

Colorado Rural Water Association

Agriculture and Drinking Water

A Proactive Protection Planning Approach



Dylan Trujillo

Source Water Protection Specialist

Colorado Rural Water Association

- Nonprofit incorporated in 1980
- Technical assistance & training to small / rural water & wastewater systems
 - Generally systems with populations of 10,000 or fewer
- Small organization
 - 16 employees
 - 8 Board of Directors

Affiliate of National Rural Water Association

- Receive funding for some programs through NRWA
- All 50 states have a “Rural Water” organization



Programs

- Training
- Circuit Riders
- Energy Efficiency Assessment
- Source Water Protection

Source Water Protection Program



Colorado's SWAP Program originated because of
the EPA's 1996 Safe Drinking Water Act
Amendments



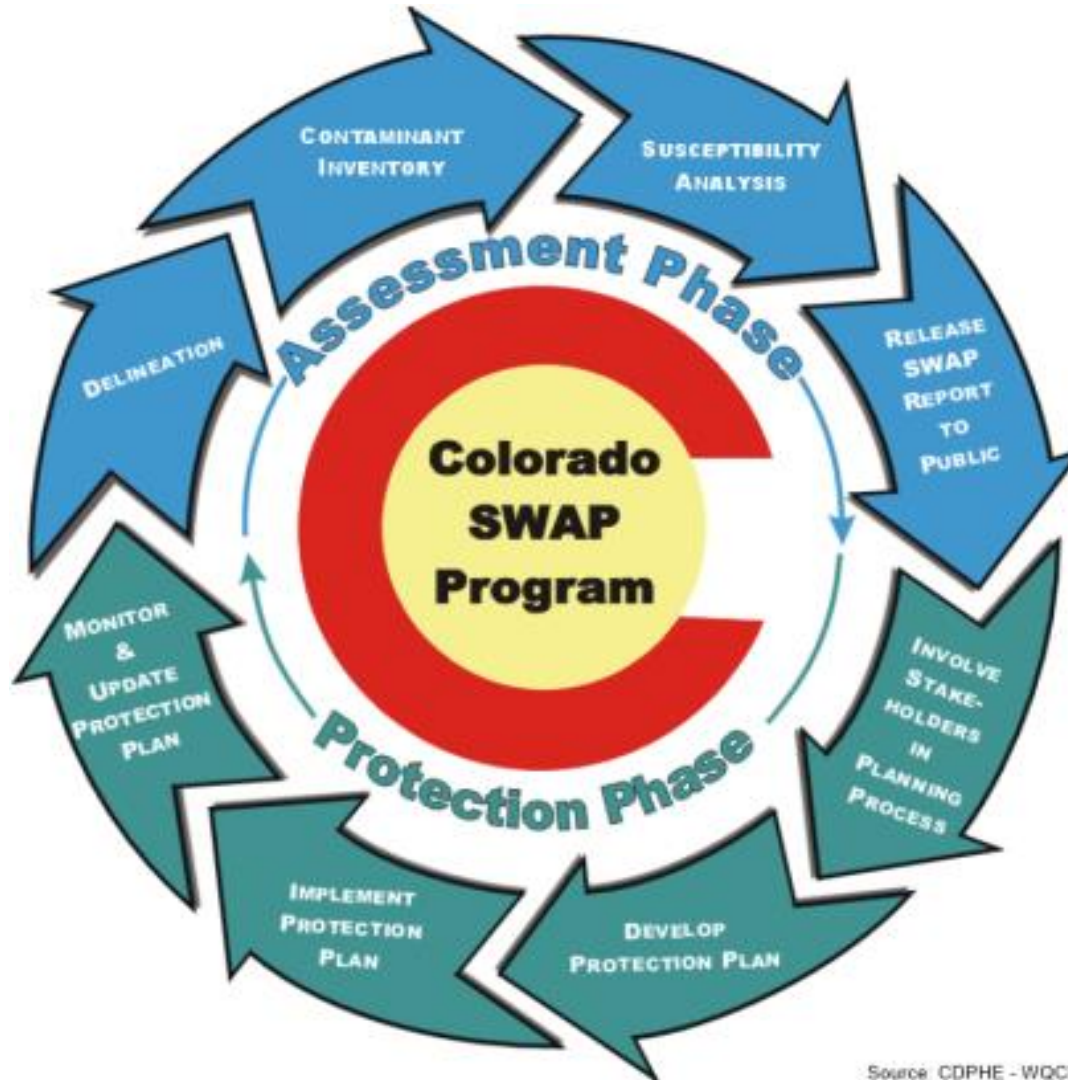
Colorado's SWAP Program

- Voluntary Program
- Main focus – stakeholder involvement, public education



Colorado SWAP Program

A Two Phase Approach



A Source Water Assessment Report Includes:

- Inventory of drinking water intakes
- Source Water Protection Area delineation
- Inventory of *Potential* Contaminants
- Susceptibility Rating
 - Physical Setting Vulnerability
 - Total Susceptibility

SOURCE WATER ASSESSMENT REPORT

Ground Water Sources

ARAPAHOE WC
Public Water System ID: C00109001
ARAPAHOE, CO
CHEYENNE County

11/8/2004



Colorado Department of Public Health and Environment
Water Quality Control Division
Source Water Assessment and Protection Program
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

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SOURCE WATER ASSESSMENT REPORT

Ground Water Sources

CHEYENNE WELLS TOWN OF
Public Water System ID: C00109006
CHEYENNE WELLS, CO
CHEYENNE County

11/8/2004



Colorado Department of Public Health and Environment
Water Quality Control Division
Source Water Assessment and Protection Program
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

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SOURCE WATER ASSESSMENT REPORT

Ground Water Sources

KIT CARSON TOWN OF
Public Water System ID: C00109011
KIT CARSON, CO
CHEYENNE County

11/8/2004



Colorado Department of Public Health and Environment
Water Quality Control Division
Source Water Assessment and Protection Program
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

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Google: "CDPHE SWAP"

Home Topics A-Z Divisions/Programs Boards/Commissions Permits Regulations Data

Home > Services > Source Water Assessment and Protection >

Emergency Response -
Drinking Water and Spills

What's New

Public Notices

I'm Looking for Information
About....

Services

Assistance and
Information for Public
Water Systems

Assistance For Permitted
Discharges

Compliance

Inspection Services

Facility Design and
Approval

Grants and Loans

Facility Operator
Certification

Permits

Source Water Assessment and Protection

Concerned About Your Drinking Water?

Protect Source Water in Colorado

Colorado Source Water Assessment and Protection (SWAP) is a new program designed to provide you, the public consumer, information about your drinking water, as well as provide you and your community a way to get involved in protecting the quality of your drinking water. The program encourages community-based protection and preventive management strategies to ensure that all public drinking water resources are kept safe from future contamination.

Protection Phase

Assessment Phase

CRWA receives funding from the USDA and CDPHE to assist the public water systems in the development of source water protection plans.

