

Gem County Ground Water Quality Improvement and Drinking Water Source Protection Plan



Cover photograph: Overlooking the Emmett Valley from the Freezeout Historical Site taken by Rebecca Goehring, Idaho Department of Environmental Quality.



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Gem County Ground Water Quality Improvement and Drinking Water Source Protection Plan

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Idaho Department of Environmental Quality

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Idaho Department of Water Resources

Idaho Public Health Districts

Idaho Soil and Water Conservation Commission

Idaho Association of Soil Conservation Districts

Natural Resources Conservation Service

University of Idaho Cooperative Extension

City of Emmett

Gem County, Idaho

Public and local government representatives providing input.

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Acronyms and Abbreviations

APA	American Planning Association
BMP	best management practice
CAFO	confined animal feeding operation
DEQ	Idaho Department of Environmental Quality
EPA	United States Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
GWQP	Ground Water Quality Plan
Home*A*Syst	Idaho Home Assessment System
HUC	hydrologic unit code
IASCD	Idaho Association of Soil Conservation Districts
IDAPA	Refers to citations of Idaho administrative rules
IDWR	Idaho Department of Water Resources
ISWC	Idaho Soil and Water Conservation Commission
ISDA	Idaho State Department of Agriculture
IWM	irrigation water management
IWRI	Idaho Water Resources Research Institute
LUST	leaking underground storage tank
MCL	maximum contaminant level
mg/L	milligrams per liter
NMP	nutrient management plan
NPA	nitrate priority area
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PWS	public water system
RCRA	Resource Conservation and Recovery Act
SWA	source water assessment
SWDH	Southwest District Health Department
TMDL	total maximum daily load
USGS	United States Geological Survey
UST	underground storage tank

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1 Introduction

Drinking water in Gem County, Idaho, is supplied by ground water pumped from numerous public and private wells. Clean, safe water is a vital resource for the state's economy and human health. Ground water and surface water are commonly interconnected, and both are vulnerable to contamination from nonpoint source pollution due to land use activities (e.g., farming) and point sources (e.g., gas stations) nearby. However, contamination can be prevented through efforts such as education and the use of best management practices (BMPs) to avoid or minimize vulnerability from potential contaminant sources.

Ground water provides over 95% of the drinking water in Idaho and is often taken for granted since it is concealed underground. Although the quality of ground water in Idaho is generally good, water quality monitoring shows that Idaho's ground water has been significantly degraded in certain portions of the state. This localized degradation negatively impacts water quality and potentially threatens domestic water supplies and other ground water beneficial uses, such as aquaculture, agriculture, mining, and industrial uses.

Nitrate is one of the contaminants responsible for this degradation and is one of the most widespread ground water contaminants in Idaho. Precipitation, irrigation, and sandy soils allow nitrate to percolate through soil and into surface water and ground water. While nitrate is just one of the potential ground water contaminants in Idaho, more is known about nitrate in Idaho ground water than other contaminants. In addition, the presence of nitrate is a good indicator of aquifer vulnerability and the potential for other water quality problems. The Idaho Department of Environmental Quality (DEQ) has defined and prioritized areas with ground water degradation by nitrate to most effectively allocate resources for water quality improvement. These areas are known as nitrate priority areas (NPAs).

This binder serves as the *Gem County Ground Water Quality Improvement and Drinking Water Source Protection Plan*. The information provided is an educational and informational resource for local governments and land-management entities. It is intended to provide background information for decision making and to help prioritize and coordinate water quality-related activities throughout Gem County. The information in this binder addresses the following:

- Discusses why nitrates are a concern and describes potential nitrate sources to ground water, as well as the risks associated with high levels of nitrate in ground water.
- Provides statewide NPA maps and rankings and Gem County maps identifying current NPAs within Gem County.
- Recognizes activities and accomplishments made to improve ground water quality throughout Gem County.
- Outlines the general strategies that will be implemented to reduce nitrate contamination in ground water and protect public water supplies.
- Presents information for protecting sources of public drinking water systems to be used during the decision-making process.
- Offers a summary of information relating to surface water quality and impaired streams in Gem County.

- Provides a list of agency contacts, regulatory directories, and website resources for technical assistance and resource information.
- Assembles sources of funding for BMP implementation.
- Provides multiple public outreach and technical resources for use in strategic planning.

Idaho's Ground Water Quality Protection Act of 1989 (Idaho Code §39-1) authorized a comprehensive approach for maintaining and improving Idaho's ground water quality. The 1996 *Idaho Ground Water Quality Plan* (GWQP) was written as a result of the act and outlines the various state and local responsibilities for protecting Idaho's ground water quality (Ground Water Quality Council 1996). DEQ is designated as the primary agency to coordinate and administer ground water quality protection programs for the state. The GWQP is available on DEQ's website at www.deq.idaho.gov/media/462972-idaho_gw_quality_plan_final_entire.pdf.

The GWQP, Idaho Ground Water Protection Interagency Cooperative Agreement (January 2008), and DEQ Policy Memorandum PM00-004, Policy for Addressing Degraded Ground Water Quality Areas, provide guidance and direction in identifying, delineating, and prioritizing areas where ground water is significantly degraded.

As the primary agency responsible for ground water quality protection, DEQ chairs the Ground Water Monitoring Technical Committee. This committee meets periodically throughout the year to coordinate monitoring projects, share results and protocols, and develop evaluation criteria. The committee representatives from other agencies include the following:

- Idaho Department of Water Resources (IDWR)
- Idaho State Department of Agriculture (ISDA)
- Idaho Soil and Water Conservation Commission (ISWC)
- Idaho Association of Soil Conservation Districts (IASCD)
- Idaho public health districts
- Idaho Water Resources Research Institute (IWRRI)
- Idaho's universities
- Federal agencies (such as the United States Geological Survey [USGS])

DEQ helped develop the *Gem County Ground Water Quality Improvement and Drinking Water Protection Plan* in a collaborative effort with IDWR, ISDA, ISWC, IASCD, Southwest District Health (SWDH), University of Idaho Extension, and Natural Resources Conservation Service (NRCS).

2 Geologic Setting and Ground Water Conditions

2.1 Physical Setting

Gem County is located in southwestern Idaho, bordered by Ada and Canyon Counties to the south, Payette and Washington Counties to the west, Adams and Valley Counties to the north, and Boise County to the east. The Gem County has a total area of approximately 565 square miles. Major drainages include the Payette River, which flows from east to west through the southern portion of the county, and Squaw Creek, whose drainage area extends to the north in the panhandle of the county. Elevations range from approximately 2,300 feet in the west along the Payette River to approximately 7,200 feet in the mountains to the north. Figure 2-1 shows a topographic map of Gem County and the surrounding area.

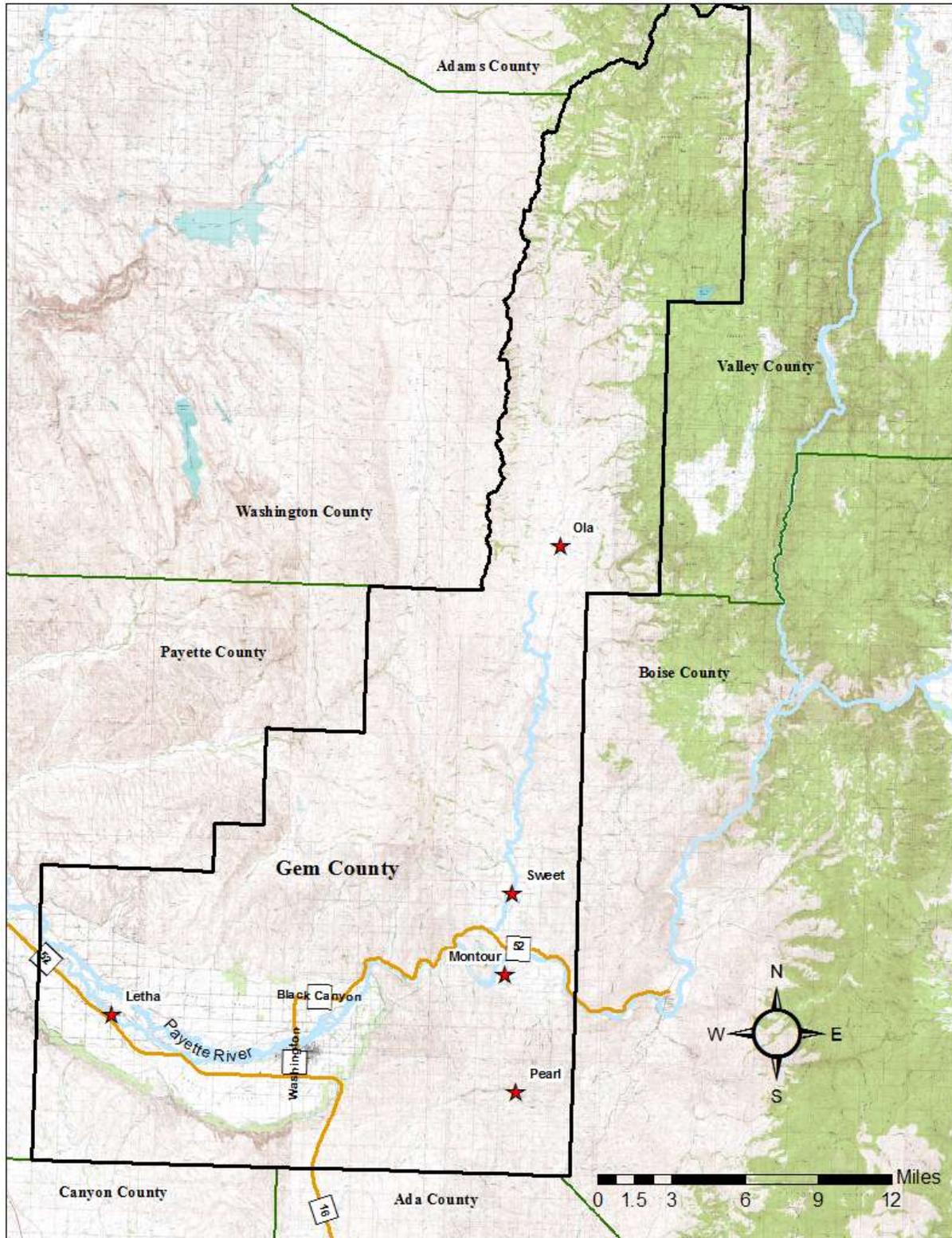


Figure 2-1. Topographic map of Gem County, Idaho, and vicinity.

2.2 Regional Geology¹

Gem County overlaps the northwestern border of the western Snake River Plain, with the southern area of the county located within the plain. The western Snake River Plain is a downdropped fault-block basin, with normal (vertical) north-northwest trending faults along the margins of the basin. The faulting along the margins of the western Snake River Plain began about 11 million years ago; the resultant central basin underwent rapid subsidence, and the subsidence was largely finished about 9 million years ago. The basin filled with rhyolite ash, basalt lava flows, and sediments that eroded off the surrounding hills, or were deposited by streams or into lakes. A major lacustrine (lake) system, named Lake Idaho, developed in the basin and existed from about 9.5 to 1.7 million years ago. The lake system was formed by lava flows in western Idaho and eastern Oregon that blocked major surface water drainages in western Idaho. The lake level elevation and boundaries fluctuated over time, likely due to changes in precipitation, the size of the surface water drainage area, tectonics, or the establishment of a lower elevation outlet for the lake. Both lake and stream sediments, including volcanic ash, clay, silt, sand, and gravel, were deposited in the basin. The south and southwestern areas of Gem County are located within the western Snake River Plain basin, and sedimentary deposits related to Lake Idaho are exposed in the hills north and south of the Payette River. More recent stream and other water-laid sediments are found along the Payette River and in drainages feeding the Payette River.

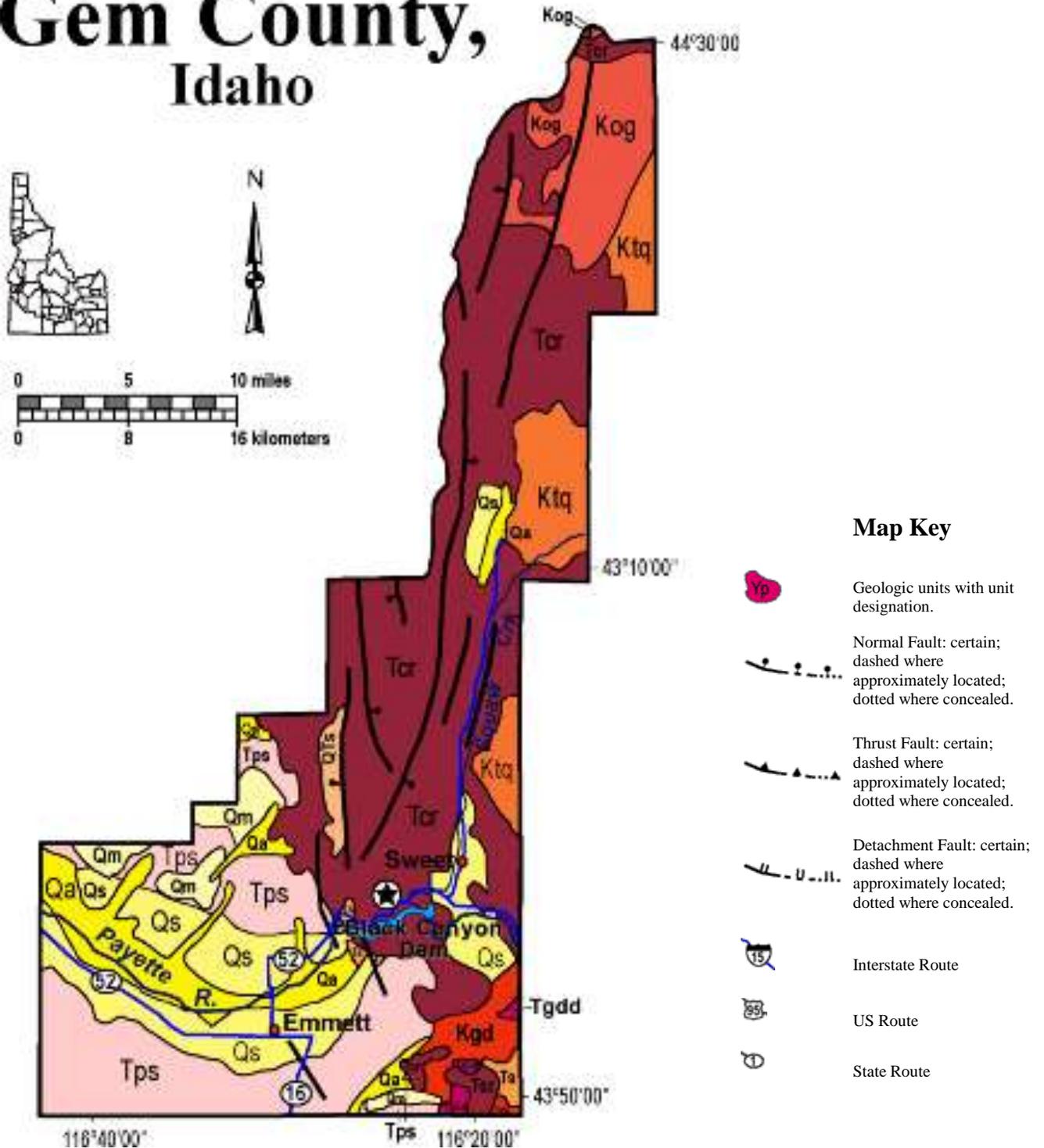
The eastern and northern areas of Gem County are outside the boundary of the western Snake River Plain. These areas are generally underlain by Columbia River basalts, which erupted from fissures in northeastern Oregon and southeastern Washington approximately 17 to 15 million years ago. The basalts flooded large areas of Oregon and Washington, and flowed into and up valleys in western Idaho. Squaw Butte is an uplifted block of the Columbia River basalt, and exposures of the basalt can be seen along the north side of the Black Canyon Reservoir.

Along the easternmost border of Gem County are several areas with exposures of igneous rocks that are part of the Idaho Batholith. The Idaho Batholith consists primarily of crystalline granitic rocks that are 65 to 95 million years old. These exposures represent topographically higher areas that were not flooded by the Columbia River basalts or by Lake Idaho.

Figure 2-2 shows a geologic map of Gem County. The map shows the sediments related to Lake Idaho and later water-laid sediments (Ts, Tps, Qts, Qs, Qm, Qa) in the southern and southwestern areas of the county; the Columbia River basalts (Tcr) in the eastern and panhandle sections of the county; and granitic rocks (Ktg, Kog, Kgd, Tgdd) related to the Idaho Batholith along the eastern border of the county.

¹ The general geology of Gem County summarized from Alt and Hyndman (1995) and Digital Atlas of Idaho (2002).

