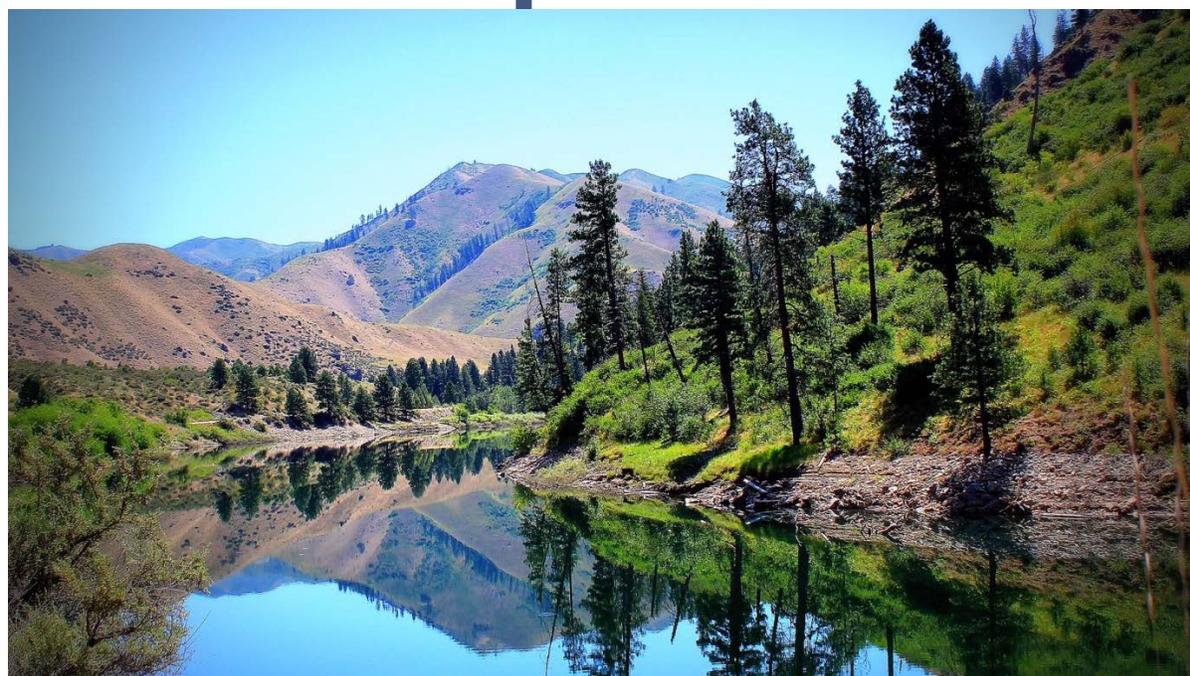


# Source Water Protection Activity Guide



State of Idaho  
Department of Environmental Quality  
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## Executive Summary

The Source Water Protection Activity Guide identifies potential sources and types of contamination that could threaten public drinking water sources (source water) and presents protection activities that can be implemented to better protect source water from contamination.

Potential contaminant sources identified in the guide are grouped into four categories – agricultural/rural, commercial/industrial, residential/municipal, miscellaneous – and include various facilities, land uses, and environmental conditions that have the potential to contaminate ground water and surface water. The guide provides a summary of each contaminant source and its associated contaminant types, protection activities, and additional resources.

Source water protection activities can include nonregulatory and regulatory approaches. Nonregulatory or voluntary management practices and education and outreach can be effective long term by changing the behaviors and practices of those in the source water protection area. Nonregulatory protection strategies are usually most effective when combined with regulatory approaches, such as land-use regulations, permitting, or other public policy strategies. The guide includes both regulatory and nonregulatory protection activities that can help to protect source water. The activities listed are not comprehensive but provide a starting point for planning efforts.

For more information or to utilize the drop down menus for the Source Water Activity Guide, please visit our website: <http://www.deq.idaho.gov/water-quality/source-water/activity-guide/>.

# 1 Contaminant Types

## 1.1 Inorganic Compound (IOC)

### Contaminant Description

A chemical substance of mineral origin, without carbon in its atomic structure. All ground water contains natural salts, minerals, and other inorganic compounds. Concentrations of naturally occurring inorganic compounds such as potassium, magnesium, and calcium typically found in unpolluted ground water are harmless to human health. However, other inorganic compounds such as nitrate, arsenic, or fluoride can occur naturally in ground water at concentrations considered harmful to human health. Human activities and infrastructure—such as septic sewer systems, waste from animal feedlots, nitrogen-based fertilizers, pesticide application, mining, and smelting—can discharge nitrate and arsenic (among other things) to the environment and increase the naturally occurring concentrations of these compounds in ground water.

Sensitive populations such as infants, people with poor or compromised health, and the elderly are especially susceptible to nitrate exposure, which may result in serious illness or death. Illness from high nitrate exposure occurs when nitrate is converted to nitrite in the body. Nitrite reduces oxygen in the blood, causing shortness of breath and blueness of the skin. The technical term for this condition is methemoglobinemia, also called “blue baby syndrome” since infants younger than six months are at the greatest risk. Livestock can also be poisoned by high levels of nitrate in their water.

Arsenic exposure has been reported to cause more than 30 different adverse health effects including cardiovascular disease, diabetes mellitus, skin changes, nervous system damage, and various cancers.

Excessive consumption of fluoride over a lifetime may lead to increased likelihood of bone fractures in adults and bone conditions causing pain and tenderness.

For more information on regulated IOCs, see information on [EPA’s National Primary Drinking Water Regulations](#).

### Related Potential Sources of Contamination

- Airport Maintenance Facilities and Fueling Areas
- Auto Salvage Yards
- Campgrounds, RV Parks, and Marinas
- CERCLA Site
- Collision Repair Shops
- Construction/Demolition Areas
- Cultivated Agriculture—Irrigated and Nonirrigated

- Dairy
- Deep Injection Well
- Feedlot
- Gas Stations
- Horticulture/Landscaping Site/Golf Course
- Landfill
- Major and Minor Roads
- Mine Site
- Motor Pools
- Motorized Vehicle Repair Shops
- Railroad
- Railroad Yards, Maintenance Areas, and Fueling Area
- Ready-Mixed Concrete, Crushed Stone, and Sand and Gravel Facilities
- Road Salt Location
- School Maintenance Facilities
- Septic System
- Shallow Injection Well
- Stormwater Runoff/Storm Drain
- Surface Water
- Tier II (formerly CAMEO)
- Tunnel and Drain Location
- Vehicle Washing/Car Washes
- Waste Transfer and Recycling Facility
- Wastewater Lagoon
- Wastewater Treatment Facilities
- Water Reuse Area

## **1.2 Microorganisms (Microbe)**

### **Contaminant Description**

Microscopic organisms, which may be a single cell or multicellular organism. Microorganisms are diverse and include bacteria, protozoa, fungi, algae, microscopic plants and animals (rotifers and planarians), and viruses. Examples of microbial contamination of drinking water include viruses such as hepatitis, protozoa such as Giardia, and bacteria such as coliform. Coliform is a group of bacteria found in the digestive tracts of mammals and in their wastes. Coliform in water can indicate fecal pollution, which can be a serious problem due to the potential for contracting diseases from pathogens. Pathogenic organisms are a principal contaminant of concern because they pose an acute health risk. Drinking only a single glass of water containing pathogens can cause illness. E. coli is one type of coliform bacteria, is the major species in the fecal coliform group, and is a good indicator of fecal pollution and the possible presence of pathogens.

For more information on microorganisms, see information on [EPA's National Primary Drinking Water Regulations](#).

### **Related Potential Sources of Contamination**

- Campgrounds, RV Parks, and Marinas
- Dairy
- Deep Injection Well
- Feedlot
- Septic System
- Shallow Injection Well
- Stormwater Runoff/Storm Drain
- Surface Water
- Tunnel and Drain Location
- Wastewater Lagoon
- Wastewater Treatment Facilities
- Water Reuse Area

## **1.3 Sediment**

### **Contaminant Description**

Sediment is fragmented materials that originate from eroded soils or the weathering and erosion of rocks or unconsolidated deposits. Sources of sediment also include waste discharge and urban runoff. Sediment creates turbidity in surface water systems. Turbidity can affect the efficiency of treatment systems and can act as an indicator of other contaminant problems such as pathogens, which tend to attach to soil particles.

For more information on turbidity, see information on [EPA's National Primary Drinking Water Regulation](#)).

### **Related Potential Sources of Contamination**

- Construction/Demolition Areas
- Cultivated Agriculture—Irrigated and Nonirrigated
- Forest Roads
- Landslides, Burn Areas, Clear-Cut Forest Areas
- Major and Minor Roads
- Ready-Mixed Concrete, Crushed Stone, and Sand and Gravel Facilities
- Road Salt Location
- Vehicle Washing/Car Washes

## 1.4 Synthetic Organic Compound (SOC)

### Contaminant Description

Any man-made organic compound. SOCs are commonly found in pesticides, herbicides, and many industrial chemicals. Many of these compounds can cause detrimental health effects such as liver and kidney problems and central nervous system and reproductive difficulties and may even increase the risk of certain cancers. Because of these effects, elevated concentrations of SOCs in drinking water are a concern to human health.

For more information on regulated SOCs, see information on [EPA's National Primary Drinking Water Regulations](#).

### Related Potential Sources of Contamination

- Aboveground Storage Tank (AST)
- Airport Maintenance Facilities and Fueling Areas
- Auto Salvage Yards
- Campgrounds, RV Parks, and Marinas
- CERCLA Site
- Collision Repair Shops
- Cultivated Agriculture—Irrigated and Nonirrigated
- Deep Injection Well
- Dry Cleaners
- Forest Roads
- Horticulture/Landscaping Site/Golf Course
- Landfill
- Leaking Underground Storage Tank
- Major and Minor Roads
- Mine Site
- Motor Pools
- Motorized Vehicle Repair Shops
- Railroad
- Railroad Yards, Maintenance Areas, and Fueling Area
- Ready-Mixed Concrete, Crushed Stone, and Sand and Gravel Facilities
- School Maintenance Facilities
- Shallow Injection Well
- Stormwater Runoff/Storm Drain
- Surface Water
- Tier II (formerly CAMEO)
- Tunnel and Drain Location

- Underground Storage Tank (UST)
- Waste Transfer and Recycling Facility
- Wastewater Treatment Facilities

## 1.5 Volatile Organic Compound (VOC)

### Contaminant Description

Any organic compound that easily evaporates at room temperature. Some VOCs may occur naturally in the environment and are components of fuels, such as benzene. Human-caused releases of VOCs are emitted by a wide array of products numbering in the thousands, including paints, adhesives, petroleum products, pharmaceuticals, refrigerants, fuels, solvents, hydraulic fluids, paint thinners, and dry-cleaning agents. VOCs vary in their toxic effects, but many are flammable and are known or suspected human carcinogens, making elevated concentrations of VOCs in drinking water a concern to human health.

For more information on regulated VOCs, see information on [EPA's National Primary Drinking Water Regulations](#).

### Related Potential Sources of Contamination

- Aboveground Storage Tank (AST)
- Airport Maintenance Facilities and Fueling Areas
- Auto Salvage Yards
- Campgrounds, RV Parks, and Marinas
- CERCLA Site
- Collision Repair Shops
- Construction/Demolition Areas
- Dairy
- Deep Injection Well
- Dry Cleaners
- Feedlot
- Forest Roads
- Gas Stations
- Landfill
- Leaking Underground Storage Tank
- Major and Minor Roads
- Mine Site
- Motor Pools
- Motorized Vehicle Repair Shops
- Railroad

- Railroad Yards, Maintenance Areas, and Fueling Area
- Ready-Mixed Concrete, Crushed Stone, and Sand and Gravel Facilities
- School Maintenance Facilities
- Shallow Injection Well
- Stormwater Runoff/Storm Drain
- Surface Water
- Tier II (formerly CAMEO)
- Underground Storage Tank (UST)
- Vehicle Washing/Car Washes
- Waste Transfer and Recycling Facility
- Wastewater Treatment Facilities

## 2 Potential Sources of Contamination: Agricultural/Rural

### 2.1 Cultivated Agriculture – Irrigated and Nonirrigated

#### Description

Cultivated agriculture involves growing and producing crops through irrigated and nonirrigated farming practices. Improper or excessive application of nutrient sources such as inorganic fertilizer or manure can lead to pollution of ground water and surface water. The two main components of fertilizer that are of greatest concern to source water quality are nitrogen and phosphorous. Pesticides are also applied to crops by aerial spraying, topsoil application, soil injection, soil incorporation, or irrigation. Aerial spraying and topsoil application pose the greatest risks for surface water contamination from runoff. Soil injection and incorporation pose the greatest likelihood of ground water contamination because the pesticides are subject to leaching. Applying pesticides through irrigation can also cause ground water contamination. Pesticides can also reach ground water through drains, sink holes, and other conduits. Excessive rain or irrigation water can wash pesticides from plants and soils and into streams or other surface water bodies. Pesticides can leach into soil if plants are watered or rainfall occurs soon after application. Some pesticides resist degradation by microbes in the soil and will eventually leach into ground water.

#### Possible Protection Activities

- Conditional Use Permits
- Conservation Buffers: Contour Buffer Strips
- Conservation Buffers: Field Borders
- Conservation Buffers: Filter Strip
- Conservation Buffers: Grass Waterways
- Conservation Buffers: Riparian Buffer
- Conservation Crop Rotation
- Conservation Tillage
- Deep Tillage
- Erosion Control
- Green Business Awards
- Ground Water Monitoring
- Inspections and Technical Assistance
- Integrated Pest Management
- Irrigation Water Management
- Nutrient Management: Fertilizer Application Methods
- Nutrient Management: Fertilizer Application Rates
- Nutrient Management: Fertilizer Application Timing
- Nutrient Management: Fertilizer Types

- Proper Fertilizer Storage, Handling, and Disposal
- Proper Pesticide Application
- Proper Pesticide Storage, Handling, and Disposal

## Potential Contaminant Types

- IOC, SOC, Sediment

## Resources

- [\*Cornell University\*](#)  
Whole farm nutrient management tutorials.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing large-scale application of pesticides to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing agricultural fertilizer application to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing stormwater runoff to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of drinking water.
- [\*Friends of Yellow Creek Watershed\*](#)  
Information on healthy watersheds.
- [\*Idaho Association of Soil Conservation Districts\*](#)  
Conservation districts are local units of government established under state law to carry out natural resource management programs at the local level. Districts work with millions of cooperating landowners and operators to help them manage and protect land and water resources on all private lands and many public lands in the United States.
- [\*Idaho Department of Agriculture: Pesticide Disposal Program\*](#)  
ISDA conducts unusable pesticide disposal collection from agricultural producers, dealers, homeowners and applicators throughout the state.

- [\*Idaho Farm Service Agency\*](#)  
Established by the federal government, the U.S. Department of Agriculture Farm Service Agency centers on protecting “water” recharge areas. USDA-FSA created a planning team of public water utility personnel, representatives from the agricultural community and other interested parties to work together in identifying potential problems and to develop management strategies to reduce the risk of source water contamination.
- [\*Idaho Home Assessment System\*](#)  
Information on pesticide storage and handling.
- [\*Massachusetts Department of Environmental Protection\*](#)  
Information on using vegetated buffer strips to slow the flow and protect water quality.
- [\*Minnesota Department of Agriculture: BMPs\*](#)  
Information on best management practices that are capable of protecting the environment while considering economic factors, availability, technical feasibility, ability to implement, and effectiveness.
- [\*National Menu of Best Management Practices \(BMPs\) for Stormwater\*](#)
- [\*Natural Resources Conservation Service \(NRCS\)\*](#)  
Information on contour buffer strips.
- [\*Natural Resources Conservation Service \(NRCS\)\*](#)  
NRCS's natural resources conservation programs help people reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damages caused by floods and other natural disasters.
- [\*University of Idaho Extension\*](#)  
Northern Idaho fertilizer guide.
- [\*University of Idaho Extension\*](#)  
Southern Idaho fertilizer guides.

## 2.2 Dairy

### Description

A dairy is a farm or business enterprise that raises and produces milk products for human consumption from cows, goats, or other animals. Dairies produce large amounts of waste, including manure and wastewater, in small areas. Depending on management practices, these

wastes can contribute pollutants such as nutrients, organic matter, sediment, pathogens, heavy metals, hormones, antibiotics, and ammonia to ground water or surface water, especially if a dairy is located on sandy soils where the depth to ground water is shallow. Poor management practices include inadequately sized and poorly lined ponds or other storage structures that allow manure or wastewater to escape into the surrounding environment, poorly maintained and unlined corrals that let contaminated wastewater seep into ground water, inadequate stormwater runoff controls, and applying too much wastewater or manure to fields too quickly or using inadequate methods. Dairies may also have aboveground or underground storage fueling tanks on site that, if not properly maintained, can impact ground water or surface water. CAFOs are agricultural facilities that house and feed numerous animals—typically cows, hogs, chickens, or turkeys—in a confined area for 45 days or more during any 12-month period.

