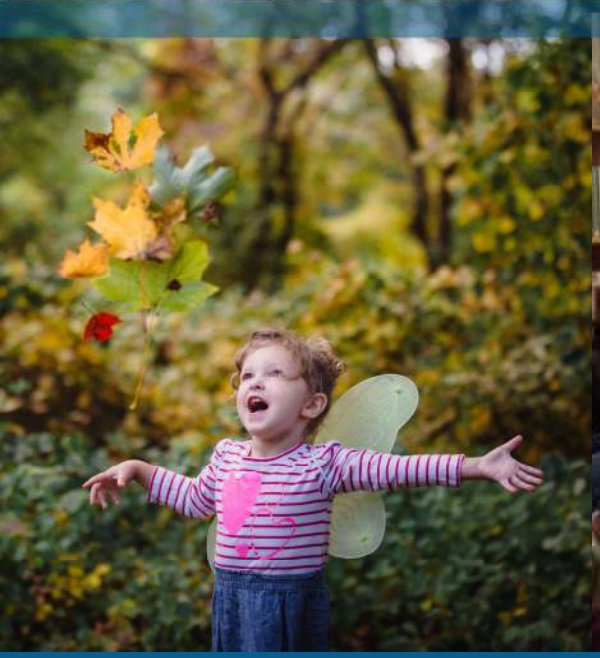

Educating and Engaging the Public on the Community Wastewater Evaluation

Erin Moore, PE, Senior Project Manager
Kyle Kortright, Staff Engineer

Tighe&Bond

Slide 1

GL2 Grafton has a tradition of working together

Greg Lane, 9/23/2022

Presentation Outline

- Project Background
- Project Goals
- Analysis Approach
- Work Completed
- Next Steps
- Community Feedback & Questions

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COMMUNITY WASTEWATER EVALUATION

Project Background

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- **The Problem?**
  - Public Health Concerns
  - Environmental Health Concerns
  - Economic Health Concerns
- **Potential Solutions?**
  - Consider a community wastewater system
  - Consider a community drinking water system
- **Why Now?**
  - Funding availability
  - Current concerns with water quality

Project Goals

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- **Collaborative effort between Town, Vermont DEC, Grafton Community, and Tighe & Bond**
  - Community involvement & input from start to finish
  - Understand current issues & desire for a community wastewater or drinking water system
  - Develop a report which compares several alternatives including construction costs, O&M costs, and potential user fees. This is called the Preliminary Engineering Report.

Analysis Approach

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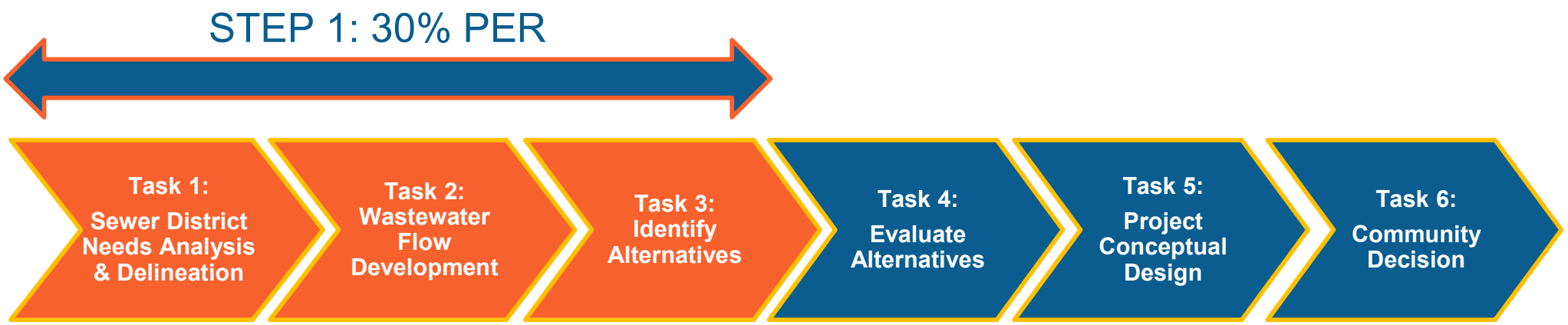
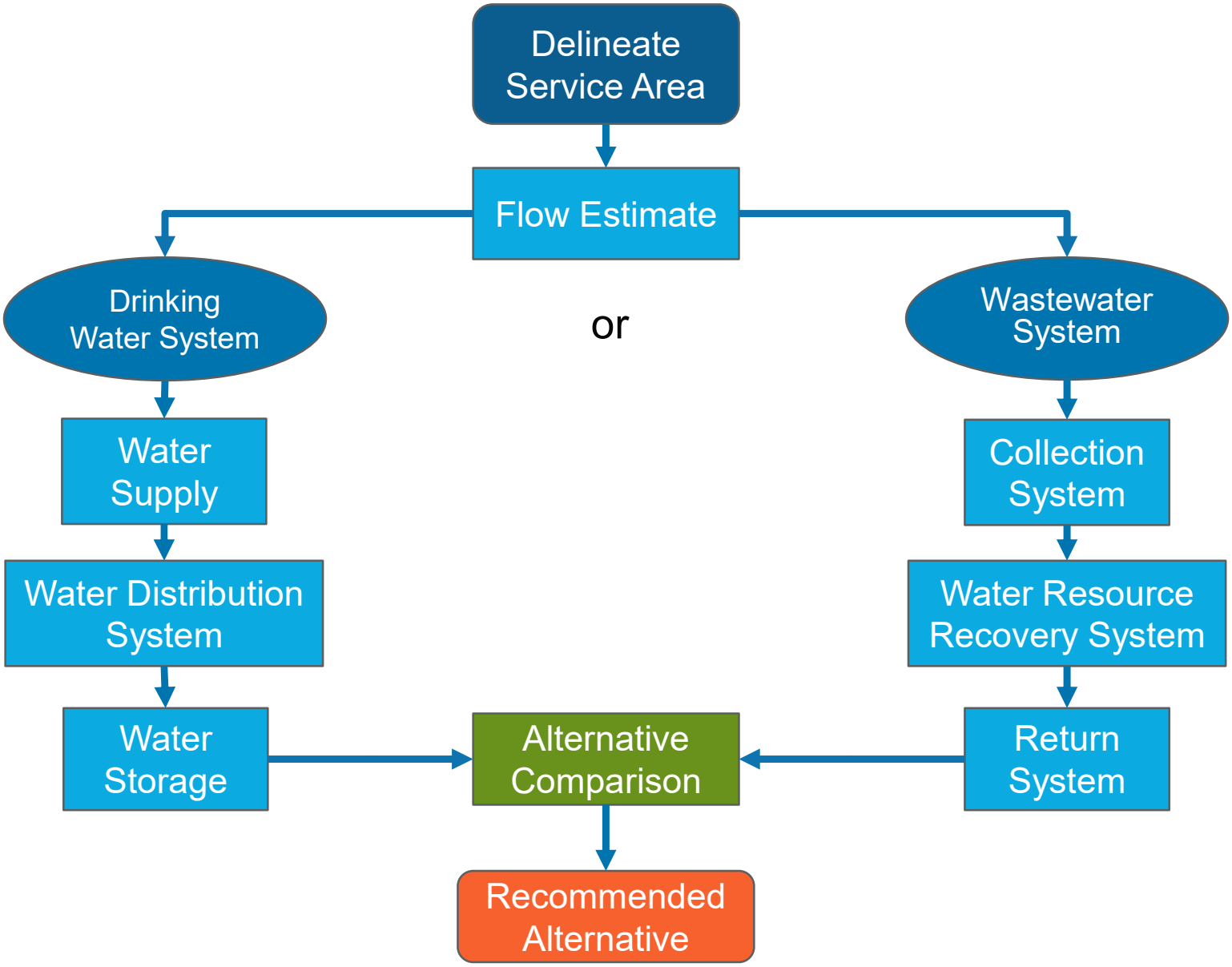
- **Process**
  - Project Completed in Four Steps:
    - STEP 1: 30% Preliminary Engineering Report – where we are today!
    - STEP 2: 60% Preliminary Engineering Report - Public Meeting
    - STEP 3: 90% Preliminary Engineering Report - Public Meeting
    - STEP 4: Final Preliminary Engineering Report - Public Hearing



Project Analysis Approach

Step 1



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COMMUNITY WASTEWATER EVALUATION