Gem County, Idaho



Map Key

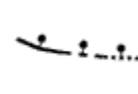
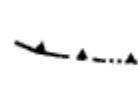
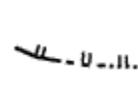
-  Geologic units with unit designation.
-  Normal Fault: certain; dashed where approximately located; dotted where concealed.
-  Thrust Fault: certain; dashed where approximately located; dotted where concealed.
-  Detachment Fault: certain; dashed where approximately located; dotted where concealed.
-  Interstate Route
-  US Route
-  State Route

Figure 2-2. Geologic map of Gem County (map legend on the next page).

Geologic Units

Qa	Quaternary alluvial deposits
Qm	Quaternary moraine and glaciofluvial outwash
Qs	Quaternary surficial cover, fluvial cover on Snake River Plain, alluvial fans (Snake River Group)
QTs	Pleistocene and Pliocene stream and lake deposits
Tps	Pliocene and Upper Miocene stream and lake deposits (Salt Lake Formation, Starlight Formation, Idaho Group)
Ts	Tertiary sedimentary rocks, undifferentiated
Tcr	Miocene basalt (Columbia River Basalt Group)
Tgdd	Eocene granodiorite, granite, diorite, and shallow dacitic intrusive
Kgd	Cretaceous granite and granodiorite of the 2-mica suite (Idaho Batholith)
Kog	Cretaceous orthogneiss, and foliated granodiorite and granite (includes mylonitic plutonic rocks in western Idaho suture zone)
Ktg	Cretaceous tonalite and quartz diorite

2.3 Ground Water Presence and Flow²

The majority of the population of Gem County resides in the southern area of the county, which is located within the western Snake River Plain. The general aquifer system in the western Snake River Plain includes three units: an upper unit of sedimentary deposits; a middle unit of fine-grained sedimentary and volcanic rock; and a lower unit of volcanic rock. The upper unit includes sediments associated with Lake Idaho, and more recent sedimentary deposits. Water wells completed in the upper unit generally produce water from sand or gravel layers within the unit. A layer of blue-colored clay is often found at the base of the upper unit, which acts as a barrier to downward ground water movement and separates the shallow aquifers from deeper aquifers located in the middle or lower units. Wells completed in the middle unit are generally

² The general hydrogeology of Gem County summarized from Newton (1991) and Whitehead (1994).

screened in water-producing sediment layers within or below the blue clay. Recharge to the aquifers in the western Snake River Plain is from precipitation, underflow (deep ground water flow) across the boundaries of the plain, and infiltration of surface water from irrigation and irrigation canals and ditches.

Ground water in basalt, which underlies the panhandle and eastern areas of Gem County, occurs primarily in permeable zones between basalt flows that are fractured and/or contain volcanic cinders or sediments. In granitic bedrock like the Idaho Batholith, ground water is generally located in unconsolidated material or sediments that fill valleys and lowlands, and within fractures, faults, or weathered zones in the bedrock. Ground water in fractured granitic bedrock generally does not extend beyond 300 to 400 feet, and yields generally decrease with depth. Recharge to the both the basalt and granite aquifers is likely from precipitation and infiltration from surface streams.

Databases maintained by IDWR showing mapped well locations and the well driller's reports for the mapped wells identified very few water wells located in the areas of Gem County underlain by granite or basalt.

In the western Snake River Plain, the regional ground water flow direction is to the south and southwest towards the Snake River in areas north of the Snake River. In southern Gem County, the ground water flow is towards the Payette River, which discharges to the Snake River. Figure 2-3 shows the regional ground water flow directions in the western Snake River Plain, and the approximate ground water flow directions in southern Gem County. Ground water flow in the mountains and hills in northern Gem County likely follows the general surface topography, flowing from areas of higher elevations to lower elevations and following surface drainage features.

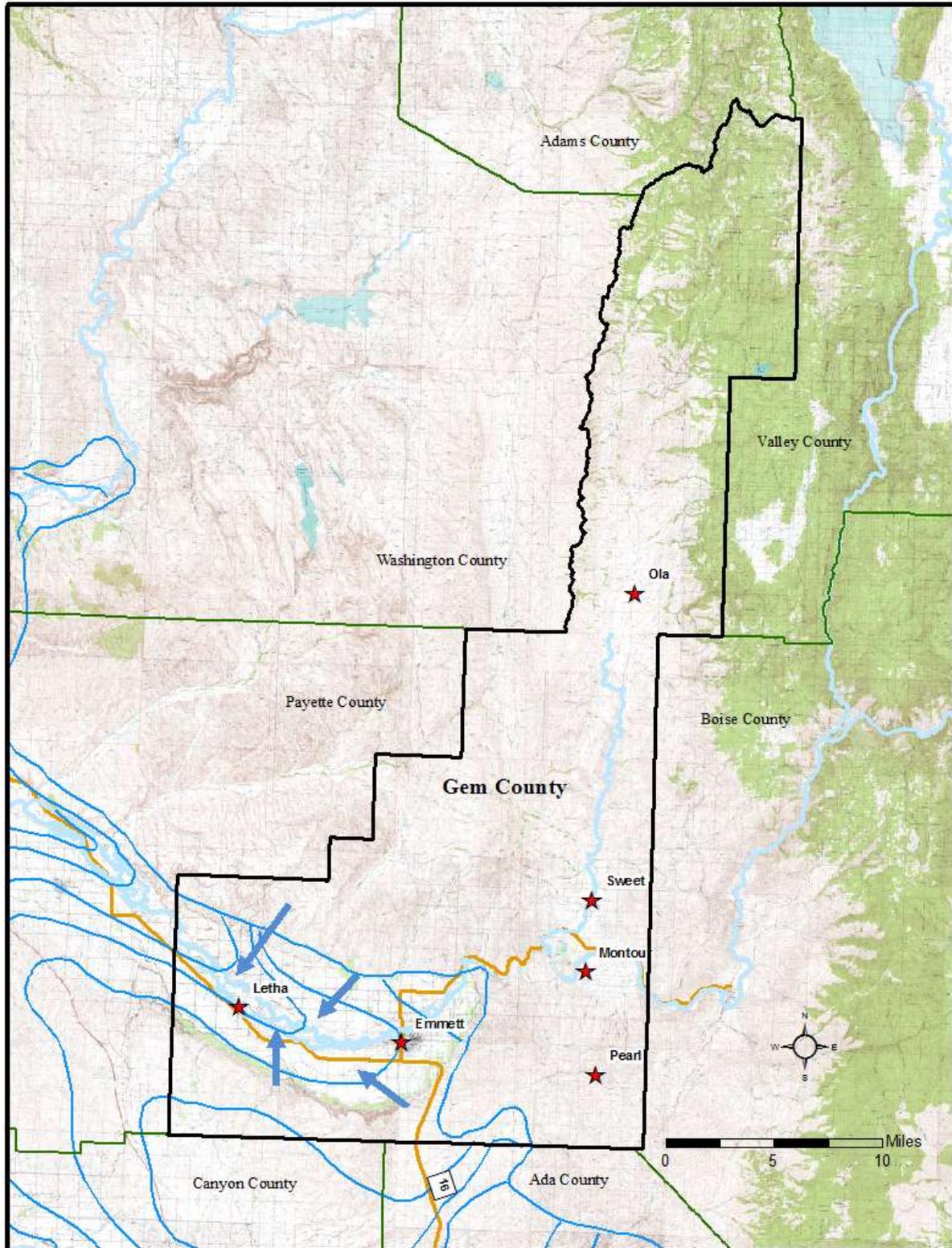


Figure 2-3. Ground water flow directions.

2.4 Ground Water Quality

Nitrate is present in shallow ground water beneath most of Gem County at concentrations that occasionally exceed the drinking water standard of 10 milligrams per liter (mg/L).

Arsenic has been detected in exceedance of the drinking water standard of 0.010 mg/L in ground water in the Emmett North Bench area. Iron and manganese have also been detected at levels that exceed the United States Environmental Protection Agency's (EPA's) Secondary Drinking Water Regulation standards.

In the Sweet and Montour areas, arsenic has been detected in exceedance of the drinking water standard of 0.010 mg/L, and fluoride has been detected in exceedance of the drinking water standard of 4.0 mg/L.

3 Statewide Nitrate Priority Areas and Rankings

As part of the goal to restore degraded ground water, DEQ has developed a list of NPAs throughout the state where ground water has been compromised due to nitrate contamination. The list ranks NPAs in the state based on severity of nitrate degradation; a ranking of 1 indicates the most severely impacted area in the state. A statewide map depicting current NPAs and rankings is provided in this section.

In 2001, DEQ, in consultation with the Ground Water Monitoring Technical Committee—comprised of staff from IDWR, ISDA, USGS, and the Idaho public health districts—delineated nitrate-degraded ground water areas using ground water quality monitoring analytical results combined with hydrogeologic and land use data. The first NPA delineation document was published in 2002. These initial NPAs can be viewed on DEQ’s website at www.deq.idaho.gov/media/472607-final_nitrate_priority_area_ranking_2002.pdf.

Data used to define and rank the priority of each area are updated on a continual basis. However, updated NPA delineations and rankings only occur about every 5 years. The most recent delineation document was published in 2008 based on data collected prior to 2007 and is located on DEQ’s website at http://www.deq.idaho.gov/media/471611-ranking_2008.pdf. DEQ began reevaluating the NPAs in 2012. The areas, boundaries, and rankings will be updated by incorporating data collected from 2007–2011.

The main criteria in identifying an NPA requires 25% of the ground water samples collected, in a hydrogeologically similar area, contain nitrate levels greater than or equal to 5 mg/L or one-half of the 10 mg/L federal drinking water standard for nitrate.

Areas are ranked based on criteria such as population, existing water quality, water quality trends, and other factors. The process also accounts for impacts on the beneficial uses (other than water supply) of an area’s ground water.

Figure 3-1 shows 32 NPAs in Idaho, along with their rankings. Figure 3-2 is a map of the NPAs in DEQ’s Boise region (Washington, Payette, Gem, Boise, Canyon, Ada, Owyhee, and Elmore Counties).

Table 3-1 summarizes the 2008 statewide ranking of NPAs, with data showing nitrate levels in each area.

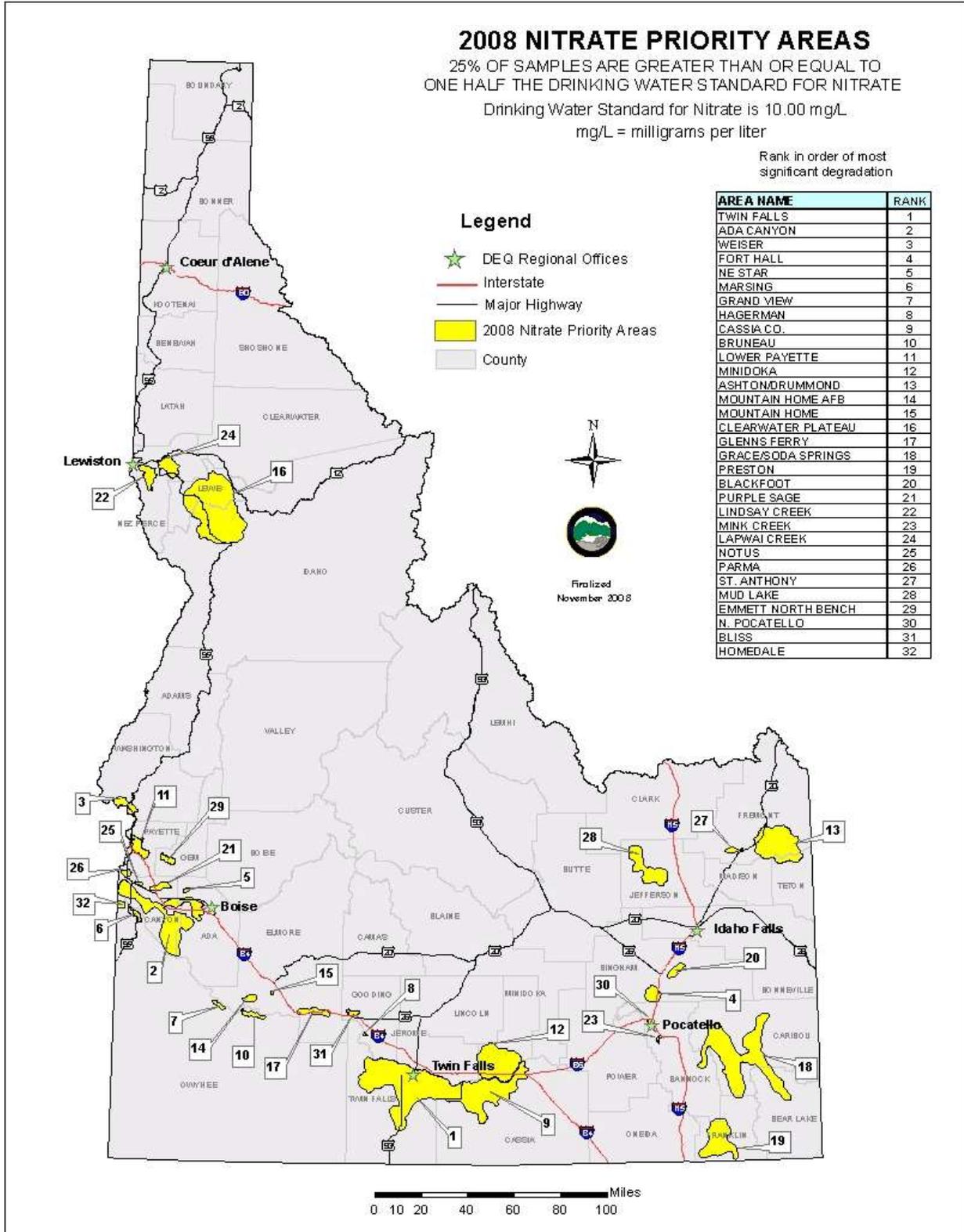


Figure 3-1. Map of 32 nitrate priority areas designated in Idaho, 2008.

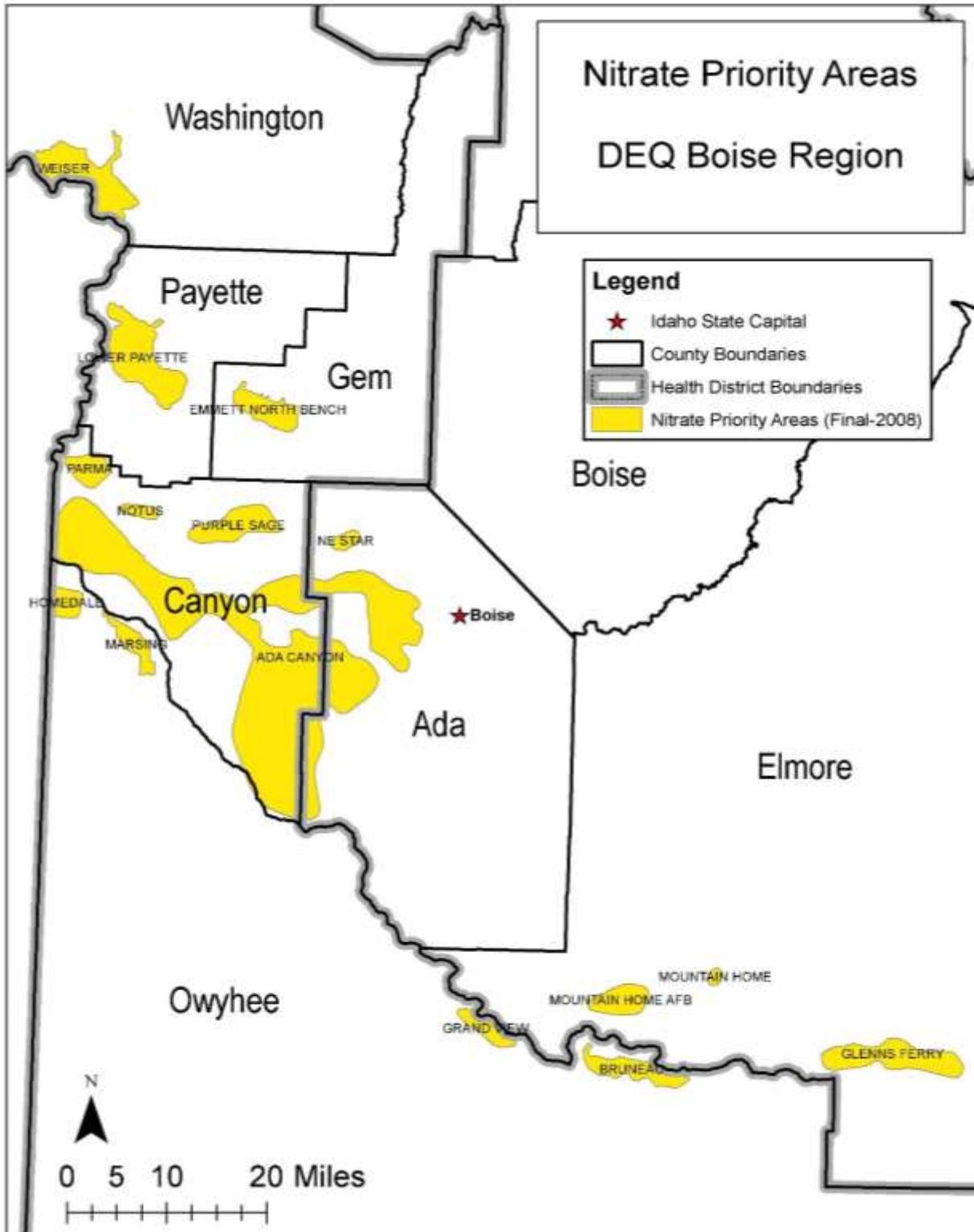


Figure 3-2. Nitrate priority areas in the Idaho Department of Environmental Quality's Boise region.

