SOURCE WATER DELINEATION AND ASSESSMENT REPORT

11/99

City of Malta
Public Water System

PWSID # MT0000284

Date of Report: October 2000

John Demarais
Certified Operator
and
Source Water Protection Contact

P.O. Box 1300
Malta, Montana 59538

phone: (406) 654-1251

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GLOSSARY*

Acute Health Effect. A negative health effect in which symptoms develop rapidly.

Alkalinity. The capacity of water to neutralize acids.

Aquifer. A water-bearing layer of rock or sediment that will yield water in usable quantity to a well or spring.

Barrier. A physical feature or management plan that reduces the likelihood of contamination of a water source from a potential contaminant source

Best Management Practices (BMPs). Methods for various activities that have been determined to be the most effective, practical means of preventing or reducing pollution.

Biennial Reporting System (BRS). An EPA database that contains information on hazardous waste sites. The data can be accessed through the EPA Envirofacts website.

Chronic Health Effect. A negative health effect in which symptoms develop over an extended period of time.

Class V Injection Well. Any pit or conduit into the subsurface for disposal of waste waters. The receiving unit for an injection well typically represents the aquifer, or water bearing interval.

Coliform Bacteria. A general type of bacteria found in the intestinal tracts of animals and humans, and also in soils, vegetation and water. Their presence in water is used as an indicator of pollution and possible contamination by pathogens.

Community. A town, neighborhood or area where people live and prosper.

Confined Animal Feeding Operation (CAFO). Any agricultural operation that feeds animals within specific areas, not on rangeland. Certain CAFOs require permits for operation.

Confined Aquifer. A fully saturated aquifer overlain by a confining unit such as a clay layer. The static water level in a well in a confined aquifer is at an elevation that is equal to or higher than the base of the overlying confining unit.

Confining Unit. A geologic formation present above a confined aquifer that does not allow the flow of water, maintaining the pressure of the ground water in the aquifer. The physical properties of a confining unit may range from a five-feet thick clay layer to a shale that is hundreds of feet thick.

Comprehensive Environmental Cleanup and Responsibility Act (CECRA). Passed in 1989 by the Montana State Legislature, CECRA provides the mechanism and responsibility to clean up hazardous waste sites in Montana.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Enacted in 1980. CERCLA provides a Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Through the Act, EPA was given power to seek out those parties responsible for any release and assure their cooperation in the cleanup. The Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) provides information about specific sites through the EPA Envirofacts website.

Delineation. The process of determining and mapping source water protection areas.

Geographic Information Systems (GIS). A computerized database management and mapping system that allows for analysis and presentation of geographic data.

Hardness. Characteristic of water caused by presence of various calcium and magnesium salts. Hard water may interfere with some industrial processes and prevent soap from lathering.

Hazard. A relative measure of the potential of a contaminant from a facility or associated with a land use to reach the water source for a public water supply. The location, quantity and toxicity of significant potential contaminant sources determine hazard.

Hydraulic Conductivity. A constant number, or coefficient of proportionality, that describes the rate water can move through an aquifer material.

Hydrology. The study of water and how it flows in the ground and on the surface.

Hydrogeology. The study of geologic formations and how they effect ground water flow systems.

Inventory Region. A source water management area for ground water systems that encompasses the area expected to contribute water to a public water supply within a fixed distance or a specified three year ground water travel time.

Leaking Underground Storage Tank (LUST). A release from a UST and/or associated piping into the subsurface.

Maximum Contaminant Level (MCL). Maximum concentration of a substance in water that is permitted to be delivered to the users of a public water supply. Set by EPA under authority of the Safe Drinking Water Act to establish concentrations of contaminants in drinking water that are protective of human health.

Montana Bureau of Mines and Geology – Ground Water Information Center (MBMG/GWIC). The database of information on all wells drilled in Montana, including stratigraphic data and well construction data, when available.

Montana Pollutant Discharge Elimination System (MPDES). Database system to track entities that discharge wastewater of any type into waters of the State of Montana.

National Pollutant Discharge Elimination System (NPDES). A national database system to track entities that discharge wastewater.

Nitrate. An important plant nutrient and type of inorganic fertilizer that can be a potential contaminant in water at high concentrations. In water the major sources of nitrates are wastewater treatment effluent, septic tanks, feed lots and fertilizers.

Nonpoint-Source Pollution. Pollution sources that are diffuse and do not have a single point of origin or are not introduced into a receiving stream from a specific outlet. Nonpoint sources of pollution, such as the use of herbicides, can concentrate low levels of chemicals into surface and/or ground waters at increased levels that may exceed MCLs.

Pathogens. A microorganism typically found in the intestinal tracts of mammals, capable of producing disease.

Point-Source. A stationary location or fixed facility from which pollutants are discharged.

Permit Compliance System (PCS). An EPA database that provides information on the status of required permits for specific activities for specific facilities. The data can be accessed through the EPA Envirofacts website.

Public Water System. A system that provides water for human consumption through at least 15 service connections or regularly serves 25 individuals.

Pumping Water Level. Water level elevation in a well when the pump is operating.

Recharge Region. A source water management region that is generally the entire area that could contribute water to an aquifer used by a public water supply. Includes areas that could contribute water over long time periods or under different water usage patterns.

Resource Conservation and Recovery Act (RCRA). Enacted by Congress in 1976. RCRA's primary goals are to protect human health and the environment from the potential hazards of waste disposal, to conserve energy and natural resources, to reduce the amount of waste generated, and to ensure that wastes are managed in an environmentally sound manner. The Resource Conservation and Recovery Information System (RCRIS) provides information about specific sites through the EPA Envirofacts website.

Secondary Maximum Contaminant Levels (SMCL). The maximum concentration of a substance in water that is recommended to be delivered to users of a public water supply, based on aesthetic qualities. SMCLs are non-enforceable guidelines for public water supplies, set by EPA under authority of the Safe Drinking Water Act. Compounds with SMCLs may occur naturally in certain areas, limiting the ability of the public water supply to treat for them.

Section Seven Tracking System (SSTS). SSTS is an automated system EPA uses to track pesticide producing establishments and the amount of pesticides they produce.

Source Water. Any surface water, spring, or ground water source that provides water to a public water supply.

Source Water Assessment Report. A report for a public water supply that delineates source water protection areas, performs an inventory of potential contaminant sources within the delineated areas, and evaluates the relative susceptibility of the source water to

contamination from the potential contaminant sources under “worst-case” conditions.

Source Water Protection Areas. For surface water sources, the land and surface drainage network that contributes water to a stream or reservoir used by a public water supply. For ground water sources, the area within a fixed radius or three-year travel time from a well, and the land area where the aquifer is recharged.

Spill Response Region. A source water management area for surface water systems that encompasses the area expected to contribute water to a public water supply within a fixed distance or a specified four-hour water travel time in a stream or river.

Static Water Level (SWL). Water level elevation in a well when the pump is not operating.

Susceptibility (of a PWS). The relative potential for a PWS to draw water contaminated at concentrations that would pose concern. Susceptibility is evaluated at the point immediately preceding treatment or, if no treatment is provided, at the entry point to the distribution system.

Synthetic Organic Compounds (SOC). Man made organic chemical compounds (e.g. herbicides and pesticides).

Total Dissolved Solids (TDS). The dissolved solids collected after a sample of a known volume of water is passed through a very fine mesh filter.

Toxic Release Inventory (TRI). An EPA database that compiles information about permitted industrial releases of chemicals to air and water. Information about specific sites can be obtained through the EPA Envirofacts website.

Transmissivity. A number that describes the ability of an aquifer to transmit water. The transmissivity is determined by multiplying the hydraulic conductivity time the aquifer thickness.

Unconfined Aquifer. An aquifer containing water that is not under pressure. The water table is the top surface of an unconfined aquifer.

Underground Storage Tanks (UST). A tank located at least partially underground and designed to hold gasoline or other petroleum products or chemicals, and the associated plumbing system.

Volatile Organic Compounds (VOC). Chemicals such as petroleum hydrocarbons and solvents or other organic chemicals which evaporates readily to the atmosphere.

* Definitions adapted from EPA’s Glossary of Selected Terms and Abbreviations (http://www.epa.gov/ceisweb1/ceishome/ceisdocs/glossary/glossary.html)

INTRODUCTION

This Source Water Delineation and Assessment Report was assembled by James Swierc with the DEQ Source Water Protection Program, based partly on a Wellhead Protection Plan prepared for the system by Bill O'Connell, Ground Water Technician for Montana Rural Water Systems. Assistance for both of these efforts was provided by John Demarais and Stan Wombold, Operators for the Malta PWS (ID# 284). Malta is located in Phillips County, along the Milk River in the area informally referred to as the "Hi-Line" in Montana.

The Montana Source Water Protection Program is intended to be a practical and cost-effective approach to protecting public drinking water supplies from contamination. A major component of the Montana Source Water Protection Program is termed "delineation and assessment". The emphasis of this delineation and assessment report is identifying significant potential contaminant threats to public drinking water sources and providing the information needed to develop a source water protection plan for Malta.

Delineation is a process whereby areas that contribute water to aquifers or surface waters used for drinking water, called source water protection areas, are identified on a map. Geologic and hydrologic conditions are evaluated in order to delineate source water protection areas. Assessment involves identifying locations or regions in source water protection areas where contaminants may be generated, stored, or transported and then determining the potential for contamination of drinking water by these sources.

Delineation and assessment is the foundation of source water protection plans, the mechanism Malta can use to protect their drinking water source. Although voluntary, source water protection plans are the ultimate focus of source water delineation and assessment. This delineation and assessment report is written to encourage and facilitate the Malta operator and the community to complete a source water protection plan that meets their specific needs.

Limitations

This report was prepared to assess threats to the Malta public water supply, and is based on published information and information obtained from local residents familiar with the community. The terms "drinking water supply" or "drinking water source" refer specifically to the source of the Malta public water supply and not any other public or private water supply. Also, not all potential or existing sources of groundwater or surface water contamination in the area of the Malta public water supply are identified. Only potential sources of contamination in areas that contribute water to its drinking water source are considered.

