checkbox"/> Other (list in Table 9) |
|--|--|

Table 9 Demand Reduction Procedures

Condition	Trigger(s)	Actions
Stage 1 (Mild)	(2)Wells out of service	Adjust SCADA system for pumping requirements, notify industry of issue.
Stage 2 (Moderate)	(3) Wells out of service	SCADA adjustments, restrict industry usage Stage 1
Stage 3 (Severe)	Groundwater Contamination	Shut down industry, restrict lawn irrigation, import water. Stage 2
Critical Water Deficiency (M.S. 103G.291)	Executive Order by Governor & as provided in above triggers	Stage 1: Restrict lawn watering, vehicle washing, golf course and park irrigation and other nonessential uses Stage 2: Suspend lawn watering, vehicle washing, golf course and park irrigation and other nonessential uses

Note: The potential for water availability problems during the onset of a drought are almost impossible to predict. Significant increases in demand should be balanced with preventative measures to conserve supplies in the event of prolonged drought conditions.

Notification Procedures. List methods that will be used to inform customers regarding conservation requests, water use restrictions, and suspensions. Customers should be aware of emergency procedures and responses that they may need to implement.

Local Cable MEL- TV, Radio, City website, door to door, local newspaper.

City of Melrose WHPP Part II - Appendix V

E. Enforcement. Minnesota Statutes require public water supply authorities to adopt and enforce water conservation restrictions during periods of critical water shortages.

**Public Water Supply Appropriation During Deficiency.
Minnesota Statutes 103G.291, Subdivision 1.**

Declaration and conservation.

(a) If the governor determines and declares by executive order that there is a critical water deficiency, public water supply authorities appropriating water must adopt and enforce water conservation restrictions within their jurisdiction that are consistent with rules adopted by the commissioner.

(b) The restrictions must limit lawn sprinkling, vehicle washing, golf course and park irrigation, and other nonessential uses, and have appropriate penalties for failure to comply with the restrictions.

An ordinance that has been adopted or a draft ordinance that can be quickly adopted to comply with the critical water deficiency declaration must be included in the plan (include with other ordinances in Attachment 7 for Part III, Item 4). Enforcement responsibilities and penalties for non-compliance should be addressed in the critical water deficiency ordinance.

Sample regulations are available at www.dnr.state.mn.us/waters

Authority to Implement Water Emergency Responses. Emergency responses could be delayed if city council or utility board actions are required. Standing authority for utility or city managers to implement water restrictions can improve response times for dealing with emergencies. Who has authority to implement water use restrictions in an emergency?

Utility Manager

City Manager

City Council or Utility Board

Other (describe):

Emergency Preparedness. If city or utility managers do not have standing authority to implement water emergency responses, please indicate any intentions to delegate that authority. Also indicate any other measures that are being considered to reduce delays for implementing emergency responses.

We have complete authority to implement emergency responses to any issues that arise.

City of Melrose WHPP Part II - Appendix V

PART III. WATER CONSERVATION PLAN

Water conservation programs are intended to reduce demand for water, improve the efficiency in use and reduce losses and waste of water. Long-term conservation measures that improve overall water use efficiencies can help reduce the need for short-term conservation measures. Water conservation is an important part of water resource management and can also help utility managers satisfy the ever-increasing demands being placed on water resources.

Minnesota Statutes 103G.291, requires public water suppliers to implement demand reduction measures before seeking approvals to construct new wells or increases in authorized volumes of water. Minnesota Rules 6115.0770, require water users to employ the best available means and practices to promote the efficient use of water. Conservation programs can be cost effective when compared to the generally higher costs of developing new sources of supply or expanding water and/or wastewater treatment plant capacities.

A. Conservation Goals. The following section establishes goals for various measures of water demand. The programs necessary to achieve the goals will be described in the following section.

Unaccounted Water (calculate five year averages with data from Table 1)		
Average annual volume unaccounted water for the last 5 years	24,072,212	gallons
Average percent unaccounted water for the last 5 years	3.46	percent
AWWA recommends that unaccounted water not exceed 10%. Describe goals to reduce unaccounted water if the average of the last 5 years exceeds 10%.		
NA		

Residential Gallons Per Capita Demand (GPCD)		
Average residential GPCD use for the last 5 years (use data from Table 1)	78	GPCD
In 2002, average residential GPCD use in the Twin Cities Metropolitan Area was 75 GPCD. Describe goals to reduce residential demand if the average for the last 5 years exceeds 75 GPCD.		
Increase residential water rates to encourage water conservation; public education		

Total Per Capita Demand: From Table 1, is the trend in overall per capita demand over the past 10 years <input type="checkbox"/> increasing or <input type="checkbox"/> decreasing? If total GPCD is increasing, describe the goals to lower overall per capita demand or explain the reasons for the increase.	
NA	

Peak Demands (calculate average ratio for last five years using data from Table 1)	
Average maximum day to average day ratio	1.82
If peak demands exceed a ratio of 2.6, describe the goals for lowering peak demands.	
NA	

B. Water Conservation Programs. Describe all short-term conservation measures that are available for use in an emergency and long-term measures to improve water use efficiencies for each of the six conservation program elements listed below. Short-term demand reduction measures must be included in the emergency response procedures and must be in support of, and part of, a community all-hazard emergency operation plan.

1. **Metering.** The American Water Works Association (AWWA) recommends that every water utility meter all water taken into its system and all water distributed from its system at its customer's point of service. An effective metering program relies upon periodic performance testing, repair, repair and maintenance of all meters. AWWA also recommends that utilities conduct regular water audits to ensure accountability. Complete Table 10 (A) regarding the number and maintenance of customer meters.

TABLE 10 (A) Customer Meters

	Number of Connections	Number of Metered Connections	Meter testing schedule (years)	Average age/meter replacement schedule (years)
Residential	1290	1290	varies	15 / 15
Institutional				/
Commercial	272	272	varies	10 / 10
Industrial	7	7	annual	2 / 5
Public Facilities	4	2	varies	10 / 10
Other				/
TOTALS	1573	1571		

Unmetered Systems. Provide an estimate of the cost to install meters and the projected water savings from metering water use. Also indicate any plans to install meters.

NONE

TABLE 10 (B) Water Source Meters

	Number of Meters	Meter testing schedule (years)	Average age/meter replacement schedule (years)
Water Source (wells/intakes)	5	3	4 / 10
Treatment Plant	NA		/

City of Melrose WHPP Part II - Appendix V

2. **Unaccounted Water.** Water audits are intended to identify, quantify, and verify water and revenue losses. The volume of unaccounted-for water should be evaluated each billing cycle. The AWWA recommends a goal of ten percent or less for unaccounted-for water. Water audit procedures are available from the AWWA and MN Rural Water Association.

Frequency of water audits: each billing cycle yearly other:

Leak detection and survey: every year every years periodic as needed

Year last leak detection survey completed:

Reducing Unaccounted Water. List potential sources and efforts being taken to reduce unaccounted water. If unaccounted water exceeds 10% of total withdrawals, include the timeframe for completing work to reduce unaccounted water to 10% or less.

Lawn irrigation of schools, municipal water use- install portable meters.

3. **Conservation Water Rates.** Plans must include the current rate structure for all customers and provide information on any proposed rate changes. Discuss the basis for current price levels and rates, including cost of service data, and the impact current rates have on conservation.

Billing Frequency: Monthly Bimonthly Quarterly
 Other (describe):

Volume included in base rate or service charge: 2491 gallons or 333 cubic feet

Conservation Rate Structures

- Increasing block rate: rate per unit increases as water use increases
 Seasonal rate: higher rates in summer to reduce peak demands
 Service charge or base fee that does not include a water volume

Conservation Neutral Rate Structure

- Uniform rate: rate per unit is the same regardless of volume

Non-conserving Rate Structures

- Service charge or base fee that includes a large volume of water
 Declining block rate: rate per unit decreases as water use increases
 Flat rate: one fee regardless of how much water is used (unmetered)

Other (describe): Monthly Service Charge based on meter size

Water Rates Evaluated: every year every years no schedule

Date of last rate change: 2006

City of Melrose WHPP Part II - Appendix V

Declining block (the more water used, the cheaper the rate) and flat (one fee for an unlimited volume of water) rates should be phased out and replaced with conservation rates. Incorporating a seasonal rate structure and the benefits of a monthly billing cycle should also be considered along with the development of an emergency rate structure that could be quickly implemented to encourage conservation in an emergency.

Current Water Rates. Include a copy of the actual rate structure in Attachment 5 or list current water rates including base/service fees and volume charges below.

Non-conserving Rate Structures. Provide justification for the rate structure and its impact on reducing demands or indicate intentions including the timeframe for adopting a conservation rate structure.
Water usage is not increasing; consistent annual rate increases encourage conservation.

4. **Regulation.** Plans should include regulations for short-term reductions in demand and long-term improvements in water efficiencies. Sample regulations are available from DNR Waters. Copies of adopted regulations or proposed restrictions should be included in Attachment #3 of the plan. Indicate any of the items below that are required by local regulations and also indicate if the requirement is applied each year or just in emergencies.

- Time of Day: no watering between 10 **am/pm** and 6 **am/pm**
(Reduces evaporation) year around seasonal emergency only
- Odd/Even: (helps reduce peak demand) year around seasonal emergency only
- Water waste prohibited (no runoff from irrigation systems)
Describe ordinance:
- Limitations on turf areas for landscaping (reduces high water use turf areas)
Describe ordinance:
- Soil preparation (such as 4"-6" of organic soil on new turf areas with sandy soil)
Describe ordinance:
- Tree ratios (plant one tree for every square feet to reduce turf evapotranspiration)
Describe ordinance:
- Prohibit irrigation of medians or areas less than 8 feet wide
Describe ordinance:
- Permit required to fill swimming pool every year emergency only
- Other (describe):

City of Melrose WHPP Part II - Appendix V

State and Federal Regulations (mandated)

- ☒ Rainfall sensors on landscape irrigation systems. Minnesota Statute 103G.298 requires “All automatically operated landscape irrigation systems shall have furnished and installed technology that inhibits or interrupts operation of the landscape irrigation system during periods of sufficient moisture. The technology must be adjustable either by the end user or the professional practitioner of landscape irrigation services.”
- ☒ Water Efficient Plumbing Fixtures. The 1992 Federal Energy Policy Act established manufacturing standards for water efficient plumbing fixtures, including toilets, urinals, faucets, and aerators.

Enforcement. Are ordinances enforced? ☒ Yes <input type="checkbox"/> No If yes, indicate how ordinances are enforced along with any penalties for non-compliance.
--

Building Inspections and enforcing building permits, enforcing existing ordinances and imposing fines when needed.
--

City of Melrose WHPP Part II - Appendix V

5. Education and Information Programs. Customers should be provided information on how to improve water use efficiencies a minimum of two times per year. Information should be provided at appropriate times to address peak demands. Emergency notices and educational materials on how to reduce water use should be available for quick distribution during an emergency. If any of the methods listed in the table below are used to provide water conservation tips, indicate the number of times that information is provided each year and attach a list of education efforts used for the last three years.

Current Education Programs	Times/Year
Billing inserts or tips printed on the actual bill	4
Consumer Confidence Reports	1
Local news papers	2
Community news letters	2
Direct mailings (water audit/retrofit kits, showerheads, brochures)	2
Information at utility and public buildings	365
Public Service Announcements	varies
Cable TV Programs	varies
Demonstration projects (landscaping or plumbing)	varies
K-12 Education programs (Project Wet, Drinking Water Institute)	varies
School presentations	Area Water Festival-annually
Events (children's water festivals, environmental fairs)	varies
Community education	Varies-City Expo
Water Week promotions	varies
Information provided to groups that tour the water treatment plant	none
Website (include address: cityofmelrose.com)	varies
Targeted efforts (large volume users, users with large increases)	Semi-annual meetings
Notices of ordinances (include tips with notices)	varies
Emergency conservation notices (recommended)	varies
Other: Wellhead Protection education	varies

List education efforts for the last three years in Attachment *see below* of the plan. Be sure to indicate whether educational efforts are on-going and which efforts were initiated as an emergency or drought management effort.

<p>Proposed Education Programs. Describe any additional efforts planned to provide conservation information to customers a minimum of twice per year (required if there are no current efforts). City Expo booth, Sauk River Water Festival (annual), Mel-TV Programs, WHP education (brochures, packets, testing); Consumer Confidence Report.</p>

A packet of conservation tips and information can be obtained by contacting DNR Waters or the Minnesota Rural Water Association (MRWA). The American Water Works Association (AWWA) www.awwa.org or www.waterwiser.org also has excellent materials on water conservation that are available in a number of formats. You can contact the MRWA 800/367-6792, the AWWA bookstore 800/926-7337 or DNR Waters 651/259-5703 for information regarding educational materials and formats that are available.

6. **Retrofitting Programs.** Education and incentive programs aimed at replacing inefficient plumbing fixtures and appliances can help reduce per capita water use as well as energy costs. It is recommended that communities develop a long-term plan to retrofit public buildings with water efficient plumbing fixtures and that the benefits of retrofitting be included in public education programs. You may also want to contact local electric or gas suppliers to see if they are interested in developing a showerhead distribution program for customers in your service area.

A study by the AWWA Research Foundation (Residential End Uses of Water, 1999) found that the average indoor water use for a non-conserving home is 69.3 gallons per capita per day (gpcd). The average indoor water use in a conserving home is 45.2 gpcd and most of the decrease in water use is related to water efficient plumbing fixtures and appliances that can reduce water, sewer and energy costs. In Minnesota, certain electric and gas providers are required (Minnesota Statute 216B.241) to fund programs that will conserve energy resources and some utilities have distributed water efficient showerheads to customers to help reduce energy demands required to supply hot water.

Retrofitting Programs. Describe any education or incentive programs to encourage the retrofitting of inefficient plumbing fixtures (toilets, showerheads, faucets, and aerators) or appliances (washing machines).

Encourage high efficiency appliance with CIP Rebates through local electric utility. Education.

Plan Approval. Water Emergency and Conservation Plans must be approved by the Department of Natural Resources (DNR) every ten years. Please submit plans for approval to the following address:

DNR Waters
Water Permit Programs Supervisor
500 Lafayette Road
St. Paul, MN 55155-4032

or Submit electronically to
wateruse@dnr.state.mn.us.

Adoption of Plan. All DNR plan approvals are contingent on the formal adoption of the plan by the city council or utility board. Please submit a certificate of adoption (example available) or other action adopting the plan.

Metropolitan Area communities are also required to submit these plans to the Metropolitan Council. Please see PART IV. ITEMS FOR METROPOLITAN AREA PUBLIC SUPPLIERS.

METROPOLITAN COUNCIL

PART IV. ITEMS FOR METROPOLITAN AREA PUBLIC SUPPLIERS

Minnesota Statute 473.859 requires water supply plans to be completed for all local units of government in the seven-county Metropolitan Area as part of the local comprehensive planning process. Much of the required information is contained in Parts I-III of these guidelines. However, the following additional information is necessary to make the water supply plans consistent with the Metropolitan Land Use Planning Act upon which local comprehensive plans are based. Communities should use the information collected in the development of their plans to evaluate whether or not their water supplies are being developed consistent with the Council's Water Resources Management Policy Plan.

<p>Policies. Provide a statement(s) on the principles that will dictate operation of the water supply utility: for example, "It is the policy of the city to provide good quality water at an affordable rate, while assuring this use does not have a long-term negative resource impact."</p>

<p>Impact on the Local Comprehensive Plan. Identify the impact that the adoption of this water supply plan has on the rest of the local comprehensive plan, including implications for future growth of the community, economic impact on the community and changes to the comprehensive plan that might result.</p>

Demand Projections

Year	Total Community Population	Population Served	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Projected Demand (MGY)
2010					
2020					
2030					
Ultimate					

<p>Population projections should be consistent with those in the Metropolitan Council's <i>2030 Regional Development Framework</i> or the Communities 2008 Comprehensive Plan update. If population served differs from total population, explain in detail why the difference (i.e., service to other communities, not complete service within community etc.).</p>

PLAN SUBMITTAL AND REVIEW OF THE PLAN

The plan will be reviewed by the Council according to the sequence outlined in Minnesota Statutes 473.175. **Prior to submittal to the Council, the plan must be submitted to adjacent governmental units for a 60-day review period.** Following submittal, the Council determines

City of Melrose WHPP Part II - Appendix V

if the plan is complete for review within 15 days. If incomplete, the Council will notify the community and request the necessary information. When complete the Council will complete its review within 60 days or a mutually agreed upon extension. The community officially adopts the plan after the Council provides its comments.

Plans can be submitted electronically to the Council; however, the review process will not begin until the Council receives a paper copy of the materials. Electronic submissions can be via a CD, 3 1/2" floppy disk or to the email address below. Metropolitan communities should submit their plans to:

Reviews Coordinator
Metropolitan Council
390 Robert St,
St. Paul, MN 55101

electronically to:
watersupply@metc.state.mn.us

City of Melrose WHPP Part II - Appendix V
Attachment (Part I, C)

Unique No. 00215113 County Name Stearns	MINNESOTA DEPARTMENT OF HEALTH WELL AND BORING RECORD Minnesota Statutes Chapter 1031	Update Date 2002/01/16 Entry Date 1988/04/17																																			
Township Name Township Range Dir Section Subsection 125 33 W 2 DCBBBD	Well Depth 128 ft. Depth Completed 128 ft. Date Well Completed 1967/09/00																																				
Well Name MELROSE 4 Contact's Name MELROSE 4 MELROSE MN	Drilling Method Drilling Fluid _____ Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No From _____ ft. to _____ ft.																																				
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>GEOLOGICAL MATERIAL</th> <th>COLOR</th> <th>HARDNESS</th> <th>FROM</th> <th>TO</th> </tr> </thead> <tbody> <tr> <td>SILTY SAND</td> <td></td> <td></td> <td>0</td> <td>1</td> </tr> <tr> <td>FINE SAND</td> <td></td> <td></td> <td>1</td> <td>32</td> </tr> <tr> <td>SAND & GRAVEL</td> <td></td> <td></td> <td>32</td> <td>46</td> </tr> <tr> <td>GRAVEL & BOULDERS</td> <td></td> <td></td> <td>46</td> <td>103</td> </tr> <tr> <td>SAND & GRAVEL</td> <td></td> <td></td> <td>103</td> <td>126</td> </tr> <tr> <td>ROCK & GRAVEL</td> <td></td> <td></td> <td>126</td> <td>128</td> </tr> </tbody> </table>	GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	SILTY SAND			0	1	FINE SAND			1	32	SAND & GRAVEL			32	46	GRAVEL & BOULDERS			46	103	SAND & GRAVEL			103	126	ROCK & GRAVEL			126	128	Use Community Supply (municipal) Casing Drive Shoe? <input type="checkbox"/> Yes <input type="checkbox"/> N Hole Diameter _____ Casing Diameter 16 in. to 98 ft Weight(lbs/ft) _____ Screen Y Open Hole From _____ ft. to _____ ft. Make _____ Type _____ Diameter Slot Length Set Fitting 0 60 30 98 ft. to 128 ft	
	GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO																																
	SILTY SAND			0	1																																
	FINE SAND			1	32																																
	SAND & GRAVEL			32	46																																
	GRAVEL & BOULDERS			46	103																																
	SAND & GRAVEL			103	126																																
ROCK & GRAVEL			126	128																																	
Static Water Level 39 ft. from Land surface Date 1967/09/00																																					
PUMPING LEVEL (below land surface) 52 ft. after hrs. pumping 1311 g.p.m.																																					
Well Head Completion Pitless adapter mfr _____ Model _____ Casing Protection <input type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade(Environmental Wells and Borings ONLY)																																					
Grouting Information Well grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No																																					
Nearest Known Source of Contamination ft. direction type Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No																																					
Pump <input type="checkbox"/> Not Installed Date Installed Y Mfr name _____ HP _____ Volts _____ Drop Pipe Length _____ ft. Capacity E+03 g.p.m. Type _____																																					
Any not in use and not sealed well(s) on property? <input type="checkbox"/> Yes <input type="checkbox"/> No																																					
Was a variance granted from the MDH for this Well? <input type="checkbox"/> Yes <input type="checkbox"/> No																																					
USGS Quad: Melrose Elevation 1225 Aquifer: QWTA Alt Id: 75-3210																																					
Report Copy																																					
Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 43099 License Business Name <u>Fredericksons Inc.</u> Name of Driller _____																																					

City of Melrose WHPP Part II - Appendix V

Unique No. 00180122	MINNESOTA DEPARTMENT OF HEALTH WELL AND BORING RECORD <i>Minnesota Statutes Chapter 1031</i>	Update Date 2002/01/16
County Name Stearns		Entry Date 1992/09/08
Township Name Township Range Dir Section Subsection 125 33 W 2 DCBBCC	Well Depth 87 ft. Depth Completed 87 ft. Date Well Completed 1981/07/23	
Well Name MELROSE 5	Drilling Method Non-specified Rotary	
Contact's Name MELROSE 5 MELROSE MN	Drilling Fluid _____ Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No From _____ ft. to _____ ft.	
	Use Community Supply (municipal)	
	Casing Drive Shoe? <input type="checkbox"/> Yes <input type="checkbox"/> N Hole Diameter _____	
GEOLOGICAL MATERIAL COLOR HARDNESS FROM TO	Casing Diameter Weight(lbs/ft) 0 in. to 18 ft	
TOPSOIL BLACK 0 2		
SAND & GRAVEL BROW 2 87		
	Screen Y Open Hole From _____ ft. to _____ ft. Make JOHNSON Type L Diameter Slot Length Set Fitting 12 100 25 62 ft. to 87 ft	
	Static Water Level 30 ft. from Land surface Date 1981/06/23	
	PUMPING LEVEL (below land surface) 41.75 ft. after 1 hrs. pumping 1000 g.p.m.	
	Well Head Completion Pitless adapter mfr _____ Model _____ Casing Protection <input checked="" type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade(Environmental Wells and Borings ONLY)	
	Grouting Information Well grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Material From To (ft.) Amount(yds/bags) G 0 60	
	Nearest Known Source of Contamination ft. direction type Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
	Pump <input checked="" type="checkbox"/> Not installed Date installed N Mfr name _____ Model _____ HP _____ Volts _____ Drop Pipe Length _____ ft. Capacity _____ g.p.m. Type _____	
	Any not in use and not sealed well(s) on property? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	Was a variance granted from the MDH for this Well? <input type="checkbox"/> Yes <input type="checkbox"/> No	
USGS Quad: Melrose Elevation 1220 Aquifer: QWTA Alt Id: 75-3210	Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. <u>73157</u> License Business Name <u>Traut Well</u> Name of Driller <u>GARY</u>	

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City of Melrose WHPP Part II - Appendix V

Unique No. 00486430 County Name Stearns	MINNESOTA DEPARTMENT OF HEALTH WELL AND BORING RECORD <i>Minnesota Statutes Chapter 1031</i>	Update Date 2002/01/16 Entry Date 1992/09/08																																													
Township Name Township Range Dir Section Subsection 125 33 W 11 ACACBB	Well Depth 105 ft. Depth Completed 105 ft. Date Well Completed 1991/04/28																																														
Well Name MELROSE 7 Contact's Name MELROSE 7 MELROSE MN	Drilling Method Non-specified Rotary Drilling Fluid Bentonite Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No From ft. to ft.																																														
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>GEOLOGICAL MATERIAL</th> <th>COLOR</th> <th>HARDNESS</th> <th>FROM</th> <th>TO</th> </tr> </thead> <tbody> <tr> <td>SANDY CLAY</td> <td>BROW</td> <td></td> <td>0</td> <td>29</td> </tr> <tr> <td>SAND & GRAVEL</td> <td>BROW</td> <td></td> <td>29</td> <td>46</td> </tr> <tr> <td>SAND & GRAVEL</td> <td>GRAY</td> <td></td> <td>46</td> <td>51</td> </tr> <tr> <td>SANDY CLAY</td> <td>GRAY</td> <td></td> <td>51</td> <td>52</td> </tr> <tr> <td>SAND & GRAVEL</td> <td>GRAY</td> <td></td> <td>52</td> <td>82</td> </tr> <tr> <td>SANDY CLAY</td> <td>GRAY</td> <td></td> <td>82</td> <td>83</td> </tr> <tr> <td>SAND & GRAVEL</td> <td>GRAY</td> <td></td> <td>83</td> <td>105</td> </tr> <tr> <td>MARL? DECOMPOSED</td> <td>DK. GR</td> <td>HARD</td> <td>105</td> <td>105</td> </tr> </tbody> </table>	GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	SANDY CLAY	BROW		0	29	SAND & GRAVEL	BROW		29	46	SAND & GRAVEL	GRAY		46	51	SANDY CLAY	GRAY		51	52	SAND & GRAVEL	GRAY		52	82	SANDY CLAY	GRAY		82	83	SAND & GRAVEL	GRAY		83	105	MARL? DECOMPOSED	DK. GR	HARD	105	105	Use Community Supply (municipal) Casing Drive Shoe? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N Hole Diameter Casing Diameter 16 in. to 83 ft. Weight(lbs/ft) Screen Y Open Hole From ft. to ft. Make JOHNSON Type L Diameter Slot Length Set Fitting 16 125 22 83 ft. to 105 ft.	
GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO																																											
SANDY CLAY	BROW		0	29																																											
SAND & GRAVEL	BROW		29	46																																											
SAND & GRAVEL	GRAY		46	51																																											
SANDY CLAY	GRAY		51	52																																											
SAND & GRAVEL	GRAY		52	82																																											
SANDY CLAY	GRAY		82	83																																											
SAND & GRAVEL	GRAY		83	105																																											
MARL? DECOMPOSED	DK. GR	HARD	105	105																																											
	Static Water Level 33 ft. from Land surface Date 1991/04/26 PUMPING LEVEL (below land surface) 90 ft. after 1 hrs. pumping 1000 g.p.m.																																														
	Well Head Completion Pitless adapter mfr Model Casing Protection <input checked="" type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade(Environmental Wells and Borings ONLY)																																														
	Grouting Information Well grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Material From To (ft.) Amount(yds/bags) G 0 58																																														
	Nearest Known Source of Contamination 340 ft. direction N type O Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																																														
	Pump <input type="checkbox"/> Not Installed Date Installed Y Mfr name AM-TURBINE Model 12-H-150 HP 150 Volts 460 Drop Pipe Length 80 ft. Capacity E+03 g.p.m. Type T																																														
	Any not in use and not sealed well(s) on property? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Was a variance granted from the MDH for this Well? <input type="checkbox"/> Yes <input type="checkbox"/> No																																														
USGS Quad: Melrose Elevation 1225 Aquifer: QBUA Alt Id: 75-3210	Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71536 License Business Name Traut M.j. Well Co. Name of Driller JEFF & KURT																																														

