St. Regis School District 1
Public Water System

PWS ID # MT0002488

Source Water Delineation and Assessment Report

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Prepared by:
Source Water Protection Program
Montana Department of Environmental Quality

Prepared for:
Franklin Smith and Daniel Gingerich
Certified Operators

St. Regis School District 1
PO Box K
St Regis, MT 59866
(406) 649-2311

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EXECUTIVE SUMMARY

This Source Water Delineation and Assessment Report (SWDAR) was prepared under the requirements and guidance of the Federal Safe Drinking Water Act and the US Environmental Protection Agency, as well as a detailed Source Water Assessment Plan developed by a statewide citizen's advisory committee here in Montana. The Department of Environmental Quality (DEQ) is conducting these assessments for all public water systems in Montana. The purpose is to provide information so that the public water system staff/operator, consumers, and community citizens can begin developing strategies to protect your source of drinking water. The information that is provided includes the identification of the area most critical to maintaining safe drinking water, i.e., the Inventory Region, an inventory of potential sources of contamination within this area, and an assessment of the relative threat that these potential sources pose to the water system.

The drinking water for St. Regis School District 1 is supplied by one well located on the west side of the school in a pump house attached to the school. Based on the sanitary survey, well log, and the depth of the well, it appears that water is derived from an aquifer in Glacial Lake Missoula Flood deposits (Figure 2, Qgl. In accordance with the Montana Source Water Protection Program criteria (1999), the aquifer (source water) is considered to have a low sensitivity to potential contaminant sources since it is confined alluvium or lake deposits. Sensitivity is defined as the relative ease that contaminants can migrate to source water through the natural materials.

As part of this assessment, three types of source water protection management areas were mapped for the St. Regis School District 1 public water system. They are: the control zone, the inventory region, and the recharge region. Potential sources of contamination were identified within each of these three regions and the results are as follows:

- No significant potential sources of contamination were identified within the control zone. The goal of management in the control zone is to avoid introducing contaminants directly into the water supply's well or immediate surrounding areas. The control zone is delineated as a 100-foot radius around the well and all sources of potential contaminants should be excluded in this region.
- Significant potential contaminant sources identified within the inventory region include: intermittent herbicide use, underground storage tanks (UST), sewer mains and a few automobile garages. The inventory region should be managed to prevent contaminants from reaching the well before natural processes reduce their concentrations. The inventory region includes the area of land overlying the aquifer upgradient northwest of the well that is expected to supply groundwater recharge to the well over the next three years.
- Potential contaminant sources identified within the recharge region include: agricultural land, lift station, sewer mains, and UST. The goal of management in the recharge region is to maintain and improve water quality over long periods of time or increased usage. Recharge to the wells is likely from infiltration of precipitation and surface water into the glacial deposit where this formation outcrops upgradient northwest of the wells.

The St. Regis School District 1 public water supply has a moderate suseptibility to leaks from sewer mains and a low susceptibility to herbicides.

Low risk potential sources and potential sources located outside the Inventory Region, but within the Recharge Region may still pose a threat over time, but are not discussed in detail in this assessment. This provides a quick look at the existing potential sources of contamination that could, if improperly managed or released, impact the source water for St. Regis School District 1. The susceptibility analysis provides the community and the public water system with information on where the greatest risk occurs and where to focus resources for protection of this valuable drinking water resource.

The costs associated with contaminated drinking water are high, and prevention is preferable to treatment. Public awareness is a powerful tool for protecting drinking water. The information in this report will help increase public awareness about the relationship between land use activities and drinking water quality.

INTRODUCTION

This Source Water Delineation and Assessment Report (SWDAR) was prepared for the St. Regis School District 1 Public Water Supply (PWS), PWS ID No. MT0002488, located in Mineral County (Figure 1). It was compiled by Joe Meek of the Source Water Protection Program at the Department of Environmental Quality (DEQ), with assistance from intern Bethany Haines. This report is based almost entirely on work completed by Ginette Abdo at Montana Bureau of Mines and Geology, along with students at St. Regis School.

PURPOSE

The primary purpose of this source water delineation and assessment report is to provide information that helps the St. Regis School District 1 protect its drinking water sources. A major component of the Montana Source Water Protection Program is '*delineation and assessment*'. Delineation is the process of identifying areas that contribute water to aquifers or surface water bodies used as drinking water supplies. The delineated areas are referred to as source water protection areas. Assessment involves identifying and inventorying potential sources of contamination within the source water protection areas, and then determining the potential for contamination of drinking water by these sources. This report is intended to meet the technical requirements for the completion of a source water delineation and assessment report for the St. Regis School District 1 public water system, as required by the Montana Source Water Protection Program (DEQ, 1999) and the federal Safe Drinking Water Act (SDWA) Amendments of 1996 (Public Law 104-182). The Montana Source Water Protection Program is intended to be a practical and cost-effective approach to protect public drinking water supplies from contamination.

LIMITATIONS

This report was prepared to assess threats to St. Regis School District 1's 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 St. Regis School District 1 public water supply, and not to any other public or private water supply. Also, not all potential or existing sources of groundwater or surface water contamination in the vicinity of the St. Regis School District 1 public water supply are identified. Potential sources of contamination are considered only in areas that contribute water to the source of the public water supply.

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 potentially represent health threats.

CHAPTER 1
BACKGROUND

THE COMMUNITY

St. Regis is located in Mineral County, adjacent to Interstate 90 and the Clark River. St. Regis is 80 miles west of Missoula and 34 miles east of the Idaho state line. The community is unincorporated, with an estimated population of 500 to 700 residents. The main economy is tourism, services associated with the interstate, a lumberyard, and the Forest Service (MBMG, 1999).

The water system supplies water from one active well to the High School, Elementary School, Senior Citizens Center, and a Day Care Center. There is also a second (emergency) well that was valved off from the PWS system and is presently used as an irrigation well.

GEOGRAPHIC SETTING

The St. Regis is at an elevation of about 2,640 feet and is surrounded by ridges of the Bitterroot and Coeur D'Alene Mountains. To the west is Boyd Mountain, to the south Cold Peak, to the east Red Hill, and to the north Tamarack Hill. Multiple gullies and small streams drain from these uplifted areas into either the St. Regis or Clark Fork Rivers. The town sits on a broad alluvial slope above the active floodplain of the St. Regis and Clark Fork Rivers (MBMG, 1999).

St. Regis School District 1 is located in the Lower Clark Fork Watershed, U.S. Geological Survey (USGS) hydrologic unit code (HUC) No. 17010204, which is located within the West Slope Watershed Management Region for Montana.

GEOLOGIC AND HYDROGEOLOGIC SETTING

This section provides an overview of the geology and hydrology of the St. Regis School District 1 area and is based on a primarily on a geologic map of the area by Lonn and McFaddan (1999) and the well logs for the St. Regis School District 1 PWS well and well log available from the Montana Bureau of Mines and Geology (MBMG) Ground-Water Information Center (GWIC). A regional geologic map is provided in Figure 2. The geology of the area can be used to determine the locations, boundaries, and hydraulic properties of local aquifers. An understanding of hydrogeologic conditions also provides an explanation for the sensitivity of local aquifers to potential contaminant sources.

The town of St. Regis lies between the confluence of the St. Regis and the Clark Fork Rivers, but sits above these rivers on an alluvial slope. The land surface is gently sloping to the southeast. The lateral extent of the aquifer is defined by the bedrock valley walls comprised of faulted Proterozoic sedimentary rocks of the Belt super-group (Ywl, Yr) juxtaposed against Tertiary (Tgc) sedimentary deposits (Lonn 1999, Figure 2). Appendix C contains a generalized geologic cross section of the area. Recharge to the deeper aquifer occurs through the fractured bedrock and Tertiary sediments that border the alluvial slope and through leakage from the overlying sediments (MBMG, 1999).

The school's well is completed in deep sand and gravels that are separated from the water table aquifer by two separate clay units with an average combined thickness of 96 feet. The deep aquifer has been characterized as semi-confined. The aquifer has artesian pressure that results in an upward gradient of groundwater flow from the deep aquifer to the shallow sand and gravel above the confining units of clay. The exact stratigraphy of the well is unclear because the driller grouped clay, sand and gravel as one unit (MBMG, 1999).

The surficial alluvial deposits (Qal) on the lower portion of the alluvial slope range in thickness from 50 to 90 feet. They lie uncomformably on Glacial Lake Missoula Flood deposits (Qgl). The thickness of the Glacial Lake Missoula deposits is unknown as most wells only on the east side of the Clark Fork River indicate a thickness of the deposits between 300 to 400 feet. Geologic mapping by Lonn (1999) has identified faulted Proterozoic Belt rocks and Tertiary sands and gravels comprising the hills that surround the area. Many faults are present in the area, but the main structure, which cuts through the St. Regis area, is the Boyd Mountain Fault illustrated in Figure 2. Movement along the Boyd Mountain fault created a basin that was infilled with Tertiary sediments. This fault is connected with a larger network of regional structures, including the Osbourne Fault, that were responsible for the faulting and deformation that created the mountain\landscape surrounding St. Regis (MBMG, 1999).

CLIMATE

Information on climate in the St. Regis School District 1 area is based on the National Oceanic and Atmospheric Administration's (NOAA) St. Regis Ranger Station climate station located at an elevation of 2,860 feet above mean sea level (Western Regional Climate Station). Average temperatures and total precipitation for the period of record are shown in Table 1.

Table 1. Monthly Climate Summary: St. Regis Ranger Station Climate Station

Station 247318 Period of Record: 10/21/1960 to 9/30/2004

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	33.5	40.3	49.5	59.3	68.5	77.0	85.8	86.1	74.6	59.4	41.7	33.2	59.1
Average Min. Temperature (F)	18.1	21.0	25.1	30.4	36.1	42.9	45.4	44.3	37.4	30.4	25.1	19.4	31.3
Average Total Precipitation (in.)	2.39	1.74	1.51	1.44	1.77	1.74	1.05	1.21	1.30	1.58	2.20	2.32	20.26
Average Total SnowFall (in.)	11.2	9.6	7.2	0.4	0.0	0.0	0.0	0.0	0.0	0.2	9.1	17.3	55.1
Average Snow Depth (in.)	7	5	2	0	0	0	0	0	0	0	1	4	2

GENERAL DESCRIPTION OF THE SOURCE WATER

The source aquifer is considered to be confined for the purposes of this report and the interpreted groundwater flow direction in the vicinity of the wells is to the southeast. Recharge to the well is from tertiary sediments that outcrop to the northwest (MBMG, 1999).

THE PUBLIC WATER SUPPLY

St. Regis School District 1 serves around 200 persons (students and staff) through 3 service connections (hook ups). The St. Regis School District 1 is classified as a non-transient non-community water supply de to the non-transient nature of the students and employees served by the system. Information on the water system was obtained from correspondence in the DEQ Public Water Supply Section files, including the most recent sanitary surveys completed on October 23, 2002 (attached as Appendix A) and MBMG Well head Protection Plan completed in 1999.

The well is pumped to the entire distribution system. Only the hot water from the well is softened. Eight captive air tanks prevent excessive pump cycling. A schematic map of the system is provided in the Sanitary Survey in Appendix A.

A preliminary assessment of groundwater sources under the direct influence of surface water (GWUDISW) was completed in 1999 and the water is classified as groundwater.

PWS WELL INFORMATION

St. Regis School District 1's drinking water is supplied by one well located on the west side of the school. The well was completed to a depth of about 164 feet and has a 6-inch steel casing that extends to the depth of the well. The well is a flowing artesian well. The well has an 18-foot clay annular seal. A copy of the well logs from the schools PWS well and irrigation well show encountered stratigraphy and well construction are attached as Appendix B and are summarized in Table 2.

Table 2. Summary of PWS Well Information

Well ID	Well No. 1 Irrigation/emergency Well	Well No. 2 PWS well
DEQ Well Name/ Source Code	Well #1 WL002	Well #2 WL003
GWIC ID	73728	39734
DNRC Water Right	W003779-00	P023059
Well Location	SE¼, SW¼, SE¼, Sec.24, T18N, R28W	SE¼, SW¼, SW¼, Sec.24, T18N, R28W
Well Elevation	Approx. 2,700 feet	Approx. 2,700 feet
Date Completed	8/25/1952	8/4/1986
Total Depth (bgs)	160 feet	164 feet
Well Completion: Casing	6" casing from 0 to 164 feet below surface	6" casing from 0 to 164 feet below surface
Well Completion: Screen	No seal records currently in GWIC.	No seal records currently in GWIC.
Well Completion: Annular Seal	No seal records currently in GWIC.	18 feet clay
Static Water Level (at time of drilling)	Not recorded	-27.72 feet

WATER QUALITY

Every PWS is required to perform regular sampling of their water supply to detect any contamination. The analytical parameters include: coliform bacteria and other pathogenic organisms, nitrates, metals, petroleum hydrocarbons, and other organic chemicals. The monitoring schedule depends on factors such as the size and source water of a PWS, the number of supplies (e.g. wells), and the population served. Each PWS has a specific monitoring program tailored to their system that follows the general protocols defined by DEQ for operation of a PWS. PWS monitoring schedules are available at: <http://nris.state.mt.us/wis/swap/swapquery.asp>. The St. Regis School District 1 PWS monitoring data from DEQ's database for the past five years was reviewed and is summarized in this section.

No health-based violations have been reported in the last five years. Health based violations are issued when the amount of contaminant in the treated drinking water exceeds the safety standard (maximum contaminant level or MCL), or water was not treated properly. The water system has had four monitoring violations in the previous five years (for missing sampling).

Other compounds detected during St. Regis School District 1's water sampling over the past five years include nitrite + nitrate (0.05 to 0.34 mg/L (milligrams per liter)), fluoride (0.03 to 0.1 mg/L), selenium (0.005 mg/L), and sulfate (2.8 to 4.0 mg/L). The compounds detected are all below established EPA primary maximum contaminant levels (MCLs). National secondary drinking water standards (SMCLs) are non-enforceable guidelines that may affect the aesthetic quality of water (i.e. odor, color, etc.) and are not health standards.

Background Water Quality Monitoring Results

Groundwater analytical data characterizing untreated groundwater quality was identified for St. Regis School District 1 Well No. 2. Background water quality sampling typically includes some general water quality parameters including major dissolved ions (calcium, magnesium, sodium, potassium, iron, manganese, silica, bicarbonate, carbonate, chloride, sulfate, nitrate, fluoride and orthophosphate), trace elements, and metals. Copies of the water quality results from the GWIC database, and a comparison of

the results to maximum contaminant levels for St. Regis School District 1's current well field is provided in Appendix A (MBMG, 1999).