The term "contaminant" is used in this report to refer to constituents for which maximum concentration levels (MCLs) have been specified under the national primary drinking water standards, and to certain constituents that do not have MCLs but are considered to be significant health threats.

CHAPTER 1
BACKGROUND

The Community

The City of Malta is located along the south bank of the Milk River in central Phillips County (Figure 1). The area along the Milk River in north-central and northeastern Montana is informally referred to as the "Hi-Line". Malta is the county seat for Phillips County, and is the largest community within the central part of the Hi-Line. The population of Malta is estimated at 2,209 people in 1998.

Malta is located along several primary regional highways through the area. U.S. Highway 2 runs east-west through the north part of town along the Hi-Line, the major transportation corridor through northern Montana. Railroad track of Burlington Northern-Santa Fe Railroad run roughly parallel to Route 2 across the Hi-Line, and provide commercial transportation service to Malta. U.S. Highway 191 runs southwest from Malta towards Billings and Lewistown. The local economy relies heavily on the agriculture, government as the local county seat and center of government, the petroleum industry, and businesses in the area.

Wastewater from the community is collected in a sanitary sewer system. The sewer systems discharge to treatment ponds located north of the town (Figure 1).

Geographic setting

Malta is located in the northern glaciated plains region of central Montana, in the Glaciated Missouri Plateau section of the Great Plains Province. The area around Malta is relatively flat within the Milk River floodplain, with rolling hills outside of the floodplain. The approximate elevation of Malta is 2,255 feet above mean sea level, with elevation on the hills surrounding Malta ranging from 2,374 feet immediately south of town up to approximately 2,500 feet several miles further south. Malta is located in Sections 17 and 18 of Township 30 North, Range 30 East at approximately 48.3570°North latitude and 107.8701°West longitude.

The Milk River flows in an eastern to northeastern direction through Malta, and is part of the lower Missouri River watershed management region for Montana. The headwaters of the Milk River are located in Glacier National Park, in the Rocky Mountains of Montana west of Malta. The river flows generally eastward; however it crosses into Canada before flowing back into Montana west of Havre. The Milk River flows east towards Malta, and through the northern part of town, with flow away from town to the northeast (Figure 1). The Dodson south irrigation canal flows along the southern margin of the Milk River floodplain, including the southern part of Malta. The Dodson canal channels water from the Milk River, with the diversion dam located in Dodson approximately 17 miles east of Malta.

The climate in the area is typical for north central Montana. Malta receives an average of 12.56 inches of annual precipitation. The wettest months are May and June averaging 1.81 and 3.13 inches monthly. The driest months are November and February, both averaging 0.38 inches per month. Snowfall in Malta averages approximately 25.6 inches per year. The average temperature ranges from a high of 86.2°F in July (minimum July average of 55.5°F) to a low of 22.1°F in January (minimum January average of –0.7°F).

General description of the Source Water

The Malta PWS obtains water from four wells installed into Milk River alluvial deposits in the south part of the town (Figure 1). The wells draw water from below an approximate depth of 57 feet below the ground surface. Ground water flow through town is not well understood; however it is considered likely to flow in a general north to northeastern direction. The aquifer is considered likely to be in communication with the Milk River and potentially the South Dodson irrigation canal. However, the nature of this interaction has not been evaluated in detail.

The Public Water Supply

The Malta PWS currently serves an estimated population of 2,340 with 1,074 active service connections. The wells are located as shown in Figure 1. The active wells are referred to as Well #4 – Robinson Well (Source 005), Well #5 – Legg Well (Source 006), Well #6 – New Pool Well (Source 007), and Well #7 – New Catholic School Well (Source 008). The active wells have replaced two older source wells which have been deleted as sources; Well #1 – Old Swimming Pool Well (Source 002), and Well #2 – Old Catholic School Well (Source 003). A well on the north side of town, Well #3 – Farmers and Ranchers Well (Source 004), is classified as an inactive source well and is currently used for irrigation.

Water from the active source wells is treated with equipment at each wellhead, with sequestration for manganese removal, and hypochlorination for disinfection. After treatment, the water is pumped into the distribution system, with excess water pumped to a 500,000 gallon storage tank located on a hill south of Malta. A general plan showing the layout of the distribution system is presented in Appendix A, with the sanitary survey for the system. The well logs for the PWS wells are included in Appendix B.

Water Quality

Every PWS is legally required to monitor their water supply for contamination. The monitoring parameters include coliforms and other signs of pathogenic organism, nitrates, metals, and various chemicals. The monitoring schedule depends on many factors such as the size and source water for a PWS, the number of sources (e.g. wells), and the population served. Each PWS has a specific monitoring program designed for their system following the general protocols for operation of a PWS as defined by DEQ. A review of the monitoring results for the Malta PWS in the DEQ PWS database indicates no violations of any drinking water quality standards.

Background water quality data for the Malta area is listed in Table 1. This data was obtained from the Malta PWS; however, the sample locations and date of sample collection has not been identified. Based on this data, shallow ground water in the Malta area is interpreted to be a sodium-sulfate or calcium-magnesium sulfate type, with the water quality data for dissolved constituents reflecting the midpoint concentration between the two classifications. The water generally has relatively high concentrations of dissolved constituents, and is classified as a Type II ground water under the Montana ground water classification system. Water under this classfication is acceptable for all uses, including public and private water supplies when better water is not available.

Table 1 – Background Water Quality in Malta

Sample Date	Cond µS/cm	pH SU	Temp °C	TDS mg/L	Hardness as $CaCO_3$ mg/L	Ca mg/L	Mg mg/L	Na Mg/L	K Mg/L	HCO_3 mg/L	CO_3 mg/L	SO_4 Mg/L	Cl Mg/L	F mg/L	NO_3 mg/L
NL	*NL*	7.5	*NL*	1127	363	83	38	193	6	358	0	428	19	0	0.6
NL	*NL*	7.8	*NL*	1136	361	83	38	191	5	360	0	436	20	0	0.7
NL	*NL*	7.4	*NL*	1569	557	133	55	237	6	501	0	610	27	0	0.0
NL	*NL*	7.6	*NL*	1133	391	90	41	178	6	408	0	389	17	0	0.9
NL	*NL*	7.8	*NL*	1152	402	94	41	174	6	442	0	361	17	0	3.9

Data obtained from Malta PWS. NL – information is not listed, or is not available

The Milk River has been classified as low priority for TMDL development, although the river does reflect use impairments. Malta is located in the eastern part of the Middle Milk River sub-basin (HUC# 10050004). Potential sources of impairment for the Milk River include irrigated crops and agriculture, and municipal point sources. The parameters of concern in the Milk River are nutrients, chlorides, salinity, suspended solids and dissolved solids.

CHAPTER 2
DELINEATION

The source water protection area, the land area that contributes water to the Malta PWS, is identified in this chapter. Three management areas are identified within the source water protection area. These three regions are the control zone, inventory region, and recharge region. The control zone, also known as the exclusion zone, is an area of at least a 100-foot radius around the well. The inventory region represents the zone of contribution of the well, which approximates a three-year groundwater time-of-travel. Analytical equations describing ground water flow using estimates of pumping and aquifer characteristics and simple hydrogeologic mapping are used to calculate groundwater time-of-travel distance. The recharge region represents the entire portion of the aquifer which contributes water to the Malta water system. Since the Milk River, a surface water body, influences the local ground water system, an additional management zone is delineated – a surface water buffer zone. The surface water buffer zone represents the area of one-half mile width on each side of the surface water bodies for a distance of 10 miles upstream from the delineated ground water inventory zone.

Hydrogeologic Conditions

Geologic and hydrogeologic studies and maps of the Milk River Watershed and Malta area are listed in Table 2. Malta is located in the ancestral valley of the Missouri River, before the last glaciers covered the area and shifted the Missouri River to its present position. The ancestral Missouri River valley runs in a general east-west direction through Malta, with the Milk River present in the valley to the east of Malta. The Milk River flows away from Malta to the northeast, in the valley of a tributary to the ancestral Missouri River. The development of the major drainage pattern around the Malta area as a result of the glaciers is depicted in Figure 2. The ancestral drainage system cut valleys into the area bedrock system (Figure 3) which has large quantities of fine-grained shales with a limited number of sandstones that can be developed as local aquifers. These valleys were filled with alluvium and glacial sediments representing a relatively shallow aquifer developed by several Hi-Line communities for their drinking water source.

The bedrock in the hills around Malta comprises the Cretaceous Judith River Formation overlying the Cretaceous Claggett Shale. The shales are exposed in the valley walls both north and south of Malta, with the Judith River Formation present on top of the hills (Figure 3). The shales contain varying levels of bentonite, a "gumbo" clay derived from volcanic ash. Erosion of these shales into the Milk River valley has resulted in clay-rich soils of varying thickness. The "gumbo" soils have a high capacity to adsorb water. In the Malta area, the PWS well logs (Appendix B) indicate a continuous clay layer present from the ground surface to the top of the aquifer material, ranging in thickness from 18 to 33 feet. The lateral extent of this clay layer around Malta is not well understood; including the disposition of the unit beneath the Milk River or the Dodson Irrigation canal.

In order to evaluate the thickness of the valley fill sediments and the source aquifer for the Malta PWS, well logs for the area obtained from the Montana Bureau of Mines and Geology – Ground Water Information Center (MBMG-GWIC). According to these logs, the valley is filled with over 175 feet of material west of Malta, but is less than a hundred feet deep in the area of Malta where the PWS wells are present. Copies of the information obtained from MBMG-GWIC are included in Appendix C.

