

Instructions For Completing a PWS-6 Report For Non-Public Water Supplies

(Revised 08/03/2021)

PWS-6 Reports for Non-public water supplies (NPWS) do not need to exceed one or two pages of text. The report should include the sections outlined below and must adequately describe the water supply, the aquifer or surface water source, and potential sources of regulated contaminants. Regulated contaminants for NPWSs include only microbiological contaminants and nitrate. In addition to the text pages, simple maps should be included to show the well(s), buildings, water distribution system, sewage disposal, roads, the source water protection region (described below), general land uses, and potential sources of regulated contaminants (See Attached Example Report). If non-regulated contaminant sources like Leaking Underground Storage Tanks (LUST) are identified near the proposed well, they should be included in the inventory and shown on maps. If a well log is available, a copy should be included with the report (**Note-The well log(s) must be submitted before final approval of the water system can be given**). **Prior to receiving approval to operate the NPWS water system; water quality monitoring data must be submitted showing the water is potable.** For more guidance on completing a Non-public PWS-6 Report, please contact the Source Water Protection Program at (406) 444-5546. A resource to help you create a map of potential contaminants is DEQ's online mapping application at <https://gis.deq.mt.gov/portal/home/>. The application has online instructions and help functions. The DEQ Circular 4 referenced below is available at <http://deq.mt.gov/Portals/112/Water/PWSUB/Documents/engineers/2014/DEQ4-2013-Final.pdf>.

Note: PWS-6 Reports can be considered as Source Water Delineation and Assessment Reports (SWDARs) for NPWSs.

Non-public PWS-6 Report Outline

- 1. INTRODUCTION AND PURPOSE:** Include the non-public water supply (NPWS) name, address, primary contact person, telephone number, and date of report. Identify who completed the report and include contact information.
- 2. WATER SYSTEM INFORMATION:** Describe the location and nature of the water supply (i.e. daycare, elder care facility, bed and breakfast, small food manufacturer, etc). If this is a new source at an existing NPWS, describe why it is needed. Identify how many individuals the NPWS will serve and the actual or projected water demand in gallons per day, assuming 10 gallons per day per patron (DEQ Circular 4 pages 27-28, Tables 3.1.1 & 2, column 4).
- 3. DELINEATION:** For a non-public water supply a 100-foot radius control zone and a 500-foot radius inventory region should be delineated as the source water protection areas for a NPWS well. A modified 500-foot fixed radius inventory region can be delineated in areas where groundwater flow direction is known. Show the boundaries of the control zone and inventory region on either a topographic map or an aerial map. The PWS-6 reviewer will describe the aquifer based on well log information included with this report. If no well log is available; well logs from other area wells will be used.
- 4. INVENTORY:** Indicate on either a topographic map or an aerial map the general land uses within the control zone and inventory region that may be potential sources of nitrate or microbial contaminants. List these using the table shown in Susceptibility Section in the attached example. Describe the location of the well with respect to sewer mains or the on-site sewage treatment system (septic system). Show the exact location of the septic system for this property and if possible, for neighboring areas on a site layout map. On an aerial map indicate cultivated cropland, irrigated cropland, irrigated pasture, and animal feeding operations within the control zone and inventory region. Source Water Protection Staff will create a map showing septic system density within the inventory region.
- 5. SUSCEPTIBILITY: *The final Susceptibility Analysis is completed by DEQ's Source Water Protection Staff.***

In the text, describe any other source water protection efforts that will be used to address and minimize the susceptibility ratings listed in Susceptibility Table (See attached example). Finally, discuss water treatment measures already being used by the PWS.
- 6. LIMITATIONS**

Identification of potential contaminant sources is limited to nitrates and microbial contaminants and is generally based on readily available information and reports. Unreported activities and contaminant releases will likely be missed and not considered in this report. The delineation method utilizes simplifying assumptions that may not fully represent complex ground water flow systems but is intended to be conservative and protective of public health.
- 7. REFERENCES:** Include a list of references used to prepare the report. Use the suggested format shown below.

References Example:

- Kendy, E., and R.E. Tresch, 1996, Geographic, Geologic, and Hydrologic Summaries of Intermontane Basins of the Northern Rocky Mountains, Montana: U.S. Geological Survey Water Resources Investigations Report 96-4025, 233 p.