Service Area Needs Analysis & Delineation

Wastewater Needs

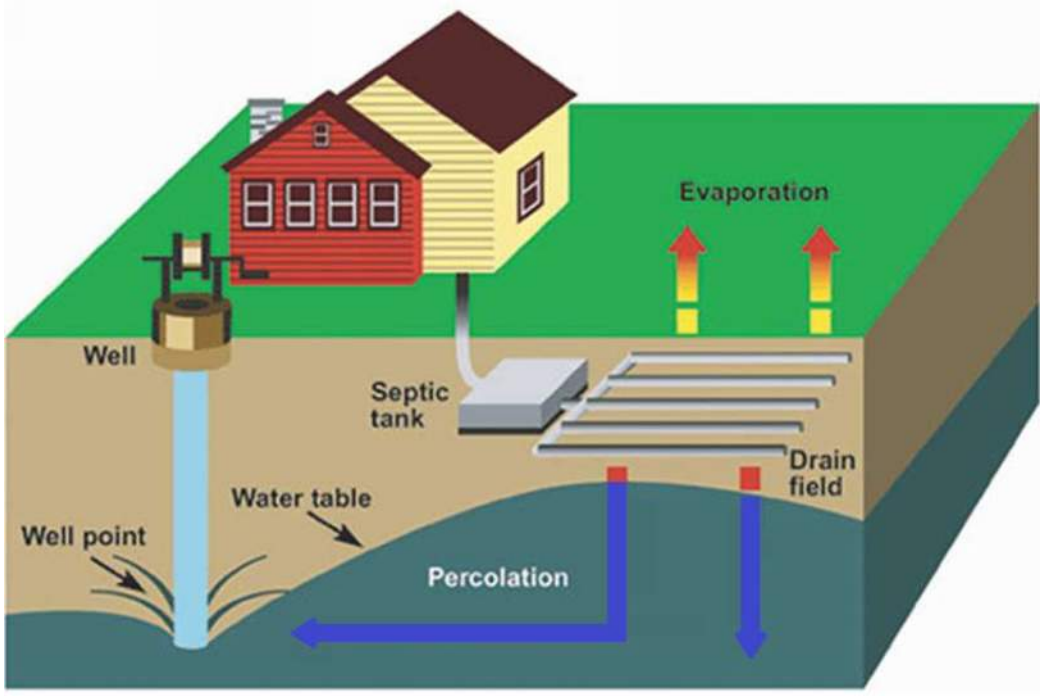
Step 1

- **Service Area Needs Analysis & Delineation**
  - What areas have current issues?
  - What areas have the potential for issues?
  - What areas would benefit the most?
- **Service Area Considerations**
  - Previous reports & survey responses
  - Parcel sizes
  - Soils & restrictive layers
  - Wetlands & flood zones
  - Village center & planning buffer

Wastewater Needs

Step 1

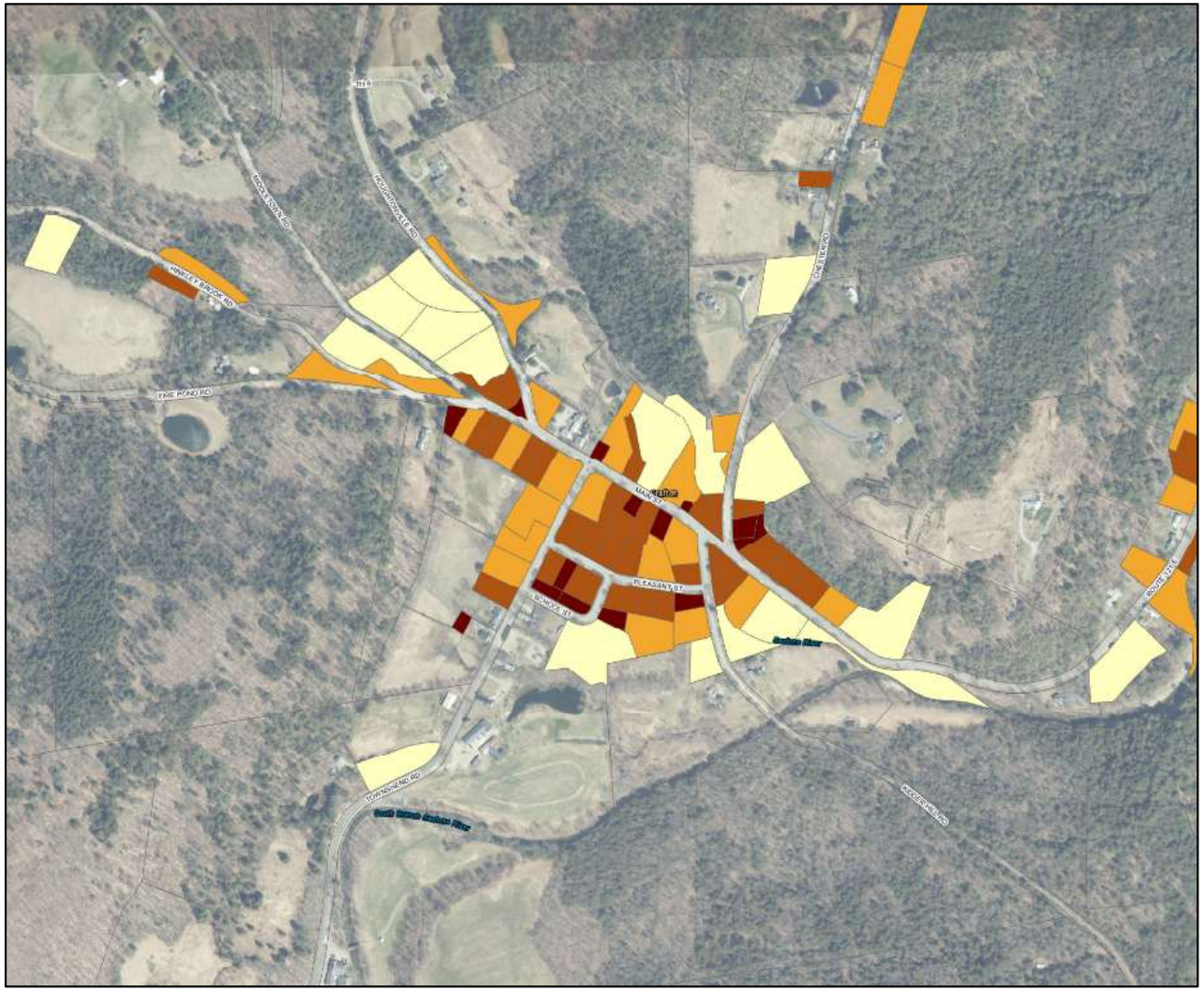
- **Previous Reports & Surveys**
  - Several water & wastewater studies completed since 1992
  - Conclusions of Previous Reports:
    - 70% parcels less than one acre, 43% are less than 0.5 acres
    - 70% of septic systems in Village constructed before 1970 or unknown
    - 2001 survey -> 70% of respondents felt that a community septic system was needed for the Village although 97% reported no issues with their septic system
    - Approximately 60% of parcels in Village do not meet one or more set-back requirements