The source aquifer for the Malta PWS is interpreted as an unconsolidated alluvial aquifer present within the valley of the ancestral Missouri River. As indicated in the well logs in Appendix C, ground water in the Malta area occurs at a depth ranging from 10 to 20 feet below the ground surface. While the aquifer is covered by surficial clay layer, the well logs indicate a variable thickness to the unit. Based on this criteria, the aquifer is considered to be generally unconfined and in communication with the Milk River, recognizing that the aquifer may be locally confined or semi-confined in some areas. Based on this criteria and classification as an unconfined aquifer in communication with surface water, the aquifer is considered to have a high source water

sensitivity to contamination.

Ground water in the Malta area is interpreted to flow in a general eastern to northeastern direction, based on the interaction of ground water with surface water in the area. The aquifer has boundaries located at the bedrock walls of the Milk River / Ancestral Missouri River valley both north and south of Malta. Recharge to the aquifer occurs from direct infiltration of precipitation, and from stream loss in the Milk River, tributaries to the river and irrigation ditches. Significant recharge may occur where tributary streams cross into the valley, with vertical flow occurring at the interface between the bedrock and the valley fill sediments. Ground water flow in the valley is considered likely to have a very shallow gradient, similar to the gradient of the Milk River which meanders across the floodplain. This shallow gradient results in a relatively slow ground water flow rate.

Table 2. List of geologic investigations near Malta.

Title of Project	Reference Information	Area Covered	Maps	Project Purpose
Physiography and Glacial Geology of Eastern Montana and adjacent areas	Alden, W.C., 1932 U.S. Geological Survey Professional Paper 174	Eastern Montana	Various maps of glacier positions and deposits	Document the regional glacial history and related deposits.
Geologic Map of the Malta 30' x 60' Quadrangle, Northeast Montana	Bergantino, R.N., 1999 Montana Bureau of Mines and Geology Open File Report MBMG 389	Malta area	Geologic Map and Structure Contour Map of Malta Area	Part of statewide project for detailed geologic mapping.

Conceptual Model and Assumptions

A conceptual hydrogeologic model is a simplified representation of the hydrogeologic system. For the Malta area, ground water occurs in Milk River alluvial sand and gravel deposits. The alluvium is covered by a discontinuous surficial clay layer that may result in locally confined conditions. In the Malta area, there appears to be a single, continuous clay layer present from the ground surface to the top of the aquifer material, ranging in thickness from 18 to 33 feet. On a regional basis, the aquifer is recharged by direct infiltration of precipitation, and stream loss from the Milk River, irrigation ditches, and tributaries to the river. Ground water is considered likely to flow in a generally parallel direction to the Milk River and the valley, to the northeast in the Malta area. The relationship between recharge areas, the Milk River and the alluvial aquifer is depicted in the cross-section in Figure 4.

Well(s) Information

The active source wells for the Malta PWS are located in the southern part of town as shown in Figure 1. Copies of the available drillers well logs are included in Appendix B, with a summary of well information listed in Table 3. The wells are all completed at approximately the same total depth; although only limited information on the well construction is available.

Methods and Criteria

The methods and criteria used to delineate the source water protection zones for the Malta water system are specified in the Montana Department of Environmental Quality Source Water Protection Program (DEQ, 1999). For the Malta system, the criteria for unconfined systems was followed for the wells. Since the aquifer is interpreted to be in communication with the Milk River, surface water criteria establishing a Surface Water Buffer Zone was applied to the watershed upgradient from Malta.

Table 3. Active source well information for Malta PWS.

Information	Well #4 Robinson Well	Well #5 Legg Well	Well #6 New Pool Well	Well #7 New Catholic School Well
PWS Source Code	005	006	007	008
Well Location (T, R, Sec or lat, long)	SW¼ SW¼ NW¼ Sec 17, T30N, R30E	SW¼ SE¼ SW¼ Sec 17, T30N, R30E	SW¼ SE¼ SE¼ Sec 18, T30N, R30E	SW¼ SW¼ SE¼ Sec 18, T30N, R30E
MBMG #	*NA*	*NA*	*NA*	*NA*
Water Right #	*NA*	*NA*	*NA*	*NA*
Date Well was Completed	1981	1973	4/13/93	*NA*
Total Depth	68 feet	73 feet	60 feet	65 feet *
Perforated Interval	*NA*	*NA*	40' – 60'	*NA*
Static Water Level	25' 6"	25' 1"	32' 2"	31' 7"
Pumping Water Level	*NA*	*NA*	*NA*	*NA*
Drawdown	*NA*	*NA*	*NA*	*NA*
Test Pumping Rate	*NA*	*NA*	*NA*	*NA*
Specific Capacity	*NA*	*NA*	*NA*	*NA*

* information listed is from original well. NA – information is not available

Time of travel calculations were completed for the ground water system using the uniform flow equation (EPA, 1991). Conservative estimates for aquifer properties were made as discussed in the following section. The inventory zones for the wells were broadened to encompass surface water bodies that can impact the aquifer, and to reflect potential changes in the flow system during seasonal periods of high flow. Since the water system is in communication with and influenced by surface water, the recharge area is considered as the area where the aquifer is present upgradient from the well. The recharge area also considers the watershed for the Milk River. The surface water buffer zones were delineated based on standard distance criteria of 10 miles upstream from the ground water inventory zones. The buffer zones encompass the land area of ½ mile width on each side of the river, irrigation ditches and tributary streams upstream from Malta.

Model Input

The values selected for the calculation of time of travel represent conservative assumptions made to identify areas that may potentially impact the source water for the Malta public water supply. These values assume that flow to the wells in the system reflect similar properties as the wells are installed into the same aquifer at the same approximate depth. The criteria for selection of each value used for this delineation is summarized as follows:

- ***Transmissivity***: The transmissivity value was determined from the results of a pump test on Well #4, completed in 1968. Water was pumped from the well at a rate of 1,040 gpm for approximately 24 hours. The pump test data is included in Appendix D. A transmissivity value of 40,500 ft^2/day was determined from this data, using the Cooper-Jacob method as described in hydrology textbooks (e.g. Todd, 1980).
- ***Thickness***: The value for the thickness of the aquifer is estimated at 40 feet, derived from the well logs for the Malta wells (Appendix B).

- ***Hydraulic Conductivity***: A value for hydraulic conductivity is estimated using the basic relationship
  T = Kb, where T = transmissivity – 40,500 ft^2/day
  b = aquifer thickness – 40 feet

The estimated value for the hydraulic conductivity (K) is 1,012.5 ft/day. A rounded value of 1,000 ft/day is used for this assessment.

- ***Hydraulic Gradient***: There is no published data available that allows for an estimate of the hydraulic gradient in the Malta area. As a result, the gradient is estimated as the gradient of the Milk River Valley through the area upgradient from Malta. Based on this criteria, the gradient is estimated as 0.0005.
- ***Flow Direction***: The flow direction is interpreted to flow within the Milk River valley towards and through Malta. The estimated flow direction for this study is considered as due east, or 90 degrees. This direction is only an estimate of the flow direction without external influences, recognizing that thee dynamics of the flow system likely change during the seasons, reflecting flow from surface water bodies in the area.
- ***Porosity***: The value for effective porosity is estimated from (Todd, 1980) at 20%. The estimated value is considered representative of gravel intermixed with finer grained material, such as a glacial till.
- ***Pumping Rate***: The pumping rate for the wells was estimated at 200 gpm, reflecting the needs of the system.

Delineation Results

The results of the calculations indicate an estimated distance of 1,450 feet (0.27 miles) for a one-year time of travel (TOT), and a distance of 3,510 feet (0.66 miles) for a three-year TOT. Results of the time-of-travel calculations are included in Appendix D. The delineated inventory zones for the Malta System are depicted in Figure 5. The inventory zone has been broadened to include the areas in the Milk River floodplain adjacent to Malta, and to include the location of the old Malta airport, to an approximate one-mile distance from the Malta PWS wells.

The surface water buffer zone for the Milk River, including Alkali Creek as a significant tributary, and the South Dodson Canal, are delineated on Figure 6.

The recharge region for the aquifer comprises the aquifer upgradient from the supply wells, delineated in the inventory zone. The United States portion of the Milk River watershed system that recharges the aquifer is also shown in Figure 6. For purposes of this assessment, the primary recharge area for the Malta PWS source aquifer is considered to be the area included within the surface water buffer zone (Figure 6).

Limiting Factors

The model calculations use values that are considered representative of actual conditions. This approach recognizes the uncertainties in the data used in the modeling process, with estimates reflecting conservative, or worst-case conditions. The assumed values are consistent with data on ground water systems similar to the Milk River Valley and Malta study area, however the lack of area specific hydrologic data provides limits to the accuracy of this evaluation.

For this assessment, the hydraulic gradient and assumed ground water flow direction are the parameters estimated with the least amount of certainty. Ground water flow within the Milk River valley is interpreted to follow a direction generally parallel to the valley walls and the River based on basic principles of hydrogeology. Pumping and the interaction of surface water with the ground water system in the area likely increase the complexity of the dynamics of the actual system. In addition, the specific details of the connection between surface water and ground water in the Malta area is not well understood as lenses of clay-rich material may inhibit water flow in some areas. Further refinement of the hydrogeologic conceptual model and time of travel flow calculations would require collection of additional data to evaluate the lateral extent of the clay layers, ground water flow directions and gradients, and the interaction of surface water with ground water in the area.

CHAPTER 3
INVENTORY

An inventory of potential sources of contamination was conducted for the Malta PWS within the control and inventory regions. Potential sources of regulated drinking water contaminants including pathogens such as Cryptosporidium were identified, however, only significant potential contaminant sources (DEQ, 1999) were selected for detailed inventory. The significant potential contaminants in the Malta PWS inventory region include petroleum from underground storage tanks, nitrates and pathogens from sanitary sewers, septic systems and agriculture; and herbicides and pesticides from cropped agricultural land.