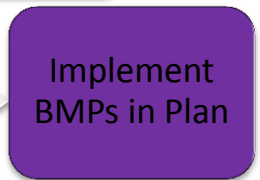
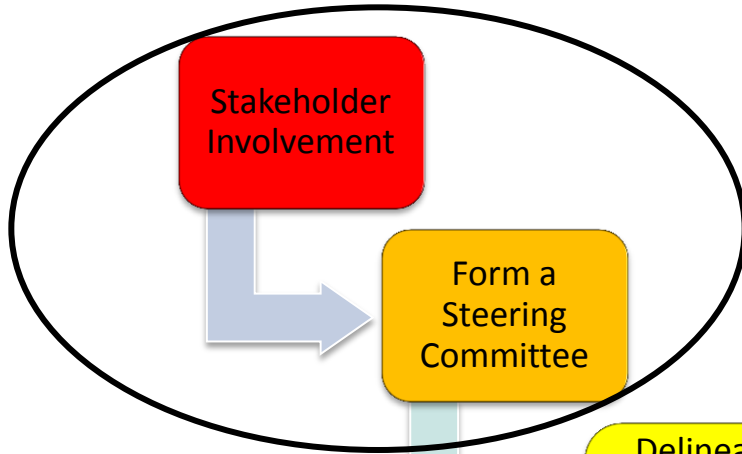


Colorado Department
of Public Health
and Environment

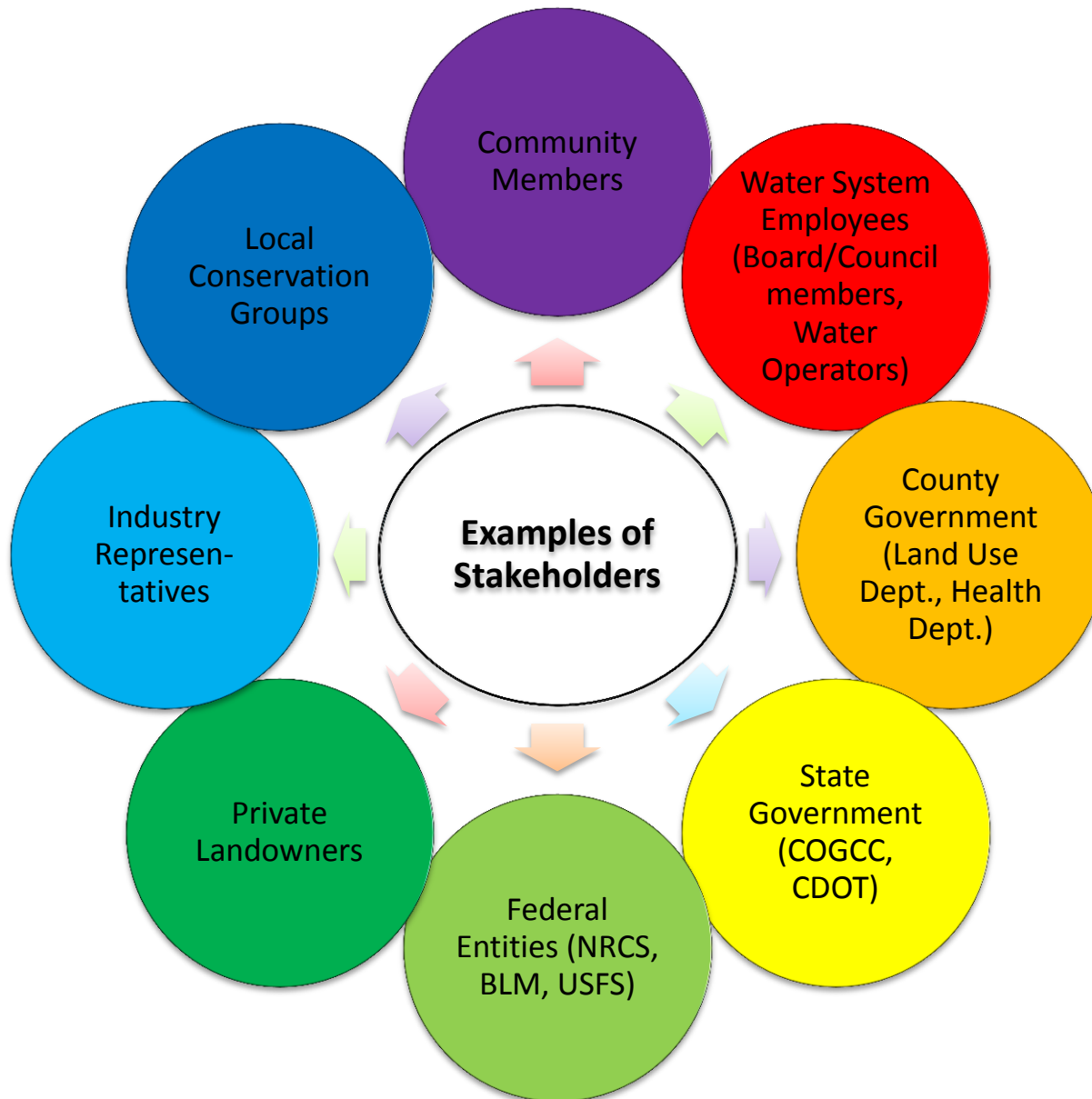
CDPHE Grant Funding

- \$5000 grant for eligible systems in Colorado
- Can be used towards plan development & Best Management Practice implementation
- Matching grant – can be cash or in-kind time

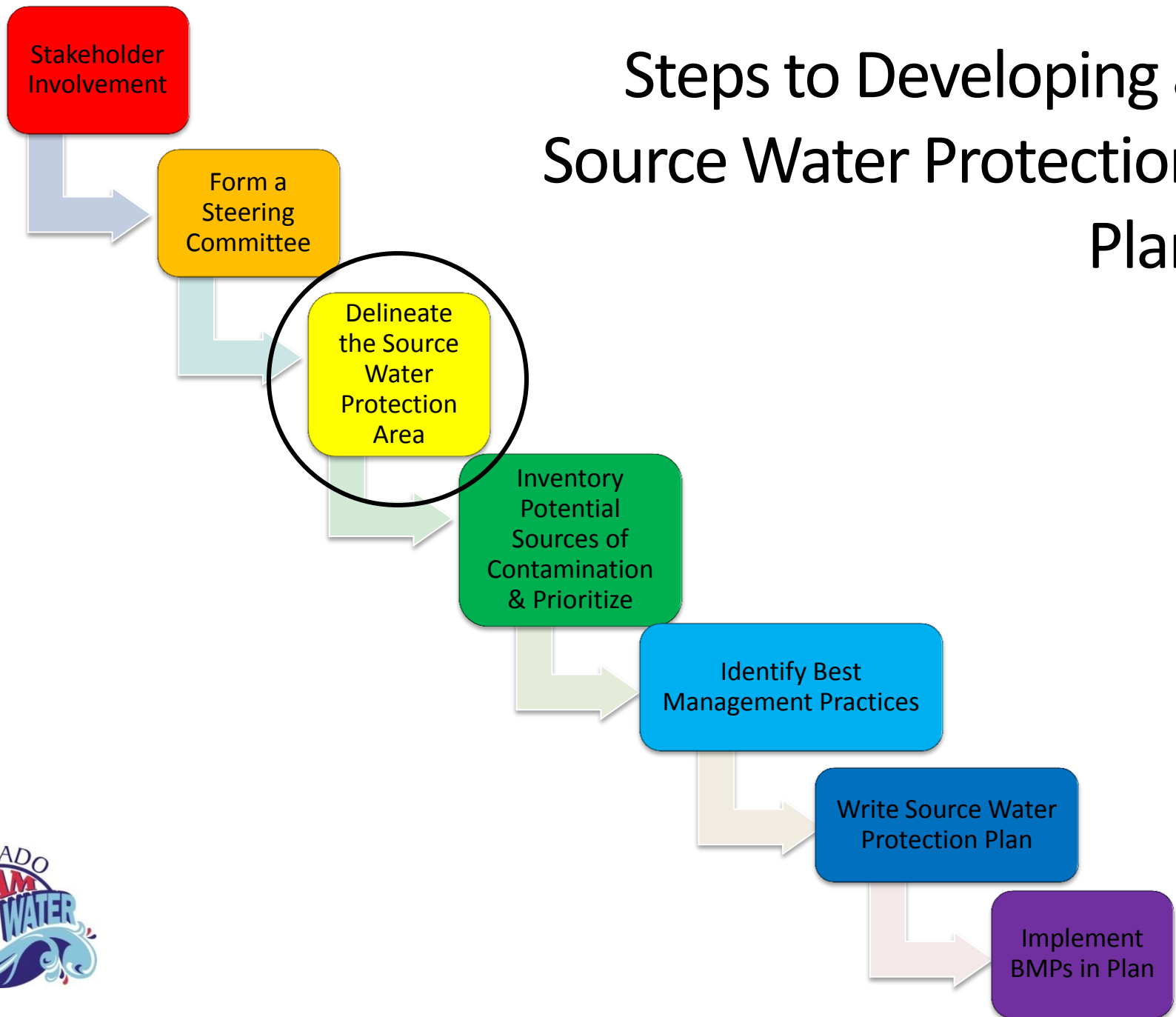
Steps to Developing a Source Water Protection Plan