### **Possible Protection Activities**

- Conditional Use Permits
- Inspections and Technical Assistance
- CAFO Siting Evaluations
- CAFO Permits
- Ground Water Monitoring
- Green Business Awards
- Fencing
- Erosion Control
- Pollution Prevention

### **Potential Contaminant Types**

- IOC, VOC, Microbe

### **Resources**

- [\*Idaho Association of Soil Conservation Districts\*](#)  
Conservation districts are local units of government established under state law to carry out natural resource management programs at the local level. Districts work with millions of cooperating landowners and operators to help them manage and protect land and water resources on all private lands and many public lands in the United States.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of drinking water.

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing livestock, poultry, and horse waste to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing agricultural fertilizer application to prevent contamination of drinking water.
- [\*EPA: NPS Outreach Toolbox\*](#)  
The Nonpoint Source (NPS) Outreach Toolbox is intended for use by state and local agencies and other organizations interested in educating the public on nonpoint source pollution or stormwater runoff. The Toolbox contains a variety of resources to help develop an effective and targeted outreach campaign.
- [\*Idaho Department of Environmental Quality\*](#)  
Information on concentrated animal feeding operations (CAFOs).

## 2.3 Feedlot

### Description

A feedlot or beef cattle operation is a farm or business enterprise that raises and produces beef products for human consumption. Beef cattle operations considered to be CAFOs, produce large amounts of waste, including manure and wastewater, in small areas. Depending on management practices, these wastes can contribute pollutants such as nutrients, organic matter, sediment, pathogens, heavy metals, hormones, antibiotics, and ammonia to ground water or surface water, especially if a CAFO is located on sandy soils where the depth to ground water is shallow. Poor management practices include inadequately sized and poorly lined ponds or other storage structures that allow manure to escape into the surrounding environment, poorly maintained and unlined corrals that let contaminated wastewater seep into ground water, inadequate stormwater runoff controls, and applying too much wastewater or manure to fields too quickly or with inadequate methods. CAFOs may also have aboveground or underground storage fueling tanks on site that can impact ground water or surface water if improperly used or maintained. CAFOs are agricultural facilities that house and feed numerous animals—typically cows, hogs, chickens, or turkeys—in a confined area for 45 days or more during any 12-month period.

### Possible Protection Activities

- Conditional Use Permits
- Inspections and Technical Assistance
- CAFO Siting Evaluations
- CAFO Permits
- Ground Water Monitoring

- Green Business Awards
- Fencing
- Erosion Control
- Pollution Prevention

### **Potential Contaminant Types**

- IOC, VOC, Microbe

### **Resources**

- [\*Idaho Association of Soil Conservation Districts\*](#)  
Conservation districts are local units of government established under state law to carry out natural resource management programs at the local level. Districts work with millions of cooperating landowners and operators to help them manage and protect land and water resources on all private lands and many public lands in the United States.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing livestock, poultry, and horse waste to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing agricultural fertilizer application to prevent contamination of drinking water.
- [\*EPA: NPS Outreach Toolbox\*](#)  
The Nonpoint Source (NPS) Outreach Toolbox is intended for use by state and local agencies and other organizations interested in educating the public on nonpoint source pollution or stormwater runoff. The Toolbox contains a variety of resources to help develop an effective and targeted outreach campaign.
- [\*Idaho Department of Environmental Quality\*](#)  
Information on concentrated animal feeding operations (CAFOs).

## 2.4 Tunnel and Drain Location

### Description

Drain locations are holes in the soil used to drain excess water from the land surface to underlying tunnels.

In the early 1900s after irrigation of the Twin Falls tract began, drainage problems occurred on the farmland. As a result, drains and drainage tunnels were constructed to drain excess flood irrigation water from agricultural fields by digging a hole from the land surface to an underlying tunnel. A series of drains in the field empties the excess water into the tunnels. These drainage systems pose risks of contamination to ground water and surface water by providing a direct conduit for contaminants associated with any development or changes in land use on or near the systems.

### Possible Protection Activities

- Sanitary Setbacks

### Potential Contaminant Types

- IOC, SOC, Microbe

## 2.5 Wastewater Lagoon

### Description

A wastewater lagoon is a man-made impoundment for the purpose of storing or treating wastewater. Lagoons should meet design standards and seepage rate standards compliant with IDAPA 58.01.16, "Wastewater Rules." Note that mines and confined animal feeding operations are exempt from these rules. If lagoons are leaking, they may degrade waters of the state. Those leaking above allowable rates have rule requirements that may include fixing the lagoon or determining the impact of the leaking lagoon on the environment.

### Possible Protection Activities

- Conditional Use Permits
- Ground Water Monitoring
- Sanitary Setbacks
- Pollution Prevention

### Potential Contaminant Types

- IOC, Microbe

## 3 Potential Sources of Contamination: Commercial/Industrial

### 3.1 Auto Salvage Yards

#### Description

An auto salvage yard is a business that dismantles automobiles for parts. Auto salvage yards may release hazardous materials into the environment, including petroleum-based products such as oils, lubricants, fuel, antifreeze, brake fluid, and steering fluid. Other hazardous materials commonly handled at salvage facilities include Freon or other refrigerants, mercury from switches, lead from lead/acid batteries and wheel weights, and asbestos from brakes. If hazardous materials are not properly managed or disposed of or good housekeeping practices are not in place, these materials can contaminate ground water or enter surface water through stormwater runoff.

#### Possible Protection Activities

- Conditional Use Permits
- Inspections and Technical Assistance
- Green Business Awards
- Sanitary Setbacks
- Pollution Prevention
- Secondary Containment
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

#### Potential Contaminant Types

- IOC, VOC, SOC

#### Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing underground storage tanks to prevent contamination of drinking water.

- [\*Idaho Department of Environmental Quality\*](#)  
Information on underground storage tanks in Idaho.

## 3.2 Brownfield Site

### Description

A brownfields site is a vacant or underutilized property where redevelopment or reuse is complicated by actual or perceived environmental contamination.

### Possible Protection Activities

- Idaho Voluntary Cleanup Program
- Brownfields Assessment Program

### Potential Contaminant Types

- Site Specific

### Resources

- [\*Idaho's Brownfield Revitalization Program\*](#)  
Brownfields revitalization is a process in which contamination at brownfields sites is addressed so that the sites can be redeveloped.

## 3.3 Collision Repair Shops

### Description

Collision repair shops generate various types of waste that can affect water quality, such as used absorbents, waste antifreeze, brake fluids, used paints, paint booth filters, paint solvents and thinners, used fluorescent lamps, used batteries, used part washer solvents, used shop towels/rags, scrap metal, used oil, and used tires. Many of these wastes may be considered hazardous and can impact surface and ground water quality. Spraying, blasting, and sanding activities performed by auto body shops can contaminate surface and ground water if not properly contained. Discharges of untreated wastewater or contaminated stormwater can impact surface and ground water quality, especially if floor drains are connected to shallow injection wells. Aboveground and underground storage tanks can be used at collision repair shops and both have the potential to leak hazardous material that can impact water quality.

### Possible Protection Activities

- Conditional Use Permits

- Inspections and Technical Assistance
- Green Business Awards
- Sanitary Setbacks
- Pollution Prevention
- Secondary Containment
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

### **Potential Contaminant Types**

- IOC, VOC, SOC

### **Resources**

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing underground storage tanks to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing vehicle washing to prevent contamination of drinking water.
- [\*Idaho Department of Environmental Quality\*](#)  
Information on underground storage tanks in Idaho.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing small quantity chemical use to prevent contamination of drinking water.
- [\*Idaho Small Business Development Center: Environmental Regulations\*](#)  
The Idaho Small Business Development Center offers no-cost, confidential assistance in complying with environmental regulations.
- [\*Washington Department of Ecology\*](#)  
Technical assistance manual for auto body shops.

- [Peaks to Prairies PPIC](#)  
Auto body topic hub.

### 3.4 Dry Cleaners

#### Description

Dry cleaners can contaminate ground water due to various chemicals and solvents used in the dry-cleaning process. Perchloroethylene (perc) is the most common cleaning solvent used in the dry-cleaning industry. Spills, leaks, or improper disposal can cause releases of these solvents, which have the potential to contaminate soil and ground water. Historically, some dry cleaners may have discarded wastes by pouring wastewater into sewers, throwing used filters and sludge into the trash, or simply dumping wastewater on the ground. These disposal practices can result in contamination of soil and infiltration to ground water.

#### Possible Protection Activities

- Conditional Use Permits
- Inspections and Technical Assistance
- Green Business Awards
- Green Chemistry
- Pollution Prevention
- Secondary Containment
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

#### Potential Contaminant Types

- VOC, SOC

#### Resources

- [EPA: Source Water Protection Practices Bulletin](#)  
Information on managing small quantity chemical use to prevent contamination of drinking water.
- [Idaho Small Business Development Center: Environmental Regulations](#)  
The Idaho Small Business Development Center offers no-cost, confidential assistance in complying with environmental regulations.

## 3.5 Gas Stations

### Description

Gas stations can affect ground water or surface water quality due to various processes, equipment, and substances used on site. The aboveground and underground storage tanks used at gas stations have the potential to leak hazardous material that can impact ground water or surface water quality. Gas stations may also generate several sources of contaminants that can be washed away with stormwater, including oil and gas spills; engine and brake residues containing antifreeze, grease, oil, copper, and asbestos; engine degreasers containing copper and brass; radiator flushing residues containing lead, oil, and grease; and residue from engine washing containing aluminum and iron. Gas stations often have car washes, and vehicle wash water can carry sediments to surface waters and contaminate ground water by infiltration or drainage to subsurface wells and/or septic systems. Gas stations may also use underground injection wells to dispose of untreated fluids collected through open drains on station fueling pads and septic systems if located in an area that does not have access to a sewer system, both of which can impact ground water.

### Possible Protection Activities

- Conditional Use Permits
- Inspections and Technical Assistance
- Green Business Awards
- Sanitary Setbacks
- Pollution Prevention
- Secondary Containment
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

### Potential Contaminant Types

- IOC, VOC

### Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing underground storage tanks to prevent contamination of drinking water.

- [Idaho Department of Environmental Quality](#)  
Information on underground storage tanks in Idaho.
- [EPA: Source Water Protection Practices Bulletin](#)  
Information on managing vehicle washing to prevent contamination of drinking water.

## 3.6 Mine Site

### Description

An active mine site is where geologic materials are currently being extracted from the earth. An inactive or abandoned mine site is not currently in operation and may not have an identifiable owner or operator. A phosphate mine is a site where phosphate ore is extracted from the earth. Active, inactive, and abandoned mines can contribute to ground water and surface water contamination. Precipitation can leach soluble minerals from the mine wastes into ground water or cause contaminated runoff into surface water. These wastes often contain metals, acid, and minerals. On-site storage of fuels or lubricants may also pose a risk to ground water or surface water sources if proper handling and storage procedures are not followed.

### Possible Protection Activities

- Conditional Use Permits
- Inspections and Technical Assistance
- Sanitary Setbacks
- Erosion Control
- Pollution Prevention
- Proper Storage, Handling, and Disposal of Hazardous Waste

### Potential Contaminant Types

- IOC, VOC, SOC

### Resources

- [EPA: NPS Outreach Toolbox](#)  
The Nonpoint Source (NPS) Outreach Toolbox is intended for use by state and local agencies and other organizations interested in educating the public on nonpoint source pollution or stormwater runoff. The Toolbox contains a variety of resources to help develop an effective and targeted outreach campaign.

## 3.7 Motor Pools

### Description

A motor pool is a group of vehicles owned by a business, government entity, or organization that is managed and maintained for the use of employees. If motor pools are maintained and/or fueled on site, hazardous materials and wastes such as solvents, oil, antifreeze, and fuel will also be managed on site. If these materials and wastes are improperly handled, stored, or disposed of, ground water and surface water can be impacted.

### Possible Protection Activities

- Inspections and Technical Assistance
- Pollution Prevention
- Secondary Containment
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

### Potential Contaminant Types

- IOC, VOC, SOC

### Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing vehicle washing to prevent contamination of drinking water.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on aqueous brake washers.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on antifreeze recycling.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on oil/water separators.
- [\*EPA: Best Environmental Practices for Auto Repair and Vehicle Fleet Maintenance\*](#)  
Information on floor cleanup.

- [\*EPA: Auto Repair and Fleet Maintenance Pollution Prevention\*](#)  
Information on the top P2 "fixes" for auto repair and fleet maintenance operations.

## 3.8 Motorized Vehicle Repair Shops

### Description

Vehicle repair shops can affect ground water or surface water quality due to various processes, equipment, and substances used on site. Aboveground and underground storage tanks can be used at motorized vehicle repair shops and if not properly maintained, both have the potential to leak hazardous material that can impact ground water or surface water quality. Motor vehicle waste disposal wells (MVWDWs) were sometimes used at repair shops, but are now prohibited in Idaho. An MVWDW is a type of injection well that receives or has received fluids generated during repair and maintenance of motorized vehicles such as automobiles, boats, airplanes, trains, and recreational vehicles. During repair and maintenance activities, fluids such as fuels, oils, and solvents may spill or drip onto the shop floor and enter the injection well potentially causing degradation of the ground water quality over time. Even if MVWDWs are not used, poor housekeeping practices can result in leaks and spills of fuels, oils, solvents, paints, lead acid batteries, and wastewater that can enter stormwater systems and/or be released to ground water. Oil and water separators, catch basins, and other water treatment devices also have the potential to impact surface water and ground water if not used and maintained properly.

### Possible Protection Activities

- Conditional Use Permits
- Inspections and Technical Assistance
- Green Business Awards
- Sanitary Setbacks
- Pollution Prevention
- Secondary Containment
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

### Potential Contaminant Types

- IOC, VOC, SOC

### Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of

drinking water.

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing underground storage tanks to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing vehicle washing to prevent contamination of drinking water.
- [\*Idaho Department of Environmental Quality\*](#)  
Information on underground storage tanks in Idaho.
- [\*Idaho Department of Water Resources\*](#)  
Information on shallow injection wells and motor vehicle waste disposal wells in Idaho.
- [\*EPA: Best Environmental Practices for Auto Repair\*](#)  
Information on aqueous parts cleaning.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on aqueous brake washers.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on antifreeze recycling.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on oil/water separators.
- [\*EPA: Best Environmental Practices for Auto Repair and Vehicle Fleet Maintenance\*](#)  
Information on floor cleanup.
- [\*EPA: Auto Repair and Fleet Maintenance Pollution Prevention\*](#)  
Information on the top Pollution Prevention "fixes" for auto repair and fleet maintenance operations.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing small quantity chemical use to prevent contamination of drinking water.
- [\*EPA: Auto Repair Compliance Assistance Tools\*](#)

- *Idaho Small Business Development Center: Environmental Regulations*  
The Idaho Small Business Development Center offers no-cost, confidential assistance in complying with environmental regulations.

### **3.9 Railroad**

#### **Description**

Freight trains carrying hazardous materials can release contaminants during a one-time accidental release or slowly via leaking rail cars. Also, weed management practices along train tracks can impact water quality if contaminants leach into the ground or enter surface water from stormwater runoff. Improper fueling practices can also lead to leaks and spills.

#### **Possible Protection Activities**

- Inspections and Technical Assistance
- Pollution Prevention
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

#### **Potential Contaminant Types**

- IOC, VOC, SOC

### **3.10 Railroad Yards, Maintenance Areas, and Fueling Areas**

#### **Description**

Railroad yards, maintenance areas, and fueling areas are areas used for storing, sorting, loading, unloading, maintaining, and refueling railroad cars or engines. Hazardous materials actively or previously used in these areas can include fuel, herbicides for rights-of-way, creosote from preserving wood ties, solvents, paints, and waste oils. If hazardous materials or generated wastes are improperly handled, stored, or disposed of, ground water and surface water can be impacted.

#### **Possible Protection Activities**

- Inspections and Technical Assistance
- Pollution Prevention
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

## Potential Contaminant Types

- IOC, VOC, SOC

## Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing underground storage tanks to prevent contamination of drinking water.
- [\*Idaho Department of Environmental Quality\*](#)  
Information on underground storage tanks in Idaho.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on aqueous brake washers.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on antifreeze recycling.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on oil/water separators.
- [\*EPA: Best Environmental Practices for Auto Repair and Vehicle Fleet Maintenance\*](#)  
Information on floor cleanup.
- [\*EPA: Auto Repair and Fleet Maintenance Pollution Prevention\*](#)  
Information on the top Pollution Prevention "fixes" for auto repair and fleet maintenance operations.

## 3.11 RCRA Site

### Description

A Resource Conservation and Recovery Act (RCRA) site generates hazardous waste or receives hazardous waste for treatment, storage, or disposal and is regulated under the Resource Conservation and Recovery Act. Proper handling, storage, and disposal of hazardous waste is

important in protecting ground water and surface water.

### **Possible Protection Activities**

- Conditional Use Permits
- Inspections and Technical Assistance
- Green Business Awards
- Sanitary Setbacks
- Pollution Prevention
- Secondary Containment
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

### **Potential Contaminant Types**

- Site Specific

## **3.12 Ready-Mix Concrete, Crushed Stone, and Sand and Gravel Facilities**

### **Description**

Facilities that generate ready-mixed concrete, crushed stone, or sand and gravel can impact surface water and ground water quality through runoff and chemical storage, use, and disposal practices. Stormwater runoff from these facilities can have a significant impact on water quality by contributing sediment and other pollutants to surface water. Diesel fuel, solvents, and oil are used on site and have the potential to impact ground water and surface water if proper handling, storage, and disposal practices are not used.