Wastewater Needs

Step 1

Parcel Sizes

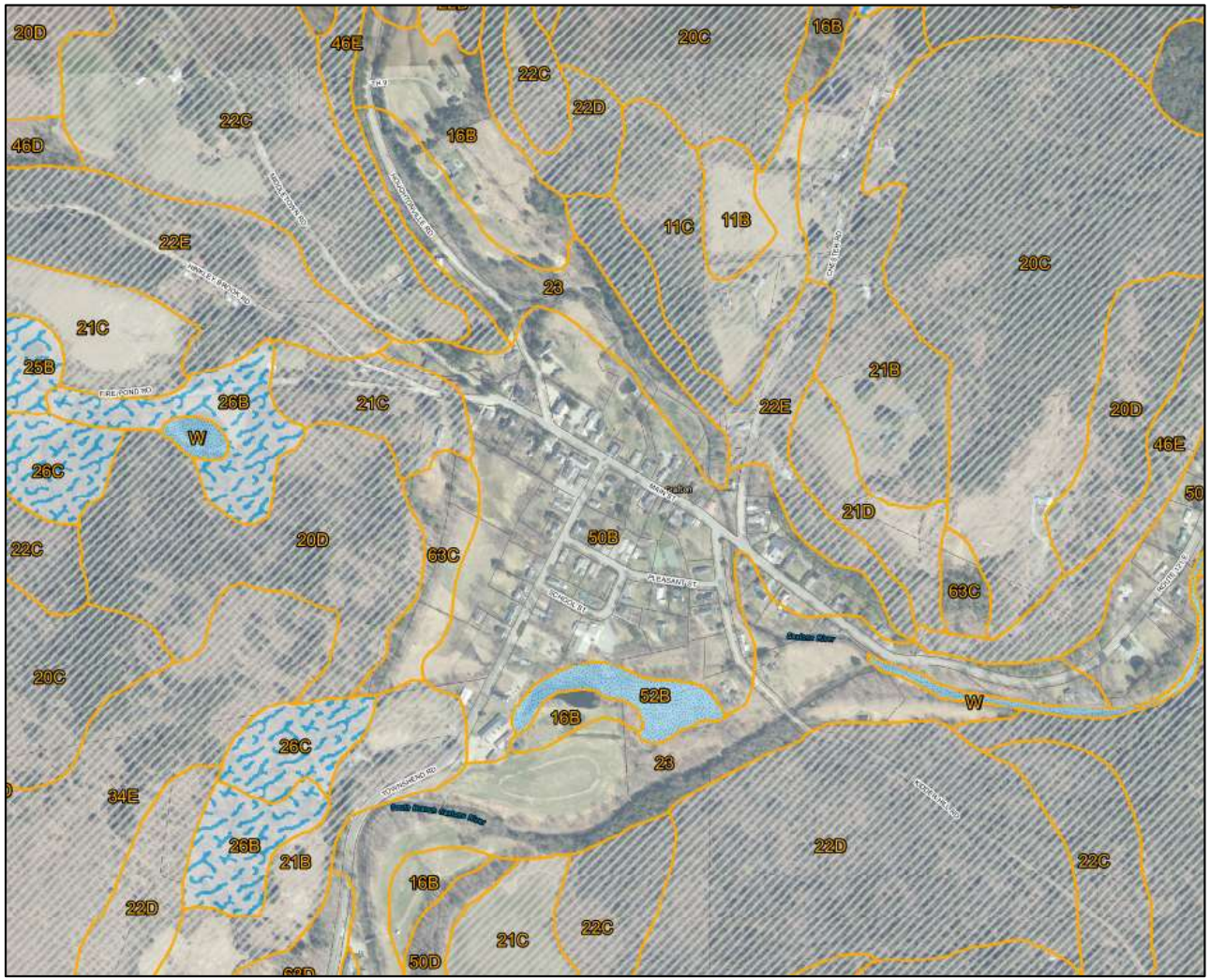


- Small parcels have leach field constraints and difficulty meeting set-back requirements
- Smallest parcels located in the Village Center

Wastewater Needs

Step 1

- **Soils & Restrictive Layers**



- Shallow groundwater & shallow depth to bedrock negatively impacts leachfield performance
- Isolated areas with anticipated shallow depth to water table
- Higher elevations anticipated to have shallow depth to bedrock

Legend
Soil Group
Potential Shallow Depth to Water
Potential Shallow Depth to Bedrock

Wastewater Needs

Step 1

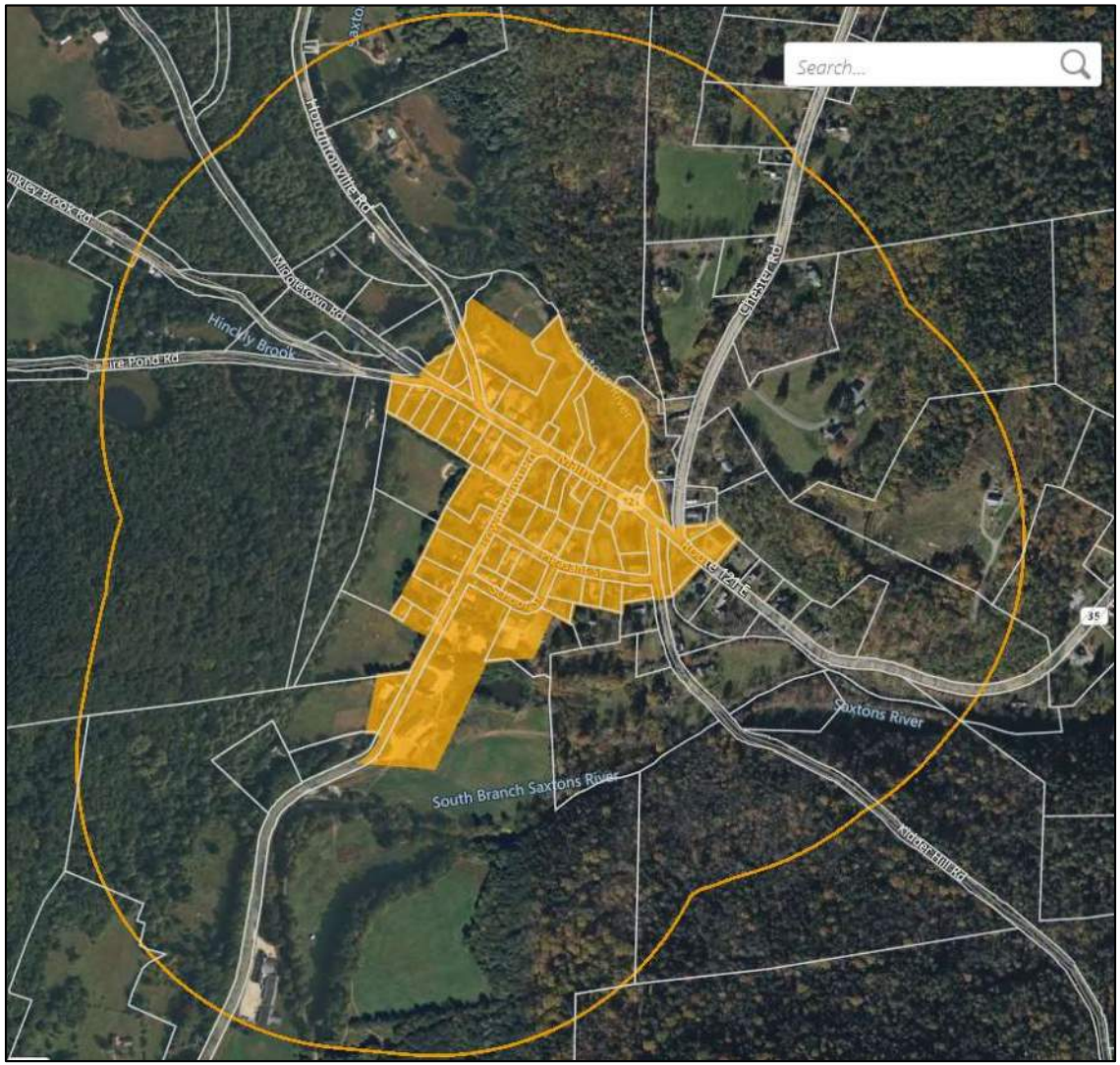
- **Wetlands & Flood Zones**

  - Septic systems must meet setback requirements from water bodies and wetlands
  - Septic systems should not be within flood zone

Wastewater Needs

Step 1

- **Village Center & Planning Buffer**



- Vermont Planning Atlas delineates Village Center
- Parcels included in 0.25-mile buffer are eligible for funding
- Important consideration for district delineation
- Parcels outside of buffer can be considered if issues exist