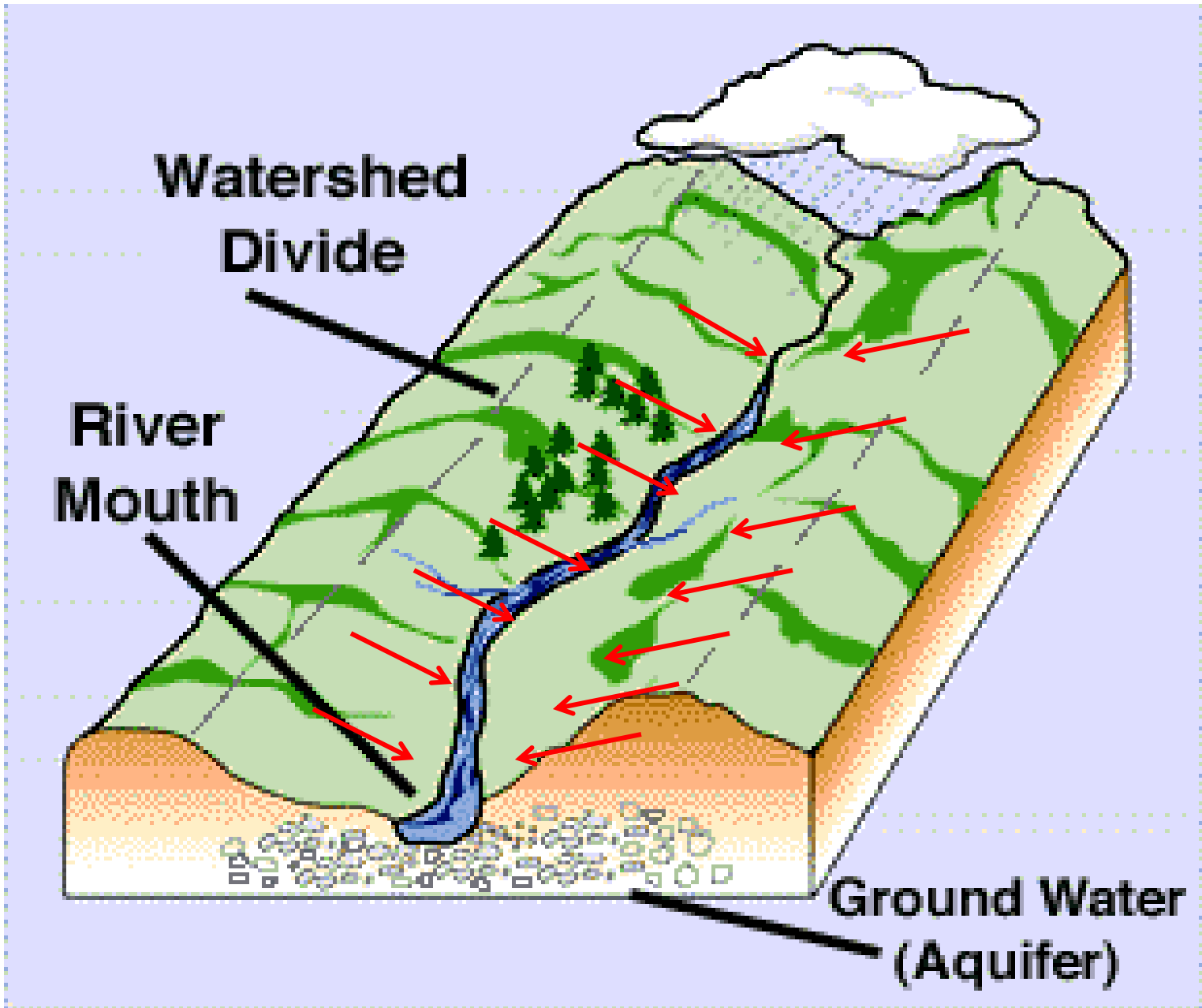


Examples of Stakeholders

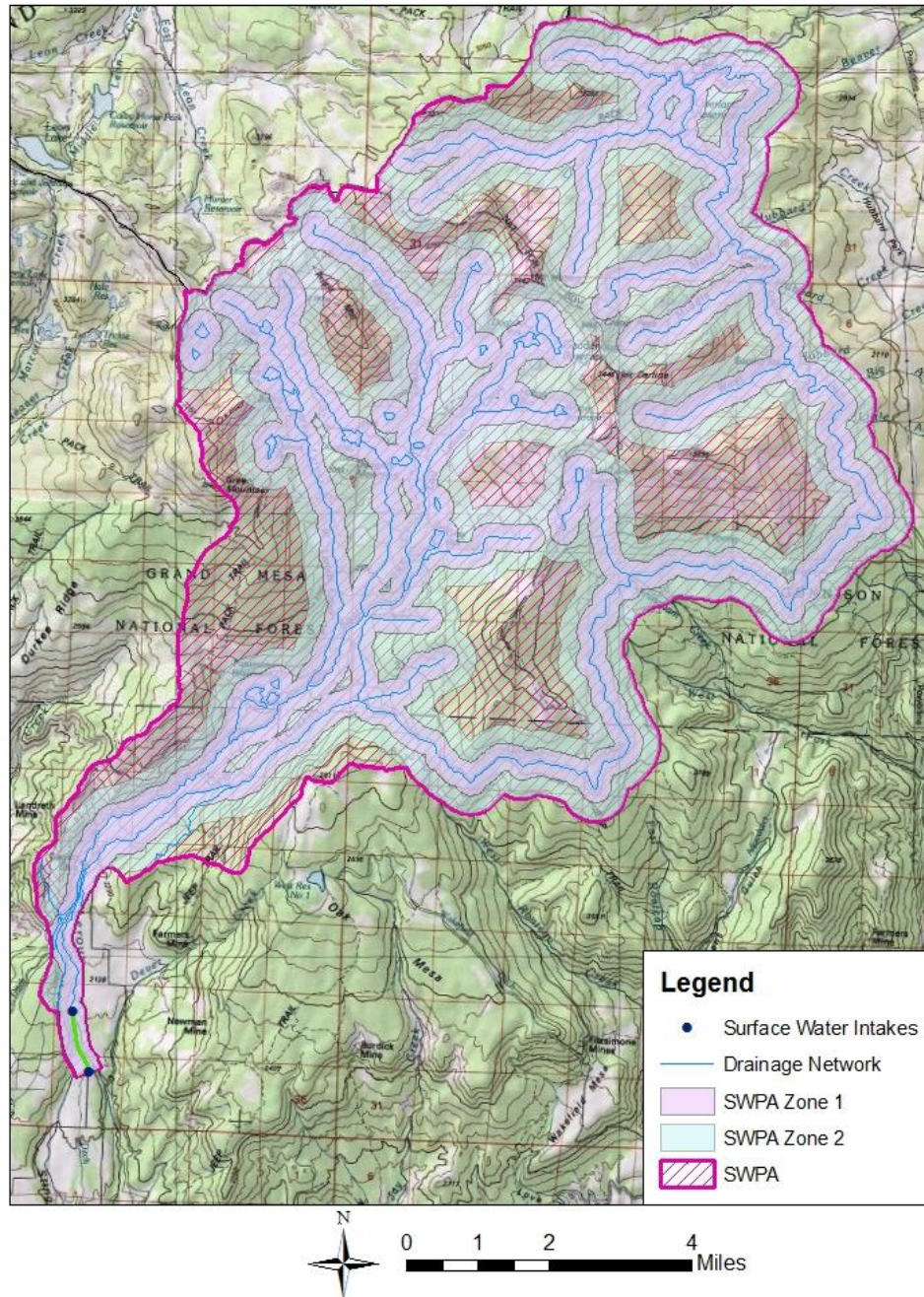


Steps to Developing a Source Water Protection Plan