CHAPTER 2
DELINEATION

This report delineates three source water management areas. The goal of source water management is protecting 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 major land use activities or other significant activities in the recharge region pose minimal threat to the source water.

CONCEPTUAL MODEL AND ASSUMPTIONS

St. Regis School District 1's production wells are located in the Lower Clark Fork watershed (USGS Hydrologic Unit Code 17010204), which is located within Montana's West Slope watershed (Heath, 1984). As detailed above, St. Regis School District 1's drinking water source is interpreted to be from an aquifer in Glacial Lake Missoula Flood deposits. The direction of groundwater flow beneath the site is presumed to be from the northeast towards the southeast towards St. Regis and Clark Fork Rivers (MBMG, 1999) Clark Fork River. The aquifer is semi-confined to unconfined (varies with location) and recharge to the wells is primarily from infiltration of surface water and precipitation through the overlying sand and gravel.

As the aquifer is confined in the St. Regis area, it is considered to have Low Source Water Sensitivity to contamination. Sensitivity is defined as the degree of ease with which contaminants may migrate to the source water aquifer. This determination is according to the DEQ Source Water Protection Program criteria for ranking aquifer sensitivity (DEQ 1999).

DELINEATION

Methods and criteria for delineating source water protection areas are specified in the Montana Source Water Protection Program (DEQ, 1999). The delineated management zones for the wells are shown on Figure 3.

Control Zone – A 100-foot radius control zone is delineated for St. Regis School District 1's well. All sources of potential contaminants should be excluded in this region.

Inventory Region –The Inventory region represents the calculated zone of contribution to the well for a distance of 2.5 miles. The delineation is based on both pumping and aquifer characteristics. The final shape for the Inventory region was based on accounting for potential variability in the groundwater flow direction, hydrogeologic factors such as the recharge are for the aquifer, and land use. The southern extent of the region is by Interstate 90; the eastern boundary follows St. Regis Street. The north and west boundaries follow the national forest border and includes a portion of the bedrock and Tertiary sediments that my recharge the aquifer. All sources of potential contaminants are inventoried in this region. The time of travel calculations are attached as Appendix D (MBMG, 1999).

Recharge Region –The recharge region for the St. Regis School District 1 well is an extension of the inventory region. The recharge region extends down to the St Regis and Clark Fork Rivers. The northern extent follows the national forest land boundary and partially follows a bedrock high that may provide recharge to the aquifer. The region includes the Tertiary sediments that outcrop to the northwest. Recharge form the bedrock is not as much as that from the Tertiary deposits; therefore, the region was not extended into the bedrock on the western edge. The fact that most of the land is

administered by the forest service in which minimal development is expected was a factor in defining the area. The inventory for the recharge region focuses on general land uses and large industrial facilities. The goal of management in the recharge region is to maintain and improve the long-term quality of groundwater in the aquifer (MBMG, 1999).

LIMITING FACTORS

Delineation of the source water protection areas for the St. Regis School District 1 PWS wells is based on published reports and lithology indicated on the well logs. The interaction of surface water with the alluvial channel deposits is not completely understood and the changes in the flow regime under seasonal conditions are not known. The delineation was completed using conservative assumptions to help ensure that the inventory zone reflects the actual area where contamination to the system may occur.

CHAPTER 3
INVENTORY

INVENTORY METHOD

Significant potential contaminant sources in the source water management areas were inventoried to assess the susceptibility of St. Regis School District 1's wells to contamination, and to provide a foundation for source water protection planning. The inventory for St. Regis School District 1 focuses on facilities or features that generate, use, store, or transport potential contaminants, as well as certain land uses in the inventory and recharge regions. It is important to remember that the sites and areas identified in this section are only potential sources of contamination to the drinking water. Contamination of drinking water sources is less likely when potential contaminants are properly used and managed.

The inventory focus is slightly different in each of the delineated management areas. The inventory for St. Regis School District 1 focuses on all activities in the control zones for the wells; certain types of facilities and land uses in the inventory region; potential sources of nitrates and pathogens in the surface water buffer; and general land uses and large facilities in the Recharge Region. Information on facilities and land uses that are potential sources of regulated contaminants was obtained from a number of databases, described below. The process for completing the inventory included several steps, which are summarized as follows:

Step 1: Urban and agricultural land uses were identified from the U.S. Geological Survey's (USGS) Geographic Information Retrieval and Analysis System <http://nris.state.mt.us/gis/datalist.html>. Sewered and unsewered residential land uses were identified from boundaries of sewer coverage obtained from municipal wastewater utilities.

Step 2: The US Environmental Protection Agency's (EPA) Envirofacts System <http://www.epa.gov/enviro/> was queried to identify EPA-regulated facilities located in the management areas. 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) and the Permit Compliance System (PCS - for Concentrated Animal Feeding Operations with MPDES permits). 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.

Step 3: Montana DEQ databases were queried to identify any of the following in the management areas:

- Underground storage tanks (USTs) <http://www.deq.state.mt.us/UST/USTDownloads.asp>
- Hazardous waste contaminated sites, above ground storage tanks (ASTs), landfills, and abandoned and active mines, including gravel pits <http://nris.state.mt.us/gis/bundler/>

Any information on past releases and present compliance status was noted.

Step 4: Major road and rail transportation routes were identified throughout the inventory region: <http://nris.state.mt.us/gis/gisdatalib/gisDataList.aspx>.

Potential contaminant sources are designated to be significant if they fall into one or more of the following categories:

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 leaking UST sites).
5. Underground injection well.
6. Major roads or rail transportation routes.
7. Cultivated cropland exceeding 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

CONTROL ZONE INVENTORY RESULTS

The control zone includes the school, school grounds and portions of the tractor shed and industrial arts shop. The shop is fully cemented with no drains. The tractor shed is a "lean to" structure with just groundcover as its base, with no evidence of leaks from the machinery. The machinery is serviced in the school garage, which is outside of the control zone (MBMG, 1999).

No potential sources of contamination were identified within the control zones for the well. The PWS should be vigilant to ensure that potential sources of contamination are excluded from the control zone and that positive drainage away from each well casing is maintained (MBMG, 1999).

INVENTORY REGION RESULTS

The inventory results for St. Regis School District 1's source water are summarized in Table 3 and are shown on Figure 3 and Figure 4. The inventory region includes the school grounds and parts of the town that immediately surround the school. Most of the region is comprised of privately owned timberland, irrigated hay/alfalfa fields, and forested land (MBMG, 1999). There are a few unsewered ranches and ranchettes on the upper portion of the alluvial slope. A large above ground propane tank sits to the east of the school complex surrounded by a fence. A new state of the art above ground vault fuel tank is mounted on a cement platform adjacent to the school garage. The school garage burns it's waste oil and the only shipments to the school would be fuel and propane trucks. Within this region there is anadditional garage, Schober. Schober's practices are unknown (MBMG, 1999). There is a site south of the well where Ankrum trucking had a diesel/gasoline spill from a truck wreck. There is not much information available on the site. The database indicates that the contamination was cleaned up and the site investigation was closed by DEQ.

There are several underground storage tanks in the inventory region. Three old septic tanks and adjacent septic drain fields were located on the school grounds. Septic systems can potentially contribute nitrate and bacteria to groundwater (Table 3).

Most landowners outside of town spot spray for knapweed on an intermittent basis. The county roads in this are sprayed annually with Curtail (MBMG, 1999).

Land uses within the inventory region include primarily timberland and irrigated hay and some low intensity residential property. Other potential sources of contamination noted include sewer mains. Additional point sources of potential pollutants (such as businesses or facilities listed on regulatory databases) were not identified in the inventory region.

Table 3. Summary of Potential Contaminant Sources in the Inventory Region

Source Type	*Potential Contaminants*	*Description/Concern*
Land Use Cover (Step 1)		
Residential Development with Sewer Lines	Pathogens and nitrates	If not properly designed, installed, and maintained, sewer lines can be a point source of residential and commercial effluent in groundwater.
Businesses and private homes that may use hazardous materials or have USTs	Pesticides, fertilizers, VOCs, SOCs, other	Spills and leaks impacting groundwater
EPA Envirofacts Sites (Step 2)		
None Identified		
DEQ Databases (Step 3)		
None Identified		
Miscellaneous Others, including Step 4		
Intermittent Spraying (i.e. pesticides, herbicides, plasticizers)	SOCs, Nitrates, Pathogens	Contaminants leaching into groundwater

Notes: Individual sites identified are evaluated in Chapter 4.

RECHARGE REGION INVENTORY RESULTS

The recharge region includes almost the entire St. Regis alluvial slope that is bounded on the south by the St. Regis River and the east by the Clark Fork and extends upgradient of this area into National Forest land along the Mullen Gulch road, incorporating most of the exposed Tertiary sediments. Parts of the town below the area are also included as well as some forested timberland to the north. The portion of town within the recharge region is mostly sewered with the exception of some unsewered areas along the Clark Fork River (MBMG, 1999).

Most of the items identified are located down gradient form the school. The Tertiary sediments and Proterozic bedrock, that supply recharge to the aquifer, are mostly administered by the Lolo National Forest and minimal development is expected. Within the portion of town there are several underground storage tanks at individual residence. Simkin's Auto is located on the edge of town to the north. This garage recycles its waste oil. The lift station for the sewer district is located between Highway 135 and the Clark Fork River. Additional sources of potential pollutions (such as businesses or facilities listed on regulatory databases) were not identified in the recharge region (MBMG, 1999).

INVENTORY UPDATE

To make this SWDAR a useful document for the years to come, the certified water system operator should review the inventory every five years year. Changes in land uses or potential contaminant sources should be noted and additions made as appropriate. The complete inventory should be submitted to DEQ every five years to ensure the source water delineation and assessment remains current.

INVENTORY LIMITATIONS

The potential contaminant sources described above are identified from readily available information. Consequently, unregulated activities or unreported contaminant releases may have been overlooked. The use of multiple sources of information, however, should ensure that the major threats to the source water for St. Regis School District 1's public water supply have been identified. The lack of identification of a potential contaminant source in the inventory or susceptibility assessment of this report does not mean that the potential for contamination does not exist or there is not a threat. It is highly recommended that the PWS and community "enhance" or refine the identification of the potential contamination sources through further research and local input.

CHAPTER 4
SUSCEPTIBILITY ASSESSMENT

HAZARD DETERMINATION

The threat of contamination is referred to as *hazard*. The degree of hazard is determined either by the proximity of a potential contaminant source to a spring or well intake, potential contaminant migration pathways, or by the density of potential non-point contaminant sources.

DISCUSSION OF SUSCEPTIBILITY

Susceptibility is the degree of likelihood for a public water supply to be impacted by inventoried contaminant sources, at concentrations that would pose a concern. Susceptibility is assessed to prioritize potential pollutant sources for local management, in this case the St. Regis School District 1 PWS managers and operators. Alternative management approaches that could be used by the PWS managers and operators to reduce susceptibility are recommended in this chapter.

Susceptibility is determined by considering the hazard rating for each potential contaminant source relative to any contaminant barriers (Table 4). Barriers to contamination are anything that decreases the likelihood that contaminants will reach a spring or well. Barriers can be engineered structures, management actions, or natural conditions. Examples of engineered barriers include spill catchment structures and leak detection for underground storage tanks. Emergency planning and best management practices (BMPs) are considered management barriers. Thick clay-rich soils, a deep water table or a thick unsaturated zone above the well intake are examples of natural barriers.

Table 4. Susceptibility Based on Hazard and 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

The well log indicates that a significant layer of clay is present overlying the aquifer. Clay layers were also identified in other well logs in the area indicating that the layer is likely laterally extensive in the St. Regis School District 1. The clay serves as a natural barrier to the downward migration of potential contaminants from the surface. Another barrier is the depth of the well intake, which is greater than 100 feet deep.

A summary of the susceptibility assessment for St. Regis School District 1 production well is provided in Table 5. This table only includes the potential contaminant sources (identified in Chapter 3) that were determined to present a significant potential risk to the drinking water supply. Therefore, this list is not exhaustive, and it is highly recommended that the PWS operator and community members familiar with

the nature of businesses and land use in the area enhance the inventory through further research and local input.

MANAGEMENT RECOMMENDATIONS

It should be noted that even small releases of some chemicals in close proximity to a public water supply well can have significant negative impact on water quality, and therefore are a significant threat to the public water supply. Steps can be taken to reduce the likelihood of releases in the source water for the PWS or in the vicinity of the sources. Management recommendations for protecting the St. Regis School District 1 drinking water supply are detailed in the susceptibility table (Table 5). If these, and other, management recommendations are implemented; they may be considered additional barriers that will reduce the susceptibility of the intake to specific sources and contaminants.