The inventory for the Malta PWS was performed consistent with the requirements of the Montana Source Water Assessment Program (1999). The inventory evaluates activities in the control zone, certain sites as potential contaminant source and land use activities in the inventory region, potential sources of nitrates and pathogens (e.g. fecal coliforms) in the surface water buffer zone, and general land uses and large facilities in the recharge region.

Inventory Method

The initial inventory steps comprise querying existing state and federal electronic databases for regulated facilities that use, store or release regulated chemicals. The steps to the database searches, and the results are listed in Appendix E. The assessment of agriculture land use and urban areas, and major transportation routes through the area are shown on Figure 7. The limits of the municipal sewer system and relative density of septic systems in the area are shown on Figure 8. The database search is supplemented and verified with a "windshield survey" and a business directory search of the delineated inventory zones in the Malta area. The results of the business directory search are included in Appendix E. This method helps ensure that the inventory is complete as a data collection exercise to identify all potential contaminant sources. The results of the "windshield survey" were generally consistent with the results from database searches. The Malta airport has been relocated to a new site northeast of town, outside of both the Inventory Region and the Surface Water Buffer Zone.

The results of the inventory process are summarized in Table 4, which summarizes the properties or sites within the Malta area. The potential contaminants are listed, with a description of the potential release mechanism for the site. In all cases, releases may occur due to unavoidable conditions such as flooding, lightning or fire. The sites where this is the primary potential release mechanism are identified as concerns resulting from such a disaster. For other sites where other release mechanisms may be more common, the potential for a release from such a disaster is assumed.

The Montana Source Water Protection Program identifies specific types of potential contaminant sources as significant, for further evaluation of the susceptibility of the water source to these sources (Chapter 4). The following categories of potential contaminant sources are considered significant:

1) Large quantity hazardous waste generators.
2) Landfills.
3) Underground storage tanks.
4) Known groundwater contamination (including open or closed hazardous waste sites, state or federal superfund sites, and UST leak sites).
5) Underground injection wells.
6) Major roads or rail transportation routes.
7) Cultivated cropland greater than 20 % of the inventory region.
8) Animal feeding operations.
9) Wastewater treatment facilities, sludge handling sites, or land application areas.
10) Septic systems.
11) Sewer mains.
12) Storm sewer outflows.
13) Abandoned or active mines, including gravel pits.

Table 4 - Summary of Inventory Results for Malta PWS.

ID#	Source Type	Potential Contaminants	Description/Concern
Step 1 Results			
1	*Agricultural Land Use*	*Pathogens and Nitrates; Pesticides and Herbicides*	*Non-point source pollution, concentration of fertilizers/chemicals in surface/ground water*
2	*Urban Land Use*	*Spills of various chemicals*	*Non-point source pollution, small spills of household chemicals*
3	*Sanitary Sewer System*	*Pathogens and Nitrates*	*Leakage from sewer lines*
4	*Septic Systems*	*Pathogens and Nitrates*	*Non-point source pollution, loading o f ground water system with effluent*
5	*Storm Water Discharge Points*	*Various chemicals*	*Non-point source releases from urban land use concentrated into point source to ground water; storm sewer system discharges to Milk River*
EPA Envirofacts Sites (Step 2)			
6	*Bebee & Sons, Pork*	*Pathogens and Nitrates*	*Spill of animal waste materials*
7	*Ezzie's Wholesale, Inc.*	*Petroleum Hydrocarbons*	*Spill or Leak from USTs and piping*
8	*Malta Livestock*	*Pathogens and Nitrates*	*Infiltation of animal waste materials*
9	*Malta Ready Mix*	*Spills of various chemicals*	*Spill of stored or handled chemicals*
10	*Malta, City of*	*Pathogens and Nitates*	*Leak from wastewater treatment lagoons*
11	*Mendel Flying Service*	*Hydrocarbon Fuels; Pesticides/Herbicides*	*Spill of stored or handled chemicals*
12	*UPS Malta Center*	*Pathogens and Nitrates, spills of various chemicals*	*Wastewater discharge*
DEQ Database – Active USTs (Step 4)			
13	*Equity Co-op Association*	*Petroleum Hydrocarbons*	*Spill or leak from USTs and piping*
14	*Honkers Self Service*	*Petroleum Hydrocarbons*	*Spill or leak from USTs and piping*
15	*Packys, Incorporated*	*Petroleum Hydrocarbons*	*Spill or leak from USTs and piping*
16	*Westside Self Service*	*Petroleum Hydrocarbons*	*Spill or leak from USTs and piping*
17	*Old Phillips County Airport*	*Petroleum Hydrocarbons*	*USTs closed, residual contamination*
18	*Weeres Texaco Building*	*Petroleum Hydrocarbons*	*USTs closed, residual contamination*
DEQ Database – LUST Sites (Step 4)			
19	*LUST Site – BN Malta*	*Petroleum Hydrocarbons*	*Residual contamination after site closure*
20	*LUST Site – Delta Ford*	*Petroleum Hydrocarbons*	*Residual contamination after site closure*
21	*LUST Site – Dobson Motors*	*Petroleum Hydrocarbons*	*Residual contamination after site closure*
22	*LUST Site – Equity Co-op*	*Petroleum Hydrocarbons*	*Residual contamination after site closure*
23	*LUST Site – Ezzies Wholesale*	*Petroleum Hydrocarbons*	*Residual contamination after site closure*
24	*LUST Site – Green's (3 sites)*	*Petroleum Hydrocarbons*	*Residual contamination after site closure*
25	*LUST Site – Holzhey Ranch*	*Petroleum Hydrocarbons*	*Residual contamination after site closure*
26	*LUST Site – K&G Drilling*	*Petroleum Hydrocarbons*	*Residual contamination after site closure*
27	*LUST Site – Kolczak*	*Petroleum Hydrocarbons*	*Residual contamination after site closure*
28	*LUST Site – Malta city shop*	*Petroleum Hydrocarbons*	*Residual contamination after site closure*
29	*LUST Site – Mangis (Malta Tire)*	*Petroleum Hydrocarbons*	*Residual contamination after site closure*
30	*LUST Site – Phillips Co. Shop*	*Petroleum Hydrocarbons*	*Residual contamination after site closure*
31	*LUST Site – Westside Self Serv.*	*Petroleum Hydrocarbons*	*Residual contamination after site closure*
DEQ Database – CECRA Sites (Step 4)			
32	*(Former) Malta Airport*	*Pesticides/Herbicides (SOCs)*	*Soil and Ground Water contamination*
DEQ Database – Landfills (Step 4)			
33	*Open (Active) Landfill*	*Various Chemicals*	*Landfill provides direct conduit for contamination to shallow ground water system*
34	*Closed Landfills*	*Various Chemicals*	*Landfill provides direct conduit for contamination to shallow ground water system*

* Note: Sites identified from multiple search queries are listed with the first step that identified the specific site. The results of the business SIC code search reflect types of facilities, with the number of facilities indicated in parentheses. Individual sites identified as significant potential contaminant sources are evaluated in Chapter 4.

Table 4 (continued) - Summary of Inventory Results for Malta PWS.

ID#	Source Type	Potential Contaminants	Description/Concern
Business SIC Code Search Results* (Step 5)			
35	*Farms – Crops (2)*	*Spills of Pesticide/Herbicides and fertilizers*	*Natural Disaster or accidental spill of stored chemicals*
36	*Farms – Dairy/Livestock (2)*	*Nitrates and Pathogens*	*Inadequate treatment for animal waste*
37	*Crop Dusters (1)*	*Pesticides/Herbicides; Fuels*	*Accidental spill of chemicals/fuels*
38	*Veterinarian (6)*	*Pathogens (medical waste)*	*Management and disposal of medical waste*
39	*Petroleum Industry (2)*	*Petroleum Hydrocarbon*	*Spill/release of hydrocarbons*
40	*Meat Packing Plant (1)*	*Pathogens*	*Accidental spill of wastes*
41	*Printers and Publishers (2)*	*Inks (Volatile organic chemicals)*	*Natural Disaster – spill/release of ink*
42	*Manufacturing – various (4)*	*Volatile organic chemicals*	*Natural Disaster or accidental spill of stored chemicals*
43	*Transportation/Shipping (4)*	*Various chemicals and fuels*	*Natural Disaster or accidental spill of stored chemicals*
44	*Miscellaneous Services(3)*	*Various chemicals and fuels*	*Natural Disaster or accidental spill of stored chemicals*
45	*Lumber, Hardware, Drug and Grocery Stores(19)*	*Various chemicals*	*Natural Disaster or accidental spill of stored chemicals*
46	*Motor vehicle, boat & motorcycle dealers; and auto/home supply (10)*	*Various chemicals*	*Natural Disaster or accidental spill of stored chemicals*
47	*Gasoline Service Stations (1)*	*Petroleum Fuels and various chemicals*	*Natural Disaster or accidental spill of stored chemicals*
48	*Florist (1)*	*Fertilizers; Herbicides and Pesticides*	*Natural Disaster or accidental spill of stored chemicals*
49	*Campground/RV Park (1)*	*Nitrates and Pathogens*	*Wastewater treatment*
50	*Beauty Parlors (6)*	*Various chemicals*	*Natural Disaster or accidental spill of stored chemicals*
51	*Mortuary/Taxidermy (1)*	*Various chemicals*	*Natural Disaster or accidental spill of stored chemicals*
52	*Equipment Leasing (1)*	*Petroleum, antifreeze, lubricants, cleaning solvents*	*Natural Disaster or accidental spill of stored chemicals*
53	*Auto Repair/Service (7)*	*Petroleum, antifreeze, paints, lubricants, cleaning solvents*	*Natural Disaster or accidental spill of stored chemicals*
54	*Health Services (11)*	*Pathogens (medical waste)*	*Management and disposal of medical waste*
55	*Government facilities (6)*	*Various*	*Natural Disaster or accidental spill of stored chemicals*
Miscellaneous Others, including Step 6			
56	*Major Roads*	*Spills of various chemicals*	*Disaster – spill/release of chemicals and fuels transported on Highway*
57	*Railroad Lines*	*Spills of various chemicals*	*Disaster – spill/release of chemicals and fuels transported on railroad line*
58	*Class V Injection Wells*	*Various chemicals*	*Direct discharge of chemical to shallow ground water system*

* Note: Sites identified from multiple search queries are listed with the first step that identified the specific site. The results of the business SIC code search reflect types of facilities, with the number of facilities indicated in parentheses. Individual sites identified as significant potential contaminant sources are evaluated in Chapter 4.