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City of Melrose WHPP Part II - Appendix V

Unique No. 608438	MINNESOTA DEPARTMENT OF HEALTH WELL AND BORING RECORD <i>Minnesota Statutes Chapter 1031</i>	Update Date 2001/11/29																																								
County Name Stearns		Entry Date 1999/01/25																																								
Township Name Township Range Dir Section Subsection 126 33 W 2 CAD	Well Depth 100 ft. Depth Completed 100 ft. Date Well Completed 1998/07/31																																									
Well Name MELROSE #8	Drilling Method Cable Tool																																									
Well Owner's Name CITY OF MELROSE CITY WELL FIELD MELROSE MN	Drilling Fluid Other	Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No From ft. to ft.																																								
Contact's Name PO BOX 216 MELROSE MN 56352	Use Community Supply (municipal)																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>GEOLOGICAL MATERIAL</th> <th>COLOR</th> <th>HARDNESS</th> <th>FROM</th> <th>TO</th> </tr> </thead> <tbody> <tr> <td>TOPSOIL</td> <td></td> <td></td> <td>0</td> <td>5</td> </tr> <tr> <td>DIRTY SAND</td> <td>BROW</td> <td></td> <td>5</td> <td>15</td> </tr> <tr> <td>SAND W/LENSES OF CLAY</td> <td>BROW</td> <td></td> <td>15</td> <td>25</td> </tr> <tr> <td>GRAVEL & ROCK</td> <td>VARIE</td> <td></td> <td>25</td> <td>40</td> </tr> <tr> <td>DIRTY SAND-FINE</td> <td>GRAY</td> <td></td> <td>40</td> <td>65</td> </tr> <tr> <td>SAND & ROCK</td> <td>GRAY</td> <td></td> <td>65</td> <td>75</td> </tr> <tr> <td>SAND</td> <td>GRAY</td> <td></td> <td>75</td> <td>100</td> </tr> </tbody> </table>	GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	TOPSOIL			0	5	DIRTY SAND	BROW		5	15	SAND W/LENSES OF CLAY	BROW		15	25	GRAVEL & ROCK	VARIE		25	40	DIRTY SAND-FINE	GRAY		40	65	SAND & ROCK	GRAY		65	75	SAND	GRAY		75	100	Casing Drive Shoe? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> N	Hole Diameter in. to 100 ft.
	GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO																																					
	TOPSOIL			0	5																																					
	DIRTY SAND	BROW		5	15																																					
	SAND W/LENSES OF CLAY	BROW		15	25																																					
	GRAVEL & ROCK	VARIE		25	40																																					
DIRTY SAND-FINE	GRAY		40	65																																						
SAND & ROCK	GRAY		65	75																																						
SAND	GRAY		75	100																																						
	Casing Diameter 24 in. to 75 ft. Weight(lbs/ft) 94.62																																									
	16 in. to 75 ft. 62.58																																									
	Screen Y	Open Hole From ft. to ft.																																								
	Make JOHNSON	Type S																																								
	Diameter Slot 16 Length 120 Set 25 Fitting 75																																									
	Static Water Level ft. from	Date																																								
	PUMPING LEVEL (below land surface) 12 ft. after 24 hrs. pumping 1000 g.p.m.																																									
	Well Head Completion Pitless adapter mfr Model Casing Protection <input checked="" type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade(Environmental Wells and Borings ONLY)																																									
	Grouting Information Well grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Material From To (ft.) Amount(yds/bags) G 0 65 3 Y																																									
	Nearest Known Source of Contamination ft. direction type Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																																									
	Pump <input checked="" type="checkbox"/> Not Installed Date Installed N Mfr name Model HP Volts Drop Pipe Length ft. Capacity g.p.m. Type																																									
	Any not in use and not sealed well(s) on property? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																																									
	Was a variance granted from the MDH for this Well? <input type="checkbox"/> Yes <input type="checkbox"/> No																																									
USGS Quad: Elevation Aquifer: Alt Id: 75-3210	Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 91686 License Business Name <u>L.t.p. Enterprises, Inc.</u> Name of Driller <u>LTP ENTRPS.</u>																																									

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City of Melrose WHPP Part II - Appendix V

Unique No. 608424	MINNESOTA DEPARTMENT OF HEALTH WELL AND BORING RECORD <i>Minnesota Statutes Chapter 1031</i>	Update Date 2001/11/29
County Name Stearns		Entry Date 1999/01/27
Township Name Township Range Dir Section Subsection 125 33 W 2 CAD	Well Depth 85 ft. Depth Completed 85 ft. Date Well Completed 1998/07/31	
Well Name MELROSE #9	Drilling Method Cable Tool	
Well Owner's Name CITY OF MELROSE CITY WELL FIELD MELROSE MN 56352	Drilling Fluid Other	Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No From ft. to ft.
Contact's Name PO BOX 216 MELROSE MN 56352	Use Community Supply (municipal)	
GEOLOGICAL MATERIAL COLOR HARDNESS FROM TO	Casing Drive Shoe? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> N	Hole Diameter in. to 85 ft
TOP SOIL 0 5	Casing Diameter 24 in. to 67 ft Weight(lbs/ft) 94.62	
SANDY CLAY BROW 5 12	16 in. to 67 ft 62.58	
GRAVEL & ROCK VARIE 12 26		
FINE SAND GRAY 26 67		
SAND GRAY 67 85	Screen Y	Open Hole From ft. to ft.
	Make JOHNSON Type S	
	Diameter Slot Length Set Fitting	
	16 70 18 67 ft. to 85 ft	
	Static Water Level ft. from	Date
	PUMPING LEVEL (below land surface)	
	24.87 ft. after 26 hrs. pumping 1000 g.p.m.	
	Well Head Completion	
	Pitless adapter mfr MONITOR Model 9PS1618WBW	
	Casing Protection <input checked="" type="checkbox"/> 12 in. above grade	
	<input type="checkbox"/> At-grade(Environmental Wells and Borings ONLY)	
	Grouting Information Well grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
	Material From To (ft.) Amount(yds/bags)	
	G 10 57 2.5 Y	
	Nearest Known Source of Contamination	
	ft. direction type	
	Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
	Pump <input checked="" type="checkbox"/> Not Installed Date Installed N	
	Mfr name	
	Model HP Volts	
	Drop Pipe Length ft. Capacity g.p.m.	
	Type	
	Any not in use and not sealed well(s) on property? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	Was a variance granted from the MDH for this Well? <input type="checkbox"/> Yes <input type="checkbox"/> No	
USGS Quad: Elevation	Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 91686	
Aquifer: Alt Id: 75-3210	License Business Name L.t.p. Enterprises, Inc.	
	Name of Driller LTP ENTERP.	

Report Copy

RESOLUTION ESTABLISHING LAWN WATERING RESTRICTIONS

WHEREAS, the Melrose Public Utilities municipal water supply system may reach critical levels due to summer peak usage; and

WHEREAS, a possibility of water shortage is made more critical by hot and dry weather conditions; and

WHEREAS, lack of adequate water pressure could cause serious fire protection problems; and

WHEREAS, it has been determined that a watering ban must be implemented in order to assure the safety and well being of the residents of the City of Melrose.

NOW, THEREFORE, BE IT RESOLVED, that the Utilities Commission of the City of Melrose Public Utilities, hereby establishes restrictions for all residential, commercial and industrial users of the Utilities' water system:

1. The Public Works Director shall be given the authority to implement emergency restrictions to restrict water use during emergency periods. The Public Works Director shall notify municipal system users of a watering ban by publishing notice in the Melrose Beacon and on MEL-TV 3.
2. Residents with an odd house number shall water lawns or wash cars when necessary only on odd-numbered calendar days, and those with even-numbered addresses shall water lawns or wash cars only on even-numbered days. Lawns shall not be watered between the hours of 10:00 a.m. and 6:00 p.m.
3. An exception may be granted for recently established lawns. Those lawns may be watered daily for up to one month after installation, but only during the hours listed above.
4. In extreme emergency cases, the Public Works Director shall have the authority to issue a total watering ban until such time that the emergency situation ceases to exist.

City of Melrose WHPP Part II - Appendix V

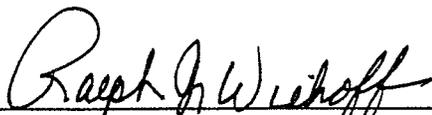
5. The penalty for violating the Utilities' watering ban shall be a warning for the first day of violation, a \$25 per day fine for the second violation, and a \$50 per day fine for the third violation.

Adopted by the Public Utilities Commission of the City of Melrose this 12th day of June, 2000.



LYLE OLMSCHIED - COMMISSION CHAIRPERSON

ATTEST:



RALPH WIEHOFF - COMMISSION SECRETARY

DEPARTMENT CALL LIST

After Hours Utility Outages/Problems 320-256-2244

After Hours Street Problems 320-256-2244

John Harren	Public Works Director	Office: 320-256-1961 Home: 320-836-2982 Cell: 320-250-3929 Email: jharren@cityofmelrose.com
-------------	-----------------------	--

Water/Wastewater Department

On Call Pager

877-802-2970

Scott Gilbertson	Water/Wastewater Supervisor	Office: 320-256-1950 Home: 320-256-4994 Cell: 320-290-0568 Email: scottg@cityofmelrose.com
Dave Decker	Water/Wastewater Operator	Home: 320-256-7505
Glenn Bauer	Water/Wastewater Operator	Home: 320-256-7648
Tim Vogel	Water/Wastewater Operator	Home: 320-256-3819
Roger Stoermann	Water/Wastewater Operator	Home: 320-256-7262

Streets/Parks Department

Mark Maus	Streets/Parks Supervisor	Office: 320-256-1953 Home: 320-256-7162 Cell: 320-333-0199 Email: mmaus@cityofmelrose.com
Gary Middendorf	Streets/Parks Worker	Home: 320-256-7746
Roman Bertram	Streets/Parks Worker	Home: 320-256-3344
Bill Rieland	Streets/Parks Worker	Home: 320-256-3129

Electric Department

On Call Pager

877-802-2532

On Call Cell Phone

320-290-2244

Dale Lyon	Electrical Supervisor	Office: 320-256-1951 Home: 320-256-3027 Cell: 320-293-0626 Email: dlyon@cityofmelrose.com
Russ Braegelmann	Line Worker	Home: 320-256-3738
Steve Scholz	Line Worker	Home: 320-256-7450
Pat Lomax	Line Worker	Home: 320-836-2341
Sauk Centre Public Utilities		Office: 320-352-2201

http://paging.acswireless.com/web_sendmsg.html - to send a text message to the pagers

PUBLIC WORKS DIRECTOR

John Harren 256-1961 (work)
320-250-3929 (cell)
320-836-2982 (home)

POWER OUTAGES/UTILITY OR STREET PROBLEMS – call 256-4278 during business hours (8:00 a.m. – 5:00 p.m. Monday-Friday) or **256-2244** after hours and weekends

ELECTRIC DEPARTMENT

Dale Lyon, Supervisor 256-1951 (work)
320-293-0626 (cell)
256-3027 (home)

WATER/WASTEWATER DEPARTMENT

Scott Gilbertson, Supervisor 256-1950 (work)
320-290-0568 (cell)
256-4994 (home)

STREETS/PARKS DEPARTMENT

Mark Maus, Supervisor 256-1953 (work)
320-333-0199 (cell)
256-7162 (home)

PUBLIC WORKS SAFETY COORDINATOR

Don Grant (MMUA) 320-249-5899 (cell)
1-800-422-0119 (main office)

POLICE DEPARTMENT

John Jensen, Chief 256-7211 (work)
320-333-7212 (cell)
256-7210 (home)

ADMINISTRATIVE OFFICES

Brian Beeman..... 256-4278 (work)
City Administrator

FIRE DEPARTMENT

Jeremy Kraemer, Chief 256-7422 (work)
320-761-1187 (cell)
256-7974 (home)

AMBULANCE DEPARTMENT

Jen Tschida, Coordinator 256-4389 (home)

BUILDING INSPECTOR

Dan Marthaler 320-249-7533 (cell)

Brian, JJ, John, Scott, Dale, Mark, Jen, Jeremy, Dan M. – laminate final copy

WATER SERVICE CHARGE MONTHLY (MINIMUM)

Attachment #5

5/8" - 3/4" Meter	\$7.75
1" Meter	10.15
1 1/4" Meter	11.05
1 1/2" Meter	16.15
2" Meter	20.65
2" Compound Meter	38.02
3" Meter	41.65
3" Compound Meter	79.30
4" Meter	65.65
4" Compound Meter	114.31
6" Meter	125.65

COMMODITY OUTPUT CHARGE MONTHLY

\$7.95 per 1,000 cubic feet

MONTHLY SERVICE CHARGE FOR WATER

<u>RL</u>	<u>CL</u>	<u>SIZE OF METER</u>	<u>AMOUNT</u>
30	40	5/8" - 3/4"	\$ 5.10
31	41	1"	7.50
32	42	1 1/4"	8.40
33	43	1 1/2"	13.50
34	44	2"	18.00
35	45	3"	39.00
36	46	4"	63.00
	47	6"	123.00
38	48	2" compound	35.37
	49	3" compound	76.65
	71	4" compound	111.66

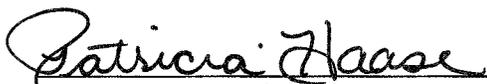
UTILITIES COMMISSION ADOPTED: 12/15/05²

City of Melrose WHPP Part II - Appendix V

CITY CLERK'S CERTIFICATE

I, Patricia Haase, the duly appointed, qualified and acting City Clerk of the City of Melrose, Minnesota, and keeper of the records, certify that the attached excerpt of the minutes of the Utilities Commission October 9, 2006 Regular Meeting has been compared by me and is a true and correct copy of said Resolution as the same as on file and of record in my office.

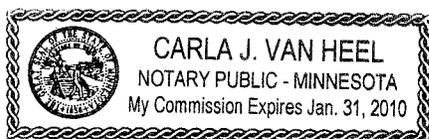
IN WITNESS WHEREOF, I have set my hand and affixed the official seal of the City of Melrose this 12th day of October, 2006.

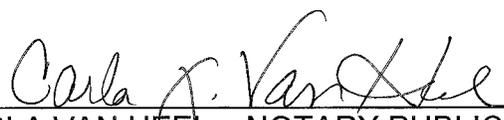


PATRICIA HAASE
CITY CLERK

(S E A L)

Sworn to before me this 12th day of October, 2006 at the City of Melrose, Minnesota.





CARLA VAN HEEL – NOTARY PUBLIC

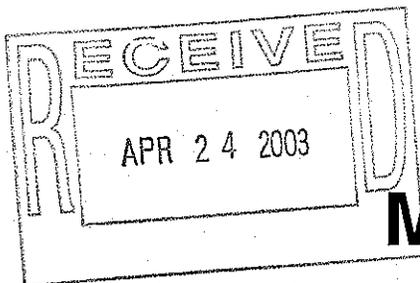
City of Melrose WHPP Part II - Appendix V

- d. Public Works Director John Harren reported that Minnesota Statute 103G.291 requires public water suppliers serving more than 1,000 people to have a Water Emergency and Conservation Plan approved by the DNR. The plan consists of:
- Water Supply System Description and Evaluation
 - Analysis of Water Demand
 - Treatment and Storage Capacity
 - Water Resources
 - Demand Projections
 - Resource Sustainability
 - Capital Improvement Plan
 - Emergency Response Procedures
 - Emergency Telephone List
 - Current Water Sources and Service Area
 - Procedure for Augmenting Water Supplies
 - Triggers for Allocation and Demand Reduction Action
 - Enforcement
 - Water Conservation Plan
 - Conservation Goals
 - Water Conservation Program

Director Harren noted that Water/Wastewater Supervisor Gilbertson had compiled the necessary information for this plan. Information compiled indicated that the average residential Gallons Per Capita Demand (GPCD) use for the last five years for the City of Melrose was 78; the recommended GPCD should be no more than 75. Therefore, it is recommended to increase residential water rates as well as provide public education to encourage water conservation. A copy of the entire Water Emergency and Conservation Plan is on file at the City Offices. The Commission expressed support of plans to assist in the conservation of water by residential users, as well as all City of Melrose water consumers.

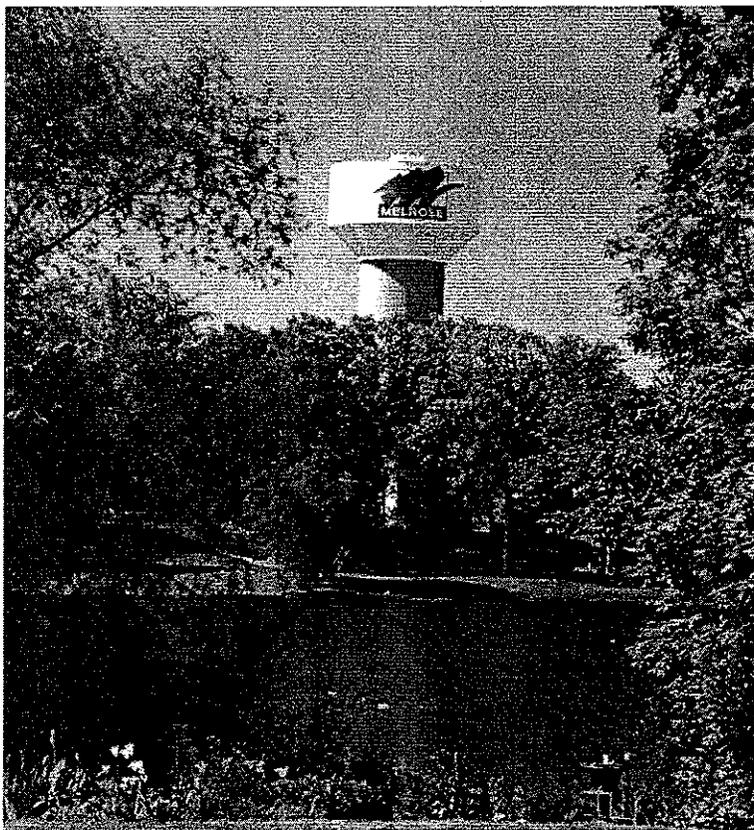
A motion was made by Mr. Budde, seconded by Mr. Wiehoff and unanimously carried to adopt the Water Emergency and Conservation Plan as submitted. This information is to be provided to the Minnesota Department of Natural Resources (DNR) by no later than October 15.

DRAFT 4/22/03



City of
Melrose, Minnesota

WELLHEAD PROTECTION PLAN
Part II



April 2003

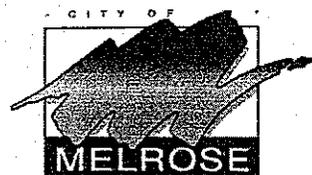


TABLE OF CONTENTS

		<u>Page Number</u>
ABBREVIATIONS		3
PUBLIC WATER SUPPLY PROFILE		4-5
DOCUMENTATION LIST		6
EXECUTIVE SUMMARY		7-9
CHAPTER 1 -	Data Elements; Assessment	10-16
CHAPTER 2 -	Impact of Changes on Public Water Supply Well	17-20
CHAPTER 3 -	Issues, Problems and Opportunities	21-23
CHAPTER 4 -	Wellhead Protection Goals	24
CHAPTER 5 -	Objectives and Plans of Action	25-39
CHAPTER 6 -	Evaluation Program	40
CHAPTER 7 -	Alternative Water Supply; Contingency Strategy	41
Exhibit	A Part I – Delineation of WHPA and Vulnerability Assessments	
Exhibit	B WHP Meeting Notices/Agendas and Meeting Minutes	
Exhibit	C Precipitation Data	
Exhibit	D Land Use in the Melrose DWSMA	
Exhibit	E City of Melrose Comprehensive Plan Land Use, Vacant Land, and Growth Areas	
Exhibit	F City of Melrose Conservation and Emergency Management Plan	
Exhibit	G Nitrate Sampling – Creek in WHPA	
Exhibit	H 2000 & 2001 City of Melrose Water Quality Reports	
Exhibit	I Department of Agriculture 2001 Assessment of Nitrogen Sources: Melrose Nitrate Study Area	
Exhibit	J Old City Dump Information	
Exhibit	K 2000 DNR Water Appropriations Permit Information	

Abbreviations

BMP	Best Management Practice
CITY	City of Melrose
DWSMA	Drinking Water Supply Management Area
FSA	Farm Service Agency
GPS	Global Positioning System
LGU	Local Governmental Unit
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MnDNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
MRWA	Minnesota Rural Water Association
NRCS	Natural Resources Conservation Service
PCSI	Potential Contaminant Source Inventory
SCES	Stearns County Environmental Services
SWCD	Soil and Water Conservation District
WHP	Wellhead Protection
WHPA	Wellhead Protection Area
WHP Plan	Wellhead Protection Plan
EQIP	Environmental Quality Incentive Program
GIS	Geographic Information System
USDA	United States Department of Agriculture
CRP	Conservation Reserve Program
MCL	Maximum Contaminant Level
mg/L	Milligrams per Liter
ppm	Parts per Million
ppb	Parts per Billion
SRWD	Sauk River Watershed District
ug/L	Micrograms per Liter

WATER SUPPLY PROFILE

1. Public Water Supply

City of Melrose
225 E First St N
PO Box 216
Melrose Minnesota 56352-0216
Telephone: 320-256-4278
Fax: 320-256-7766

2. Wellhead Protection Manager

Tracy Ekola, Public Works Director
Scott Gilbertson, Water Supervisor
225 E First St N, PO Box 216
Melrose Minnesota 56352-0216
Telephone: 320-256-4278
Fax: 320-256-7766
Email: tekola@cityofmelrose.com
scottg@meltel.net

3. Technical Assistance

Dave Neiman, Resource Specialist
Minnesota Rural Water Association
Rt 2, Box 29
Elbow Lake MN 56531
Telephone: 218-820-0595
Fax: 218-685-5272
Email: daven@brainerd.net

4. General Information

Unique Well Numbers: 215113, 180122, 486430, 608438, 608424
Population Served: 3091, 2000 US Census
Metered Water Connections: 976
Melrose Township
Grove Township
Stearns County

5. **Wellhead Protection Team**

Tracy Ekola	Public Works Director
Scott Gilbertson	Water Supervisor
Karen Thostenson	Assistant City Administrator
Sharon Meyer	Local Farmer
Roger Meyer	Local Farmer
Marvin Thielen	Local Farmer
Judy Thielen	Local Farmer
Gerald Sonnen	Local Farmer
Aaron Meyer	Stearns County SWCD
Susan McGuire	Stearns County Env. Health
Julie Klocker	Sauk River Watershed District
Wally Sand	Grove Township
Richard Thull	Grove Township
Loren Niehoff	Grove Township
Don Salzmann	Former Melrose Public Works Director
Bernard Wiebolt	Grove Township
Ervin Mayers	Contractor/Gravel Pit Operator
Rodney Atkinson	Atkinson Well & Pump
Steve Holste	MNDOT
Dan Lais	MN DNR
Dave Neiman	MRWA
Mike Howe	MDH

6. **Minnesota Department of Health Contact**

Mike Howe
Source Water Protection Planner
Minnesota Department of Health
3400 North First Street, Suite 305
St Cloud MN 56303
Telephone: (320) 255-4216
Fax: (320) 255-4264
Email: mike.howe@health.state.mn.us

DOCUMENTATION LIST

<u>STEP</u>	<u>DATE PERFORMED</u>
Scoping Meeting II Held: (4720.5349, subp. 1)	January 31, 2001
Scoping Decision Notice Received: (4720.5340, subp. 2)	March 12, 2001
Remaining Portion of Plan Submitted to Local Units of Government (LGU's): (4720.5350, subp. 1 & 2)	April 24, 2003
Review Received and Considered From Local Units of Government: (4720.5350, subp. 2 & 3)	June 26, 2003
Public Hearing Conducted: (4720.5350, subp.4)	June 26, 2003
Remaining Portion WHP Plan Submitted: (4720.5360, subp. 1)	July 3, 2003
Approved Review Notice Received:	

EXECUTIVE SUMMARY

The City of Melrose operates five wells within the Wellhead Protection Areas (WHPAs). All of these wells are located outside the City limits. These wells supply the entire source of groundwater for the City's water supply system. Water usage for industrial purposes (Jennie-O Turkey Store and Melrose Dairy Proteins) account for 82%, commercial uses account for 4%, and residential uses account for approximately 14% of the total water usage.

The City, as well as the area's agricultural economy, depends on a quality water supply source for the large industrial uses.