Table 5. Susceptibility Assessment of Significant Potential Contaminant Sources

Potential Contaminant Source	Potential Contaminants	Hazard	Hazard Rating	Barriers	Susceptibility	Management Recommendations
Inventory Region						
Sewer Mains	Pathogens and nitrates from sewer main leaks or manhole leaks	Ongoing or catastrophic leakage of sewage into groundwater	*High*	Aquifer depth >100 feet below ground surface (bgs) Thick clay layers overlie the aquifer	*Moderate*	Support maintenance, rehabilitation, or replacement of existing sewer mains; use of sewer main liners; and rapid response planning for leaks or ruptures.
Intermittent chemical spraying (i.e. pesticides, herbicides)	SOCs, Nitrates, Pathogens	Contaminants leaching into groundwater	*Moderate*	Aquifer depth >100 feet below ground surface (bgs) Thick clay layers overlie the aquifer	*Low*	*E*ncourage and support efforts to provide educational information, materials, and resources to land owners on the proper application and storage of pesticides and fertilizers and implementing best management practices (BMPs).
Vehicle/Equipment Maintenance Area/Shop	Petroleum products, maintenance products, VOCs, SOCs and others	Spills or leaks of chemicals used	*Moderate*	Aquifer depth >100 feet below ground surface (bgs) Thick clay layers overlie the aquifer	*Low*	Maintain sealed concrete floors. Ensure proper chemical and waste use, storage, and disposal/recycling. Ensure good housekeeping.
Fuel Storage Tanks	Petroleum products and VOCs	Spills or leaks	*Moderate*	Aquifer depth >100 feet below ground surface (bgs) Thick clay layers overlie the aquifer	*Low*	Ensure proper operation and maintenance. Verify existing contamination, if any, is being properly removed or remediated. Properly abandon and remove USTs if out-of-service. Test soil to evaluate potential impact from historic spills or leaks.
Recharge Region						
UST	VOCs, petroleum hydrocarbons	Spills and leaks impacting groundwater		Aquifer depth >100 feet below ground surface (bgs) Thick clay layers overlie the aquifer Cross or down-	*Not rated*	Review permit status for USTs and ensure proper operation and maintenance. Verify existing contamination is being properly removed or remediated. Properly abandon and remove USTs if out-of-service.
Recharge Region continued						
Lift Station	VOCs, SOCs, metals, pathogens, nitrates, others	Ongoing or catastrophic leakage of sewage	*Moderate*	Aquifer depth >100 feet below ground surface (bgs)	*Very Low*	Review permit status (contact DEQ Permitting and Compliance Water Protection Bureau – 406-444-3080 for more information) and

		into groundwater		Thick clay layers overlie the aquifer Cross or down-		ensure proper operation and maintenance, emergency planning, training of local emergency response personnel, groundwater monitoring, spill prevention and BMPs.
Agricultural Crop Land	Nitrate and SOCs from fertilizer, pesticides and herbicides. Pathogens (if grazing occurs)	Contaminants leaching into groundwater	*Moderate*	Aquifer depth >100 feet below ground surface (bgs) Thick clay layers overlie the aquifer Cross or down-gradient location	*Very Low*	Encourage use of agricultural best management practices (BMPs) in the recharge region

Notes: VOCs - Volatile organic compounds (i.e. solvents, fuel components) SOCs - Synthetic Organic Compounds (i.e. pesticides, herbicides, plasticizers)
UST - Underground Storage Tank LUST - Leaking Underground Storage Tank
BMPs - Best Management Practices DEQ- Montana Department of Environmental Quality
RR – Recharge Region SIC - Standard Industrial Code

CONCLUSION

This Source Water Delineation and Assessment Report (SWDAR) was prepared under the requirements and guidance of the Federal Safe Drinking Water Act and the US Environmental Protection Agency, as well as a detailed Source Water Assessment Plan developed by a statewide citizen's advisory committee here in Montana. The Department of Environmental Quality (DEQ) is conducting these assessments for all public water systems in Montana. The purpose is to provide information so that the public water system staff/operator, consumers, and community citizens can begin developing strategies to protect your source of drinking water. The information that is provided includes the identification of the area most critical to maintaining safe drinking water, i.e., the Inventory Region, an inventory of potential sources of contamination within this area, and an assessment of the relative threat that these potential sources pose to the water system.

The drinking water for St. Regis School District 1 is supplied by one well located on the west side of the school in a pumphouse attached to the school. Based on the sanitary survey, well log and the depth of the well, it appears the drinking water source is derived from an aquifer in Glacial Lake Missoula Flood deposits (Figure 2, Qgl). In accordance with the Montana Source Water Protection Program criteria (1999), the aquifer (source water) is considered to have a low sensitivity to potential contaminant sources. Sensitivity is defined as the relative ease that contaminants can migrate to source water through the natural materials.

As part of this assessment, three types of source water protection management areas were mapped for the St. Regis School District 1 public water system. They are: the control zone, the inventory region, and the recharge region. Potential sources of contamination were identified within each of these three regions and the results are as follows:

- No potential sources of contamination were identified within the control zone. The goal of management in the control zone is to avoid introducing contaminants directly into the water supply's well or immediate surrounding areas. The control zone is delineated as a 100-foot radius around the well and all sources of potential contaminants should be excluded in this region.
- Significant potential contaminant sources identified within the inventory region include: intermittent herbicide use, underground storage tanks (UST), sewer mains and a few automobile garages. The inventory region should be managed to prevent contaminants from reaching the well before natural processes reduce their concentrations. The inventory region includes the area of land overlying the aquifer upgradient northwest of the well that is expected to supply groundwater recharge to the well over the next three years.
- Potential contaminant sources identified within the recharge region include: agricultural land, lift station, sewer mains, and UST. The goal of management in the recharge region is to maintain and improve water quality over long periods of time or increased usage. Recharge to the wells is likely from infiltration of precipitation and surface water into the glacial deposit where this formation outcrops upgradient northwest of the wells.

The St. Regis School District 1 public water supply has a moderate susceptibility to leaks from sewer mains and low susceptibility to herbicides.

Low risk potential sources and potential sources located outside the Inventory Region,

but within the Recharge Region may still pose a threat over time, but are not discussed in detail in this assessment. This provides a quick look at the existing potential sources of contamination that could, if improperly managed or released, impact the source water for St. Regis School District 1. The susceptibility analysis provides the community and the public water system with information on where the greatest risk occurs and where to focus resources for protection of this valuable drinking water resource.

The costs associated with contaminated drinking water are high, and prevention is preferable to treatment. Public awareness is a powerful tool for protecting drinking water. The information in this report will help increase public awareness about the relationship between land use activities and drinking water quality.

REFERENCES

Heath, Ralph C., 1984. Ground-water Regions of the United States, U.S. Geological Survey, Water Supply Paper 2242, Washington D.C., 78p.

Lonn, J.D., McFaddan, M.D., 1999, Geologic map of the Wallace 30' x 60' quadrangle, Montana Bureau of Mines and Geology Open File Report 388, 15 page(s), scale 1:100,000.

Montana Bureau of Mines and Geology, 2004. Groundwater Information Center, lithologic well logs. http://mbmggwic.mtech.edu/

Montana Bureau of Mines and Geology, 1999. St. Regis School Wellhead Protection Plan.

Montana Department of Environmental Quality Public Water Supply Section, 2004. Safe Drinking Water Information System (SDWIS).

Montana Department of Environmental Quality, 1999. Montana Source Water Protection Program. http://www.deq.state.mt.us/ppa/p2/swp/index.asp

Montana Department of Environmental Quality Underground Storage Tank Program web site. http://www.deq.state.mt.us/Rem/tsb/iss/USTDownloads.asp

Montana Natural Resources Information Interactive Map website. 2004. http://nris.state.mt.us/interactive.html

United States Census Bureau, 2000. http://factfinder.census.gov/home/saff/main.html?_lang=en

United States Environmental Protection Agency “Envirofacts Data Warehouse and Applications”. http://www.epa.gov/enviro/

United States Environmental Protection Agency, 1991, Protecting Local Groundwater Supplies Through Wellhead Protection, EPA 570/9-91-007, 18 p.

United States Geological Survey. 1992. National Landcover Dataset, Montana. 30-meter electronic digital landcover dataset interpreted from satellite imagery. http://nris.state.mt.us/nsdi/nris/nlcd/nlcdvector.html

Various Authors, 1999-2004. Correspondence in DEQ’s PWS files regarding the St. Regis School District 1 Water Supply.

Western Regional Climate Center Montana Climate Summaries. wrcc@dri.edu

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 non-point source 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 (e.g. dry well). 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.

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.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS). A database that provides information about specific sites through the EPA Envirofacts website.

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 inhibits the flow of water and maintains the pressure of the groundwater in the aquifer. The physical properties of a confining unit may range from a five-foot thick clay layer to shale that is hundreds of feet thick.

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

Glacial. Of or relating to the presence and activities of ice or glaciers. Also, pertaining to distinctive features and materials produced by or derived from glaciers.

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 groundwater flow systems.

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

Lacustrine. Pertaining to, produced by, or formed in a lake or lakes.

Large Capacity Septic System. Defined by Underground Injection Control regulations as an on-site septic system serving 20 or more persons.

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 – Groundwater Information Center (MBMG/GWIC). The database of information on all well drilled in Montana, including stratigraphic data and well construction data, when available.

Montana Pollutant Discharge Elimination System (MPDES). A permitting system that utilizes a database to track entities that discharge wastewater of any type into waters of the State of Montana.

National Pollutant Discharge Elimination System (NPDES). A national permitting system that utilizes a database to track entities that discharge wastewater into waters of the United States.

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. Examples of nonpoint- source pollution include agriculture, forestry, and run-off from city streets. Nonpoint sources of pollution, such as the use of herbicides, can concentrate low levels of these chemicals into surface and/or groundwaters at increased levels that may exceed MCLs.

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

Phase II (and IIb) Rules. EPA updated or created legal limits on 38 contaminants. The rules became effective July 30, 1992 and January 1, 1993. Some of these contaminants are frequently-applied agricultural chemicals such as nitrate and others are industrial solvents.

Phase V Rule. EPA set standards for 23 contaminants in addition to those addressed by the Phase II Rules. The Phase V Rule became effective January 17, 1994. Some of these contaminants include inorganic chemicals such as cyanide and other Phase V contaminants are pesticides that enter water supplies through run-off from fields where farmers have applied them or by leaching through the soil into groundwater. Six are probable cancer-causing agents. Others can cause liver and kidney damage, or problems of the nervous system and brain.

Point Source. A stationary location or a fixed facility from which pollutants are discharged. This includes any single identifiable source of pollution, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fracture, container, rolling stock (tanker truck), or vessel or other floating craft, from which pollutants are or may be discharged.

Pollutant. Generally, any substance introduced into the environment that adversely affects the usefulness of a resource (e.g. groundwater used for drinking water).

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 (PWS). 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. An area in which water is absorbed that eventually reaches the zone of saturation in one or more aquifers. As a source water management region, the term generally describes 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.

Resource Conservation and Recovery Information System (RCRIS). Is a database that 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 groundwater source that provides water to a public water supply.

Source Water Delineation and Assessment Report (SWDAR). A report for a public water supply that delineates source water protection areas, provides 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 groundwater 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.

Standard Industrial Classification (SIC) Code. A method of grouping industries with similar products or services and assigning codes to these groups.

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.

Total Maximum Daily Load (TMDL). The total pollutant load to a surface water body from point, nonpoint, and natural sources. The TMDL program was established by section 303(d) of the Clean Water Act to help states implement water quality standards.

Toxicity. The quality or degree of being poisonous or harmful to plants, animals, or humans.

Toxicity Characteristic Leachate Procedure. A test designed to determine whether a waste is hazardous or requires treatment to become less hazardous.

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.

Turbidity. The cloudy appearance of water caused by the presence of suspended matter.

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 that evaporate readily to the atmosphere.

Watershed. The region drained by, or contributing water to, a stream, lake, or other water body of water.

* With the exception of the definitions for Lacustrine, Phase II and Phase V Rules, and Standard Industrial Classification Code, definitions were adapted from EPA's Term References System (formerly known as Glossary of Selected Terms and Abbreviations) which can be found at: http://www.epa.gov/trs/index.htm . The definitions of glacial and lacustrine were taken from the Glossary of Geology by Robert L. Bates and Julia A. Jackson.

The definitions for Phase II and Phase V Rules were adapted from:
http://www.epa.gov/OGWDW/source/therule.html#PhaseII

http://www.epa.gov/OGWDW/source/therule.html#PhaseV

The definition for Standard Industrial Classification Code was adapted from:
EPA/Office of Enforcement and Compliance Assurance: Guide to Environmental Issues: Glossary of Terms & Acronyms *Term Detail*

Appendix A
PWS Sanitary Survey

The Cadmus Group, Inc
2620 Colonial Drive, Suite B
Helena, MT 59601
Telephone: 406-443-9194
Fax: 406-443-9197

November 4, 2002

St. Regis School District 1
C/O Franklin Smith
P.O. Box K
St. Regis, MT 59866

MINERAL COUNTY

RE: PWSID # MT0002488– ST. REGIS SCHOOL

Dear Mr. Smith:

On October 22-23, 2002, I conducted a sanitary survey of the St. Regis School Public Water Supply (PWS). I would like to thank you for your assistance and for showing me your water system. This PWS consists of one active well and eight pressure tanks serving the High School, Elementary School, Senior Citizens Center, and a Day Care Center. The system serves a non-transient population of approximately 180. There is also a second emergency well that was valved off from the PWS system and is presently used as an irrigation well.

This system is classified as a Non-Transient Non-community water supply due to the non-transient nature of the students and employees served by the system. This was a routine sanitary survey conducted under contract with the Montana Department of Environmental Quality (MDEQ). The State completes sanitary surveys on all Montana public water supply systems at about 3-5 year intervals. Sanitary Surveys are required of public water systems by both State and Federal regulations, and the MDEQ provides the sanitary surveys as a service to the regulated community.

I work for The Cadmus Group, Inc., and Cadmus is a contractor for the MDEQ. The following report contains a description of the water system; any recommendations for the system are numbered at the end of the report.

SDWIS
3-18-03
South Hills

Well 1 (Inactive—Used for Irrigation Only)

This well is located in a small room on the north side of the High School. The well log (well log was furnished by phone 6/5/89) shows that a 6-inch steel well was drilled and cased to a depth of 164 feet October 13, 1952. The GWIC well log shows the well was completed August 25, 1952. This is an artesian well that was completed at the same depth as Well 2; therefore, we can probably assume the same closed-in artesian pressure of 12 psi for this well as was shown on the well log for Well 2.

During the last sanitary survey, it was determined that the two wells serving this PWS had two different entry points. To reduce sampling costs, the system was re-plumbed to allow Well 2 to be the only well serving this system. Well 1 is now used only as an irrigation well and is valved off from the potable water supply. Well 1 could be used as an emergency backup source if the need arises.

SANITARY SURVEY FORM – WATER SYSTEM FACILITIES Page 2 of 9

Water System Facilities (WSF) numbers are WSF Type Codes plus an assigned number. (i.e. source facility numbering starts with 002 and all non-source facilities start with 001). See instruction sheet for a list of WSF Type Codes. When a source is operational it is considered **A**ctive, this includes systems that are seasonal. **I**nactive sources are those which are shut down but can return to active status, such as a system out of business. **P**roposed sources are those that have been identified through the Plan Review process, but are not connected to the water system.