PWS 6 Report
For
Our Lady of the Valley Catholic Church
Helena Montana

(April 24, 2007)

The current water and wastewater facilities at Our Lady of the Valley Catholic Church described in this report have served the parish in the Helena Valley since the late 1970s. In 2007, the Montana Department of Environmental Quality (DEQ) became aware the church had surpassed the population served threshold that triggers classification of a water system as a public water supply (PWS) and is subject to regulation under the federal Safe Drinking Water Act (any water system serving twenty-five or more persons per day for 60 days in a calendar year is a public water system that must meet certain design and operation standards). The existing well and the existing septic system at the church do not meet the minimum design standards so a new well and septic system are proposed. The plans and specifications for the water system must meet certain DEQ design standards including Department Circular PWS 6 and this report addresses the requirements of that circular.

The church is classified as a transient PWS. Contaminants of concern for a transient PWS include only those that pose an acute health risk hence are limited to certain microbiological organisms and nitrate.

1. INTRODUCTION:

- Owner name and address:
Roman Catholic Bishop of Helena
PO BOX 1729
Helena MT 59624-1729
406-458-6114

- Facility name and address
Our Lady of the Valley Catholic Church
1502 Shirley Road
Helena MT 59602
(see also Figure 1)

- Primary contact person and phone number
Paul Tschida
5570 N, Montana Ave
Helena MT 59602
406-458-9633

- Date of report.
April 24, 2007

- If parcel is less than 20 acres in size, provide copy of plat approval statement with lot layout map.
The church is on PARCEL 2 PER C/S #507671/O which is 4.843 acres in size. The plat approval statement is not relevant since the new water and new wastewater systems are public and will be review/approved by the Montana Department of Environmental Quality.

2. WATER SYSTEM INFORMATION:

- Describe the location and nature of the water supply (i.e. subdivision, day care, food processor, other business, etc).
The church serves a parish of approximately 450 people for weekend services and occasional to frequent weekday events. Not all parishioners attend all services. The church is located in T11NR3WS32. Generally, the church is between North Montana Avenue and I-15 about 5 miles north of Helena (see inset on Figure 1).

- Identify how many people will be served (including workers and clients)

Approximately 200 parishioners attend services on a typical Sunday. The church facility is occasionally used by community groups such as the Boy Scouts for evening meetings. The church has two sets of restrooms and a small, domestic scale kitchen for food preparation.

- Indicate the estimated water use in gallons per day.
For the purposes of this report, potable water demand is estimated at 10 gallons per day per person or 2,000 gallons per day (10 gpd/person x 200 persons) plus irrigation.

- Describe the location of the well
The proposed well will be located approximately 100 feet northeast of the northeast corner of building (see Figure 1). The proposed well site is at more than 100 feet from the building sewer service connection, septic tank, existing septic tank and drainfield, and proposed septic system including replacement drainfield area. A brief description of aquifer conditions is excerpted below (from Mark Brookes, Morrison Maierle, Monopoly Court PWS 6 Report, 2003)

- Describe any water treatment devices
The water table is expected to be around 12'-15' below the ground surface at the proposed well site so full-time disinfection will be utilized

- Show the location of all parts of the septic system for this property and adjacent properties on the map.
The proposed wastewater system will be a public transient system engineered to meet DEQ standards. The system will be a design using pressure dosing (see Figure 1 for approximate location)

3. DELINEATION:

- Draw a 500-foot circle around the proposed drinking water source on a map. This is your "inventory region".
See Figure 1 for the inventory region.

- Provide a well log.
This is a proposed system so a well log is not available. No well log is available for the existing well which will continue to be used for irrigation purposes. Attachment 1 is a well log for a nearby well (800' north) and may be representative of conditions expected in the vicinity of the church.
- Provide a recent lab analysis for coliform bacteria and nitrate.
Water quality data will be provided upon completion of the well and prior to using the well as a drinking water source. It should be noted that the existing well is not properly sealed at the casing top (it is open) and continually tests positive for coliform bacteria. Nitrate analysis in April 2007 showed concentration < 2.5 mg/L.
- If this is a proposed well, describe the intended depth and grout placement method.
The well will be around 100' TD and will be grouted to at least 18' below ground surface (BGS). The static water level in the underlying alluvium is expected to be around 12'-16' BGS. Discontinuous clay layers may be encountered, and the well is expected to be completed into a producing zone around 65'-85' BGS. See Attachment 1 for a nearby well log.