The potential contaminant sources classified as significant are summarized in Table 5. While other potential sources may be present within the delineated management regions, the significant sources are identified as a

subset of the potential sources that are considered more likely to contaminate the source aquifer under "worst-case" conditions. The following discussions identify the results of the inventory for significant potential contaminant sources within the delineated management regions for the Malta PWS. The discussions focus on the location of the four active PWS wells.

Inventory Results/Control Zone

The control zone represents the most critical point to protecting the integrity of the wellhead for ground water sources. All of the wells are located within the city limits, and the primary concern for the wells within the inventory zones is sanitary sewer lines that transverse the city. Inventory sheets for each property where the wells are located are included in Appendix F.

Inventory Results/Inventory Region

The land use in the Inventory Region is primarily urban residential and commercial. Based on the GAP data analysis, there is no developed agricultural land within this region (see Figure 7). Malta has multiple active service stations with petroleum USTs, mostly located within the inventory region. There are also LUST sites located throughout Malta, with ground water remediation still active at several locations. The majority of these are located in the northern part of Malta away from the PWS wells.

The former Malta airport, classified as a CECRA site due to releases of pesticides and herbicides, is located in the upgradient part of the inventory zone. While the active file on the site has not been closed, the site is considered inactive, and recent ground water sampling yielded any detectable quantities of the released pesticides and herbicides.

The urban nature of the area around the PWS wells with the storm sewer system is considered a potential contaminant source to the ground water system. Stormwater may concentrate chemicals spilled at the surface at the discharge point; however, the storm sewer system discharges directly to the Milk River significantly reducing this as a potential source of contamination to the ground water system.

The Malta sanitary sewer system serves the entire community, including the area where the PWS wells are located. The concern from the sewers is due to leakage from improper seals at joints in the sewer pipes. A secondary concern from the sewer system and other buried utilities such as the water distribution system and the storm sewer system is the potential for released contaminants to migrate within the fill material. Installation of the pipes disturbs the clay-rich soils and results in a preferred pathway for contaminants to migrate with any shallow ground water in a sometimes unpredictable manner.

The significant potential contaminant sources in the Inventory Zone are described individually in Chapter 4 relative to each PWS source well. Completed inventory sheets for all of these sites are included in Appendix G. The general location of these sites is shown in Figure 9.

Inventory Results/Surface Water Buffer Zone

The inventory of significant potential contaminant sources for the surface water buffer zone concentrates on source of nitrates or pathogens. Septic systems, at a low hazard density, and agricultural land use represent the only potential source identified in the surface water buffer zone. While some agricultural land use may include dairy or other animal operations, there are no permitted confined animal feeding units in the Malta area.

Table 5. Significant potential contaminant sources for Malta PWS.

ID#	*Source*	*Contaminants*	*Description*

1	*Agricultural Land Use*	*Pathogens and Nitrate; Pesticide/Herbicides (SOCs)*	*Primary concern in cropland in Milk River Valley upgradient from Malta*
2	*Urban Land Use*	*Various*	*The majority of the area around the PWS wells is within the city limits*
3	*Sanitary Sewer Main*	*Pathogens and Nitrate*	*Area around wells is sewered. Concern from leaks and backfill around sewers providing a preferred conduit for other contaminants to migrate*
4	*Septic Systems*	*Pathogens and Nitrate*	*Area southwest of wells and sewered area with high density, within well inventory zone*
5	*Storm Water Discharge Points*	*Various organic chemicals*	*Not inventoried at this time*
13-16	*Active UST Sites*	*Petroleum Hydrocarbons*	*At several locations within inventory zone*
17-18	*Recently closed UST sites*	*Petroleum Hydrocarbons*	*At former Malta/Phillips County Airport and in north side of inventory zone*
19-31	*LUST Sites*	*Petroleum Hydrocarbons*	*Primarily in northern part of town, but also at various locations near wells*
32	*(Former) Malta Airport*	*Pesticides/Herbicides (SOCs)*	*CECRA Site with impacts to ground water located upgradient from PWS Wells; however, recent sampling results did not detect any SOCs*
56	*Major Roads*	*Various Chemicals*	*Transportation corridors through town, concern over an accident and spill of any transported chemicals*
57	*Railroad Lines*	*Various Chemicals*	*Transportation corridors through town, concern over an accident and spill of any transported chemicals*
58	*Class V Injection Wells*	*Various organic chemicals*	*Not inventoried at this time (EPA responsibility); may provide conduits for chemicals into subsurface*

Inventory Results/Recharge & Watershed Region

The land use in the recharge region is primarily agriculture. There are several mining operations within the Milk River watershed, as shown in Figure 6; however, these are not considered likely to represent a threat to water quality in the Malta PWS wells. General land use for the area is depicted in Figure 8.

Inventory Update

The certified operator for the Malta PWS will update the inventory every year. Changes in land uses or potential contaminant sources will be noted and additions made as needed. The complete inventory will be submitted to DEQ every five years to ensure re-certification of the source water delineation and assessment report.

Inventory Limitations

The inventory is limited by the accuracy of information in databases used for the assessment. The windshield survey provides a level of quality assurance that the information presented reflects current conditions at the time of preparation of this report. The location of Class V injection wells is not complete at this time, and is currently being compiled by EPA for the area.

CHAPTER 4
SUSCEPTIBILITY ASSESSMENT

Susceptibility is the potential for a public water supply to draw water contaminated by inventoried sources at concentrations that would pose concern. Susceptibility is assessed in order to prioritize potential pollutant sources for management actions by local entities, in this case the Malta PWS.

The goal of Source Water Management is to protect the source water by 1) controlling activities in the control zone, 2) managing significant potential contaminant sources in the Inventory Region, and 3) ensuring that land use activities in the Recharge Region pose minimal threat to the source water. Management priorities in the Inventory Region are determined by ranking the significant potential contaminant sources identified in the previous chapter according to susceptibility. Alternative management approaches that could be pursued by the Malta PWS to reduce susceptibility are recommended.

Susceptibility is determined by considering the hazard rating for each potential contaminant source and the existence of barriers that decrease the likelihood that contaminated water will flow to the Malta PWS wells (Table 6). Hazard is rated by the proximity of a potential contaminant source to the well(s). Susceptibility ratings are presented individually for each significant potential contaminant source and each associated contaminant (Table 7). The susceptibility of each well to each potential contaminant source is assessed separately.

Table 6. Relative susceptibility to specific contaminant sources as determined by hazard and the presence of barriers.

Presence Of Barriers	Hazard		
	High	**Moderate**	**Low**
No Barriers	Very High Susceptibility	High Susceptibility	Moderate Susceptibility
One Barrier	High Susceptibility	Moderate Susceptibility	Low Susceptibility
Multiple Barriers	Moderate Susceptibility	Low Susceptibility	Very Low Susceptibility

For points sources, the relative hazard of the significant potential contaminant sources listed in Table 7 reflects the location of the sites relative to the PWS Wells, and how long ground water would take to travel from that site to the wells. For sites located within a time of travel distance of less than one year, the relative hazard is assigned as high. For sites within a time of travel distance of one to three years, the relative hazard is assigned as moderate. For the remaining sites located in the recharge region, the relative hazard assigned is low.

For non-point sources, the relative hazard is assigned based the following table:

Source Type	***High Hazard***	***Moderate Hazard***	***Low Hazard***
Septic Systems	> 300 per sq. mi.	50 – 300 per sq. mi.	< 50 per sq. mi.
Municipal Sanitary Sewer (% Land Use)	> 50% of region	20% – 50% of region	< 20% of region
Cropped Agricultural Land(% Land Use)	> 50% of region	20% – 50% of region	< 20% of region

For the Malta PWS, the majority of sites are assigned a relative hazard of high or moderate, with none of the

identified sites located within the recharge region. The primary barrier for all of these is clay-rich soils that can inhibit migration of any released potential contaminants into the subsurface.

Susceptibility Assessment Results

The results of the susceptibility assessment are summarized in Table 7. Based on the assessment, the primary threats to the PWS source aquifer are from the urban land use and the sanitary sewer system since the wells are located within the developed town area. The relative susceptibility of each type of potential contaminant source is summarized in the following.

- ***Agricultural Land Use*** – Agriculture in the Milk River Valley includes cattle ranching and both irrigated and dryland farming. The use of flood irrigation provides a mechanism for concentration of non-point source pollution into both surface and ground waters. Surface water may be impacted by return flows to the Milk River, and ground water may be impacted by direct infiltration of the irrigation water into the ground water system. The relative hazard from agricultural land use for the PWS wells is rated as low, since there is only limited agriculture in the inventory zone. Clay-rich soils may act as a barrier that inhibits the migration of agriculturally related contaminants, resulting in a susceptibility ranking of low for this potential source.

- ***Urban Land Use*** – Improperly disposed waste chemicals may infiltrate directly into the ground water system, or be concentrated with storm water. Since all of the wells are located within the city limits, including the control zones, the relative hazard from urban land use is ranked as high. Clay-rich soils may act as a barrier that inhibits the migration of any contaminants, resulting in a susceptibility ranking of high for this potential source.

- ***Sanitary Sewer Main*** – The sanitary sewer system is present in the area surrounding all of the PWS wells. The concern from the sewer reflects the potential for leakage from the sewers into the ground water system in the area. Since the sewered area covers the majority of the inventory zone, including the control zones, the relative hazard is ranked as high. Clay-rich soils may act as a barrier that inhibits the migration of any contaminants, resulting in a susceptibility ranking of high for this potential source.