*A **water source facility** is a well, spring, intake, infiltration gallery or consecutive connections from which a system draws or purchases water:*

Total Number of Source Facilities 2--one Active

WATER SYSTEM FACILITIES SUMMARY (WSF)

WSF ID	Facility Name	Water Type Code	Purchased	Seller PWSID
DS 001	Distribution System			
WL 002	Well 1--Artesian (Inactive now) used for irrigation	GW	☐ Yes ☒ No	
WL 003	Well 2-Active used for entire system	GW	☐ Yes ☒ No	
PC 001	Pressure Control For WL 002 (Inactive)		☐ Yes ☐ No	
PC 002	Pressure Control For WL 003		☐ Yes ☐ No	
TP 002	Treatment Plant for Well 2 (Softening)		☐ Yes ☐ No	
TP 001	Treatment Plant for Well 1 (Softening) Inactive		☐ Yes ☐ No	
	↑change #'s		☐ Yes ☐ No	
			☐ Yes ☐ No	
			☐ Yes ☐ No	
			☐ Yes ☐ No	
			☐ Yes ☐ No	

Description of Water System Facility flow: **Well 2 (WL 003) is pumped to the entire distribution system. Only the hot water from Well 2 is softened (TP 002). Excessive pump cycling is prevented by eight Well-X-Trol WX-302 (PC 002) captive air tanks. Well 1 (WL 002), a 500-gallon pressure tank (PC 001), and another softening unit (TP 001) near Well 1 are no longer active for this system to reduce sampling costs. Well 1 is valved off from the potable water supply and is used only as an irrigation well and as an emergency backup well should the need arise.**

Example: Well 1(WL002) is pumped into pumphouse where chlorine is applied (TP001) and from there to the storage tank (ST001). The treated water flows by gravity to the Distribution System (DS001)

EMERGENCY POWER

Does the system have emergency power? ☐ Yes ☒ No

If yes, what type: _____

Frequency of testing: _____

Record of primary power failures: _____ in last year

Switchover: ☐ Automatic ☐ Manual

Comments: Both wells are artesian.

SANITARY SURVEY FORM – WELLS & PUMPS Page 3 of 9

(Please copy this sheet for additional wells & pumps)

COMPLETE ONE SECTION FOR EACH SOURCE

STATUS OF SOURCE ☐ (A)ctive ☒ (I)nactive ☐ (P)roposed

WSF ID WL 002 *Entry Point ID* EP 502
These are state assigned identification numbers

Source Name Well 1
Name of Source – Example: Well 1 or South well, etc.

Location of Water Source (TRS or street address) **In a small room on the north side of High School**

Entry Point Name EP for Well 1
Name of EP – Example: Entry point for North Well 1 & South Well 2

Location of Entry Point At a tap in the booster pump room.

Available ☐ Perm ☒ Emerg ☐ Interim ☐ Seasonal ☐ Other
If seasonal: _____ to _____

GWUDISW PA Completed ☒ Yes ☐ No

Log Available? ☒ Yes ☐ No

Average Production unk
indicate units

Maximum Production unk
indicate units

Date Drilled 10/13/1952 or 8/25/52?
if well... date drilled

Casing Size 6 inch steel
size of casing installed in well

Case Depth 164 feet
depth of casing installed in well

Well Depth 164 feet
depth of well expressed in feet

Grout Depth unknown
depth of grout used to seal well walls

Log SWL Artesian-Probably 12 psi
(static) expressed in feet below ground elevation

Log PWL Artesian
(pumping) expressed in feet below ground elevation

Pump Capacity unk
capacity of pump installed expressed in gallons per min

Intake Type centrifugal
type of intake mechanism

Screened Interval none
expressed in feet below ground elevation

Well Yield unk
pump tested in gallons per minute

Latitude 47deg 18min 01sec
latitude of source

Longitude 115deg 05min 57sec
longitude of source

WELLS – COMPLETE ONE SECTION FOR EACH SOURCE

WSF ID WL 002
Example: WL002

Is well site subject to flooding? ☐ Yes ☒ No

Is well located in proximity of a potential source of pollution (includes surface water, known chemical spills, agricultural use, etc.)? ☐ Yes ☒ No

If yes . . explain Confined well with approximately 8 psi pressure

Does casing extend at least ☒18 inches above outside ground level; ☐12 inches above finished floor inside well house; and ☐3 feet above 100 year flood elevation? (Check for appropriate distance) ☒ Yes ☐ No

Is top of the well casing properly sealed? (sanitary seal) ☒ Yes ☐ No

Is well vent properly screened and terminated in a downward position? ☐ Yes ☐ No

Does well have suitable sampling tap? ☒ Yes ☐ No

Are check valves, blow-off valves and water meters maintained and operating properly? ☒ Yes ☐ No

Is upper termination of well protected (housed or fenced)? ☒ Yes ☐ No

Is intake located below the maximum drawdown? ☒ Yes ☐ No

PUMPS – COMPLETE ONE SECTION FOR EACH SOURCE

WSF ID WL 002

Type Two 5-HP Baldor centrifugal pumps. One is plumbed into the system to add boost pressure to the far end of the system for well 2; however, it has proved unnecessary. Another centrifugal pump provides irrigation flow from this well.
(example: 30 hp line shaft turbine)

Rated Capacity unk

Are pumps operable? ☒ Yes ☐ No

How frequently has pumps(s) been replaced? _____

Are backup pumps/motors provided? ☒ Yes ☐ No

Are controls functioning properly and adequately protected? ☒ Yes ☐ No

Do underground compartments have a drain? ☐ Yes ☐ No

Is facility properly protected against trespassing and vandalism? ☒ Yes ☐ No

Are pump records maintained (amp, drawdown, discharge, pressure, maintenance schedule, manuals, etc.)? ☐ Yes ☒ No

Is the plumbing adequately painted to prevent excessive corrosion? ☒ Yes ☐ No

Is adequate heating, lighting, and ventilation provided? ☒ Yes ☐ No

Is a preventive maintenance program in operation? ☐ Yes ☐ No

Are recommended spare parts on hand? ☐ Yes ☒ No

Comments: (Such as, detailed information on any items with identified deficiencies)

Well was made inactive due to sample costs associated with two entry points. GWUDISW PA passed by Gregg Butts 4/28/99. Used for irrigation and as an emergency backup well.

Comments: (Such as, detailed information on any items with identified deficiencies)

One of the centrifugal pumps is plumbed to provide boost pressure for Well 2, but it has not been needed and has not operated.

SANITARY SURVEY FORM - TREATMENT Page 5 of 9

Treatment Objective

B = Disinfection By - Product Control
C = Corrosion Control
D = Disinfection
E = Dechlorination
F = Iron Removal
I = Inorganics Removal
M = Manganese Removal
N = *No Treatment at Source*
O = Organics Removal
P = Particulate Removal
R = Radionuclides Removal
S = Softening (Hardness Removal)
T = Taste / Odor Control
Z = Other _____

Treatment Codes

(See separate sheet of Treatment Codes)

Example -

WATER TREATMENT FACILITIES

WSF ID	Treatment Plant Name	Treatment Objective and Code			
TP 001	Chlorination for Well 1	D421			Example
TP 002	Filtration and Disinfection for Spring	D341	D720	D421	Example
TP001	Softening for Well 1--inactive	S460			
TP002	Softening for Well 2	S460			

Treatment Description / Comments: There are two softening units for the two wells. The softener for Well 1 is inactive and the softening unit for Well 2 only softens the hot water.

FOR SYSTEMS EMPLOYING FULL-TIME DISINFECTION

What disinfectant is used? NA

Do you record the amount of disinfectant used? ☐ Yes ☐ No

If yes, amount used: _____lbs/day _____ ppm _____ other (give units)

Do you compare disinfectant use with water pumped to verify concentration? ☐ Yes ☐ No

Is chemical storage adequate and safe? ☐ Yes ☐ No

If no, explain _____

Is disinfectant residual being monitored daily? ☐ Yes ☐ No

Are residual reports submitted to the State monthly? ☐ Yes ☐ No

Is the disinfection equipment being operated and maintained properly? ☐ Yes ☐ No

Is operational standby equipment provided? ☐ Yes ☐ No

If not, are critical spare parts on hand? ☐ Yes ☐ No

Have there been any interruptions in disinfection during the past year due to disinfection system failure? ☐ Yes ☐ No

Dates _____

Describe provisions for providing contact time between disinfection point and the first point of use. _____

IF USING GAS CHLORINATION NA

Is a manifold provided to allow feeding gas from more than one cylinder? ☐ Yes ☐ No

Is there automatic switchover from cylinder to cylinder?

Are scales provided for weighing of containers? ☐ Yes ☐ No

Are chlorine storage and use areas isolated from other work areas? ☐ Yes ☐ No

Are caps on stored cylinders? ☐ Yes ☐ No

Is room vented to the outdoors by exhaust grills located no more than 6 inches above the floor level? ☐ Yes ☐ No

Is vent inlet near the ceiling? ☐ Yes ☐ No

Is room containing chlorination treatment labeled sufficiently (DANGER signs, etc.)? ☐ Yes ☐ No

Is a view port provided into the room storing chlorine? ☐ Yes ☐ No

Is a means of leak detection provided? ☐ Yes ☐ No

Is a self-contained breathing apparatus available for use during repair of leaks? ☐ Yes ☐ No

Are personnel trained to use apparatus? ☐ Yes ☐ No

Are all doors hinged outward and equipped with panic bars? ☐ Yes ☐ No

Are all gas cylinders restrained near the top and about half way down by chaining to wall or by other means? ☐ Yes ☐ No

Comments: _____

SANITARY SURVEY FORM - PRESSURE CONTROL ASSEMBLIES

COMPLETE ONE SECTION FOR EACH PRESSURE CONTROL ASSEMBLY

CAPTIVE AIR TANK(S)

WSF ID PC 002 Location, Description Eight WX-302 captive air tanks located in the boiler room up the stairs in the Elementary School

Is there a pressure relief valve? ☐ Yes ☒ No
Is there an operable pressure gauge? ☒ Yes ☐ No
Does low pressure level provide adequate pressure? ☒ Yes ☐ No
Are there water-logged tanks? ☐ Yes ☒ No
Is the exterior surface of the tanks in good physical condition? ☒ Yes ☐ No
Can tank(s) be by-passed for repair? ☒ Yes ☐ No
Pump run time _____
Time of Day _____ Cut-In 40 psi
Cut-Out 60 psi
Pump Type: **submersible**

Comments: **Should have a pressure relief valve installed to offer protection to the tanks and distribution system.**

PRESSURE TANK(S)

WSF ID PC 001 Location, Description 500 gallon pressure tank located in the basement of the high school near Well 1--INACTIVE WELL AND TANK.

Is there an operable pressure gauge? ☐ Yes ☐ No
Does low pressure level provide adequate pressure? ☐ Yes ☐ No
Pump recharge rate _____ Cut-In _____ psi
Time of day _____ Cut-Out _____ psi
Is the tank water logged? ☐ Yes ☐ No
Is air charge system adequate? ☐ Yes ☐ No
Is the exterior surface of the pressure tank in good physical condition? ☐ Yes ☐ No
Is there a water level sight glass? ☐ Yes ☐ No
Is there a bottom drain valve? ☐ Yes ☐ No
Is there a pressure relief valve? ☐ Yes ☐ No
Can tank(s) be by-passed for repair? ☐ Yes ☐ No
Pump type:

Comments: Pressure tank is inactive.

CAPTIVE AIR TANK(S)

WSF ID _____ Location, Description _____

Is there a pressure relief valve? ☐ Yes ☐ No
Is there an operable pressure gauge? ☐ Yes ☐ No
Does low pressure level provide adequate pressure? ☐ Yes ☐ No
Are there water-logged tanks? ☐ Yes ☐ No
Is the exterior surface of the tanks in good physical condition? ☐ Yes ☐ No
Can tank(s) be by-passed for repair? ☐ Yes ☐ No
Pump run time _____
Time of Day _____ Cut-In _____ psi
Cut-Out _____ psi
Pump Type: _____

Comments: _____

PRESSURE TANK(S)

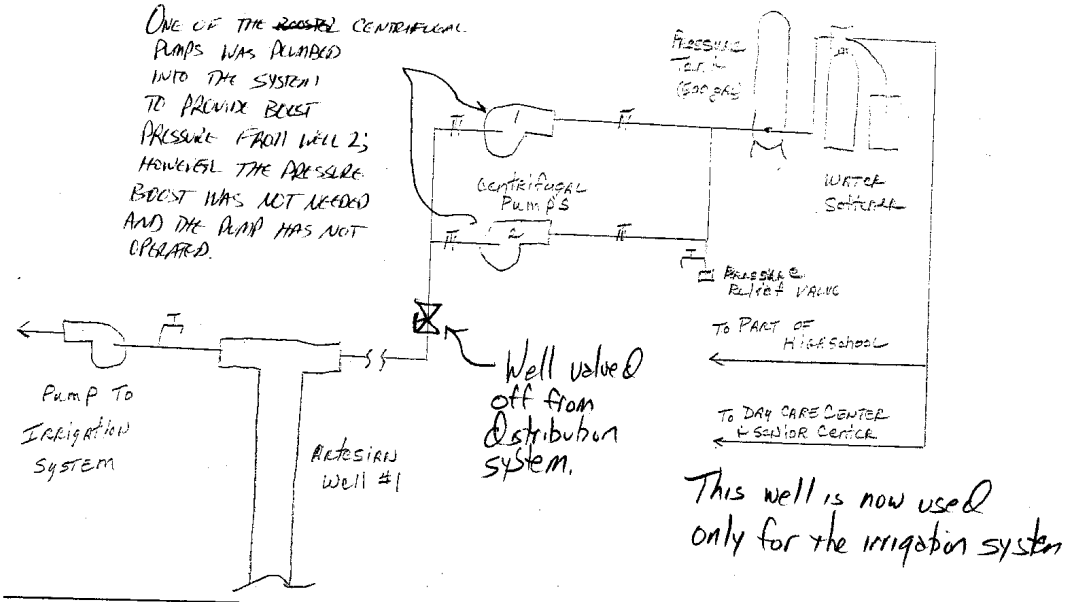
WSF ID _____ Location, Description _____

Is there an operable pressure gauge? ☐ Yes ☐ No
Does low pressure level provide adequate pressure? ☐ Yes ☐ No
Pump recharge rate _____ Cut-In _____ psi
Time of day _____ Cut-Out _____ psi
Is the tank water logged? ☐ Yes ☐ No
Is air charge system adequate? ☐ Yes ☐ No
Is the exterior surface of the pressure tank in good physical condition? ☐ Yes ☐ No
Is there a water level sight glass? ☐ Yes ☐ No
Is there a bottom drain valve? ☐ Yes ☐ No
Is there a pressure relief valve? ☐ Yes ☐ No
Can tank(s) be by-passed for repair? ☐ Yes ☐ No