Wastewater Needs

Step 1

Service Area Delineation

Legend

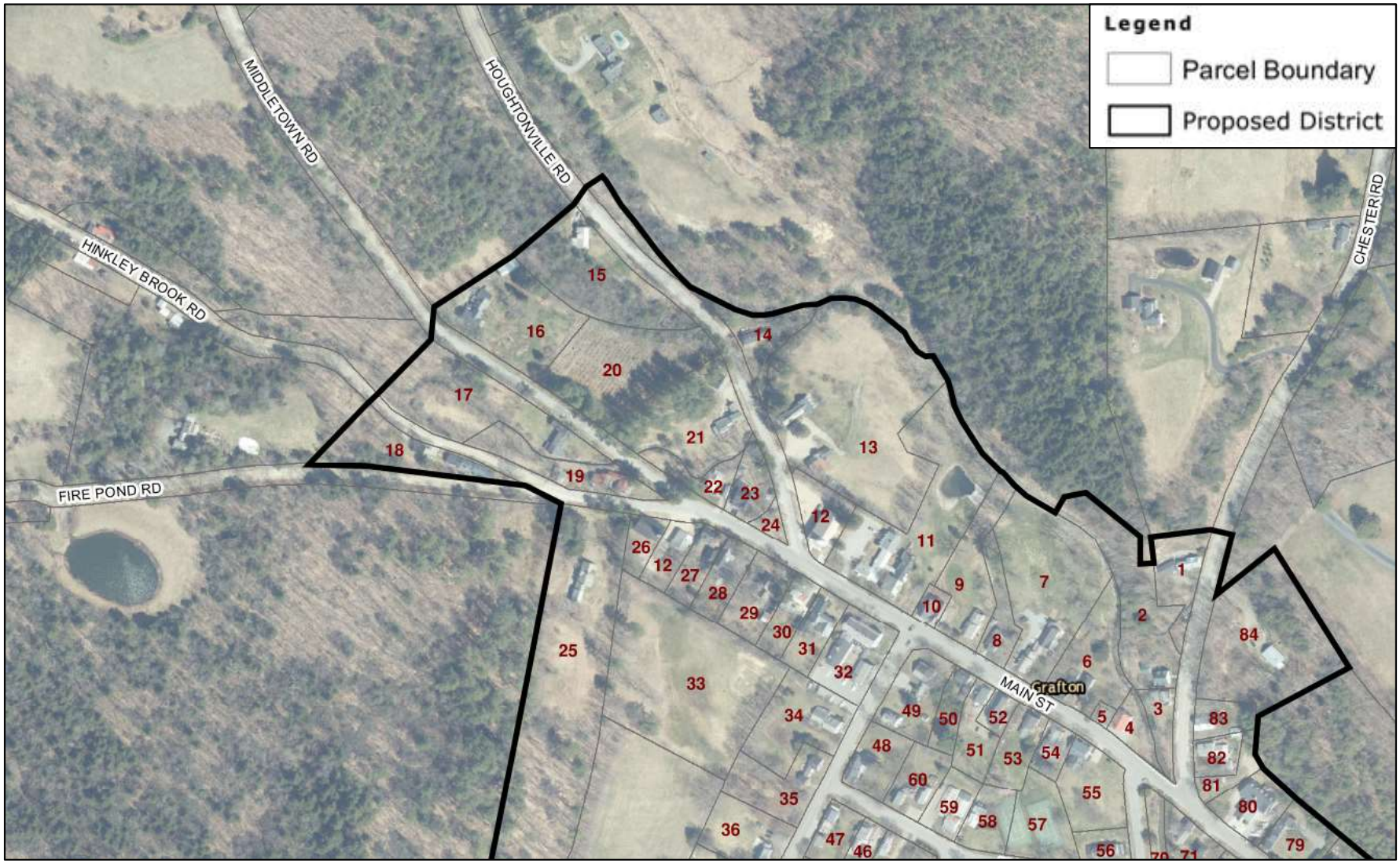
- Parcel Boundary
- Proposed District

- Proposed service area includes most parcels within the Village 0.25-mile planning buffer
- 84 Parcels Total
  - 56 Residential
  - 24 Commercial
  - 4 Vacant

30% Report Review

Step 1

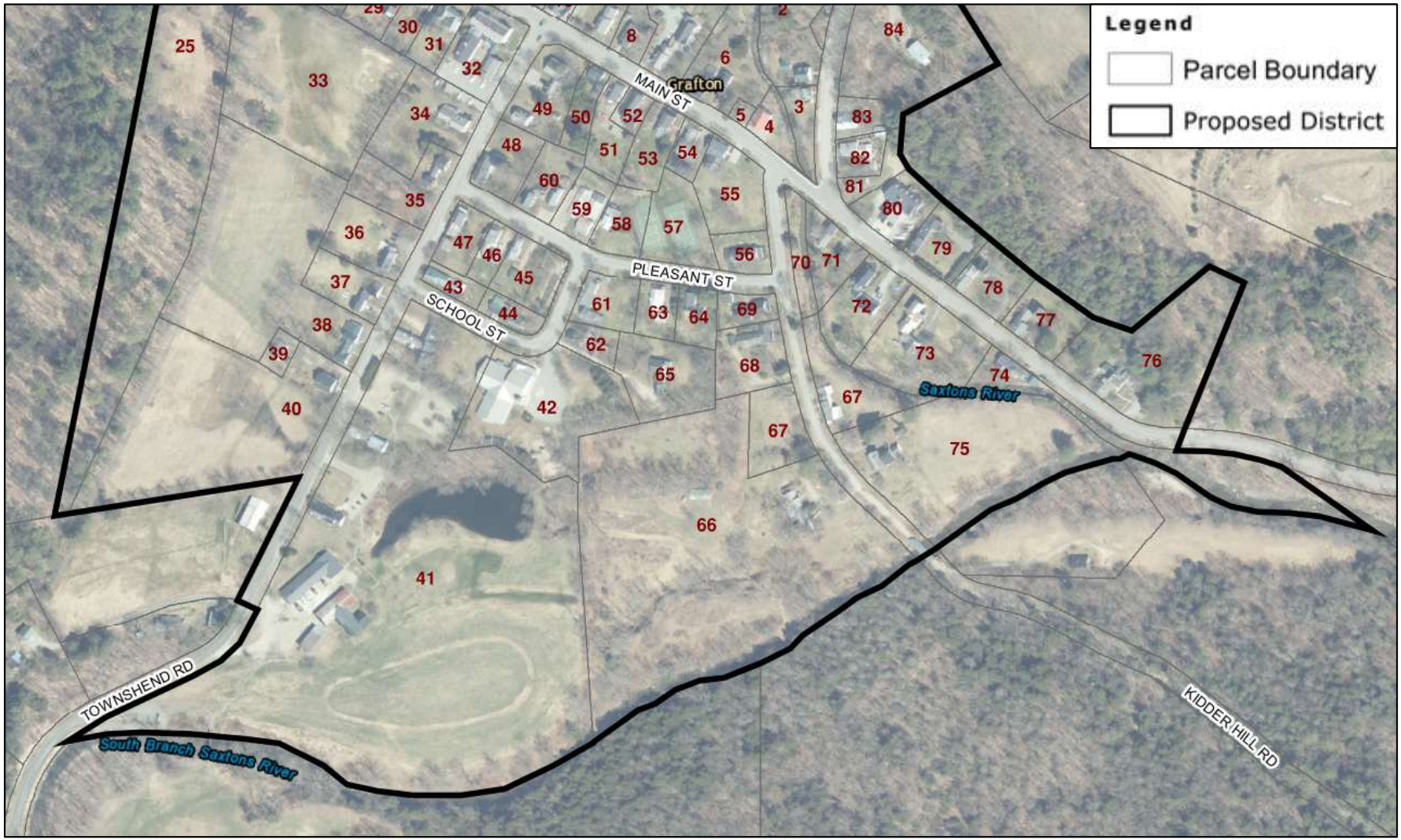
- **Service Area Delineation – Northern Extent**



30% Report Review

Step 1

- **Service Area Delineation – Southern Extent**



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COMMUNITY WASTEWATER EVALUATION

Flow Estimate

Flow Estimate

Step 1

- **Flow Estimate for Service Area**
  - Flow estimates based on VT DEC Environmental Protection Rules Chapter 1, Section 1-803
  - Estimates based on grand list parcel information, information about businesses, and questions answered by Town
  - Flow estimate for service area = **42,600 gpd** including 10% factor for future expansion/growth

Use of Building or Structure		
Details of use	**Units**	**Gallons Per Day (gpd) Per Unit***
Assembly Area; Conference Room with no food service		
for each use	seat	4
Assembly Area; Banquet Hall; Conference Room with catered food service prepared off the lot		
for each use	seat per meal	8
Assembly Area; Banquet Hall; Conference Room with food service for one meal (food prepared in a kitchen on the lot) (if more than one meal is served, use Restaurant)		
for each use	seat	14
Barber Shop; Hair Salon		
no hair washing	chair	50
hair washing	chair	150
hair salon	stylist, operator	32
barber shop; hair salon	employee (not a barber, stylist or operator)	13
Beer, Wine, or Spirits Tasting Room		
no public toilets, may have seats but no meal served	tasting room	100
no public toilets, may have seats but no meal served	employee	13
with public toilets and seats but no meal served	tasting room	300
with public toilets and seats if meal served	seat licensed by the Department of Health	use ***Restaurant*** or 300, whichever is greater
Brewery		
brewery	gallon of beer brewed	4.5
brewery	employee	13