Table 3-1. Statewide nitrate priority area 2008 ranking summary sheet.

Area Name	DEQ Region ^a	Acres	Miles (mi ²)	Population	Total Samples ^b	Max NO ₃ ^c	Mean NO ₃	Median NO ₃	# ≥ 2.0 mg/L	% ≥ 2.0 mg/L	# ≥ 5.0 mg/L	% ≥ 5.0 mg/L	# ≥ 10.0 mg/L	% ≥ 10.0 mg/L	# PWS/ SWA ^d	Trend	Score	Rank
Twin Falls	TFRO	379,520	593	63,354	605	41.0	5.20	4.90	536	89	288	48	34	6	88	Increase	24.78	1
Ada Canyon	BRO	211,200	330	121,063	933	55.9	5.27	4.10	701	75	383	41	108	12	213	Increase	24.75	2
Weiser	BRO	25,600	40	7,258	99	43.5	12.26	12.00	86	87	78	79	58	59	25	No change	24.59	3
Fort Hall	PRO	23,680	37	1,763	8	24.1	14.79	14.80	8	100	7	88	7	88	7	No change	24.20	4
NE Star	BRO	2,560	4	166	63	48.0	11.14	7.68	42	67	35	56	27	43	1	Increase	23.44	5
Marsing	BRO	5,760	9	521	33	37.0	9.57	7.90	21	64	19	56	13	39	12	Increase	21.98	6
Grand View	BRO	5,760	9	510	22	121.0	15.33	9.60	22	100	20	91	11	50	2	No change	20.55	7
Hagerman	TFRO	1,280	2	877	8	19.6	9.92	11.00	8	100	5	63	5	63	4	Insufficient	20.45	8
Cassia Co.	TFRO	193,280	302	17,525	384	40.0	6.34	5.74	331	86	224	58	65	17	48	No change	20.32	9
Bruneau	BRO	11,520	18	23	4	110.0	43.40	31.70	3	75	3	75	3	75	0	Insufficient	19.80	10
Lower Payette	BRO	26,880	42	6,718	119	28.0	6.05	4.74	83	70	57	48	22	19	25	No change	17.70	11
Minidoka	TFRO	147,200	230	18,395	319	83.0	5.35	4.32	224	70	131	41	27	8	56	No change	17.25	12
Ashton/ Drummond	IFRO	162,560	254	2,484	179	48.0	7.03	6.00	159	89	124	69	28	16	18	No change	16.83	13
Mountain Home AFB	BRO	8,960	14	8,903	36	28.9	7.00	5.41	29	81	20	56	8	22	8	No change	16.62	14
Mountain Home	BRO	1,280	2	100	35	40.0	9.96	5.80	29	83	19	54	10	29	4	No change	16.26	15
Clearwater Plateau	LRO	359,040	561	4,236	183	77.1	6.79	3.70	119	65	68	37	39	21	22	No change	16.25	16
Glenns Ferry	BRO	20,480	32	1,868	11	32.2	9.07	5.72	9	82	8	73	3	27	4	No change	15.99	17
Grace/Soda Springs	PRO	317,440	496	8,042	96	37.2	4.62	3.21	64	67	28	29	8	8	45	No change	15.59	18

Table 3-1 (continued). Statewide nitrate priority area 2008 ranking summary sheet.

Area Name	DEQ Region ^a	Acres	Miles (mi ²)	Population	Total Samples ^b	Max NO ₃ ^c	Mean NO ₃	Median NO ₃	# ≥ 2.0 mg/L	% ≥ 2.0 mg/L	# ≥ 5.0 mg/L	% ≥ 5.0 mg/L	# ≥ 10.0 mg/L	% ≥ 10.0 mg/L	# PWS/ SWA ^d	Trend	Score	Rank
Preston	PRO	106,880	167	8,178	59	30.8	5.15	4.19	40	68	24	41	6	10	23	No change	15.41	19
Blackfoot	PRO	15,360	24	1,100	15	16.0	6.98	5.64	15	100	9	60	3	20	13	No change	15.00	20
Purple Sage	BRO	14,080	22	2,835	87	22.7	5.26	4.61	66	76	38	44	9	10	25	No change	14.72	21
Lindsay Creek	LRO	28,160	44	1,273	45	18.6	4.74	3.80	25	56	18	40	9	20	16	No change	14.12	22
Mink Creek	PRO	1,920	3	1,478	40	21.0	4.57	2.42	24	60	13	33	8	20	11	No change	13.85	23
Lapwai Creek	LRO	33,920	53	1,026	16	18.7	5.63	5.19	13	81	9	56	2	13	8	No change	13.72	24
Notus	BRO	2,560	4	135	6	10.2	5.76	6.93	5	83	4	67	1	17	0	Insufficient	13.71	25
Parma	BRO	7,040	11	890	17	15.0	4.83	5.36	10	59	9	53	3	18	3	No change	13.63	26
St. Anthony	IFRO	7,680	12	666	14	42.6	9.46	3.29	9	64	5	36	3	21	5	No change	13.18	27
Mud Lake	IFRO	81,280	127	1,309	52	20.0	3.90	2.89	33	63	14	27	4	8	11	No change	12.41	28
Emmett North Bench	BRO	10,880	17	887	27	17.0	4.65	3.69	19	70	9	33	3	11	3	No change	12.15	29
North Pocatello	PRO	1,920	3	4,464	11	8.9	4.62	3.80	11	100	3	27	0	0	11	No change	10.35	30
Bliss	TFRO	7,040	11	76	24	8.6	3.19	3.11	16	67	7	29	0	0	0	No change	8.79	31
Homedale	BRO	5,760	9	387	24	16.0	4.67	1.54	12	50	9	38	5	20	1	Decrease	7.90	32
Total	—	2,228,480	3,482	288,510	3,574	—	—	—	2,772	—	1,688	—	532	—	712	—	—	—

Notes: Square miles (mi²); milligram per liter (mg/L)

a. BRO = Boise Regional Office, IFRO = Idaho Falls Regional Office, LRO = Lewiston Regional Office, PRO = Pocatello Regional Office, TFRO = Twin Falls Regional Office

b. Number of sample sites within nitrate priority area

c. NO₃ = nitrate

d. Number of public water systems (PWS) or source water assessments (SWA) within a nitrate priority area

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4 Gem County Nitrate Priority Area Maps

The map in Figure 4-1 shows the current NPA identified for Gem County. The NPA boundaries depicted on this map are approximate and the boundaries may change following the 2012 delineation process.

If you own a well and live in one of the NPAs, it is particularly important to test your well water on a regular basis. If your well is not in an NPA, this does not rule out the potential for nitrate contamination, so testing your well water regularly is still recommended. See Tab 14, Public Information and Outreach Materials, for private well owner information and analytical laboratory contacts.

More information about nitrates in ground water is provided on DEQ's website at <http://www.deq.idaho.gov/water-quality/ground-water/nitrate.aspx>.

An interactive map-based source of information on ground water quality areas where nitrate concentrations potentially degrade drinking water quality is found at <http://mapcase.deq.idaho.gov/npa>. If 25% of ground water samples collected in an area contain nitrate levels greater than or equal to one-half the federal drinking water standard (i.e., greater than or equal to 5 mg/L), the area qualifies as an NPA. The federal drinking water standard for nitrate, as set by EPA, is 10 mg/L.

To view an interactive map-based source of information on ground water quality analytical data collected by DEQ (or DEQ contractors), go to <http://mapcase.deq.idaho.gov/gwq/>.

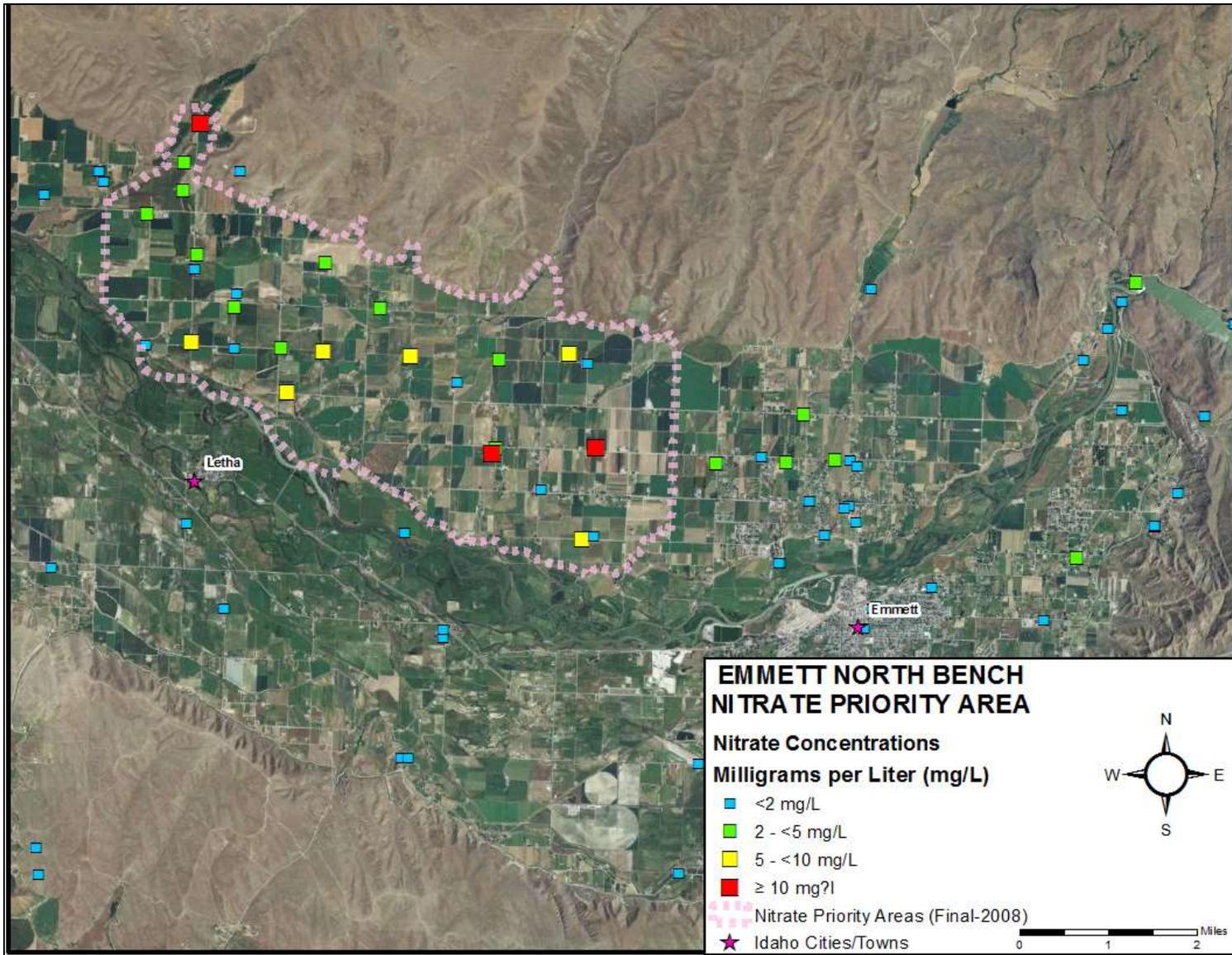


Figure 4-1. Emmett North Bench nitrate priority area for ground water.

5 Nitrate, Potential Nitrate Sources, and Other Ground Water Contaminants

5.1 Why is Nitrate a Concern?

Ground water supplies 95% of the water used in Idaho households and provides drinking water to more than 200 Idaho cities and towns. High levels of nitrate in drinking water are associated with adverse health effects. Therefore, strategies aimed at eliminating or minimizing nitrate contamination in the environment are critical.

Nitrate is a form of nitrogen. Nitrogen is an essential nutrient for plant growth; its compounds are vital components of plant foods and fertilizers. A variety of sources generate nitrate, such as precipitation, septic sewer systems, plants, waste from animals, nitrogen-based fertilizers, and other organic matter that returns nitrate to the soil as it decomposes.

Nitrate is a widespread contaminant in Idaho's ground water; it is also the most preventable. In fact, it is "the most widespread contaminant found in Idaho ground water and the most common contaminant identified in public water drinking systems" (DEQ 2001). Nitrate levels in ground water serve as an indicator of the likelihood that other contaminants will reach the aquifer. While many other contaminants have been identified in Idaho ground water, nitrate's abundance, chemical mobility, and clear association with widespread land uses establish it as a priority contaminant.

Ground water quality monitoring data collected by DEQ, IDWR, ISDA, and USGS revealed nitrate concentrations, in some areas of Idaho, above or near the maximum contaminant level (MCL) for drinking water established by EPA.

5.2 Drinking Water Maximum Contaminant Level

The drinking water MCL is the highest permissible level of contaminant in drinking water for it to be deemed suitable for human consumption. EPA has established federal drinking water standards, called MCLs, for many contaminants; the MCL for nitrate is 10 mg/L. The Idaho ground water quality standard for nitrate in drinking water is also 10 mg/L. Nitrate concentrations of 2 mg/L or greater generally indicate an anthropogenic (human-caused) impact to ground water.

People who rely on private wells for their drinking water supply are particularly at risk of exposure to high levels of nitrate and other contaminants. Private well owners are not required to test their water on a regular basis and may not be aware a problem exists. See Tab 14, Public Information and Outreach Materials, for private well owner information and analytical laboratory contacts. Public water systems (PWSs) are subject to the Safe Drinking Water Act and are required to test regularly. Nitrate levels in public drinking water must be below 10 mg/L MCL.

5.3 Health Effects

Elevated nitrate levels can pose a health threat for both humans and animals and can be an indicator of other water quality problems. The MCL of 10 mg/L is based on studies assessing the risk of developing

methemoglobinemia (also known as blue baby syndrome) in infants as a result of exposure to nitrates. Methemoglobinemia is the inability to absorb oxygen in the blood system. Nitrate levels above the regulatory level have been associated with methemoglobinemia. The condition typically affects newborns and infants up to 6 months of age and occurs when nitrate is converted to nitrite in a child's body. Nitrite reduces oxygen in the child's blood, leading to shortness of breath and blueness of skin. This condition can be serious, causing the child's health to deteriorate rapidly over a period of days, and can result in death. Other populations potentially vulnerable to methemoglobinemia include pregnant women, adults with reduced stomach acidity, adults who lack a hereditary enzyme needed to combat effects of nitrate in their body, and dialysis patients (Cohen and Wiles 1996). Healthy adults are typically not affected short-term by elevated nitrate in water. However, long-term effects for consuming high-nitrate water are uncertain (Mahler et al. 2007).

High-nitrate water is generally a health hazard to animals only when used with high-nitrate feed. Short-term use of water with nitrate levels up to 40 mg/L is generally considered acceptable for animals. Water with nitrate levels greater than 100 mg/L is not recommended for livestock (Mahler et al. 2007). For more information about how water quality can affect animals, visit Washington State University's College of Veterinary Medicine website at www.vetmed.wsu.edu/rdvm/links.aspx or the University of Idaho's College of Agricultural and Life Sciences website at www.avs.uidaho.edu/.

5.4 Nitrate in Ground Water

Nitrate is soluble in water and can easily pass through soil to ground water supplies. Ground water is the primary source for drinking water in the Gem County area; therefore, ground water with high nitrate levels can potentially impact drinking water reserves. Nitrate can persist in ground water for decades and accumulate at high levels as more nitrogen is added to the soil every year and leaches into the ground water. High levels of nitrate in soil, ground water, and drinking water can originate from the application of nitrogen in the form of commercial fertilizer and animal waste, legume crop plow-down, and septic tank failures. Shallow wells, wells in sandy soil, or wells that are improperly constructed or maintained are more likely to have nitrate contamination than deeper wells with protective casings and effective well seals. Nitrate in ground water is often an indicator of aquifer vulnerability and may suggest the presence of other contaminants. The presence of higher concentrations of nitrate in ground water is generally associated with certain land use activities (Tab 6). Whenever nitrogen-containing compounds come into contact with soil, a potential for nitrate leaching into ground water exists. Nitrate is highly soluble and will stay as a solution in percolation water after leaving the root zone until it reaches ground water. Nitrate is difficult to remove from water; it cannot be removed from water by boiling, filtration, disinfection, or water softening. Water treatment that is effective in removing nitrate includes distillation, reverse osmosis, and ion exchange.

6 Potential Nitrate Sources

*“It’s not a matter of who is most responsible.
What’s important is that you do what you can in the hope that
what you do matters.”—unknown*

Sources of nitrate include both point and nonpoint sources. A point source is a distinct and mappable supply of contamination. Nonpoint source pollution occurs with no visible or obvious point from which the contamination originates. Identified below are land use practices often serving as both point and nonpoint sources associated with nitrate contamination. When these land use practices are managed appropriately, they do not result in the degradation of water quality. However, poor management or inadequate control over such land use activities can lead to decreased water quality.