Pump type: _____ Comments: _____

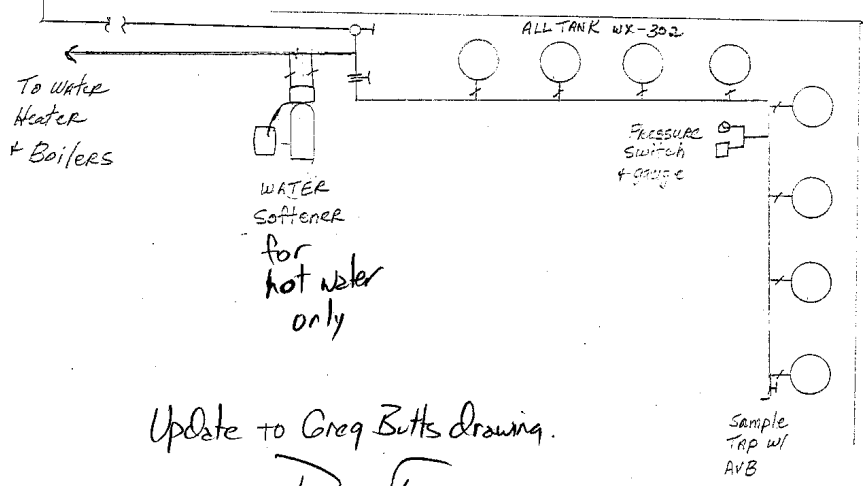
ST. Regis School

Well #1 (SOURCE 002)



Well #2

Well #2 (SOURCE 003) → Now serves the entire distribution system

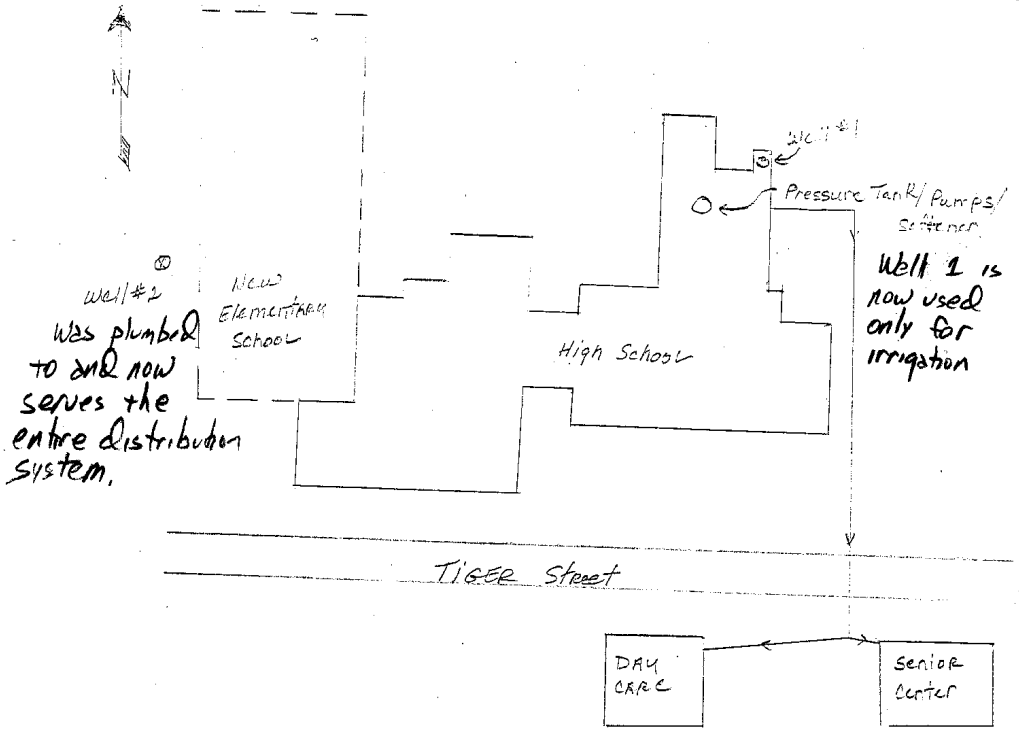


Update to Greg Butts drawing.

Denver Fraser
10/23/2002

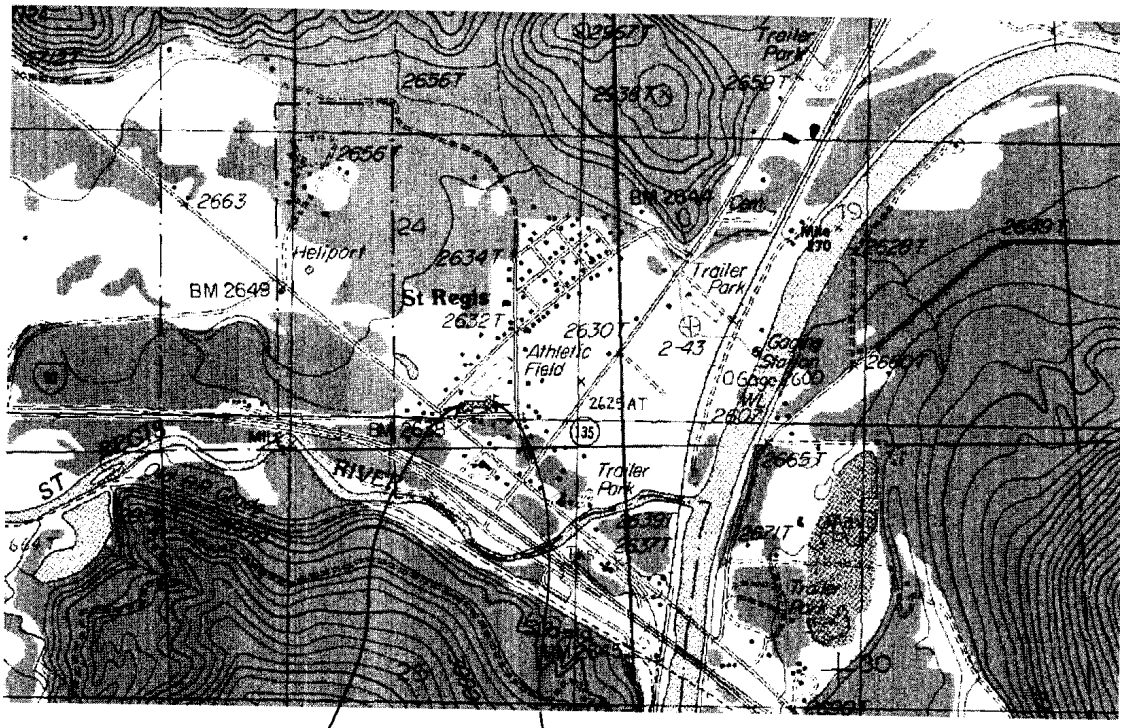
SANITARY SURVEY FORM - DIAGRAMS

Draw brief site plan showing location of well(s), springs(s), water storage, distribution system, pumphouse(s), entry point(s), treatment, etc.



Greg Butts Drawing updated by Denver Fraser 10/23/2002

Draw Brief schematic of placement of filters and disinfection equipment in relation to the source, entry point and distribution system below



St. Regis School
MT0002488

Well 2
Lat: 47°18'01
Long: 115°06'03"

Well 1
Lat: 47°18'01"
Long: 115° 05'57"

'Saint Regis; MT'; Scale: 1" = 0.297Mi 479Mt 1,570Ft, 1 Mi = 3.363" , 1 cm = 188Mt

gwa

File No. 39

TRIPLICATE

(4)

061 T. 18N R. 28W 24

County Mineral DC

123935

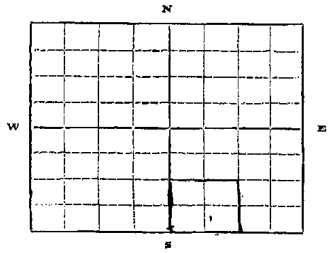
RECEIVED
MAR 2..
Montana Bureau of Mines and Geology

STATE OF MONTANA
ADMINISTRATOR OF GROUNDWATER CODE
OFFICE OF STATE ENGINEER

Declaration of Vested Groundwater Rights

(Under Chapter 237, Montana Session Laws, 1961)

1. School District # 6 (Name of Appropriator), of St. Regis (Address) (Town)
County of Mineral State of Montana have appropriated groundwater according to the Montana laws in effect prior to January 1, 1962, as follows:



SW ¼ SE Sec. 24 T. 18 R. 28

Indicate point of appropriation and place of use, if possible. Each small square represents 10 acres.

2. The beneficial use on which the claim is based water for public school

3. Date or approximate date of earliest beneficial use; and how continuous the use has been 1954 continuous

4. The amount of groundwater claimed (in miner's inches or gallons per minute) 25 gallons per minute

5. If used for irrigation, give the acreage and description of the lands to which water has been applied and name of the owner thereof lawns only

6. The means of withdrawing such water from the ground and the location of each well or other means of withdrawal flow and pump

7. The date of commencement and completion of the construction of the well, wells, or other works for withdrawal of groundwater unknown - probably 1954

8. The depth of water table 160 feet

9. So far as it may be available, the type, size and depth of each well or the general specifications of any other works for the withdrawal of groundwater drilled--probably eight inch casing

10. The estimated amount of groundwater withdrawn each year 300,000 gallons

11. The log of formations encountered in the drilling of each well if available not available

12. Such other information of a similar nature as may be useful in carrying out the policy of this act, including reference to book and page of any county record

School District #6
Signature of Owner Glenn E. Ed. Light
Date March 2, 1962

Three copies to be filed by the owner with the County Clerk and Recorder of the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; Triplicate to the School of Mines and Quadruplicate for the Appropriator.

M: 73728

Montana Bureau of Mines and Geology
Ground-Water Information Center Site Report
ST REGIS SCHOOL OLD BUILDING - WELL 2

Plot this site on a topographic map

Location Information

GWIC Id: 73634
Location (TRS): 18N 28W 24 DCCD
County (MT): MINERAL
DNRC Water Right: P090463
PWS Id: 02488003
Block:
Lot:
Addition:

Source of Data: LOG
Latitude (dd): 47.3001
Longitude (dd): -115.1001
Geomethod: MAP
Datum: 1927
Certificate of Survey:
Type of Site: WELL

Well Construction and Performance Data

Total Depth (ft): 164.00
Static Water Level (ft): -27.72
Pumping Water Level (ft):
Yield (gpm):
Test Type: AIR
Test Duration:
Drill Stem Setting (ft):
Recovery Water Level (ft):
Recovery Time (hrs):

How Drilled: FOWARD ROTARY
Driller's Name: KANE
Driller License: WWC023
Completion Date (m/d/y): 8/4/1986
Special Conditions:
Is Well Flowing?: YES
Shut-In Pressure: 12.00
Geology/Aquifer: Not Reported
Well/Water Use: PUBLIC WATER SUPPLY

Hole Diameter Information

From	To	Diameter
0.0	164.0	7.0

Annular Seal Information

From	To	Description
0.0	18.0	CLAY

Casing Information[1]

From	To	Dia	Description
-1.0	164.0	6.0	STEEL

Completion Information[1]

From	To	Dia	Description
164.0	164.0	6.0	OPEN BOTTOM

Lithology Information

From	To	Description
0.0	1.0	SOIL
1.0	18.0	GRAVEL CLAY SAND
18.0	25.0	GRAVEL CLAY WATER
25.0	60.0	SAND GRAVEL
60.0	156.0	CLAY SAND
156.0	164.0	GRAVEL WATER

[1] - All diameters reported are **inside** diameter of the casing.

RECEIVED Well #2

OCT 06 1986

MONTANA DEPT. OF NATURAL RESOURCES & CONSERVATION

File No. _____

WELL LOG REPORT

State law requires that this report be filed by the water well driller within 60 days after completion of the well.

1. WELL OWNER
Name HAROLD & MARIE EDSON

2. CURRENT MAILING ADDRESS
BOX 251
ST. REGIS MT 59866

3. WELL LOCATION
County MINERAL
Township 18 N Range 27 W
¼ ¼ ¼ Section 24
Lot _____ Block _____
Subdivision _____

4. PROPOSED USE Domestic ☐ Stock ☐ Irrigation ☐
Other ☐ specify _____

5. DRILLING METHOD _____ cable, _____ bored,
X forward rotary, _____ reverse rotary, _____ jetted,
_____ other (specify) _____

6. WELL CONSTRUCTION AND COMPLETION

Size of drilled hole	Size and weight of casing	From (feet)	To (feet)	Perforations or Screen	Kind	Size	From (feet)	To (feet)
7"	6"	-1	164					

Was casing left open end? X Yes ___ No
Was a packer or seal used? ___ Yes X No
If so, what material? _____
Was the well gravel packed? ___ Yes X No
Was the well grouted? ___ Yes X No
To what depth? SURFACE SEALED 18'
Material used in grouting? CLAY
Well head completion: Pitless adapter
___ Yes ___ No
Top of casing 12 in. or greater above grade
X Yes ___ No

7. WHAT IS THE TEMPERATURE OF THE WATER?
45 Degrees Fahrenheit

8. WATER LEVEL
Static water level _____ feet below land surface
If flowing: closed-in pressure 12 psi
_____ gpm
Controlled by: _____ valve, _____ reducers,
_____ other, (specify) _____

9. WELL TEST DATA _____ pump _____ bailer
X other, (specify) AIR
Pumping water level below land surface:
_____ ft. after _____ hrs. pumping _____ gpm
_____ ft. after _____ hrs. pumping _____ gpm

10. WAS WELL PLUGGED OR ABANDONED? ___ Yes X No
If yes, how? _____

11. DATE COMPLETED AUG 4 - 1986

12. WELL LOG

Depth (ft.) From	To	Formation
0	1	SOIL
1	18	GRAVEL, CLAY, SAND
18	25	GRAVEL, CLAY, WATER
25	60	SAND, GRAVEL,
60	156	CLAY, SAND
156	164	GRAVEL, WATER

(use separate sheet if necessary)

13. DRILLER'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Date SEPT. 24 1986
Firm Name LYNE WELL DRILLING & PUMP SERVICE
Address 168 MILLAR RD ST. REGIS, MT
Signature [redacted] License No. 23

RESOURCES & CONSERVATION DNRC
MONTANA 59620 444-6610

PARTIAL COPY
Please call/write to complete reverse side.
A Form 642 will be sent to DNRC.