### **Possible Protection Activities**

- Conditional Use Permits
- Inspections and Technical Assistance
- Green Business Awards
- Sanitary Setbacks
- Pollution Prevention
- Secondary Containment
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

## Potential Contaminant Types

- IOC, VOC, SOC, Sediment

## Resources

- [Pinellas County](#)  
Pollution prevention opportunities for concrete batch plants.
- [EPA: Ready Mixed Concrete, Crushed Stone and Sand and Gravel Industrial Stormwater Compliance Resources](#)  
This page provides stormwater compliance resources for glass, clay, cement, concrete, gypsum, and mineral mining facilities.

## 3.13 Stormwater Runoff/Storm Drain

### Description

Stormwater runoff is rainwater or snowmelt that flows over the land. Runoff can carry sediment and contaminants from streets, rooftops, and lawns to surface water bodies or can infiltrate through the soil to ground water. Storm drains are the metal grates found on urban and suburban streets, often at corners and on the sides of curbs and gutters. They help prevent flooding by draining stormwater runoff that does not percolate into the ground. Storm drains can be independent from sewer systems and may transport untreated stormwater directly to surface water or ground water. As runoff flows over the land or impervious surfaces, it accumulates debris, chemicals, oil, sediment, pet waste, soap used for washing cars, and other activities that can adversely affect water quality.

### Possible Protection Activities

- Erosion Control
- Conservation Buffers: Filter Strip
- Conservation Buffers: Riparian Buffer
- Conservation Buffers: Grass Waterways
- Conservation Buffers: Contour Buffer Strips
- Conservation Buffers: Field Borders
- Nutrient Management: Fertilizer Application Rates
- Nutrient Management: Fertilizer Types
- Nutrient Management: Fertilizer Application Timing
- Nutrient Management: Fertilizer Application Methods
- Proper Pesticide Application
- Proper Pesticide Storage, Handling, and Disposal

- Proper Fertilizer Storage, Handling, and Disposal
- Low Impact Development: Impervious Surface Reduction
- Low Impact Development: Green Roofs
- Low Impact Development: Rain Gardens
- Low Impact Development: Downspout Disconnection
- Low Impact Development: Rain Barrel
- Low Impact Development: Green Streets
- Low Impact Development: Xeriscaping
- Low Impact Development: Grass Swales
- Pollution Prevention
- Pet Waste Cleanup
- Street Sweeping
- Stormwater Retrofits
- Storm Drain Marking
- Proper Disposal of Household Hazardous Waste (HHW)
- Proper Storage, Handling, and Disposal of Hazardous Waste

### **Potential Contaminant Types**

- IOC, VOC, SOC, Microbe

### **Resources**

- [\*Ada County Highway District\*](#)  
Information on how you can help protect storm water quality.
- [\*Partners for Clean Water\*](#)  
Providing the Treasure Valley with the latest information on stormwater quality, the Partners for Clean Water work together to educate the community to keep pollutants out of stormwater and the environment.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing sanitary sewer overflows and combined sewer overflows to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing stormwater runoff to prevent contamination of drinking water.
- [\*EPA: NPS Outreach Toolbox\*](#)  
The Nonpoint Source (NPS) Outreach Toolbox is intended for use by state and local

agencies and other organizations interested in educating the public on nonpoint source pollution or stormwater runoff. The Toolbox contains a variety of resources to help develop an effective and targeted outreach campaign.

- [\*EPA: Erosion and Sediment Control\*](#)  
Information on model ordinances related to erosion and sediment control.
- [\*Idaho Department of Environmental Quality Stormwater BMPs\*](#)  
Catalog of stormwater best management practices for Idaho cities and counties.
- [\*National Menu of Best Management Practices \(BMPs\) for Stormwater\*](#)
- [\*Friends of Yellow Creek Watershed\*](#)  
Information on healthy watersheds.
- [\*NOAA Coastal Services Center Impervious Surface Analysis Tool \(ISAT\)\*](#)  
ISAT is a custom suite of easy-to-use scripts for ArcGIS used to calculate the percentage of impervious surface area within user-selected geographic areas, such as watersheds, municipalities, and subdivisions.
- [\*EPA: Polluted Runoff - Nonpoint Source \(NPS\) Pollution\*](#)  
Information on managing urban runoff.
- [\*National Menu of Best Management Practices \(BMPs\) for Stormwater\*](#)
- [\*Impacts from Urban, Agricultural, Land Use, and Forested Watersheds\*](#)  
Water utilities can play a vital role in influencing land use decisions that affect drinking water sources. Runoff from different land uses can load significant amounts of nutrients and contaminants into source water. For each type of land use, tools and practices are available to generate positive impacts on water quality.

### **3.14 Toxic Release Inventory (TRI) Site**

#### **Description**

Toxic Release Inventory (TRI) sites indicate locations of potential contaminants identified on the federal TRI, which is a database made available to the public by the US Environmental Protection Agency. The TRI tracks the management of over 650 toxic chemicals that may pose a threat to human health and the environment. Facilities in different industry sectors must report annually how much of each chemical they release to the environment and/or manage through recycling, energy recovery, and treatment. Facilities that report to the TRI are typically larger

facilities involved in manufacturing, mining, electric power generation, chemical manufacturing, and hazardous waste treatment.

### **Possible Protection Activities**

- Conditional Use Permits
- Inspections and Technical Assistance
- Green Business Awards
- Green Chemistry
- Pollution Prevention
- Secondary Containment
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

### **Potential Contaminant Types**

- Site Specific

### **Resources**

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing small quantity chemical use to prevent contamination of drinking water.

## **3.15 Vehicle Washing/Car Washes**

### **Description**

Vehicle wash water may contain oil, grease, metal (paint chips), phosphates, detergents, soaps, cleaners, road salts, sediment, and other chemicals that can contaminate source water. Vehicle wash water can carry contaminants and sediments to surface waters through storm drains and can contaminate ground water by infiltration or drainage to subsurface wells (injection wells) or septic systems. Coin-operated, manual car washing facilities can be particularly concerning because an attendant is not usually on site to monitor the products used or what is disposed of down the drain.

### **Possible Protection Activities**

- Green Business Awards
- Water Audits
- Pollution Prevention
- Road Salt Reduction

- Street Sweeping
- Storm Drain Marking

### **Potential Contaminant Types**

- IOC, VOC, Sediment

### **Resources**

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing vehicle washing to prevent contamination of drinking water.

## **3.16 Wastewater Lagoon**

### **Description**

A wastewater lagoon is a man-made impoundment for the purpose of storing or treating wastewater. Lagoons should meet design standards and seepage rate standards compliant with IDAPA 58.01.16, “Wastewater Rules.” Note that mines and confined animal feeding operations are exempt from these rules. If lagoons are leaking, they may degrade waters of the state. Those leaking above allowable rates have rule requirements that may include fixing the lagoon or determining the impact of the leaking lagoon on the environment.

### **Possible Protection Activities**

- Conditional Use Permits
- Ground Water Monitoring
- Sanitary Setbacks
- Pollution Prevention

### **Potential Contaminant Types**

- IOC, Microbe

## **3.17 Water Reuse Area**

### **Description**

A water reuse area is where treated municipal or industrial wastewater is applied to land for irrigation. Improper application rate and timing of wastewater to the land can result in runoff to surface water or leaching into the ground water.

### 3.17.1 Possible Protection Activities

- Conditional Use Permits
- Ground Water Monitoring
- Sanitary Setbacks
- Irrigation Water Management
- Pollution Prevention

### Potential Contaminant Types

- IOC, Microbe

## 4 Potential Sources of Contamination: Residential/Municipal

### 4.1 Airport Maintenance Facilities and Fueling Areas

#### Description

Airport maintenance facilities and fueling areas store, handle, and generate wastes associated with aircraft fueling, deicing, repair, and cleaning activities. Facilities may also use oil heaters on site. If associated hazardous materials and wastes are improperly managed or spilled, ground water and surface water can be impacted.

#### Possible Protection Activities

- Conditional Use Permits
- Inspections and Technical Assistance
- Pollution Prevention
- Secondary Containment
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

#### Potential Contaminant Types

- IOC, VOC, SOC

#### Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of drinking water.

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing underground storage tanks to prevent contamination of drinking water.
- [\*Idaho Department of Environmental Quality\*](#)  
Information on underground storage tanks in Idaho.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on aqueous brake washers.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on antifreeze recycling.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on oil/water separators.
- [\*EPA: Best Environmental Practices for Auto Repair and Vehicle Fleet Maintenance\*](#)  
Information on floor cleanup.
- [\*EPA: Auto Repair and Fleet Maintenance Pollution Prevention\*](#)  
Information on the top Pollution Prevention "fixes" for auto repair and fleet maintenance operations.

## 4.2 Campgrounds, RV Parks, and Marinas

### Description

Campgrounds, RV parks, and Marinas are typically found in remote locations without access to sewage systems. Therefore, septic systems are typically used to dispose of wastewater and must be properly sited and maintained to prevent ground water contamination. If boat launches and fueling stations are on site, gasoline and diesel fuel from boats can contaminate surface water and ground water if spills occur. Other threats to source water include household hazardous waste from RVs and camp sites, pesticide or fertilizer application if there are any improved areas, and human and pet waste.

### Possible Protection Activities

- Sanitary Setbacks
- Proper Pesticide Application
- Pet Waste Cleanup
- Secondary Containment
- Septic System Location and Maintenance

- Proper Disposal of Household Hazardous Waste (HHW)
- Spill Prevention and Control

### **Potential Contaminant Types**

- IOC, VOC, SOC, Microbe

### **Resources**

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing underground storage tanks to prevent contamination of drinking water.
- [\*Idaho Department of Environmental Quality\*](#)  
Information on underground storage tanks in Idaho.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Managing septic systems to prevent contamination of drinking water.

## **4.3 Horticulture/Landscaping Site/Golf Course**

### **Description**

Fertilizers and pesticides are frequently applied to landscaped areas, including golf courses, and can seep into ground water or run off into stormwater if overapplied or applied incorrectly. The two main components of fertilizer used on landscaped areas that are of greatest concern to source water quality are nitrogen and phosphorous. Pesticides contain a variety of organic and inorganic compounds that are poisonous.

### **Possible Protection Activities**

- Conditional Use Permits
- Inspections and Technical Assistance
- Green Business Awards
- Water Audits
- Nutrient Management: Fertilizer Application Rates
- Nutrient Management: Fertilizer Types
- Nutrient Management: Fertilizer Application Timing

- Nutrient Management: Fertilizer Application Methods
- Proper Pesticide Application
- Integrated Pest Management
- Proper Pesticide Storage, Handling, and Disposal
- Proper Fertilizer Storage, Handling, and Disposal
- Irrigation Water Management
- Pollution Prevention
- Proper Storage, Handling, and Disposal of Hazardous Waste

### **Potential Contaminant Types**

- IOC, SOC

### **Resources**

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing turfgrass and garden fertilizer application to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing small-scale application of pesticides to prevent contamination of drinking water.
- [\*Idaho Home Assessment System\*](#)  
Information on pesticide storage and handling.

## **4.4 Railroad**

### **Description**

Freight trains carrying hazardous materials can release contaminants during a one-time accidental release or slowly via leaking rail cars. Also, weed management practices along train tracks can impact water quality if contaminants leach into the ground or enter surface water from stormwater runoff. Improper fueling practices can also lead to leaks and spills.

### **Possible Protection Activities**

- Inspections and Technical Assistance
- Pollution Prevention
- Proper Storage, Handling, and Disposal of Hazardous Waste

- Spill Prevention and Control

### **Potential Contaminant Types**

- IOC, VOC, SOC

### **Resources**

- [\*Stormwater Maintenance\*](#)  
Maintenance descriptions and EPA resources and state BMP manuals and maintenance information.

## **4.5 Railroad Yards, Maintenance Areas, and Fueling Area**

### **Description**

Railroad yards, maintenance areas, and fueling areas are areas used for storing, sorting, loading, unloading, maintaining, and refueling railroad cars or engines. Hazardous materials actively or previously used in these areas can include fuel, herbicides for rights-of-way, creosote from preserving wood ties, solvents, paints, and waste oils. If hazardous materials or generated wastes are improperly handled, stored, or disposed of, ground water and surface water can be impacted.

### **Possible Protection Activities**

- Inspections and Technical Assistance
- Pollution Prevention
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

### **Potential Contaminant Types**

- IOC, VOC, SOC

### **Resources**

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing underground storage tanks to prevent contamination of drinking water.

- [\*Idaho Department of Environmental Quality\*](#)  
Information on underground storage tanks in Idaho.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on aqueous brake washers.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on antifreeze recycling.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on oil/water separators.
- [\*EPA: Best Environmental Practices for Auto Repair and Vehicle Fleet Maintenance\*](#)  
Information on floor cleanup.
- [\*EPA: Auto Repair and Fleet Maintenance Pollution Prevention\*](#)  
Information on the top Pollution Prevention "fixes" for auto repair and fleet maintenance operations.

## 4.6 School Maintenance Facilities

### Description

School maintenance departments are responsible for maintaining and improving all buildings and grounds within a school district. Their facilities contain equipment and materials needed to manage HVAC systems, plumbing, roads, swimming pools, playgrounds, lawns, and structures. They can also contain any hazardous waste generated from activities associated with maintenance. If hazardous materials or wastes are improperly stored, handled, or disposed of, ground water and surface water can be impacted.

### Possible Protection Activities

- Nutrient Management: Fertilizer Application Rates
- Nutrient Management: Fertilizer Types
- Nutrient Management: Fertilizer Application Timing
- Nutrient Management: Fertilizer Application Methods
- Proper Pesticide Application
- Integrated Pest Management
- Proper Pesticide Storage, Handling, and Disposal

- Proper Fertilizer Storage, Handling, and Disposal
- Irrigation Water Management
- Pollution Prevention
- Storm Drain Marking
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

### **Potential Contaminant Types**

- IOC, VOC, SOC

### **Resources**

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing underground storage tanks to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing vehicle washing to prevent contamination of drinking water.
- [\*Idaho Department of Environmental Quality\*](#)  
Information on underground storage tanks in Idaho.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on aqueous brake washers.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on antifreeze recycling.
- [\*EPA: Best Environmental Practices for Auto Repair and Fleet Maintenance\*](#)  
Information on oil/water separators.
- [\*EPA: Best Environmental Practices for Auto Repair and Vehicle Fleet Maintenance\*](#)  
Information on floor cleanup.

- [EPA: Auto Repair and Fleet Maintenance Pollution Prevention](#)  
Information on the top Pollution Prevention "fixes" for auto repair and fleet maintenance operations.

## 4.7 Septic System

### Description

Septic systems or on-site wastewater disposal systems are underground wastewater treatment structures that use a combination of nature and technology to treat wastewater from household plumbing produced by bathrooms, kitchen drains, and laundry. A typical septic system has four main components: a pipe from the home, a septic tank, a drainfield, and the soil. Microbes in the soil digest or remove most contaminants from wastewater before it reaches ground water. The septic tank holds the wastewater long enough to allow solids to settle out and oil and grease to float to the surface. Tanks are designed to prevent sludge and scum from leaving the tank and traveling into the drainfield. Malfunctioning systems due to improper design and/or maintenance can release bacteria, viruses, and chemicals to ground water. Additionally, wastes disposed of improperly into septic systems can adversely impact operation of the system and contribute to ground water contamination. Septic systems are common in rural areas without centralized sewer systems.

### Possible Protection Activities

- Inspections and Technical Assistance
- Sanitary Setbacks
- Septic System Location and Maintenance

### Potential Contaminant Types

- IOC, Microbe

### Resources

- [EPA: Source Water Protection Practices Bulletin](#)  
Managing septic systems to prevent contamination of drinking water.
- [EPA: Homeowners Guide to Septic Systems](#)  
A brochure developed by the EPA that details all you need to know about your septic system and its maintenance.
- [EPA: NPS Outreach Toolbox](#)  
The Nonpoint Source (NPS) Outreach Toolbox is intended for use by state and local agencies and other organizations interested in educating the public on nonpoint source

pollution or stormwater runoff. The Toolbox contains a variety of resources to help develop an effective and targeted outreach campaign.

- [\*Septic Insight App\*](#)  
Get Insight on the function of your Septic System with this all in one app.

## 4.8 Stormwater Runoff/Storm Drain

### Description

Stormwater runoff is rainwater or snowmelt that flows over the land. Runoff can carry sediment and contaminants from streets, rooftops, and lawns to surface water bodies or can infiltrate through the soil to ground water. Storm drains are the metal grates found on urban and suburban streets, often at corners and on the sides of curbs and gutters. They help prevent flooding by draining stormwater runoff that does not percolate into the ground. Storm drains can be independent from sewer systems and may transport untreated stormwater directly to surface water or ground water. As runoff flows over the land or impervious surfaces, it accumulates debris, chemicals, oil, sediment, pet waste, soap used for washing cars, and other activities that can adversely affect water quality.