4. INVENTORY:

- Describe all land uses within the 100-foot area around the well. This needs to be detailed.
The 100-foot well control zone includes the irrigation well, a grassy lawn area and small storage shed. The irrigation well is in a pit and the casing top is open. The submersible pump will be removed, and a new sanitary seal installed so the well will not be considered to be a potential contaminant source. The grassy area is irrigated occasionally and mowed, but no chemical weed control occurs here. A more highly maintained lawn is located east of the church building and provides a play area or place for outdoor activities. Weed control and fertilizer applications occur only in this area which is more than 100 feet from the proposed well.

The upper several hundred feet of the Helena valley-fill aquifer system is a series of complexly stratified alluvial lenses. These lenses consist of cobbles, gravel, and sand with abundant intercalated clay (Briar, 1992). The author goes on to state:

This near-surface stratigraphic sequence grades from predominately cobble, gravel and coarse sand where tributary streams enter along the south and west margins of the valley to predominately sand, silt, and clay near Lake Helena. Driller's logs indicate that the upper few-hundred feet of the valley fill contains as much as 30 to 70% intercalated silt and clay, but individual fine-grained layers are not laterally continuous across the valley. The lateral discontinuity of the many fine-grained layers allows hydraulic interconnection of the coarse-grained water-yielding zones, which therefore function as one complex aquifer system.

This aquifer system is either unconfined or semi-confined based on the depth of the water and this distinction cannot be determined until a well is completed, developed, tested and the aquifer test data is interpreted. The groundwater flow direction in the portion of the valley intercepted by the proposed replacement wells is to the northeast (Briar, 1992). The natural hydraulic gradient in the vicinity of the replacement wells is generally flat (0.0064 ft/ft) which is consistent with the relatively high hydraulic conductivities reported by the author for this material of 200 ft/day. The TOT calculations are very sensitive to the estimate for porosity. For this report porosity was conservatively assumed to be 20% to account for the well graded nature of the aquifer material and the abundance of intercalated silts and clays.

- Describe all land uses within a 500-foot radius of the well. This can be a more general description. **Land use in this area includes the church buildings and parking lot. Stormwater drainage off the parking lot is not directed to shallow infiltration structures or through any type of conveyance but is allowed to run-off into the adjacent grassy areas well outside the 100-foot control zoned. The church will be served by a new large capacity septic system located 150 feet southeast of the proposed well. The existing septic tanks and/or grease trap will be removed or filled in place. The new wastewater system location is lateral to the well based on ground water flow direction. Land use beyond the church property is suburban residential that uses individual wells and septic systems. The closest domestic septic system is about 300 ft from the well control zone. Residential septic system density is moderate.**
- On a map or air photo, show general land uses described as: sewer residential, sewer commercial, unsewer residential, unsewer commercial, irrigated agriculture, grassland, or forest (“sewered means connected to a city, town, or sewer district sewer system, unsewered means septic systems are used
See Figure 1.

5. SUSCEPTIBILITY: Completed by the Review Authority. Susceptibility is based on the type of contaminant source, location, and aquifer conditions.

Susceptibility is assessed by considering the relative hazard of significant potential contaminant sources tempered by the presence of barriers to contaminant transport. For this proposed PWS, the large capacity septic system that will serve the church is a high hazard potential contaminant source. The location is lateral relative to the proposed well and the well intake will be at least 50 feet below the average static water level. The mixing zone for the drainfield is located east of the well and does not intercept the well control zone. With two barriers, susceptibility is considered to be moderate.

The hazard posed by area septic systems is considered to be moderate. The well intake will be at least 50 feet below the average static water level. With one barrier, susceptibility is considered to be moderate. There are no drainfield mixing zones that encroach on the well control zone.