The DWSMA covers approximately 1980 acres. The portion of the Drinking Water Source Management Areas (DWSMAs) within the City is approximately 230 acres or 12% of the total area of the DWSMA, whereas, the portion of the DWSMA in Grove Township covers approximately 1750 acres or 88% of the total area.

PART I of the WHP Plan contains the Melrose WHPA Delineation and Vulnerability Assessment (Exhibit A). The map on Page 9 shows the WHPAs and DWSMAs in the Melrose area. The WHPAs include all areas where water can move from the ground surface to a public drinking water supply within ten years.

The groundwater flow was determined using modeling completed by the Minnesota Department of Health (MDH) and modified using knowledge of local geologic conditions. The DWSMAs are divided into two types. The groundwater DWSMA represents areas where rain falling on the ground can directly enter the groundwater and travel to a public water supply well. The creek DWSMA represents areas where rain falling on the ground can first enter the creek and possibly travel to City wells by way of the creek. These portions of the DWSMA are distinguished from each other because their management strategies may differ. Continued monitoring of the creek water quality may show that it has low nitrates relative to the concentration in Well #5 throughout much of the year. In this case, the creek is most likely not contributing nitrates (or water) to the nearby wells and the creek portion of the DWSMA can be dropped.

The DWSMAs are *vulnerable* to contamination. There are few if any barriers to the vertical movement of water that could prevent contaminants released on the ground from reaching the water table. Of particular concern are the gravel pits just south of City Wells #8 and #9. The proximity of the pits and the coarse materials mean that any materials spilled in this area will likely reach the wells within a few days.

City of Melrose WHPP Part II - Appendix V

PART II of the WHP Plan includes an assessment of the data elements, impact of changes on the public water supply wells, identification of problems and opportunities in the WHPA, goals of the WHP Team, plan of action, evaluation of the plan and emergency/contingency plan. Chapters 1 through 3 provide the assessment of existing conditions in the WHPA and the impact of changes that may occur in the WHPA. Chapter 4 and 5 discuss ways to protect our water supply (goal statements and plan of action). Chapter 6 provides a means of evaluating the implementation and effectiveness of this WHP Plan. Finally, Chapter 7 references the City's contingency/emergency plan in case of a man-made or natural disaster that would impact the City's water supply.

This Plan was developed by the City of Melrose in cooperation with the WHP Team members and cooperating state and local government units through a series of WHP meetings. Meeting agendas and notices are provided in Exhibit B.

The greatest influence of the WHP Team is through education of the public and residents that live in the WHPA. An educated public will recognize the importance of protecting both the City's and the rural residences water supply. Further controls will augment the efforts, but are difficult to enforce due to the WHPA being located outside of the City's jurisdiction.



Figure 1 Melrose City WHPAs and DWSMAs

0.4 0 0.4 0.8 Miles

Scale 1:24,000 10 year travel time



- DWSMA Areas
- ▭ Groundwater DWSM
- ▭ Creek DWSMA
- City Wells
- WHPA Areas
- ▭ Gravel Pit
- ▭ Creek Drainage
- ▭ Channel Aquifer
- ▭ Uplands
- ▭ Emergency Area
- 1 year travel time

II. ASSESSMENT OF DATA ELEMENTS

A. Use of the Wells

The City has five wells located 1/3 mile southeast of Melrose. Well #4 was installed in 1967 and is 128' deep; Well #5 was installed in 1981 and is 87' deep; and Well #7 was installed in 1991 and is 105' deep. In 1998, Wells #8 and #9 were installed and are 100' and 85' deep respectively. The five wells draw water from the Quaternary Water Table aquifer and the Pleistocene Undifferentiated aquifer. The total pumping capacity is 4900 gallons per minute, which equates to 7,056,000 gallons per day. Actual average pumping rate is 1700 gpm and varies from 1,500,000 gallons per day to 3,000,000 gallons per day. Each well house contains the equipment necessary to feed the various chemicals into the water to insure our customers that the water they are drinking is safe and of good quality. Chlorine, fluoride, and sodium silicate are the chemicals added. Chlorine is added to insure that no bacteria are present in the drinking water. Fluoride is added to promote strong teeth. Sodium silicate is added to sequester iron and manganese. Once the water is treated and leaves the well field, it is pumped into the distribution system.

Industrial water use is 82%, residential is 14% and commercial is 4% of the total quantity distributed.

B. Wellhead Protection Area Delineation Criteria

The following criteria were used for delineating the WHPA and are described in the Part I Delineation of Wellhead Protection Areas and Vulnerability Assessments and are on file with the MDH.

1. Time of Travel
2. Flow Boundaries
3. Daily Volume
4. Ground Water Flow Field
5. Aquifer Transmissivity

C. Quality and Quantity of Water Supplying the Public Water Supply Well

The City's current water supply provides both adequate quantity and quality. Future water use for the City is expected to stay at current levels or decrease. Industries in the City are continuing to recycle liquid streams and reuse water, therefore, causing a potential for declining water use in the City. Approximately 10 to 20 new homes are built annually in the City. However, increase in residential water use is masked by the large volume of industrial use.

Esthetically the water quality could be improved by water treatment to remove hardness, iron and manganese. However, due to the high cost of water treatment and the large volume of water for industrial use, water treatment is not desired at this time.

D. The Land and Groundwater Uses in the Drinking Water Supply Management Area.

Land is used in the DWSMA for agricultural, urban residential and commercial, rural residential, grassland and mining purposes.

Municipal and private wells extend into the unprotected aquifer. Private wells are used for drinking water and irrigation purposes. A map of the private wells within the DWSMA is on file at the City Administration Offices. Municipal wells are used for drinking water and industrial purposes (turkey processing and cheese plant). Industrial purposes account for 82% of the water usage. Impacts from the land and groundwater uses in the DWSMA should have a direct affect on the management strategies, due to the vulnerability of the aquifer.

MDA completed an assessment of agriculture practices in the DWSMA. The report is provided in Exhibit I. According to the report there is strong evidence that producers are voluntarily adopting the educational materials and recommended nitrogen management strategies developed by the University of Minnesota. Due to excellent agreement with the U of M recommendations, the opportunities for improvements in nitrogen applications are very limited in the Melrose DWSMA. It appears most management practices currently used in the DWSMA should continue. MDA personnel indicated that best management practices were being followed at both the golf course and the sod farm.

The MPCA conducted a Phase 1 and Phase 2 Environmental Site Assessment on the old City Dump (closed 1970) located near the intersection of CR 173 and Riverview Road. The report was submitted to the City in February 2001. The reports are on file at the City Administration Offices. A Health Consultation Report regarding this site was prepared by the MDH. The MDH Health Consultation Report, provided in Exhibit J, summarizes the MPCA finds and provides recommendations. The study indicated that surface soil samples and soil samples below the waste dump had Diesel Range Organics and chrome levels above their respective Soil Reference and Soil Leaching Values. Groundwater samples did not have any tested contaminants at concentrations exceeding MDH Health Risk Limits, Health Based Values, EPA Maximum Contaminant Levels or Secondary Maximum Contaminant Levels. The MPCA has a guidance document available called Best Management Practices for Minnesota's Old Dumps. This document suggests various practices to manage risks of the dumpsite and is provided in Exhibit J. Also included in the Exhibit is correspondence to John Curry, MPCA Closed Landfill Unit, and follow up correspondence received from the MDH regarding the old City Dump site.

Fencing to eliminate site access to the north area of the old dump and additional signs to the entire dump area has been installed. Development of this area is unlikely since it is zoned A-40 according to Stearns County Environmental Services.

City of Melrose WHPP Part II - Appendix V

Based on this assessment and past water supply monitoring results, the closed dump does not reflect a significant risk to the water supply. Continued monitoring and best management practices will be continued to ensure risks are minimized.

The water supply is vulnerable to potential contaminants introduced via the nearby gravel pits.

CHAPTER TWO

**IMPACT OF CHANGES ON PUBLIC WATER SUPPLY WELL
(4720.5220)**

I. CHANGES IDENTIFIED IN:

- A. Physical Environment: Significant changes in the physical environment in or adjacent to the DWSMA are not expected. Minor changes could include irrigation of cropland in the DWSMA. Only 5% to 6% of agricultural land in the DWSMA, is irrigated. Significant increase in irrigated acreage is not expected. If irrigated land doubles or triples, the WHP team should discuss this issue further. Significant increases or change of use of the gravel mines is not expected.
- B. Land Use: There are no significant changes expected in the land use in the DWSMA. Only 5% of the land in the DWSMA is within City limits. Future development in the City limits within the DWSMA is limited due to limited vacant land. There is some potential for commercial expansion in the few vacant lots along County Road 173 and 335th Avenue within the City limits. The City of Melrose 1998 Comprehensive Plan Figure 4 – Ag/Vacant Land, Figure 6 – Land Use Plan, and Figure 9 – Growth Areas provide illustration of existing and potential future development in the DWSMA. Growth areas shown may not be indicative of actual or realistic development possibilities. The growth area south of Interstate 94 and east of County State Aid Highway 13 (just east of the City limits) represents potential annexation of already developed commercial properties. The growth area further to the east is currently agricultural land. Future development of this land is unlikely according to the landowner.

Zoning (for the portion of the DWSMA outside the city limits) is regulated jointly by the Stearns County Environmental Services and Grove Township. The majority of the DWSMA is (outside of the City) is zoned A-40 and a small portion is zoned A-80. Therefore, extensive development is not expected. There is some commercially zoned property located adjacent to the City along County Road 13. There is potential for the City to annex this commercial land and provide water and sewer services.

According to Grove Township officials and rural residents, agricultural land use is not expected to change in the DWSMA. Irrigation of cropland or change to less intensive agriculture such as Conservation Reserve Program (CRP) could be expected.

City of Melrose WHPP Part II - Appendix V

C. Surface Water: Changes to surface water (creek) are not expected since significant land use changes are not expected. Water quality in the creek will continue to be monitored for three years as part of the WHP Plan. Changes in agriculture practices (such as additional acreage enrollment in CRP) could have a positive impact on surface water quality).

test
wells
near
8 & 9

D. Groundwater: Changes in groundwater quality and quantity are not expected. The current water quality is good with the exception of nitrates in City Well #5. The City will continue to monitor the nitrate level of all City wells. There are numerous private wells in the DWSMA. These wells are identified on a map on file at the City. The City has no information regarding the water quality of these wells. At this time, the WHP Team has not identified if additional high capacity wells (such as irrigation or City wells) are expected to be drilled in the drinking water supply management area. Well studies on file at the City indicate that existing test wells near City Wells #8 & #9 may be acceptable as future wells for the City. However, due to the vulnerability of the existing well field, the City will likely conduct additional studies to identify other alternatives. WHP Team members have identified that irrigation in this area may be considered. Potential irrigation wells should be discussed with the WHP Team.

Issues related to other high capacity wells that may impact the City's DWSMA include a) the possibility that a new high capacity well may come on line (or an existing high capacity well may increase water use) in a location which will cause the boundary of the DWSMA to change; and b) that the use of the land following the construction of a new high capacity well may cause the introduction of contaminants which will impair the quality of the water that is in the aquifer from which Melrose draws its water supply. The intent of this statement is to request support from Minnesota DNR's Water Appropriations Permit Program to minimize the impact of high capacity wells upon the City's DWSMA. The owner's (proposers) of such high capacity wells should be held responsible to the Melrose Wellhead Protection Program. The wellhead protection management strategy will be to obtain a letter of recognition of the issue from the DNR Hydrologist that serves the Stearns County area.

A Nitrate Clinic was held at the Melrose Credit Union on June 8, 2001. The Stearns County Soil and Water Conservation District and the City of Melrose conducted the nitrate testing for the clinic. Thirteen water samples from Grove Township were tested with results for nitrate levels as follows: 0, 0.1, 10.4, 1.3, 0.1, 0, 0, 0, 0, 2.7, 0.2, 6.5, 0.2 ppm.

II. IMPACT OF CHANGES

- A. **Expected Changes in Water Use:** Significant changes in water use by the City are not expected. The industries in the City have previously performed water use audits for water conservation purposes. Large increases in industrial water use are not expected. Residential and commercial expansion within the City are not expected to have significant impact on water usage or require an increase in the MN DNR appropriations permit for the City. The WHP Team has not received other information at this time to indicate other significant changes.
- B. **Influence of Existing Water and Land Government Programs and Regulation:** The majority of land in the DWSMA is in Grove Township. Currently, the Township has some zoning authorities but relies mostly on Stearns County land use plan and zoning ordinance. Recognition of the sensitivity of the DWSMA will be requested of local land use officials. The influence of the County and Township land use planning and ordinances have the most potential for impact to the DWSMA. The City needs to request notification and work with Grove Township and County officials on land use applications.

The land within the City will have limited impact as it is almost "fully" developed. Additionally, the City is located in the creek DWSMA, which may only have a small impact on the subject aquifer.

The Melrose WHP Plan is recognized in the Stearns County Water Plan.

Stearns County Environmental Services has identified numerous individual sewage treatment systems (ISTS) in the DWSMA. Enforcement of the County's ISTS regulations within the DWSMA may positively impact the water quality. Currently, point of sale or addition of a bathroom or bedroom trigger an ISTS inspection by Stearns County Environmental Services. Nonconforming ISTS's are required to be upgraded.

CRP or related conservation programs of SWCD/NRCS could have positive impacts on the water quality.

The City has recently (2001) constructed a waste oil dumpsite near the east City limits to ensure and promote proper disposal of waste oil and keep it out of the City's storm sewer system. The City has also closed the old brush dump site (2000) that was located near Well #7. The City provides leaf and grass disposal through City-wide garbage service currently provided by Bueckers Sanitary. Brush and branches can be dropped off by City residents at a designated site (near the Public Works Garage). City staff chip the brush and branches and use the wood chips for City parks.

C. Administrative, Technical, and Financial Considerations

The City will budget for WHP Plan implementation and will assign implementation of WHP Plan Action Items to the Public Works Director and Water Department Supervisor. WHP Plan Action Items will be implemented by Team, City staff or cooperating agencies.

WHP Team will be maintained to assist in implementation of management strategies and for review and comment on implementation progress. The WHP Team will meet as necessary, but no less than once each year. Programs provided by local, state, and federal agencies will be utilized in a partnership to accomplish implementation of WHP Plan. The City will work to establish recognition of WHPA/DWSMA needs in other local government plans, policies, and rules.

CHAPTER THREE

ISSUES, PROBLEMS, AND OPPORTUNITIES (4720.5230)

I. LAND USE ISSUES, PROBLEMS, AND OPPORTUNITIES RELATED TO:

- A. The Aquifer: The aquifer used by the City public water supply wells is located in a buried sand channel deposit, which lacks protective clay layers resulting in a vulnerable setting.
- B. The Well Water: The well water shows some results of man-caused impacts to quality with nitrates present in Well #5. Surface water may have some influence to the wells by creek recharge to the groundwater. However, the significance (or volume) is not known at this time and is suspected to be low based on geologic and hydro-geologic information provided by the MDH.
- C. The Drinking Water Supply Management Area: The DWSMA is broken down into two areas as described in Part 1 Delineation of Wellhead Protection Areas and Vulnerability Assessments. The largest *land area* impact to the DWSMA is agriculture. Gravel mining is also a significant impact as it is located adjacent to the public water supply wells.

II. IDENTIFICATION OF:

- A. Problems and Opportunities Disclosed at Public Meetings and in Written Comment

A public informational meeting was held on April 26, 2001 at 7:30 PM at the Melrose City Center. Meeting minutes are provided in Exhibit B. The MDH and MN Rural Water Association presented an overview of the WHP Program and the roles of the Team members. Rich Soule of the MDH gave a presentation on the geology and hydrogeology of the area that affects the City's public water supply. The only comment during the meeting was regarding water levels in nearby residential "sand point wells". This comment is regarding the "appropriations" of water in the aquifer and is not related to the wellhead protection efforts. The City's DNR appropriations permit worksheets are provided in Exhibit K.

WHP Team meeting minutes provided extensive discussion of WHP issues and are also included in Exhibit B.

City of Melrose WHPP Part II - Appendix V

Problems and Opportunities summarized from WHP team meetings

Problems

- DWSMA is largely outside of City limits. Success of land management and control is contingent upon Grove Township and Stearns County Environmental Services cooperation to protect the Melrose WHPA.
- Source of nitrates in Well #5 is not known.
- Owners of ISTS in DWSMA may have little or no understanding if they have a conforming system. Stearns County Environmental Services only completes ISTS inspections upon point of sale or addition of bathroom or bedroom.
- Possible lack of understanding that the City public water supply is highly supportive of value added agricultural industry that provides 1000+ jobs for local population. Eighty-two percent (82%) of the water volume from City wells is used to support the agricultural industries.
- Commercial properties along CSAH 13 may have Class V injection wells (unknown at this time). City services are available upon annexation; however, Grove Township may not be willing to consider annexation due to loss of tax base.
- Old City Dump is upgradient to wells. No significant impact has been documented to the wells at this time based on extensive monitoring of the public water supply by the MDH. Phase II ESA indicates minimal contaminant potential based on groundwater and soil analysis.
- Gravel mining operation is located close to the public water supply wells.
- Surface water may have some influence to the wells by creek recharge to the groundwater. However, the significance (or volume) is not known at this time and is suspected to be low based on geologic and hydro-geologic information provided by the MDH.
- Request FSA establish Melrose DWSMA as high priority.

Opportunities

- Results of MDA Nutrient inputs shows landowners are doing a good job. Continuation of good BMPs will enhance WHP efforts.
- Participation of Stearns County Environmental Services and Stearns County Soil and Water Conservation District can help obtain recognition of DWSMA in County Water Plan.
- Opportunity to use programs of SWCD, NRCS and FSA exists for CRP priority areas, EQUIP grants, etc.
- Opportunity exists to encourage Stearns County Environmental Services to establish a well sealing cost-share program for high priority vulnerable DWSMAs.
- Stearns County and Grove Township can be encouraged to include DWSMA as special zoning overlay district the next time an ordinance is amended.
- Stearns County can notify the City of any development mining permit or other potential impacts in the City' WHPA.
- Opportunity to utilize Stearns County Environmental Services to inventory and evaluate ISTS located in DWSMA.

C. Data Elements

Part I Delineation of Wellhead Protection Areas and Vulnerability Assessments discuss the accuracy of the information used to delineate and assess the WHPA. Part I recommends the following information should be collected over the next 10 years to modify the next WHP Plan:

1. Approximately 10-20 local wells should be surveyed to a common datum and their water levels measured within the same one-week period.
2. A 72-hour pumping test should be completed at the City well field with continuous water level observation conducted at no less than three other wells.

Revisions will be made to the WHP Plan at 10-year intervals, as required by State Rule. The City will continue to collect samples of the creek water and test for nitrates over a 3-year period. With the assistance of the MDH staff, the City conducted an inventory of potential contaminant sources (PLSI) located in the DWSMA. PCSI maps are on file with the City's WHP records. Information gathered for the PCSI was used to develop WHP strategies.

D. Status and Adequacy of Official Controls, Plans and other Local, State, and Federal programs on Water Use and Land Use.

The DWSMA is largely outside the City limits. Success of land management and control is contingent upon Grove Township and Stearns County Environmental Services Cooperation to protect the Melrose WHPA. The Stearns County Water Plan recognizes the Melrose WHPA. Opportunity exists to influence groundwater quality by working with Grove Township and Stearns County on issues including ISTS upgrades, well sealing, and gravel mine management and reclamation. Annexation of commercial properties with potential Class V injection wells should also be discussed with Grove Township. Continued relationships with area farmers through the WHP Team is encouraged to maintain and recognize the use of BMPs in the WHPA. DWSMA needs to be recognized on a statewide basis as a high priority by local, state, and federal programs. Increased funding for programs, such as well sealing, CRP, and ISTS upgrades/compliance in WHPAs will have a positive impact on public water supply quality and cost of improvements.

CHAPTER SEVEN

**ALTERNATIVE WATER SUPPLY; CONTINGENCY STRATEGY.
(4720.5280)**

The City's DNR approved emergency/contingency plan is addressed in Chapter 7 of the June 1996 Comprehensive Water Plan and Management Plan for the Melrose Water System prepared by Progressive Consulting Engineers, Inc. A copy of the plan and the DNR approval letter is provided in Exhibit F.

List of Exhibits

REFERENCED DATA FOR PART II

- Exhibit A** Part I – Delineation of WHPA and Vulnerability Assessments
- Exhibit B** WHP Meeting Notices/Agendas and Meeting Minutes
- Exhibit C** Precipitation Data
- Exhibit D** Land Use in the Melrose DWSMA
- Exhibit E** City of Melrose Comprehensive Plan Land Use, Vacant Land, and Growth Areas
- Exhibit F** City of Melrose Conservation and Emergency Management Plan
- Exhibit G** Nitrate Sampling – Creek in WHPA
- Exhibit H** 2000 & 2001 City of Melrose Water Quality Reports
- Exhibit I** Department of Agriculture 2001 Assessment of Nitrogen Sources: Melrose Nitrate Study Area
- Exhibit J** Old City Dump Information
- Exhibit K** 2000 DNR Water Appropriations Permit Information

Part I – Delineation of WHPA and Vulnerability Assessments

City of Melrose WHPP Part II - Appendix V

Wellhead Protection Plan for the City of Melrose

Part I

Delineation of Wellhead Protection Areas and Vulnerability Assessments

Source Water Assessment

March, 2002

R.G. Soule
Minnesota Department of Health

Table of Contents

Source Water Assessment

Figure 1...WHPA/DWSMA

Hydrogeologic setting

Figure 2.....Conceptual Model

Criteria: Flow boundaries

Figure 3.....flow and aquifer

Figure 4...Cross sections

Method used to delineate

Figure 5.....Model Feature

Figure 6.....Model Results

Figure 7.....Uncertainty

City of Melrose WHPP Part II - Appendix V

Source Water Assessment

This report documents the delineation of the wellhead protection areas (WHPAs) and drinking water supply management areas (DWSMA) for the City of Melrose.

Status of the Source Water Protection Plan: The city initiated a wellhead protection plan on July 7, 1999. This plan is scheduled for completion by May 30, 2003. The delineation of the wellhead protection areas has been completed and approved as of April 21, 2001. The delineation was performed in accordance with rules for preparing and implementing wellhead protection measures for public water supply wells that were prepared by the Minnesota Department of Health (MR 4720.5100 to 4720.5580).

Source Water Protection Area: Figure 1 shows the boundaries of the WHPAs and DWSMA. The WHPAs were determined by using an analytic element modeling tool known as Split. This tool identified the 10 year time of travel of groundwater to the city wells. A surface water drainage component was added to the delineation to account for rapid overland flow and recharge of the aquifer. The DWSMA was determined by overlaying the boundaries of the WHPAs on an aerial photo base map.

Description of the Source Water: The City of Melrose obtains its drinking water supply from Wells Nos. 4, 5, 7, 8, and 9 (Unique numbers 215113, 180122, 486430, 608438, and 608424) that are completed in a sand and gravel aquifer which exhibits unconfined hydraulic conditions in the immediate vicinity of the well field. Within the area of the well field, the aquifer occurs from about the ground surface to a depth of about 130 feet. Well records indicate that groundwater occurs within 15 feet of the ground surface.

Aquifer Sensitivity: The local geology suggests that these wells are not protected by geologic materials such as a thick layer of clay. The aquifer is directly vulnerable to current land uses. The sensitivity of the aquifer may be evidenced by the low to moderate levels of nitrates that have been detected in the wells.

Well Construction Assessment: The well meets the construction standards of the State Well Code so the wells themselves are not considered a likely avenue for contamination of the aquifer.

Susceptibility of the Source Water to Contamination: The source water used by The city is susceptible to contamination because of the local geologic setting. The land uses around the wells and within the wellhead protection area may contribute contaminants which would present a health concern to the users of the public water supply.

Contaminants of Concern: Because of the vulnerable nature of the aquifer serving the well, any type of land use that may release drinking water contaminants regulated under the federal Safe Drinking Water Act are a potential concern, including but not limited to:

- disease organisms
- nitrates
- volatile organic compounds, and

City of Melrose WHPP Part II - Appendix V

synthetic organic compounds

Results of Monitoring Source Water: Water in the distribution system is regularly sampled and analyzed for contaminants regulated under the federal Safe Drinking Water Act. Generally, nitrates have been detected at about 2 to 5 p.m. in the water supply, but below the regulatory limit of 10 p.m. However, 14 p.m. nitrates were detected in well 5 on September 11, 1995. Levels have subsequently declined to below the drinking water standard and are closely monitored by the city. No other contaminants have been detected in the water supply. [^]**

* Not accurate - should say zero to 2 ppm.

** Additional information - Elevated nitrate levels are found only in well no. 5. Current well no. 5 nitrate levels are below 10 ppm. Well no. 5 is programmed only to run as a "lag" pump and will not operate unless another well is also pumping in parallel. The blended water supply system results in nitrate levels well below the regulatory level.

FIGURES

*Geology
Summary*

Hydrogeological Setting and City Water Supply

Analysis of geologic logs from wells in the area suggests that the city wells draw from glacial outwash consisting of sand, gravel and cobbles deposited in a channel eroded into clay till and granitic bed rock. South of the well field is an uplands where the coarse glacial sediments are overlain in many areas by thin deposits of clayey glacial till. The aquifer thickness varies between 50 and 120 feet thick depending on the proportion of sandy materials deposited and the elevation of the bedrock surface. The wells are 83 to 128 feet deep with well screens 17 to 28 feet long. Each well is capable of pumping approximately 1,000 gallons per minute.