6.1 Well Construction

Older well construction standards did not offer the level of protection to ground water that more current standards require. Older well seals can allow contaminants from the land surface to move down along the outside casing of the well toward ground water. A well with multiple-screened intervals may create cross-contamination between aquifers. Also, improperly abandoned wells provide a direct connection between the land surface and the aquifer, allowing surface contaminants an easy path to ground water. Each circumstance or combination of issues can increase the probability of developing a nitrate contamination problem within an aquifer.

6.2 Residential Land Uses

6.2.1 Fertilizer Application, Irrigation Practices, and Other Residential Activities

The following activities associated with residential development are possible contributors to nitrate problems in residential areas:

- Excessive use of fertilizer on lawns, gardens, and other landscaping
- Excessive use of water on lawns, gardens, and landscaping
- Animal waste management (pastures and kennels)
- Septic system discharge

The combination of these activities may be a potential source of nitrate contamination in ground water.

Pastured animals on small acreages can also degrade ground water if not managed properly. According to Scott Jensen of the Canyon County Cooperative Extension Service, “Pasture management involves more than just grass care. It involves managing the interrelationships among animals, plants, and soil” (Jensen 2002).

Information for rural residential homeowners is currently available from the University of Idaho Extension and through the Homestead Assessment System (Home*A*Syst). Home*A*Syst helps homeowners, farmers, or ranchers determine how safe their drinking water is, assess practices and activities that may potentially contaminate ground water, and take action. Worksheets and factsheets

are available at homeasyst.idahoag.us/ to assist with site evaluations, identify practices known to increase the risk of contaminated drinking water, and help develop an action plan for reducing risk.

6.2.2 Septic Systems

Domestic septic systems may contribute to elevated concentrations of nitrate in ground water. The standard household septic system is not designed to effectively treat wastewater for nitrates. Properly operating systems deliver a certain amount of nitrate to the ground water (an average of about 45 mg/L of nitrate [EPA 1978]). Generally, this source of nitrate is not a concern when the volume of wastewater is relatively small compared to the volume of ground water.

Ground water problems can occur in areas where high septic densities exist. Primarily, these sites are found within cities' urban growth boundaries or in more isolated subdivisions. Low-density settings have little impact as ground water dilutes the discharged wastewater and spreads pollutants over a large area. As densities increase, discharge volumes increase as well and may overcome the ground water's ability to dilute wastes, thereby increasing the potential for contamination.

Idaho's septic system regulations under the "Individual/Subsurface Sewage Disposal Rules" (IDAPA 58.01.03) and "Rules Governing the Cleaning of Septic Tanks" (IDAPA 58.01.15) are implemented through Idaho's public health districts, with technical assistance from DEQ. In cases where the concentration of nitrate entering ground water may be a problem, additional treatment systems can be placed on the septic tanks, reducing the effluent nitrate concentration to 27 mg/L or 16 mg/L.

In NPAs, local public health districts may require a ground water impact analysis to be conducted for all proposed subdivisions. This assessment determines the number of septic tanks permitted on a single subdivision site, avoiding any adverse impact on ground water quality. These analyses are referred to as nutrient-pathogen studies. DEQ reviews the nutrient-pathogen studies on behalf of each health district.

Additionally, health districts perform day-to-day activities to regulate septic systems. These tasks include conducting site evaluations and inspections, issuing system permits, and issuing septic tank pumper licenses. Health district programs have also been developed to address key issues, such as establishing design standards and acceptable waste management practices for private septic systems; establishing criteria under which sanitary permits are issued to build private septic systems discharging pollutants to waters in the state; and establishing site soil evaluation standards for placement of septic systems.

Other DEQ septic system regulation responsibilities include conducting plan and specification reviews for large soil absorption systems or drainfields with greater than 2,500 gallons per day effluent; reviewing nutrient-pathogen studies for large soil absorption systems; heading the technical guidance committee; reviewing new technologies; and providing training courses for installers and pumpers.

6.3 Agriculture

Agricultural activities generate sources of nitrate through all forms of fertilizers, legume crops, and organic matter. Nitrogen not used by plant growth is stored in the soil and can leach into ground water as nitrate if sufficient water is available to carry the compound through various layers of soil (known as the soil profile).

Several factors influence the degree of nitrogen leaching in agricultural areas. For instance, soil type, irrigation practices, and volume of water applied affect how quickly and easily nitrate leaches through the soil. The nitrogen source itself, application season, and application rate directly impact overall levels of nitrogen introduced. Overapplication of nitrogen can occur in several ways:

- Applying fertilizers at rates greater than what the crop needs or can use
- Failing to account for residual and organic nitrogen sources already present in the soil profile, especially in the form of nitrogen-fixing crops
- Inappropriately timing nutrient application with regard to crop needs
- Failing to account for other nitrogen sources such as irrigation water
- Failing to calibrate solid waste delivery systems to ensure uniform application over the entire land application area
- Failure to conduct nutrient analysis of solid waste and wastewater to determine the appropriate amount for land application

Irrigation systems may include gravity, solid set, hand line, wheel line, drip, surge, and center pivot. All systems have the potential to increase nitrate levels in ground water. Gravity or flood irrigation methods apply large volumes of water and are most effective in leaching nitrate through the soil profile and have the highest potential to degrade ground water quality.

A number of programs and activities address irrigation practices. The University of Idaho's Nutrient and Pest Management Program is an educational effort based on soil testing programs and soil fertility recommendations appropriate to soil type and crop. The NRCS, ISWC, and local soil and water conservation districts coordinate and implement a number of programs. Their focus is to use cost-sharing BMPs and educational outreach to reduce nutrient loads from agriculture and provide nutrient management planning and engineering technical support. These programs include the Environmental Quality Incentives Program (EQIP), Soil and Water Conservation Assistance Program, and State Water Quality Program for Agriculture. For additional program information, visit the NRCS website at www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/.

6.4 Animal Feeding Operations and Dairies

An animal feeding operation is defined as holding or confining animals in buildings, pens, or lots. Sources of nitrate from such animal feeding operations are typically attributed to runoff, facility wastewater, and manure. To protect ground water, regulations regarding solid and liquid effluents are in place for outfits feeding more than 1,000 head of animals. Waste management for operations feeding less than 1,000 head of animals is voluntary.

The ISDA has the authority to promulgate and enforce rules for dairy operations. Noncompliance with the rules or discharge violations may result in revocation of authority to sell milk for human consumption. ISDA also conducts dairy waste inspections to prevent waste discharges and evaluate waste collection, treatment, handling, disposal, and management procedures for compliance with the federal Clean Water Act and ISDA regulations.

Additionally, ISDA collects ground water samples for nitrate analysis during annual inspections at all active dairies in Idaho. Every 5 years, ISDA will run nitrogen isotope tests on water samples from each dairy showing nitrate concentrations greater than 5 parts per million. ISDA also has authority to require further compliance and operation changes where evidence indicates a dairy is a nitrate source

contributing to aquifer degradation. To date, follow-up has been restricted due to limited staff resources.

If a dairy or feedlot discharges into a surface water body, EPA issues a National Pollutant Discharge Elimination System (NPDES) permit.

Information on the location of dairies and feedlots with NPDES permits regulated and permitted by EPA can be found at www.epa.gov/myenvironment/. To access NPDES dairy and feedlot information for your area from this website, follow these steps:

- Enter your location, such as address, zip code, city, county, water body, or park name.
- Select My Maps.
- Select Water under the Map Contents box in the upper right corner of the map.
- Select Water Dischargers.

6.5 Industrial and Municipal Wastewater Land Application Areas

Wastewater land application facilities generate nutrient-rich water called process water. Such facilities are among the few sources of nitrate regulated by DEQ. These facilities are required to obtain a wastewater reuse permit to apply wastewater to land. DEQ's regulatory waste discharge permit system requires land applicers to take the following steps:

- Schedule process water applications to meet crop nutrient and water needs.
- Develop management plans for irrigation and nutrient use.
- Develop water and nutrient budgets.
- Sample wastewater, ground water, soil, and crops as required by permit.
- Prepare reports on how activities are functioning and whether the process is meeting established goals.

6.6 Ground Water Recharge

Ground water recharge occurs naturally when standing water is allowed to seep into the ground. Depending on the specific conditions, recharge with contaminated water may adversely affect the ground water quality.

Managed ground water recharge takes place when water is pumped into a recharge basin or is injected into the ground in compliance with an IDWR permit.

6.7 Ground Water and Surface Water Interaction

The mutual influence and interaction between ground water and surface water quality are important considerations in evaluating sources of nitrate contamination. In some areas, ground water and surface water are hydraulically connected and combine to form a single water source. Thus, if degraded water quality exists in one, it may degrade the other as well.

6.8 Stormwater Disposal

As land development increases, so does the volume of concentrated stormwater runoff. A variety of contaminants, including nutrients, are contained in the runoff. However, nitrate is found in relatively low concentrations in most stormwater and has a low-to-moderate potential for contaminating ground water, either through surface percolation (the downward movement of water through soil and rocks) or through subsurface infiltration and injection practices (Pitt et al. 1994).

Stormwater management methods use ponds (retention, detention, evaporation, and infiltration), seepage beds, swales, or a combination. Practices infiltrating stormwater (i.e., allowing stormwater to enter the soil's surface) have the greatest potential to contribute nitrate to ground water.

Over the past 30 years, a number of local jurisdictions have implemented stormwater management functions at various levels of authority. These entities often require detention or retention of stormwater runoff during real estate development activities. In practice, jurisdictions requiring on-site control of stormwater flows after development activities are completed expect the runoff to be retained on site. This is due to few developments having access to drains, canals, or water bodies for off-site stormwater discharge.

In addition, federal stormwater regulations require some municipalities, construction sites greater than 1 acre, and certain types of industrial facilities to obtain permits from EPA to discharge stormwater. Even in some urban areas, NPDES permits are required for stormwater runoff. For more information on NPDES permit requirements, see EPA's website at yosemite.epa.gov/r10/water.nsf/Stormwater/stormwater+permits.

Federal regulations require municipalities to implement programs controlling runoff from new development and redevelopment areas.

6.9 Other Ground Water Contaminants

Although nitrate is a common and widespread contaminant in ground water within Gem County, other potential and major contaminant sources exist and are briefly discussed in this section. Also note there are several naturally occurring contaminants (metals) present in ground water within Gem County.

Regardless of the efforts that operators and regulators undertake to protect human health and the environment, releases still occur. Accidental spillage, leaking underground pipes, or improper handling of waste materials can all lead to ground water contamination.

6.9.1 Petroleum Sources

Often businesses, such as gas stations, store large quantities of petroleum in underground storage tanks (USTs). Gas tanks and/or piping leaks have the potential to leak benzene, ethyl benzene, toluene, xylenes, and naphthalene that can impact shallow ground water. DEQ conducts inspections of UST facilities on a regular basis to confirm current standards are being met and tanks are not leaking.

DEQ inspectors are required to visit each facility at least once every 3 years; however, leaks may still occur even with prevention systems in place. DEQ oversees petroleum release investigation and cleanup under the leaking underground storage tank (LUST) program. An overview of USTs and

LUSTs in Idaho is provided on DEQ's website at www.deq.idaho.gov/waste-mgmt-remediation/storage-tanks.aspx.

6.9.2 Hazardous Chemicals

Businesses in Gem County often use chemicals as part of their function or process. Several laws and regulations govern the purchase, transport, storage, use, and handling of these chemicals. Inspectors at DEQ regularly examine businesses using and storing chemicals considered to be hazardous and operations generating hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Their purpose is to confirm materials are handled properly and facilities are in compliance with hazardous waste rules and regulations. Some of these chemicals do enter the environment and are present in ground water. DEQ oversees chemical release investigation and cleanup activities under its ground water program, RCRA program, and/or remediation program. An overview of hazardous waste management in Idaho is provided on the DEQ website at www.deq.idaho.gov/waste-mgmt-remediation.aspx.

6.9.3 Mapping Ground Water and Drinking Water Contaminant Sources

EPA offers an online mapping application for several of the federally regulated programs in Idaho affecting ground water and drinking water.

The EPA-managed MyEnvironment search application is designed to map a cross section of environmental information based on the user's location. Information includes, but is not limited to, the following:

- Toxic releases and hazardous waste sites (TOXMAP).
- Superfund information links.
- Brownfields Program information links.
- Hazardous waste information links.
- Cleanups in my community map.
- USGS streamflow levels data for stream gauges.
- Water conditions for local water bodies based on EPA Water Quality and Impaired Stream data.
- EPA local drinking water provider and community water system information from the Safe Drinking Water Information System.
- Water quality monitoring activities—Provides the ability to identify monitoring stations in your neighborhood by the pollutants they measure.
- New and expiring facility permits in my area—This feature reports new and expiring permits (from EPA's Integrated Compliance Information System database) given to facilities that emit pollutants to water in your neighborhood.
- Watershed—This feature shows your area's watershed and connects you to EPA's Surf Your Watershed website, which provides a variety of links to citizen-based groups at work in your watershed, water quality data, and more.
- Fish advisories per area.

To get started, visit www.epa.gov/myenvironment/ and enter your location.

If you are interested in other online mapping tools, see Tab 4 and or Tab 9 for links to interactive map-based sources of information on ground water quality.

7 Gem County Water Quality Activity Overview and Accomplishments

Table 7-1 gives an overview of completed water quality activities and accomplishments in Gem County.

Table 7-1. Overview of activities completed to improve ground water quality in Gem County.

Drinking Water Systems and Wells	
Number of active public water systems in Gem County as of 2009	27
Number of Gem County well permits issued by Idaho Department of Water Resources since January 1950	3,807
Drinking Water Source Protection Plans	
City of Emmett	2010
Gem County Grant Awards for Water Quality Projects	
§319^a Grant Awards: Nonpoint Source Implementation for Surface Water and Ground Water Source Water Protection Awards: Protection for Sources of Public Drinking Water	
2003 S098 Lower Payette River TMDL Implementation Phase I	\$211,320
2004 S110 Gem County Storm Water Management Demonstration	\$61,480
2006 S177 Lower Payette River TMDL Implementation Phase II	\$234,793
2009 S327 Lower Payette River TMDL Implementation Phase III	\$183,162
2012 S452 City of Emmett Well Decommissioning	\$10,000
Total grant funds since 2005	\$700,755
Surface Water Pollutant Load Allocations (TMDL)	
Lower Payette River (17050122)	TMDL 2000; 5-year review 2010
Bissell Creek	2003
Big Willow Creek	2008
Little Willow Creek	2013
Payette River, North Fork Subbasin (17050122)	TMDL 2005; 5-year review 2012
Lower Boise River (17050114)	TMDL 2000; TMDL addendum 2008; 5-year review 2009
Lake Lowell	2010

Note: total maximum daily load (TMDL)

a. Refers to §319 of the federal Clean Water Act.

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8 General Strategies For Improving Ground Water Quality

The general and regional management strategies provided in this section address nitrate in ground water and offer suggestions to maintain or improve ground water quality in each NPA. These same strategies will also serve to protect and preserve shared ground water and drinking water resources throughout Gem County.

The implementation of these strategies is voluntary and based on the premise that citizens of Gem County want to manage their activities to limit potential impacts on their ground water resource. Along with participating entities, state and federal agencies will periodically evaluate the progress and success of these strategies in reducing nitrate levels in each NPA.

The goals of these strategies are as follows:

- Reduce nitrate contamination in each NPA to protect public health.
- Improve ground water quality in Gem County to an extent that warrants removing the NPAs from the statewide nitrate priority list.
- Protect and preserve the ground water and drinking water resources in the county.

The proposed objectives to support achieving these goals are as follows:

- Make resources available to local governments to assist their decision-making processes.
- Educate the public about health risks associated with drinking water containing high nitrate levels and promote testing of private wells for nitrate concentrations.
- Educate the public about sources of nitrate in ground water to promote prevention, protection, and remediation efforts in maintaining and improving water quality.
- Implement agricultural, industrial, and residential BMPs to reduce nitrate loading of the ground water, thereby improving ground water quality.

Plan development would include the following:

- Gather a team of government and local advocates.
- Seek opportunities to hold education and outreach events.
- Attain grant funding if local communities show interest.

For each implementing agency, there is a table of action items (Table 8-1 through Table 8-9) including general time frames for completing each item. Detailed information regarding the agencies and the resources they offer is found under Tab 11, “Agencies, Regulatory Directories, and Website Resources.”

Table 8-1. Idaho Department of Environmental Quality implementation tasks for Gem County nitrate priority areas.