Montana Bureau of Mines and Geology
Ground-Water Information Center Site Report
ST REGIS SCHOOL OLD BUILDING - WELL 1

Plot this site on a topographic map
View Water Quality for this Site

Location Information

GWIC Id: 73728
Location (TRS): 18N 28W 24 DCDC
County (MT): MINERAL
DNRC Water Right: W003779
PWS Id: 02488002
Block:
Lot:
Addition:

Source of Data: GW4
Latitude (dd): 47.3003
Longitude (dd): -115.1001
Geomethod: MAP
Datum: 1927
Certificate of Survey:
Type of Site: WELL

Well Construction and Performance Data

Total Depth (ft): 160.00
Static Water Level (ft):
Pumping Water Level (ft):
Yield (gpm): 50.0
Test Type:
Test Duration:
Drill Stem Setting (ft):
Recovery Water Level (ft):
Recovery Time (hrs):

How Drilled:
Driller's Name: REMIOR
Driller License:
Completion Date (m/d/y): 8/25/1952
Special Conditions:
Is Well Flowing?: YES
Shut-In Pressure:
Geology/Aquifer: 112ALVM
Well/Water Use: PUBLIC WATER SUPPLY

Hole Diameter Information

No Hole Diameter Records currently in GWIC.

Annular Seal Information

No Seal Records currently in GWIC.

Casing Information[1]

From	To	Dia	Description
0.0	164.0	6.0	19 LB STEEL

Completion Information[1]

No Completion Records currently in GWIC.

Lithology Information

From	To	Description
0.0	18.0	BOULDERS
18.0	28.0	SAND
28.0	58.0	GRAVEL
58.0	84.0	CLAY
84.0	86.0	SAND
86.0	88.0	CLAY
88.0	125.0	BLUE MUD
125.0	150.0	BLUE SANDY MUD
150.0	158.0	CLAY
158.0	164.0	GRAVEL

[1] - All diameters reported are **inside** diameter of the casing.

Well #1

Old Building St Regis School

St Regis 15 min QU

6/5/89

Well Log Transcription M:7372

as furnished by phone from

Bell Osborne's daughter of

Liberty Drilling in Kalispel

entered 1/22/99 LB on 6/5/89 at 1:45 P.M.

Oct. 13, 1952 well finished

164 feet T18N R27W Sec 24 or 25

6" Casing PWSID# 02488

St. Regis Schools

Well "Log" Well #1

1 - 18'	boulders	
18 - 28'	Sand	
28 - 58'	Gravel	
58 - 84'	Clay	
84 - 86'	Sand	
86 - 88'	Clay	
88 - 125'	Blue mud	72' Confinement
125 - 150'	Blue Sandy mud	
150 - 158'	Clay	
158 - 164'	Gravel	- used 6' for WHPA input

Information taken from notes written by Archie in well log books.

Montana Bureau of Mines and Geology
1300 West Park Street, Butte MT 59701 (406) 496-4167

Analytical Laboratory Report
Analysis Id: **1997Q0268**

State:	MT	**County:**	MINERAL
Latitude - Longitude:	N W Datum	**Site Location:**	18N 28W 24 DC 1
Topographic Map:		**Site Id:**	73728
Geologic Source:	ALLUVIUM (QUATERNARY)	**Project:**	WHPSCHO *
Drainage Basin:	CLARK FORK RIVER BTWN FLATHEAD RIVEF	**Station Id:**	
Agency + Sampler:	MBMG * GNA	**Sample Source:**	WELL
Field Number:	ST REGI	**Land Surface Altitude:**	
Date + Time:	05-SEP-96 13:20:00	**Sample Media:**	
Lab + Analyst:	MBMG * TSH	**Sustained Yield / Method:**	
Date Complete:	21-Oct-96	**SWL above (-) /below MP:**	
Release Flag:	YES	**Total Depth:**	160 ft - Reported
Sample Handling:	3120	**Casing Diameter (in):**	
Method Sampled:	GRAB	**Casing Type:**	
Procedure Type:	DISSOLVED	**First Completion Type:**	
Water Use:	PUBLIC WATER SUPPLY	**First Perforation Interval:**	

Site Name: SCHOOL DISTRICT #6

	mg/L	meq/L		mg/L	meq/L
Calcium (Ca):	31.9	1.59	**Bicarbonate (HCO3):**	137.6	2.26
Magnesium (Mg):	9.1	0.75	**Carbonate (CO3):**	0.0	0.00
Sodium (Na):	1.2	0.05	**Chloride (Cl):**	2.1	0.06
Potassium (K):	.807	0.02	**Sulfate (SO4):**	4.6	0.10
Iron (Fe):	<.003	0.00	**Nitrate (as N):**	.09	0.01
Manganese (Mn):	<.002	0.00	**Fluoride (F):**	<1.	0.00
Silica (SiO2):	11.7		**OrthoPhosphate (as P):**		
Total Cations:		2.42	**Total Anions:**		2.42

Field Chemistry and Other Analytical Results (units as specified).

Calculated Dissolved Solids:	129.38	**Total Hardness as CaCO3:**	117.11
Sum of Diss. Constituents:	199.20	**Field Hardness as CaCO3:**	
Field Conductivity (Micromhos):	199	**Total Alkalinity as CaCO3:**	112.86
Lab Conductivity (Micromhos):	232.00	**Field Alkalinity as CaCO3:**	
Field pH:	8.38	**Ryznar Stability Index:**	7.89
Laboratory pH:	8.00	**Langlier Saturation Index:**	0.06
Water Temp. (C):		**Sodium Adsorption Ratio:**	0.05
Air Temp. (C):		**Field Redox (mV):**	
Nitrite (mg/L as N):	Not Rptd	**Field Dissolved O2 (mg/L):**	
Field Nitrate as N (mg/L):		**Phosphate, TD, (mg/L as P):**	Not Rptd
Ammonia (NH4):	Not Rptd	**Field Chloride (mg/L):**	
PCP's (ug/L):	Not Rptd	**PCB's (ug/L):**	Not Rptd

DISSOLVED Trace Element results (ug/L)

Aluminum (Al):	<30.	**Cadmium (Cd):**	<2.	**Mercury (Hg):**	Not Rptd	**Tin (Sn):**	Not Rptd
Antimony (Sb):	<2.	**Chromium (Cr):**	5.0	**Molybdenum (Mo):**	<10.	**Titanium (Ti):**	<10.
Arsenic (As):	1.2	**Cobalt (Co):**	<2.	**Nickel (Ni):**	2.6	**Thallium (Tl):**	Not Rptd
Barium (Ba):	54.4	**Copper (Cu):**	3.3	**Silver (Ag):**	<2.	**Vanadium (V):**	<5.
Beryllium (Be):	<2.	**Lead (Pb):**	4.1	**Selenium (Se):**	<1.	**Zinc (Zn):**	95.8
Boron (B):	<30.	**Lithium (Li):**	<6.	**Strontium (Sr):**	54.	**Zirconium (Zr):**	<20.
Bromide (Br):	<100.						

Explanation: mg/L = milligrams per Liter, ug/L = micrograms per Liter, meq/L = milliequivalents per Liter, ft = feet, mg/Kg = milligrams per Kilogram, pC/L = picoCuries per Liter
Qualifiers: A = Hydrice atomic absorption, E = Estimated due to interference, H = Exceeded holding time, N = Spiked sample recovery not within control limits, P = Preserved sample, S = Method of standard additions, * = Duplicate analysis not within control limits.

Sample Condition: CLEAR

Field Remarks:

Lab Remarks:

Note: In correspondence, please refer to Lab Number: 1997Q0268

Print Date: 21-Jan-99

DEPARTMENT OF ENVIRONMENTAL QUALITY
METCALF BUILDING
POB 200901
Helena, MT 59601-0901

Preliminary Assessment of Groundwater Sources that may be under the Direct Influence of Surface Water

SYSTEM NAME St Regis School PWS ID# E2488
SOURCE NAME Well 1 COUNTY Mineral
DATE 1-20-99 NC NTNC C POPULATION

		Index Points
A.	TYPE OF STRUCTURE (CIRCLE ONE)	
	(Well)	GO TO SECTION B
	Spring	40
	Infiltration Gallery	40
B.	HISTORICAL PATHOGENIC ORGANISM CONTAMINATION	
	History or suspected outbreak of *Giardia*, or other pathogenic organisms associated with current system configuration	40
	No history or suspected outbreak of *Giardia*	(0)
C.	HISTORICAL MICROBIOLOGICAL CONTAMINATION (Circle all that apply)	
	Record of acute MCL violations of the Total Coliform Rule over the last 3 years (circle the one that applies)	
	No violations	(0)
	One violation	5
	Two violations	10
	Three violations	15
	Record of non-acute MCL violations of the Total Coliform Rule over the last 3 years (circle the one that applies)	
	One violation or less	(0)
	Two violations	5
	Three violations	10
	DHES-verified complaints about turbidity	5
D.	HYDROGEOLOGICAL FEATURES (Circle all that apply)	
	Horizontal distance between a surface water and the source*	
	greater than 500 feet	(0)
	250-500 feet	5
	100-250 feet	10
	less than 100 feet	15
E.	WATER CONSTRUCTION (Circle all that apply)	

Unknown well construction..... 35

Poorly constructed well (uncased, or casing not sealed to depth of at least 18 feet below land surface), or casing construction is unknown 15

In wells tapping unconfined or semiconfined aquifers, depth below land surface to top of perforated interval or screen

great than 100 feet.....	(0)
50 -100 ft.....	5
25 - 50 ft.....	10
0 - 25 ft.....	15
unknown.....	15

D. WELL INTAKE CONSTRUCTION

Unknown intake construction..... 25

In wells tapping unconfined or semiconfined aquifers, depth to static water level below land surface

greater than 100 feet.....	0
50 - 100 ft.....	5
0 - 50 ft.....	10
unknown.....	10

N/A

Poor sanitary seal, seal without acceptable material, or unknown seal type..... 15

ANALYST Camela Carstarphen TOTAL SCORE 0

PRELIMINARY ASSESSMENT DETERMINATION (circle the one that applies)

I) (PASS): Well is classified as groundwater.
II) FAIL: Well must undergo further GWUDISW determination.
III) FAIL: Spring or infiltration gallery; must undergo futher GWUDISW determination.
IV) FAIL: Well will Pass if intake construction deficiencies (section F) are repaired.
V) FAIL: Well may PASS if well construction details (section E) become available.

COMMENTS this aquifer has artesian pressure and wells completed in this aquifer do Flow.

DEPARTMENT OF ENVIRONMENTAL QUALITY
METCALF BUILDING
POB 200901
Helena, MT 59601-0901

Preliminary Assessment of Groundwater Sources that may be under the Direct Influence of Surface Water

SYSTEM NAME St Regis School PWS ID# 02488
SOURCE NAME Well 2 COUNTY Mineral
DATE 1-20-99 NC NTNC C POPULATION

Index Points

A. TYPE OF STRUCTURE (CIRCLE ONE)

(Well).....GO TO SECTION B
Spring..... 40
Infiltration Gallery..... 40

B. HISTORICAL PATHOGENIC ORGANISM CONTAMINATION

History or suspected outbreak of *Giardia*, or other pathogenic organisms associated with surface water, with current system configuration..... 40
No history or suspected outbreak of *Giardia*..... (0)

C. HISTORICAL MICROBIOLOGICAL CONTAMINATION (Circle all that apply)

Record of acute MCL violations of the Total Coliform Rule over the last 3 years (circle the one that applies)
No violations..... (0)
One violation..... 5
Two violations..... 10
Three violations..... 15

Record of non-acute MCL violations of the Total Coliform Rule over the last 3 years (circle the one that applies)
One violation or less..... (0)
Two violations..... 5
Three violations..... 10

DHES-verified complaints about turbidity..... 5

D. HYDROGEOLOGICAL FEATURES (Circle all that apply)

Horizontal distance between a surface water and the source
greater than 500 feet..... (0)
250-500 feet..... 5
100-250 feet..... 10
less than 100 feet..... 15

E. WATER CONSTRUCTION (Circle all that apply)

Unknown well construction..... 15

Poorly constructed well (uncased, or casing not sealed to depth of at least 18 feet below land surface), or casing construction is unknown 15

In wells tapping unconfined or semiconfined aquifers, depth below land surface to top of perforated interval or screen

great than 100 feet.....	(0)
50 -100 ft.....	5
25 - 50 ft.....	10
0 - 25 ft.....	15
unknown.....	15

D. WELL INTAKE CONSTRUCTION

Unknown intake construction..... (25)

In wells tapping unconfined or semiconfined aquifers, depth to static water level below land surface

greater than 100 feet.....	0
50 - 100 ft.....	5
0 - 50 ft.....	10
unknown.....	10

N/A

Poor sanitary seal, seal without acceptable material, or unknown seal type..... 15

ANALYST Camela Carstarphen TOTAL SCORE 25

PRELIMINARY ASSESSMENT DETERMINATION (circle the one that applies)

I) (PASS): Well is classified as groundwater.
II) FAIL: Well must undergo further GWUDISW determination.
III) FAIL: Spring or infiltration gallery; must undergo futher GWUDISW determination.
IV) FAIL: Well will Pass if intake construction deficiencies (section F) are repaired.
V) FAIL: Well may PASS if well construction details (section E) become available.

COMMENTS this aquifer has artesian pressure and wells completed in this aquifer flow

Appendix B
PWS Well Logs

Montana Bureau of Mines and Geology
Ground-Water Information Center Site Report
ST REGIS SCHOOL OLD BUILDING - WELL 2

GWIC Id: 73634
Location (TRS): 18N 28W 24 DCCD
County (MT): MINERAL
DNRC Water Right: P090463-00
PWS Id: 02488003
Block:
Lot:
Addition:

Source of Data: LOG
Latitude (dd): 47.3001
Longitude (dd): -115.1001
Geomethod: MAP
Datum: NAD27
Altitude (feet):
Certificate of Survey:
Type of Site: WELL

Well Construction and Performance Data

Total Depth (ft): 164.00
Static Water Level (ft): -27.72
Pumping Water Level (ft):
Yield (gpm):
Test Type: AIR
Test Duration:
Drill Stem Setting (ft):
Recovery Water Level (ft):
Recovery Time (hrs):
Well Notes:

How Drilled: FOWARD ROTARY
Driller's Name: KANE
Driller License: WWC023
Completion Date (m/d/y): 8/4/1986
Special Conditions:
Is Well Flowing?: YES
Shut-In Pressure: 12.00
Geology/Aquifer: 120SNGR
Well/Water Use: PUBLIC WATER SUPPLY

Hole Diameter Information

From	To	Diameter
0.0	164.0	7.0

Casing Information[1]

From	To	Dia	Wall Thickness	Pressure Rating	Joint	Type
-1.0	164.0	6.0				STEEL

Annular Seal Information

From	To	Description
0.0	18.0	CLAY

Completion Information[1]

From	To	Dia	# of Openings	Size of Openings	Description
164.0	164.0	6.0			OPEN BOTTOM

Lithology Information

From	To	Description
0.0	1.0	SOIL
1.0	18.0	GRAVEL CLAY SAND
18.0	25.0	GRAVEL CLAY WATER
25.0	60.0	SAND GRAVEL
60.0	156.0	CLAY SAND
156.0	164.0	GRAVEL WATER

[1] - All diameters reported are inside diameter of the casing.