### Possible Protection Activities

- Erosion Control
- Conservation Buffers: Filter Strip
- Conservation Buffers: Riparian Buffer
- Conservation Buffers: Grass Waterways
- Conservation Buffers: Contour Buffer Strips
- Conservation Buffers: Field Borders
- Nutrient Management: Fertilizer Application Rates
- Nutrient Management: Fertilizer Types
- Nutrient Management: Fertilizer Application Timing
- Nutrient Management: Fertilizer Application Methods
- Proper Pesticide Application
- Proper Pesticide Storage, Handling, and Disposal
- Proper Fertilizer Storage, Handling, and Disposal
- Low Impact Development: Impervious Surface Reduction
- Low Impact Development: Green Roofs
- Low Impact Development: Rain Gardens
- Low Impact Development: Downspout Disconnection
- Low Impact Development: Rain Barrel
- Low Impact Development: Green Streets

- Low Impact Development: Xeriscaping
- Low Impact Development: Grass Swales
- Pollution Prevention
- Pet Waste Cleanup
- Street Sweeping
- Stormwater Retrofits
- Storm Drain Marking
- Proper Disposal of Household Hazardous Waste (HHW)
- Proper Storage, Handling, and Disposal of Hazardous Waste

### **Potential Contaminant Types**

- IOC, VOC, SOC, Microbe

### **Resources**

- [\*Ada County Highway District\*](#)  
Information on how you can help protect storm water quality.
- [\*Partners for Clean Water\*](#)  
Providing the Treasure Valley with the latest information on stormwater quality, the Partners for Clean Water work together to educate the community to keep pollutants out of stormwater and the environment.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing sanitary sewer overflows and combined sewer overflows to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing stormwater runoff to prevent contamination of drinking water.
- [\*EPA: NPS Outreach Toolbox\*](#)  
The Nonpoint Source (NPS) Outreach Toolbox is intended for use by state and local agencies and other organizations interested in educating the public on nonpoint source pollution or stormwater runoff. The Toolbox contains a variety of resources to help develop an effective and targeted outreach campaign.
- [\*EPA: Erosion and Sediment Control\*](#)  
Information on model ordinances related to erosion and sediment control.

- [\*Idaho Department of Environmental Quality Stormwater BMPs\*](#)  
Catalog of stormwater best management practices for Idaho cities and counties.
- [\*National Menu of Best Management Practices \(BMPs\) for Stormwater\*](#)
- [\*Friends of Yellow Creek Watershed\*](#)  
Information on healthy watersheds.
- [\*NOAA Coastal Services Center Impervious Surface Analysis Tool \(ISAT\)\*](#)  
ISAT is a custom suite of easy-to-use scripts for ArcGIS used to calculate the percentage of impervious surface area within user-selected geographic areas, such as watersheds, municipalities, and subdivisions.
- [\*EPA: Polluted Runoff - Nonpoint Source \(NPS\) Pollution\*](#)  
Information on managing urban runoff.
- [\*Stormwater Maintenance\*](#)  
Maintenance descriptions and EPA resources and state BMP manuals and maintenance information.
- [\*Impacts from Urban, Agricultural, Land Use, and Forested Watersheds\*](#)  
Water utilities can play a vital role in influencing land use decisions that affect drinking water sources. Runoff from different land uses can load significant amounts of nutrients and contaminants into source water. For each type of land use, tools and practices are available to generate positive impacts on water quality.

## 4.9 Waste Transfer and Recycling Facility

### Description

Waste transfer and recycling facilities handle residential and commercial solid waste residues that could be hazardous. Hazardous waste generated at a household can be disposed of in a municipal landfill and therefore could be common at waste transfer facilities if alternative disposal options are not available or used. Waste from conditionally exempt small quantity generators (businesses generating less than 220 pounds of hazardous waste each month) can also be disposed of in a municipal or non-municipal landfill through a conditional exemption in the hazardous waste regulations. Many hazardous wastes—such as electronic wastes, mercury-containing products, batteries, and used oil—can be recycled and are handled at recycling facilities. If improper storage or handling practices are used, ground water or surface water could be impacted.

**Possible Protection Activities**

- Household Hazardous Waste Diversion Programs/Events
- Proper Storage, Handling, and Disposal of Hazardous Waste

**Potential Contaminant Types**

- IOC, VOC, SOC

**4.10 Wastewater Lagoon****Description**

A wastewater lagoon is a man-made impoundment for the purpose of storing or treating wastewater. Lagoons should meet design standards and seepage rate standards compliant with IDAPA 58.01.16, “Wastewater Rules.” Note that mines and confined animal feeding operations are exempt from these rules. If lagoons are leaking, they may degrade waters of the state. Those leaking above allowable rates have rule requirements that may include fixing the lagoon or determining the impact of the leaking lagoon on the environment.

**Possible Protection Activities**

- Conditional Use Permits
- Ground Water Monitoring
- Sanitary Setbacks
- Pollution Prevention

**Potential Contaminant Types**

- IOC, Microbe

**4.11 Wastewater Treatment Facilities****Description**

Wastewater treatment facilities are facilities that receive and treat wastewater. They can be publicly or privately owned and are responsible for receiving and treating sewage and/or wastewater from households, commercial activities, and industries. Wastewater and sewage is conveyed to treatment facilities through sewer systems, which include pipes, lift stations, sewer lines, and manholes. Treated effluent is released back into surface water or applied to the land. If treatment standards are not met or pollutants pass through the plant untreated due to inadequate treatment methods, outdated facilities, or system failures, pollutants can enter waterways and contaminate drinking water sources. Additionally, if sanitary sewer overflows occur due to pipe

breaks, pump failures, grease buildup, or extreme rainstorms, raw sewage can overflow into city streets, property, or streams and contaminate drinking water sources.

### **Possible Protection Activities**

- Water Audits

### **Potential Contaminant Types**

- IOC, VOC, SOC, Microbe

### **Resources**

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing small quantity chemical use to prevent contamination of drinking water.

## **4.12 Water Reuse Area**

### **Description**

A water reuse area is where treated municipal or industrial wastewater is applied to land for irrigation. Improper application rate and timing of wastewater to the land can result in runoff to surface water or leaching into the ground water.

### **Possible Protection Activities**

- Conditional Use Permits
- Ground Water Monitoring
- Sanitary Setbacks
- Irrigation Water Management
- Pollution Prevention

### **Potential Contaminant Types**

- IOC, Microbe

## 5 Potential Sources of Contamination: Miscellaneous

### 5.1 Aboveground Storage Tank (AST)

#### Description

Aboveground storage tanks (ASTs) are tanks or other containers that are above ground, partially buried, bunkered, or in a subterranean vault.

The majority of ASTs store petroleum products such as motor fuels, petroleum solvents, heating oil lubricants, and used oil. Oil storage facilities with ASTs are typically found in refineries, and fuel distribution centers. ASTs may also be found in airports, school bus barns, hospitals, automotive repair shops, military bases, farms, and industrial plants. Discharges of chemicals, petroleum, or nonpetroleum oils from storage tanks can contaminate source water. Product spilled, leaked, or lost from storage tanks may accumulate in soils and infiltrate into ground water or be carried away in stormwater runoff to surface water.

#### Possible Protection Activities

- Conditional Use Permits
- Inspections and Technical Assistance
- Sanitary Setbacks
- Pollution Prevention
- Secondary Containment
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

#### Potential Contaminant Types

- VOC, SOC

#### Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of drinking water.

### 5.2 CERCLA Site

#### Description

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) sites, more commonly known as "Superfund" sites, are hazardous waste sites on the US Environmental Protection Agency's National Priorities List for cleanup. Over 80% of Superfund sites have

ground water that is contaminated to some degree. Although the Superfund program works to restore contaminated ground water at these sites, or prevent it from moving to uncontaminated areas, the existing contamination at these sites has the potential to impact drinking water sources.

### **Possible Protection Activities**

- Ground Water Monitoring
- Erosion Control
- Pollution Prevention

### **Potential Contaminant Types**

- IOC, VOC, SOC

## **5.3 Construction/Demolition Areas**

### **Description**

Areas where construction or demolition activities take place can impact water quality if inadequate erosion control practices result in discharges of sediment and other pollutants to surface water bodies through stormwater runoff. The frequent movement of equipment and vehicles on and off the site can cause mud and debris to be tracked from the site and cause increased soil compaction, which reduces infiltration and increases runoff volume. The tracked mud and debris is deposited on the roads, which are usually connected to the stormwater drainage system that leads directly to a surface water body. Other pollutants associated with construction activities include chemicals, fuel, and lubricants, which if not handled, stored, or disposed of correctly can contaminate ground water or surface water.

### **Possible Protection Activities**

- Phased Development
- Inspections and Technical Assistance
- Erosion Control
- Spill Prevention and Control

### **Potential Contaminant Types**

- IOC, VOC, Sediment

### **Resources**

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing stormwater runoff to prevent contamination of drinking water.

- [\*EPA: NPS Outreach Toolbox\*](#)  
The Nonpoint Source (NPS) Outreach Toolbox is intended for use by state and local agencies and other organizations interested in educating the public on nonpoint source pollution or stormwater runoff. The Toolbox contains a variety of resources to help develop an effective and targeted outreach campaign.
- [\*Idaho Small Business Development Center: Environmental Regulations\*](#)  
The Idaho Small Business Development Center offers no-cost, confidential assistance in complying with environmental regulations.
- [\*EPA: Erosion and Sediment Control\*](#)  
Information on model ordinances related to erosion and sediment control.
- [\*Idaho Department of Environmental Quality Stormwater BMPs\*](#)  
Catalog of stormwater best management practices for Idaho cities and counties.
- [\*Low Impact Development Center\*](#)  
Information on green streets.

## 5.4 Deep Injection Well

### Description

Deep injection wells are used for disposing fluids by permanently placing them underground. In Idaho, excess stormwater, agricultural water, and facility heating/cooling water are the most common fluids disposed of with injection wells. The construction and use of large-capacity cesspools and motor vehicle waste disposal wells is prohibited in Idaho. Deep injection wells are deeper than 18 feet below ground surface and are regulated by the Idaho Department of Water Resources. Injection wells can directly or indirectly cause negative impacts to ground water resources if not properly sited, constructed, or operated.

### Possible Protection Activities

- Sanitary Setbacks

### Potential Contaminant Types

- IOC, VOC, SOC, Microbe

## 5.5 Forest Roads

### Description

The construction and design of forest roads can alter vegetation important for maintaining bank and shoreline stabilization and moderating water temperatures, encourage erosion through steep slopes, interfere with natural surface water flow patterns, and introduce potential contaminants through construction equipment and vehicle fuel spills.

### Possible Protection Activities

- Erosion Control
- Spill Prevention and Control

### Potential Contaminant Types

- VOC, SOC, Sediment

### Resources

- [\*USDA Forest Service: Northern Research Station\*](#)  
Information on forest and road construction and maintenance.
- [\*EPA: NPS Outreach Toolbox\*](#)  
The Nonpoint Source (NPS) Outreach Toolbox is intended for use by state and local agencies and other organizations interested in educating the public on nonpoint source pollution or stormwater runoff. The Toolbox contains a variety of resources to help develop an effective and targeted outreach campaign.

## 5.6 General Waste Site

### Description

A general waste site is where the Idaho Department of Environmental Quality Waste Management and Remediation Program has initiated remediation actions and includes sites such as brownfields, above ground storage tanks, leaking underground storage tanks, Resources Conservation and Recovery Act sites, mines, and emergency response sites. Waste remediation is a process in which contaminants are removed or neutralized so they cannot cause harm. The extent and degree of contamination varies by site but can impact ground water and surface water.

### Possible Protection Activities

- Ground Water Monitoring

- Proper Storage, Handling, and Disposal of Hazardous Waste

### **Potential Contaminant Types**

- Site specific

## **5.7 Landfill**

### **Description**

Landfills are areas of land or excavations where wastes (garbage) are placed for permanent disposal. Chemicals that should be disposed of in hazardous waste landfills sometimes end up in municipal landfills. In addition, the disposal of many household wastes is not regulated and many of these wastes are placed in municipal landfills. Once in the landfill, chemicals can leach into ground water via precipitation and surface runoff. Many older or closed landfills do not have the safeguards that are required today.

### **Possible Protection Activities**

- Ground Water Monitoring
- Household Hazardous Waste Diversion Programs/Events
- Sanitary Setbacks
- Proper Disposal of Household Hazardous Waste (HHW)

### **Potential Contaminant Types**

- IOC, VOC, SOC

### **Resources**

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing pet and wildlife waste to prevent contamination of drinking water.

## **5.8 Landslides, Burn Areas, Clear-Cut Forest Areas**

### **Description**

Landslides, areas with fire damage, and clear-cut forest areas can impact water quality on both a short- and long-term basis. Soon after land-disturbing events, material and sediment can wash into surface water due to the exposure of erodible soils. Carbon can also leach into the ground water after a burn. In the long-term, water quality effects occur from the loss of erosion and runoff protection that is afforded by vegetation and from the development of hydrophobic soils.

Hydrophobic soils repel water, causing rain to run off rather than infiltrate. Soils can reach this state after intense heating during a fire and can persist in this state for more than a year if left untreated. Firefighting retardant can contain chemicals such as nitrogen and phosphorous and can have adverse impacts on water quality if sprayed directly over lakes and streams or if it enters stormwater runoff.

### 5.8.1 Possible Protection Activities

- Erosion Control

### 5.8.2 Potential Contaminant Types

- Sediment

### 5.8.3 Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing pet and wildlife waste to prevent contamination of drinking water.
- [\*University of Idaho\*](#)  
Information on hydrophobic soils after fires.
- [\*EPA: NPS Outreach Toolbox\*](#)  
The Nonpoint Source (NPS) Outreach Toolbox is intended for use by state and local agencies and other organizations interested in educating the public on nonpoint source pollution or stormwater runoff. The Toolbox contains a variety of resources to help develop an effective and targeted outreach campaign.

## 5.9 Leaking Underground Storage Tank

### 5.9.1 Description

Petroleum releases from leaking underground storage tanks (LUSTs) pose numerous potential threats to human health and the environment. Petroleum can seep into and through the soil to the water table. At the water table, these liquids can accumulate as a pool on top of the water because most substances in underground storage tanks (USTs) (e.g., petroleum) are less dense than water. Here the chemicals can dissolve into and contaminate ground water and surface water. In Idaho, ground water supplies about 95% of the population's drinking water, so keeping it clean is a high priority. In addition, vapors from petroleum releases can be a health and safety concern within buildings and around construction workers.

### **5.9.2 Possible Protection Activities**

- Conditional Use Permits
- Pollution Prevention
- Secondary Containment
- Spill Prevention and Control

### **Potential Contaminant Types**

- IOC, VOC, SOC, Microbe

## **5.10 Major and Minor Roads**

### **Description**

Major and minor roads include interstates; state and US highways; county, local, private, residential, and seasonal roads; and trails. Contaminants from vehicles and activities associated with road and highway construction and maintenance are washed from roads and roadsides with rain or snowmelt and can seep into ground water or run off directly to surface water bodies. Contaminants can include herbicides from right-of-way treatment, road salt and road salt anti-corrosives, anticaking additives, automotive fluids, and fertilizers. Major roads pose an additional threat from the potential for large volume spills of materials contained in tankers and semi-trucks.

### **Possible Protection Activities**

- Phased Development
- Erosion Control
- Low Impact Development: Impervious Surface Reduction
- Low Impact Development: Green Streets
- Road Salt Reduction
- Street Sweeping
- Spill Prevention and Control

### **Potential Contaminant Types**

- IOC, VOC, SOC, Sediment

## Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing small-scale application of pesticides to prevent contamination of drinking water.
- [\*NOAA Coastal Services Center Impervious Surface Analysis Tool \(ISAT\)\*](#)  
ISAT is a custom suite of easy-to-use scripts for ArcGIS used to calculate the percentage of impervious surface area within user-selected geographic areas, such as watersheds, municipalities, and subdivisions.
- [\*Low Impact Development Center\*](#)  
Information on green streets.

## 5.11 NPDES Location

### Description

National Pollutant Discharge Elimination System (NPDES) locations represent sites from which pollutants are or may be discharged to surface water from a point source location and are required to obtain an NPDES permit. The NPDES permit program seeks to protect the beneficial uses, including drinking water, of all streams and lakes by regulating the amount of pollution that can enter waters of the United States by discharges from industrial, municipal, agricultural, or other point sources. According to the US Environmental Protection Agency, a point source means any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, concentrated animal feeding operation, or vessel or other floating craft from which pollutants are or may be discharged. Properly managed NPDES facilities play an important role in protecting drinking water sources.