Figure 2 shows the conceptual model for the groundwater flow in the vicinity of the city well fields. This is an idealized geologic cross section along the line of the general groundwater flow path from the southwest to the northeast. The figure depicts the aquifer as relatively thick in the area of the well fields but limited by glacial tills and the granitic bedrock some distance away for the well field. However, despite the limits of the aquifer it is sufficiently extensive to cover the area of interest for the groundwater modeling. Surface water drainage also contributes to the delineation. The clayey soils in the upland areas south of the well field (USDA 1985), suggest that there is overland flow down hill and rapid infiltration near the well fields. As a result, the wellhead protection delineation includes these upland recharge areas. The potential vulnerability of the aquifer to potential contaminants introduced via the local gravel pits is also shown. Although many of these pits appear to have been mined to the water table, substantial gravel is probably present at greater depths and may extend all the way to the portion of the aquifer where the city wells are screened. In addition, the geology of the upland area is very complex and there is likely "windows" in the clayey materials that allow for locally important recharge of the aquifer. Finally, the lack of vulnerability to the aquifer by the creek between the well field and the Sauk River is shown. This relatively shallow creek is likely an expression of the groundwater surface and does not interact strongly with the aquifer. In addition, the creek is generally lined with peat (and important exception is in the vicinity of Highway 94) which is a very effective barrier to contaminant movement, should it be present in the creek.

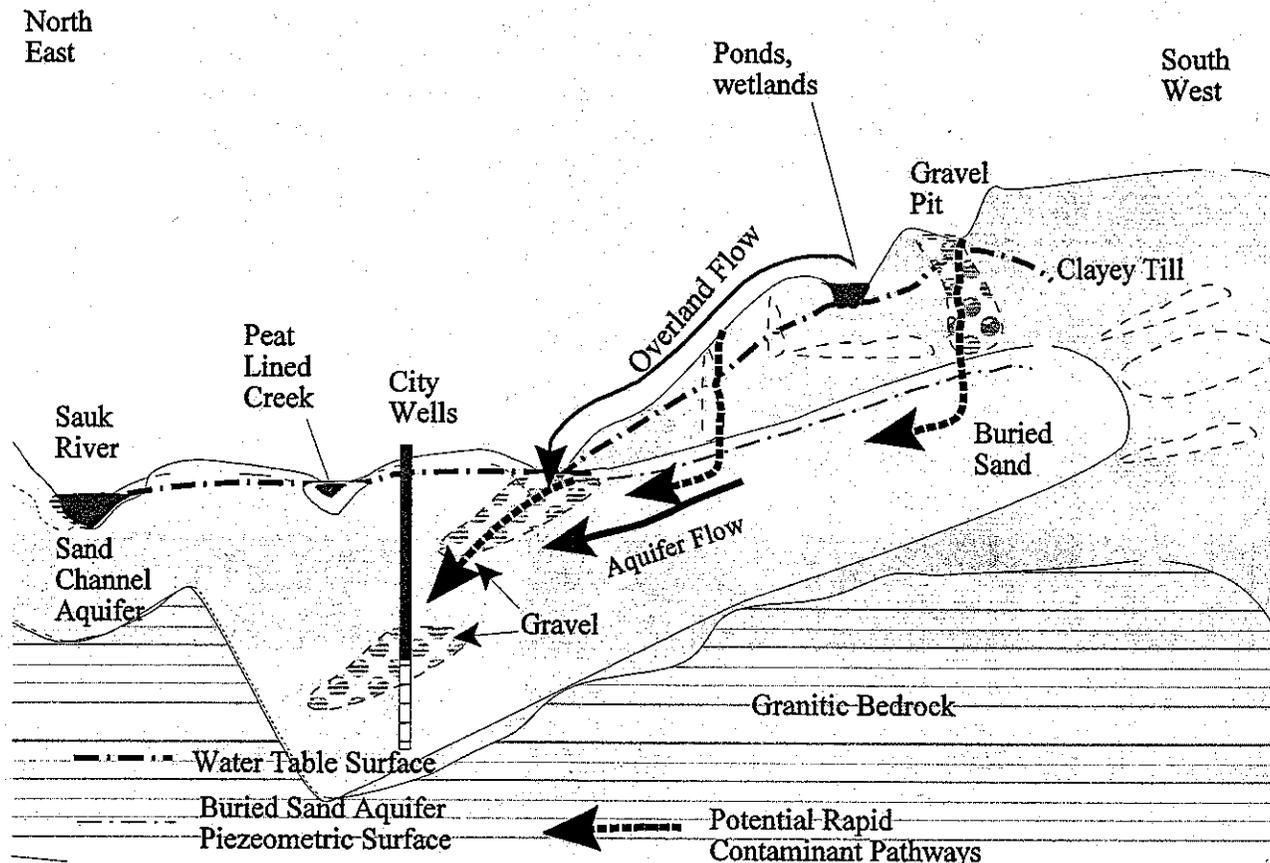


Figure 2 Hydrogeologic Conceptual Model Cross Section.

Criteria Used to Delineate the Wellhead Protection Area

The following discussion presents the values used to address the five criteria for delineating a WHPA which are specified in MR 4720:

Time of Travel - The City of Melrose has adopted a 10-year time of travel to characterize groundwater movement in the aquifers that supply their wells.

Flow boundaries – The locations of the important flow boundaries are shown on Figure 3. The flow boundaries for the aquifers include: 1) their physical limits, 2) adjacent drainages, including the Sauk River, 3) an up gradient head boundary determined by local water levels in wells, 4) Infiltration into the channel aquifer from rain fall, and 5) Other high-capacity wells have been identified in proximity to the municipal wells. Figure 4 shows geologic cross sections in the area

City of Melrose WHPP Part II - Appendix V

derived from gridding the sand contents described on local well logs. The locations of these cross sections can be found on Figure 2.

Ground-water flow

Daily volume of water pumped - City records were used to identify the maximum volume of water pumped annually by their system over the previous 5-year period. These totals reflect pumping only from Wells Nos. 4, 5, 7, 8, and 9. For the purposes of WHPA delineation, the maximum annual water use figure of 670,000,000 gallons was used. The resulting figure was then apportioned between the three wells in the following manner: Well No. 4 (~~25%~~), Well No. 5 (~~25%~~), Well No. 7 (~~7%~~), Well No. 8 (~~25%~~), Well No. 9 (~~25%~~). This apportionment reflects the manner in which the city intends to use the wells in the future.

(not accurate)

15% 29% 23%

18%

15%

Groundwater flow field - Figure 3 shows the general groundwater flow field in the area of the well field. The groundwater flow field was determined by contouring water level data from area wells (Figure 2). The groundwater flow in the immediate vicinity of the well field is roughly southwest to northeast. This is consistent with the flow that is show in Falteisek (1998). The magnitude of the groundwater gradient varies somewhat over the area of interest. Relatively high gradients (0.008) are observed in the southern portion of the site where the aquifer likely thins near it's boundary. The gradient is quite flat (0.0016) near the eastern city wells (8 and 9), probably in response to locally higher transmissivities due to greater amounts of gravel in the aquifer stack. The largest and central part of the flow field has an intermediary gradient of 0.004, which is probably representative of the overall groundwater flow.

Aquifer Transmissivity - The transmissivity of the aquifer used by the city wells was estimated to be approximately 1,600 m²/d. Transmissivity estimates calculated using the method of Driscoll (1986) from pumping tests completed by well drillers to demonstrate well capacity show substantial local variation. The 15 closest wells have a minimum transmissivity of 10 m²/d, maximum of 5,000 m²/d, and a geometric mean of 82 m²/d. However, the calibrated transmissivities of regional groundwater flow models are typically between one and two standard deviations above the geometric mean. This results in a range of 613 to 4,300 m²/d. Since the upper limit of this range approaches the maximum value mentioned above, an upper limit of 1.5 the standard deviations above the mean, or about 1,700 m²/d was considered to be the likely upper limit of the overall aquifer performance.

Method Used to Delineate Wellhead Protection Area

The WHPAs were delineated using the analytic element ground water flow model Split v2.0. This program is capable of simulating relatively complex hydrologic scenarios, such as spatial variability in aquifer recharge and geology, including the presence of flow boundaries.

A single-layer model was developed which includes the following features: 1) line sinks of given head to simulate Sauk River, as determined from 1:24,000 scale topographic maps, 2) an upgradient head boundary of 380 m from the water level information, 3) an infiltration element representing 6 inches of annual recharge along the wide, sandy channel of the Sauk River and 4) a series of well elements with given discharge to simulate pumping at city wells and 21 local high capacity wells. These features are shown in map form in Figure 5.

The outer boundary of the aquifer shown in Figure 3 is a modified version of the sand glacial outwash aquifer mapped by Kneable and others (1995). It has been modified by inclusion of geologic data from construction records for wells in the study area. This geologic information indicates that the relationship between the aquifer used by the city wells and the sand plain aquifer mapped by Kneable and others (1995) is locally complex. In most places the aquifer is unconfined, but in others areas it is covered by till. Generally, the aquifer rests on a layer of clayey till or the granitic bedrock, both of which can be considered to be impermeable.

The base and thickness of the aquifer were chosen based on the available hydrogeologic information. The base of the aquifer was chosen to be 320m (1049ft.) above sea level. This base elevation was chosen based both on actual elevation of the deepest part of the aquifer and the model requirement that the lowest head of an element must be above the base of the aquifer. The saturated thickness in the well field area is about 40m (130ft). This geometry requires a bulk hydraulic conductivity of about 42.5 to yield the maximum transmissivity of 1,700 m²/d selected above. The actual value of the aquifer thickness used in the model as substantially in excess of 40 so that the aquifer remained unconfined. The final water levels generated by the model resulted in a saturated thickness of about 42m.

A precipitation-derived recharge value of approximately 6 in/yr was applied to that portion of the model where sandy soils are present. This value is consistent with the estimates of Kanivetsky (1979). One inch per year was applied outside of that area to account for reduced infiltration and increased runoff where till is present at the land surface.

The discharge values of the wells were set at the maximum values that are expected over the coming 5-year period, as discussed above in "Daily volume of water pumped".

Model Calibration and Sensitivity

The model was calibrated to hydraulic head at area wells in the state well records database. The differences between the observed and model-estimated water elevations is not as important as their comparable gradients and flow directions. The model-estimated gradient is fairly consistent across the area of interest and is about 0.0045. This is slightly steeper than average observed gradient of 0.004. The model-estimated flow direction is somewhat (5 to 10 degrees) more easterly than the observed flow direction. The model-predicted are within 2 meters of the observed groundwater elevations in the well field area. The general agreement between the observed and modeled values suggest that this is a sufficiently calibrated model. The Input file for the final model is in the appendix.

The sensitivity of the model is only important in how it effects the predicted area of the 10 year travel time from the wells. The model input parameters were varied and the impact on the 10 year capture zone were assessed. The parameter that has the most impact on this capture zone is the transmissivity. Higher values of hydraulic conductivity yield capture zones that are somewhat less wide and proportionately longer. Lower values of aquifer thickness result in proportionately wider capture zones of about the same length. The pumping rate of the wells also has some impact on the capture zone, but primarily by changing its width.

WHPA
Recommend

Several different aquifer inhomogeneities were included in versions of the model. Low hydraulic conductivity inhomogeneities representing the southern boundary of the aquifer and one representing a thinner portion of the aquifer north east of the well field were included. These features did not substantially impact the groundwater flow field or the predicted capture zones and hence were left out of the final version.

The transmissivity of the aquifer is also an uncertain parameter. Since this input value was selected as relatively high based on the statistics of the local measurements, it is likely conservative. Lower values may yield capture zones that are slightly wider, but shorter.

In summary, the following information should be collected over the next 10 years to modify the existing WHPA:

- 1) Approximately 10 to 20 local wells should be surveyed to a common datum and their water levels measured within the same one week period.
- 2) A 72 hour pumping test should be completed at the city well field with continuous water level observation conducted at no less than three other wells.

Model Uncertainty Analysis and Recommendations for Future

The accuracy of the delineation of the 10 year capture zone is closely linked to the measurements of water elevations in local wells. These include both measurements of water levels and the elevation of the measuring point. Although the groundwater flow directions and gradients that have been used in this delineation are generally consistent with the previously published reports, a small change in either the direction or gradient could result in a change in the WHPA.

One way to evaluate the potential impact of changes in the existing water elevation information is to apply the analysis tool Hugo. This is a simple groundwater modeling tool that takes the likely range of existing water elevation information and the basic aquifer parameters and generates a statistically "best fit" groundwater flow field. The ground water elevations are included as a range of values (in this case ± 5 ft). This is because there is some uncertainty about both the elevation of the measuring point and the temporal changes that are likely to effect the water levels in the wells. The model generates a flow field the best fits these elevation intervals and then evaluates many more flow fields that vary from this optimal solution by up to 10%. It also finds the 10 year capture zone for each of these slightly different flow fields. The resulting "envelopes" of the capture zones provides an indication of how changes in the exiting water elevation information could effect the WHPA.

These envelopes and the result of the Split model are shown on Figure 7. The split tracks are not completely contained in the uncertainty envelope generated by Hugo, and extend somewhat across the northern boundary of the groundwater portion of the WHPA. This is due to the slight difference between the model-generated and observed flow fields discussed above. Since the Hugo model has little else than the measured groundwater elevations for input, the capture zones are more consistent with the ambient observed flow field but also appear to have a more northerly component. This

suggests that the groundwater, gravel pit and uplands portions of the WHPA most likely capture most of the uncertainty in the flow field.

Surface Watershed Component

Because surface water run off from the uplands likely recharges the aquifer as described above, it is important to not only to delineate the groundwater capture zone for the wells, but also to delineate the land surface area that contributes this runoff. This surface watershed for the Melrose WHPAs was determined by careful review of the 24,000 scale topographic maps of the area, in conjunction with staff from the city of Melrose and the wellhead team. The surface watershed is shown in Figure 1. The area labeled "Northern Drainage" is drainage to the creek just north of the well field. The area labeled "Uplands" is that part of the WHPA that either diverts surface water flow to the area of the aquifer that is exposed at the ground surface or could have recharge direct to the aquifer through deep sandy materials.

Method Used to Delineate Drinking Water Supply Management Area (DWSMA)

The DWSMA was determined by overlaying the WHPAs and the localized surface watershed for Otter Creek on digital aerial photos and topographic maps of the area. City of Melrose staff and wellhead team then traced the boundaries of the DWSMA on paper copies of these maps, and these lines were subsequently digitized by MDH. The DWSMA was delineated based on physical features such as roadways, property lines, surface water drainage ways and government survey lines.

Vulnerability Assessment

This chapter documents the vulnerability assessments of the wells and drinking water supply management area for the City of Melrose. These assessments were performed in accordance with rules for preparing and implementing wellhead protection measures for public water supply wells, which were prepared by the Minnesota Department of Health (MR 4720.5210).

The vulnerability of City of Wells Nos. 4, 5, 7, 8, and 9 (Unique numbers 215113, 180122, 486430, 608438, and 608424) was determined by evaluating available information on the 1) geology, 2) well construction and 3) chemical and isotopic composition of the well water and comparing these results with the criteria in the wellhead protection rule (MR 4720.5550). This process was automated using the well vulnerability database at the Minnesota Department of Health (MDH).

The vulnerability of the DWSMA was determined by evaluating available information on 1) the lateral continuity of protective geologic materials overlying the aquifer and 2) the chemical and isotopic composition of well water from the aquifer.

Well Vulnerability Assessment

The MDH has developed a database of community and non-community non-transient public water supply wells in Minnesota that stores information pertinent to well vulnerability and rates the vulnerability of individual wells. A score is calculated for each well based on factors such as well construction, geology at the well site and chemical data, and higher scores correlate to greater perceived vulnerability. A numeric cutoff is used to identify vulnerable from non-vulnerable wells (MDH, 1993). Vulnerable wells are also identified based on the presence of contamination, such as nitrate-nitrogen in excess of 10 mg/l, or young (post-1953) water, as indicated by the presence of 1 tritium unit or greater in the well water. The results of this assessment for City wells are described below. A printout from the MDH vulnerability database is shown in the Appendix.

The wells are determined to be vulnerable to contamination from activities at the land surface. This evaluation is based on factors such as 1) the shallow depth of the wells, 2) the geologic sensitivity at these sites, and 3) the results of chemical monitoring of the well water.

The results of routine chemical monitoring of water samples from the water treatment plant and city wells conducted by the MDH over the period 1993–2000 showed indications of well vulnerability, but no violations of any parameters monitored under the Safe Drinking Water Act. Nitrate-nitrogen is a commonly cited indicator of human-caused impacts on water quality. Nitrate-nitrogen has been detected at moderate levels (<1 – 14 mg/l). Some samples have historically been above the drinking water standard of 10 mg/l, but monthly monitoring insures that the MCL is not regularly exceeded. Additional sampling has shown that pesticides and volatile organic compounds have not been detected in the water.

Drinking Water Supply Management Area Vulnerability Assessment

The vulnerability of the aquifer throughout the DWSMA for the city was evaluated primarily on the basis of geologic logs from wells in the area in conjunction with the DNR sensitivity map (Falteisek, 1998), and available water quality data. The DWSMA is rated as highly vulnerable to contamination throughout most of its extent. This reflects the lack of laterally continuous protective cover, in the form of clay or till, over the aquifer that is indicated from the grid of percentage of clay above the static water elevation that is shown on Figure 8.

References:

Minnesota Department of Health, 1993, Methodology for Phasing Wells into Minnesota Wellhead Protection Program.

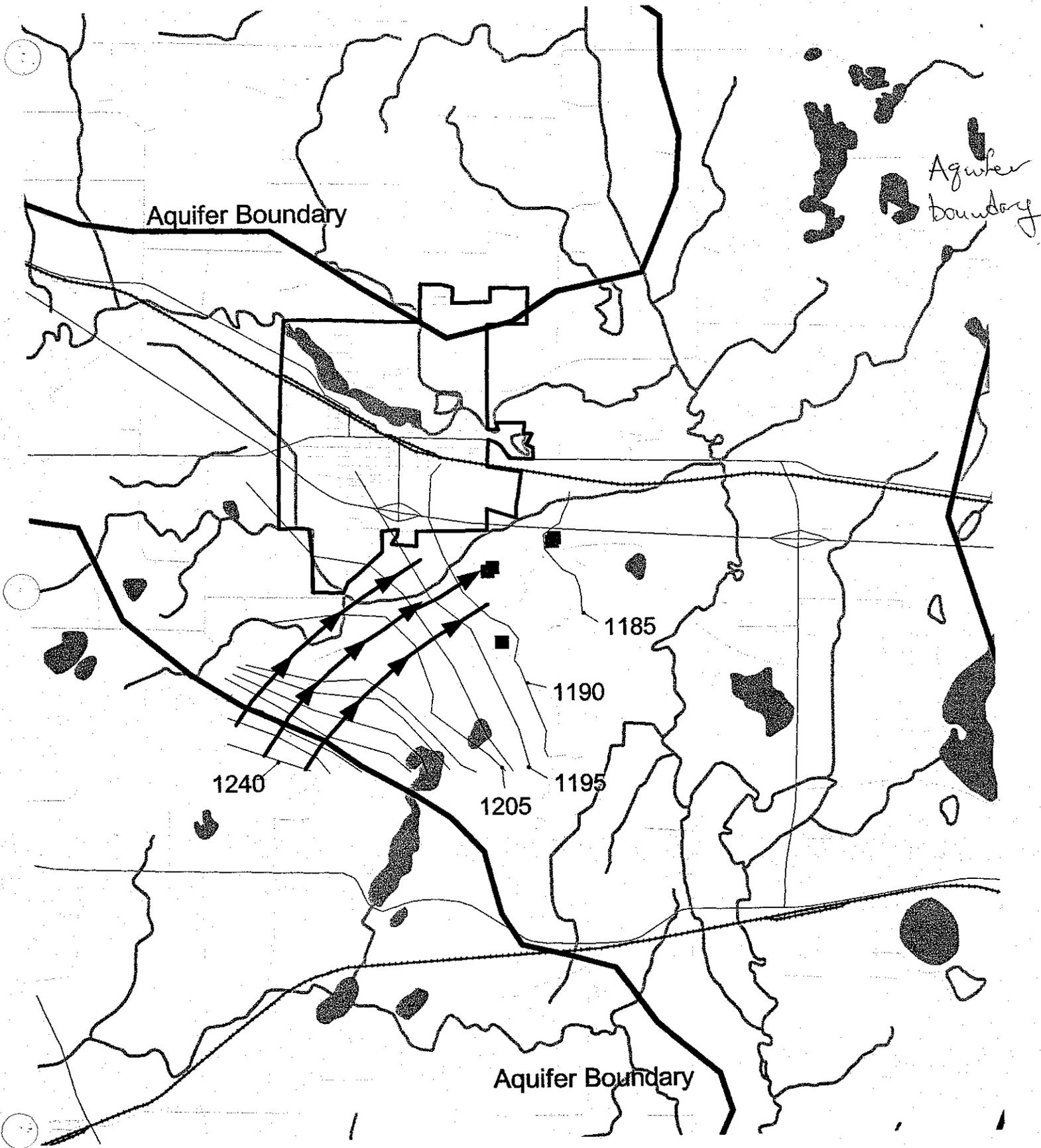


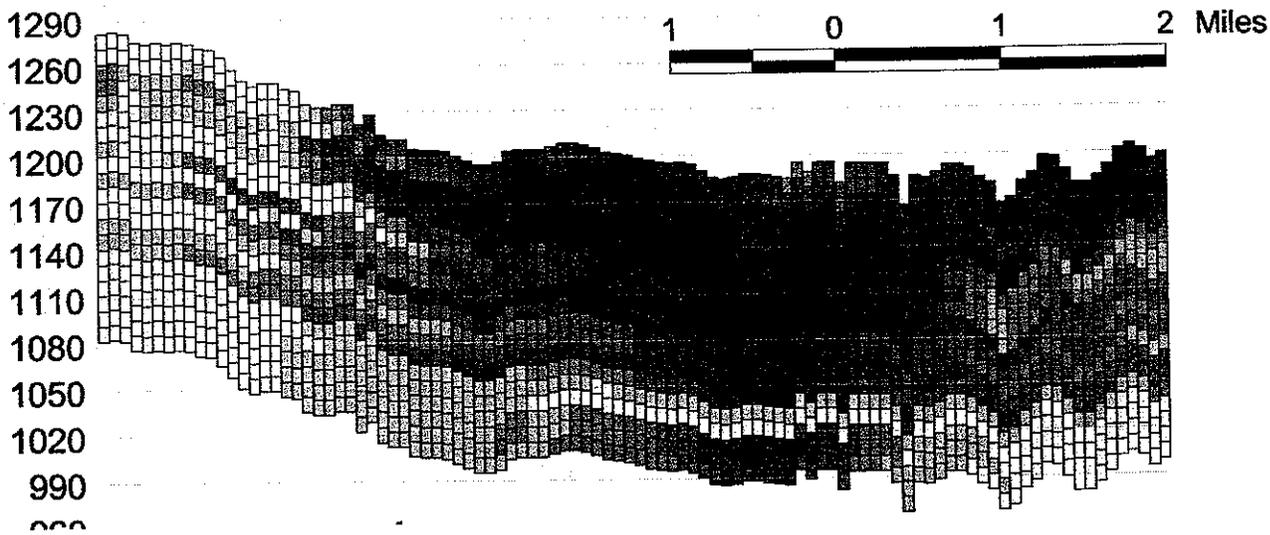
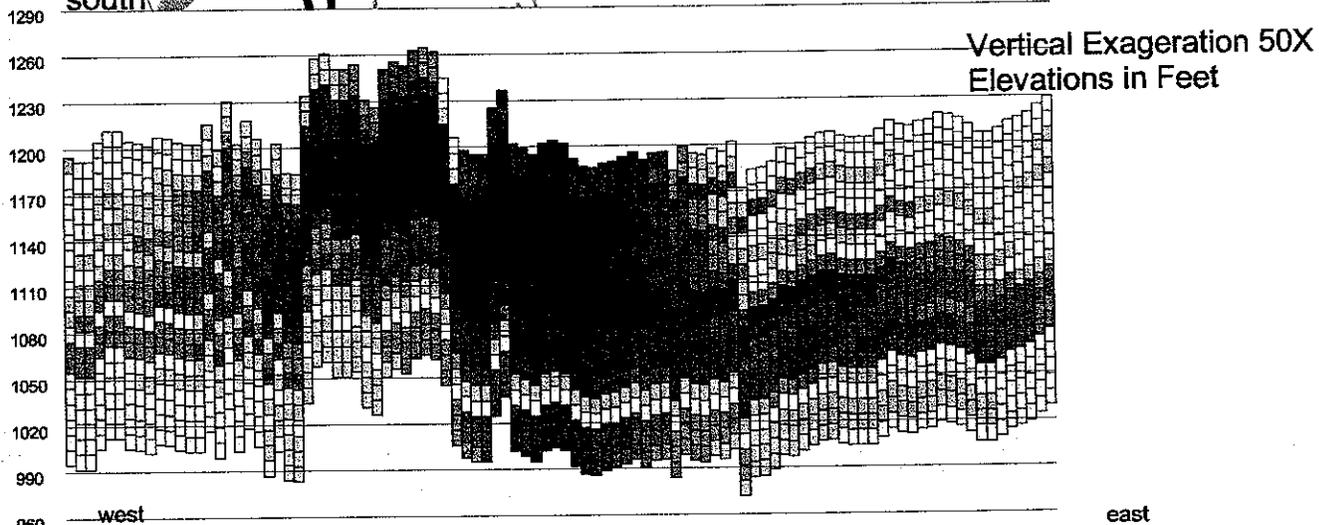
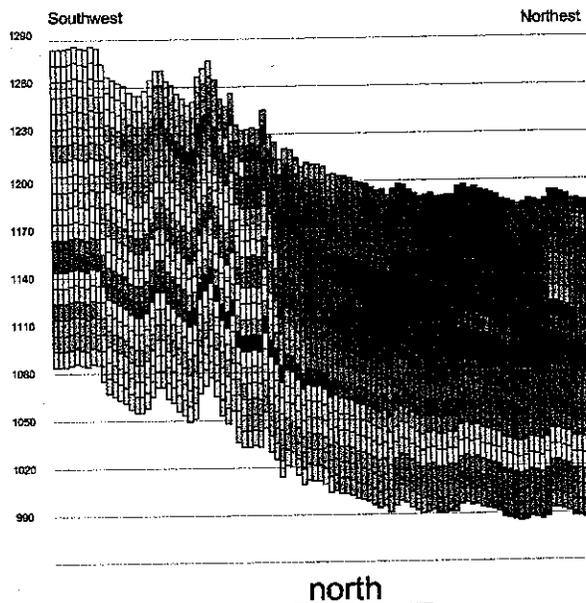
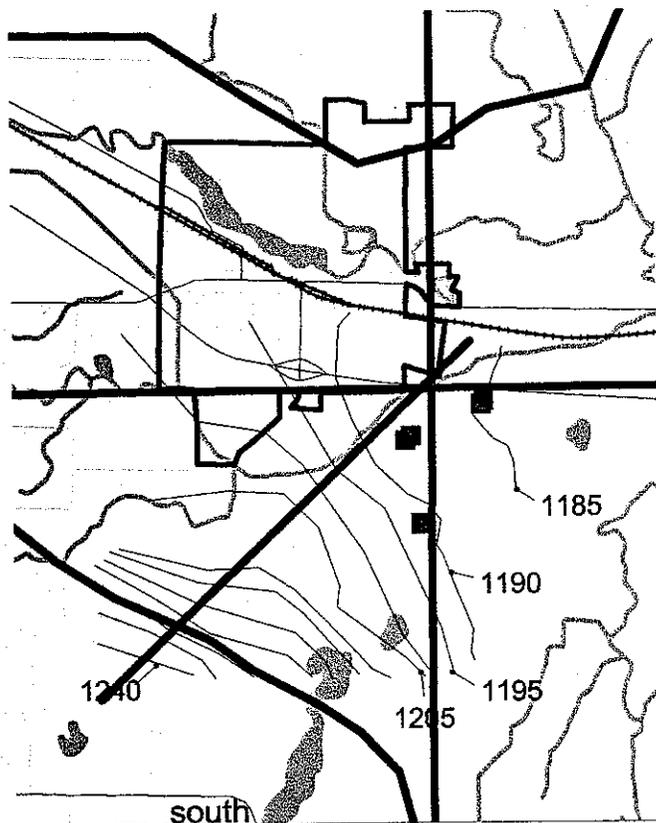
Figure 3 Groundwater Flow and Aquifer Boundaries