Action Item	Time Frame
Facilitation and Reporting	
Report implementation updates at Interagency Ground Water Protection Committee meetings (see the Idaho Ground Water Protection Interagency Cooperative Agreement [DEQ 2008])	As necessary
Post summary reports and revised plan on DEQ website.	As necessary
Work with county commissioners and other local officials to evaluate adequacy of local zoning and land use planning initiatives.	As requested
General Information and Education	
Provide copies of the final <i>Gem County Ground Water Quality Improvement and Drinking Water Source Protection Plan</i> and any future updates to local decision makers, including Gem County commissioners, the Gem County growth and development office, city planning and zoning office, and Gem Soil and Water Conservation District. Post plan and revisions on DEQ's website.	As needed
Work with communities to promote proper fertilizer application in parks, cemeteries, schools, and golf courses.	Ongoing
Make the final plan available to public via DEQ's website.	Ongoing
Grant Oversight	
Award and oversee §319 Clean Water Act grant project funding and source water protection grant projects.	Annually
Public Drinking Water Systems	
Review and approve all plan and specification submittals for engineering design of new public water supplies.	As needed
Prepare source water assessments for all new public water supplies.	As needed
Coauthor or write, review, and certify drinking water source protection plans for public water systems (PWSs).	As requested
Require and review PWS monitoring data to confirm drinking water complies with all state and federal maximum contaminant levels.	Frequencies vary

Action Item	Time Frame
Use sanitary survey inspections to familiarize PWSs with source delineation information, provide an opportunity for PWSs to update their potential contaminant inventory, disseminate relevant outreach and education materials, and solicit involvement in the state's drinking water protection certification program.	As needed
Monitoring	
Compile regional water quality data. With input from other agencies and the public, adjust boundaries of the Gem County nitrate priority area as appropriate.	2008; approximately every 5 years thereafter
Conduct coordinated ground water monitoring as needed to better characterize nitrate concentrations and trends, identify the vertical extent of contamination, and/or identify the presence of nitrate contamination within and outside of the nitrate priority area boundaries.	Regularly
Within a regional context, assess whether a ground water quality monitoring project is warranted and whether funding is available.	Second quarter of each year

Table 8-2. Southwest District Health Department implementation tasks for Gem County nitrate priority areas.

Action Item	Time Frame
Septic Systems	
Provide information about treatment system options and septic system maintenance at public locations in cities that are in or near nitrate priority areas and at the Gem County courthouse.	Ongoing
Continue with the review and permitting of all new, expanded, and replacement septic systems.	As requested
Inspect existing septic systems when new homes or home extensions are added.	As needed
Private Water Supply Wells and Public Health	
Provide information regarding the responsibilities of being a private well owner/user at public locations in cities in or near nitrate priority areas and at Gem County offices. Include information and resources for understanding proper well location with respect to potential sources of contamination, installation procedures, and wellhead maintenance.	Ongoing
Provide information about the health effects of nitrate at public locations in cities that are in or near nitrate priority areas and at Gem County offices.	Ongoing
Promote regular testing of private wells to determine if any contamination is present.	Ongoing
Provide sample bottles and information about analytical laboratories for testing of private wells.	As requested

Table 8-3. Local conservation districts with the assistance of Idaho Association of Soil Conservation Districts and Idaho Soil and Water Conservation Commission implementation tasks for Gem County nitrate priority areas.

Action Item	Time Frame
Public Awareness, Education, and Outreach	
Prepare an information and education plan that includes timelines, public service announcements, brochures, mailings, demonstrations, and tours.	Ongoing
Contact producers to inform them of the following: –Water quality goals and objectives for projects implemented –Potential agricultural impacts of nitrate contamination in ground water –Benefits of proper nutrient management plan (NMP) –Irrigation water management (IWM) benefits –Details on incentive programs –Information and education programs	Ongoing
Conduct IWM outreach: –Conduct irrigation workshops. –Make soil moisture monitoring equipment available to producers interested in optimizing their irrigation applications. –Encourage sprinkler irrigators to take advantage of the Idaho Power Energy Efficiency for Agricultural Irrigation program.	As requested
Identify additional high-priority landowners and offer them information on the benefits of implementing NMP and IWM, using data and outputs compiled over the course of the project.	Ongoing
Work with communities to promote proper fertilizer application in parks, cemeteries, schools, and golf courses.	Ongoing
Work with county commissioners and other local officials to evaluate adequacy of local zoning and land use planning initiatives.	As requested
Provide information and training to private landowners who accept manure or compost from animal feeding operations for use as fertilizer.	Ongoing
Develop and distribute the following information and training: –Identify target audience. –Create informational brochures, flyers, or pamphlets as guidance for proper storage and application methods. –In coordination with the University of Idaho Extension and other interested groups, develop seminar and presentation materials for workshops. –Disseminate information to the target audience through mailings, workshops, or other means as appropriate.	Ongoing

Action Item	Time Frame
Best Management Practices—Program Planning	
Submit a §319 Clean Water Act grant application to fund implementation of best management practices (BMPs) as outlined in the district’s 5-year plan.	As appropriate
<p>Establish a steering committee of Gem Soil and Water Conservation District members and staff from IASCD, ISWC, DEQ, ISDA, and NRCS to develop a project plan that will include the following:</p> <ul style="list-style-type: none"> –Criteria for prioritizing activities in the nitrate priority areas for NMP, IWM, and total maximum daily loads (TMDLs) –Contracting procedures for NMP –Estimating incentives to be offered and methods of distribution –Monitoring and evaluation of BMP effectiveness –Information and education outreach options and methods to be used 	As appropriate
<p>Prepare a work plan that includes the following components:</p> <ul style="list-style-type: none"> –Develop a producer contact list for project information and education. –Prepare a written conservation plan and contract for NMP development and implementation (NMP services to include soil sampling, analysis, and planning for crops with cost share). –Educate landowners on IWM and installation and monitoring of water sensors. –Track load reductions. –Deliver project findings reports to DEQ biannually. –Provide an educational campaign to major producers and other landowners. –Evaluate unregulated manure storage sites to identify risk to ground water supplies. –Develop remediation plans and implement BMPs, including evaluation of agronomic application rates. 	As appropriate
NMP, IWM, and BMP Implementation and Evaluation	
<p>Implement NMPs:</p> <ul style="list-style-type: none"> –Identify and focus on high-priority or critical areas. –Review water quality monitoring reports and data from other agencies. –Contact critical landowners. –Develop and conduct NMPs. –Follow-up with producers to review and evaluate NMPs. –Compile general (nonproducer-specific) information in report to DEQ. 	Ongoing
<p>IWM evaluations:</p> <ul style="list-style-type: none"> –Identify fields to evaluate. –Install soil moisture equipment. –Analyze data. –Report findings to producers. –Compile general (nonproducer-specific) information in report to DEQ. 	Ongoing

Action Item	Time Frame
Implement BMP effectiveness evaluation program: –Analyze soil sampling data and fertilizer receipts to determine compliance with NMPs. –Analyze soil moisture sensor data to evaluate irrigation management recommendations. –Review ground water quality results for samples collected within all nitrate priority areas identified in Gem County.	Fourth quarter of each year
Perform Biannual Reviews and Prepare §319 Clean Water Act Grant Report for DEQ	
Conduct status review with each participant.	Annually
Prepare report with general information about activities and results conducted and submit to DEQ in a time frame that coincides with the invoice period (as required by DEQ).	As required
Prepare a work plan that includes the following components: –Develop a producer contact list for project information and education. –Prepare a written conservation plan and contract for NMP development and implementation (NMP services to include soil sampling, analysis, and planning for managing the amount, source, placement, form, and timing of the land application of nutrients and soil amendments for plant production).	Implementation schedule to be set after funding is obtained.

Notes: Idaho Association of Soil Conservation Districts (IASCD), Idaho Soil and Water Conservation Commission (ISWC), Idaho Department of Environmental Quality (DEQ), Idaho State Department of Agriculture (ISDA), and Natural Resources Conservation Service (NRCS)

Table 8-4. United States Department of Agriculture, Natural Resources Conservation Service implementation tasks for Gem County nitrate priority areas.

Action Item	Time Frame
Public Awareness, Education, and Outreach	
Coordinate with and support the Gem Soil and Water Conservation District information and education plan.	Ongoing
Provide timely announcements of all Farm Bill sign-ups and other funding opportunities for implementation of best management practices (BMPs) to address resource concerns.	Ongoing
Work with producers involved in Natural Resources Conservation Service (NRCS) programs and provide information on the following: –Water quality resource concerns on their lands –Potential impacts of nitrate contamination to ground water quality –Proper nutrient management –Irrigation water management (IWM) and the benefits of high-level IWM implementation –Use of conservation crop rotation and other practices to mitigate ground water quality impacts	Ongoing
Participate in community activities and meetings, providing technical assistance and information on BMPs to address ground water and surface water quality concerns.	Ongoing
Coordination with Conservation Partners	
Inform all conservation partners of the availability of special Environmental Quality Incentives Program (EQIP) funding (Agricultural Water Enhancing Program and Cooperative Conservation Partnership Initiative) to target specific resource concerns and areas of concern.	Ongoing
Work with the NRCS, State Ground Water Monitoring Technical Committee and the soil and water conservation districts to use ranking and other processes to help target special resource concerns (e.g., nitrate priority areas).	Ongoing
Participate in and coordinate with any special projects (e.g., §319 Clean Water Act projects) active in the county to help implement BMPs. Assist ISWC and soil and water conservation district, when requested, in evaluating program success through water quality modeling of estimated load reductions.	Depends on active projects
Participate as a member of the Idaho State Department of Agriculture, Agricultural Ground Water Committee and the Idaho Department of Environmental Quality, Ground Water Monitoring Technical Committee to stay abreast of current issues and inform partners of NRCS activities.	Ongoing

Action Item	Time Frame
Implementation of Conservation Practices	
<p>Use the existing field office work plan to accomplish the following:</p> <ul style="list-style-type: none"> –Provide information to producers on incentive programs, such as EQIP to implement BMPs. –Develop contracts with producers and assist with the implementing needed conservation practices that address resource concerns. –Use NRCS tools to track progress and results. 	Ongoing
<p>Contract with interested producers and provide technical assistance to implement conservation practices that address ground water and surface water quality protection and/or mitigation.</p>	Ongoing
<p>Include the following management practices:</p>	
<ul style="list-style-type: none"> –Irrigation water management –Nutrient management –Pest management –Conservation crop rotation –Residue management –Prescribed grazing 	
<p>Include the following structural practices and improved technologies:</p>	
<ul style="list-style-type: none"> –Upgrade irrigation systems and technologies to improve efficiency –Filter strips and riparian buffers –Sediment basins and pump-back systems –Waste management systems and manure management on animal feeding operations 	

Table 8-5. Idaho State Department of Agriculture implementation tasks for Gem County nitrate priority areas.

Action Item	Time Frame
Education and Outreach	
<p>Through the Idaho State Department of Agriculture, Agriculture Ground Water Coordination Committee, complete the following:</p> <ul style="list-style-type: none"> -Request that University of Idaho fertilizer application guides are reviewed and updated as needed. -Promote education and outreach regarding potential sources of nitrate. -Promote voluntary implementation of best management practices (BMPs). 	Ongoing
Work with communities to promote proper fertilizer application in parks, cemeteries, schools, and golf courses.	Ongoing
Work with county commissioners and other local officials to evaluate adequacy of local zoning and land use planning initiatives.	As requested
Water Supply Wells	
Promote use of Home*A*Syst as a tool to assess and change homeowner and farmstead activities that have the potential to contaminate drinking water wells.	Ongoing
Livestock Facility Waste Management	
Continue to require nutrient management plans (NMPs) at every licensed dairy and beef cattle feeding operation designated as a confined animal feeding operation (CAFO) (>1,000 head of animals) to help control runoff and infiltration of animal waste.	Ongoing
Identify all beef cattle feeding operations (<1,000 head of animals) that could be considered significant contributors of contaminants to waters of the state and work with the operators to properly manage waste and develop NMPs for their facilities.	Ongoing
Manure Storage and Application	
Continue to aid owners and operators in developing the required manure storage and application procedures in beef and dairy facility NMPs.	Ongoing
<p>Develop information and training for private landowners who accept manure or compost from animal feeding operations for use as fertilizer. Develop the following components:</p> <ul style="list-style-type: none"> -Identify target audience. -Create informational brochures, flyers, or pamphlets as guidance for proper storage and application methods. -In coordination with the University of Idaho Extension and other interested groups, develop seminar and presentation materials for workshops. -Disseminate information to the target audience through mailings, workshops, or other means, as appropriate. 	Ongoing

Action Item	Time Frame
Monitoring	
Collect samples annually for coliform bacteria and nitrate at licensed dairies.	Ongoing
Every 5 years, monitor dairy wells that have nitrate levels greater than 5 parts per million for nitrogen isotopes.	
Conduct ground water monitoring for pesticides in accordance with the Idaho Pesticide Management Plan and federal Insecticide, Fungicide and Rodenticide Act grant while coordinating with the Idaho Department of Environmental Quality and Idaho Department of Water Resources.	

Table 8-6. Idaho Department of Water Resources implementation tasks for Gem County nitrate priority areas.

Action Item	Time Frame
Information and Education	
Using the well permitting process, provide information to homeowners concerning the potential presence of nitrate in drinking water supplies.	Ongoing
Work with county commissioners and other local officials to evaluate the adequacy of local zoning and land use planning initiatives if requested.	As requested
Monitoring	
Through the Statewide Ambient Ground Water Quality Monitoring Program, conduct ground water monitoring to better characterize nitrate contamination, determine nitrate concentration trends, and identify the presence of nitrate contamination inside and outside the nitrate priority area boundaries.	Ongoing

Table 8-7. Confined animal feeding operation siting team implementation tasks for Gem County nitrate priority areas.

Action Item	Time Frame
The Idaho State Department of Agriculture (as team lead of Idaho's confined animal feeding operation [CAFOs] site advisory team), Idaho Department of Environmental Quality, and Idaho Department of Water Resources will continue to review sites proposed for CAFOs, determine environmental risks, and submit site-suitability determinations to counties.	As requested

Table 8-8. University of Idaho Extension implementation tasks for Gem County nitrate priority areas.

Action Item	Time Frame
Information and Education	
Provide education to all fertilizer users through University of Idaho Extension educators, workshops, website, and materials, such as newsletters and factsheets. Information should address proper irrigation and fertilizer application procedures, rates (based on University of Idaho Extension guidance), and timing, with consideration for crop up-take, migration of excess nitrates, and impacts to ground water.	Ongoing
Encourage ongoing outreach and provision of information by the University of Idaho Extension to small acreage operations and part-time agricultural operations (hobby farms).	Ongoing
Distribute University of Idaho Extension publications to homeowners in priority areas through mass mailings or through distribution by local retailers and develop new publications as needed. Educational materials should address fertilizer and pesticide application rates and impacts to ground water.	Ongoing
Promote demonstration projects and disseminate results.	Ongoing

Table 8-9. Municipalities implementation tasks for Gem County nitrate priority areas.

Action Item	Time Frame
Ground Water Quality Protection	
<p>“Environmental Quality—Health” (Idaho Code §39-1) states, “Cities, counties and other political subdivisions of the state shall incorporate the ground water quality protection plan in their programs and are also authorized and encouraged to implement ground water quality protection policies within their respective jurisdictions...” (Idaho Code §39-126, available on the Internet at legislature.idaho.gov/idstat/Title39/T39CH1SECT39-126.htm).</p>	As appropriate
Education and Outreach	
<p>Work with residents, landscape contractors, cemeteries, and schools within jurisdiction to promote proper fertilizer application.</p>	Ongoing
<p>Work with DEQ, ISDA, IDWR, IASCD, ISWC, other agencies, and local governments to gather their input on local zoning, plans, and ordinances.</p>	As needed
Comprehensive Planning	
<p>“Local Land Use Planning” (Idaho Code §67-65) states that “When considering amending, repealing, or adopting a comprehensive plan, the local governing board shall consider the effect the proposed amendment, repeal, or adoption of the comprehensive plan would have on the source, quantity and quality of ground water in the area” (Idaho Code §67-6537, available on the Internet at legislature.idaho.gov/idstat/Title67/T67CH65SECT67-6537.htm).</p>	As appropriate
<p>Review and consider maps of watersheds, aquifer recharge areas, ground water basins, and unique water resource conditions to accurately determine the potential impacts of development on water quality and water resources in areas of interest.</p>	
<p>Identify existing and potential water pollution sources (landfills; chemical storage sites; abandoned commercial, industrial, and mine properties; and agricultural nonpoint sources) when considering land use changes.</p>	
<p>Identify appropriate land uses in areas of sensitive water resources.</p>	
Ordinance Development	
<p>Develop ordinances that support the comprehensive plan and ground water and drinking water resource protection.</p>	As appropriate
<p>Consider a requirement for additional studies to assess impacts to ground water quantity and/or quality due to development activities and changes in land use.</p>	

Action Item	Time Frame
Planning and Zoning Decisions	
Consider potential impacts to water quality when evaluating land use changes.	As appropriate
Use the CAFO siting team to review sites proposed for CAFOs and determine environmental risks.	
Consider the harmful impacts that may occur to ground water resources before approving the following: –Fertilizer manufacturing and/or distribution centers –Commercial endeavors that use large volumes of liquids in aboveground and belowground tanks –Placement and/or expansion of CAFOs or animal feeding operations –Subdivision development; specifically residential densities using individual wells and septic systems	
Work with the Association of Idaho Cities and Idaho Association of Counties as necessary and appropriate.	Ongoing and as appropriate

Notes: Idaho Department of Environmental Quality (DEQ), Idaho State Department of Agriculture (ISDA), Idaho Department of Water Resources (IDWR), Idaho Association of Soil Conservation Districts (IASCD), and Idaho Soil and Water Conservation Commission (ISWC); confined animal feeding operation (CAFO)

9 Drinking Water Source Protection

PWSs can be publicly or privately owned and serve many Idahoans. A PWS is defined as an operation serving at least 25 people or 15 service connections for at least 60 days per year. Many citizens get their drinking water from private wells that are not regulated under the Safe Drinking Water Act. As such, private well owners are responsible for ensuring their water is safe to drink.

