Defending The Source Water Protection Plan – Protecting Our Environment Together

Dyana Stewart and Tim Walker
Source Water Protection Specialists
Florida Rural Water Association
“A CLEAN environment is a human right like any other. It is therefore part of our responsibility towards others to ensure that the world we pass on is as healthy if not HEALTHIER than we found it.”
Dalai Lama

“Plans to protect air and water, wilderness and wildlife are in fact plans to protect MAN” – Stewart Udall
What is “Source Water” and “Source Water Protection Plans”?

- “Source water” can be defined as surface and/or ground water that is consumed by humans.
  - Approximately 6,900 Public Water Supply Systems in Florida
  - Fresh groundwater provided drinking water (public supplied and self-supplied) for 17.33 million people (92 percent of Florida’s population).
  - Fresh surface water provided drinking water for 1.47 million people (8 percent). (Data based on 2010)

- A Source Water Protection Plan is a local, grass-roots effort implemented by city officials, councils, utilities personnel, agricultural producers, manufacturing and other business interests and any other concerned citizens.
Comprehensive Source Water Protection

MULTIPLE RISKS REQUIRE MULTIPLE BARRIERS

SOURCE WATER & COLLECTION SYSTEM

PROTECTION BARRIERS  RISK PREVENTION  RISK MANAGEMENT  RISK MONITORING/COMPLIANCE  INDIVIDUAL ACTION
Costs of contamination

- Direct costs include:
  - Cost of obtaining temporary source
  - Soil and water investigations cost
  - Cleanup and remediation costs
  - Legal fees
  - Development of new water source
  - Consulting fees
Costs of contamination

Indirect costs include:
- Loss of customer confidence in water supply
- Increased monitoring costs
- Real estate devaluation
- Potential loss of jobs
- Potential lawsuits from real or alleged consumption of contaminated water
LET'S TAKE A BREAK FOR A FEW SLIDES AND PLAY A GAME!
The football has to be manufactured from certain materials and to a size and weight specification to be NFL accepted. Also, it has to be pumped up with air to a minimum level. You can go over but don’t go under!
Like the football, the Plan also has to meet certain minimum standards to be acceptable

- A map showing the Protection Area
- Inventory of Wells
- Inventory of Potential Contaminant Sources
- Define responsibility and authority of entities
- Preventative measures outlined to protect the Source Water
- A contingency plan to provide alternative safe drinking water in case of contamination
- A Steering Committee to review, update, and IMPLEMENT the Plan
MEET THE PLAYERS – EVIL TEAM CONTAMINATION

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MEET THE PLAYERS – GOOD TEAM PROTECTION
THE FRWA SOURCE WATER SPECIALIST!
WATERBOY OR WATERGIRL, WHATEVER THE CASE MAY BE! IT IS YOU!!
LAST BUT CERTAINLY NOT LEAST IS EVERYONE WHO CHEERS FOR CLEAN WATER
BACK TO THE BORING SLIDES FOR A WHILE
A Source Water Protection Plan consists of four basic components:

- Delineation
- Contaminant Inventory and Susceptibility
- Management Plan
- Contingency Plan
Step 1-Delineation

- Determine Source Water protection area. Again, this could be a complete watershed, or several drainage basins.
- Determine Public Water Systems in protection area.
  - For an effective protection plan, all systems must work together to protect the aquifer.
- Determine protection zones for individual wells based on FDEP Source Water Assessment Protection Program.
Step 2- Contaminant Inventory and Susceptibility

Methods to Identify Potential Sources of Contaminants:

- Database Search
- Windshield Survey
- Site Visits with One-on-One Interviews
- FDEP SWAPP
  - https://fldep.dep.state.fl.us/us/swapp/
In FAVA models, training points consist of data from wells reflecting background water quality. Parameters used in the models to reflect known occurrences of aquifer vulnerability in the natural hydrogeologic system include dissolved oxygen and total dissolved nitrogen. Input spatial data, also known in WofE as “evidential themes” include combinations of several improved or newly created statewide GIS coverage such as:

- Depth to water table
- Hydraulic head difference
- Thickness of confinement
- Distance to karst features
- Soil permeability
- Aquifer system overburden
Types of Groundwater Pollution

- **Point Source Pollution** – contaminants have an identifiable source
  - Wastewater facility, haz.waste generator

- **Nonpoint Source Pollution** – contaminant source cannot be found
  - Erosion, precipitation, storm water runoff, etc.
Potential Contamination Sources

Potential contaminant sources are designated as significant if they fall into one of the following categories:

1) Large quantity hazardous waste generators.
2) Landfills.
3) Underground storage tanks.
4) Known groundwater contamination (including open or closed hazardous waste sites, state or federal superfund sites, and UST leak sites).
5) Underground injection wells.
6) Major roads or rail transportation routes.
7) Cultivated cropland greater than 20% of the inventory region.
8) Animal feeding operations.
9) Wastewater treatment facilities, sludge handling sites, or land application areas.
10) Septic systems.
11) Sewer mains.
12) Storm sewer outflows.
13) Abandoned or active mines.
Gas Stations and Petroleum Storage Tanks

Diagram showing gas stations and petroleum storage tanks with a diagram of the plume migrating through the soil, vapor phase, and groundwater flow.
Drycleaners

The PCE Challenge

- PCE Surface Discharge
- Leaky Sewer Release
- PCE Point of Use Release
- PCE Vapor Plume
- PCE Vapor
- PCE Zone
- Finer Grained Lens
- Groundwater
- Aquifer
- PCE Sand Grain
- Dissolved Phase PCE Plume
- Finer Grained Layer

Water Table
Sewer Line
PCE
Water Film
Sand Grain
PCE
Groundwater Flow

Finer Grained Lens
Landfills
Onsite Septic Wastewater Systems
Agricultural Uses

- Nitrate and phosphate runoff from fertilizers and waste products from livestock can be a major source of surface and groundwater pollution.
- Ag accounts for about 36% of groundwater usage in Florida.
Household and domestic contamination

Although difficult to regulate, household chemicals have a large impact on the water supply. Improper disposal and use can wash into stormwater drains and reach the water supply.

Nonpoint Source Pollution (NPS) is the largest overall source of surface water quality problems. Over-fertilizing lawns and gardens contributes a great deal to the problem.
NOW A COMMERCIAL BREAK FROM YOUR SPONSOR
EVIL TEAM CONTAMINATION

CON

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Nickname Nation
GOOD TEAM PROTECTION
AND THE SNAP!   THE CROWD GOES WILD!
CON, TAMMI, & NATION TRY TO BREAK THROUGH THE DEFENSIVE LINE
BACK TO THE BORING SLIDES FOR A WHILE
Step 3 - Identify Management Strategies

Voluntary Strategies

- EDUCATION
- Best Management Practices for Local Businesses
- Drinking Water Protection Signs
- Land acquisition
- Household hazardous waste collection
Regulatory Strategies

• Zoning
  • Land use controls
  • Subdivision regulations
  • Special permitting
  • Growth controls
• Septic system ordinances
Step 4– Contingency Planning

- Most PWSs already required to have
- Many don’t include specific source water protection information
  - Emergency response procedures
  - Identify short and long-term alternative sources

Plan of Action in Case of:
- Hazardous Spills
- Emergencies
- Contamination
- System Failure
- Increases in Demand
Contingency Planning

Basic Plan:
- Contact Information to Mobilize the Emergency Response Team

Full Plan:
- Identify Potential Threats
- Formulate Response Scenarios
- Determine a Trigger Point for when to Respond

Long-Term Plan:
- Identify Future Supplies to Accommodate Growth
- Comprehensive Monitoring Program
Conservation

- In 2013, 800 million gallons/day withdrawn from Floridan aquifer, predicted to reach 1.2 billion/day by 2033. 6 million more people are predicted to move to Florida by 2033.
  - Encourage use of low-flow plumbing
  - Use drip irrigation in farming to reduce evaporation loss
  - Use properly sized pipes to reduce transport loss
  - Water lawns in morning and evening or opt for no lawn
  - Direct storm water in recharge basins
LET'S SUMMARIZE WHAT WE HAVE LEARNED DEFENDING SOURCE WATER PROTECTION PLANS

Source Water Protection: What Works Best

A combination of regulatory and voluntary strategies that addresses a community's specific characteristics and needs—a source water protection program tailored to fit the priorities of the community.

Costs of Source Water Protection

- Vary widely from community to community – basically the costs of source water protection are up to you!
- As we know, preventative maintenance is almost always cheaper. A contamination incident will result in numerous direct and indirect costs, including loss of confidence from your customers!
Let's summarize what we have learned defending source water protection plans—cont.

- Rural Water Source Water Specialists, EPA, and Primacy Agencies defend the content of the Plans and the soundness of the scientific method and models.
- Steering Committee Members must defend their effort to implement the plan.
- Steering Committee Members must make reasonable effort to inform the Source Water Specialist of known potential contaminants peculiar to their area.
- The General Public has a responsibility to get involved, understand the issues, and use common sense measures to protect their water resources.

Now who won at our game???
SCORE!!
That probably wasn’t a surprise

Protected Source Water for Everyone!
We all win when the good team wins!
Questions?