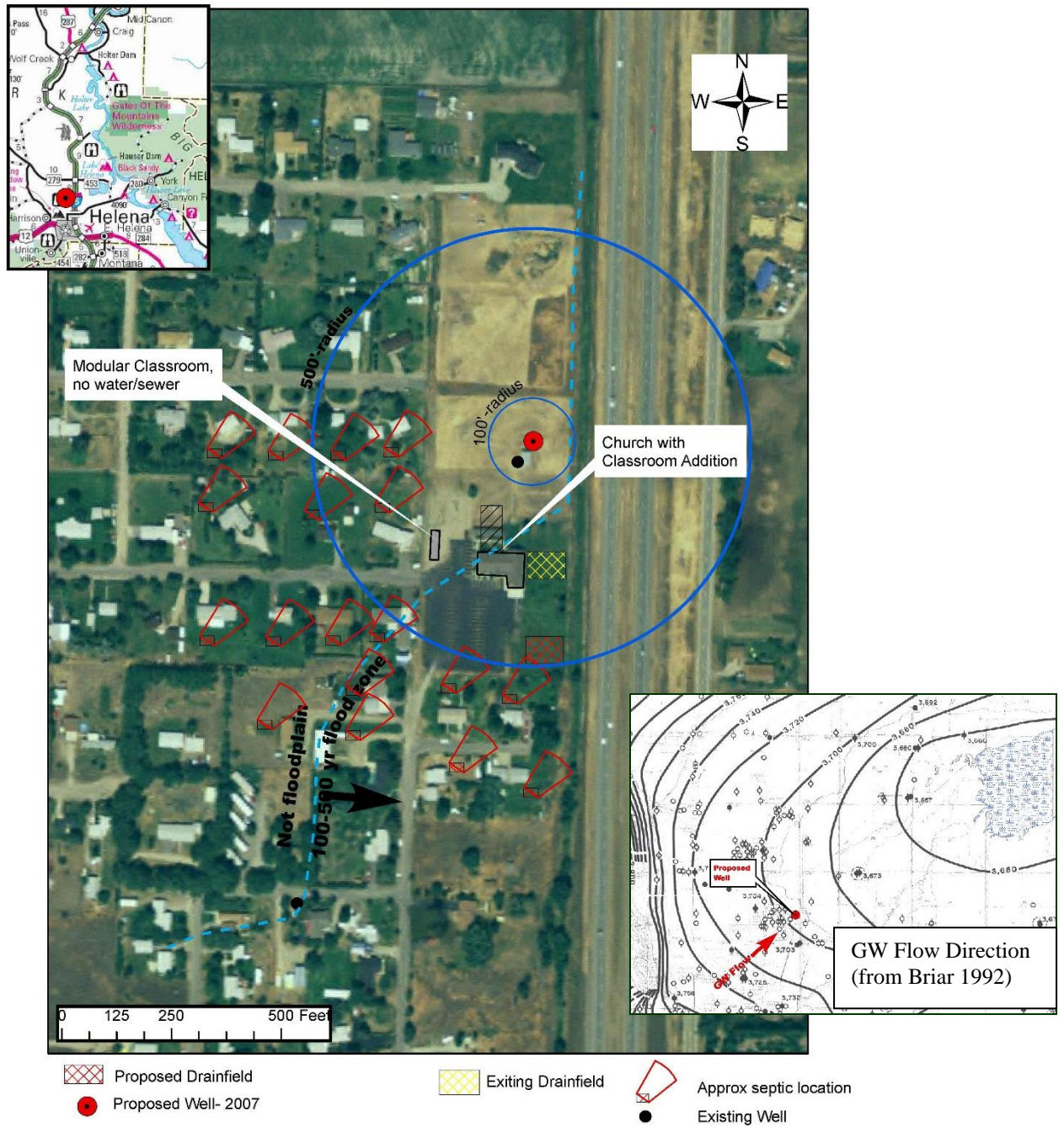
Source	Contaminants	Description (<i>Location and nature of hazard</i>)	Hazard Rating	Barriers	Susceptibility
<i>Large Capacity Septic System Serving Church</i>	<i>Pathogens and Nitrates</i>	<i>Septic System Serving Church</i>	<i>High</i>	<i>-Lateral Location -Well intake > 50' BGS</i>	<i>Moderate</i>
<i>Area Septic Systems</i>	<i>Pathogens and Nitrates</i>		<i>Moderate</i>	<i>Well intake > 50' BGS</i>	<i>Moderate</i>

6. LIMITATIONS:

Identification of potential contaminant sources is limited to available information. Unregulated activities or unreported contaminant releases may not be considered in this report. The delineation method utilizes simplifying assumptions that may not fully represent complex ground water flow systems but is intended to be protective of public health.

Figure 1

Our Lady of the Valley



MONTANA WELL LOG REPORT

Form No. 603 R2-99

Well ID # _____

This log reports the activities of a licensed Montana well driller and serves as the official record of work done within the borehole and casing and describes the amount of water encountered. **This form is to be completed by the driller and filed with DNRC within 60 days of completion of the work.** Acquiring Water Rights is the well owner's responsibility and is not accomplished by the filing of this report.

Well log information is stored in the Groundwater Information Center at the Montana Bureau of Mines and Geology (Butte) and water right information is stored in the Water Rights Bureau records (Helena).

For fields that are not applicable, enter NA. Optional fields have a grayed background. Record additional information in the REMARKS section.