### Possible Protection Activities

- CAFO Siting Evaluations
- CAFO Permits
- Stormwater Retrofits
- Storm Drain Marking

### Potential Contaminant Types

- Site specific

## Resources

- [EPA: Source Water Protection Practices Bulletin](#)  
Information on managing stormwater runoff to prevent contamination of drinking water.
- [Idaho Department of Environmental Quality Stormwater BMPs](#)  
Catalog of stormwater best management practices for Idaho cities and counties.
- [Idaho DEQ IPDES Program](#)

## 5.12 Road Salt Location

### Description

A road salt location is where road salt and sand are stored. Salt contributes to increased chloride levels in ground water and surface water through infiltration or runoff from roadways. Also, if runoff containing road salt reaches stormwater injection wells, it can provide a concentrated input of chloride to ground water. Additionally, the sand stored at these locations can enter surface water from stormwater runoff and can increase turbidity, negatively affecting the water quality. Proper salt and sand storage is key to preventing the introduction of potentially harmful contaminant loads to nearby surface and ground waters.

### Possible Protection Activities

- Pollution Prevention
- Road Salt Reduction
- Street Sweeping

### Potential Contaminant Types

- IOC, Sediment

## 5.13 Shallow Injection Well

### Description

Shallow injection wells are less than or equal to 18 feet in depth and used as a means to dispose fluids in the subsurface by permanently placing fluids underground. In Idaho, excess stormwater, agricultural water, and facility heating/cooling water are the most common fluids disposed of with injection wells. The construction and use of large-capacity cesspools and motor vehicle waste disposal wells is prohibited in Idaho. Injection wells can directly or indirectly cause negative impacts to ground water resources if not properly sited, constructed, or operated.

**Possible Protection Activities**

- Sanitary Setbacks

**Potential Contaminant Types**

- IOC, VOC, SOC, Microbe

**5.14 Stormwater Runoff/Storm Drain****Description**

Stormwater runoff is rainwater or snowmelt that flows over the land. Runoff can carry sediment and contaminants from streets, rooftops, and lawns to surface water bodies or can infiltrate through the soil to ground water. Storm drains are the metal grates found on urban and suburban streets, often at corners and on the sides of curbs and gutters. They help prevent flooding by draining stormwater runoff that does not percolate into the ground. Storm drains can be independent from sewer systems and may transport untreated stormwater directly to surface water or ground water. As runoff flows over the land or impervious surfaces, it accumulates debris, chemicals, oil, sediment, pet waste, soap used for washing cars, and other activities that can adversely affect water quality.

**Possible Protection Activities**

- Erosion Control
- Conservation Buffers: Filter Strip
- Conservation Buffers: Riparian Buffer
- Conservation Buffers: Grass Waterways
- Conservation Buffers: Contour Buffer Strips
- Conservation Buffers: Field Borders
- Nutrient Management: Fertilizer Application Rates
- Nutrient Management: Fertilizer Types
- Nutrient Management: Fertilizer Application Timing
- Nutrient Management: Fertilizer Application Methods
- Proper Pesticide Application
- Proper Pesticide Storage, Handling, and Disposal
- Proper Fertilizer Storage, Handling, and Disposal
- Low Impact Development: Impervious Surface Reduction
- Low Impact Development: Green Roofs
- Low Impact Development: Rain Gardens
- Low Impact Development: Downspout Disconnection
- Low Impact Development: Rain Barrel

- Low Impact Development: Green Streets
- Low Impact Development: Xeriscaping
- Pollution Prevention
- Pet Waste Cleanup
- Street Sweeping
- Stormwater Retrofits
- Storm Drain Marking
- Proper Disposal of Household Hazardous Waste (HHW)
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Low Impact Development: Grass Swales

### **Potential Contaminant Types**

- IOC, VOC, SOC, Microbe

### **Resources**

- [\*Ada County Highway District\*](#)  
Information on how you can help protect storm water quality.
- [\*Partners for Clean Water\*](#)  
Providing the Treasure Valley with the latest information on stormwater quality, the Partners for Clean Water work together to educate the community to keep pollutants out of stormwater and the environment.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing sanitary sewer overflows and combined sewer overflows to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing stormwater runoff to prevent contamination of drinking water.
- [\*EPA: NPS Outreach Toolbox\*](#)  
The Nonpoint Source (NPS) Outreach Toolbox is intended for use by state and local agencies and other organizations interested in educating the public on nonpoint source pollution or stormwater runoff. The Toolbox contains a variety of resources to help develop an effective and targeted outreach campaign.
- [\*EPA: Erosion and Sediment Control\*](#)  
Information on model ordinances related to erosion and sediment control.

- [\*Idaho Department of Environmental Quality Stormwater BMPs\*](#)  
Catalog of stormwater best management practices for Idaho cities and counties.
- [\*Friends of Yellow Creek Watershed\*](#)  
Information on healthy watersheds.
- [\*NOAA Coastal Services Center Impervious Surface Analysis Tool \(ISAT\)\*](#)  
ISAT is a custom suite of easy-to-use scripts for ArcGIS used to calculate the percentage of impervious surface area within user-selected geographic areas, such as watersheds, municipalities, and subdivisions.
- [\*EPA: Polluted Runoff - Nonpoint Source \(NPS\) Pollution\*](#)  
Information on managing urban runoff.
- [\*Impacts from Urban, Agricultural, Land Use, and Forested Watersheds\*](#)  
Water utilities can play a vital role in influencing land use decisions that affect drinking water sources. Runoff from different land uses can load significant amounts of nutrients and contaminants into source water. For each type of land use, tools and practices are available to generate positive impacts on water quality.

## 5.15 Surface Water

### Description

Surface water, such as lakes, ponds, streams, and rivers, contain pathogens and bacteria from numerous sources including waterfowl and mammals. Surface water can also contain contamination from hazardous substances that are discharged directly from an outfall pipe or storm water runoff that comes into contact with contamination on the land surface.

### Possible Protection Activities

- Fencing
- Erosion Control
- Conservation Buffers: Filter Strip
- Conservation Buffers: Riparian Buffer
- Low Impact Development: Impervious Surface Reduction
- Low Impact Development: Green Roofs
- Low Impact Development: Rain Gardens
- Low Impact Development: Downspout Disconnection
- Low Impact Development: Rain Barrel

- Low Impact Development: Green Streets
- Low Impact Development: Xeriscaping
- Low Impact Development: Grass Swales
- Pet Waste Cleanup
- Road Salt Reduction
- Street Sweeping
- Stormwater Retrofits
- Storm Drain Marking

### **Potential Contaminant Types**

- IOC, VOC, SOC, Microbe

### **Resources**

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing pet and wildlife waste to prevent contamination of drinking water.
- [\*Storm Drain Marking Toolkit\*](#)  
The storm drain marking toolkit is a set of materials designed to assist cities and counties in planning and implementing a community event to mark storm drains. The purpose of the program is to provide a visible way to advise citizens not to dump waste down storm drains.

## **5.16 Tier II (formerly CAMEO)**

### **Description**

Tier II (CAMEO [Computer-Aided Management of Emergency Operations]) chemical facilities store or use hazardous material. Discharges of hazardous material from these facilities through leaks or spills can contaminate source water by accumulating in soils and infiltrating to ground water or being carried away in stormwater runoff to surface water. The Idaho Bureau of Homeland Security maintains a list of CAMEO facilities in the CAMEO database.

### **Possible Protection Activities**

- Conditional Use Permits
- Inspections and Technical Assistance
- Green Business Awards
- Sanitary Setbacks

- Pollution Prevention
- Secondary Containment
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

### **Potential Contaminant Types**

- IOC, VOC, SOC

### **Resources**

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing above ground storage tanks to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing small quantity chemical use to prevent contamination of drinking water.

## **5.17 Underground Storage Tank (UST)**

### **Description**

While many types of storage tanks may be buried underground, the term “underground storage tank” refers specifically to certain types of tanks that are regulated under the federal Resource Conservation and Recovery Act. These tanks are buried at least 10% underground and store either petroleum products (e.g., gasoline, diesel, kerosene, jet fuel) or certain hazardous substances. The underground piping connected to the tanks is also considered part of the UST. USTs are most often found at gas stations and other fueling facilities. If an UST develops a leak, its contents can migrate through the soil and reach ground water.

### **Possible Protection Activities**

- Conditional Use Permits
- Inspections and Technical Assistance
- Sanitary Setbacks
- Pollution Prevention
- Secondary Containment
- Proper Storage, Handling, and Disposal of Hazardous Waste
- Spill Prevention and Control

## Potential Contaminant Types

- VOC, SOC

## Resources

- [EPA: Source Water Protection Practices Bulletin](#)  
Information on managing underground storage tanks to prevent contamination of drinking water.
- [Idaho Department of Environmental Quality UST-LUST Database Search](#)  
DEQ maintains a database of active and closed UST sites across the state.
- [Idaho Department of Environmental Quality](#)  
Information on underground storage tanks in Idaho.

## 5.18 Unsealed, Insufficiently Sealed, or Abandoned Wells and Test Holes

### Description

Unsealed or improperly abandoned wells or test holes can threaten the quality of drinking water because they can act as conduits for contaminants to move from the surface through the earth's protective formations into deeper aquifers. Deteriorated well casings, open uncased boreholes, and poor or absent annular seals allow water to move between previously separated aquifers, which can degrade water quality. In addition, abandoned wells are sometimes used for illegal waste dumping. Current state regulations require that public water system wells have no less than 58 feet of annular seal and private wells no less than 38 feet. Seals prevent the possible downward movement of contaminated surface waters or other fluids in any annular space around the well casing and prevent the movement of ground water either upward or downward from different zones of pressure, temperature, or quality within the well or outside the casing.

### Possible Protection Activities

- Proper Well Decommissioning

### Potential Contaminant Types

- Site specific

## Resources

- [\*Idaho Well Construction Standard Rules\*](#)  
Information on the decommissioning (abandoning) of wells.
- [\*Idaho Department of Water Resources\*](#)  
Application for authorization to abandon a well.

## 6 Protection Activity: Best Management Practices

### 6.1 Conservation Buffers: Contour Buffer Strips

#### Description

Conservation buffers are small areas or strips of land in permanent naturally occurring or planted vegetation that are designed to intercept pollutants and manage other environmental concerns. The vegetation filters out sediments, nutrients, pesticides, and other pollutants before they reach the water body. Conservation buffers can include filter strips, riparian buffers, grass waterways, contour buffer strips, and field borders.

Contour buffer strips are strips of perennial vegetation that alternate downslope from wider cultivated strips and are farmed on the contour. Buffer strip vegetation consists of adapted species of grasses or a mixture of grasses and legumes. Buffer strips established on the contour can significantly reduce sheet and rill erosion, slow runoff, trap sediment, and remove nutrients, pesticides, and other contaminants as they pass through the buffer strip, thereby reducing the potential for increased turbidity in source waters and introduction of other contaminants.

#### Resources

- [\*NRCS Contour Buffer Strips\*](#)

### 6.2 Conservation Buffers: Field Borders

#### Description

Typically grass, a field border is a strip of vegetative cover established around a field perimeter that reduces the sediment load in water leaving the field. Borders can slow field runoff, capture soil, prevent rill and gully erosion, and prevent soil from entering streams. Use field borders to comply with required field setback distances applicable to manure and chemical applications.

### **6.3 Conservation Buffers: Filter Strip**

#### **Description**

Filter strips are vegetated surfaces designed to treat stormwater runoff from adjacent surfaces. Filter strips slow runoff velocities, filter out sediment and other pollutants, and provide infiltration into underlying soils. With proper design and maintenance, filter strips offer high pollutant removal when treating runoff from roads and highways, roof downspouts, very small parking lots, and pervious surfaces.

### **6.4 Conservation Buffers: Grass Waterways**

#### **Description**

Grass waterways are sloped grassed channels, generally broad and shallow, that prevent soil erosion while draining runoff water from adjacent cropland. The grass vegetation also prevents erosion that results from concentrated flows and prevents gully erosion in areas of concentrated flow.

#### **Resources**

- [\*NRCS Engineering Field Handbook: Grassed Waterways\*](#)

### **6.5 Conservation Buffers: Riparian Buffer**

#### **Description**

Naturally vegetated lands along rivers and streams are called riparian buffers. Appropriately sized areas can limit streambank erosion, reduce flood flows, filter and settle-out pollutants, and protect aquatic and terrestrial habitat. As a tool for local governments, riparian buffers are used to maintain riparian area functions. Riparian buffers can be reestablished through landowner education, land acquisition, revegetation, and land-use controls on new development.

### **6.6 Conservation Crop Rotation**

#### **Description**

Crop rotation involves growing crops in a recurring sequence on the same field and can result in numerous benefits for the crop and the environment. When implemented as part of a conservation management system, crop rotation helps to reduce erosion, protect water quality, improve water infiltration, improve soil richness, manage nutrient concentrations, improve irrigation efficiency, manage pests, provide food for livestock and wildlife, provide cover for wildlife, and maintain or improve agronomic yields.

## 6.7 Deep Tillage

### Description

A deeper than normal tillage depth can modify soil's physical or chemical properties. When deep tillage is practiced as part of a conservation management system, it can improve infiltration, root penetration, and aeration; reduce runoff and erosion; increase soil mixing; and reduce the concentration of contaminants. All these improvements help lead to improved water quality.

## 6.8 Erosion Control

### Description

Erosion is the wearing away of the land surface by running water, wind, ice, or other geological processes. Erosion can be accelerated and exaggerated by human activity when soils are disturbed through uncontrolled development, agricultural practices, grazing, and deforestation. Agricultural and construction site erosion cause siltation in waterways, which contributes to turbid conditions and poor water quality.

Erosion control activities can include setting general construction site guidelines such as timing of construction, staging areas, preservation of existing vegetation, clearing limits, stabilization of construction entrances, and erosion prevention on temporary and private roads. Other controls include mulching, installing geotextile, matting, using soil binders, topsoiling, seeding, sodding, planting, using pipe slope drains, roughening slopes, gradient terracing, and building retaining walls. Idaho's Catalog of Stormwater Best Management Practices for Idaho Cities and Counties has a full description of available best management practices to initiate erosion control.

### Resources

- [\*Ada County Highway District\*](#)  
Information on how you can help protect storm water quality.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing stormwater runoff to prevent contamination of drinking water.
- [\*EPA: Erosion and Sediment Control\*](#)  
Information on model ordinances related to erosion and sediment control.
- [\*Idaho Department of Environmental Quality Stormwater BMPs\*](#)  
Catalog of stormwater best management practices for Idaho cities and counties.
- [\*Friends of Yellow Creek Watershed\*](#)  
Information on healthy watersheds.

- [\*EPA: Polluted Runoff - Nonpoint Source \(NPS\) Pollution\*](#)  
Information on managing urban runoff.

## 6.9 Fencing

### Description

Fencing around a drinking water source prevents the trespass of livestock and wildlife and helps ensure other sanitary setbacks are met. Fencing also enhances the security of the system by preventing unauthorized entry.

### Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing pet and wildlife waste to prevent contamination of drinking water.

## 6.10 Green Chemistry

### Description

Green chemistry is the design of chemical products and processes that reduce or eliminate the use or generation of hazardous substances. Green chemistry spans the life of a product, from design and manufacture through its final use. The use of less-hazardous substances can potentially reduce the susceptibility of drinking water sources to potential contaminants within its source water protection area. Incorporating green chemistry in business practices; at schools (cleaning practices, chemistry curriculum); and within residential homes can greatly reduce threats to source water.

## 6.11 Integrated Pest Management

### Description

Integrated pest management (IPM) is a strategy of pest control that involves evaluating all possible strategies (chemical and nonchemical) to reduce crop losses but using pesticides only as the last resort. IPM relies on regularly inspecting crops to assess pest levels and damage. Nonchemical control options include mechanical, cultural, and biological controls (e.g., crop rotation and cultivation); sanitation (e.g., cleaning equipment to reduce introductions); and pest-resistant plants.

## Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing small-scale application of pesticides to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing large-scale application of pesticides to prevent contamination of drinking water.
- [\*EPA: Polluted Runoff - Nonpoint Source \(NPS\) Pollution\*](#)  
Information on managing urban runoff.

## 6.12 Irrigation Water Management

### Description

Irrigation water management (IWM) involves a combination of management strategies aimed at delivering irrigation water in amounts and at times that best match crop water needs. Proper IWM can reduce the movement of pollutants such as salts, pesticides, nutrients, bacteria, and sediment from the land into ground or surface water sources. IWM strategies can include leveling irrigation land, efficiently applying irrigation water, scheduling irrigation, using runoff or tailwater, and managing drainage water.

#### *Irrigation Land Leveling*

Irrigation land leveling involves strategically reshaping the irrigated land surface to allow for uniform and efficient application of irrigation water and reduced runoff.

#### *Irrigation Application Methods*

Irrigation water can be applied using four basic methods: (1) surface (or flood), (2) sprinkler, (3) trickle, and (4) subsurface. When selecting the appropriate irrigation method, consider land slope, water intake rate of the soil, crop water needs, and wind.

#### *Irrigation Scheduling*

Irrigation scheduling uses water management strategies to balance the water needs of a crop, avoiding both over- and under-application of water. Irrigation scheduling ensures the proper amount of water is applied to the crop when needed.

#### *Proper Tailwater Management*

Tailwater management reduces the discharge of pollutants from surface runoff. Tailwater management systems that collect and/or store runoff and return it to the same or other fields for irrigation use include recovery and reuse facilities, return-flow or pumpback facilities, sequence-use facilities, reservoir systems, or cycling-sump facilities.