1 0 1 2 Miles



Groundwater Flow

Figure 4 Geologic Cross Sections



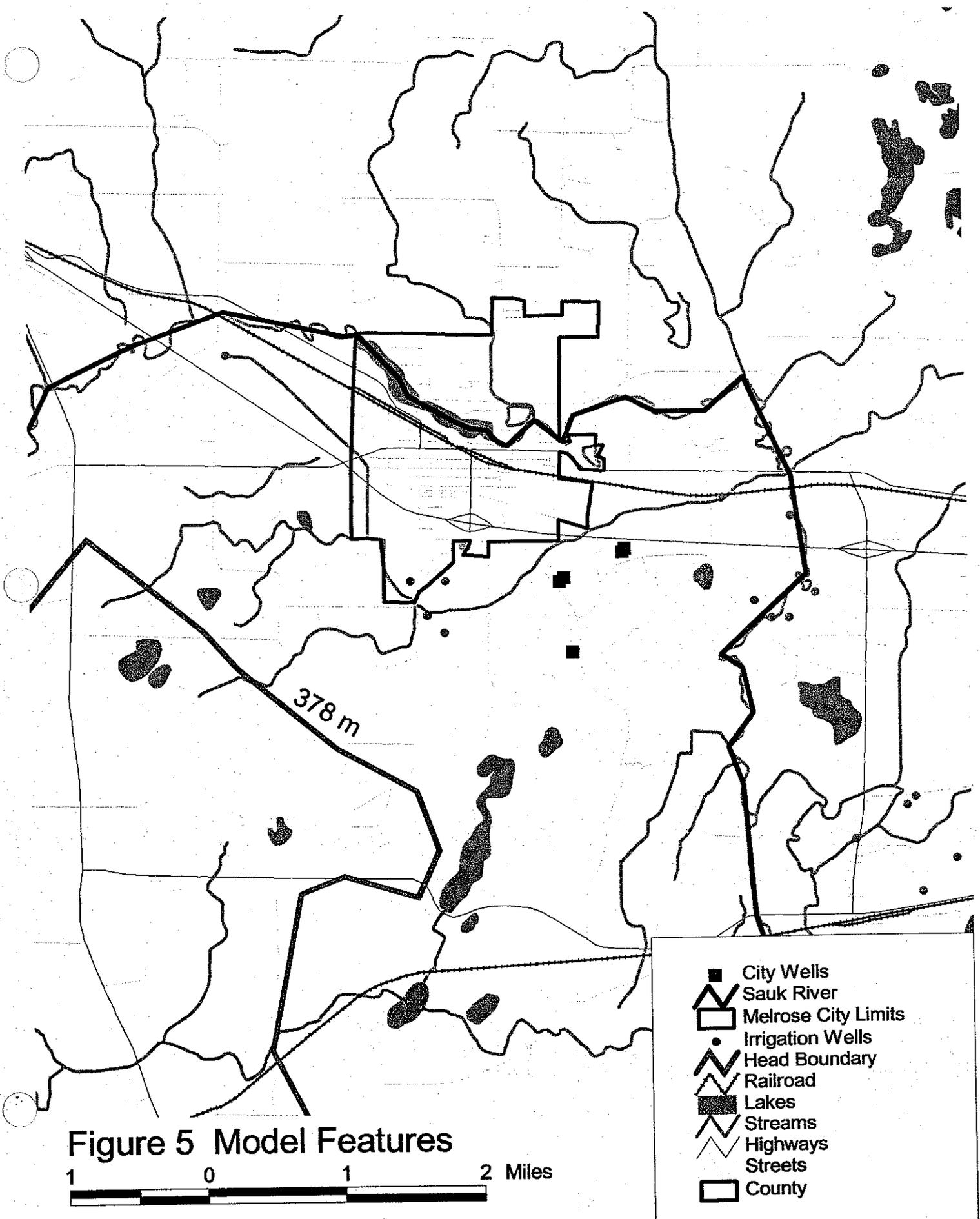


Figure 5 Model Features

1 0 1 2 Miles

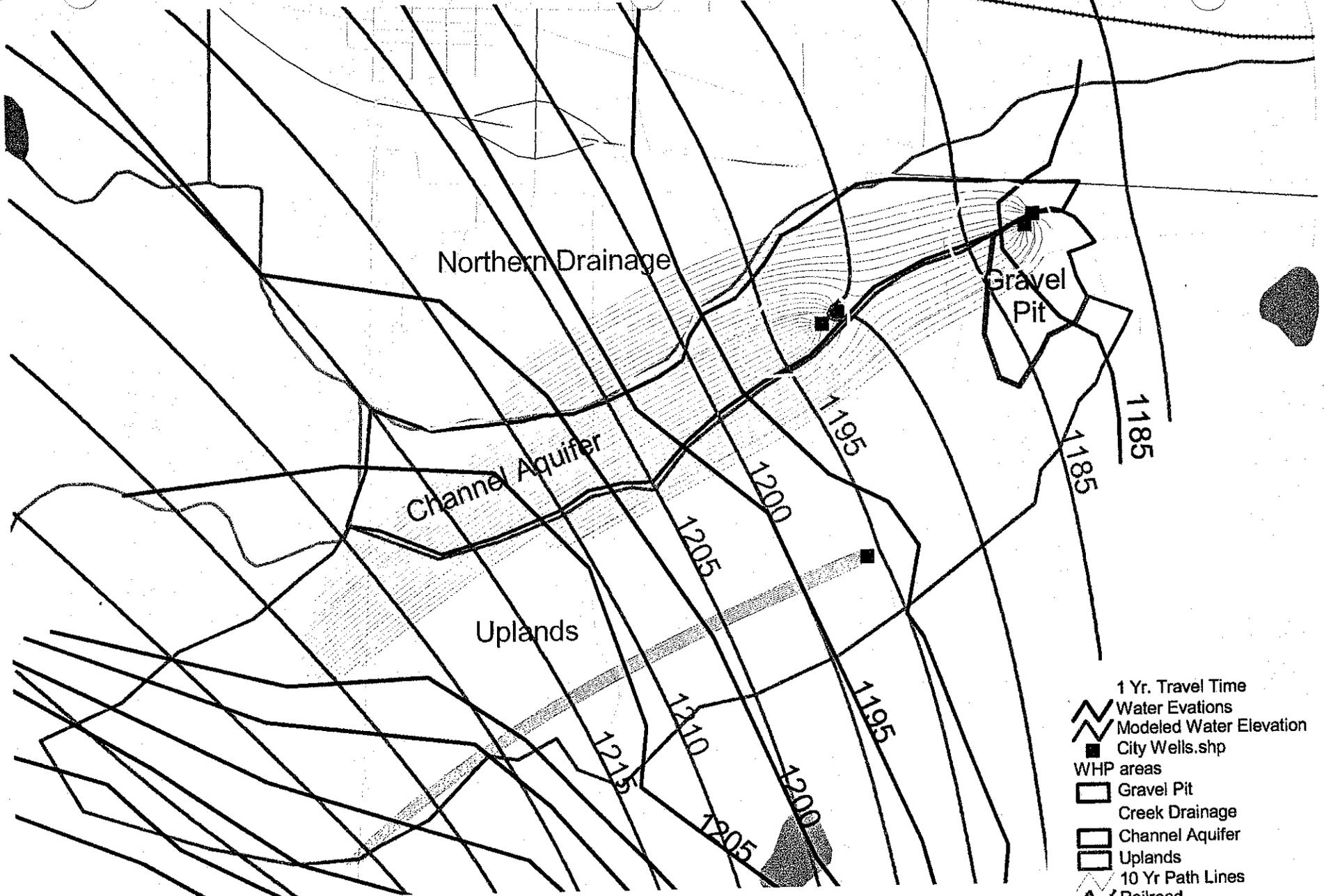
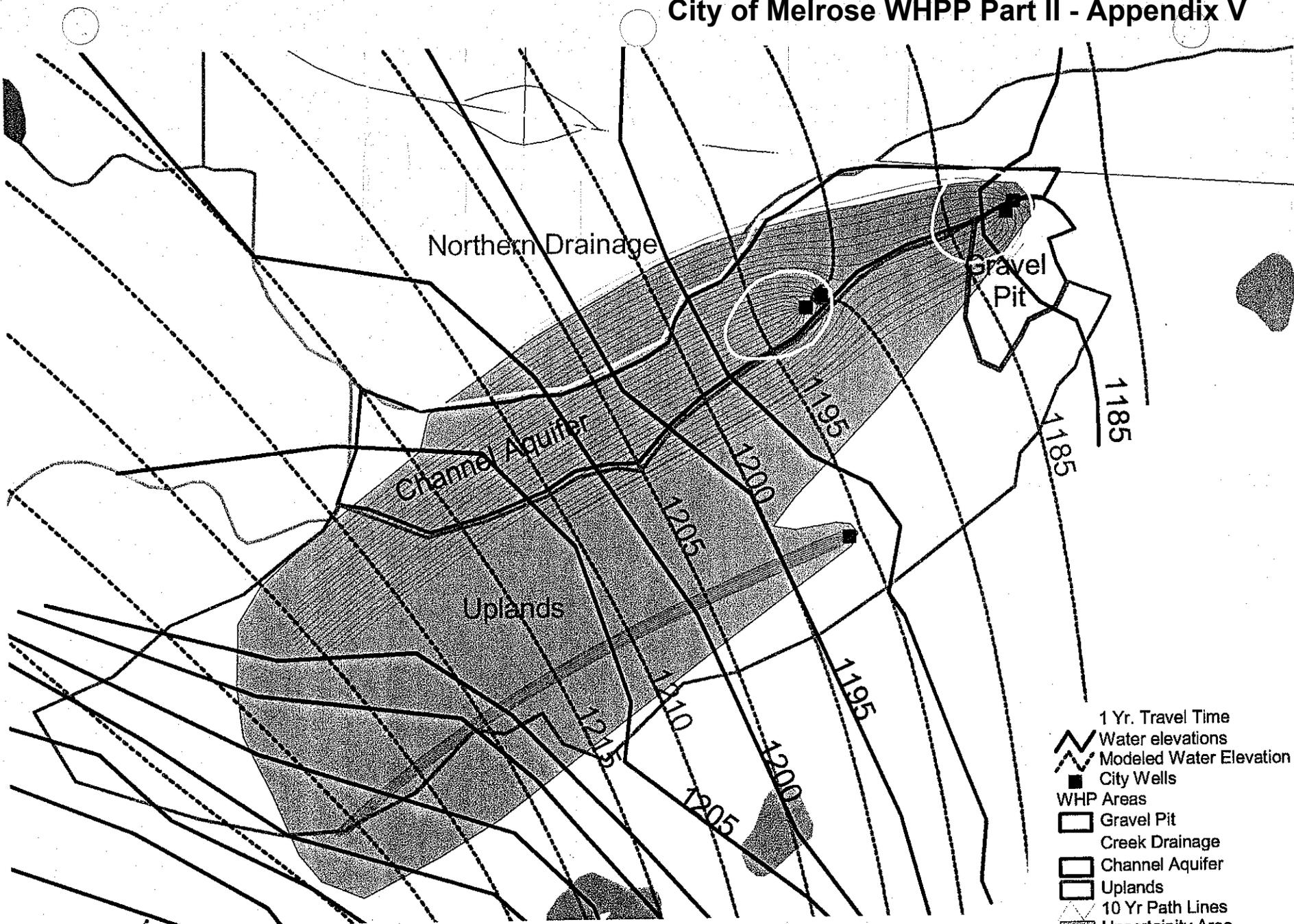


Figure 6 Model Results



Scale 1:24,000 10 year travel time Elevation in Feet



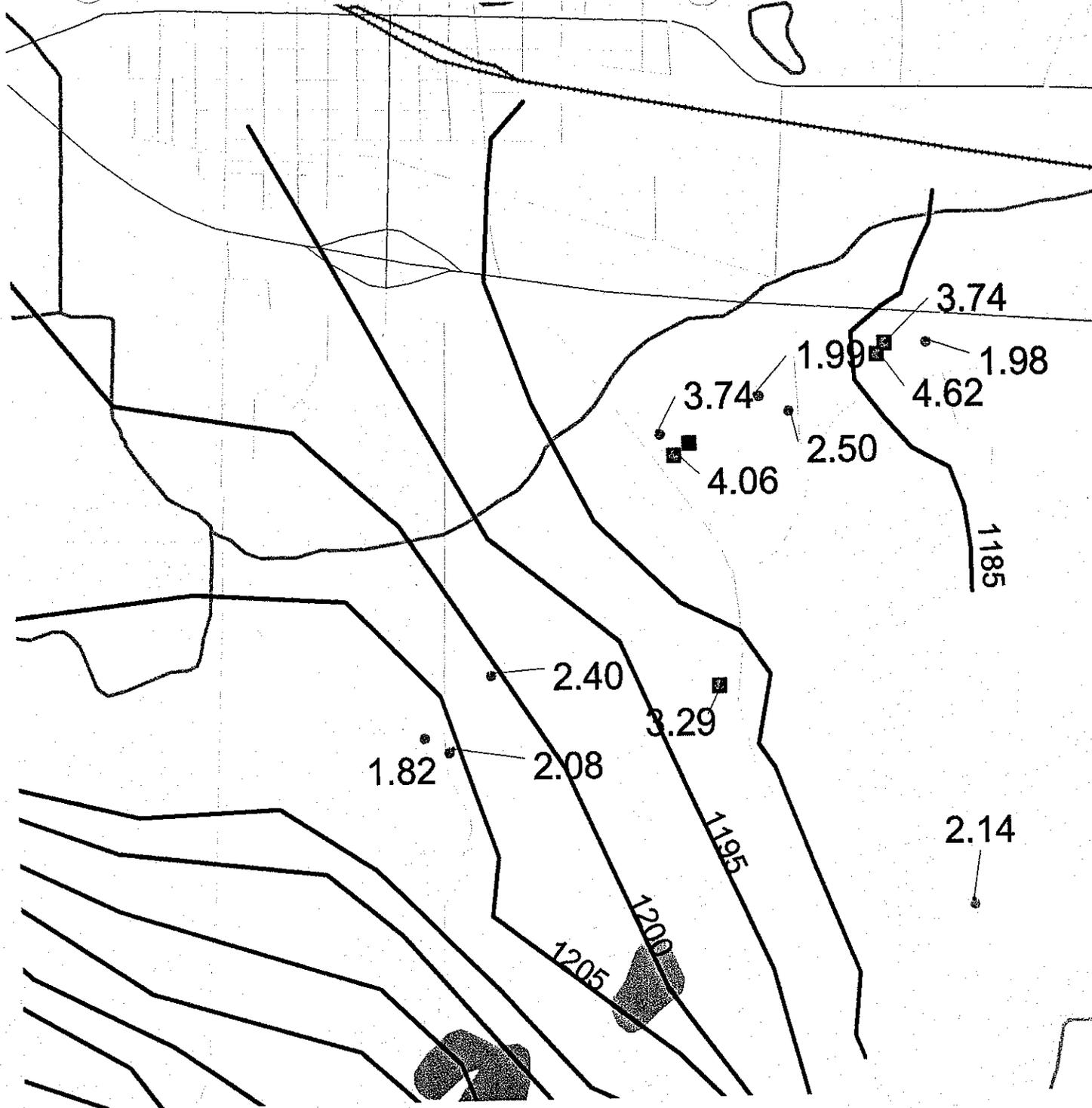
- 1 Yr. Travel Time
- Water elevations
- Modeled Water Elevation
- City Wells
- WHP Areas
- Gravel Pit
- Creek Drainage
- Channel Aquifer
- Uplands
- 10 Yr Path Lines
- Uncertainty Area
- Railroad
- Lake
- Stream
- Highways
- Streets

Figure 7 Uncertainty

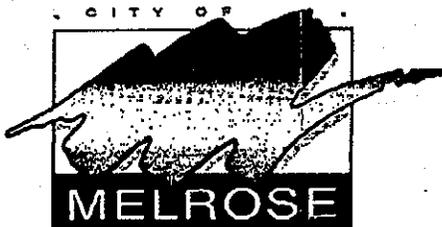
0.4 0 0.4 0.8 Miles

Scale 1:24,000 10 year travel time Elevation in Feet

City of Melrose WHPP Part II - Appendix V

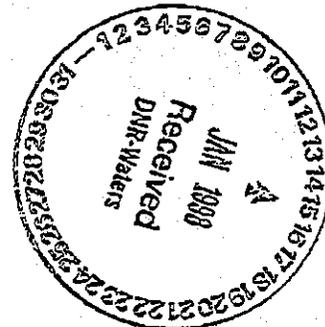


City of Melrose Conservation and Emergency Management Plan



225 East First Street North
PO Box 216
Melrose, Minnesota 56352-0216

320-256-4278
Fax 320-256-7766



January 12, 1998

John Linc Stein, Administrator
Permit and Land Use Section
Minnesota Department of Natural Resources
500 Lafayette Rd.
St. Paul, MN 55155-4032

Dear Mr. Stein:

RE: Water Emergency and Conservation Plan

This letter is in response to your correspondence dated September 9, 1997, in which you requested that we respond to several items in Melrose Conservation Plan.

Part II

D. Short-Term Demand Reduction Procedures:

The City of Melrose will utilize a total watering ban for short-term demand reduction. The City would also work with industry to minimize water usage during critical periods. These measures will be based on the emergency at the time.

F. Establish Triggers for Implementing Plan Components:

Any event that will cause a water pumping shortfall in the City of Melrose will trigger the water emergency plan. This would include having a working well out of service, unusually dry weather, a storage unit out of service, or an unusually high demand not normally seen in the water distribution system.

G. Enforcement:

The City of Melrose has given the Superintendent of Public Works the authority to implement the emergency management plan. The City passed a resolution on October 20, 1997, establishing the provisions and the authority to implement the plan. (See attached copy of resolution.)

MAYOR
George O'Brien

COUNCIL MEMBERS
Joseph Beckermann
Ronald Butkowsk
Ernest Hedglin
Jane Meyer

CITY CLERK-TREASURER
Rose Ann Inderieden



Minnesota Department of Natural Resources

500 Lafayette Road
St. Paul, Minnesota 55155-4032

January 26, 1998

City of Melrose
Don E. Salzmann, Superintendent of Public Works
225 East First Street North
P.O. box 216
Melrose MN, 56352-0216

Dear Mr. Salzmann:

WATER EMERGENCY AND CONSERVATION PLAN

The Department has received the January 12, 1998-addendum to the City of Melrose "Emergency Management and Conservation Plan" which addressed our comments on the plan. Therefore, the plan is hereby approved. Water emergency and conservation plans must be updated every ten years to address the items included in the implementation schedule and to assess the effectiveness of conservation efforts.

Thank you for your cooperation. If you have any questions, please contact Travis Germundson at (612) 296-0512.

Sincerely,
DNR WATERS

A handwritten signature in black ink, appearing to read 'John Linc Stine'.

John Linc Stine, Administrator
Permits and Land Use Section

enclosure

cc: Travis Germundson, Permits Unit
Dan Lais, Area Hydrologist

DNR Information: 612-296-6157, 1-800-766-6000 • TTY: 612-296-5484, 1-800-657-3929



RESOLUTION ESTABLISHING LAWN WATERING RESTRICTIONS

WHEREAS, the Melrose Public Utilities municipal water supply system may reach critical levels due to summer peak usage; and

WHEREAS, a possibility of water shortage is made more critical by hot and dry weather conditions; and

WHEREAS, lack of adequate water pressure could cause serious fire protection problems; and

WHEREAS, it has been determined that a watering ban must be implemented in order to assure the safety and well being of the residents of the City of Melrose.

NOW, THEREFORE, BE IT RESOLVED, that the Utilities Commission of the City of Melrose Public Utilities, hereby establishes restrictions for all residential, commercial and industrial users of the Utilities' water system;

1. The Superintendent of Public Works shall be given the authority to implement emergency restrictions to restrict water use during emergency periods. The Superintendent of Public Works shall notify municipal system users of a watering ban by publishing notice in the Melrose Beacon and on MEL-TV 3.
2. Residents with an odd house number shall water lawns or wash cars when necessary only on odd-numbered calendar days, and those with even-numbered addresses shall water lawns or wash cars only on even-numbered days. Lawns shall not be watered between the hours of 10:00 a.m. and 6:00 p.m.
3. An exception may be granted for recently established lawns. Those lawns may be watered daily for up to one month after installation, but only during the hours listed above.
4. In extreme emergency cases, the Superintendent of Public Works shall have the authority to issue a total watering ban until such time that the emergency situation ceases to exist.

John Stein

Page Two

January 12, 1998

Part III - Water Conservation Plans for Public Water Suppliers

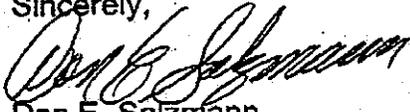
B. The following is an estimate of water conservation potential:

- | | | |
|----|-------------------------------|------------|
| a. | Inclining water rates | (5-10%) |
| b. | Retrofitting and water audits | (10-30%) |
| c. | Reduction of pressure | (Up to 5%) |
| d. | Leak detection and repairs | (Up to 5%) |
| e. | Public education | (Up to 5%) |

The City of Melrose is confident that using the conservation plan as proposed will result in more efficient water usage which will result in a reduction of overall water usage.

I would like to thank you for the time you spent on this plan. If you have any comments or questions, please feel free to call me at (320) 256.4666.