Over 95% of Idaho's drinking water comes from ground water. Protecting this resource is largely done through voluntary action where communities develop programs to help prevent drinking water supplies from being contaminated. These programs may involve creating a drinking water protection plan and implementing regulatory and/or nonregulatory management practices. Most human activities at the land surface cause some change in water quality in the aquifer below. Where ground water is the primary source of drinking water, a community should protect the physical area around the wellhead and the areas above which the well pumps water for drinking.

The maps in this section show Gem County PWSs and their source areas, known as delineations, or the portions of the watershed or subsurface area contributing ground water to wells. Figure 9-1 depicts the delineations for all of Gem County. Figure 9-2 depicts the delineations for southern Gem County and the Emmett North Bench NPA. Figure 9-3 provides a county view of domestic and PWS wellheads. Each well can act as a conduit for ground water contamination. The maps in this section are provided as a reference tool when making land use decisions that may affect ground water and/or drinking water quality in Gem County.

Preventing ground water contamination requires thoughtful management and cooperation on the part of citizens and the various levels of government. In many cases, land use planning efforts by both city and county governments are the best instruments available for protecting aquifers. If potential contamination sources are prevented from being located over critical recharge areas, the risk of contamination can be greatly reduced.

DEQ sees great potential to protect public health and preserve and protect Idaho's drinking water by providing community leaders a county-wide mapping application that depict drinking water capture zones and delineations. These maps should be considered as land use decisions are made.

For interactive map-based sources of information on ground water quality and for areas where nitrate concentrations potentially degrade drinking water quality, visit <http://mapcase.deq.idaho.gov/npa>.

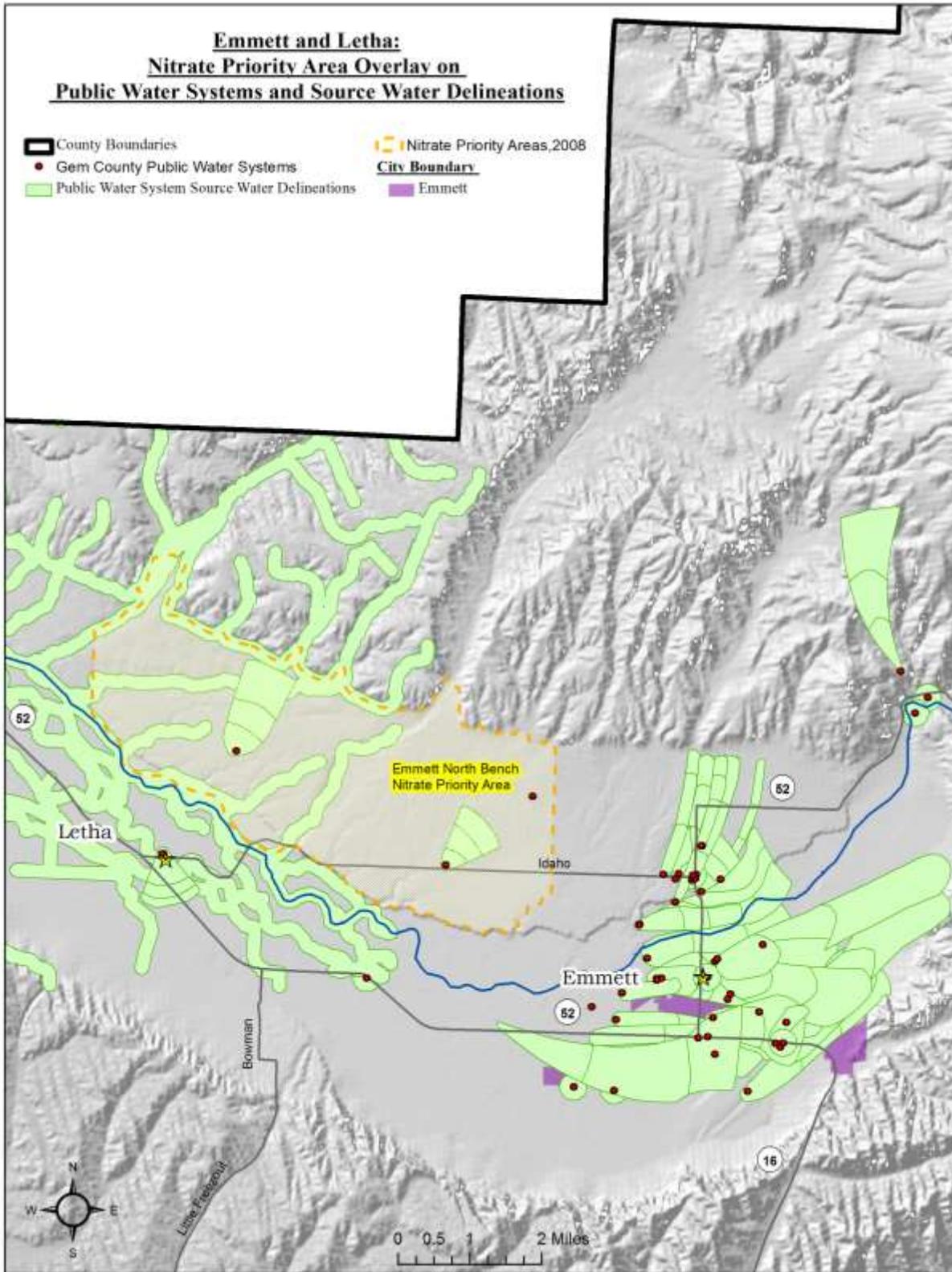


Figure 9-2. Public water system source areas relating to Emmett, Letha, and the Emmett North Bench nitrate priority area.

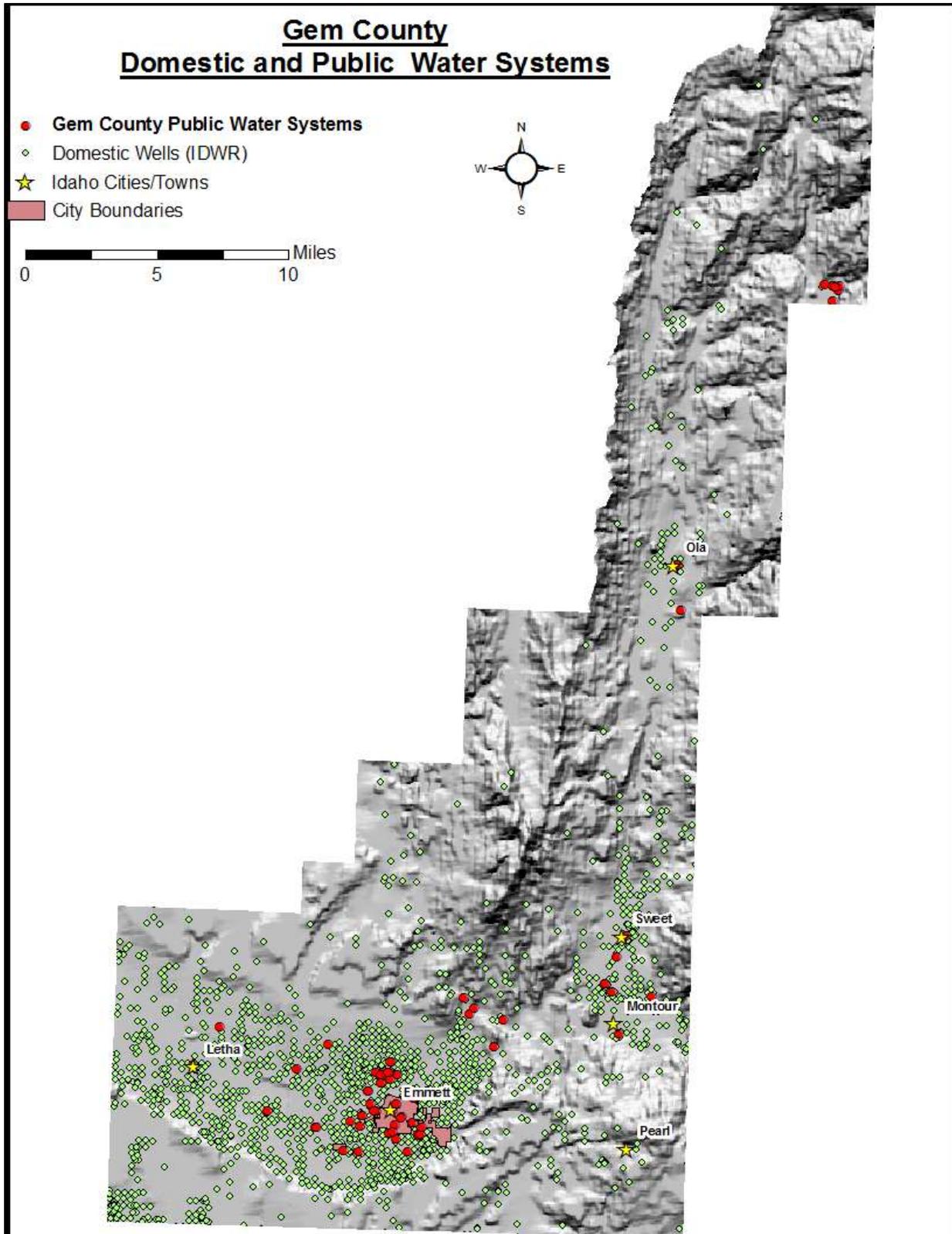


Figure 9-3. Gem County domestic and public water system wells.

10 Surface Water Total Maximum Daily Loads

This section is provided as a resource for making land use decisions to protect surface water quality and to use as supporting documentation for funding requests about projects related to ground water and surface water quality.

Ground water and surface water are interrelated (Figure 10-1). Ground water is surface water (i.e., lakes, rivers, streams, or overland flow) that has percolated into and through the ground to an aquifer (the porous sediment or fractured rock below the water table). Ground water may move back into surface water bodies through seeps, springs, or base flow into a river or lake, depending on the geology of an area.

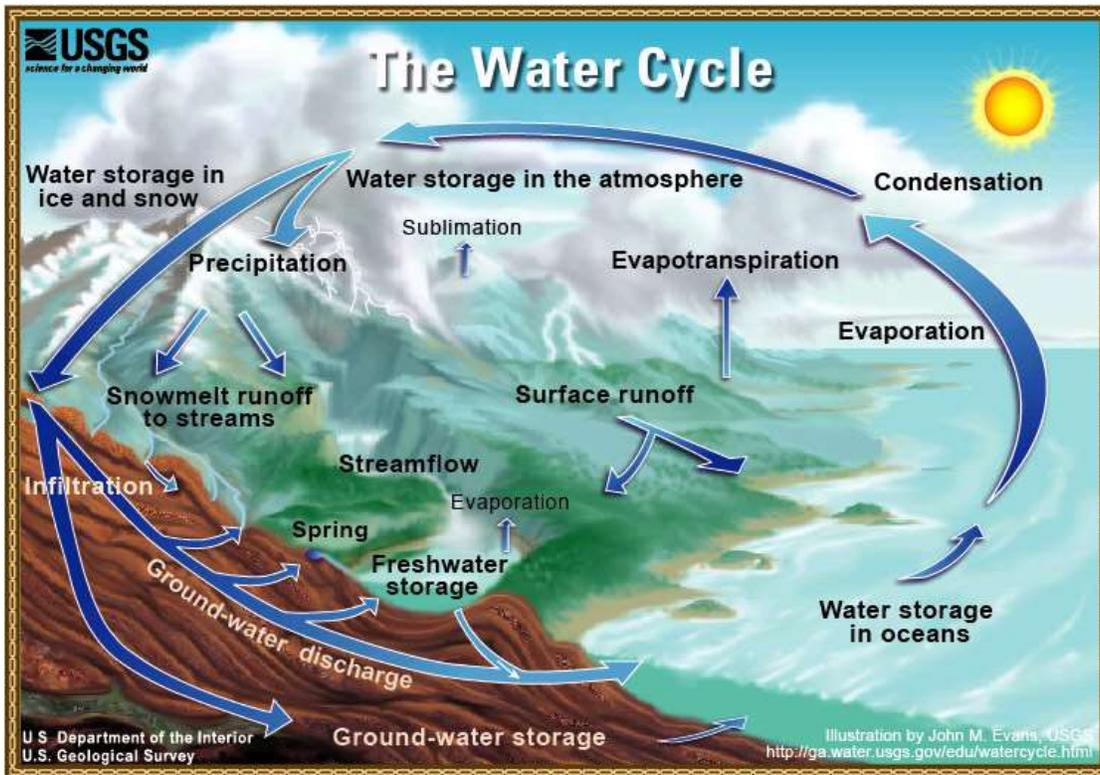


Figure 10-1. Interaction between ground water and surface water.

Many management practices known to protect ground water quality are also used to prevent nonpoint source surface water pollution. Unlike point sources, which are directly related to a specific source or facility, nonpoint sources are generally related to activities taking place at multiple locations throughout a watershed or large-scale activities. Nonpoint source pollution is the cumulative effect of activities such as fertilizer use, pesticide use whether for home or agriculture, oil disposed down storm drains, and various land use practices including urban development, agriculture, mining, and forestry. For these reasons, modifying land use activities can reduce and control nonpoint source pollution. Due to Idaho's rural nature, most water pollution in the state is related to nonpoint sources.

To restore degraded surface waters in the state, Idaho (DEQ specifically) must develop water quality management plans for its various water bodies. These are called subbasin assessments and total

maximum daily loads (TMDLs). The TMDL provides a pollution budget written for point and nonpoint sources of pollution for that surface water body. It includes a calculation of the maximum amount of a pollutant a water body can receive from human-caused sources and still meet water quality standards. The pollution budget is expressed in terms of load: the amount of pollutant added to a water body during a given time or per a given volume of water.

There are a number of watersheds (drainage areas) within the county boundary. Each watershed is a basin or subbasin, depending on scale, and each may be subject to a TMDL.

To learn more about the quality of the surface water bodies in Gem County, Figure 10-2 provides a point of reference.

Information regarding the beneficial use support status and causes of impairment to a surface water can be found using the hydrologic unit code (HUC) number/name, or water body name.

To see an interactive, map-based source of information on the water quality of lakes, rivers, and streams in Idaho, including the Clean Water Act §303(d) listed water bodies, visit mapcase.deq.idaho.gov/wq2010/.

To see TMDL documents for the impaired waters in Gem County, visit the DEQ website at www.deq.idaho.gov/water-quality/surface-water/tmdls/table-of-sbas-tmdls.aspx.

An overview of the TMDL process is found at www.deq.idaho.gov/water-quality/surface-water/tmdls.aspx.