### *Proper Drainage Water Management*

Drainage management or water table control is an essential element of irrigation water management in places where the water table impinges upon the root zone. Drainage management practices are intended to control and manage soil moisture in the crop root zone, improve soil conditions, and improve plant root development. These practices can also benefit source water and crops by encouraging infiltration, reducing soil erosion, keeping salts leached below the root zone, and deepening the root zone. However, subsurface drainage systems can also have adverse impacts on water quality, so appropriate management practices—including water table management, treatment of drainage water, and reuse of drainage water—should be used to limit such impacts. If interested in these practices, seek assistance from an entity familiar with designing and operating drainage systems.

## **6.13 Low Impact Development**

### **Description**

Low impact development is an approach to land development (or redevelopment) that incorporates natural features to manage stormwater and protect water quality. Low impact development minimizes runoff by promoting infiltration, evapotranspiration, and collection for use through natural landscape features and fewer impervious surfaces. The result is a functional and visually appealing development that treats stormwater as a resource, not as waste.

### **Downspout Disconnection**

Rooftop runoff can flow indirectly or directly to storm sewers or surface water, taking pollutants with it. Pollution and increased flow can harm fish, wildlife, habitat, and drinking water. If flooding occurs, sewage and wastewater can also flow into natural waterways. To reduce water quality impacts, redirect flow from downspouts into yards or gardens to reduce the amount of runoff by allowing some infiltration and remove some pollutants through the soil and vegetation.

### **Grass Swales**

Grass swales are depressions in the ground near impervious surfaces that collect stormwater runoff from streets, driveways, parking lots, and other hard surfaces. Once water is collected in the swale, infiltration helps remove contaminants before the water recharges ground water supplies. Grass swales also provide a place for snow storage in winter months.

### **Green Roofs**

Green roofs are roof surfaces planted with living plants. Green roofs can protect waters from pollution because they absorb and delay rainfall runoff, thereby reducing pollutants from stormwater runoff.

## **Green Streets**

Green streets refer to transportation rights-of-way that use natural features, landscaping, and water quality protection elements to reduce stormwater runoff and improve water quality while creating aesthetically pleasing, livable communities. Common features of green streets include alternative street designs, swales, bioretention curb extensions, sidewalk planters, permeable pavement, and sidewalk trees and vegetation.

## **Impervious Surface Reduction**

Impervious surfaces are those such as roads, buildings, housing developments, and parking lots that replace natural landscapes as development occurs. Impervious surfaces can affect water quality, streamflow, and flooding characteristics of streams, particularly in urban and suburban areas where storm drains carry significant runoff from roofs and paved areas to nearby waterways rather than allowing rain and snowmelt to soak into the ground. Stormwater runoff can carry pollutants such as oil, dirt, chemicals, and lawn fertilizers directly to streams and rivers where they harm water quality. In contrast, rainfall in vegetated watersheds is absorbed into soils (infiltration), stored as ground water, and slowly discharged to streams through seeps and springs. Flooding is less significant in these watersheds because some of the runoff during a storm is absorbed into the ground, lessening the amount of stormwater runoff into a stream.

As development and impervious surface area increase, flooding can occur more frequently, impacting water quality. Reducing impervious surface area can reduce runoff and impacts to water quality. Options include using landscaped center islands, porous pavement materials, or mulch and gravel, which helps reduce site runoff rates by maximizing surface roughness, infiltration opportunities, and flow paths. Structural controls can also be used, such as building common driveways on adjoining lots so one driveway can serve both properties.

## **Rain Barrel**

A rain barrel is any type of container that collects rainwater from downspouts and rooftops. As water accumulates in the container, it can be used for activities such as watering gardens or washing cars. By collecting and storing rainwater, rain barrels reduce flows to nearby receiving waters, especially during storm events.

## **Rain Gardens**

Rain gardens are landscaped areas designed to capture runoff from a rooftop or paved surface and allow it to slowly infiltrate into the soil. They remove pollutants and can be beautiful alternatives to traditional lawns.

## **Xeriscaping**

Xeriscaping is a type of landscaping focused on reducing irrigation needs by using native, drought-tolerant plants and other techniques that minimize water use. As a result, xeriscaping can also reduce pollutants—such as pesticides, fertilizers, and contaminants from lawn mowing equipment—that may impact ground water or surface water.

## Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing stormwater runoff to prevent contamination of drinking water.
- [\*EPA: Polluted Runoff - Nonpoint Source \(NPS\) Pollution\*](#)  
Information on managing urban runoff.
- [\*Idaho Department of Environmental Quality\*](#)  
The Green Project Reserve requires all Clean Water State Revolving Fund (CWSRF) programs to direct a portion of their capitalization grant toward projects that address green infrastructure, water efficiency, energy efficiency, or other environmentally innovative activities.
- [\*Low Impact Development Center\*](#)  
Information on green streets.
- [\*NOAA Coastal Services Center Impervious Surface Analysis Tool \(ISAT\)\*](#)  
ISAT is a custom suite of easy-to-use scripts for ArcGIS used to calculate the percentage of impervious surface area within user-selected geographic areas, such as watersheds, municipalities, and subdivisions.

## 6.14 Nutrient Management

### Description

Nutrient management includes managing the amount, source, placement, form, and timing of nutrient and soil amendment applications. Nutrient management practices can minimize the potential for environmental damage including agricultural nonpoint source pollution of surface and ground water sources; maintain or improve the physical, chemical, or biological condition of soil; prevent or reduce excess nutrient concentrations in the soil; properly use all sources of organic material, including animal waste, as a plant nutrient source; and save money.

### Fertilizer Application Methods

Fertilizer application methods should be selected according to soil type, crop, weather conditions, slope, and irrigation practices. Inspect and calibrate fertilizer application equipment regularly and as recommended. Examples of application methods include banding, pop-up, broadcast, topdress, and sidedress applications. See the University of Idaho Fertilizer Guidelines for more information, or contact your local extension office.

Band application involves placing fertilizer in a band, often two inches to the side of and two inches down from the seed, during planting. Since band application is done during planting, it is also referred to as a starter application. The band can safely supply the young plants with nutrients without damaging the tender roots.

Pop-up fertilizer is placed with the seed (as opposed to near the seed) during planting. The fertilizer supplies early season nutrients like starter fertilizers (see band application).

Broadcast fertilizer application involves uniformly applying fertilizers or other beneficial micronutrients over the soil surface before planting. After broadcasting, tilling the soil will incorporate the nutrients and reduce losses due to volatilization and denitrification. Broadcast fertilizing is not beneficial with immobile nutrients such as phosphorus that need to be placed closer to the root zone.

Topdressing involves applying fertilizers, usually nitrogen, over the soil and plant surface after planting.

Sidedress application involves applying fertilizer between crop rows. Certain tests can help determine whether a sidedress application will be beneficial to the crop. Sidedressing is not effective for immobile nutrients such as phosphorous.

## **Fertilizer Application Rates**

Proper fertilizer application rates limit fertilizer to an amount necessary to achieve realistic crop yield goals. Yearly soil sampling will help to determine plant nutrient needs and to make accurate fertilizer recommendations. Optimal application rate calculation includes crediting other sources that contribute nitrogen and phosphorous to the soil.

## **Fertilizer Application Timing**

Time fertilizer applications to capitalize on periods of maximum crop uptake. Applying part of the fertilizer in the spring and following up with period applications as needed has proven to be a successful technique for improving crop uptake and decreasing leaching. Applying the full amount of fertilizer in the fall has been shown to cause ground water degradation. Abnormal weather or crop quality may necessitate altering the fertilizer amounts or timing.

## **Fertilizer Types**

Fertilizer is available in different forms (fertilizer types), and applying the correct form helps reduce the amount of contamination leached into soils. For example, nitrate forms of nitrogen fertilizer are especially susceptible to leaching and should be used only when the leaching potential is low. Ammonium nitrogen fertilizers can be used in moderate to high leaching potential scenarios but should be limited when soils are warm and moist (conditions favorable to nitrate conversion). Use slow-release nitrogen fertilizers in these conditions. Nitrification

inhibitors can also delay the conversion of ammonium to nitrate under certain conditions. See the University of Idaho Fertilizer Guidelines for more information, or contact your local extension office.

## Resources

- [EPA: Source Water Protection Practices Bulletin](#)  
Information on managing turfgrass and garden fertilizer application to prevent contamination of drinking water.
- [EPA: Source Water Protection Practices Bulletin](#)  
Information on managing agricultural fertilizer application to prevent contamination of drinking water.
- [Cornell University](#)  
Whole farm nutrient management tutorials.
- [University of Idaho Extension](#)  
Northern Idaho fertilizer guide.
- [University of Idaho Extension](#)  
Southern Idaho fertilizer guides.
- [EPA: Polluted Runoff - Nonpoint Source \(NPS\) Pollution](#)  
Information on managing urban runoff.

## 6.15 Pet Waste Cleanup

### Description

Pet owners should always pick up pet waste and throw it in the trash. Pet waste is full of bacteria that is a health risk to pets and people, especially children. If washed into storm drains and surface water, the bacteria can harm aquatic life and contaminate drinking water supplies. Pet waste can increase the biological oxygen demand of surface water, which reduces water oxygen content and puts a strain on aquatic life. In some jurisdictions, picking up after a pet is legally required.

### Resources

- [EPA: Source Water Protection Practices Bulletin](#)  
Information on managing pet and wildlife waste to prevent contamination of drinking water.

- [EPA: Polluted Runoff - Nonpoint Source \(NPS\) Pollution](#)  
Information on managing urban runoff.

## 6.16 Pollution Prevention

### Description

Pollution prevention (P2) is any activity—including the use of materials, processes, or practices—that reduces or eliminates the creation of pollutants or waste at the source. Instead of trying to manage the wastes or pollutants through treatment or disposal methods, P2 aims to prevent the initial generation or reduce the toxicity of wastes and pollutants such as hazardous waste, air pollutants, solid waste, and wastewater. P2 also includes any activity that reduces the toxicity of materials purchased or reduces the consumption of resources such as raw materials, water, energy, or fuel. P2 methods can reduce the susceptibility of drinking water sources to potential contaminants within a source water protection area.

### Resources

- [Community-Based Social Marketing](#)  
This site consists of resources for those working to foster sustainable behaviors, such as those involved in conservation, energy efficiency, transportation, waste reduction, and water efficiency.
- [EPA: Source Water Protection Practices Bulletin](#)  
Information on managing small quantity chemical use to prevent contamination of drinking water.
- [Idaho Environmental Guide](#)  
The Idaho Environmental Guide is a resource for local government officials to assist in managing a community's environmental responsibilities.
- [Idaho Small Business Development Center: Environmental Regulations](#)  
The Idaho Small Business Development Center offers no-cost, confidential assistance in complying with environmental regulations.
- [Pollution Prevention Resource Exchange Topic Hubs](#)  
The Pollution Prevention Resource Exchange (P2Rx™) is a national partnership of regional pollution prevention information centers funded in part through grants from EPA. They build networks, deliver P2 information, and measure P2 program results.
- [Pollution Prevention Resource Center](#)  
The Pacific Northwest Pollution Prevention Resource Center (PPRC) is a nonprofit

organization that works collaboratively with business, government, non-government organizations, and other sectors to promote environmental protection through pollution prevention.

- [EPA: Pollution Prevention Program](#)
- [Idaho Department of Environmental Quality](#)  
Information on Idaho's Pollution Prevention Program.

## 6.17 Proper Disposal of Household Hazardous Waste (HHW)

### Description

HHW is sometimes disposed of improperly when it is poured down the drain, onto the ground, into the storm sewers, or put in the trash. Some household hazardous waste can injure sanitation workers, contaminate wastewater treatment systems, or leak out of landfills into ground water. Therefore, it is important to properly dispose of HHW.

Many communities have household hazardous waste disposal programs available for free to citizens and small businesses. Even if your community does not have an official or all-inclusive program, many do recycle used oil, antifreeze, batteries, and refrigerators. If your community does not have a program, other no-cost solutions are available for specific wastes. For example, local retail outlets may offer recycling of some hazardous wastes, such as compact fluorescent light bulbs, electronic equipment, and cell phones. Nonprofit organizations may be interested in leftover paint or used computers and monitors. If all else fails, call the manufacturer and see if it will recycle or properly dispose of the waste for you.

### Resources

- [Idaho Department of Environmental Quality](#)  
Information on household hazardous waste.

## 6.18 Proper Fertilizer Storage, Handling, and Disposal

### Description

Commercial fertilizer is a major source of nitrogen to soils and ground and surface waters. Locate fertilizer storage areas downslope and at least 400 feet away from drinking water sources to provide reasonable assurance source water will not be contaminated. Separation from the well should be greater in areas of sand or fractured bedrock. Keep fertilizer storage areas locked and provide signs or labels identifying the cabinet or building as a fertilizer storage area. Fertilizers should be stored in sound, properly labeled, original containers. Provide pallets to keep large drums or bags off the floor, and store dry products separate from liquids to prevent wetting from spills. Store fertilizer separately from pesticides. Use containment for large bulk tanks to contain

spills. Conduct mixing and loading on impermeable surfaces away from drinking water sources; immediately clean up any spills. Properly recycle or dispose of fertilizer containers. Following these management procedures greatly reduces the possibility of drinking water contamination.

## Resources

- [EPA: Source Water Protection Practices Bulletin](#)  
Information on managing turfgrass and garden fertilizer application to prevent contamination of drinking water.
- [EPA: Source Water Protection Practices Bulletin](#)  
Information on managing agricultural fertilizer application to prevent contamination of drinking water.
- [EPA: Polluted Runoff - Nonpoint Source \(NPS\) Pollution](#)  
Information on managing urban runoff.

## 6.19 Proper Pesticide Application

### Description

Pesticides are made up of various chemicals that can reduce the damage to plants caused by pests and control the growth of unwanted plant species. Herbicides, fungicides, insecticides, and rodenticides are all types of pesticides. Pesticides are applied to crops by aerial spraying, topsoil application, soil injection, soil incorporation, or irrigation. If mismanaged or misapplied, pesticides can seep into ground water supplies or runoff to surface water sources where they can be difficult and expensive to remove. If inhaled or consumed, pesticides can be hazardous to human and animal health.

To limit risks associated with pesticide use, select an effective pesticide that targets the intended pest and use products with lower human and environmental risks. Always follow guidance and warnings on the pesticide label regarding setbacks from water, irrigation infrastructure, wetlands, and other sensitive areas. Reconsider starting an application if significant rain or wind may cause drift or runoff at the application site, thereby increasing health and environmental hazards and decreasing product effectiveness. Methods to reduce pesticide use include crop rotation or applying pesticides using soil incorporation methods, post-emergent application, early pre-plant application, spot treatment, split application, reduced rates, and combination products.

### Resources

- [EPA: Polluted Runoff - Nonpoint Source \(NPS\) Pollution](#)  
Information on managing urban runoff.

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing small-scale application of pesticides to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing large-scale application of pesticides to prevent contamination of drinking water.

## 6.20 Proper Pesticide Storage, Handling, and Disposal

### Description

Pesticides are made up of various chemicals and are used to reduce plant damage due to pests and to control growth of unwanted plant species. Handle and dispose of pesticides properly to avoid risking contamination that could affect the water supplies and health of others. Pesticide containers should be kept dry and clear of activities that might knock over a jug or rip open a bag. Pesticide storage areas should be downslope and as distant from drinking water sources as possible to provide reasonable assurance source water will not be contaminated. Separation should be greater if the site has sandy soils or fractured bedrock near the land surface. If possible, reduce the amount and types of pesticides stored. Keep pesticide storage areas locked and provide signs or labels identifying the cabinet or building as a pesticide storage area. Pesticides should be stored in sound, properly labeled, original containers. Steel shelves are easier to clean than wood if a spill occurs, and smaller container shelves should have a lip to keep containers from sliding off. Provide pallets to keep large drums or bags off the floor and keep pesticides separate to prevent cross-contamination. Use containment for large bulk tanks to contain spills. Conduct mixing and loading on impermeable surfaces away from drinking water sources; immediately clean up any spills. Properly recycle or dispose of pesticide containers. Following these management procedures greatly reduces the possibility of drinking water contamination. Effects of pesticide contamination vary depending on the toxicity of the pesticide and the amount of exposure. If large amounts of pesticide enter a water supply, as can happen with a spill or accident, acute health effects are possible. However, low levels of contaminants in drinking water can also be harmful to people and animals through chronic exposure.

### Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing small-scale application of pesticides to prevent contamination of drinking water.
- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing large-scale application of pesticides to prevent contamination of drinking water.

- [\*Idaho Home Assessment System\*](#)  
Information on pesticide storage and handling.
- [\*EPA: Polluted Runoff - Nonpoint Source \(NPS\) Pollution\*](#)  
Information on managing urban runoff.

## 6.21 Proper Storage, Handling, and Disposal of Hazardous Waste

### Description

Hazardous waste is waste with properties that make it dangerous or potentially harmful to human health or the environment. Hazardous wastes can be liquids, solids, contained gases, or sludges. They can be the by-products of manufacturing processes or simply discarded commercial products, such as cleaning fluids or pesticides.