Montana Bureau of Mines and Geology
Ground-Water Information Center Site Report
ST REGIS SCHOOL OLD BUILDING - WELL 1

Location Information

GWIC Id:	73728	Source of Data:	GW4
Location (TRS):	18N 28W 24 DCDC	Latitude (dd):	47.3003
County (MT):	MINERAL	Longitude (dd):	-115.1001
DNRC Water Right:	W003779-00	Geomethod:	MAP
PWS Id:	02488002	Datum:	NAD27
Block:		Altitude (feet):	
Lot:		Certificate of Survey:	
Addition:		Type of Site:	WELL

Well Construction and Performance Data

Total Depth (ft):	160.00	How Drilled:	
Static Water Level (ft):		Driller's Name:	REMIOR
Pumping Water Level (ft):		Driller License:	
Yield (gpm):	50.00	Completion Date (m/d/y):	8/25/1952
Test Type:		Special Conditions:	
Test Duration:		Is Well Flowing?:	YES
Drill Stem Setting (ft):		Shut-In Pressure:	
Recovery Water Level (ft):		Geology/Aquifer:	120SNGR
Recovery Time (hrs):		Well/Water Use:	PUBLIC WATER SUPPLY
Well Notes:			

Hole Diameter Information

No Hole Diameter Records currently in GWIC.

Casing Information[1]

From	To	Dia	Wall Thickness	Pressure Rating	Joint	Type
0.0	164.0	6.0				19 LB STEEL

Annular Seal Information

No Seal Records currently in GWIC.

Completion Information[1]

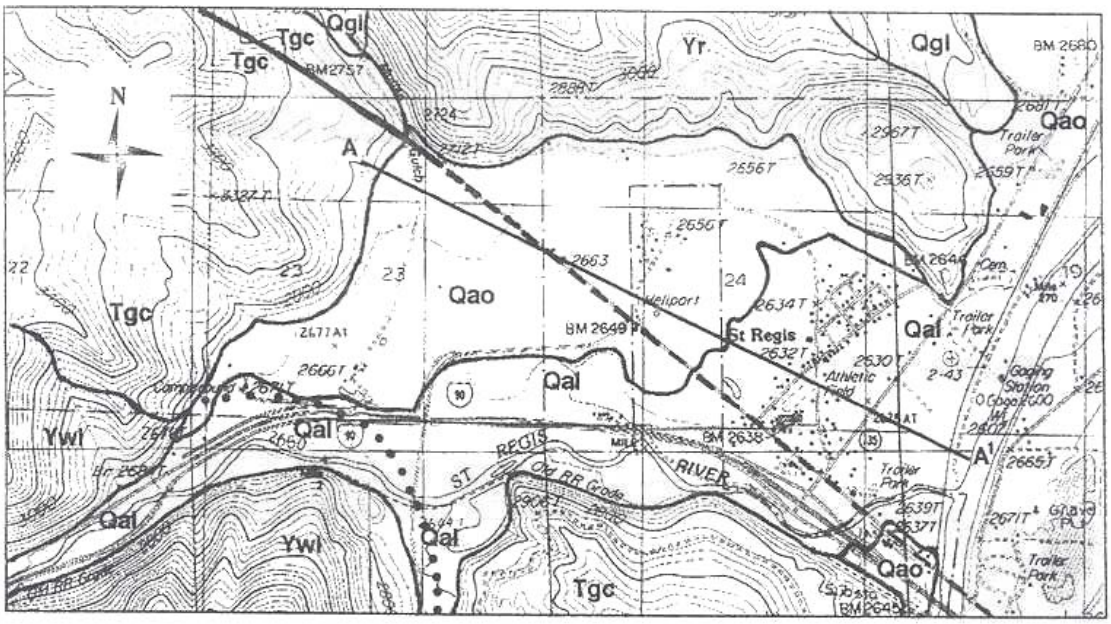
No Completion Records currently in GWIC.

[1] - All diameters reported are **inside** diameter of the casing.

Lithology Information

From	To	Description
0.0	18.0	BOULDERS
18.0	28.0	SAND
28.0	58.0	GRAVEL
58.0	84.0	CLAY
84.0	86.0	SAND
86.0	88.0	CLAY
88.0	125.0	BLUE MUD
125.0	150.0	BLUE SANDY MUD
150.0	158.0	CLAY
158.0	164.0	GRAVEL

Appendix C
Figures from MBMG Wellhead Protection Plan



Map Units

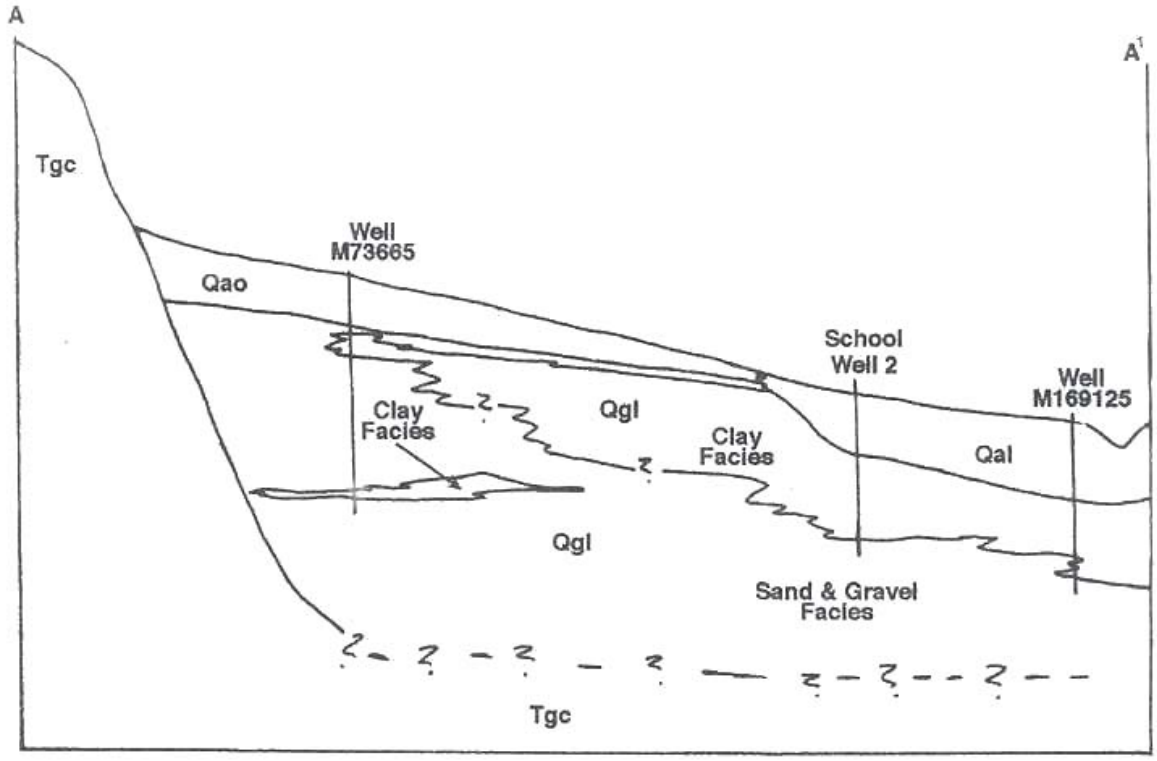
Qal	Quaternary alluvium of modern channels and flooplains
Qao	Quaternary alluvium, older (fan deposits)
Qgl	Quaternary alluvium of the Glacial Lake Missoula flood deposits
Tgc	Tertiary sediments
Ywl	Middle Proterozoic lower member, Wallace Formation
Yr	Middle Proterzoic, Revett Formation

Contact between units (dotted where concealed)

Boyd Mtn Fault (dashed where inferred)

A — A' Line of cross-section (Figure 4)

Figure 3. Map showing geology of the St. Regis and surrounding area. (Modified from Lonn, 1999)



Vertical scale: 1" = 120'
Horizontal scale: 1" = 1320'

Figure 4. Generalized cross-section of the St. Regis area. A and A1 are shown on figure 3 along with descriptions of geologic units. M numbers refer to the Montana Bureau of Mines and Geology Groundwater Information Center well identification system (GWIC, 1999).

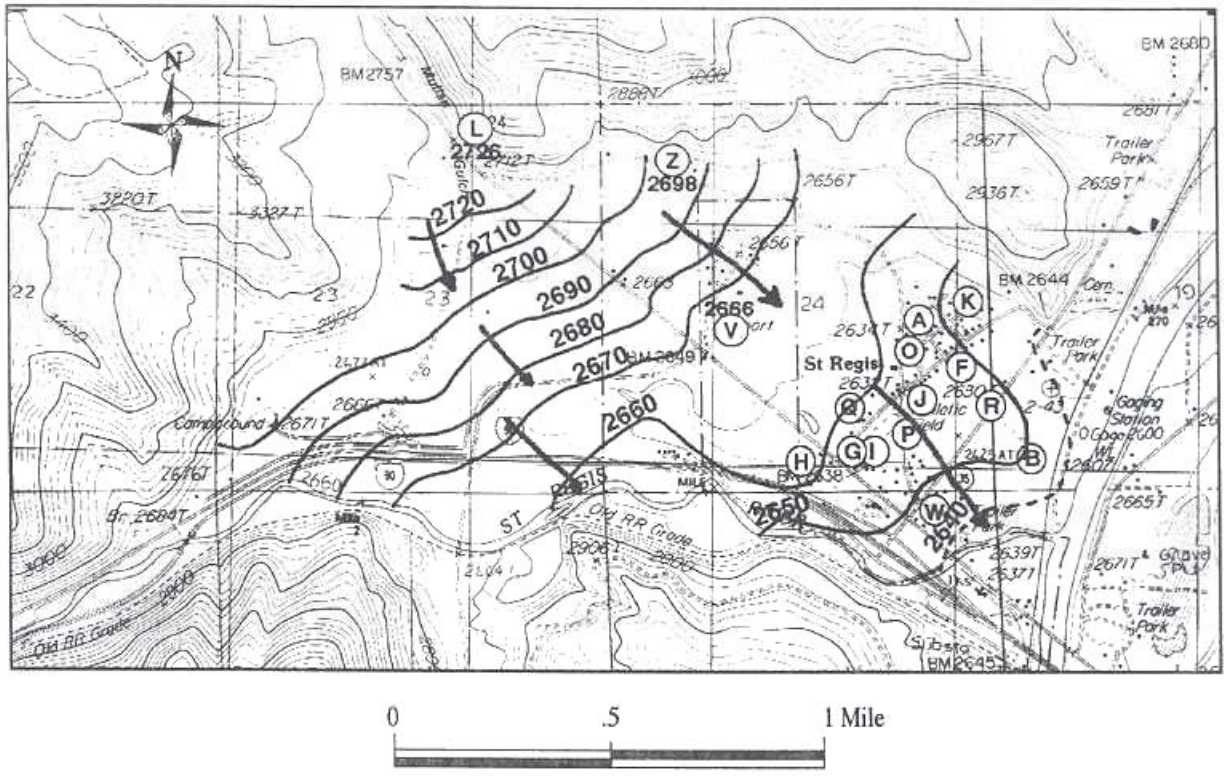


Figure 5. Groundwater flow direction map, April 1997 (site names and ground-water elevations are listed in Appendix A.)

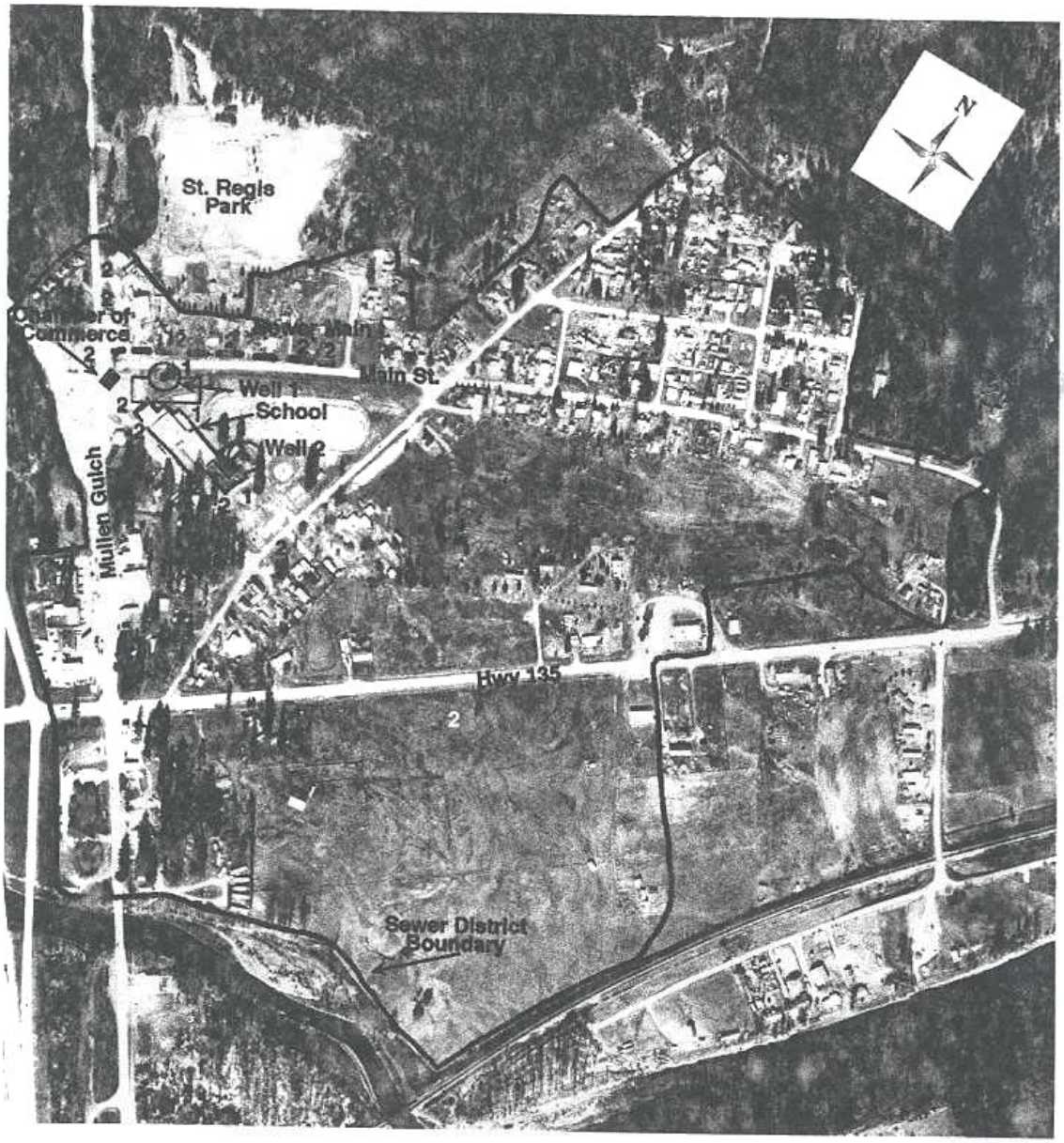


Figure 6. Aerial photo showing the control zones for well 1 and 2, the sewer district boundaries and the special protection region site ID numbers 1 and 2.