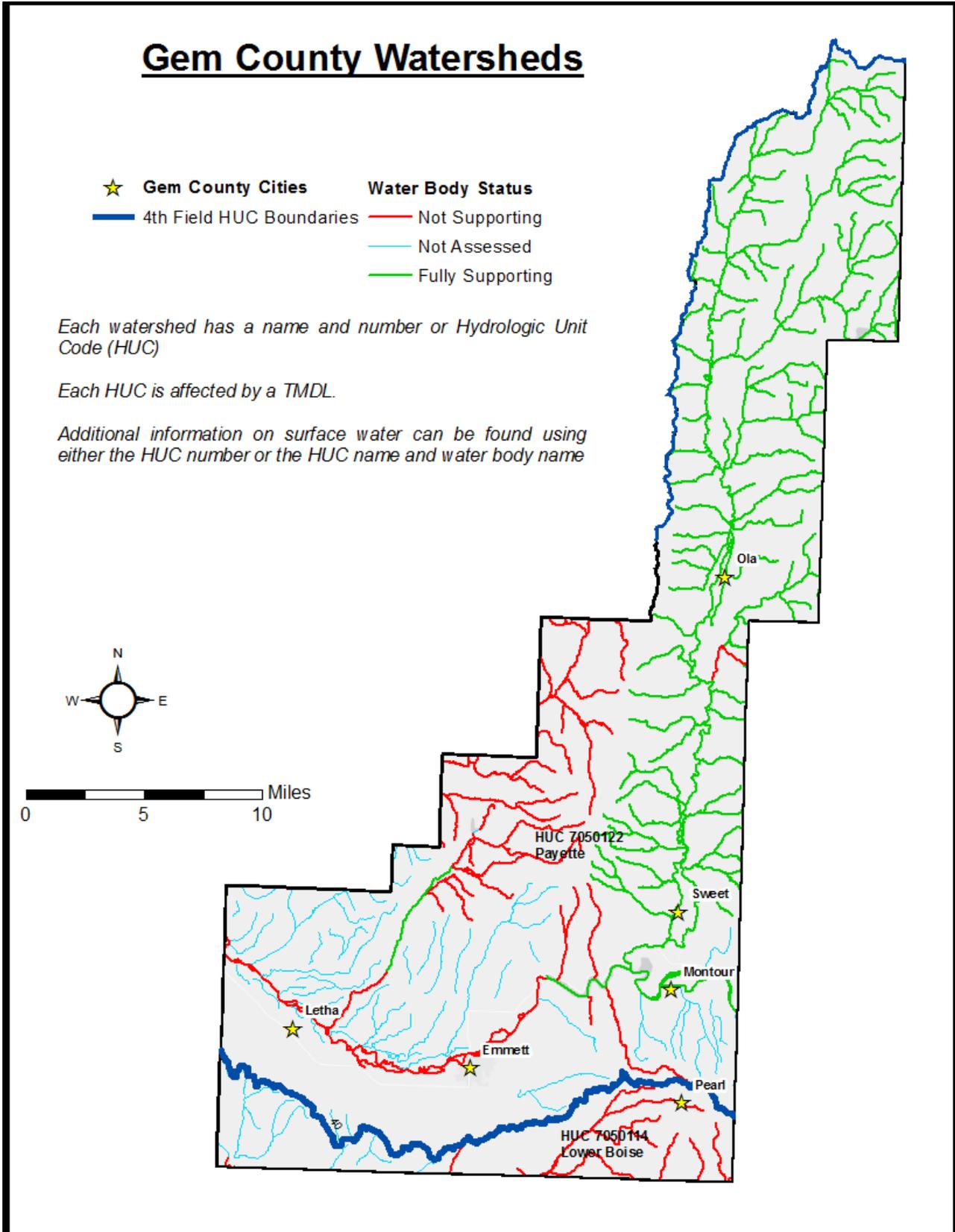


Figure 10-2. Gem County watersheds.

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11 Agencies, Directories, and Website Resources

Table 11-1 lists entities that can assist in ground water quality management and/or drinking water protection. Additional information and resources can be found in section 11.1.

Table 11-1. Resources and authorities for ground water quality management in Idaho.

Resource	Phone Number and Website
Gem Soil and Water Conservation District –Nutrient and irrigation water management plans –Grant opportunities –Technical assistance –Restoration and urban conservation	(208) 365-4212 swc.idaho.gov
Idaho Soil and Water Conservation Commission –Technical assistance to owners/operators of private lands for planning, implementing, and evaluating agricultural best management practices –Nutrient and irrigation water management plans	(208) 332-1790 swc.idaho.gov
Idaho State Department of Agriculture –Beef and dairy animal feeding operations –Confined animal feeding operation (CAFO) siting team –Pesticides	(208) 332-8500 www.agri.idaho.gov
Idaho Home Assessment System –Fertilizer storage, application, and handling –Animal waste –Lawn and garden management –Well condition assessment tools	(208) 332-8603 http://homeasyst.idahoag.us/
Idaho Department of Water Resources –Well construction, permits, underground injection –Water rights –Hydrogeologic studies	(208) 287-4800 www.idwr.idaho.gov
Natural Resources Conservation Service Technical assistance to implement conservation practices for erosion control and water quality	(208) 378-5700 www.id.nrcs.usda.gov/
Idaho Department of Environmental Quality –Ground water quality –Nutrient-pathogen studies –Public drinking water systems –Source water protection –CAFO siting team –CAFOs for swine, poultry, horses, sheep, mink, and deer –Wastewater permitting, large soil absorption systems, land application	(208) 373-0550 www.deq.idaho.gov

Resource	Phone Number and Website
Southwest District Health Department –Septic tanks and drainfields –Subdivision sanitary restrictions –Noncommunity drinking water systems –Smaller community drinking water systems –Private well owner assistance with water quality sampling	(208) 365-6371 (Emmett Office) www.publichealthidaho.com/
Idaho Water Resources Research Institute –Project WET –Outreach and training materials on water issues for teachers	(208) 332-4422 www.projectwet.org http://www.uidaho.edu/research/iwrrri/outreach/teachereducation
University of Idaho Extension—Gem County –Agricultural research results –Education and outreach for the general public	(208) 365-6363 www.extension.uidaho.edu/gem/
University of Idaho Animal and Veterinary Science Department Water quality effects on animal health	(208) 885-6345 www.uidaho.edu/cal/avs
Idaho Rural Water Association Training and technical assistance for water and wastewater systems	(800) 962-3257 or (208) 343-7001 https://irwa.sharepoint.com/Pages/default.aspx
Association of Idaho Cities Ordinance development assistance	(208) 344-8594 www.idahocities.org

11.1 Regulatory Directory and Website Resources

The following is not intended as a source of regulatory guidance but is provided to direct readers to proper agencies.

11.1.1 Idaho Department of Environmental Quality

DEQ is responsible for protecting the quality of ground water in Idaho and relies on a combination of programs to protect ground water from pollution, clean up degraded ground water, and monitor and assess ground water quality. DEQ’s ground water policy is to maintain and protect the existing high quality of Idaho’s ground water and restore degraded ground water, where feasible. DEQ has identified areas, known as NPAs, where ground water quality has been degraded. DEQ conducts source water assessments to help PWSs understand potential threats to their public water supplies, and approves and regulates PWSs and wastewater systems. DEQ Ground Water Program staff in the state office can be contacted at (208) 373-0502. Ground Water Program staff in DEQ’s Boise Regional Office can be contacted at (208) 373-0550.

See the DEQ web pages listed below for more information:

- Ground water information specific to nitrate contamination
<http://www.deq.idaho.gov/water-quality/ground-water/nitrate.aspx>
- Information on private, domestic drinking water
<http://www.deq.idaho.gov/water-quality/ground-water/private-wells.aspx>
- Drinking water protection information
<http://www.deq.idaho.gov/water-quality/source-water/protection.aspx>
- Information regarding source water assessments of public drinking water systems
<http://www.deq.idaho.gov/water-quality/source-water/assessments.aspx>
- Information on source water protection grants (when available)
<http://www.deq.idaho.gov/water-quality/grants-loans/source-water-protection-grants.aspx>
- Information regarding the operation of swine and poultry facilities
<http://www.deq.idaho.gov/water-quality/wastewater/cafos.aspx>
- Information on nutrient pathogen studies for septic tank effluent evaluations
<http://www.deq.idaho.gov/water-quality/wastewater/septic-systems/nutrient-pathogen-evaluations.aspx>
- Information on design of septic systems
<http://www.deq.idaho.gov/water-quality/wastewater/septic-systems/technical-guidance-manual.aspx>
- 2010 interactive map of §305(b) Integrated Report
<http://mapcase.deq.idaho.gov/wq2010/>

11.1.2 Idaho State Department of Agriculture

ISDA serves the agriculture industry and consumers through regulatory and service activities. ISDA safeguards the public, plants, animals, and environment through promotion, education, and regulation. ISDA is responsible for dairy and feedlot permitting and monitoring, pesticide management and monitoring, agricultural chemical regulation, and nutrient management. ISDA staff can be contacted at (208) 332-8500.

ISDA programs affecting ground water quality are described below:

- The Nutrient Management Program is designed to minimize adverse impacts on surface or ground water. Managing nutrients is a priority to protect agriculture's economic viability and the environment. For more information, visit www.idahoag.us/Categories/Environment/nmp/indexnmp.php. The ISDA Division of Animal Industries can be reached at (208) 332-8540. Additional CAFO information is found at www.idahoag.us/Categories/Animals/cattleFeedlots/indexcattlefeedlots.php.
- Authority to regulate siting of CAFOs in Idaho rests with the counties. County ordinances can regulate CAFO zoning and contain environmental protection clauses and rules about waste removal. Counties can request an environmental risk assessment for site suitability. CAFO siting information is available at www.idahoag.us/Categories/Environment/CAFOsiting/indexsitingTeam.php. ISDA Dairy & Eggs can be reached at (208) 332-8550. Additional dairy information is found at www.idahoag.us/Categories/Animals/Dairy/indexdairyMain.php.

- The Agricultural Water Quality Program implements monitoring and protection programs related to pesticides with public and private partners to protect ground and surface water quality. The ISDA Water Quality Program staff can be reached at (208) 332-8597. For more information, visit www.idahoag.us/Categories/Environment/water/indexwater.php.
- The Division of Agricultural Resources works to promote, direct, and ensure safe agricultural and environmental practices. Through education and enforcement, the division ensures compliance with federal and state rules and laws governing pesticide use in Idaho. The ISDA Agricultural Resources program can be reached at (208) 332-8605. For more information, visit www.idahoag.us/Categories/Pesticides/indexPesticides.php.

11.1.3 Idaho Soil and Water Conservation Commission

ISWC's purpose is to provide support and service to Idaho's 51 soil and water conservation districts, encouraging the wise use and enhancement of soil, water, and related resources. Responsibilities of the ISWC include the following:

- Administer general funds appropriated by the Idaho Legislature to the districts for implementing resource conservation practices.
- Provide technical assistance personnel to the districts to administer water quality projects and conduct soil surveys.
- Participate in the National Cooperative Soil Survey program, a comprehensive effort to provide modern soil survey information on all nonfederal lands.
- Administer the Conservation Improvement Grants program.

ISWC staff can be contacted at (208) 332-1790. For more information, visit www.swc.idaho.gov.

11.1.4 Soil Conservation Districts

Soil conservation districts provide action at the local level to promote the wise and beneficial conservation of natural resources, with emphasis on soil and water. Idaho's soil conservation districts, ISWC, and NRCS have forged a unique local, state, and federal partnership to promote soil conservation. Water quality projects are administered locally by soil and water conservation districts. These projects address nonpoint source water quality problems coming from agricultural activities and encourage voluntary use of BMPs.

Soil conservation district offices and contact information are found at iascd.org/. TMDL field staff and field office locations can be found at <http://iascd.org/#/districtdivision-info/district-contact-info>.

Soil and water conservation district programs relating to ground water quality are described below:

- The Idaho Home Assessment System (Home*A*Syst) provides information on protecting drinking water. It is a cooperative project developed, coordinated, and supported by several state and federal agencies and organizations. The contact for Home*A*Syst can be reached at (208) 332-8603. Additional information about Home*A*Syst is found at homeasyst.idahoag.us/Water/indexHomeASyst.php.
- Idaho OnePlan (IASCD) provides data and tools to help growers develop a single conservation farm plan that can be preendorsed by various agencies, streamlining and simplifying the regulatory process that farmers face. Idaho OnePlan is a multiagency project to combine government regulations and current BMPs for agriculture into a single plan. OnePlan integrates

federal, state, and local regulations for nutrient, pest, and waste management; water quality and wetlands; air quality; financial assistance; endangered species; and petroleum storage tanks. The contact for Idaho OnePlan at the IASCD can be reached at (208) 888-1890, extension 102. Additional information about Idaho OnePlan can be found at www.oneplan.org.

11.1.5 Southwest District Health

The mission of Idaho's seven Public Health Districts is to prevent disease, disability, and premature death; promote healthy lifestyles; and protect the health and quality of the environment. Central and Southwest District Health Departments are responsible for small public water systems, nonpublic water systems, septic tank and sewage disposal rules for nonmunicipal systems, and approving permits for new and replacement septic systems.

SWDH is responsible for Adams, Canyon, Gem, Payette, Owyhee and Washington Counties. Additional information can be found at www.publichealthidaho.com/. Some of SWDH's responsibilities are described below:

- SWDH Environmental Health Services regulates subsurface sewage disposal systems in cooperation with DEQ. Developers/homeowners should contact SWDH to discuss applications and permitting requirements for subsurface sewage disposal system. Note that a subsurface sewage permit is usually a prerequisite to obtaining a building permit from the county. SWDH Environmental Health Services can be contacted at (208) 455-5400. Additional septic tank information is found at www.swdh.org/septic-systems.asp.
- SWDH Environmental Health Services is responsible for maintaining and releasing sanitary restrictions in force on all platted subdivisions (see Idaho Code §50-13 at legislature.idaho.gov/idstat/Title50/T50CH13.htm). SWDH may require a nutrient pathogen study, depending on the location of the subdivision, size of the lots, and density of dwellings. SWDH Environmental Health Services can be contacted at (208) 455-5400. Additional land development information is found at <http://www.swdh.org/land-development.asp>.
- Owners of private water supplies have the sole responsibility to maintain them and ensure safe potable water. The Private Water Program that SWDH administers provides education, technical assistance, and water sampling for a nominal fee. Private residents can choose to collect their own water samples as well. SWDH can provide guidance on what tests would be beneficial and what the results mean to public health. For more information, contact the SWDH Public Drinking Water Coordinator at (208) 455-5400, or visit their website at www.swdh.org/private-public-water.asp.
- SWDH has developed the following brochures related to ground water issues available at:
 - *Nitrate in Drinking Water*, available at www.swdh.org/pdf/Nitrate-Nitrite-in-Drinking-Water.pdf
 - *Well Water Safety: A Guide for Private Well Owners*, available at www.swdh.org/private-public-water.asp
 - *Disinfecting Domestic Wells*, available at www.swdh.org/PDF/Disinfecting-Domestic-Wells.pdf
 - *Hydrogen Sulfide in Drinking Water*, available at www.swdh.org/PDF/Hydrogen-Sulfide-in-Drinking-Water.pdf
 - *Arsenic in Drinking Water*, available at www.swdh.org/pdf/Arsenic-in-Drinking-Water.pdf

- The Idaho Department of Health and Welfare has a brochure for private well owners available at <http://idahodocs.contentdm.oclc.org/cdm/singleitem/collection/p15100coll7/id/239697/rec/1>.

11.1.6 Idaho Department of Water Resources

IDWR serves the people of Idaho and protects their welfare by ensuring water is conserved and available to sustain Idaho's economy, ecosystem, and the resulting quality of life. IDWR provides a variety of services for the public, such as water rights research, historical record reproduction of water rights, driller's reports, and dam safety inspections. IDWR issues permits for water wells and develops rules for well construction. IDWR is also responsible for the statewide monitoring of ground water quality. The IDWR State Office can be contacted at (208) 287-4800. The IDWR Western Regional Office, in Boise, can be contacted at (208) 334-2190. More information is available on the web pages listed below.

- Most private water supplies consist of a single well serving a single residence. IDWR regulates and permits all wells in Idaho. Well construction standards and permit applications are located at www.idwr.idaho.gov/watermanagement/wellinformation/default.htm.
- Water resource information is found at www.idwr.idaho.gov/.
- IDWR maintains an interactive mapping website with well construction and water quality information at www.idwr.idaho.gov/geographicinfo/mapserver/mapserver.htm.
- Statewide ground water quality data is found at <http://www.idwr.idaho.gov/GeographicInfo/MapServer/mapserver.htm>. Note: this site is periodically offline for data management.
- IDWR injection well information and requirements are at www.idwr.idaho.gov/watermanagement/wellinformation/injection/injection.htm.

11.1.7 Natural Resources Conservation Service

NRCS provides technical assistance to farmers, ranchers, and other private landowners, helping them implement conservation practices on their land. This includes providing information on soils, forestry management, pasture and hayland management, erosion control, and water quality. For NRCS field office programs and technical resources, contact (208) 378-5700. NRCS field office contact information by county and conservation district are available at <http://offices.sc.egov.usda.gov/locator/app>.

NRCS programs can be generally divided between financial assistance and technical assistance. Information about NRCS programs can be accessed at www.id.nrcs.usda.gov/programs/. More information on specific programs is given below:

- EQIP is a voluntary conservation program that allows some farmers to receive financial and technical assistance for conservation practices on agricultural land. For more information, visit www.nrcs.usda.gov/wps/portal/nrcs/main/id/programs/financial/eqip/.
- The Conservation Innovation Grants program is voluntary and is intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection, in conjunction with agricultural production. For more information, visit www.id.nrcs.usda.gov/programs/cig/index.html.

- The Cooperative Conservation Partnership Initiative provides financial and technical assistance for conservation practices on agricultural land. For more information, visit <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/ccpi/>.
- The Conservation Reserve Program provides financial and technical assistance to eligible farmers and ranchers to address soil, water, and natural resource concerns. For more information, visit <http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=crp>.
- The Conservation Technical Assistance Program provides technical assistance supported by science-based technology and tools to help people conserve, maintain, and improve their natural resources. For more information, visit www.nrcs.usda.gov/programs/cta/.
- Ecological Sciences/Technical Resources for water quality include the following:
 - Idaho Nutrient Transport Risk Assessment, a water quality risk assessment tool for conservation planning (2006), available at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/id/technical/?cid=nrcs144p2_046692.
 - Nitrogen Transport Risk Assessment (August 2005), available at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/id/technical/?cid=nrcs144p2_046692.
 - Nutrient management is found at www.id.nrcs.usda.gov/technical/nutrient_management.html.
 - Agronomy is found at www.id.nrcs.usda.gov/technical/agronomy.html.
 - Idaho soils program technical resources are found at www.id.nrcs.usda.gov/technical/soils/index.html.