Hazardous waste containers should be kept dry and clear of activities that might knock over the container. Storage areas should be downslope and as distant from drinking water sources as possible to provide reasonable assurance source water will not be contaminated. Separation should be greater if the site has sandy soils or fractured bedrock near the land surface. Provide pallets to keep large drums or containers off the floor. Use containment for large bulk tanks to contain spills. Conduct loading on impermeable surfaces away from drinking water sources; immediately clean up any spills. Comply with hazardous waste regulations prescribed in the state's Rules and Standards for Hazardous Waste.

### Resources

- [\*Idaho Department of Environmental Quality\*](#)  
Information on hazardous waste and regulations in Idaho.

## 6.22 Proper Well Decommissioning

### Description

Unused wells can threaten the quality of drinking water from private wells and those servicing public water systems because they provide a pathway for contaminants to move from the surface into deeper aquifers. Deteriorated well casings, open uncased boreholes, and poor or absent annular seals can also allow water to move between previously separated aquifers, which can degrade water quality. In addition, abandoned wells are sometimes used for illegal waste dumping, further highlighting the need for wells to be properly decommissioned.

Decommissioning or permanently removing a well from service involves filling or plugging the well in accordance with Idaho's "Well Construction Standards Rules" (IDAPA 37.03.09), which are administered by the Idaho Department of Water Resources. Idaho law requires well abandonments to be performed by a licensed well driller and in compliance with administrative rules. A properly decommissioned well will not produce or accept fluids, serve as a conduit for

contaminant movement inside or outside the well casing, or allow surface or ground water to move into unsaturated zones, into another aquifer, or between aquifers. If no records exist from the contractor who drilled the well, contact the local health department, or the Idaho Department of Water Resources to identify the location of the abandoned well, look for pipes sticking above ground; pipes sticking through walls or floors in the basement; electrical switch boxes in the yard; cement pits in or under sheds; windmills; old crock, brick, or stone structures; or old hand pumps. Metal detectors and informative neighbors can also be helpful.

## Resources

- [\*Idaho Well Construction Standard Rules\*](#)  
Information on the decommissioning (abandoning) of wells.
- [\*Idaho Department of Water Resources\*](#)  
Application for authorization to abandon a well.

## 6.23 Road Salt Reduction

### Description

Road salt is used for snow and ice control. Communities and individuals should use care when applying salt, especially in areas of swale drainage. Salt applied to roadways can run off the roadway and infiltrate into soils or reach stormwater injection wells, thereby increasing chloride levels in ground water. Chloride can be long lasting in slow-moving ground water. Chloride may also be discharged from ground water into surface water or to surface water directly via runoff.

## Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing stormwater runoff to prevent contamination of drinking water.

## 6.24 Sanitary Setbacks

### Description

A sanitary setback is a 50–200 foot radius around a well, spring, or surface water intake where constructing or maintaining sources of contamination is prohibited. These sources include, but are not limited to, septic tanks and drainfields, sewer lines, underground storage tanks, vehicles, structures where toxic materials are used or stored, livestock enclosures, or garbage of any kind. Under the “Idaho Rules for Public Drinking Water Systems” (IDAPA 58.01.08), public water systems are required to meet minimum setbacks only for certain contaminants.

## Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Managing septic systems to prevent contamination of drinking water.
- [\*EPA: Homeowners Guide to Septic Systems\*](#)  
A brochure developed by the EPA that details all you need to know about your septic system and its maintenance.
- [\*Septic Insight App\*](#)  
Get Insight on the function of your Septic System with this all in one app.

## 6.25 Secondary Containment

### Description

In case of a spill, secondary containment provides a barrier between storage containers, equipment, piping, or transfer areas that hold or use hazardous materials and the land surface. Secondary containment methods can include impervious dikes, berms, or retaining walls; curbing, culverts, gutters, or other drainage systems; weirs; booms; barriers; spill diversion and retention ponds; sorbent materials; drip pans; and sumps and collection systems.

### Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing small quantity chemical use to prevent contamination of drinking water.

## 6.26 Septic System Location and Maintenance

### Description

In a typical septic system, waste leaves a house through a pipe then enters a septic tank, where solids settle in a layer at the bottom and oils and grease float to the top. The liquid then flows into a drainfield and eventually the soil, where microbes digest most contaminants before they can reach the ground water. Septic systems should be located in suitable soils. Avoid steep slopes, high water tables, and small lot sizes. Septic systems should be inspected every 2–3 years by a licensed contractor and pumped as recommended (generally every 3–5 years depending on the size of the system and number of people living in the home).

Wastewater and sewage from septic systems can contaminate drinking water sources during flood events or system breakdowns. According to the US Environmental Protection Agency, approximately 10–25% of septic systems fail at some point. If these failures release untreated wastewater and sewage into source water, risks to human health and the environment increase.

When septic systems are properly designed, constructed, and maintained, most of these risks are minimized if not eliminated. Properly maintained septic systems also help to preserve property values and avoid costly repairs.

## Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Managing septic systems to prevent contamination of drinking water.
- [\*EPA: Homeowners Guide to Septic Systems\*](#)  
A brochure developed by the EPA that details all you need to know about your septic system and its maintenance.
- [\*EPA: Polluted Runoff - Nonpoint Source \(NPS\) Pollution\*](#)  
Information on managing urban runoff.
- [\*Septic Insight App\*](#)  
Get Insight on the function of your Septic System with this all in one app.

## 6.27 Spill Prevention and Control

### Description

Minimize exposure of pollutants to stormwater runoff and ground water by enclosing any drips, overflows, leaks, and other liquid material releases, by isolating pollutant spills from stormwater runoff, and promptly cleaning up spills.

### Resources

- [\*IDEQ Storm Water Best Management Practices Catalog\*](#)  
Information on spill prevention and control methods.

## 6.28 Storm Drain Marking

### Description

Dumping of waste down storm drains is discouraged because these outlets drain directly to surface and ground water. When pollutants such as motor oil, antifreeze, and fertilizer are poured down the storm drain, they end up polluting our rivers, lakes, streams, and ground water. Communities can help prevent this pollution by alerting citizens to the environmental dangers of pouring hazardous materials down storm drains and encouraging them to properly dispose of these materials.

## Resources

- [\*Storm Drain Marking Toolkit\*](#)

The storm drain marking toolkit is a set of materials designed to assist cities and counties in planning and implementing a community event to mark storm drains. The purpose of the program is to provide a visible way to advise citizens not to dump waste down storm drains.

## 6.29 Stormwater Retrofits

### Description

Stormwater retrofits are structural features applied in urban watersheds to help minimize channel erosion, reduce pollutant loads to surface and ground water, and improve aquatic habitat. Retrofits can be big or small, but some type of retrofit is usually possible for most stormwater management situations. Examples include large retention ponds and small on-site water quality treatment facilities. Retrofits should be chosen while keeping in mind cost, pollutant removal capability, and watershed size.

### Resources

- [\*National Menu of Best Management Practices \(BMPs\) for Stormwater\*](#)

## 6.30 Street Sweeping

### Description

A street sweeper cleans pollutants and sediments from the street to reduce the amount of pollutants entering receiving waters from runoff. Streets, roads, highways, and parking lots accumulate significant amounts of pollutants that contribute to stormwater pollutant runoff to surface waters. Pollutants including sediment, debris, trash, road salt, and trace metals can be minimized by street sweeping.

### Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing stormwater runoff to prevent contamination of drinking water.
- [\*Stormwater Maintenance\*](#)  
Maintenance descriptions and EPA resources and state BMP manuals and maintenance information.

## 7 Protection Activity: Education, Outreach and Public Programs

### 7.1 Brownfields Assessment Program

#### Description

DEQ's Brownfields Assessment Program funds and conducts environmental assessments of brownfields sites to assist communities in revitalizing their neighborhoods. DEQ conducts as many community brownfields assessments as funding allows. If contamination is found, DEQ will work with the applicant to locate funding opportunities for cleaning up the property and returning it to productive use.

#### Resources

- [\*Idaho's Brownfields Revitalization Program\*](#)

### 7.2 Calendar/Poster Contests

#### Description

Calendar and poster contests can engage the public or a targeted group of students in thinking about source water protection or a related theme. Calendars and posters can then be used as educational material for the public and/or be donated to help an organization raise money for water-related projects or field trips. Printing of the calendars or posters may be provided as a donation or at a reduced price or present an opportunity to partner with sponsors or engaged businesses.

### 7.3 Consumer Confidence Reports

#### Description

Adhering to the Consumer Confidence Rule (40 CFR Parts 141 and 142), public water suppliers serving the same people year-round (community water systems) provide consumer confidence reports (known as annual water quality or drinking water quality reports) to their customers. Public water systems can enhance their reports to share source water protection strategies, best management practices, and potential contaminant information with their customers in addition to the minimum information they are required to report. Some systems combine CCRs with other outreach strategies such as calendar contests.

#### Resources

- [\*City of Bryan\*](#)  
Example consumer confidence report calendar incorporating facts on water.

## 7.4 Earth Day Celebrations

### Description

Since 1970, Earth Day, celebrated each year on April 22, is considered the birth of the environmental movement. Earth Day is a platform to promote source water protection through activities, events, and educational campaigns.

### Resources

- [\*EPA: NPS Outreach Toolbox\*](#)  
The Nonpoint Source (NPS) Outreach Toolbox is intended for use by state and local agencies and other organizations interested in educating the public on nonpoint source pollution or stormwater runoff. The Toolbox contains a variety of resources to help develop an effective and targeted outreach campaign.

## 7.5 Environmental Education

### Description

Environmental education allows individuals to engage in environmental issues through problem solving and taking action to improve the environment. Environmental education can be used to promote source water protection through public events and classroom activities and can target teachers, students, or the general public.

### Resources

- [\*Idaho Department of Environmental Quality\*](#)  
Environmental education resources for teachers.
- [\*Project WET \(Water Education for Teachers\)\*](#)  
The mission of Project WET is to reach children, parents, educators and communities of the world with water education through workshops, events, publications and networking.

## 7.6 Green Business Awards

### Description

Green business awards recognize businesses that use processes, practices, or materials that help to protect the environment or increase public involvement in environmental action. Criteria for eligibility and selection are determined by the organizers but could involve factors such as sustainability, significance, and location. Green business award programs can encourage businesses to continue their source water protection efforts and inspire additional businesses to initiate similar measures.

## 7.7 Household Hazardous Waste Diversion Programs/Events

### Description

Waste is considered hazardous when it has properties that make it dangerous or potentially harmful to human health or the environment. Hazardous waste can be liquids, solids, contained gases, or sludges. Household hazardous waste is generated in a home rather than a business or organization. Examples include paints and stains, cleaners, aerosols, laundry products, batteries, yard and garden products, thermostats, compact fluorescent light bulbs, electronics, and pharmaceuticals. Federal requirements regulate management of hazardous waste generated by industries, but household hazardous waste is not regulated and therefore may be disposed of in a municipal solid waste landfill. Furthermore, in Idaho, waste from conditionally exempt small quantity generators (businesses generating less than 220 pounds of hazardous waste each month) can be disposed of in a municipal or non-municipal landfill through a conditional exemption in the hazardous waste regulations. Leachate from household hazardous waste can leak from landfills and contaminate ground water sources. Additionally, if waste is improperly disposed of down the drain or gutter, public drinking water supplies can be contaminated.

Household hazardous waste diversion programs or events—such as reuse programs, collection events, permanent drop-off sites, business partnerships, or exchange programs—can help to protect ground water. Cities and counties are typically the most appropriate entities to coordinate a program or event as they already have an established infrastructure and system for garbage collection, management, and fees. However, numerous opportunities exist for partnerships including with nearby cities or counties, fire departments, health districts, and state or federal agencies.

### Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing stormwater runoff to prevent contamination of drinking water.
- [\*Idaho Department of Environmental Quality\*](#)  
How to organize a household hazardous waste diversion program or event for local governments.
- [\*Idaho Department of Environmental Quality\*](#)  
Information on household hazardous waste.
- [\*Idaho Department of Agriculture: Pesticide Disposal Program\*](#)  
ISDA conducts unusable pesticide disposal collection from agricultural producers, dealers, homeowners and applicators throughout the state.

## 7.8 Idaho Voluntary Cleanup Program

### Description

DEQ's Voluntary Cleanup Program is designed to encourage innovation and cooperation between the state, local communities, and private parties to revitalize properties with hazardous substances or petroleum contamination.

### Resources

- [\*Idaho Voluntary Cleanup Program\*](#)

## 7.9 Inspections and Technical Assistance

### Description

Existing activities already regulated by state, federal, or other government agencies can be targeted for inspections, technical assistance, and training when located in source water protection areas, which can be an effective strategy for protecting source water.

### Resources

- [\*Idaho Small Business Development Center: Environmental Regulations\*](#)  
The Idaho Small Business Development Center offers no-cost, confidential assistance in complying with environmental regulations.
- [\*Idaho Department of Environmental Quality\*](#)  
Information on Idaho's Pollution Prevention Program.

## 7.10 Literature

### Description

Literature can include brochures, fact sheets, and other materials distributed to the public, schools, or businesses to promote source water protection and best management practices or to share information on potential contaminants.

### Resources

- [\*Project WET \(Water Education for Teachers\)\*](#)  
The mission of Project WET is to reach children, parents, educators and communities of the world with water education through workshops, events, publications and networking.

## 7.11 Marketing

### Description

#### PSA

A public service announcement (PSA) is a type of advertisement featured on television, radio, print, or other media with the intent of raising awareness or changing behaviors and attitudes on social issues. PSAs are usually sponsored by a nonprofit or government agency. PSAs can help promote source water protection or upcoming events and programs.

#### Radio Interviews

Interviews at local radio stations can help promote source water protection or publicize an upcoming event or program.

#### Social Marketing

Social marketing is a process that applies marketing principles and techniques to influence behaviors that benefit society and the target audience. Principles of social marketing suggest that lack of information is only one of the barriers to changing behavior, yet awareness or information-based campaigns are the most common approach to changing behaviors. A comprehensive social marketing campaign requires a clearly defined target audience, a singular call to action, an understanding of target audience perceived barriers and benefits to taking action, and a verified strategy to reduce those barriers and/or emphasize those benefits. Other social marketing strategies include using a trusted source to deliver or endorse the message, asking for pledges or public statements from target audiences, creating positive peer pressure, creating social norms, or installing prompts.

Social marketing can be used to promote behaviors that result in source water protection. For example, a simple social marketing campaign may seek to make sweeping sidewalks instead of hosing them off a social norm by asking targeted audiences to sign a pledge, identifying a respected person in the community to endorse the behavior and its importance, working with a local store to discount brooms, and working with the local water utility to highlight how much money could be saved on utility bills.

#### Resources

- [\*Community-Based Social Marketing\*](#)  
This site consists of resources for those working to foster sustainable behaviors, such as those involved in conservation, energy efficiency, transportation, waste reduction, and water efficiency.

## 7.12 Placemats

### Description

Placemats showing the hydrologic cycle and sources of drinking water can help the public, particularly children, understand where drinking water comes from and the importance of protection. Placemats can be marketed to local businesses or be given away at events.

## 7.13 Tours

### Description

Tours offer the general public a firsthand look at water facilities, rivers, and regions critical to clean and available water resources and help convey the importance of protecting drinking water sources.

### Resources

- [EPA: Healthy Watersheds Outreach Tools](#)  
Information on key principles, techniques, and information for effective watershed outreach.

## 8 Protection Activity: Land Conservation

### 8.1 Development Impact Fees

#### Description

Development impact fee (DIF) programs add fees to development activities. These fees are then used to create the infrastructure necessary for that development (e.g., DIF revenue can be used to create community stormwater treatment systems to mitigate the effects of development).

#### Resources

- [Land Trust Alliance](#)  
The Land Trust Alliance works to quickly, effectively and permanently save land and natural resources.
- [The Trust for Public Land: The Source Protection Handbook](#)  
The handbook provides resources to help a community both make the case for land conservation and also go about actually conserving those lands.

## 8.2 Fee Simple Land Acquisition

### Description

Fee simple land acquisition entails the outright purchase of land. Land is usually conveyed to a nonprofit organization or group, such as a land trust, for management. Land acquisition may be a valuable option for source water protection in cases where the governing body is lacking authority for ordinances or zoning. Areas to target for acquisition include sensitive lands such as recharge zones or lands predisposed to geologic sensitivity and possible contamination.

### Resources

- [\*Land Trust Alliance\*](#)  
The Land Trust Alliance works to quickly, effectively and permanently save land and natural resources.
- [\*The Trust for Public Land: The Source Protection Handbook\*](#)  
The handbook provides resources to help a community both make the case for land conservation and also go about actually conserving those lands.

## 8.3 Purchase of Development Rights

### Description

Purchase of development right (PDR) programs pay landowners to protect critical lands through legal agreements, or conservation easements, between a landowner and a land trust or government agency. These agreements permanently limit land use to protect its conservation value. Under conservation easements, landowners continue to own and use the land and can sell it or pass it on to heirs. Easements can be sold to government agencies, nonprofit organizations, or private corporations or donated to a land trust or government agency. PDR programs can be funded through bonds, federal programs, or tax revenues.

## 8.4 Tax Credits for Restoration and Enhancement Activities

### Description

A tax credit for restoration and enhancement activities is a tax benefit offered by a local government to landowners who restore and enhance existing riparian areas. The benefit can be deducted from the total amount a taxpayer owes the government.