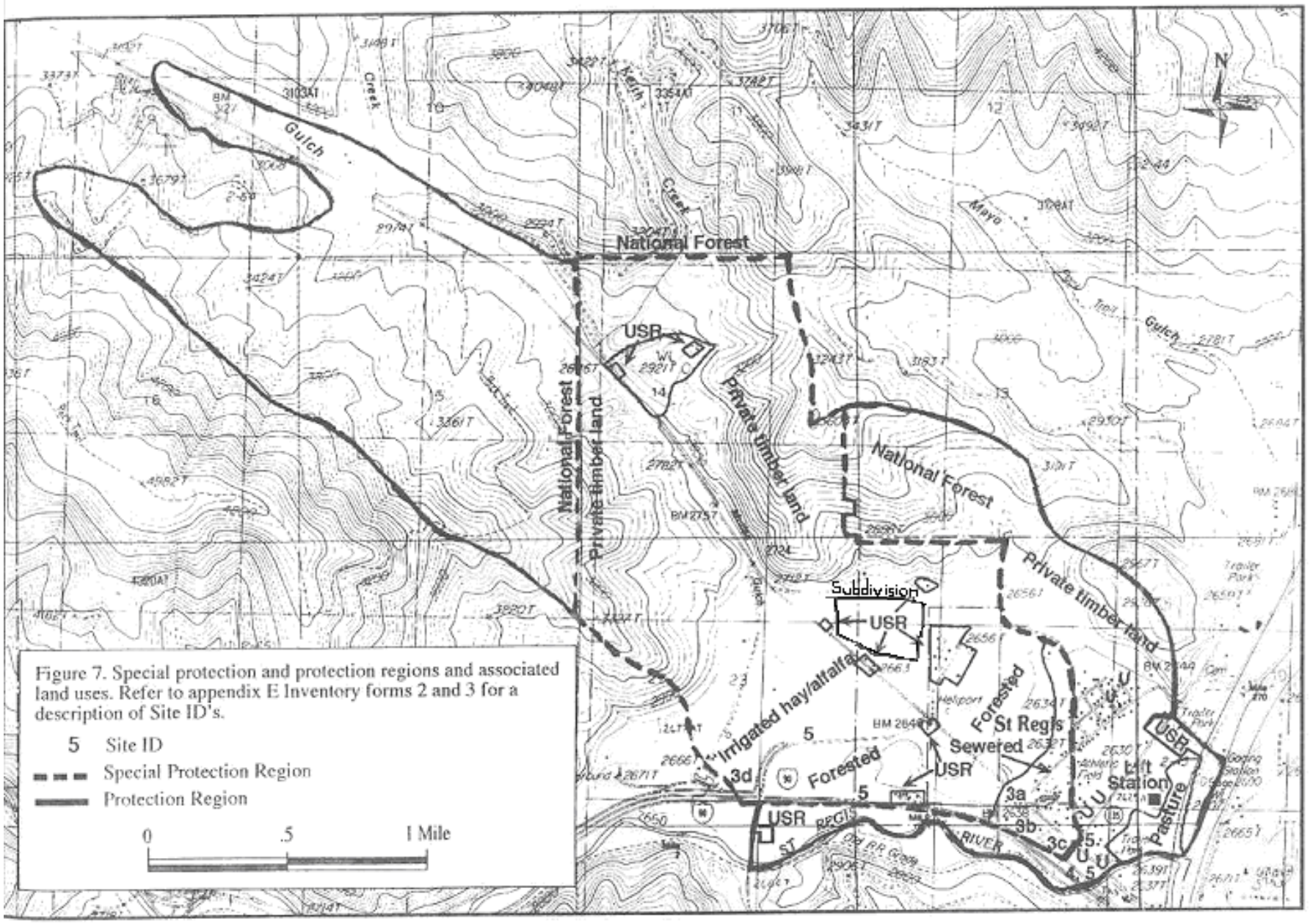


Figure 7. Special protection and protection regions and associated land uses. Refer to appendix E Inventory forms 2 and 3 for a description of Site ID's.

5 Site ID

Special Protection Region

Protection Region

0 .5 1 Mile

Appendix D
MBMG Delineation Model

Delineation for the Inventory Region according to the MBMG Wellhead Protection Plan.

The General Particle Tracking Module (GPTRAC) of the semi-analytical model was used to initially delineate the special protection region. This module was chosen because of its ability to delineate a wellhead protection area for semi-confined aquifer conditions. However, several input parameters were unknown and the results were used only as a general guide for the final delineation.

The input parameters used in the model are listed below:

Aquifer Thickness: model was tested at 6, 50, and 100 feet

The aquifer thickness is unknown. Typically, the screened length of the well is used as the aquifer thickness in confined aquifers where wells only partially penetrate the aquifer. Information from well 2 was used as a first approximation of aquifer thickness. The height from the bottom of the well to the top of the confining layer was 6 feet.

Transmissivity: 26,000 ft^3/day

An average transmissivity value was obtained from aquifer testing in the area. Drawdown and/or recovery data from 5 wells during 2 aquifer tests were used to provide a transmissivity estimate (Newman, 1991).

Effective porosity: 0.25

This value is the lower end range of porosity for sand and gravel (Freeze and Cherry, 1979).

Ground-water gradient: 0.005

The gradient was obtained from the ground-water flow map compiled from April 1997 data. This value reflects the gradient in the vicinity of the school.

Ground-water flow direction: 335°

The ground-water flow direction helps define the shape of the wellhead protection area. For modeling purposes, the angle of flow was defined with 0° representing ground-water flow due east (90° due north).

Discharge: Well No.1 700 ft^3/day. Well No. 2 500 ft^3/day

Discharge amounts are based on actual records and include irrigation usage during the summer months. These values were 642 ft^3/day for well 1 and 430 ft^3/day for well 2. These amounts were rounded to 700 and 500 ft^3/day, respectively.

Hydraulic conductivity of confining layer: (unknown) 0.01 and 0.0001 ft^2/day

Values for the hydraulic conductivity were obtained from Freeze and Cherry (1979) and represent a range for clay material.

Thickness of confining layer: 72 feet

A confining layer thickness of 72 feet was denoted on the drillers' log from well 2. Although a clay layer most likely exists where well 1 was drilled, the drillers log did not clearly describe a discrete clay unit but grouped clay, sand and gravels together (appendix C).

Time of travel: 3-years

The modeling results produced a narrow, linear line for both wells that extended up gradient several miles when using a 6-foot aquifer thickness. One special protection region was defined for the wells. The length of the line decreased as aquifer thickness was increased. The model was not sensitive to the hydraulic conductivity of the confining unit. The down gradient extent of the delineated area was negligible. The final shape for the special protection region was based on accounting for potential variability in the ground-water flow direction, hydrogeologic factors such as the recharge area for the aquifer, and land use. The special protection region is shown in figure 7. Portions of the special protection region were tailored to known boundaries such as roadways and the national forest boundary.

Appendix E
List of Potential Contaminant Sources

DEQ UST List

http://www.deq.state.mt.us/UST/USTDownloads.asp

Notes:
Active USTs have usually been upgraded to 1998 standards (which includes leak detection and monitoring) Spills or improper handling during tank filling or product distribution at these facilities may impact the drinking water supply.

DEQ classifies inactive USTs as temporarily out of service and requires that the product in the tank be removed. However, testing of the tanks, distribution lines or soils around the tank is not required to evaluate the potential for historic leaks or spills that may impact subsurface soils and groundwater.

Alt Facility ID	Facility Name	Facility Location Address	City	County	Active Tanks	Non Active Tanks
31-03760	Charles G Bennett	PO Box 217	Saint Regis	Mineral		1
31-00467	Charles H M Jensen	40 Frontage Rd W	Saint Regis	Mineral		1
31-09660	Former MWRR St Regis	Sec 30 T18N R27W	Saint Regis	Mineral		2
31-06008	Gene Collins	Address Unknown	Saint Regis	Mineral		1
31-08329	George & Helen Cruzan	PO Box 336	Saint Regis	Mineral		2
31-07872	Harold Ensign	Address Unknown PO Box 251	Saint Regis	Mineral		1
31-12934	John Cochran	Address Unknown PO Box 187	Saint Regis	Mineral		1
31-01533	Ken Miller	69 Old US highway 10 E	Saint Regis	Mineral		2
31-03497	Michael L Guthneck	338 Mullan Gulch Rd	Saint Regis	Mineral		1
31-05827	Saint Regis Exxon	Mullan Rd & MT Highway 135 N	Saint Regis	Mineral	4	3
31-07690	Saint Regis Travel Center	100 Mullan Rd W	Saint Regis	Mineral	3	1
31-05864	Schobers Truck Stop	10 Mullan Gulch Rd	Saint Regis	Mineral		5
31-12908	St Regis Public Schools Main St	6 Main St	Saint Regis	Mineral		1
31-00468	St Regis Public Schools Tiger St	6 Tiger St	Saint Regis	Mineral		1
31-07503	Stangs Inc	12 Old US highway 10 E	Saint Regis	Mineral	3	4
31-01591	William P & Audrey C Hammer	Star Rte Box 405	Saint Regis	Mineral		1

DEQ LUST List

http://www.deq.state.mt.us/UST/USTDownloads.asp

City	SiteName	Location	AltEventID	Date	Confirmed Release Date	Project Officer	Active
Saint Regis	Bob Hermes Residence	101 Main St	3110625*3253	22-Sep-97	22-Sep-97		No
Saint Regis	Ken Miller	69 Old US-10 E	3101533*2721	11-Sep-95	11-Sep-95		No
Saint Regis	Saint Regis Travel Center	100 Mullen Road W	3107690*4340	18-May-04	18-May-04	Scott Gestring	Yes
Saint Regis	Schobers Truck Stop	10 Mullan Gulch Rd	3105864*3924	06-Apr-00	06-Apr-00	Aaron Anderson	Yes
Saint Regis	St Regis Exxon	Mullan Rd & SR-135 N	3105827*3295	15-Oct-97	15-Oct-97		No
Saint Regis	St Regis Public Schools Main St	6 Main St	3112908*1491	27-Nov-92	27-Nov-92		No
Saint Regis	St Regis Travel Center	Drawer G	3107690*2932	19-Apr-96	18-Apr-96	Scott Gestring	Yes

Appendix F
Monitoring Waivers

APPENDIX G
MONITORING WAIVERS

Waiver Recommendation

The St. Regis School District 1 PWS may be eligible for certain monitoring waivers including Phase 5 inorganics and volatile organic compounds. Information on susceptibility and use waivers is provided in this section to give the PWS operators an opportunity to consider if waivers may be feasible.

Before a susceptibility or use wavier is requested, the PWS Operators are encouraged to carefully review the Monitoring Waiver Requirements, described below. If after reviewing this section it is determined that an additional waivers are feasible, the PWS should submit a letter to DEQ requesting the specific monitoring waivers. The PWS must be in compliance with monitoring requirements to be considered. If requested by DEQ, the PWS may also need to provide additional information regarding chemical use in the area within the Inventory Region. The table below shows how identified potential contaminant sources affect the eligibility for monitoring waivers.

Susceptibility Assessment as it relates to Waiver Eligibility

Source	Contaminant	Susceptibility	Waiver Eligibility
Transportation Corridors	VOCs, SOCs, petroleum products and other chemicals		Chemical use in right-of-way may preclude waivers for some chemicals. PWS should confirm chemical use history along the right-of-way. Waivers might be rescinded if a spill occurred.
Sewer System/ Wastewater Treatment	Nitrates, pathogens		Waivers are not available for pathogens and nitrate.
Agricultural Cropped Areas	Nitrates and SOCs		Chemical use may preclude waivers for some chemicals. The PWS should confirm chemical use/storage history by land parcel.

Monitoring Waiver Requirements

The 1986 Amendments to the Safe Drinking Water Act require that community and non-community PWSs sample drinking water sources for the presence of volatile organic chemicals (VOCs) and synthetic organic chemicals (SOCs). The US EPA has authorized states to issue monitoring waivers for organic chemicals to systems that have completed an approved waiver application and review process. All PWSs in the State of Montana are eligible for consideration of monitoring waivers for several organic chemicals. The chemicals diquat, endothall, glyphosate, dioxins, ethylene dibromide (EDB), dibromochloropropane (DBCP), and polychlorinated biphenyls (PCBs) are excluded from monitoring requirements by statewide waivers.

Use Waivers

A Use Waiver can be allowed if through a vulnerability assessment, it is determined that specific organic chemicals were not used, manufactured, or stored in the area of a water source (or source area). If certain organic chemicals have been used, or if the use is unknown, the system would be determined to be vulnerable to organic chemical contamination and ineligible for a Use Waiver for those particular contaminants.