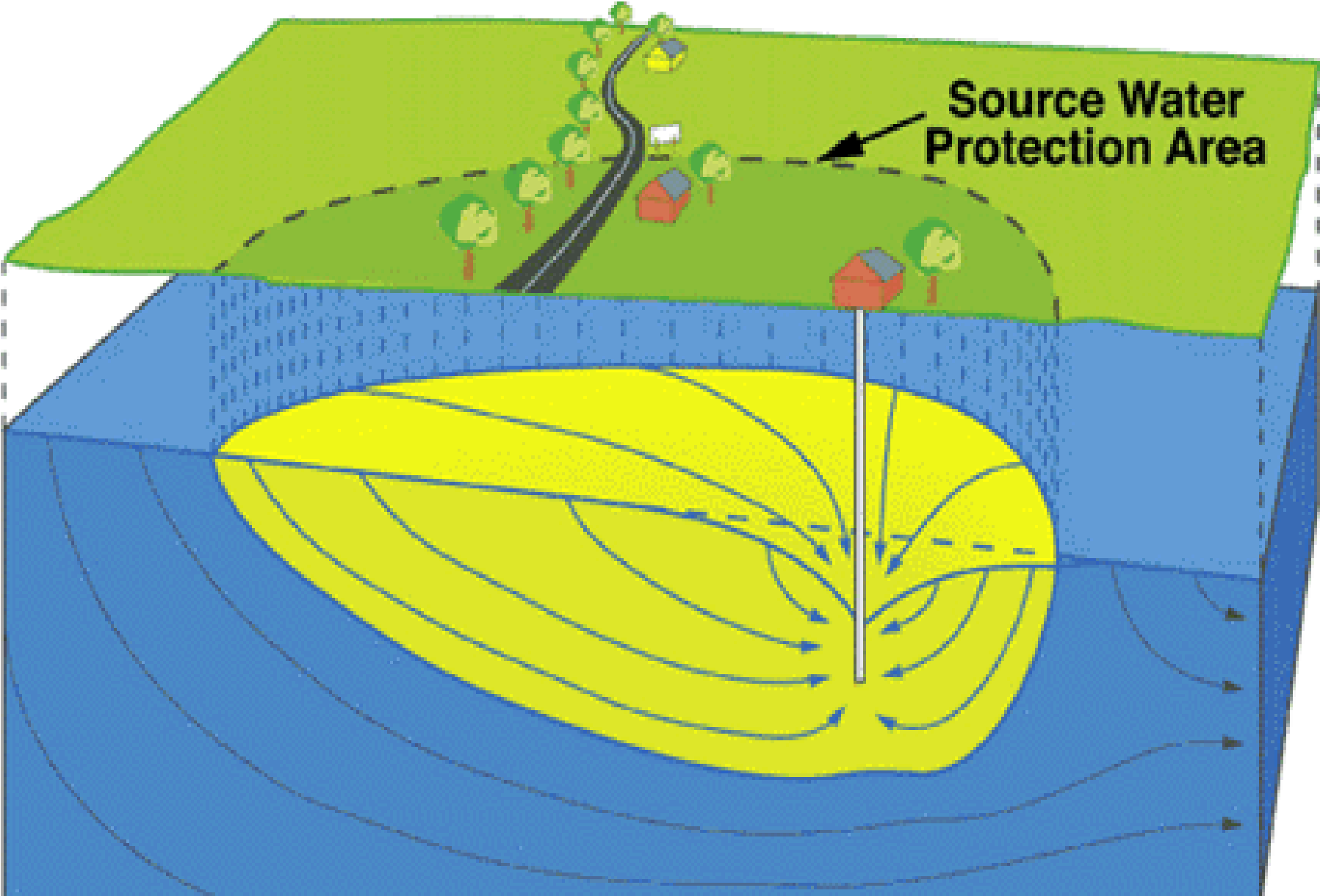




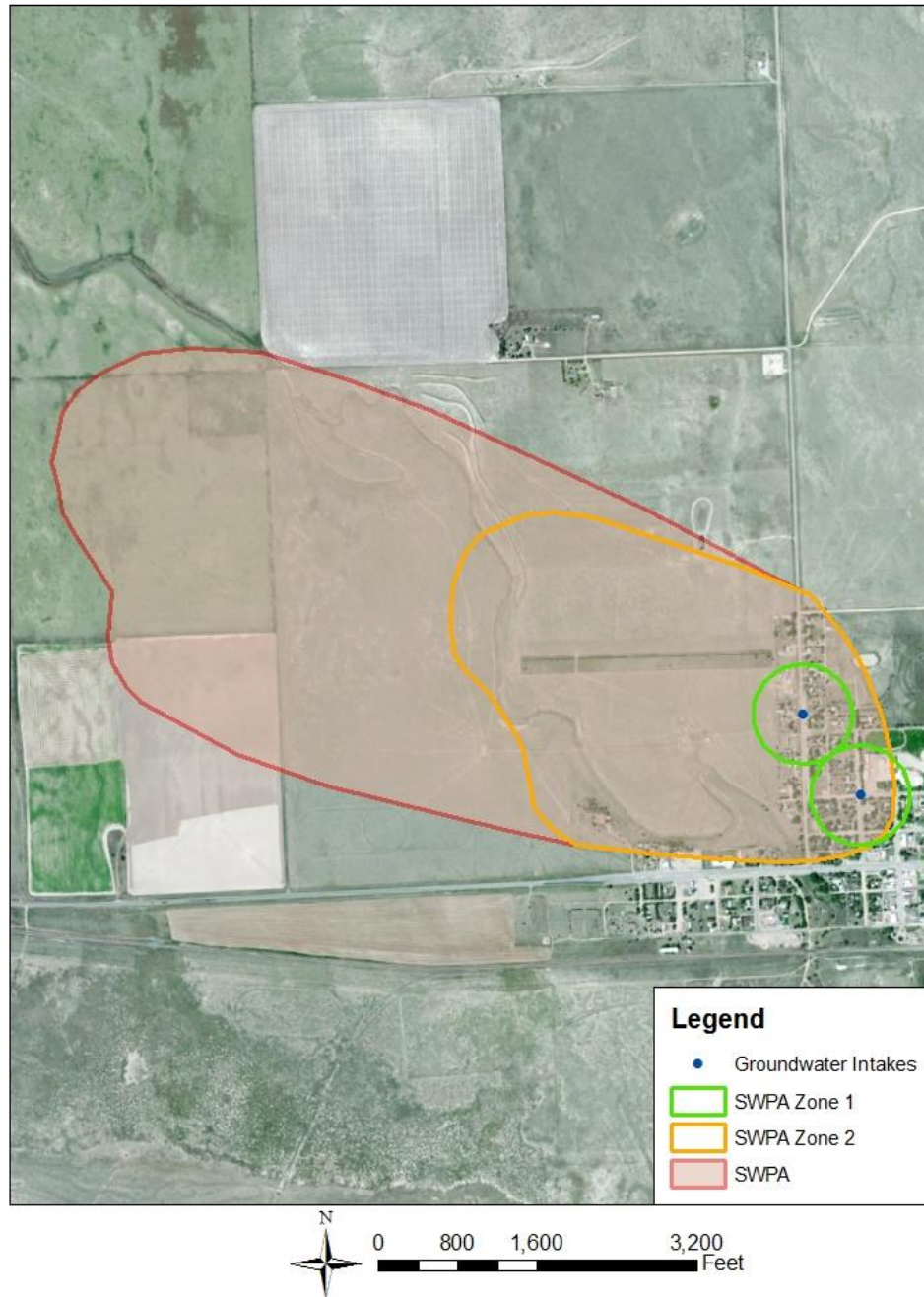
Example Surface Water Source Water Protection Area