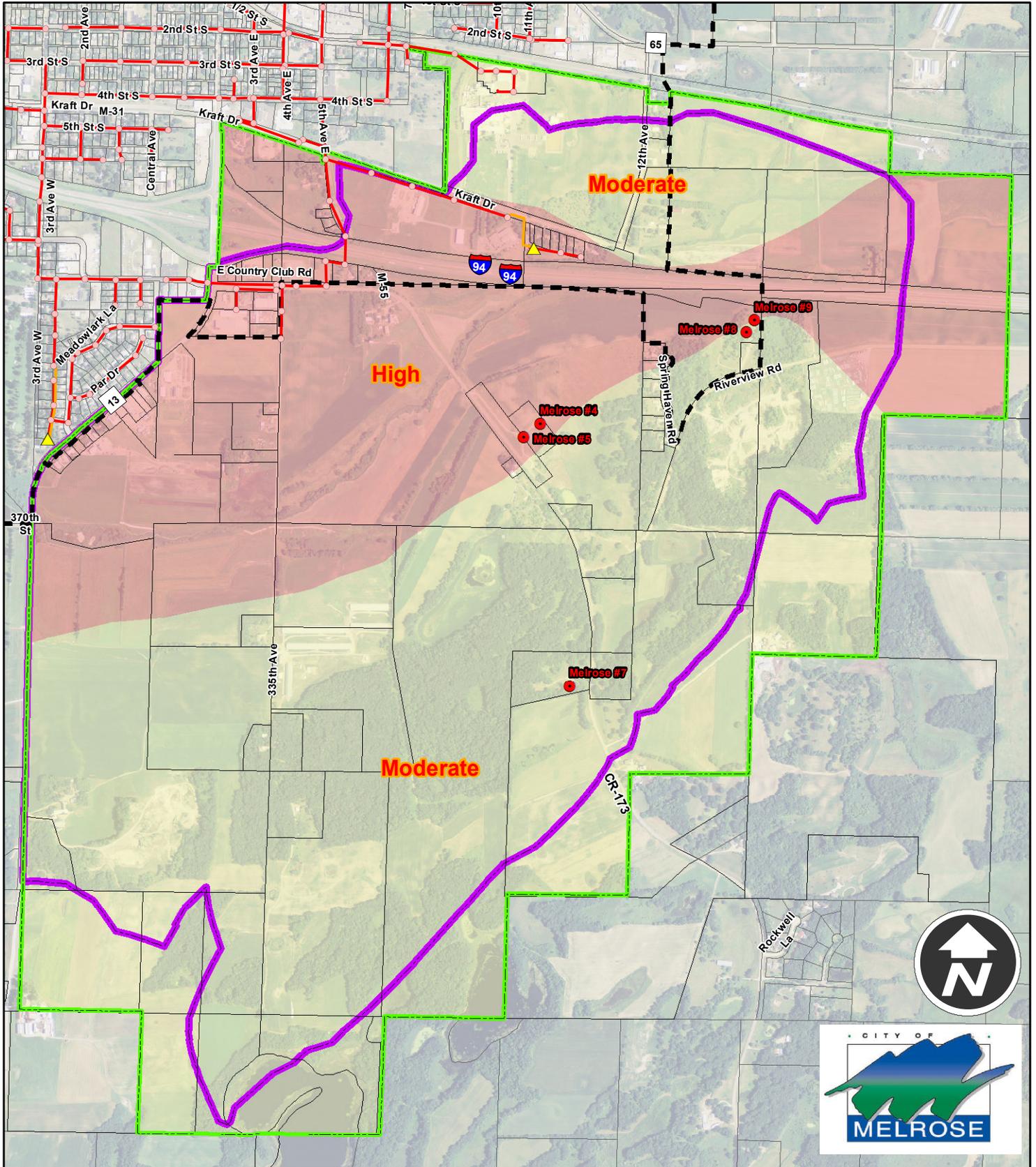
Sincerely,



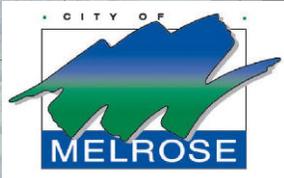
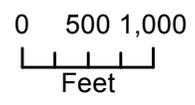
Don E. Salzmann
Superintendent of Public Works

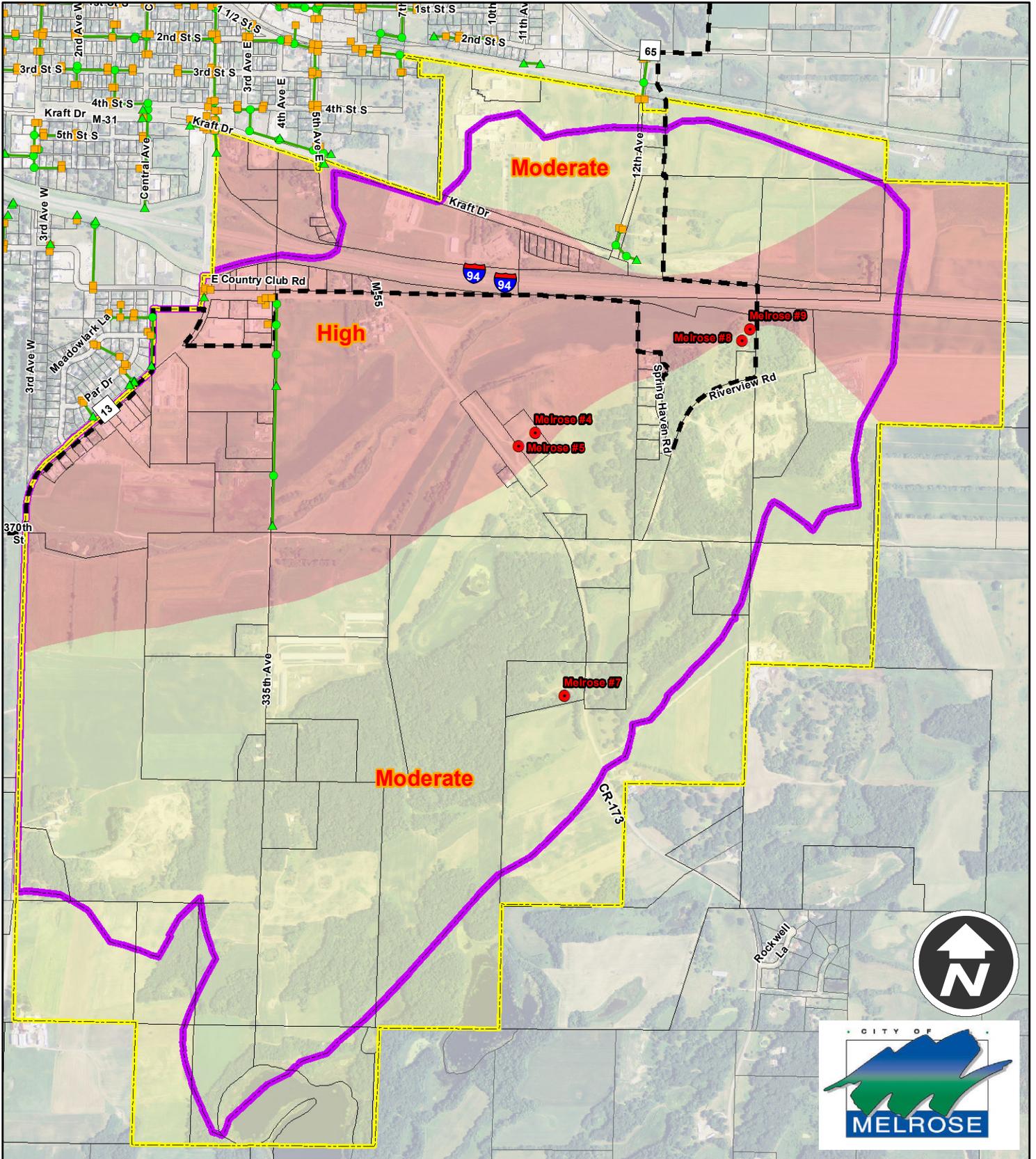
c: Naeem Qureshi, P.E.

f:\waplan.krt/pg2-3



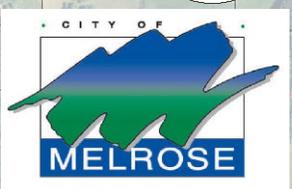
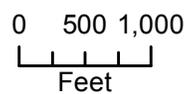
- Public Water Supply Sources
- City of Melrose
- DWSSMA
- WHPA
- Parcels
- DWSSMA Vulnerability High
- DWSSMA Vulnerability Moderate
- ▲ Liftstation
- Sewer Manholes
- Forcemain
- Sanitary Sewer





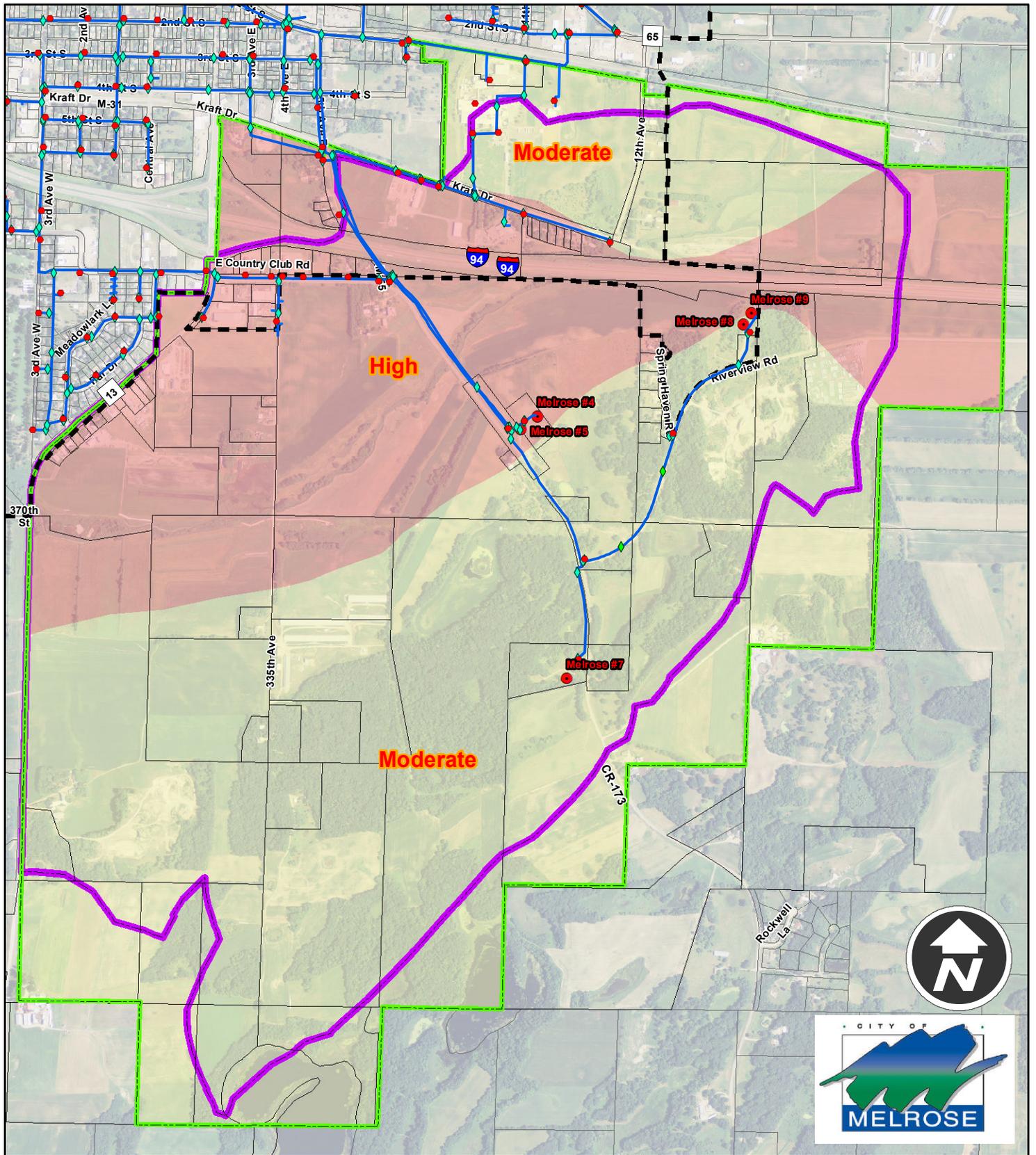
- Public Water Supply Sources
- City of Melrose
- DWSMA
- WHPA
- Parcels
- DWSMA Vulnerability High
- DWSMA Vulnerability Moderate

- ▲ Storm Aprons
- Catchbasin
- Storm Manholes
- Storm Sewer

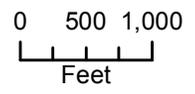
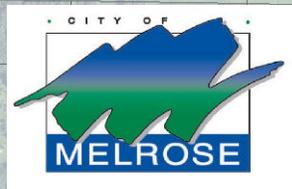


City of Melrose, MN

Water System



- Public Water Supply Sources
- City of Melrose
- DWSMA
- WHPPA
- Parcels
- DWSMA Vulnerability High
- DWSMA Vulnerability Moderate
- Water Hydrants
- ◆ Water Valve
- ◆ Air Release Valve
- Watermain



August 2014
 Data: LMIC, MNDOT, Stearns County, MDH, City of Richmond, WSB, MnDNR
 Bayerl Water Resources & Stearns County Soil & Water Conservation District



Protecting, maintaining and improving the health of all Minnesotans

ACTION REQUIRED

DATE: April 1, 2014
TO: Melrose, PWSID 1730016
FROM: Karla R. Peterson, Supervisor
Community Public Water Supply Unit
Drinking Water Protection Section
SUBJECT: Consumer Confidence Report – Distribution Requirements

All community water systems must distribute a drinking water report known as a Consumer Confidence Report (CCR) annually to their customers **before July 1, 2014**.

Your system may reformat the CCR and/or add additional information about your water system (treatment processes, upgrades planned, etc.) however, that is not necessary. After filling in the contact phone number and any other grey shaded areas, the CCR will satisfy the requirements. If you choose to reformat the CCR, all the information in the Minnesota Department of Health (MDH) CCR must be included in your newly reformatted CCR.

Distribution:

The requirements to distribute your CCR are determined by population. The population served by your water supply is 3632. The option(s) on how to distribute your CCR are listed on the enclosed Certification Form. Please indicate what option(s) you chose on the Certification Form. The Certification Form must be returned to MDH, along with a copy of the CCR that was distributed to your customers. Even if you are distributing the MDH CCR, you must fill in the grey shaded area(s) and return a copy of the CCR and the completed Certification Form to MDH **by July 1, 2014**.

You are required to keep a copy of the CCR for at least three years. **Failure to produce and distribute a CCR as required—as well as failure to submit a copy of the CCR and the Certification Form to MDH by July 1, 2014—may result in enforcement actions, including fines.**

KRP:mkh
Enclosure



City of Melrose WHPP Part II - Appendix VII 2013 CERTIFICATION FORM

Name of System: Melrose

PWSID: 1730016

The information in the attached Consumer Confidence Report (CCR) is accurate and has been distributed to customers served by our water supply in the following manner. You must check at least one option, however check ALL that apply:

Newspaper Publication. Published the **entire** CCR in one or more local community newspapers with a comment that the CCR is not being directly mailed to all customers but that a copy is available upon request (provided a phone number for customers to call and request a copy of the CCR). You must **return a copy** or newspaper clipping of the CCR to MDH. List newspaper(s) and date(s) of publication:

Mail Delivery. Paper copy individually mailed to all customers.

Mail Notification of Electronic Delivery. Mailed notification (i.e., postcard or in newsletter, etc.) that CCR is available via **direct** URL (you must provide a direct link to CCR and give the option for the customer to request a paper copy) URL

Electronic Notification. Emailed a **direct** URL to CCR for bill-paying customers; emailed the CCR as a file attachment (PDF) or directly inserted CCR into the body of the email message. URL _____

Options should include how a paper copy of the CCR can be obtained if one is not provided.

Efforts must be made to reach customers who do not receive water bills, (such as apartment tenants, nursing home residents, etc.). This can be done by publicizing the availability of the CCR in the media, posting in public places, delivering multiple copies of the CCR for distribution by single-biller customers, delivering CCR to community organizations, posting on the internet, and/or including within the CCR a request for recipients to share information with non-billing customers.

COMPLETE THE FOLLOWING:

Signature: *T. Vogel* Print Name: Timothy E. Vogel
Job Title: Lead Operator Phone: 320-256-4278 Date: 4-8-14
Email address: tvogel@cityofmelrose.com
Please print clearly

PLEASE NOTE: Although MDH sent a CCR to your system, we need a "final" copy of the CCR that your system distributed for our records. Whether you reformatted the CCR, or simply added a phone number for your system on the CCR, you must return a copy of the CCR and this form to MDH.

Return this form and a copy of the CCR or newspaper clipping of the CCR, **by July 1, 2014.**

Mailing Address:
Minnesota Department of Health
c/o Ms. Mackenzie Hales

Fax: 651/201-4701
Email:

Drinking Water Protection Section
P. O. Box 64975
St. Paul, Minnesota 55164-0975

health.drinkingwateradvisory@state.mn.us

RETURN A COPY OF YOUR CCR AND THIS FORM TO MDH

City of Melrose WHPP Part II - Appendix VII

CONSUMER CONFIDENCE REPORT

PWSID: 1730016

City of Melrose 2013 Drinking Water Report

The City of Melrose is issuing the results of monitoring done on its drinking water for the period from January 1 to December 31, 2013. The purpose of this report is to advance consumers' understanding of drinking water and heighten awareness of the need to protect precious water resources.

Source of Water

The City of Melrose provides drinking water to its residents from a groundwater source: five wells ranging from 85 to 128 feet deep, that draw water from the Quaternary Water Table and Quaternary Buried Unconfined aquifers.

The water provided to customers may meet drinking water standards, but the Minnesota Department of Health has also made a determination as to how vulnerable the source of water may be to future contamination incidents. If you wish to obtain the entire source water assessment regarding your drinking water, please call 651-201-4700 or 1-800-818-9318 (and press 5) during normal business hours. Also, you can view it on line at www.health.state.mn.us/divs/eh/water/swp/swa.

Call **320-256-4278** if you have questions about the City of Melrose drinking water or would like information about opportunities for public participation in decisions that may affect the quality of the water.

Results of Monitoring

No contaminants were detected at levels that violated federal drinking water standards. However, some contaminants were detected in trace amounts that were below legal limits. The table that follows shows the contaminants that were detected in trace amounts last year. (Some contaminants are sampled less frequently than once a year; as a result, not all contaminants were sampled for in 2013. If any of these contaminants were detected the last time they were sampled for, they are included in the table along with the date that the detection occurred.)

Key to abbreviations:

MCLG—Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MCL—Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MRDL—Maximum Residual Disinfectant Level.

MRDLG—Maximum Residual Disinfectant Level Goal.

AL—Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirement which a water system must follow.

90th Percentile Level—This is the value obtained after disregarding 10 percent of the samples taken that had the highest levels. (For example, in a situation in which 10 samples were taken, the 90th percentile level is determined by disregarding the highest result, which represents 10 percent of the samples.) Note: In situations in which only 5 samples are taken, the average of the two with the highest levels is taken to

City of Melrose WHPP Part II - Appendix VII

CONSUMER CONFIDENCE REPORT

PWSID: 1730016

determine the 90th percentile level.

ppm—Parts per million, which can also be expressed as milligrams per liter (mg/l).

ppb—Parts per billion, which can also be expressed as micrograms per liter (µg/l).

nd—No Detection.

N/A—Not Applicable (does not apply).

Contaminant (units)	MCLG	MCL	Level Found		Typical Source of Contaminant
			Range (2013)	Average /Result*	
Arsenic (ppb) (05/03/2012)	0	10	N/A	2.04	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.
Barium (ppm) (05/03/2012)	2	2	N/A	.1	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
Fluoride (ppm)	4	4	1-1.6	1.25	State of Minnesota requires all municipal water systems to add fluoride to the drinking water to promote strong teeth; Erosion of natural deposits; Discharge from fertilizer and aluminum factories.
Haloacetic Acids (HAA5) (ppb)	0	60	nd-1.4	1.4	By-product of drinking water disinfection.
Nitrate (as Nitrogen) (ppm)	10.4	10.4	.07-9.6	9.6	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
TTHM (Total trihalomethanes) (ppb)	0	80	1.8-22.6	22.6	By-product of drinking water disinfection.

*This is the value used to determine compliance with federal standards. It sometimes is the highest value detected and sometimes is an average of all the detected values. If it is an average, it may contain sampling results from the previous year.

Nitrate in drinking water at levels above 10 parts per million is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask advice from your health care provider.

Contaminant (units)	MRDLG	MRDL	****	*****	Typical Source of Contaminant
Chlorine (ppm)	4	4	.18-.86	.54	Water additive used to control microbes.

****Highest and Lowest Monthly Average.

*****Highest Quarterly Average.

Contaminant		90%	# sites	
-------------	--	-----	---------	--

City of Melrose WHPP Part II - Appendix VII

CONSUMER CONFIDENCE REPORT

PWSID: 1730016

(units)	MCLG	AL	Level	over AL	Typical Source of Contaminant
Copper (ppm) (07/19/2011)	1.3	1.3	.48	0 out of 20	Corrosion of household plumbing systems; Erosion of natural deposits.
Lead (ppb) (07/ 19/2011)	0	15	5.3	0 out of 20	Corrosion of household plumbing systems; Erosion of natural deposits.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. City of Melrose is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

Monitoring may have been done for additional contaminants that do not have MCLs established for them and are not required to be monitored under the Safe Drinking Water Act. Results may be available by calling 651-201-4700 or 1-800-818-9318 during normal business hours.

Compliance with National Primary Drinking Water Regulations

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U. S. Environmental Protection Agency (EPA) prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 18004264791.

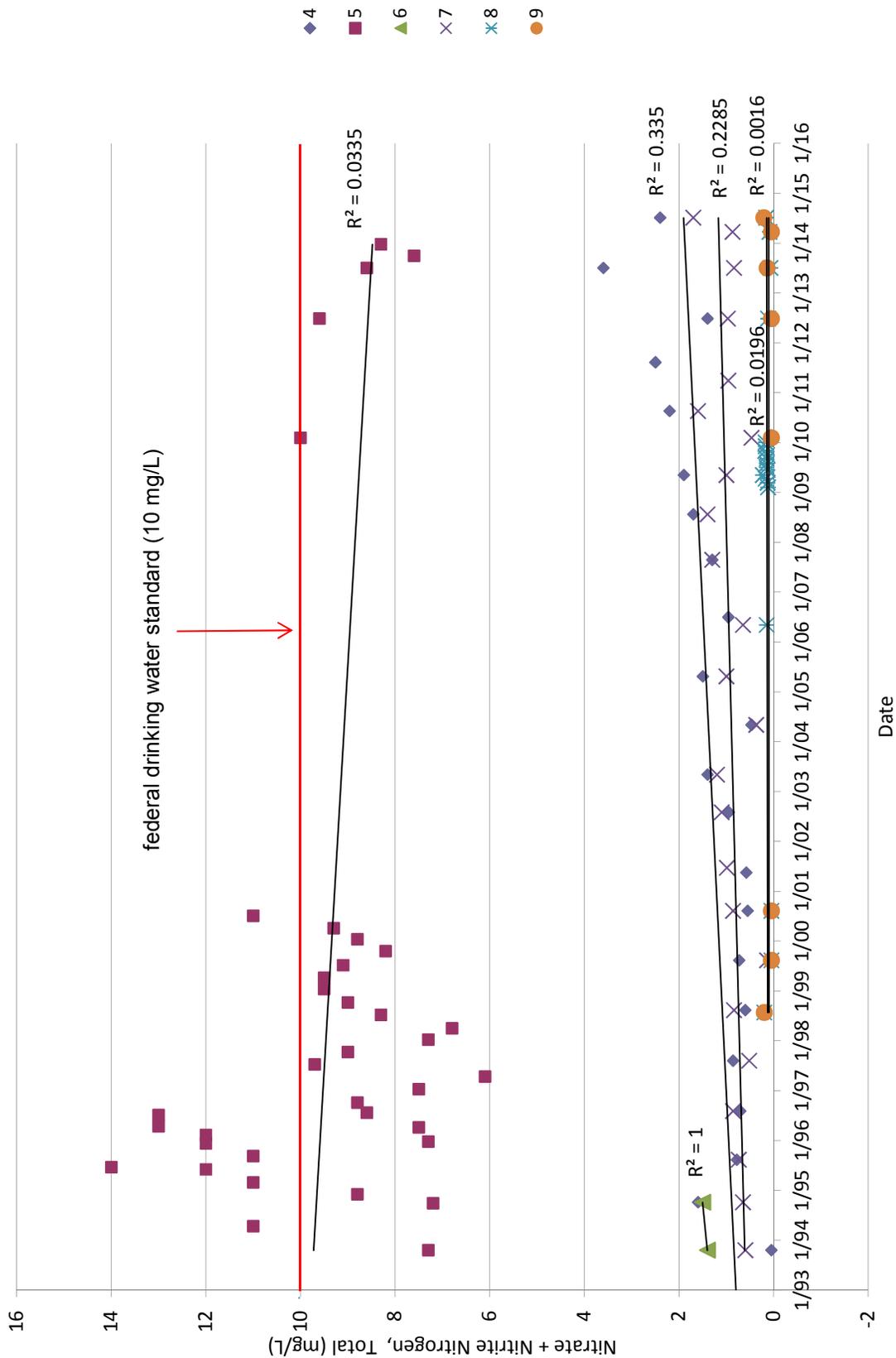
City of Melrose WHPP Part II - Appendix VII

CONSUMER CONFIDENCE REPORT

PWSID: 1730016

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 18004264791.