## 8.5 Transferable Development Rights

### Description

Transferable development right (TDR) programs sell development credits in exchange for permanent easements on critical lands. Easements are legal agreements between a landowner and a land trust or government agency that permanently limit land use to protect its conservation value. The TDR programs increase development intensity in other areas beyond the limits of local regulations and create a market to push development to areas where it is best accommodated.

## 9 Protection Activity: Planning

### 9.1 Comprehensive Plan

#### Description

Comprehensive planning is an all-inclusive attempt to establish guidelines for the future growth of a community. A comprehensive plan documents the final product from the efforts of this process, and is a policy guide used to make decisions about community development. The availability of clean drinking water is critical to the future of a community. Therefore, source water protection should be an important part of a community's comprehensive plan.

#### Resources

- [Idaho Environmental Guide](#)  
The Idaho Environmental Guide is a resource for local government officials to assist in managing a community's environmental responsibilities.
- [Ohio State University](#)  
Fact sheet on comprehensive planning.

### 9.2 Conservation Design

#### Description

Conservation design is a flexible planning tool that places homes in a small part of a development to preserve the existing natural resource areas. The remaining open areas are then used for recreation or resource protection.

#### Resources

- [Source Water Protection Ordinance Template](#)  
In working with the Idaho Department of Environmental Quality (IDEQ), AIC legal

counsel, Jerry Mason, has developed a memo explaining the source water protection process and an ordinance prototype that Idaho communities can explore with their own attorneys.

- [\*University of Wisconsin - Planning Implementation Tools Conservation Design\*](#)

## **9.3 Impact Studies**

### **Description**

Impact studies determine the degree to which potential contaminants will impact source waters. They can help communities prioritize source water protection activities and develop best management practices or policies to limit the impact of contaminants.

## **9.4 New Well Site Suitability Review**

### **Description**

A new well site suitability review examines the vulnerability or suitability of a potential location for a new well. Locate new wells in areas that will maximize yield but minimize potential source water contamination. Completing a source water protection area delineation and potential contaminant inventory can assist with assessing site suitability so wells are located away from contamination sources.

## **9.5 Potential Contaminant Inventory**

### **Description**

A potential contaminant inventory (PCI) is an inventory of facilities, land uses, and environmental conditions within a source water protection area that are potential sources of contamination to ground water or surface water. DEQ is required to conduct a PCI for each source water assessment it completes. All available PCIs can be found on DEQ's source water assessment web application and be used to develop protection strategies or determine site suitability for new well locations.

## **9.6 Source Water Protection Plan**

### **Description**

A source water protection plan documents a community's source water protection program or activities and informs and educates the public. The plan outlines the management tools the local committee plans to use to protect drinking water sources. Management tools can apply to existing or future potential contaminant sources and can be regulatory or nonregulatory.

A community can gain official recognition for its source water protection plan by pursuing state certification through DEQ. The certification covers a 5-year period, after which recertification

may be pursued. Systems with certified source water protection plans are granted additional points when applying for DEQ-administered drinking water grants and loans. Additionally, US Department of Agriculture Rural Development Programs require any water system financed to have a current certified source water protection plan in place prior to the final advance of financial assistance within Idaho.

## Resources

- [\*Source Water Assessments\*](#)  
Source water assessment information for Idaho public water systems is accessible using the Source Water Assessment Database. The database provides information on the assessed sources (well, spring, or surface water intake), including a potential contaminant inventory, susceptibility (to contamination) summary, maps (both a static and dynamic map) of the source water delineation, and a summary report.
- [\*Idaho Source Water Protection Planning Tool\*](#)  
A tool that assists public water systems in developing a source water protection plan and contingency plan for their water system.

## 9.7 Source Water Protection Program

### Description

A source water protection program is designed to protect public water supply wells and intakes. The goal is to prevent contaminants from entering public water supply wells and intakes by managing the land that contributes water to the wells and intakes. Source water or wellhead protection planning is one way to ensure a community has a long-term source of clean water. Program actions include reviewing the source water assessment for the public water supply, inventorying potential contaminants in the delineated source water area, and developing and implementing a source water protection plan.

### Resources

- [\*Source Water Assessments\*](#)  
Source water assessment information for Idaho public water systems is accessible using the Source Water Assessment Database. The database provides information on the assessed sources (well, spring, or surface water intake), including a potential contaminant inventory, susceptibility (to contamination) summary, maps (both a static and dynamic map) of the source water delineation, and a summary report.
- [\*Idaho Department of Environmental Quality\*](#)  
Information on water quality grants, loans, and other resources.

## 9.8 Water Audits

### Description

Water audits of domestic, sanitary, landscaping, and process water use identify ways to increase a facility's water-use efficiency. Increased water efficiency can indirectly promote source water protection by reducing urban runoff from landscaping and water entering wastewater treatment or septic systems that could carry contaminants.

## 9.9 Wellhead Protection Program

### Description

A wellhead protection program is synonymous with a source water protection program, but strictly focuses on protecting public water supply wells. The goal is to prevent contaminants from entering public water supply wells by managing the land that contributes water to the wells. Wellhead protection planning is one way to ensure a community has a long-term source of clean water. Program actions include reviewing the source water assessment for the public water supply, inventorying potential contaminants in the delineated source water area, and developing and implementing a source water protection plan.

### Resources

- [\*Source Water Assessments\*](#)  
Source water assessment information for Idaho public water systems is accessible using the Source Water Assessment Database. The database provides information on the assessed sources (well, spring, or surface water intake), including a potential contaminant inventory, susceptibility (to contamination) summary, maps (both a static and dynamic map) of the source water delineation, and a summary report.

## 10 Protection Activity: Regulations and Permits

### 10.1 CAFO Permits

#### Description

In Idaho, counties regulate confined animal feeding operation (CAFO) siting. Dairies and beef feedlots must apply for county CAFO permits before they can open. Depending on the county, either planning and zoning boards or commissioners approve or deny the applications. Idaho statute requires the opportunity for public input before CAFOs are sited. At a minimum, the board of county commissioners must hold at least one public hearing at which the public may comment on a proposed site. Only members of the public with primary residences within one mile of a proposed site may comment at the hearing. However, this distance may be increased by the board. The board must consider public comments when deciding whether to approve or reject a proposed site.

## Resources

- [Idaho Department of Environmental Quality](#)  
Information on concentrated animal feeding operations (CAFOs).

## 10.2 CAFO Siting Evaluations

### Description

In Idaho, counties regulate confined animal feeding operation (CAFO) siting. With new or expanding CAFO sites, the county can request CAFO siting evaluations, during which representatives of DEQ, the Idaho State Department of Agriculture, and the Idaho Department of Water Resources serve on a CAFO site advisory team to determine environmental risks and site suitability. County ordinances regulate CAFO zoning and contain environmental-protection clauses and rules about waste removal.

## Resources

- [Idaho Department of Environmental Quality](#)  
Information on concentrated animal feeding operations (CAFOs).

## 10.3 Conditional Use Permits

### Description

A conditional use permit allows a city or county to provide flexibility within a zoning ordinance to consider special uses that may be essential or desirable to the community or restrict uses that could have detrimental effects on the community.

When approving conditional use permits, cities and counties can restrict certain practices that may negatively impact source water and/or require that source water protection best management practices be implemented. Additionally, cities and counties can require that potential impacts to source water be outlined in the conditional use permit applications and specify which state and federal environmental requirements or permits the permittee must comply with. Local entities cannot enact requirements that are inconsistent with state or federal rules, statutes, regulations, or permits but can enact complimentary or more comprehensive requirements. For example, heating oil tanks are not regulated under state or federal regulations, but they still have the potential to impact source water if not secondarily contained and properly maintained. Therefore, a city can issue a permit for a facility that uses a heating oil tank, with the condition that the facility install secondary containment for the tank.

## Resources

- [\*Idaho Environmental Guide\*](#)  
The Idaho Environmental Guide is a resource for local government officials to assist in managing a community's environmental responsibilities.

## 10.4 Development or Regional Impact (DRI) Review Requirements

### Description

Development of regional impact (DRI) applies to any development that would have a substantial effect upon the health, safety, or welfare of citizens of more than one county because of its character, magnitude, or location. Local jurisdictions or regional planning commissions can use the DRI designation to assess the potential for water pollution or other adverse impacts to source water from the proposed projects in source water protection areas and recommend measures to reduce such impacts. DRI reviews can educate municipalities and developers about source water protection.

### Resources

- [\*Land Trust Alliance\*](#)  
The Land Trust Alliance works to quickly, effectively and permanently save land and natural resources.
- [\*The Trust for Public Land: The Source Protection Handbook\*](#)  
The handbook provides resources to help a community both make the case for land conservation and also go about actually conserving those lands.

## 10.5 Ground Water Monitoring

### Description

Ground water monitoring is the testing of ground water to define ground water flow, assess and characterize water quality conditions and trends, and identify potential problem areas. Ground water monitoring is required by law for certain sites and activities but can be helpful to identify problems for any site, land use, or activity that could impact ground water quality. Cities and counties can require ground water monitoring as a permit condition.

## 10.6 Inspections and Technical Assistance

### Description

Existing activities already regulated by state, federal, or other government agencies can be targeted for inspections, technical assistance, and training when located in source water protection areas, which can be an effective strategy for protecting source water.

### Resources

- [\*Idaho Small Business Development Center: Environmental Regulations\*](#)  
The Idaho Small Business Development Center offers no-cost, confidential assistance in complying with environmental regulations.
- [\*Idaho Department of Environmental Quality\*](#)  
Information on Idaho's Pollution Prevention Program.

## 10.7 Land-Use Planning and Zoning

### Description

Land-use planning is a form of public policy that seeks to order and regulate land use to prevent conflicts. Land-use planning often leads to land-use regulations, also known as zoning, which prescribe the types of activities allowed on a given piece of land. Land use and development choices and policies can affect the hydrogeology of ground and surface water sources. Potential contaminants introduced directly or indirectly to the land surface through various land-use activities can infiltrate the soil and reach ground water or run off the land surfaces to receiving waters. Land-use planning and zoning can protect source water by assessing and controlling high-risk land uses and protecting sensitive areas.

Planning and zoning are handled locally, not by state or federal authorities. However, the Idaho Local Land Use Planning Act (Idaho Code 67-6537) requires local governing boards to consider impacts on ground water quality when amending, repealing, or adopting a comprehensive plan. Additionally, cities and counties can integrate source water protection into their local comprehensive plan, and source water areas into land-use planning and zoning regulations. Possible tools to enhance source water protection through planning and zoning include subdivision and growth controls to reduce septic systems or zoning or land-use prohibitions to control dangerous substances and activities involving these substances. For example, prohibit gas stations in sensitive areas, require setback zones for septic systems, or restrict specific pesticide, fertilizer manure, and sludge applications.

### Resources

- [\*EPA: Source Water Protection Practices Bulletin\*](#)  
Information on managing stormwater runoff to prevent contamination of drinking water.

- [\*Source Water Protection Ordinance Template\*](#)  
In working with the Idaho Department of Environmental Quality (IDEQ), AIC legal counsel, Jerry Mason, has developed a memo explaining the source water protection process and an ordinance prototype that Idaho communities can explore with their own attorneys.
- [\*Land Trust Alliance\*](#)  
The Land Trust Alliance works to quickly, effectively and permanently save land and natural resources.
- [\*The Trust for Public Land: The Source Protection Handbook\*](#)  
The handbook provides resources to help a community both make the case for land conservation and also go about actually conserving those lands.

## 10.8 Overlay District

### Description

An overlay district places an additional zoning requirement on a geographic area without modifying the underlying zoning. Overlay districts can improve overall water quality by restricting development in specific locations in a watershed or source water protection area in addition to standard zoning requirements or as standalone regulations if base zoning does not exist. Common requirements may address building setbacks, density standards, lot sizes, impervious surface reduction, vegetation, and land-use restrictions. Overlay districts can target changes to source water protection areas alone, allowing uses outside the district to continue. More than one overlay district may apply to a single area depending on environmental conditions. Specific types of overlay districts include those addressing floodplains, agricultural areas, aquifers, and wetlands.

### Agricultural

Agricultural overlay districts promote agricultural land uses, protect prime soils, and prevent nonagricultural uses from negatively impacting agriculture as the primary land use. As “spots” of development appear throughout agricultural areas, municipal services must expand, causing discontinuity in the primary land use and promoting urban sprawl. The amount of impervious area created when open land is cleared can be limited with an agricultural overlay district, which will generate less runoff and fewer pollutants transported to ground water and receiving waters.

### Aquifer

To preserve and maintain ground water supplies and recharge, an aquifer overlay district controls the land cover and activities that occur in the primary recharge area. The amount of impervious area can be limited within an aquifer overlay zone, which will generate less runoff and fewer

pollutants transported to ground water and receiving waters. Additionally, certain land uses could impact water quality and should be limited or prohibited in an aquifer overlay district:

- Fuel oil storage
- Gas stations
- Unenclosed or uncovered outdoor storage of road salt
- Landfills, solid-waste transfer stations, and recycling or composting facilities Industrial uses such as chemical laboratories

## **Floodplain**

Benefitting humans and the environment, floodwaters distribute nutrient-rich sediments to soil and vegetation and replenish streams and wetlands. A healthy floodplain stores and transports flood waters, which reduces flooding frequency, property damage, fatalities, erosion, and hazardous material releases into waterways.

Floodplain overlay districts can minimize impacts to water quality due to flooding and flood-related erosion by any of the following methods:

- Restricting or prohibiting uses that could threaten water quality
- Requiring water supply and sanitation systems to be protected against flood damage at the time of construction
- Delineating areas vulnerable to flooding to protect individuals from purchasing floodplain land not suitable for their purposes
- Regulating excavation, filling, dumping, dredging, and channelization that may increase flood damage
- Preventing or regulating the construction of flood barriers that unnaturally divert floodwater and increase velocity, turbidity, and water levels.

## **Wetland**

A wetland overlay district is a defined area a specified distance within the ordinary high-water mark of navigable streams, rivers, lakes, ponds, flowage, or the floodplain's landward edge. Wetland overlay districts can require that some existing vegetation is maintained as a buffer to protect water quality and the amount of tree and shrub clearing is limited. The amount of vegetation removed within a certain distance of navigable streams can also be limited. Public review and hearings can be required for earthmoving activities and conditional uses within the protection zone.

## **10.9 Phased Development**

### **Description**

Phased development in new subdivision construction limits soil exposure and reduces runoff and off-site erosion. A master development plan is created to show the parcelization, utilities, and roadway layout. The plan divides the site into distinct portions with only one portion cleared at a

time and roadways constructed only in the current phase. When a percentage of the lots is sold or built upon in the first phase, the next construction phase begins. Successful phased development depends on the site's topography and size.

## Resources

- [\*Source Water Protection Ordinance Template\*](#)  
In working with the Idaho Department of Environmental Quality (IDEQ), AIC legal counsel, Jerry Mason, has developed a memo explaining the source water protection process and an ordinance prototype that Idaho communities can explore with their own attorneys.
- [\*EPA: Erosion and Sediment Control\*](#)  
Information on model ordinances related to erosion and sediment control.
- [\*EPA: Polluted Runoff - Nonpoint Source \(NPS\) Pollution\*](#)  
Information on managing urban runoff.

## 10.10 Site Plan Review Requirements

### Description

A site plan graphically represents a parcel of land's existing and proposed characteristics. A proposed development's compliance with applicable city or county ordinances is determined through the site plan review process. Cities and counties can require that potential impacts to source water be defined in the site plan and be part of the review.

## 10.11 Source Water Protection Ordinance

### Description

A source water protection ordinance is used by cities and counties to address proposed and existing development and potential water quality impacts. The ordinance maps the resource as a protection area and requires specific land use and development within the boundaries. The ordinance could apply to the whole protection area or different restrictions could apply to specific zones of sensitivity. Source water ordinances may include some or all of the following:

- Prohibit land uses, such as landfills, underground fuel storage tanks, or animal feeding operations.
- Enact subdivision controls, such as limiting septic system density by requiring larger lot sizes, and special permit or site requirements such as limiting use of toxic and hazardous materials, pesticides, and salts.
- Require performance standards, such as secondary containment for petroleum or chemical storage over a certain volume or erosion control that includes establishing vegetative cover with a certain number of days after construction completion.

Additionally, source water protection best management practices may require variances from current ordinances, such as current subdivision design requirements that may not allow departures from typical subdivision designs (e.g., street widths, sidewalk exclusions, and downspout requirements).

## Resources

- [\*Source Water Protection Ordinance Template\*](#)  
In working with the Idaho Department of Environmental Quality (IDEQ), AIC legal counsel, Jerry Mason, has developed a memo explaining the source water protection process and an ordinance prototype that Idaho communities can explore with their own attorneys.
- [\*Source Water Assessments\*](#)  
Source water assessment information for Idaho public water systems is accessible using the Source Water Assessment Database. The database provides information on the assessed sources (well, spring, or surface water intake), including a potential contaminant inventory, susceptibility (to contamination) summary, maps (both a static and dynamic map) of the source water delineation, and a summary report.