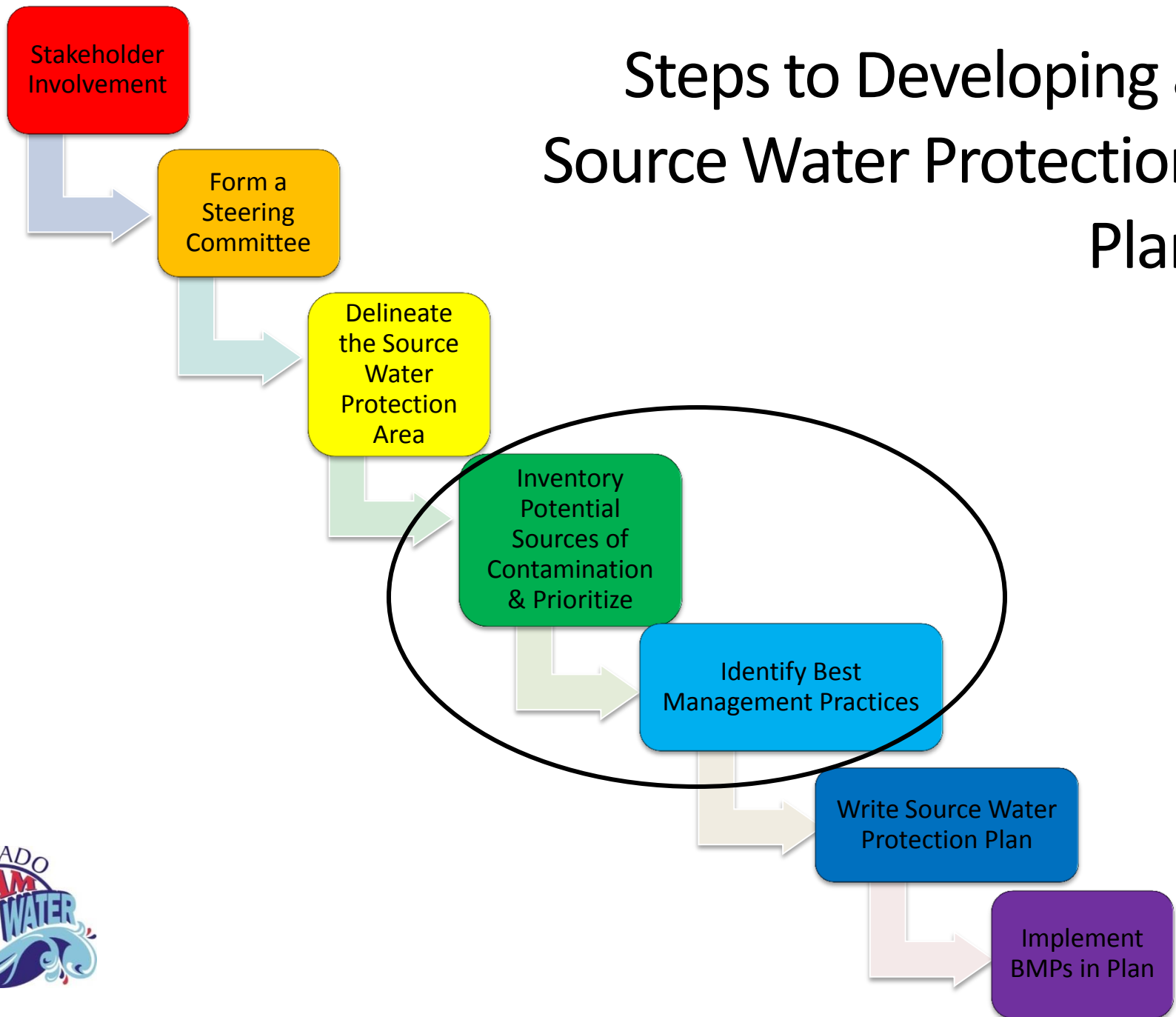
Ground Water Delineation



Example Groundwater Source Water Protection Area



Steps to Developing a Source Water Protection Plan



Agriculture and Potential Sources of Contamination

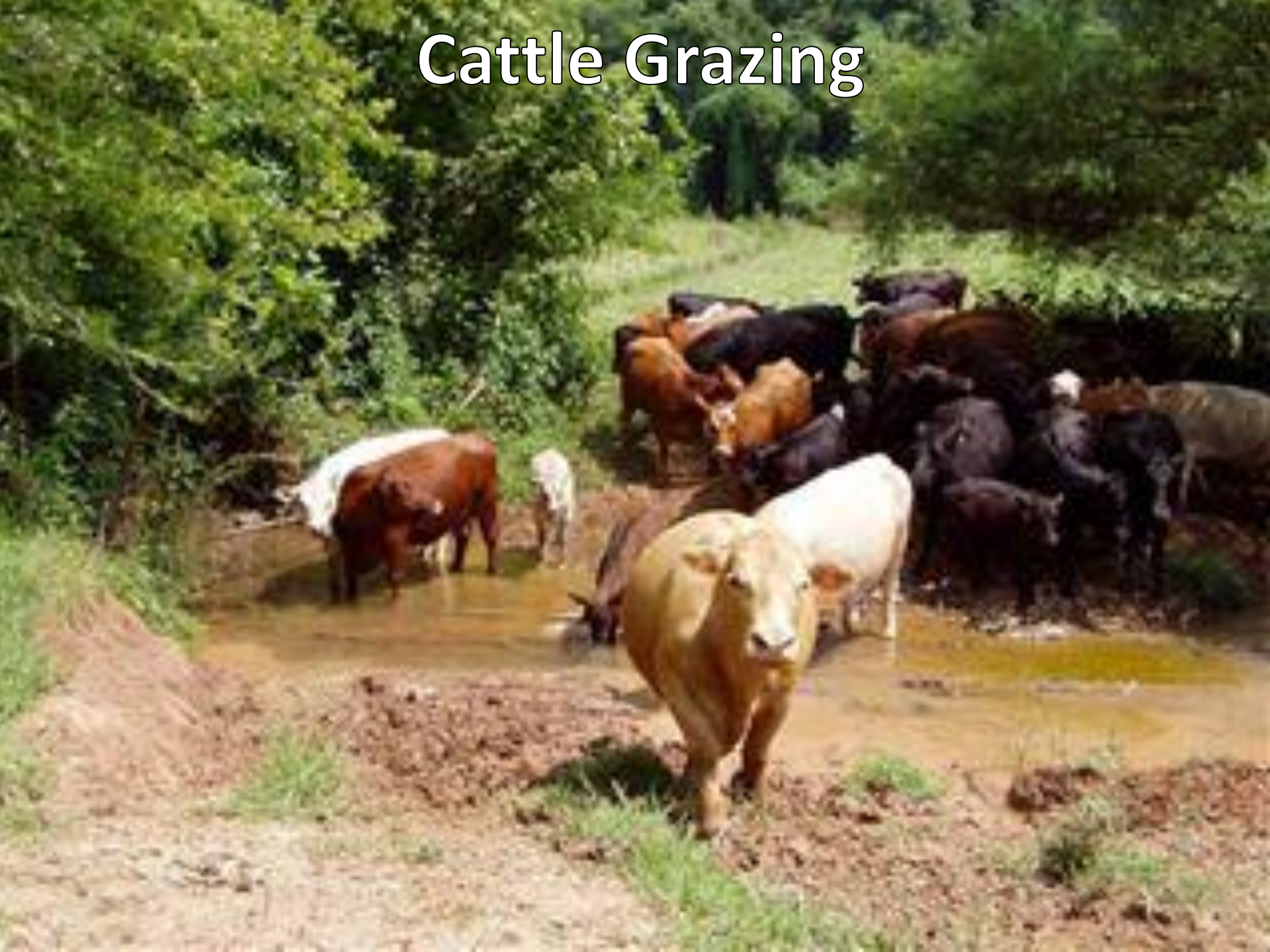
- Potential, not definite, drinking water contaminants.
- Proper agriculture practices and farming techniques pose little risk to a drinking water intake.
- Farmers and ranchers have been integral partners in developing many community's source water protection plans.



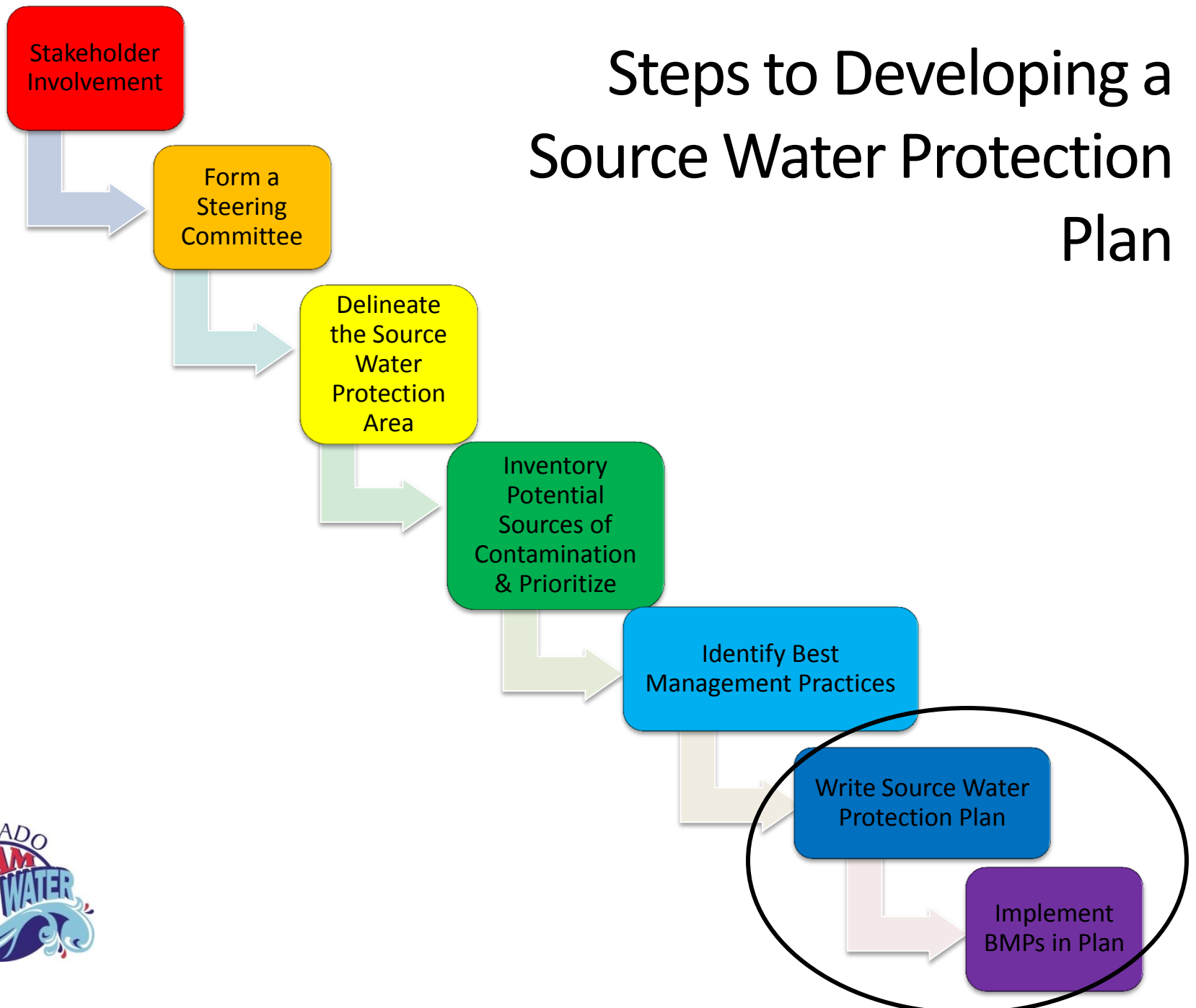
Improper Agricultural Practices



Cattle Grazing



Steps to Developing a Source Water Protection Plan



Gateway Metro District

Source Water Protection Plan

Gateway Metro District



**PWSID # 149300
Groundwater Source**

Pitkin County, Colorado

**Bob Walker, President
PO Box 645
Snowmass, CO 81654
(970) 927-4262
(970)963-8393**

October 15, 2012

Authors:
Gwen and Mary Leslie: Environmental Process Control
Paul Hempel: Colorado Rural Water Association

Issue of Concern: Small Scale Ranchettes



- Wells in shallow alluvial aquifer
- Residential horses, chickens, etc.
- Cattle grazed seasonally on public lands bordering the SWPA
- A few storage tanks with no secondary containment

Best Management Practices:

- Public Education:
 - Identified property owners with questionable land use practices and provided them with NRCS material that outlined cost-share opportunities for addressing their practices.
 - Provided ranchette owners with educational material that highlighted the connection between land use practices and source water protection.
 - Provided property owners with educational material regarding storage tanks, with an emphasis on proper secondary containment techniques.