Nitrate + Nitrite Nitrogen, Total (mg/L) Concentrations in Public Water Supply wells at Melrose, Minnesota



City of Melrose WHPP Part II - Appendix VIII



Minnesota Department of Health Environmental Health in Minnesota

MDH Public Water Supply Sources Report

PWSID: **1730016**
 PWS Name: **Melrose**
 PWS Type: **Community**
 PWS Status: **Active**

Public Water Supply Sources: Information from MNDWIS and CWI (sorted by Sample Point ID)

Source Type Codes: **GW** = Ground water; **SW** = Surface water; **GUI** = Ground water under influence

Location Source: **MGS** = digitized by the MN Geological Survey; * indicates incomplete records

O* = duplicate in Unverified Well Data; **R*** = duplicate in MNDWIS PWS Sources Removed from Flow; **S*** = duplicate in MNDWIS PWS Sources in Flow;

MNDWIS PWS SOURCES IN FLOW														
Source Info						MNDWIS Data				CWI Data				
Sample Point ID	Name	Type	Availability	Status	Well No. (link to Well Log(s))	Location Info (link to Map)	Drill Year	Depth (in feet)	Case Depth (in feet)	Case Diam. (in inches)	Drill Date	Depth Completed (in feet)	Case Depth (in feet)	Case Diam. (in inches)
S02	Well #4	GW	Primary	Active	215113 O*	04/30/1999 (M. Howe)	1967	128	98	16	09-00-1967	128.00	98.00	16.00
S03	Well #5	GW	Primary	Active	180122 O*	04/30/1999 (M. Howe)	1981	87	62	16	07-23-1981	87.00	18.00	0.00
S05	Well #7	GW	Primary	Active	486430	04/30/1999 (M. Howe)	1991	105	83	16	04-28-1991	105.00	83.00	16.00
S07	Well #8	GW	Primary	Active	608438	08/06/2004 (M. Howe)	1998	100	75	16	07-31-1998	100.00	75.00	16.00
S08	Well #9	GW	Primary	Active	608424	04/30/1999 (M. Howe)	1998	85	67	16	07-31-1998	85.00	67.00	16.00

MNDWIS PWS SOURCES REMOVED FROM FLOW														
Source Info						MNDWIS Data				CWI Data				
Sample Point ID	Name	Type	Availability	Status	Well No. (link to Well Log(s))	Location Info (link to Map)	Drill Year	Depth (in feet)	Case Depth (in feet)	Case Diam. (in inches)	Drill Date	Depth Completed (in feet)	Case Depth (in feet)	Case Diam. (in inches)
S01	Well #2	GW	Not in Use	Inactive	215114 O*	01/01/1990 ()	1957	106	76	0	00-00-1957	106.00	76.00	16.00
S04	Well #6	GW	Sealed	Inactive	436032 O*	09/23/1999 (M. Howe)	1987	77	51	0	09-24-1987	76.00	51.00	16.00

MNDWIS and CWI data value discrepancies in preceding tables are shown in **RED** (0 or null values excepted).

Unverified Wells

The following tables show information on wells whose existence (or previous existence) has not yet been confirmed.

UNVERIFIED Well Data													
Well Search Reference	Name(s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
A	Well No. 1		35.0	35.0		12.0	Before 1934	Cable Tool/Bored				In pumping stn. at 4th St. & 3rd Ave.	Ref.: 1934 MDH San. Rpt.

City of Melrose WHPP Part II - Appendix VIII

UNVERIFIED Well Data													
Well Search Reference	Name(s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
B	Well No. 2		35.0	35.0		12.0	Before 1934	Cable Tool/Bored				In pumping stn. at 4th St. & 3rd Ave.	Ref.: 1934 MDH San. Rpt.
C	Well No. 3		31.0	31.0		12.0	1935	Cable Tool/Bored				In 6' deep manhole, 100 ft. E of pumping stn. at 4th St. & 3rd Ave. E.	Ref.: 1935 MDH San. Rpt.
D	Well No. 4		31.0	31.0		12.0	1935	Cable Tool/Bored	1952			In 6' deep manhole, 100 ft. W of pumping stn. at 4th St. & 3rd Ave. E.	Ref.: 1935 MDH San. Rpt.
E	Test Well No. 5						Before 1947	Cable Tool/Bored				In pump house, E part of city. Next to gravel-packed well (F). Unkn. loc'n.	Ref.: 1947 MDH San. Rpt.
F	Well No. 5; Gravel-packed Well						Before 1947	Cable Tool/Bored				In pump house, E part of city. Next to Test Well (E). Unkn. loc'n.	Ref.: 1947 MDH San. Rpt. Not used.
G	Well No. 6		27.0	27.0	20.0	16.0	Before 1948	Cable Tool/Bored				In pump house "directly behind the four wells (A, B, C, D)..."	Ref.: 1948 MDH San. Rpt.
H	Well No. 7 (Dug); Shallow Dug Well		28.0	28.0	28.0	360.0	Before 1949	Dug	1967			"just E of the four old wells"	Ref.: 1949 MDH San. Rpt. Shallow dug well.
I	West No. 1		36.0	36.0	24.0	12.0	1953	Cable Tool/Bored	1957			SE corner of 5th Ave. W & 2nd St. N.	Ref.: 1953 MDH San. Rpt.
J	Nehi Bottling Plant Well; Melrose Bottling Plant												Ref.: 1954 MDH San. Rpt. Inter-connection broken.

City of Melrose WHPP Part II - Appendix VIII

UNVERIFIED Well Data													
Well Search Reference	Name(s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
K	Litchfield Produce Co. Well												Ref.: 1954 MDH San. Rpt. Inter-connection exists.
L	Melrose Creamery						Before 1954					On S. 5th Ave. E, south of Main St.	Ref.: 1954 MDH San. Rpt. Inter-connection exists. This creamery was formerly located N of the Sauk R. and a well may exist at that location also.
M	Hospital Well						Before 1956						Ref.: 1956 MDH San. Rpt. Inter-connection bet. hospital supply & city supply. Supply assumed to be a well.
N	West No. 2		36.0	36.0	21.0	12.0	Before 1956	Cable Tool/Bored			1957	Lots 6 & 7, Blk. 14 of Great Northern Addn., 60 ft. SE of West No. 1 Well.	Ref.: 1956 MDH San. Rpt.
O	South No. 1	215116	54.0	54.0	32.0	10.0	1956	Cable Tool/Bored				0.3 miles S of city limits along E side of Co. Rd. 73 at point at least 50 ft. from E road ROW.	Ref.: 1956 MDH San. Rpt.
P	South No. 2	215114 R*	106.0	106.0	76.0	16.0	1956	Cable Tool/Bored				0.2 mi. S of South No. 1 Well.	Ref.: 1956 MDH San. Rpt.
Q	South No. 3	215115	86.0	86.0	60.0	16.0	1962					Between South No. 1 & 2.	Ref.: 1962 MDH San. Rpt.
R	Well No. 4	215113 S*	130.0	130.0	100.0	16.0	1968	Cable Tool/Bored				E of Wells 2 & 3.	Ref.: 1968 MDH San. Rpt.

City of Melrose WHPP Part II - Appendix VIII

UNVERIFIED Well Data													
Well Search Reference	Name(s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
S	Well No. 5	180122 S*	87.0	87.0	62.0	16.0	1981						Ref.: 1982 MDH San. Rpt.
T	Well No. 6; H177023	436032 R*	86.0	76.0	51.0	16.0	1987			Y	2001		Ref.: MDH WELLS database. Sealing record H177023.
U	1909 Well						Before 1909	Cable Tool/Bored				Water Works, "S. 1st Ave. W." & north of "W. Main St."	Ref.: 1909 Sanborn historical map.
V	H163950		14.0	14.0	12.0	144.0				Y	2000	126-33-34 SE/NE/SE. "211 E. 1st St. N."	Ref.: WELLS database. H163950. Was this well really 12 ft. diam.? Is this seal. rec. for the Nehi Bottling Plant well?
W	Kraft Foods Well						Before 1949						Ref.: 1949 MDH City Well files mention inter-connection between Kraft well and city supply.
X	Melrose Co-op Creamery						Before 1909					N. 4th Ave. E and E 5th St. N. No. of Sauk R.	Ref.: 1909 Sanborn Map. MGS City Well files (1949). Different from "Melrose Creamery". Did well exist here?? Can city help?
Databases Searched					Remarks								
County Well Index (1-mile radius); MDH DWP Microfiche; MDH 1988-2002 Muni Well Inventory (1Suite); Lakesnwoods.com; Biennial Report of the MN State Dairy and Food Commissioner-1907; Minnesota Geological Survey City Well File Folders; MGS Bulletin					This Unverified Municipal Well Inventory is as complete and thorough as possible, given available documentation. However, MDH Planners and Hydros, as well as City representatives should feel free to add or subtract from this report as necessary. The city of Melrose in Millwood and Grove Twps, platted in 1871, was the terminus of the railroad from 1872, until 1878. It was first incorporated in 1881 as a city. It had a station of the Great Northern Railway. There were reportedly four creameries in Melrose in 1907: the								

City of Melrose WHPP Part II - Appendix VIII

UNVERIFIED Well Data													
Well Search Reference	Name(s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
(22, 27, 31, or 32); MN Historical Society-Collections Online; MNBrew.com (breweries); MDH DWP MNDWIS; Past and Present MN Railroad Stations; Sanborn Fire Insurance Maps; MDH WELLS													<p>Melrose Creamery, the St. Rose Creamery, Meter Brove Co-op Creamery, & Farmers Co-op Creamery. The two identified in the Sanborns and MDH Inspection Rpts reviewed for this report were the Melrose Co-op Creamery, located north of the Sauk R. on N. 4th Ave. E., and the Melrose Creamery (1900 & 1909 Sanborn maps indicates water "supply from spring", but other late sources mention a well), also located north of the Sauk R. on S. 5th Ave. E. According to the MGS City Well file (1949 document), the "Co-op (Melrose) Creamery" had an inter-connection with the city supply. The 1954 MDH Sanitary Rpt. states that the Melrose Creamery had an inter-connection. Unless the creameries' names were confused, this indicates that both creameries had inter-connections with the city's supply. However, Sanborn maps last mentioned the "Melrose Co-op Creamery" in 1914, but continued to mention the Melrose Creamery. 1949 MGS City Well Files mention a "Coop (Melrose) Creamery" inter-connected w/the city supply. Which creamery is being referenced? Unlikely to be "Melrose Co-op Creamery" since no mention of it on Sanborn maps after 1914. This could be a reference to the Melrose Creamery. Can city determine when Melrose Co-op Creamery stopped operating? If it is determined that the Melrose Co-operative Creamery ceased operations before 1949, then the MGS well inter-connection reference is to the Melrose Creamery. The 1894 Sanborn shows a "creamery" located "400 ft. north of the iron bridge", putting it near West Wells 1 & 2. It is possible that this creamery (circa 1894) had a well. The Melrose Creamery moved from north of the Suak R. to south of the river, between 1909 and 1942. It may have had wells in both locations. Can the city investigate? There was reportedly a brewery, operated under a succession of different names (J.M. Hemmisch, Melrose Brewery-Wiesner & Wrede, Hilt & Molitor, & Melrose Brewing Co.), in Melrose from 1896 to 1916. The 1932 MGS Bulletin 22 did not have informaton on city wells in Melrose. Sanborn historical maps show several public and private wells. The 1894 Sanborn shows a railroad water tower/pump house (well) south of the RR tracks, between S 4th Ave. E & 5th Ave. SE. The 1900 Sanborn shows wells at a planing mill, the RR round house east of town, and a brewery. A note on the 1925 Sanborn shows the RR Dug Well still in operation. Information about the dug well at the RR round house was provided to the MDH Well Mgt. unit. The brewery is shown with the "ruins" of an older brewery. The older brewery may have had a well also. Can the city investigate? West No. 1 & 2 wells appear to be near the Kraft Food well (215111, drilled in 1972). Could the Kraft well be the same as West No. 1 or 2? 1949 MGS City Well Files mention an inter-connection between a Kraft well and the city water supply. Since the current Kraft well was drilled in 1972, a previous Kraft well must have existed. Can the city locate this well. Private wells that have been inter-connected with city's water supplies are eligible for MDH grant sealing funding.</p>
Unverified Well Data Compiled By: Geoffery Nash Compiled Date: 1/30/2014 1:32:32 PM													

Source: MN Dep't. of Health - 2/4/2014

City of Melrose WHPP Part II - Appendix VIII

Use of MDH Public Water Supply Sources Report

The report you have received shows three classes of Public Water Supply wells:

- In Use (actively used)
- Removed From Flow (for back-up or emergency use; may be disconnected from PWS)
- **Unverified Wells (unused wells with no documented location, unique ID number, and/or well sealing record)**

Unverified wells are unsealed, abandoned wells. These wells pose a risk of contamination to existing wells and aquifers. According to State Well Code and under the terms of your Wellhead Protection Plan, your PWS may need to identify, locate, and properly seal Unverified Wells within your Drinking Water Supply Management Area, to current MDH standards. While historical records may indicate that some of these wells were "capped", "abandoned", or "sealed" in the past, unless it can be shown that the sealing was performed to current standards, they may need to be located, cleaned out, and sealed properly with a well sealing record issued.

The report lists database references that were searched to compile the report. Under "Remarks" are notes and questions to help you with this process. State grant funding is available to help fund sealing of these old public water supply wells.

If you have questions, please talk to your MDH Planner or Hydrologist to address your PWS's specific issues. This report is not intended to be the "last word" on the status of unverified wells and your input will be critical in successfully finding and sealing these potential sources of contamination.

Restart

City of Melrose WHPP Part II - Appendix VIII

SUPERSEDED...FOR REFERENCE ONLY

City of Melrose (PWSID 1730016, Stearns County)

Well Sequence (in record)	Well Name	Unique #	Casing Diameter (inches)	Well Depth (feet)	Cased Depth (feet)	Year Constructed	Well Type	Year Out of Service	Sealing Record #	Location
1	Sauk River Intake		9			<1922		1935: Intake has been removed		
2	Well Number (No.) 1		12	35		1934	Drilled	1956: Disconnected and plugged		At the pumping station at Fourth Street and Third Avenue East
3	Well No. 2		12	35		1934	Drilled	1956: Disconnected and plugged		At the pumping station at Fourth Street and Third Avenue East
4	Well No. 3		12	31		1935	Drilled	1957: Disconnected and plugged		100 feet East of the pumping station
5	Well No. 4		12	31		1935	Drilled	1952: Disconnected from the system		100 feet West of the pumping station
6	Test Well					1947		1948: Abandoned and Capped		Eastern part of the city; next to a gravel packed well
7	Well No. 5					1947		1948: Abandoned and Capped		Eastern part of the city; next to a gravel packed well
8			16	27	20	1948	Drilled	1954: Disconnected; 1956: Abandoned and plugged		Directly behind the pumping station housing Wells No.1-4
9	Cistern Well		360	28		1949	Dug	1967: Permanently Disconnected		Just East of the pumping station housing Wells No.1-4
10	West No. 1		12	36	24	1953	Drilled	1957: Permanently Abandoned		At the Southeast corner of Fifth Avenue West and Second Street North

SUPERSEDED...FOR REFERENCE ONLY

City of Melrose WHPP Part II - Appendix VIII

SUPERSEDED...FOR REFERENCE ONLY

City of Melrose (PWSID 1730016, Stearns County)

Well Sequence (in record)	Well Name	Unique #	Casing Diameter (inches)	Well Depth (feet)	Cased Depth (feet)	Year Constructed	Well Type	Year Out of Service	Sealing Record #	Location
11	West No. 2		12	36	21	1956	Drilled	1957: Permanently Abandoned		60 feet Southeast of Well No. 1; on lots 6 & 7 of Block 14, Great Northern Addition
12	South No. 1	215116	10	54	32	1957	Drilled			0.3 miles South of the city limits along the East side of County Aid Road No. 73
13	South No. 2	215114	16	106	76	1957	Drilled	1994: Abandoned		0.2 miles South of Well South No. 1
14	South No. 3	215115	16	86	61	1962	Drilled			Between Wells South No. 1 and South No. 2
15	Well No. 6	436032	16	77	51	1987	Drilled	2001	yes	H177023
16	Nehi Bottling Plant Well					<1954	Unknown			Cross-connection with City well mentioned in 1954 MDH Sanitary Report
17	Litchfield Produce Co. Well					<1954	Unknown			Cross-connection with City well mentioned in 1954 MDH Sanitary Report
18	Melrose Creamery Well					<1954	Unknown			Cross-connection with City well mentioned in 1954 MDH Sanitary Report
<p>Databases Searched: MDH District files MDH DPW Microfiche (1922-87) MDH DWP MNDWIS, WELLS & 1 Suite MGS, Bulletin 31 So. MN (1944) or Bulletin 32 No. MN (1947) Lakeswoods.com & Biennial Report of the MN State Dairy and Food Commissioner, Volume 11, 1907 MNBrew.com (breweries) This list does not include those wells currently, Permanent, Active Compiled by: G. Nash (2012) Date: 2006 & 6/1/2012</p> <p>MELROSE Township, settled in 1857 and organized in 1866. The city of Melrose in Millwood and Grove Townships, platted in December 1871, was the terminus of the railroad from November 18, 1872, until 1878, was first incorporated in 1881 and in 1896 as a city and received a city charter in 1898. Melrose had a station of the Great Northern Railway. In 1907, the city had four creameries in operation: Melrose Creamery, St. Rose Creamery, Meier Brove Co-operative Creamery Co., and the Farmers Co-operative Creamery. A brewery was also in operation in 1938. Other businesses included a turkey plant and a Kraft Foods facility.</p>										

SUPERSEDED...FOR REFERENCE ONLY

City of Melrose WHPP Part II - Appendix VIII

SUPERSEDED...FOR REFERENCE ONLY

PWSID: **1730016**
 PWS Name: **Melrose**
 PWS Type: **Community**
 PWS Status: **Active**

Public Water Supply Sources: Information from MNDWIS and CWI (sorted by Sample Point ID)

Source Type Codes: **GW** = Ground water; **SW** = Surface water; **GUI** = Ground water under influence

Location Source: **MGS** = digitized by the MN Geological Survey; * indicates incomplete records

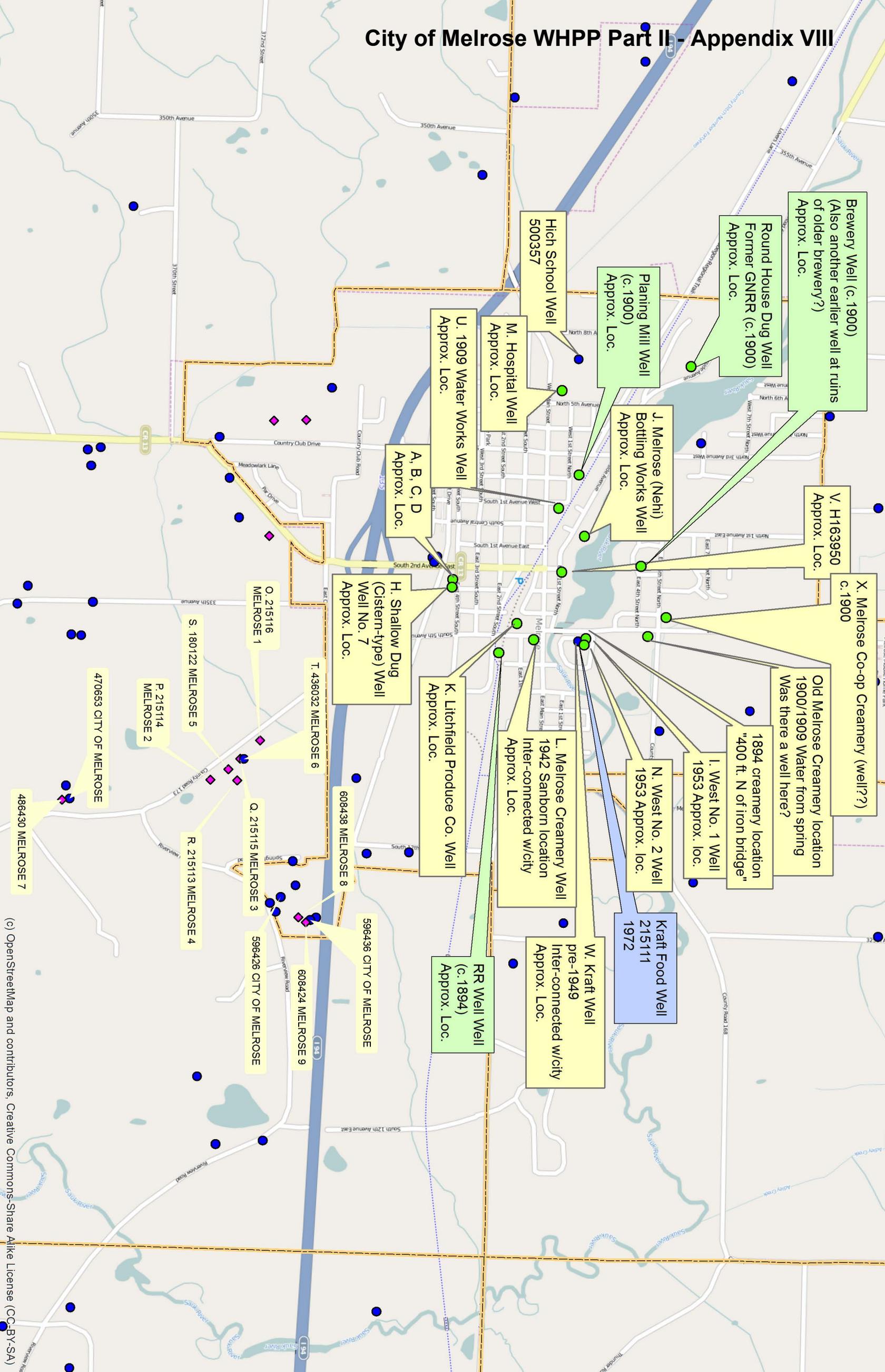
Values in **RED** indicate discrepancies between MNDWIS and CWI (0 or null values excepted).

SOURCES IN FLOW														
Source Info						MNDWIS Data				CWI Data				
Sample Point ID	Name	Type	Avail-ability	Status	Well No. (link to Well Log(s))	Location Info (link to Map)	Drill Year	Depth (in feet)	Case Depth (in feet)	Case Diam. (in inches)	Drill Date	Depth Completed (in feet)	Case Depth (in feet)	Case Diam. (in inches)
S02	Well #4	GW	Primary	Active	215113	04/30/1999 (M. Howe)	1967	128	98	16	09-00-1967	128.00	98.00	16.00
S03	Well #5	GW	Primary	Active	180122	04/30/1999 (M. Howe)	1981	87	62	16	07-23-1981	87.00	18.00	0.00
S05	Well #7	GW	Primary	Active	486430	04/30/1999 (M. Howe)	1991	105	83	16	04-28-1991	105.00	83.00	16.00
S07	Well #8	GW	Primary	Active	608438	08/06/2004 (M. Howe)	1998	100	75	16	07-31-1998	100.00	75.00	16.00
S08	Well #9	GW	Primary	Active	608424	04/30/1999 (M. Howe)	1998	85	67	16	07-31-1998	85.00	67.00	16.00
SOURCES REMOVED FROM FLOW														
Source Info						MNDWIS Data				CWI Data				
Sample Point ID	Name	Type	Avail-ability	Status	Well No. (link to Well Log(s))	Location Info (link to Map)	Drill Year	Depth (in feet)	Case Depth (in feet)	Case Diam. (in inches)	Drill Date	Depth Completed (in feet)	Case Depth (in feet)	Case Diam. (in inches)
S01	Well #2	GW	Not in Use	Inactive	215114	01/01/1990 (MGS)	1957	106	76	0	00-00-1957	106.00	76.00	16.00
S04	Well #6	GW	Sealed	Inactive	436032	09/23/1999 (M. Howe)	1987	77	51	0	09-24-1987	76.00	51.00	16.00

Source: MN Dep't. of Health - 6/1/2012

SUPERSEDED...FOR REFERENCE ONLY

City of Melrose WHPP Part II - Appendix VIII



Brewery Well (c. 1900)
(Also another earlier well at ruins of older brewery?)
Approx. Loc.

Round House Dug Well
Former GNRR (c. 1900)
Approx. Loc.

Planing Mill Well
(c. 1900)
Approx. Loc.

J. Melrose (Nehi) Bottling Works Well
Approx. Loc.

High School Well
500357

M. Hospital Well
Approx. Loc.

U. 1909 Water Works Well
Approx. Loc.

A, B, C, D
Approx. Loc.

V. H163950
Approx. Loc.

X. Melrose Co-op Creamery (well??)
c. 1900

Old Melrose Creamery location
1900/1909 Water from spring
Was there a well here?

1894 creamery location
"400 ft. N of iron bridge"

I. West No. 1 Well
1953 Approx. loc.

N. West No. 2 Well
1953 Approx. loc.

Kraft Food Well
215111
1972

L. Melrose Creamery Well
1942 Sanborn location
Inter-connected w/city
Approx. Loc.

K. Litchfield Produce Co. Well
Approx. Loc.

RR Well Well
(c. 1894)
Approx. Loc.