- ***Septic Systems*** – There are only small areas inside the inventory zone that are not included within the service area for the sanitary sewer system. The relative hazard is based on the location of the wells relative to the areas served by septic systems, and the density of the septic systems in these areas. The primary area of concern is from systems that do not function as designed, resulting in discharges to ground water. Clay-rich soils may act as a barrier to contamination from any septic systems. The primary area of concern is southwest of the wells, resulting in a relative hazard of high for the Catholic School Well and the Pool Well, associated with a relative susceptibility of high. The hazard to the Legg Well and Robinson Well is ranked as moderate, associated with a relative susceptibility of moderate.

- ***Storm Water Discharge Points*** – The storm water system discharges water directly to the Milk River, effectively removing any contamination that storm water picks up to the outside of the inventory zone. Since the storm water discharge points are located on the boundary of the inventory zone, the relative hazard is low. The relative susceptibility of the aquifer to storm water from the discharge points, based on clay-rich soils and dilution in the Milk River, is considered to be very low.

- ***Underground Storage Tanks (USTs) and Leaking USTs in the Northern Malta Area*** – Several sites are located within a small area in northern Malta, near the intersection of US Highway 2 and US Highway 191. There are active remediation systems present recovering free-phase hydrocarbons from the ground water surface, and addressing affected soils. For sites with impacted ground water, there are no barriers present that can prevent migration of the contaminated water away from the area. While ground water flow normally flows towards the Milk River, changes in conditions such as an extreme flood event in the river

may result in a reversal of the ground water flow direction towards the PWS wells. The inactive PWS well used for irrigation is located well within a one-year time of travel from these sites, and may already be impacted. Since these sites are located within the inventory zone at a time of travel of more than one year from the active PWS wells, they are assigned a relative susceptibility of moderate. However, since there are no barriers to prevent already contaminated ground water from migrating, the relative susceptibility from these sites is high.

- ***Underground Storage Tanks (USTs) and Leaking USTs in the Central Malta Area*** – Several sites are located within central Malta, within a one-year time of travel distance from the PWS wells. None of these sites had any detectable impacts to ground water. For these sites, clay-rich soils can be considered as a barrier to contamination of the source aquifer. Based on location relative to the wells, the sites are generally assigned a relative hazard of high, associated with a relative susceptibility of high for the LUST sites, and moderate for the active USTs.

- ***Former Malta Airport (CECRA Site)*** – The former Malta Airport is located in the southwest part of the inventory zone. The site is currently a medium priority CECRA site, resulting from spills of pesticides/herbicides which resulted in detectable impacts to ground water in the area. While these impacts have not been detected for several years, the site still requires regular monitoring of ground water quality. Based on the location in the inventory zone at a distance greater than the one-year time of travel, the site is assigned a moderate hazard. Since ground water has been affected, there are no barriers to migration of chemicals away from the site resulting susceptibility ranking of high.

- ***Major Roads and Railroad Lines*** – An accident on one of the major transportation routes through Malta may result in significant impacts to the source aquifer, depending on the location of any spill, and the amount and type of the spilled substance. The relative hazard, based on location, is considered high for US Highway 191, and moderate for US Highway 2 and the railroad lines. The clay-rich soils in the area may act as a barrier to contamination in the event of an accident; however the retardent properties of the clay vary with different chemicals. Based on this barrier, the relative susceptibilities are considered high for US Highway 191, and moderate for US Highway 2 and the railroad lines. Development of a contingency plan to respond to any spill from these sources is strongly recommended due to the unpredictable nature of accidents along major transportation corridors.

An additional concern for the PWS wells represent existing wells located within the Malta area. Improperly constructed wells may act as a conduit for surface water to flow into the aquifer. Summary information on wells in the area is presented in Appendix C, with a map showing the general location of the wells in town area, based on the Township, Section and Range locations.

Table 7. Susceptibility assessment for significant potential contaminant sources**.**

Source	Description	Potential Contaminant	Concern (Hazard)	Well(s)	Hazard Rating	Barriers	Susceptibility	Recommended Management
Non-Point Source Potential Contaminants Sources								
Agricultural Land Use	Some agriculture in surface water buffer zone	Pesticides and herbicides; Nitrates	Non-point source concentration	All	Low	Clay-rich soils	Low	Educate community of BMPs for agriculture
Urban Land Use	All PWS wells are within city limts	Various	Improper disposal of small amounts of chemicals	All	High	Clay-rich soils	High	Educate community on proper waste disposal
Sanitary Sewer Main	All PWS wells are within area served by city sewer	Pathogens and Nitrates	Leak	All	High	Clay-rich soils	High	Monitor integrity of sewer lines
Septic Systems	Small area southwest of city limits, within Inventory Zone	Pathogens and Nitrates	System failure resulting in discharges to ground water	Catholic School Well Pool Well	High	Clay-rich soils	High	Connect to Sanitary Sewer
				Legg Well, Robinson Well	Moderate	Clay-rich soils	Moderate	Connect to Sanitary Sewer
Storm Water Discharge Points	Storm sewers discharge to Milk River	Various	Non-point source concentration	All	Low	Clay-rich soils, Dilution in Milk River	Very Low	Monitor integrity of system
Underground Storage Tank (UST) and Leaking Underground Storage Tank (LUST) Sites, Northern Malta area								
Equity Co-op Assocation	Active USTs	Petroleum Hydrocarbons	Leak or Spill	All	Moderate	Clay-rich soils; Meets EPA standards	Low	Monitor Compliance Results
	Inactive LUST	Petroleum Hydrocarbons	Leaching from residual contamination after remediation	All	Moderate	Clay-rich soils	Moderate	Monitor status of remediation and site closure
Honkers Self Service	Active USTs	Petroleum Hydrocarbons	Leak or Spill	All	Moderate	Clay-rich soils; Meets EPA standards	Low	Monitor Compliance Results
	Active LUST (former Green's Exxon)	Petroleum Hydrocarbons	Free Product on Water Table Surface	All	Moderate	None	High	Monitor status of remediation and site closure
	Active LUST (former Green's Sales, former Mr. Tire)	Petroleum Hydrocarbons	Free Product on Water Table Surface	All	Moderate	None	High	Monitor status of remediation and site closure

Table 7 (continued). Susceptibility assessment for significant potential contaminant sources**.**

Source	Description	Potential Contaminant	Concern (Hazard)	Well(s)	Hazard Rating	Barriers	Susceptibility	Recommended Management
Underground Storage Tank (UST) and Leaking Underground Storage Tank (LUST) Sites, Northern Malta area (continued)								
	Active LUST (former Green's Sales Bulk Plant)	Petroleum Hydrocarbons	Leaching from contaminated soils to ground water	All	Moderate	None	High	Monitor status of remediation and site closure
Weeres Texaco Building	Recently closed USTs	Petroleum Hydrocarbons	Leaching from residual contamination after tanks were closed	All	Moderate	Clay-rich soils	Moderate	Monitor status of site closure
Delta Ford	Active LUST (Two Leaks)	Petroleum Hydrocarbons	Free Product on Water Table Surface	All	Moderate	None	High	Monitor status of remediation and site closure
Dobson Motors	Closed LUST Site	Petroleum Hydrocarbons	Small release from tank overfills	All	Moderate	Clay-rich soils	Moderate	Monitor status of remediation and site closure
Former Ezzie's Wholesale Plant	Active LUST Site	Petroleum Hydrocarbons	No free product detected	All	Moderate	None	High	Monitor status of remediation and site closure
Mangis, N.H. (Former Malta Tire)	Closed LUST Site	Petroleum Hydrocarbons	Small release from tank overfills	All	Moderate	Clay-rich soils	Moderate	Monitor status of remediation and site closure
Underground Storage Tank (UST) and Leaking Underground Storage Tank (LUST) Sites, Central Malta (within 1-year TOT to wells)								
Packys, Incorporated	Active USTs	Petroleum Hydrocarbons	Leak or Spill	All	High	Clay-rich soils; Meets EPA standards	Moderate	Monitor Compliance Results
	Inactive LUST	Petroleum Hydrocarbons	Leaching from residual contamination after remediation	All	High	Clay-rich soils	High	Monitor status of remediation and site closure
(Former) Malta Airport	Recently closed USTs	Petroleum Hydrocarbons	Leaching from residual contamination after tanks were closed	All	High	Clay-rich soils	High	Monitor status of site closure
Malta City Shop	Inactive LUST Site	Petroleum Hydrocarbons	Leaching from residual contamination after remediation	Pool Well, Robinson Well	High	Clay-rich soils	High	Monitor status of remediation and site closure
				Legg Well, Catholic School Well	Moderate	Clay-rich soils	Moderate	

Table 7 (continued). Susceptibility assessment for significant potential contaminant sources**.**

Source	Description	Potential Contaminant	Concern (Hazard)	Well(s)	Hazard Rating	Barriers	Susceptibility	Recommended Management
Underground Storage Tank (UST) and Leaking Underground Storage Tank (LUST) Sites, Central Malta (within 1-year TOT to wells), cont.								
Phillips County Shop	Inactive LUST Site	Petroleum Hydrocarbons	Leaching from residual contamination after remediation	Catholic School Well	High	Clay-rich soils	High	Monitor status of remediation and site closure
				Legg Well, Pool Well, Robinson Well	Moderate	Clay-rich soils	Moderate	
Additional Sites and Concerns								
(Former) Malta Airport	CECRA Site (Medium Priority)	Pesticides	Leaching from contaminated soils, previously detected impacts to ground water	Catholic School Well, Pool Well	Moderate	None	High	Monitor status of site ground water monitoring and closure activities
				Legg Well, Robinson Well	Low	None	Moderate	
Major Roads	US Hwy 191	Various Chemicals	Accidental spill of transported chemicals	Catholic School Well, Pool Well	High	Clay-rich soils	High	Develop emergency response plan and protocols
				Legg Well, Robinson Well	Moderate	Clay-rich soils	Moderate	
	US Hwy 2	Various Chemicals	Accidental spill of transported chemicals	All	Moderate	Clay-rich soils	Moderate	
Railroad Lines	Parallel to US Hwy 2 in north part of town	Various Chemicals	Accidental spill of transported chemicals	All	Moderate	Clay-rich soils	Moderate	Develop emergency response plan and protocols

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Detailed Inventory Process and Results

Step 1: Urban and agricultural land uses were identified using data from the GAP program implemented at the University of Montana (Redmond et. al., 1998). The GAP program classified the state at 90 meter pixels for approximately 50 land use and vegetation types. This information was obtained in electronic format from the Montana State Library NRIS website.