1. WELL OWNER:

Name **Our Lady of the Valley Catholic Church**
 Mailing Address **1502 Shirley Rd.**
Helena, MT 59602

2. WELL LOCATION: List ¼ from smallest to largest

Township **11N** N/S Range **3W** E/W County **L & C**
 Lot _____ Tract/Blk _____ Subdivision Name _____

Well Address _____
 GPS Yes No
 Latitude _____ Longitude _____

Error as reported by GPS locator (± feet) _____
 Horizontal datum NAD27 WGS84

3. PROPOSED USE:

Domestic Stock Irrigation
 Public Water Supply Monitoring Well Other _____

4. TYPE OF WORK:

New well Deepen existing well Abandon existing well
 Method: Cable Rotary Other _____

5. WELL CONSTRUCTION DETAILS:

Borehole:
 Dia. **10** in. from **0** ft. to **40** ft.
 Dia. **6** in. from **40** ft. to **80** ft.
 Dia. _____ in. from _____ ft. to _____ ft.
Casing:
 Steel: Wall thickness **1/4** Threaded Welded
 Dia. **6 5/8** in. from **+3** ft. to **80** ft.
 Dia. _____ in. from _____ ft. to _____ ft.

Plastic: Pressure Rating _____ lbs. Threaded Welded
 Dia. _____ in. from _____ ft. to _____ ft.

Perforations/Slotted Pipe:

Type of perforator used **Plasma Cut**
 Size of perforations/slots **5** in. by **5/16** in.
200 no. of perforations/slots from **70** ft. to **80** ft.
 _____ no. of perforations/slots from _____ ft. to _____ ft.

Screens: Yes No

Material
 Dia. _____ Slot Size _____ from _____ ft. to _____ ft.
 Dia. _____ Slot Size _____ from _____ ft. to _____ ft.

Gravel Packed: Yes No

Size of Gravel _____
 Gravel placed from _____ ft. to _____ ft.

Packer: Yes No
 Type _____ Depth(s) _____

Grout: Material used **Cement**
 Depth from **-6** ft. to **40** ft. OR Continuous feed

6. WELL TEST DATA:

A well test is required for all wells. (See details on well log report cover).
 Static water level **7.8** ft. below top of casing or
 Closed-in artesian pressure _____ psi.

How was test flow measures:
 bucket/stopwatch, weir, flume, flowmeter, etc. _____

Yellowstone Controlled Groundwater Area - Water Temperature _____ °F
 AQUIFER TEST DATA FORM ATTACHED

Test - 1 hour minimum

Drawdown is the amount water level is lowered below static level.
 All depth measurements shall be from the top of the well casing.
 Time of recover is hours/minutes since pumping stopped.

Air test*

_____ gpm with drill stem set at _____ ft. for _____ hours
 Time of recovery _____ hrs/min. Recovery water level _____ ft.

OR Bailer test*

_____ gpm with drill stem set at _____ ft. for _____ hours
 Time of recovery _____ hrs/min. Recovery water level _____ ft.

OR Pump test*

Depth pump set for test **60** ft.
40 gpm pump rate with **5.4** ft. of drawdown after **8** hrs pumping
 Time of recovery **2** hrs/min. Recovery water level **7.8** ft.

Or Flowing Artesian*

_____ gpm for _____ hours

Flow controlled by _____

*During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.

7. WELL LOG:

Depth, Feet		Material: color/rock and type/descriptor (example: blue/shale/hard or brown/gravel/water, or brown/sand/heaving)
From	To	
0	7	Fine Gravel, Sand & Cobbles
7	28	Fine Gravel & Brown Clay
28	73	Brown Sandy Clay
73	80	Fine/Med Gravel & Crs Sand

ADDITIONAL SHEETS ATTACHED

8. DATE WELL COMPLETED: **08/24/07**

9. REMARKS: _____

10. DRILLER/CONTRACTOR'S CERTIFICATION:

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name, firm, or corporation (print) **H & L Drilling, Inc.**

Address **Box 919 East Helena, MT 59635**

Signature _____

Date **10/22/07** License no. **447**



Montana DNRC P.O. BOX 201601 HELENA, MT 59620-1601 444-6610

DEPARTMENT COPY

MBMG ID# _____

DRILLER: Please give this copy to the well owner to complete reverse side.

OWNER: Complete reverse side and send to DNRC when the well is completed and the water has been used beneficially for the intended purpose.

Form provided by Forms On-A-Disk, Inc. (214) 340-9429 · FormsOnADisk.com