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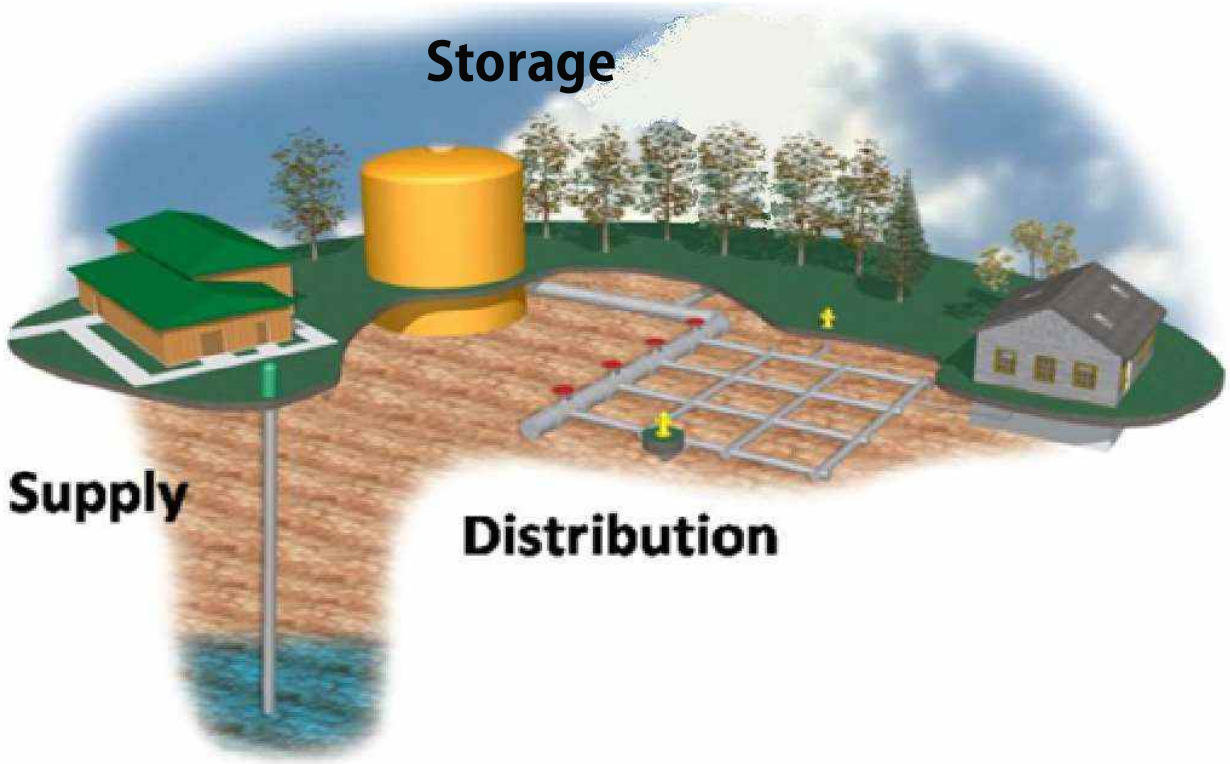
Identify Alternatives

Drinking Water System

Step 1

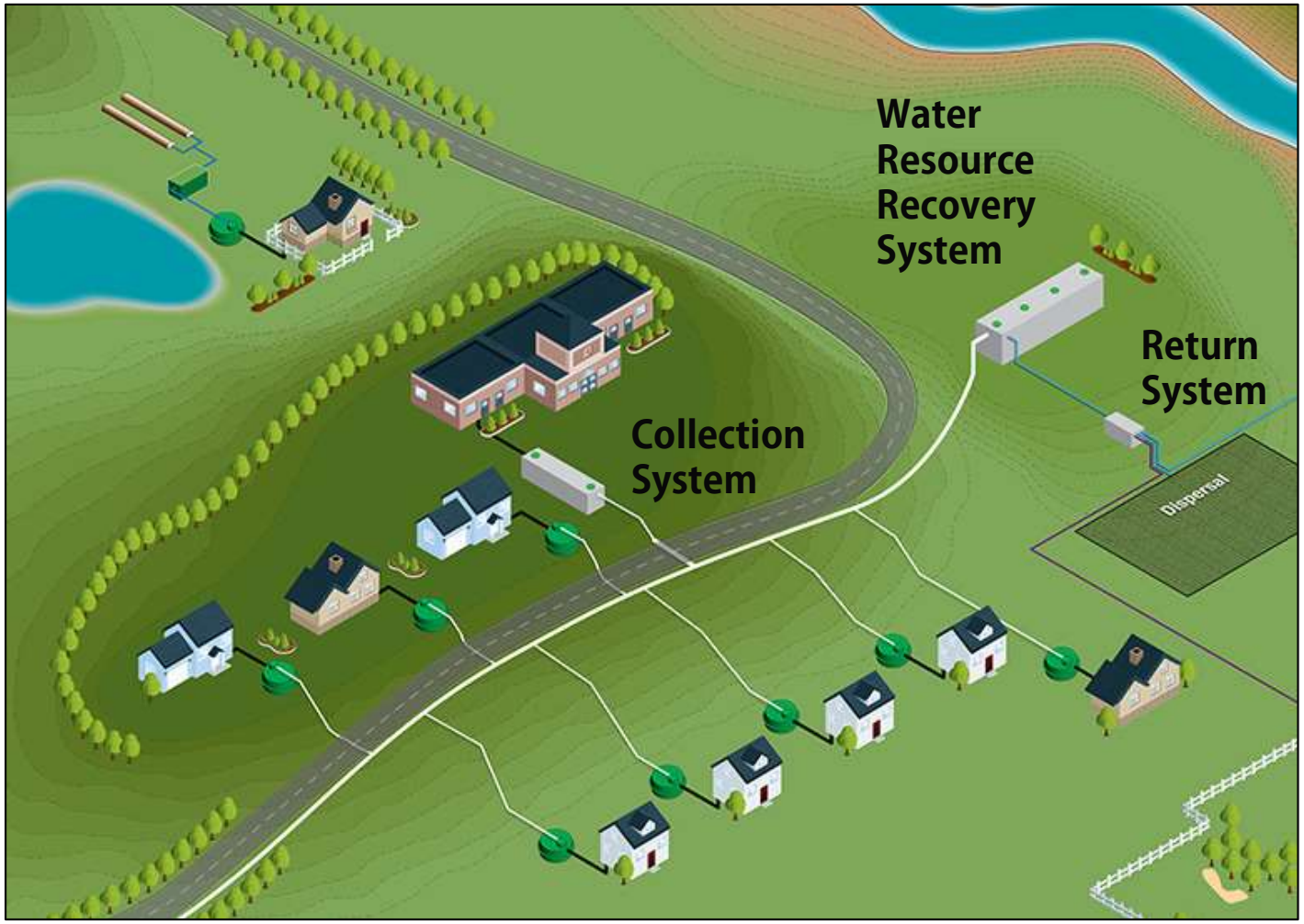
- **Components of a Drinking Water System**
  - Water Supply
  - Water Distribution
  - Water Storage
- **Preliminary Design**
  - Drilled wells & small pump house at Grafton Village Park property
  - New ductile iron water mains & service connections
  - Water Storage Tank near Fire Pond