- This information is depicted in Figure 7.

Sewered and unsewered residential land use were identified from boundaries of sewer coverage obtained from municipal wastewater utilities. Storm water management and discharge points were identified with the help of the PWS Operator. Septic system density outside of the sewered area was evaluated using census block population data, reflecting a septic system density of 2.6 persons per septic system.

- This information is depicted in Figure 8.

Step 2: EPA's Envirofacts System was queried to identify EPA regulated facilities located in the Inventory Region. This system accesses facilities listed in the following databases: Resource Conservation and Recovery Information System (RCRIS), Biennial Reporting System (BRS), Toxic Release Inventory (TRI), and Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS). The available reports were browsed for facility information including the Handler/Facility Classification to be used in assessing whether a facility should be classified as a significant potential contaminant source.

- A total of ten facilities were identified using this query, with locations of sites within the delineated inventory zone for Malta shown in Figure 9.

Step 3: The Permit Compliance System (PCS) was queried using Envirofacts to identify Concentrated Animal Feeding Operations with MPDES permits. The water system operator familiar with the area included in the inventory region indicated that no significant animal feeding operations that required any permits are present in the inventory zone and surface water buffer zones.

- No permitted facilities in the Malta area were identified with this query.

Malta Area Envirofacts Sites

Facility Name	*Address*	*EPA Facility ID*	*Comments*
Bebee & Sons, Pork Production	*S. of US Hwy 2*	8105672	Wastewater Treatment Discharge
Ezzies Wholesale, Inc	*Hwy 2 E.*	MT0002283273	Hazardous Waste Handler
Hi-Line Crematory	202 South 2nd St.	7660250	Air Emissions
Malta Livestock	*Not Listed*	8105632	Wastewater Treatment Discharge
Malta Ready Mix	*Not Listed*	8105416	Wastewater Treatment Discharge
Malta, City of	*Not Listed*	7388168	Wastewater Treatment Discharge
Mendel Flying Service	Malta Airport	MTD986072742	Hazardous Waste Handler
Narco – Bowdoin Station	329 South 3rd East, H.C.	MT0002405595	Air Emissions
UPS Malta Center	*North 7th Ave East*	8104142	Wastewater Discharge
Western Area Power Admin, Malta Switch	*Not Listed*	MT9890090005	Hazardous Waste Handler

Step 4: DEQ databases were queried to identify the following in the inventory region: Underground Storage Tanks (UST), hazardous waste contaminated sites, landfills, abandoned mines and active mines including gravel pits. Any information on past releases and present compliance status was noted.

- The following active UST Sites were identified. The location of these sites is shown in Figure 9.

Malta Area Active Underground Storage Tanks (USTs)

Name	*Address*	*Facility ID*	*Number USTs*	*Comments*
Equity Co-op Association	428 S. 1st St. East	36-10706	4	LUST Site with 2 closed USTs; 2 gasoline USTs and 2 diesel USTs
Ezzie's Wholesale, Inc.	Hwy 2 East	36-11372	6	LUST Site, 3 diesel and 3 gasoline USTs, all 6,000 gallons
Honkers Self Service	3rd North 1st St. E.	36-02371	5	LUST Site, 2 diesel and 3 gasoline USTs
Packys, Incorporated	902 Central Ave. S	36-02359	2	Two 17,000 gasoline USTs
Westside Self Service	Hwy 2 West of Malta	36-06668	5	LUST Site, 2 diesel and 3 gasoline USTs

- The old Phillips County Airport (ID# 36-02062), located approximately ¼ mile southwest of Malta, has three USTs that have recently been listed as inactive. The Weeres Texaco Building Site (ID# 36-04837), located within central Malta, has three recently closed gasoline USTs. No releases of petroleum were reported for these facilities. The location of these sites is indicated in Figure 9.

- The following Leaking UST (LUST) Sites were identified. The location of these sites is shown in Figure 9.

Malta Area Leaking Underground Storage Tank (LUST) Sites

Name	*Address*	*Facility ID*	*Leak #*	*Confirmed Release Date*	*Cleanup Completion Date*	*Ground Water Impacts / Comments*
BN Malta – Section Tool House		36-09589	3070	6/17/88		
Delta Ford – Leak 1	102 S. 1st Ave. W	36-09844	730	5/14/91		Gasoline leak, Free product on ground water surface
Delta Ford – Leak 2			1690	4/4/93		Waste Oil tank leak
Dobson Motors, Inc	Hwy 2 & Hwy 191	36-01409	1485	11/21/92	1/11/93	Small release from tank overfills
Equity Co-op Assoc.	428 S. 1st. St. E	36-10706	2153	3/28/94		Inactive 12/16/96
Ezzies Wholesale, Inc.	4 W. 1st St	36-06657	1453	10/28/92		No free product detected
Greens Exxon (Honkers Self Service)	Hwy 2 & Hwy 191	36-02371	1830	8/25/93		Free product on ground water surface
Green's Sales, Inc (Bulk Plant)		36-13519	2573	4/24/95		
Green's Sales, Inc	Hwy 2 & Hwy 191	36-06518	1390	9/25/92		Free product on ground water surface
K&G Drilling		36-06516	246	3/28/90	5/14/90	Release from out of service UST
Kolczak Diesel Welding and Repair	Hwy 2 E	36-05690	2332	9/22/94	11/24/97	Release from out of service UST
Malta City Shop	735 S. 1st. Ave	36-06636	1974	11/23/93	5/10/94	No free product detected
Mangis, Ned H. (Former Malta Tire)	118 S. 1st. W	36-12542	1733	1/9/92	3/12/93	Small release
Phillips Co. Rd Shop	537 S. 2nd E	36-04423	1699	6/24/93	10/3/96	Small release
Westside Self Service #1	Hwy 2 W	36-06668	2463	12/30/96		Free product
Westside Self Service #2			3095	7/22/94		Remediation ongoing

- A single hazardous waste contaminated sites (CECRA Sites) was identified in the DEQ database for the Malta area. The site is the (former) Malta Airport, southwest of Malta, identified as a medium priority site.

The site was evaluated by the EPA under CERCLA in 1985, finding low levels of pesticides 2,4-D and Dicamba in soils, and trace levels of Tordon in groundwater at the site. EPA subsequently declared the facility as "no further action" under CERCLA. In 1993, MDHES (the predecessor to MDEQ) sampled the site, and found the pesticides remaining in the soils, but did not detect any in ground water samples. While listed as a medium priority site, the facility is currently inactive in the MDEQ project files. The location of the site is shown in Figure 9.

- There are three landfills located in the DEQ database for the Malta area. All of the landfills are located south of Malta as shown in Figure 6. The location of the northernmost facility is shown in Figure 9. The southernmost landfill is still active, while the remaining two landfills are listed as closed.

- There are no active mines, including gravel pits, in the DEQ database for the Malta area.

Step 5: A business phone directory was queried to identify businesses that generate, use, or store chemicals in the inventory region. Equipment manufacturing and/or repair facilities, printing or photographic shops, dry cleaners, farm chemical suppliers, and wholesale fuel suppliers were targeted by SIC code.

- The SIC code search identified several businesses for Malta, listed in the following. The businesses in ***bold italic*** represent significant potential contaminant sources further evaluated in Chapter 4.