A Farmer's Guide To Agriculture and Water Quality Issues



PATHOGEN MANAGEMENT FACT SHEETS



PA-1 Pathogens and Water Quality

What are Pathogens?

A pathogen is any agent that causes disease in animals or plants. For this discussion, pathogens include microorganisms such as bacteria, protozoa, and viruses. In the U.S., most disease outbreaks from pathogens are associated with food contamination resulting from improper storage, poor personal hygiene of the food handler, undercooking, raw food consumption, cross-contamination, and contaminated processing or packaging of food. There are, however, several significant waterborne pathogens. Most waterborne disease-causing microorganisms come from animal and human wastes that may enter waterways through runoff, infiltration and subsurface flow, point-source discharge, stormwater, or defecation in water bodies.

Pathogens and Water Quality

Until recently, water pollution control efforts in the U.S. have emphasized sediment, nutrients, and toxic chemical risks. However, it is becoming clear that microbial pollutants such as bacteria, viruses, and protozoa may present even greater risks to human health. The Centers for Disease Control and Prevention (CDC) estimate that each year in the U.S. up to 900,000 cases of illness and possibly 900 deaths occur as a result of infections from waterborne pathogens. From 1986 through 1990, 20 waterborne disease outbreaks due to intestinal protozoa were reported in 10 states, affecting more than 15,000 people. In 1993 and 1994, 17 states reported 30 disease outbreaks associated with drinking water. These outbreaks caused more than 400,000 people to become ill, most from an outbreak of cryptosporidiosis in Milwaukee, the largest waterborne disease outbreak ever documented in the U.S. More than 10,000 beach closures and advisories were reported in 2002 at ocean, bay, Great Lakes, and other freshwater beaches across the U.S. due to unsafe levels of bacteria. Children, the elderly, and those with weakened immune systems are at higher risk from microbial pollutants in water than the rest of the population. These groups comprise about 25% of the U.S. population.

The US EPA estimates that pathogens are the leading pollutant of U.S. rivers and streams, polluting more than 93,000 miles of rivers and streams, 35% of the nation's impaired streams. In addition, nearly 5,000 square miles of U.S. coastal waters are contaminated by pathogens.



Source Water Protection Practices Bulletin

Managing Above Ground Storage Tanks to Prevent Contamination of Drinking Water

Above ground storage tanks (ASTs) are tanks or other containers that are above ground, partially buried, bunkered, or in a subterranean vault. These can include floating fuel systems. This fact sheet focuses on the management of facilities with ASTs to prevent contamination of drinking water sources (ground water and surface water used as public drinking water supplies).

ABOVE GROUND STORAGE TANK USE

The majority of storage tanks contain petroleum products (e.g., motor fuels, petroleum solvents, heating oil, lubricants, used oil). Oil storage facilities with ASTs are typically found in marketing terminals, refineries, and fuel distribution centers. Storage tanks may also be found in airports, school bus barns, hospitals, automotive repair shops, military bases, farms, and industrial plants. Discharges of chemicals, petroleum, or non-petroleum oils from storage tanks can contaminate source water. Product spilled, leaked, or lost from storage tanks may accumulate in soils or be carried away in storm runoff.



Some of the causes for storage tank releases are holes from corrosion, failure of piping systems, and spills and overfills, as well as equipment failure and human operational error. The Spill Prevention Control and Countermeasures (SPCC) regulations require owners or operators of certain above ground oil storage facilities to prepare and comply with written, site-specific, spill prevention plans (see 40 CFR Part 112):

- Facilities with a total above ground oil storage capacity of more than 1,320 gallons;
- Single above ground tanks with an oil storage capacity of more than 660 gallons; and
- Facilities with a combined underground oil storage capacity greater than 42,000 gallons.



Above ground storage tanks

Town of Basalt

Town of Basalt Source Water Protection Plan



Eagle and Pitkin County, Colorado

December 2010

Written by Colleen Williams
Source Water Specialist
Colorado Rural Water Association

For the community water providers:
Town of Basalt: 10 # 000119134

Issues of Concern: Livestock Practices, Fertilizers



- Cattle ranching operation was active within 500 feet of a drinking water well.
 - Specifically, cows were calving close to the well.
- The same well's recharge area included farm land that was irrigated by the Roaring Fork River via a diversion ditch.
- Fertilizer and weed abatement

Best Management Practices:

- Open Communication:
 - Land owners and town officials maintained an open line of communication with regards to land use and proper practices to encourage stewardship of the land and protect the quality of the surface and groundwater.
 - Water operator brought cookies to the rancher to strengthen the relationship, leading to the eventual move of the livestock operation away from the well.
- Public Education
 - Proper irrigation techniques were encouraged, as well as proper liner maintenance techniques for irrigation ditches. Other ag BMPs were encouraged.
- Funding Research
 - Funding opportunities were researched that could be used to create a buffer zone surrounding the town's well to keep livestock contained through the use fencing