11.1.8 University of Idaho Extension

Professionals with the University of Idaho Extension work with Idahoans to address agricultural, natural resource, youth, family, community, and environmental issues. Collaborative relationships with countless agencies, groups, and individuals make a vast array of innovative educational programs available to the state. Extension faculty are joined by several thousand volunteers and dozens of cooperating agencies, organizations, and businesses, both public and private, on local, state, and national levels.

In keeping with the land-grant mission, the University of Idaho Extension, Southern District provides lifelong education and serves the needs of adults and youth in the district. The Southern District encompasses 18 counties of southwestern and south-central Idaho. Agricultural enterprises include farming, ranching, and dairy. Tree fruit, seed, row crops, and forages are the main crops spanning the Boise, Payette, and Weiser River valleys. Cow-calf operations center in the rangeland areas of Owyhee, Washington, and Adams Counties. Dairies are located primarily in Ada and Canyon Counties. Extension education covers production, management, and marketing of these agricultural commodities, as well as natural resource conservation and development. The Southern District can be contacted at (208) 454-7674. A list of extension offices by county is available at <http://www.extension.uidaho.edu/find.asp>.

Dairy and beef producers can draw on University of Idaho Extension expertise to protect herds and operate more efficiently. The extension provides research-based, local information to help producers protect the environment and manage their animals. More information is found at www.extension.uidaho.edu/animals.asp.

The University of Idaho Extension provides timely and local research-based information to help growers control pests, market products, and find new varieties. More information can be obtained at www.extension.uidaho.edu/crops.asp.

11.1.9 Idaho Water Resource Research Institute, Project WET

IWRRI's Project WET provides educational materials, lesson plans for watershed protection, and teacher workshops to reach children and their parents. The program is implemented by the IWWRI. More information can be obtained at <http://www.uidaho.edu/research/iwrri/outreach/teachereducation> or www.projectwet.org.

11.1.10 General State of Idaho Contacts

For information about other state resources not found in this section, see Idaho's official website at www.accessidaho.org.

11.1.11 Idaho's Geospatial Data Clearinghouse

Downloadable geographic information systems data allow efficient processing of geospatial data into deliverable data and maps. Idaho's Geospatial Data Clearinghouse is available at <http://inside.uidaho.edu/>.

11.1.12 United States Environmental Protection Agency

EPA's **MyEnvironment** is a search application that allows the user to find environmental data for their area. It is available at www.epa.gov/myenvironment/.

12 Funding Sources

12.1 Section 104(b)(3) Tribal and State Wetland Protection Grant, United States Environmental Protection Agency

The Tribal and State Wetland Protection program, created by EPA in 1990 under the Clean Water Act §104(b)(3), provides financial assistance to state, tribal, and local government agencies to develop new wetland protection programs, or refine and improve existing programs. All projects must clearly demonstrate a direct link to improving an applicant's ability to protect, restore, or manage its wetland resources. More information is available www.epa.gov/owow/wetlands/initiative/.

12.2 Section 319 (h) Nonpoint Source Grants, United States Environmental Protection Agency/Idaho Department of Environmental Quality

The Nonpoint Source Management program provides financial assistance for implementing BMPs to abate nonpoint source pollution. DEQ manages the nonpoint source program. All projects must demonstrate the applicant's ability to abate nonpoint source pollution through the implementation of BMPs. More information is available at www.deq.idaho.gov/water-quality/grants-loans/nps-§319-subgrants.aspx.

12.3 Conservation Operations Program, Natural Resources Conservation Service

The Conservation Operations Program (CO-01) provides technical assistance to individuals and groups of landowners to establish a link between water quality and implementation of conservation practices. The NRCS technical assistance program provides farmers and ranchers with information and detailed plans needed to conserve their natural resources and improve water quality. More information on NRCS is available at www.nrcs.usda.gov/programs.

12.4 Conservation Technical Assistance, Natural Resources Conservation Service

The NRCS provides conservation technical assistance to private landowners, conservation districts, tribes, and other organizations. Conservation plan preparation and BMP implementation is the main form of technical assistance. Assistance includes interpreting soil, plant, water, and other physical conditions needed to determine the proper BMPs. The Conservation Technical Assistance program provides financial assistance in implementing BMPs described in the conservation plan. More information on NRCS is available at www.nrcs.usda.gov/programs.

12.5 Environmental Quality Incentives Program, Natural Resources Conservation Service

EQIP offers technical assistance and cost-share monies to landowners for establishing a 5- to 10-year conservation agreement for activities such as manure management, pest management, and erosion control. The program gives special consideration to contracts in those areas where agricultural improvements will help meet water quality objectives. More information is available at www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip.

12.6 Conservation Programs, Natural Resources Conservation Service

NRCS's natural resources conservation programs help people reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damage caused by floods and other natural disasters. Public benefits include enhanced natural resources that help sustain agricultural productivity and environmental quality while supporting continued economic development, recreation, and scenic beauty. More information is available at www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs.

Programs include, but are not limited to, the following:

- Conservation Technical Assistance Program and activities
- Environmental Improvement Programs
 - Agricultural Management Assistance
 - Cooperative Conservation Partnership Incentive
 - Environmental Quality Incentives Program (EQIP)
 - National Water Quality Initiative (NWQI)
 - Conservation Innovation Grants (CIG)
 - Wildlife Habitat Incentive Program (WHIP)

More information for programs specific to Idaho is available at www.id.nrcs.usda.gov/programs/.

12.7 Source Water Protection Grants, Idaho Department of Environmental Quality

DEQ's Source Water Protection Grants provide funding for projects to protect sources of public drinking water. Projects can take either a local or regional approach. Local projects will concentrate on protecting a specific community public water supply system, while regional protection activities will cover multiple systems and communities. Water treatment and water system operations and maintenance are not eligible activities. More information is available at <http://www.deq.idaho.gov/water-quality/grants-loans/source-water-protection-grants.aspx>.

12.8 Resource Conservation and Rangeland Loan Development Program, Idaho Soil and Water Conservation Commission

The Resource Conservation and Rangeland Loan Development Program provides grants for improving rangeland and riparian areas and loans for developing and implementing conservation improvements. More information is available at swc.idaho.gov/programs_services/rcrdp.html.

12.9 Financial Programs, Idaho Water Resource Board

The Idaho Water Resource Board Financial Program assists local governments, water and homeowner associations, nonprofit water companies, and canal and irrigation companies with funding for water system infrastructure projects. The types of projects that can be funded include public drinking water systems; irrigation systems; drainage or flood control; ground water recharge; and water project engineering, planning, and design. Funds are made available through loans, grants, bonds, and a revolving development account. More information is available at www.idwr.idaho.gov/waterboard/Financial%20program/financial.htm.

12.10 Aquifer Protection District, Local Initiative

“Aquifer Protection Districts” (Idaho Code §39-5) provides a mechanism for counties overlying sensitive resource aquifers to form an aquifer protection district. The purpose of such a district is to protect existing and potential ground water supplies and recharge areas, particularly those areas contributing to public water supplies. An aquifer protection district is created through an election. Once established, the district can raise revenue through fees charged to landowners benefitted by the availability of water from the aquifer protected by the district. This revenue ensures an area can pay for ongoing programs and services needed to protect the aquifer. The revenue can be used as matching funds to receive additional resources. Unfortunately, this legislation would need to be amended to include general resource aquifers before a county could pursue this option.

In 2006, Kootenai County voters approved the formation of the state’s first aquifer protection district established to ensure the county can continue to pay for services and programs necessary to prevent the contamination of drinking water. Those services include protecting source water, preventing spills by secondary containment and proper handling of hazardous materials, minimizing septic discharges, managing stormwater, monitoring ground water quality, and conducting education and outreach activities. More information on the Kootenai County Aquifer Protection District is available at www.phd1.idaho.gov/environmental/rathdrum/protectionprogram.cfm.

12.11 Embrace-A-Stream Program, Trout Unlimited

Trout Unlimited provides funding to landowners for small-scale stream restoration projects. These projects have significant involvement from Trout Unlimited volunteers. For more information, see www.tu.org.

12.12 Fish America Foundation

The Fish America Foundation provides matching funds for restoration projects entailing the improvement of sport fisheries. For more information, see www.fishamerica.org.

12.13 Pheasants Forever

Pheasants Forever can provide up to 100% cost-share for projects establishing, maintaining, or enhancing wildlife habitat for pheasant and other upland game. For more information, see www.pheasantsforever.org.

13 Planning Tools for Local Governments

The information presented in this section is specific to local government planning for protecting ground water and source water within their jurisdiction.

Local governments are encouraged to use the following tools during the planning, zoning, and permitting process to protect and improve ground water and source water in Gem County.

1. Review *Environmental Planning Tools and Techniques*.

This document is useful in protecting ground water by linking land use to water quality and is available on DEQ's website at www.deq.idaho.gov/media/458914-env_planning_tools_entire.pdf.

2. Review *Idaho Land Use Handbook : The Law of Planning, Zoning, and Property Rights in Idaho*.

This free handbook is available from Givens Pursley LLP. You must provide an e-mail address. www.givenspursley.com/Publications.aspx.

3. Use the checklists included at the end of this section.

- Use the Local Government Checklist for Individual Project Proposals when evaluating land use decisions and approving proposed projects within your jurisdiction.
- Use the Local Government Checklist for Addressing Source Water in Comprehensive Plan when reviewing county and municipal comprehensive plans to ensure source water protection has been addressed.

4. Consider using BMPs for projects that may affect ground water. BMP information is available from the following websites:

www.deq.idaho.gov/media/458917-compendium_report_2003_entire.pdf
www.oneplan.org/BMPs.asp

5. Use American Planning Association (APA) Policy Guides provided at the end of this section.

- APA Policy Guide for Water Resources Management, available at www.planning.org/policy/guides/adopted/waterresources.htm
- APA Policy Guide for Solid and Hazardous Waste Management, available at www.planning.org/policy/guides/adopted/wastemgmt.htm
- Additional APA policy guides are available at www.planning.org/policy/guides/index.htm

6. Review the following information and resources provided at the end of this section.

- *Advice Worth Drinking* brochure, available at http://wiki.epa.gov/watershed2/index.php/Source_Water_Collaborative
- *Your Water Your Decision* brochure, available at www.yourwateryourdecision.org/media/download/OfficialsGuideV14.pdf

7. Use geospatial and interactive mapping tools.

There are many sites for downloading and viewing geospatial information. Much of the available and downloadable data about other potential ground water contaminant sources is available through INSIDE Idaho. INSIDE Idaho is the official geospatial data clearinghouse for the state. It serves as a comprehensive geospatial data digital library, providing access to, and a context within which to use, geospatial data and information by, for, and about Idaho.

INSIDE Idaho and other data providers use a set of services allowing efficient processing of geospatial data into deliverable data and maps.

- These services are based on a number of web service models and protocols including REST, SOAP, KML, and OGC W*S and are broadly supported by a large number of products, including a desktop geographic information system.
- These services directly access data and map products without downloading individual data files.

There are a variety of ways to search the available data, but general categories include the following:

- Biota
- Climatology/meteorology/atmosphere
- Elevation
- Farming
- Health
- Inland waters
- Oceans
- Structure
- Boundaries
- Economy
- Environment
- Geoscientific information
- Imagery/base maps/earth cover
- Location
- Society
- Transportation

To get started, visit www.insideidaho.org/index.html. This website provides access to DEQ, IDWR, and state agency map products.

Local Government Checklist for Individual Project Proposals

- Does the project deplete ground water supplies or interfere substantially with ground water recharge so that there would be a net deficit in aquifer volume or a lowering of the local ground water level? For example, would the production rate of preexisting nearby wells drop to a level that would not support existing land uses or planned uses for which permits have been granted?

- Does the project discharge into the ground water?

- Does the project discharge any waste material into the ground from septic tanks or other sources, if any (for example: domestic sewage, industrial, agricultural, etc.)?

- Does the proposed project discharge any waste materials to surface waters?

- Does the project alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site?

- Does the project create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

- Does the project include measures to reduce or control surface, ground, and runoff water?

Local Government Checklist for Addressing Source Water in Comprehensive Plan

Water, General

- Make an inventory of water resources
- Map watersheds, aquifer recharge areas, ground water basins, unique water resources
- Analyze institutional arrangements and responsibilities for water management
- Assess adequacy of existing regulations to address water resources

Water Quality

- Assess the current and future quality of water resources
 - Perform ground water tests in the vicinity of landfills and hazardous materials dumps, ponds, tanks, and storage areas
- Assess the current and future quantity of water resources
 - Analysis of current and future water consumption
- Identify existing and potential water pollution sources
 - Inventory hazardous materials dumps, ponds, and storage sites
 - Identify proposed, existing, and abandoned sources of pollution
 - Identify existing nonpoint sources of contaminants
 - Identify existing contaminated sites
 - Identify existing ground water contamination
- Assess adequacy of regulations for
 - Use, storage, and disposal of hazardous materials
 - Control of point and nonpoint sources
 - Stormwater runoff

Assess Policy Direction Concerning

- Protection, use, and development of water resources
- Protection of watersheds and aquifer recharge areas
- Preservation of wetlands, wild rivers, and watersheds
- Prevention of contamination
- Identification of appropriate land uses in areas of sensitive water resources
- Actions necessary to maintain or improve water quantity and quality to meet projected needs
- Water conservation (ground and surface) and reuse
- Drought management and emergency contingency plans
- Direction for the establishment of local development standards that
 - Incorporate better site design
 - Use best management practices for managing impacts on water resources
 - Address the on-site prevention, retention, and treatment of stormwater runoff
- Financing strategies for needed improvements
- Private, nongovernment-owned/-operated water systems
- Implementation of policy direction

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14 Public Information and Outreach Materials

The brochures listed below and provided in this section involve ground water quality and are designed for the general public. The developing agency for each brochure is included, along with the website address for the brochure, if available.

- *Arsenic in Drinking Water* (SWDH)
www.swdh.org/pdf/Arsenic-in-Drinking-Water.pdf
- Assistance adopting or updating zoning or subdivision ordinances (Association of Idaho Cities)
www.idahocities.org/
- *Basic Information: Fluoride in Drinking Water* (DEQ)
www.deq.idaho.gov/media/520884-fluoride_brochure.pdf
- *Fertilizer and Pesticide Use at Home* (DEQ)
www.deq.idaho.gov/media/522676-fertilizer_pesticide.pdf
- *Homeowner's Guide to Septic Systems* (DEQ)
www.deq.idaho.gov/media/474190-septic_homeowners_guide.pdf
- *Idaho Private Well Owner Brochure* (Idaho Department of Health and Welfare)
www.phd7.idaho.gov/EH/Water/Forms/IDHWwellownerbrochure.pdf
- *Iron in Your Well Water* (SWDH)
healthandwelfare.idaho.gov/Portals/0/Health/EnvironmentalHealth/Iron_Labs_.pdf
- *It Will Never Be This Obvious: Four Steps to Well Water Safety* (Idaho Department of Health and Welfare)
www.healthandwelfare.idaho.gov/LinkClick.aspx?fileticket=VSJEz0yl5ck%3D&tabid=95&mid=948
- Laboratories certified for drinking water analyses (Idaho Department of Health and Welfare)
healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx
- *Standards for Land Development (CDHD)*
www.cdhd.idaho.gov/pdfs/eh/land_standards_development.pdf
- Nitrates
 - *Nitrate in Your Well Water*
healthandwelfare.idaho.gov/Portals/0/Health/EnvironmentalHealth/Nitrates_Labs_.pdf
 - *Nitrate in Idaho's Ground Water*
www.deq.idaho.gov/media/473065-nitrate_in_idahos_gw_english.pdf
 - *Nitrate in Idaho's Ground Water—Spanish*
www.deq.idaho.gov/media/473068-nitrate_in_idahos_gw__spanish.pdf
- *OnePlan: For Your Place, on Your Time* (IASCD)
www.oneplan.org/
- *Septic Systems and Drainfields: What You Need to Know*
www.deq.idaho.gov/media/657502-septic_systems_and_drainfields.pdf
- *Subsurface Sewage Disposal Application—SWDH*
www.swdh.org/pdf/Septic-Application.pdf

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15 Idaho Environmental Guide: A Resource for Local Governments

The *Idaho Environmental Guide* is a resource for local government officials to assist in managing a community's environmental responsibilities. Local government officials should consult this guide before approving projects to understand and consider impacts to air, water, and/or land potentially affecting the health, welfare, and sustainability of communities within their jurisdiction. The *Idaho Environmental Guide* is informational and should be used in strategic planning for environmental issues. This guide is not an all-encompassing summary of state and federal rules and regulations. The *Idaho Environmental Guide* can be accessed through DEQ's website at <http://www.deq.idaho.gov/media/654730-ieg-2012.pdf>.

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