# Instructions for Completing a PWS-6 Report for Non-Public Water Supplies

**(Revised 06/02/2022)**

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.mtdeq.us/portal/home/. The application has online instructions and help functions. The DEQ Circular 4 referenced below is available at https://deq.mt.gov/files/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)

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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)**

> 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 note 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.

**3. <u>DELINEATION:</u>**

- 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. <u>INVENTORY:</u>**

- 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.**

- 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: sewered residential, sewered commercial, unsewered residential, unsewered 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. <u>SUSCEPTIBILITY:</u> 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.**

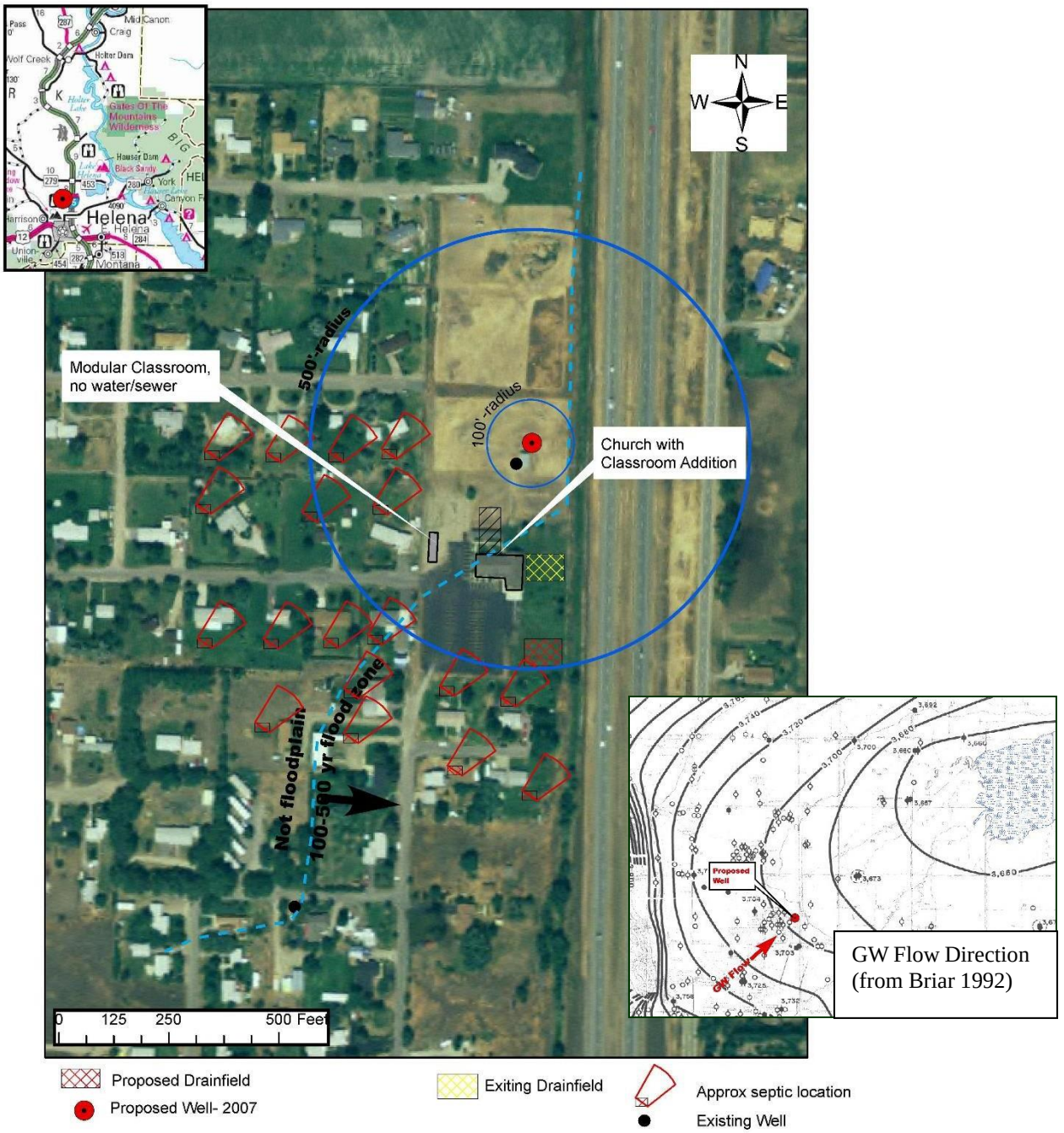
**The hazard posed by area septic systems is considered to be moderate. The well intake will be at least 50 feet below the average static water level. With one barrier, susceptibility is considered to be moderate. There are no drainfield mixing zones that encroach on the well control zone.**

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

**6. <u>LIMITATIONS:</u>**

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
   ___ ¼ ___ ¼ NE ¼ SW ¼, Section 32
   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 From | Depth, Feet To | Material: color/rock and type/descriptor (example: blue/shale/hard or brown/gravel/water, or brown/sand/heaving) |
|---|---|---|
| 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.