Town of Eads SWPP

Town of Eads Source Water Protection Plan

Kiowa County, Colorado
December 17, 2013

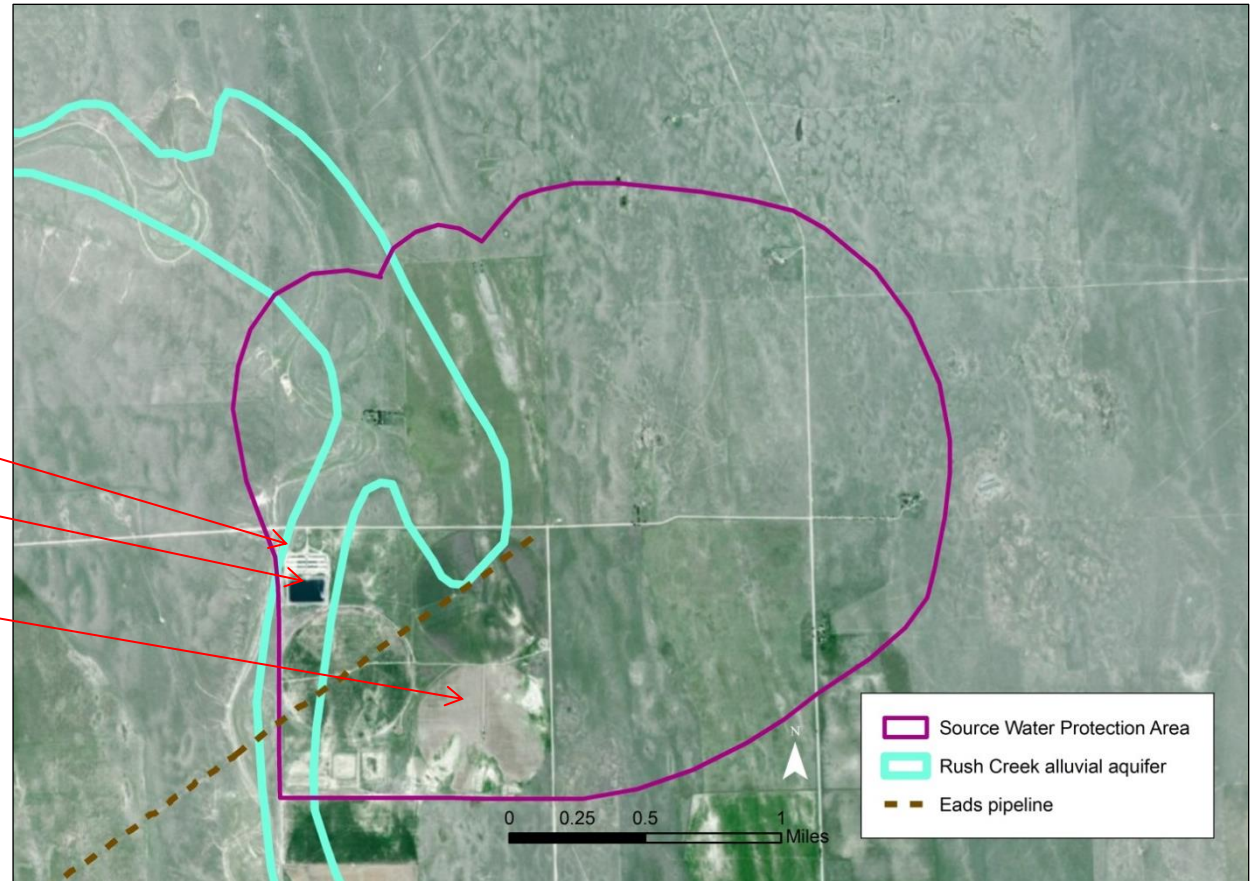


Written by: Colleen Williams
Source Water Specialist
Colorado Rural Water Association

For the Community Water Provider:
Town of Eads: ID # C00131400

Issue of Concern: Swine CAFO

- Swine houses
- Wastewater lagoons
- Wastewater spray fields

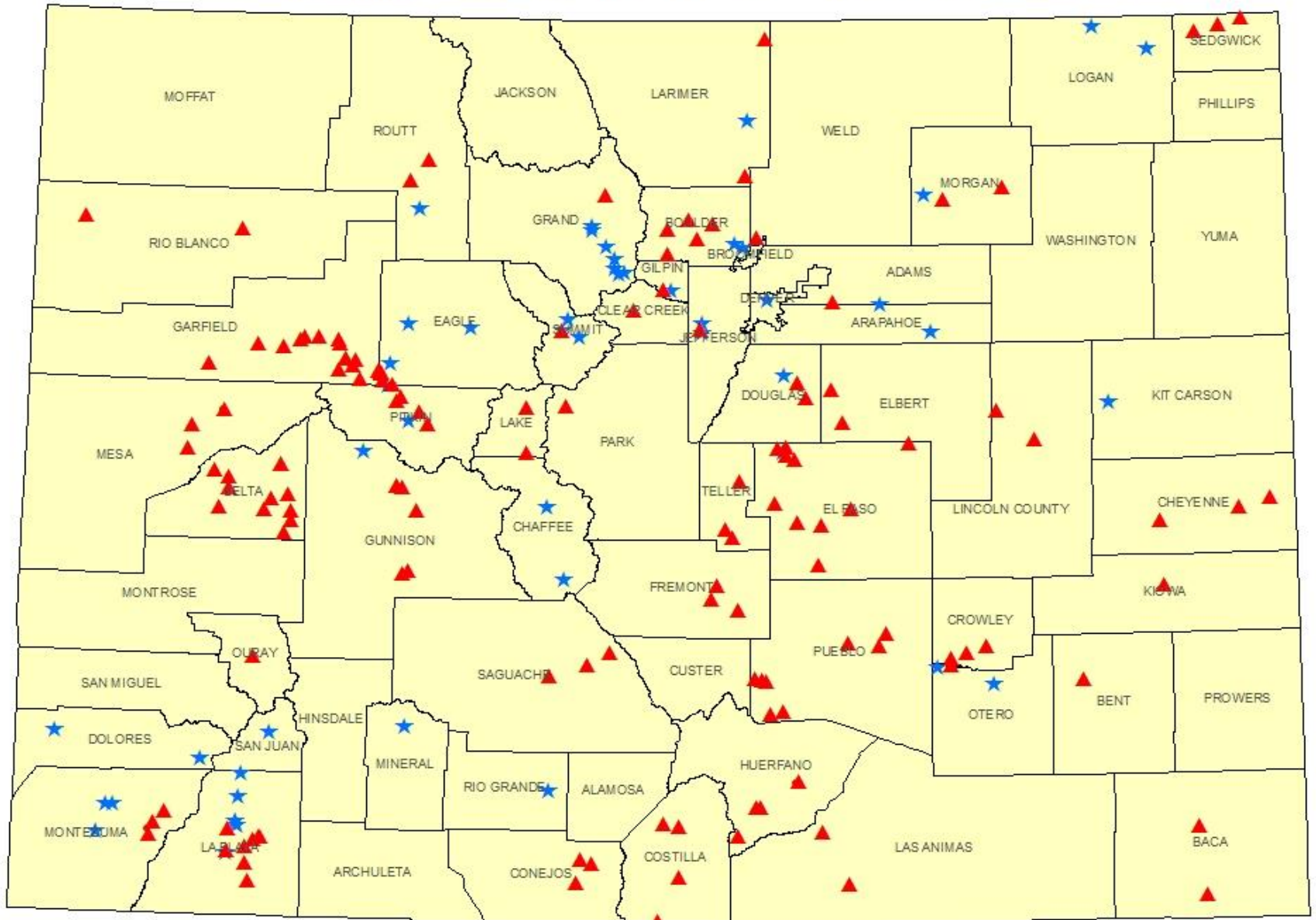


- This CAFO had a history of violations, and had already contaminated the groundwater south of the Town's wells (elevated nitrates).

Best Management Practices:

- Public Outreach and Communication:
 - Ensured the CAFO operation complied with all regulations already in place to protect groundwater. Contacted regulatory agencies to inquire about compliance and educate them about the town's source water concerns.
 - Obtained results from monitoring wells around the Rush Creek site to ensure groundwater levels of nitrate and nitrogen did not exceed the regulatory limit of 10 mg/L.
 - Met with CAFO industry representative and educated them about the Source Water Protection Plan and the potential contamination of the groundwater near the Town's wells.

Communities Working with CRWA's Source Water Program



Legend

- ▲ Completed SWPPs
- ★ SWPPs in Progress
- County Boundaries



Map developed by Colorado Rural Water Association
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 03/31/2015



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