Wastewater Systems

Step 1

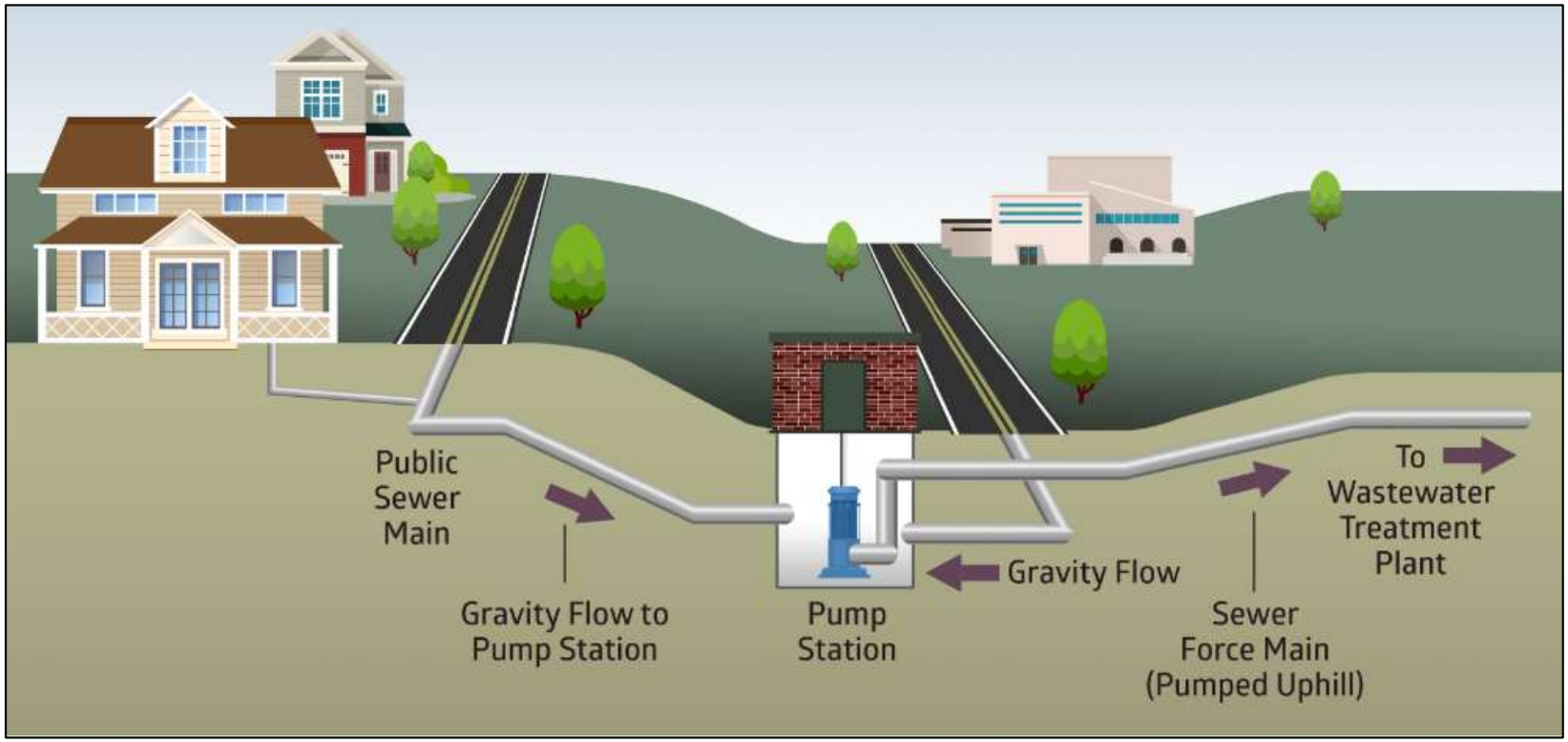
- **Components of a Wastewater System**
  - Collection System
    - Conventional
    - Septic Tank Effluent
  - Water Resource Recovery System
    - Recirculating Sand Filters
    - Packed Bed Media Filters
  - Return System
    - Conventional Leachfield
    - Drip Dispersal



Wastewater Systems

Step 1

- **Conventional Gravity & Pumped Collection Systems**
  - Typical for larger communities
  - Solids transported to water resource recover system
  - Larger diameter sewer mains installed by open cut excavation
  - Central pump stations



Wastewater Systems

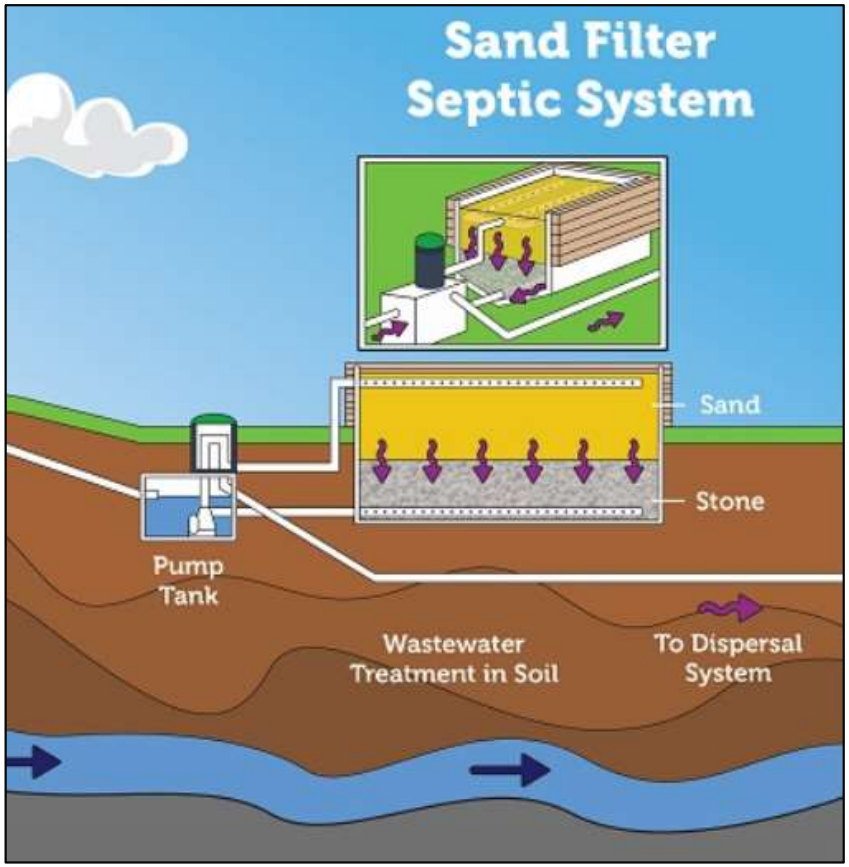
Step 1

- **Septic Tank Effluent Collection Systems**
  - Septic Tank Effluent Gravity (STEG)
  - Septic Tank Effluent Pumped (STEP)
  - Typical for smaller rural communities
  - Solids remain in septic tanks
  - Smaller diameter sewer mains installed by directional drilling

Wastewater Systems

Step 1

- **Recirculating Sand Filters**
  - Effluent percolates through filter bed, portion of flow is recirculated
  - Workhorse: sand media
  - Re-circulation increases oxygen content
  - Tried and true technology