Malta Area SIC Code Search Results

Name	*Address*	*SIC*	*Business Type*	*Potential Concern*
Hould Farms	Hc 72 Box # 7310	191	Agriculture - General Farms (crops)	Fertilizers; Herbicides/Pesticides
Triple H Inc	407 S 7th Ave E	191	Agriculture - General Farms (crops)	Fertilizers; Herbicides/Pesticides
Ginter Dairy Distributors	21 S 9th St SW	241	Agriculture - Dairy Farms	Animal Waste; Pathogens
Barthelmess Ranch Corp	Hc 84 Box # 8070	291	Agriculture - General Farms (livestock)	Animal Waste; Pathogens
Hitch Aviation	***Airport Rd***	***721***	***Agricultural Crop Services***	***Herbicides and Pesticides***
Hi-Line Veterinary Hospital	N Of Malta	742	Agricultural Veterinary Services	Animal Waste; Pathogens
Johnson Anne DVM	S Of City	742	Agricultural Veterinary Services	Animal Waste; Pathogens
Milk River Veterinary Svc	E Of Malta	742	Agricultural Veterinary Services	Animal Waste; Pathogens
Phillips County Vet Clinic	Highway 191 S	742	Agricultural Veterinary Services	Animal Waste; Pathogens
Ritchey Lisa DVM	Highway 191 S	742	Agricultural Veterinary Services	Animal Waste; Pathogens
Montana Game Birds	234 S 2nd E	752	Agricultural Animal Services, except Vet	Animal Waste; Pathogens
Samedan Oil Corp	Highway 2 E	1311	Oil and Gas - Petroleum and Natural Gas	VOCs (Hydrocarbons)
Kn Energy Inc	Highway 191 S	1382	Oil and Gas - Field Exploration Services	VOCs (Hydrocarbons)
Hi Line Packing Inc	1 1/4 Mile NE Of Malta	2011	Food Products - Meat Packing Plant	Animal Waste; Pathogens
Phillips County News	18 S 1st E	2711	Newspaper Publishing or Printing	VOCs from Inks
Moore's Printing	227 S 2nd Ave E	2741	Miscellaneous Publishing	VOCs from Inks
Malta Ready Mix	S 5th Ave E	3273	Manufacturing - Ready Mix Concrete	Miscellaneous Chemicals
Green's Diesel & Welding Rpr	1st Ave & E Frontage Rd	3519	Manufacturing - Internal Combustion Engines	Miscellaneous Chemicals
Bds Inc	2 Mile S Hwy # 191	3561	Manufacturing - Industrial Pumps & Pumping Eqpt	Miscellaneous Chemicals
Randy's Gun & Machine Shop	300 S 1st Ave E	3599	Manufacturing – Miscellaneous Industrial	Miscellaneous Chemicals
Amtrak	51 S 1st St E	4011	Railroad Transportation	Miscellaneous Chemicals
D C Trucking	S Wagner Rd	4213	Motor Freight Trucking, except local	Transported Chemicals
US Post Office	207 S 1st Ave E	4311	United States Postal Service	Fuel Hydrocarbons
Malta Stockyards	Highway 2 W	4789	Miscellaneous Transportation	Animal Waste; Pathogens
Kmmr	155 1/2 S 1st Ave E	4832	Radio Broadcasting Station	Miscellaneous Chemicals
Big Flat Electric Co-Op	333 S 7th E	4911	Electric Services	PCBs from Transformers
Malta Irrigation District	509 S 3rd E	4971	Irrigation Systems	Miscellaneous Chemicals
Bill's Refrigeration	330 S 1st St E	5078	Wholesale Hardware – Refrigeration Equipment	Miscellaneous Chemicals
Malta Auto Co	1 Mile E Highway # 2	5083	Wholesale Farm & Garden Machinery and Eqpt	Miscellaneous Chemicals
Northern Ag Svc	Highway 2 E	5083	Wholesale Farm & Garden Machinery and Eqpt	Miscellaneous Chemicals
D & S Diesel Svc	E US Highway # 2	5084	Wholesale Industrial Machinery & Equipment	Miscellaneous Chemicals
Ezzies Wholesale	Highway 2 E	5172	Wholesale Petroleum Products, except bulk	Fuel Hydrocarbons
Farmers & Ranchers Lumber Co	7 N 1 E	5211	Retail - Lumber and other Building Materials	Miscellaneous Chemicals
Hanson Lumber & Building Supl	238 1st St E	5211	Retail - Lumber and other Building Materials	Miscellaneous Chemicals
Glacier Route Svc	9 N 1st E	5251	Retail - Hardware Stores	Miscellaneous Chemicals
Ben Franklin	46 S 1st St E	5251	Retail - Hardware Stores	Miscellaneous Chemicals
Hardware Hank	50 S 1st E	5251	Retail - Hardware Stores	Miscellaneous Chemicals
Green's Sales Inc	Highway # 191	5411	Food Stores – Grocery	Miscellaneous Chemicals
Honkers Self Svc	3 N 1st St E Hwy # 2	5411	Food Stores – Grocery	Miscellaneous Chemicals
Albertson's	30 S 3rd St E	5411	Food Stores – Grocery	Miscellaneous Chemicals
Malta Iga	411 S 5th W	5411	Food Stores – Grocery	Miscellaneous Chemicals
L & L Meats	205 N 1st E	5421	Food Stores – Meats	Animal Waste; Pathogens

Karen's	4 S 1st St W	5499	Food Store – Miscellaneous	Miscellaneous Chemicals
Delta Ford	102 S 1st Ave W	5511	Motor Vehicle Dealers	Miscellaneous Chemicals
Ideal Auto	65 S 3rd St E	5511	Motor Vehicle Dealers	Miscellaneous Chemicals
Delta Ford	Highway # 2	5511	Motor Vehicle Dealers	Miscellaneous Chemicals
Dick's Auto & Farm Supply	202 S 1st St E	5531	Auto and Home Supply Stores	Miscellaneous Chemicals
Valley Motor Supply Co	10 S 3rd E	5531	Auto and Home Supply Stores	Miscellaneous Chemicals
Battery Warehouse At B & B Sls	118 S 1st W	5531	Auto and Home Supply Stores	Miscellaneous Chemicals
Malta Tire Ctr	Highway 2 W	5531	Auto and Home Supply Stores	Miscellaneous Chemicals
Matt's Alignment & Brake	176 S Central St	5531	Auto and Home Supply Stores	Miscellaneous Chemicals
Westside Self Svc	***Highway 2 W & # 242***	***5541***	***Gasoline Service Stations***	***Fuel Hydrocarbons***
Malta Marine	4 N 1st E	5551	Boat Dealers	Miscellaneous Chemicals
Mick's	904 S Central Ave	5571	Motorcycle Dealers	Miscellaneous Chemicals
Daniel's Drug-Healthmart	154 S 1st Ave E	5912	Drug Stores	Miscellaneous Chemicals
Valley Drug Co	131 S 1st Ave E	5912	Drug Stores	Miscellaneous Chemicals
Liquor Haven	121 S 2nd St	5912	Drug Stores	Miscellaneous Chemicals
Jan's Floral & Greenhouse	405 N 1st St E	5992	Miscellaneous Retail – Florists	Fertilizers; Herbicides/Pesticides
Edgewater Inn & Campground	101 W Highway # 2	7033	Recreational Vehicle Parks & Campgrounds	Nitrates and Pathogens
Hair-Care	239 S 4th St E	7231	Beauty Shops	Miscellaneous Chemicals
Judy's Kut 'n Kurl	302 Agate Ave	7231	Beauty Shops	Miscellaneous Chemicals
Shapers Salon & Hair Care	4 S 1st St W	7231	Beauty Shops	Miscellaneous Chemicals
Shear Designs	200 Central Ave S	7231	Beauty Shops	Miscellaneous Chemicals
Sue's Stylette	24 S 1st E	7231	Beauty Shops	Miscellaneous Chemicals
Trends Sets	60 S 2nd St E	7231	Beauty Shops	Miscellaneous Chemicals
Jerry's Barber Pole	116 S 1st Ave E	7241	Barber Shops	Miscellaneous Chemicals
Adams Funeral Home	202 S 2nd St E	7261	Funeral Services and Crematories	Miscellaneous Chemicals
U-Haul Co	Highway 2 E	7359	Miscellaneous Equipment Rental & Leasing	Miscellaneous Chemicals
Bill's Classic Auto Body	***Highway 2 E***	***7532***	***Automotive Repair - top, body, upholstery & paint***	***Miscellaneous Chemicals***
Fine Line Auto Body	***200 S 1st W***	***7532***	***Automotive Repair - top, body, upholstery & paint***	***Miscellaneous Chemicals***
Abe's Auto Repair	***24 S 2nd W***	***7538***	***General Automotive Repair***	***Miscellaneous Chemicals***
Lee's Auto Repair	***65 S 3rd E***	***7538***	***General Automotive Repair***	***Miscellaneous Chemicals***
Mechanics Plus	***204 S 1st St E***	***7538***	***General Automotive Repair***	***Miscellaneous Chemicals***
Performance Plus Auto	***904 S Central Ave***	***7538***	***General Automotive Repair***	***Miscellaneous Chemicals***
Precision Mechanics	***620 S 1st E***	***7538***	***General Automotive Repair***	***Miscellaneous Chemicals***
Lass Roland MD	417 4th St E	8011	Health Services – Doctors	Medical Waste
P C Family Health Clinic	315 S 8th Ave E	8011	Health Services – Doctors	Medical Waste
Yutani Dennis MD	417 4th St E	8011	Health Services – Doctors	Medical Waste
Lang Richard C DDS	55 S 2nd E	8021	Health Services – Dentists	Medical Waste
Veseth Michael A DDS	132 Central Ave S	8021	Health Services – Dentists	Medical Waste
Royson	830 Central Ave S	8041	Health Services – Chiropractors	Medical Waste
Malta Eye Clinic	155 S 1st Ave E	8042	Health Services – Optometrists	Medical Waste
Totman Carl A OD	47 S 2nd St E	8042	Health Services – Optometrists	Medical Waste
Phillips County Wic Project	417 S 4th E	8049	Health Services, not elsewhere classified	Medical Waste
Good Samaritan Ctr	801 S 3rd St E	8051	Health - Nursing and Personal Care Facilities	Medical Waste
Phillips County Medical Ctr	417 S 4th St	8062	Hospitals	Medical Waste
County Yards	***3475 S Malta # A***	***9121***	***Government – Local***	***Animal Waste; Pathogens***
Phillips County Weed Control	***159 Central Ave S***	***9121***	***Government – Local***	***Miscellaneous Chemicals***
City Shop	***735 S 1st Ave E***	***9121***	***Government – Local***	***Miscellaneous Chemicals***
Malta Fire Dept	Courthouse	9224	Government - Public Safety	Miscellaneous Chemicals
Transportation Dept	PO Box 713	9621	Government – Transportation Programs	Miscellaneous Chemicals
National Guard	C Highway # 191	9711	Government - National Security	Miscellaneous Chemicals

Note – Some businesses may be identified by multiple SIC codes.

Step 6: Major road and rail transportation routes were identified throughout the inventory region.

- The major transportation routes through Malta are US Highway 2, which runs in an east-west direction through the north part of Malta; and US Highway 191, which runs from US Highway 2 south out of Malta. Montana Highway 242 runs north out of Malta. A railroad line is also present in a general parallel direction to US Highway 2. The locations of these, and other minor transportation routes, are identified on Figure 8.

Step 7. All land uses and facilities that generate, store, or use large quantities of potentially hazardous materials were identified within the recharge region and identified on the base map. This information reflects the results of the inventory process outlined in the previous steps.

- All of the inventoried facilities are identified on the base map in Figure 9.