H. Shallow Dug (Cistern-type) Well No. 7
Approx. Loc.

T. 436032 MELROSE 6

O. 215116 MELROSE 1

S. 180122 MELROSE 5

P. 215114 MELROSE 2

470653 CITY OF MELROSE

486430 MELROSE 7

Q. 215115 MELROSE 3

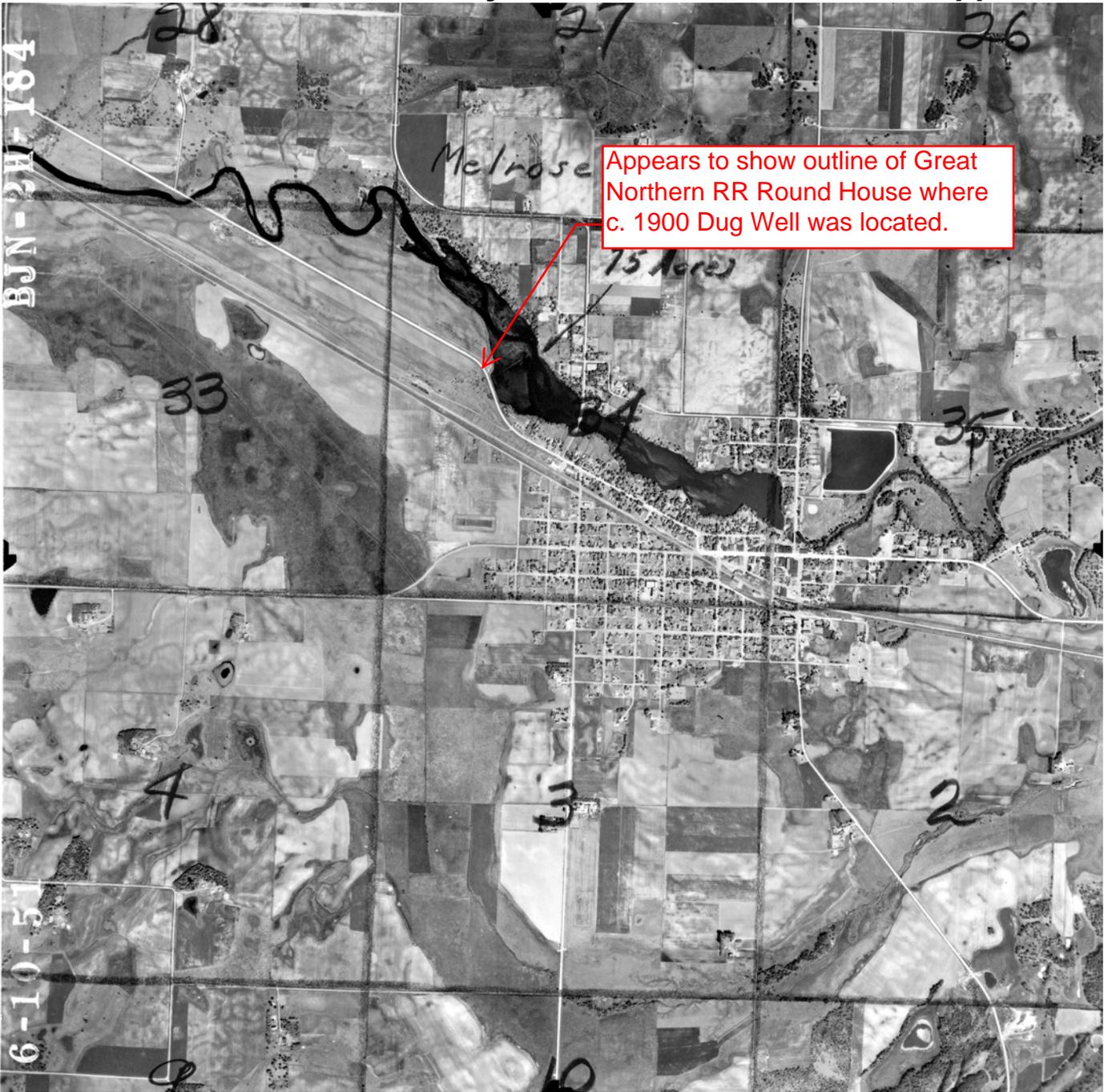
R. 215113 MELROSE 4

608438 MELROSE 8

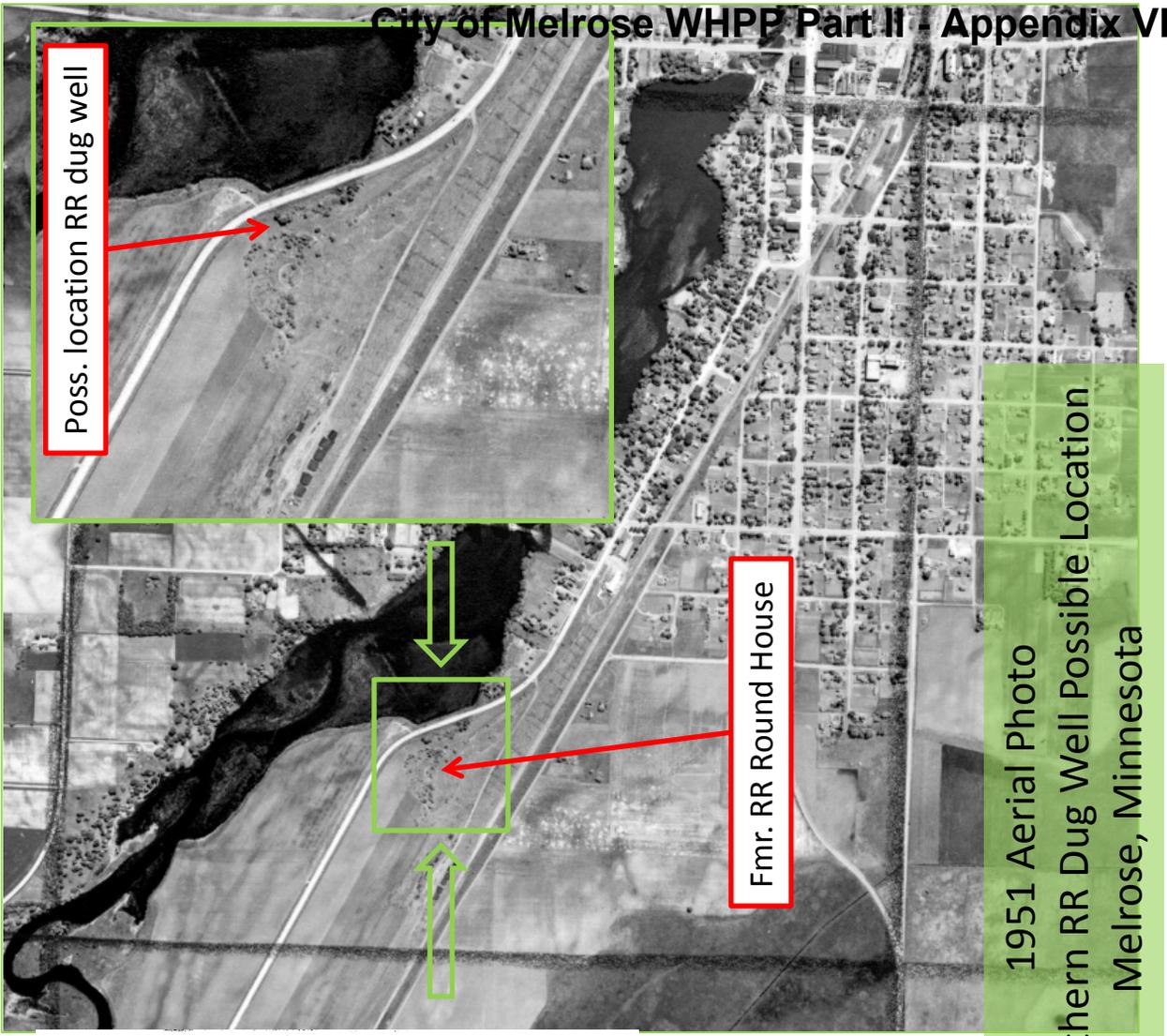
596436 CITY OF MELROSE

608424 MELROSE 9

City of Melrose WHPP Part II - Appendix VIII

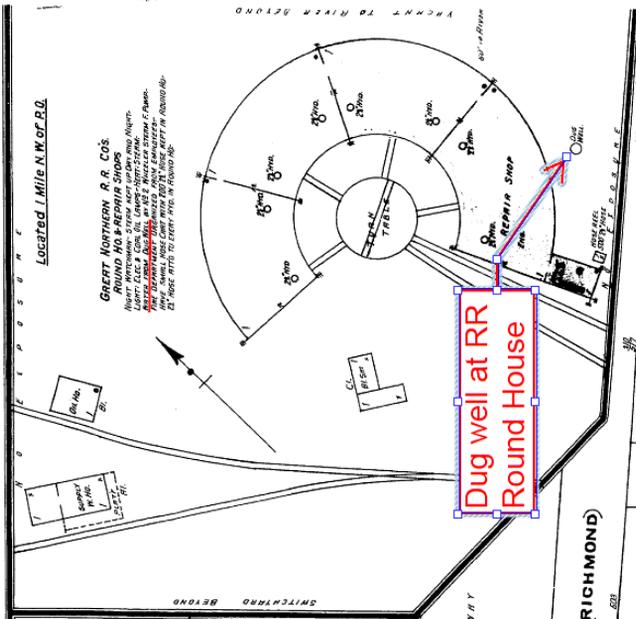


1951 Aerial Photo
Minnesota Historical Aerial Photographs Online



1951 Aerial Photo
Great Northern RR Dug Well Possible Location
Melrose, Minnesota

Source: Minnesota Historical Aerial Photographs Online
<https://www.lib.umn.edu/apps/mhapo/>
G. Nash, MDH



Source: 1909 Sanborn Map

City of Melrose WHPP Part II - Appendix VIII



City of Melrose WHPP Part II - Appendix IX



MINNESOTA DEPARTMENT OF TRANSPORTATION
Engineering Services Division
Technical Memorandum No. 11-10-M-02
April 20, 2011

To: Electronic Distribution Recipients
From: Bernard J. Arseneau, P.E., PTOE
Deputy Commissioner/Chief Engineer
Subject: Roadway Incident Procedure
Vehicle Fluid and Cargo Spill Response

Expiration

This new Technical Memorandum replaces Maintenance Bulletin 97-1 and Mn/DOT Policy Guideline, Multimodal No. 89-1-G-1 and shall remain in effect until April 20, 2016 unless superseded prior to that date or incorporated into the Mn/DOT Maintenance Manual.

Implementation

The guidelines in the Technical Memo shall be used immediately.

Introduction

Mn/DOT personnel frequently respond to incidences where motor vehicle fluid and/or cargo spills have occurred. At these scenes, vehicle fluids and fuels such as antifreeze, gasoline and/or diesel fuel may be found on the roadway or its shoulder. Ignition of vehicle fuels could prevent rescue and cause severe burns or fatalities. Roadway lanes remain closed until vehicle fluid spills are remediated, impeding the flow of traffic. Unrecovered spills will contaminate Mn/DOT right of way.

This procedure provides guidance for responding quickly to vehicle fluid spills and loss of cargo in order to protect motorist safety, minimize impacts to the environment, ensure proper cleanup and open the roadway to travel. This procedure should be used in conjunction with the State of Minnesota "Open Roads Policy" which is an agreement between the Minnesota State Patrol and Mn/DOT for quick clearance of the state highway system and the Minnesota "Quick Clearance Statute" found in [Minn.Stat. §169.041, Subd. 5a.](#)

Mn/DOT personnel may discover abandoned containers on roadway right of way where no motor vehicle incident has occurred. Proper management of abandoned containers is described in Mn/DOT Technical Memorandum No. 10-08-ENV-02.

Mn/DOT response to spills and abandoned containers may differ from procedures described in this document when the incident occurs on state highways located within tribal reservation boundaries. Consult with the Mn/DOT Office of Environmental Services to determine proper, current procedures for responding to incidents within tribal reservations.

Purpose

The intent of this procedure is to provide guidance for Mn/DOT employees responding to roadway incidents on how to properly and safely handle materials in order to open roadways for traffic. This procedure should be applied to spills at traffic incidents where there is an identified responsible party(ies) who will be responsible for all costs associated with the incident or spills. This procedure may also be applied to spills where no responsible party can be identified, likely resulting in Mn/DOT absorbing the cost of cleanup unless another funding source can be identified.

Appropriate spill response actions are determined by considering factors such as the spill location, weather conditions and volume and composition of the spilled substance. This procedure establishes communication protocol necessary to make response action determinations.

-MORE-

City of Melrose WHPP Part II - Appendix IX

Technical Memorandum No. 11-10-M-02
Roadway Incident Procedure
April 20, 2011
Page 2

Guidelines

General Requirements

Emergency response contractors will complete removal of hazardous materials and any other materials that have been determined not safe for Mn/DOT personnel to handle. Emergency response contractors may be brought to the scene by Mn/DOT personnel, the Minnesota Pollution Control Agency on-call person (MPCA), Minnesota Department of Agriculture on-call person (MDA), other incident responders or a party responsible for the incident (*see Retaining an Emergency Response Contractor*). Mn/DOT personnel may handle the following materials to open the roadway to traffic:

- motor vehicle fluids, which include gasoline, diesel fuel, hydraulic fluid, transmission fluid, engine oil and coolant.
- intact cargo containers that do not contain hazardous or otherwise dangerous materials.
- ruptured containers or packages and associated released contents that are not hazardous and determined not to be dangerous because of the material content or volume released.

Mn/DOT shall not handle any of the following items under any circumstance:

- intact or ruptured cargo containers or packages of hazardous materials or materials determined to be dangerous.
- Mn/DOT personnel shall not perform removal or cleanup of released material along the roadway that is not obstructing travel. Cleanup of this material will be completed by a contractor (*see Retaining an Emergency Response Contractor*). Mn/DOT personnel should monitor the cleanup operation to ensure that department requirements are met (*see Cleanup off the Traveled Portion of Roadway*).

Spilled fluids recovered with sorbent and cargo removed from the traveled roadway will be stored in the right of way in the proximity of the incident and not brought back to any Mn/DOT facility, except under extreme circumstances (*see Roadway Clearance*). A contractor will remove and manage final disposition of the waste material (*see Retaining an Emergency Response Contractor*).

Mn/DOT Personnel Requirements

Training

- Mn/DOT employees responding to incidents covered by this policy must receive Mn/DOT's annual Right-To-Know training that includes instruction in how to manage spilled vehicle fluids and recognize hazardous or dangerous materials.

Safety

- Personnel will use required personal protective equipment
- Safe work practices will be followed during assessment of the incident scene and application of containment materials.
- Proper personal hygiene practices and decontamination procedures will be followed after exposure to spilled substances.

Response Procedure

Arriving at the Incident

When Mn/DOT is the first to arrive at a vehicle incident, the employee will evaluate the situation, notify the Dispatcher or other personnel designated by the district office and request the following as needed:

- State Patrol, local police or other emergency services personnel
- Subarea Supervisor
- Additional traffic control
- District Safety Administrator
- Trained Mn/DOT personnel, if not already on site, for containment of vehicle fluid spills and cargo removal (*see Roadway Clearance*)

-MORE-

City of Melrose WHPP Part II - Appendix IX

Technical Memorandum No. 11-10-M-02
Roadway Incident Procedure
April 20, 2011
Page 3

If the evaluation determines that hazardous materials are present at the scene or the situation is dangerous because of the material content or volume released, an emergency response contractor must perform all operations to open the travel lanes:

- The emergency response contractor will be retained by Mn/DOT, MPCA, MDA, another incident responder or the responsible party to assume complete control and cleanup responsibilities (*see Retaining an Emergency Response Contractor*). Mn/DOT personnel are then relieved of all work involving cleanup of the spilled materials in the travel lanes.
- Mn/DOT personnel should continue to monitor the incident response and provide traffic control until the incident response is complete.

When Mn/DOT is called to a motor vehicle accident scene:

- Determine the appropriate amount of sorbent or containment products that are needed for containment of fluid spills (*see Roadway Clearance*).

Roadway Clearance

The following procedure should be followed when Mn/DOT personnel complete actions to open the roadway or until such time when Mn/DOT is relieved by an emergency response contractor:

Fluid Spills

- If needed deploy necessary traffic control
- Ensure that the appropriate Maintenance subarea supervisor has been notified
- Inform Dispatch or other personnel designated by the district office of identity of responsible party or parties for the accident.
- Ensure that the Duty Officer has been notified at 1-800-422-0798 or 651-649-5451 in the Twin Cities Metro Area.
- If there is a motor vehicle fluid spill, assess the spill to determine the types and amount of fluid spilled and determine safety precautions needed.
 - Determine a safe working distance in relation to motor vehicle fluid type, quantity of the spill and presence of nearby sources of ignition.
 - Use appropriate type and amount of sorbent and containment products to safely and effectively absorb and contain spilled vehicle fluids
- Only trained personnel shall contain vehicle fluid spills and move nonhazardous cargo containers (*see Mn/DOT Personnel Requirements*).
- The contained fluids or contaminated sorbent materials shall be removed from the traveled portion of the roadway and relocated to a safe location on site for pickup by responsible party or their agent.
- The contaminated materials shall be protected from the elements and marked with traffic cones.
- Contaminated material, including soil, sand and sorbents must not be thinspread anywhere on the highway right of way or brought to any Mn/DOT facility/site for storage. Possible exceptions to bringing contaminated material to a Mn/DOT facility for storage prior to disposal are:
 - extreme weather conditions that prevent storing at the incident scene or
 - incidents in urban areas where nearby storage space is not available.
- Monitor the situation and apply additional sorbent and/or containment products as necessary.
- If not picked up in a timely manner, the contaminated materials shall be protected from the elements and if necessary, marked with traffic cones.

Cargo

- If cargo has been released from a vehicle(s), take appropriate action as follows:
 - Do not handle cargo that contains hazardous or dangerous material. Notify the dispatcher or other personnel designated by the district office that an emergency response contractor is needed to handle the cargo.
 - Ensure that the Duty Officer has been notified of any release of hazardous

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City of Melrose WHPP Part II - Appendix IX

Technical Memorandum No. 11-10-M-02
Roadway Incident Procedure
April 20, 2011
Page 4

material cargo at 1-800-422-0798 or 651-649-5451 in the Twin Cities Metro Area.

- Remove the following cargo from the traveled portion of the roadway (per Open Roads policy) and relocate to a safe location near the incident scene for pickup by responsible party or their agent:
 - Intact cargo that does not contain hazardous or dangerous material.
 - Ruptured containers and associated contents that are not hazardous or otherwise dangerous.

Retaining an Emergency Response Contractor

An emergency response contractor shall be retained to complete removal of hazardous materials and any other materials that have been determined not safe for Mn/DOT personnel to handle. Emergency response contractors may be brought to the scene by Mn/DOT personnel, the Minnesota Pollution Control Agency on-call person (MPCA), Minnesota Department of Agriculture on-call person (MDA), other incident responders or a party responsible for the incident. In general, the MPCA will retain a contractor to respond to large petroleum spills and any spills or cargo involving hazardous materials. The following steps should be taken to determine who will retain the emergency response contractor:

- Provide the state duty officer with contact information of a Mn/DOT person at the scene who can help coordinate the contractor response.
- The Mn/DOT contact person should request that the state duty officer connect him/her with the MPCA on-call person in order to determine who will mobilize the contractor or other emergency response team.

Cost Reimbursement

Mn/DOT's costs incurred for cleanup, disposal, repair and all associated costs in responding to the incident will be compiled by the maintenance area involved and billed to the responsible party or the responsible party's insurance carrier. Record the following information to enable Mn/DOT's effort to recover incident response costs:

- The State Patrol event number and yellow tag number if issued.
- The company name and US DOT number of any commercial vehicle operators involved in the incident.

Cleanup off the Traveled Portion of Roadway

Any contaminated soil and/or surface water on highway right of way must be cleaned up in accordance with Mn/DOT Office of Environmental Services procedure (available from OES or District Permits Office). If right of way cleanup cannot be completed at the time of the incident, a permit must be obtained from the local Mn/DOT Permit's Office prior to initiating work. Utility clearance through Gopher State One Call must be completed before any excavation of contaminated soil can take place. Cost to complete the cleanup and dispose of the contaminated soil should be at the expense of the responsible party or parties.

Questions

For information on the technical contents of this memorandum, please contact **Brian Kamnikar** at **(651) 366-3617**.

Any questions regarding publication of this Technical Memorandum should be referred to the Design Standards unit, DesignStandards.DOT@state.mn.us. A link to all active and historical Technical Memoranda can be found at <http://techmemos.dot.state.mn.us/techmemo.aspx>.

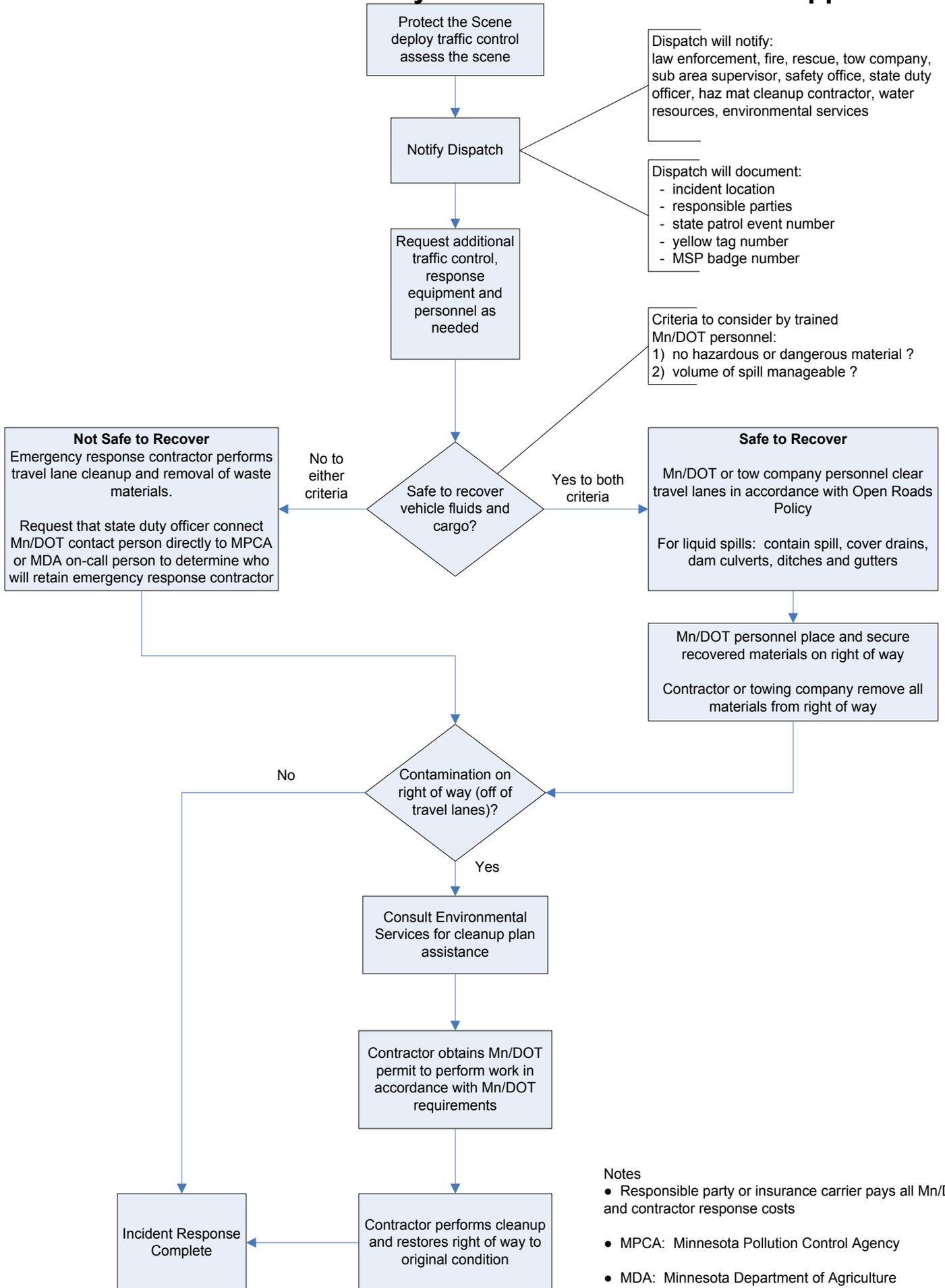
To add, remove, or change your name on the Technical Memoranda mailing list, please visit the web page <http://techmemos.dot.state.mn.us/subscribe.aspx>

Attachments:

Roadway Incident Scene Response Procedure flowchart

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Roadway Incident Scene Response Procedure City of Melrose WHPP Part II - Appendix IX



City of Melrose WHPP Part II - Appendix XI

Glossary of Terms

Data Element. A specific type of information required by the Minnesota Department of Health to prepare a wellhead protection plan.

Drinking Water Supply Management Area (DWSMA). The surface and subsurface areas surrounding a public water supply well, including the wellhead protection area, that must be managed by the entity identified in the wellhead protection plan. (Minnesota Rules, part 4720.5100, subpart 13). This area is delineated using identifiable landmarks that reflect the scientifically calculated wellhead protection area boundaries as closely as possible.

Emergency Response Area (ERA). The part of the wellhead protection area that is defined by a one-year time of travel within the aquifer that is used by the public water supply well (Minnesota Rules part 4720.5250, subpart 3). It is used to set priorities for managing potential contamination sources within the DWSMA.

Emergency Standby Well. A well that is pumped by a public water supply system only during emergencies, such as when an adequate water supply cannot be achieved because one or more primary or seasonal water supply wells cannot be used.

Inner Wellhead Management Zone (IWMZ). The land that is within 200 feet of a public water supply well (Minnesota Rules, part 4720.5100, subpart 19). The public water supplier must manage the IWMZ to help protect it from sources of pathogen or chemical contamination that may cause an acute health effect.

Nonpoint Source Contamination. Refers to contamination of the drinking water aquifer that is caused by polluted runoff or pollution sources that cannot be attributed to a specifically defined origin, e.g., runoff from agricultural fields, feedlots, or urban areas.

Point Source Contamination. Refers to contamination of the drinking water aquifer that is attributed to pollution arising from a specifically defined origin, such as discharge from a leaking fuel tank, a solid waste disposal site, or an improperly constructed or sealed well.

Primary Water Supply Well. A well that is regularly pumped by a public water supply system to provide drinking water.

Seasonal Water Supply Well. A well that is only used to provide drinking water during certain times of the year, either when pumping demand cannot be met by the primary water supply well(s) or for a facility, such as a resort, that is closed to the public on a seasonal basis.

Vulnerability. Refers to the likelihood that one or more contaminants of human origin may enter either 1) a water supply well that is used by the public water supplier or 2) an aquifer that is a source of public drinking water.

WHP Area (WHPA). The surface and subsurface area surrounding a well or well field that supplies a public water system, through which contaminants are likely to move toward and reach the well or well field (Minnesota Statutes, part 103I.005, subdivision 24).

WHP Plan Goal. An overall outcome of implementing the WHP plan, e.g., providing for a safe and adequate drinking water supply.

WHP Measure. A method adopted and implemented by a public water supplier to prevent contamination of a public water supply, and approved by the Minnesota Department of Health under Minnesota Rules, parts 4720.5110 to 4720.5590.

WHP Plan Objective. A capability needed to achieve one or more WHP goals, e.g., implementing WHP measures to address high priority potential contamination sources within 5 years.