Wastewater Systems

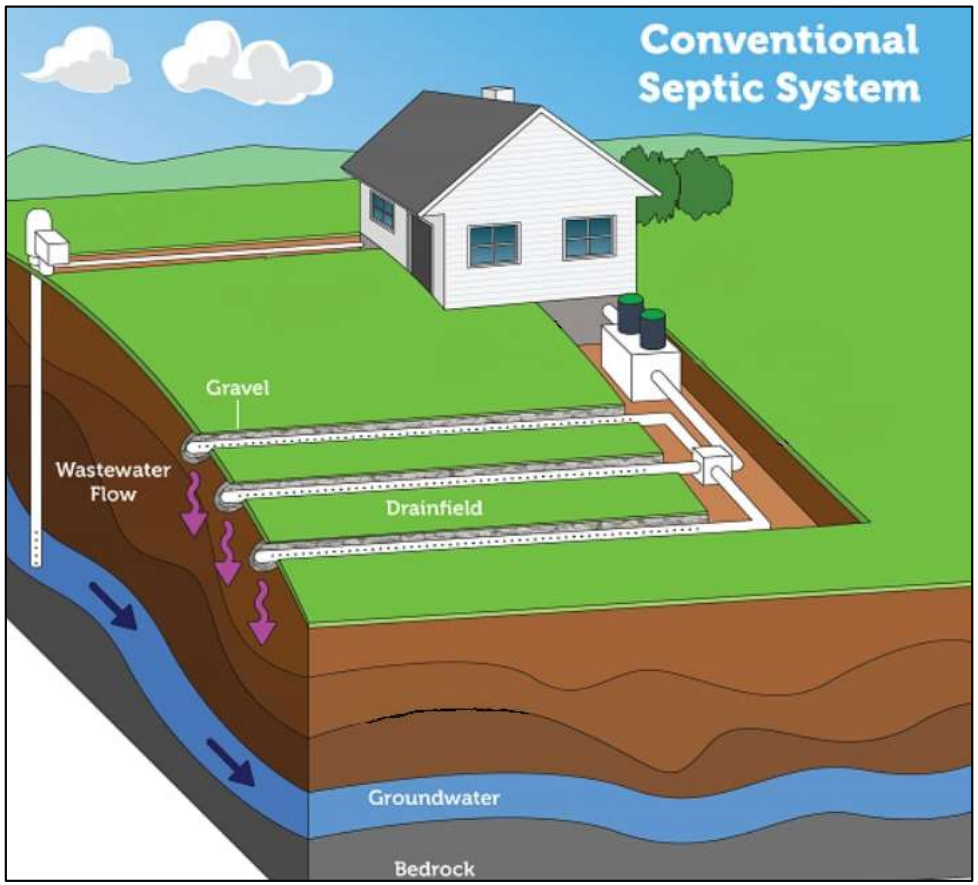
Step 1

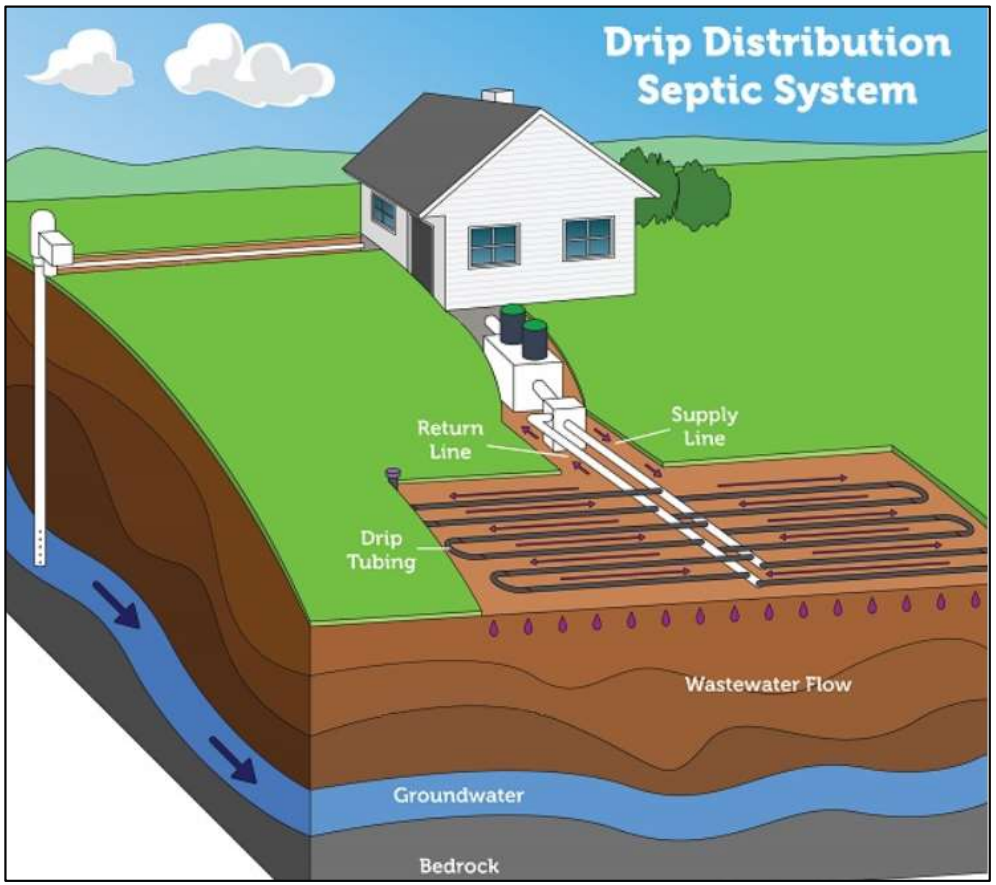
- **Modular Textile Media Filter Systems**
  - Series of partially buried fiberglass tanks
  - Workhorse: textile media
  - Tanks are aerated
  - Small building for controls and equipment

Wastewater Systems

Step 1

- **Conventional Leachfield**
  - Perforated pipe in gravel trench
  - Larger version of standard residential leachfield
- **Drip Dispersal**
  - Small diameter pipes installed at shallow depth
  - Effluent drips into soil





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Potential Wastewater Locations

Potential Wastewater Locations

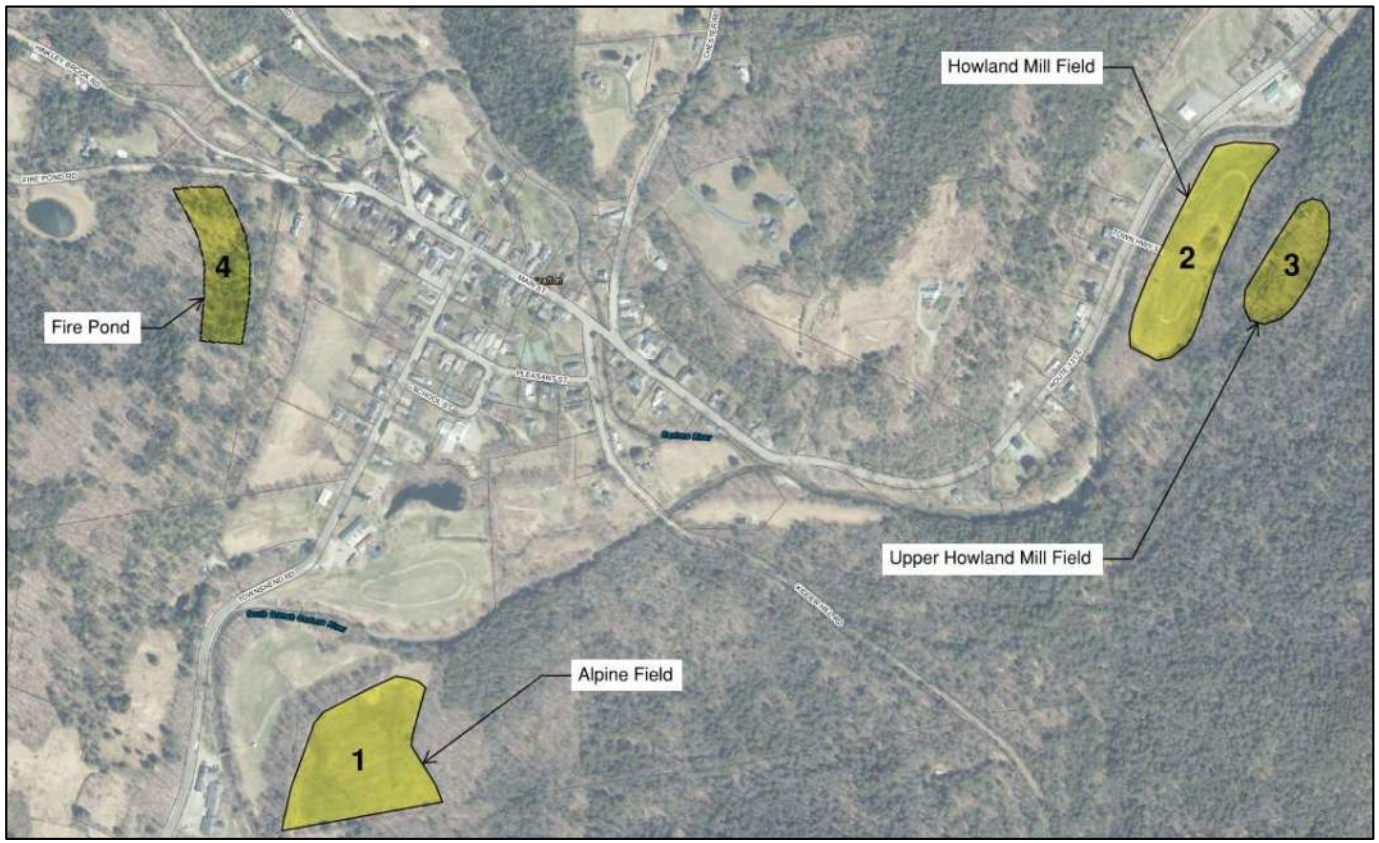
Step 1

- **Potential Treatment/Return Sites**

– 4 potential locations identified

– Howland Mill Field and Upper Howland Mill Field eliminated due to flood zone and topography

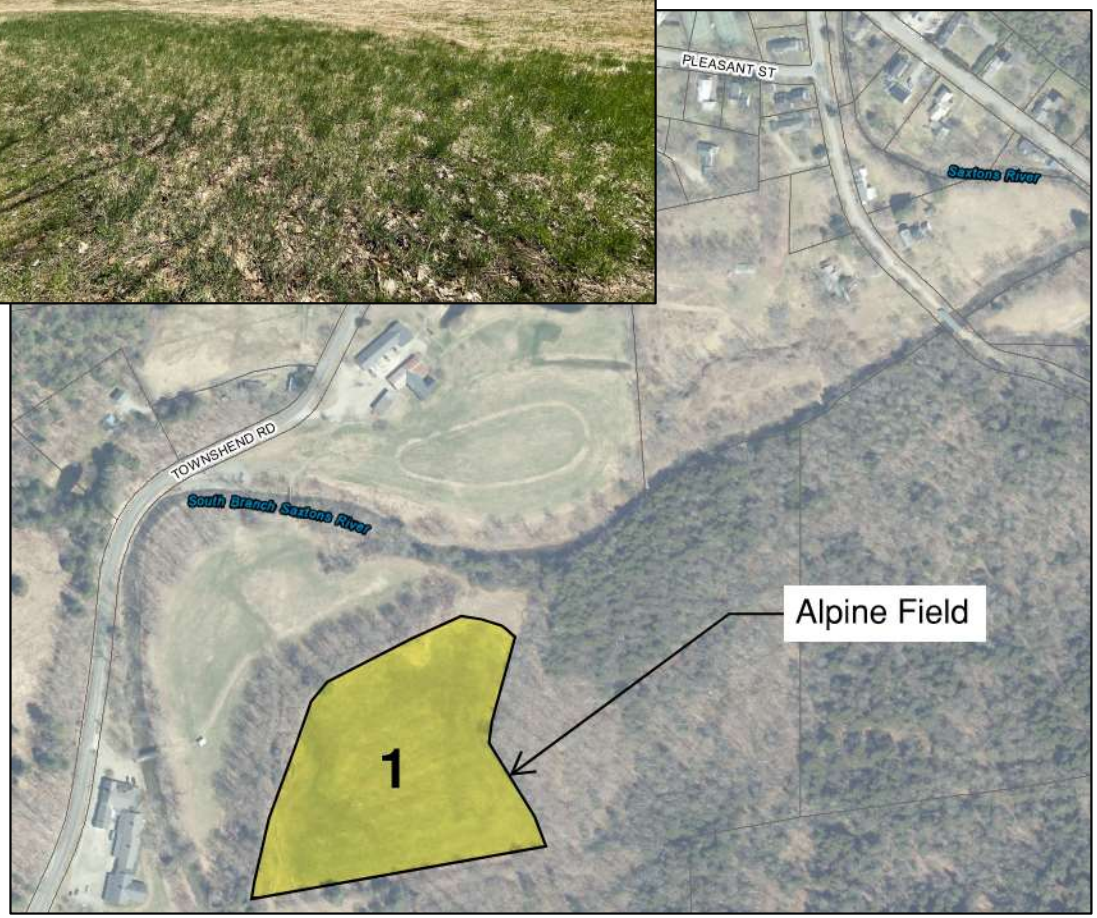
– Two sites considered in alternatives analysis
  - Alpine Field
  - Fire Pond (AKA Grafton Village Park)



Potential Wastewater Locations

Step 1

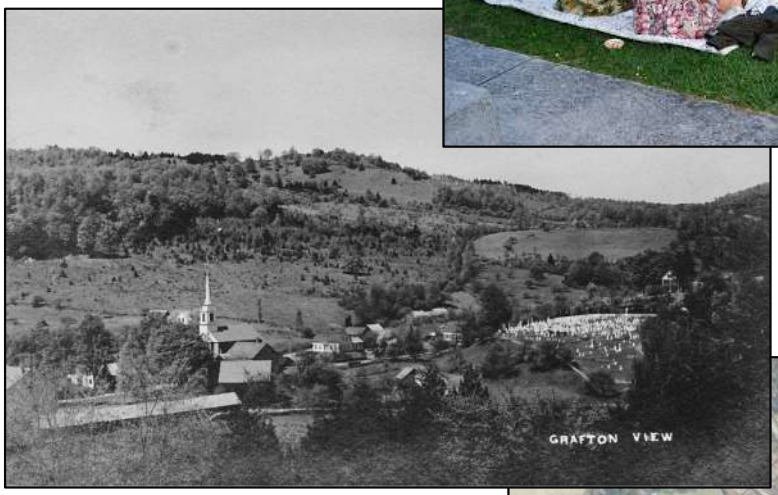
- **Alpine Field**
  - Sufficient area
  - Acceptable slopes
  - Isolated from Village
  - Above floodplain
  - Cleared agricultural field
- **Challenges**
  - Not owned by Town
  - No soil testing yet



Potential Wastewater Locations

Step 1

- **Fire Pond**
  - 56 acres total, ~ 4 acres usable
  - Above floodplain
  - Owned by Town
  - Potential for multi-use
  - Potential to restore park to former condition
- **Challenges**
  - Slope limits the usable area
  - Forested
  - 2-year time of travel may not be obtainable



Next Steps

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- **Process**
  - Project Completed in Four Steps:
    - STEP 1: 30% Preliminary Engineering Report – where we are today!
    - STEP 2: 60% Preliminary Engineering Report - Public Meeting
    - STEP 3: 90% Preliminary Engineering Report - Public Meeting
    - STEP 4: Final Preliminary Engineering Report - Public Hearing

STEP 1: 30% PER

Next Steps

- **Next Steps**
  - Incorporate Town, DEC, & Public comments
  - Develop 60% report which will include Alternatives Analysis

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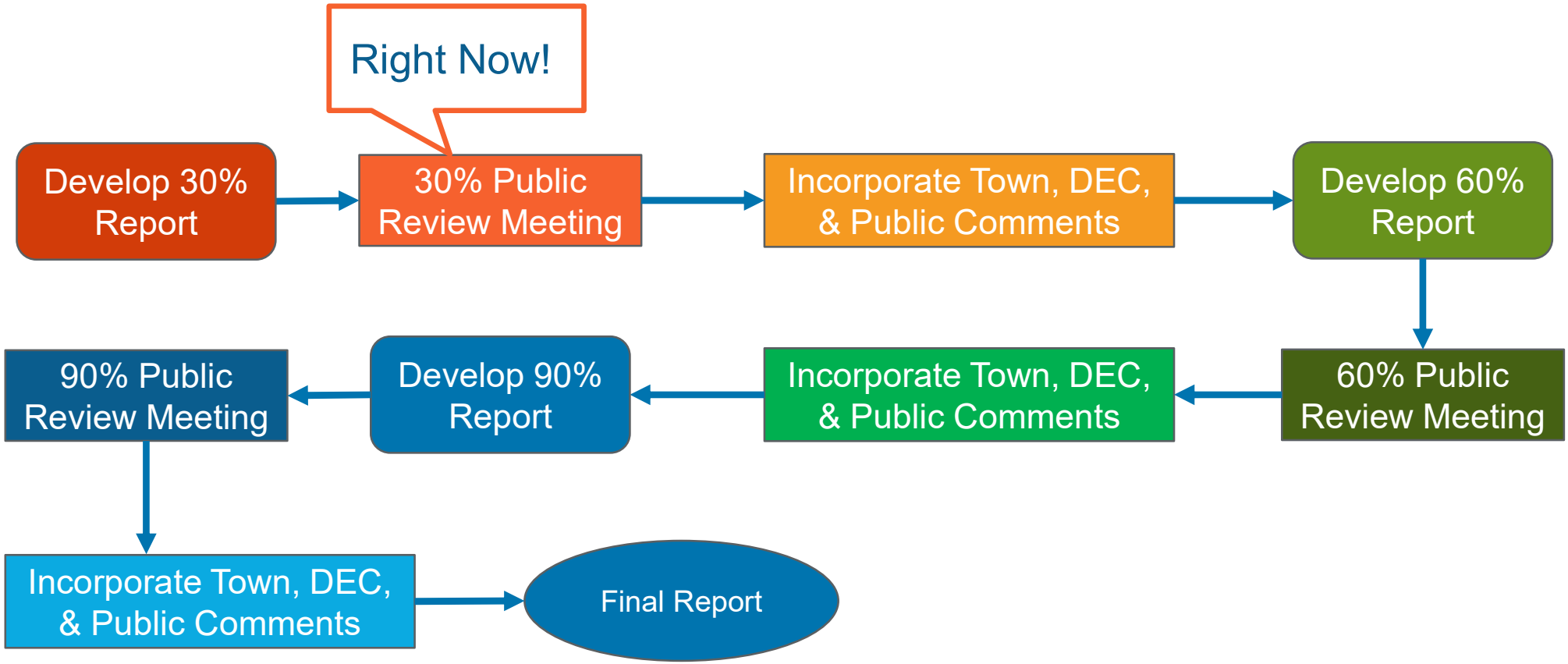
COMMUNITY WASTEWATER EVALUATION



Community Feedback & Questions

graftonwastewaterstudy@tighebond.com

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