
2. STUDY AREA DESCRIPTION

The study area includes parcels within the Village Business, Village Residential, and Irasville Village zoning districts in Waitsfield, Vermont. The study area is further bounded by the service area for the municipal water project, to include only properties within these zoning districts on the northern/western side of the Mad River. Waitsfield Village and Irasville are located along Vermont Route 100 near the western border of the Town of Waitsfield. Waitsfield is located in Washington County in the northeast portion of the state. Figure 1 shows the borders of the study area in their wider geographical context. Table 3 includes a list of properties within the study area including parcel identification numbers, street addresses, owner or contact names, property uses, and approximate parcel sizes.

2.1. Community Profile

Waitsfield serves as the commercial center of the Mad River Valley, and is located between the villages of Moretown and Warren in central Vermont. The Town is bordered by Moretown and Duxbury to the north, Northfield to the east, Warren to the south, and Fayston to the west. Waitsfield Village contains residences and commercial development, as well as municipal services including the Waitsfield Elementary School, fire and ambulance services, the Town Offices, and the Joslin Memorial Library. Existing development in Irasville is primarily commercial, through there are a few residences, as well as apartments and senior housing. Woodlands and agricultural land surround both village areas.

The Town of Waitsfield's population grew from 1,422 in 1990 to 1,659 in 2000 (US Census, 2000 and Waitsfield Town Plan, 2005), representing a 17% increase in this ten year period. The population results of the 2010 US Census are not currently available, but are expected in the spring of 2011.

The Waitsfield Village and Irasville study area includes 139 properties, totaling approximately 255 acres. Within the Waitsfield Village area, 21 properties contain single-family residences or multi-unit residential condominiums. The area contains over a dozen small retail stores, offices, cafés, and restaurants, some with accessory apartments or residences, as well as the Mad River Valley Health Center. There are also several public buildings including the Town Offices, post office, library, Waitsfield-Fayston Fire Station, Mad River Valley Ambulance, the Waitsfield United Church of Christ, Mad River Valley Welcome Center, and the Waitsfield Elementary School. The Irasville area, in contrast, functions as the Mad River Valley's "downtown" for commercial and service businesses (Waitsfield Town Plan, 2005)—and hosts two grocery stores and a natural foods market, several restaurants, the Mad River Green and Village Square shopping centers, the Waitsfield Inn, a movie theater, lumber yard, and three gas stations, as well as senior and affordable housing, additional commercial enterprises, and 10 residences. Property sizes for developed properties in both areas range from less than 0.1 acre to about 26 acres.

2.2. Natural Resources

Natural features can pose both opportunities for and limits to the construction and successful operation of decentralized wastewater dispersal systems. These features, such as topography, surface waters, wetlands, and soils, are described below with particular attention to their impact on the potential for onsite wastewater dispersal in Waitsfield Village and Irasville. Figure 3 identifies environmental sensitivities within the study area.

2.2.1. Topography

The study area lies in the heart of the Mad River Valley, ultimately bounded by the main ridge of the Green Mountains to the west and by the Northfield Range to the east. Both the Irasville and Waitsfield Village areas are relatively flat along Route 100 (Figures 1 and 3). There are some areas of steep slopes near the Mad River in Irasville, where the developed plateau drops off into the river's floodplain, as well as on the hillslopes to the northwest of Waitsfield Village. Generally, elevations range from around 900 feet above mean sea level (AMSL) on the hillslope at the end of Mehuron Drive towards the northwest of Waitsfield Village, to a low of 700 feet AMSL to the north where the Mad River leaves the study area.

2.2.2. Surface Water and Wetlands

The Mad River is by far the most prominent water feature in the study area, flowing from southwest to northeast past Irasville and Waitsfield Village, and nearly the entire eastern border of the study area lies within the FEMA-designated 100-year floodplain for the Mad River, as well as the Fluvial Erosion Hazard Area for the Mad River defined by the Vermont DEC's River Management Section (Figure 3). Several small, unnamed tributaries to the Mad River flow from the Green Mountains southeast through both village areas, and there is a small pond on Town-owned land in the Irasville area near the Big Picture Theater. There are several land areas, often associated with the unnamed tributaries, which are included in the Vermont Significant Wetlands Inventory (Figure 3). These wetland areas include portions of the Flemer Green, formerly known as the "Polo Field" parcel, at the north end of Waitsfield Village and the area north of the town-owned pond and the Big Picture Theater.

Irasville and Waitsfield Village are located entirely within the Mad River's watershed area. The Mad River is designated a "Class B" water by the Vermont Department of Environmental Conservation, and its seasonal impairment by elevated levels of bacteria is a continued cause of concern (Friends of the Mad River, 1995 and 2010; Waitsfield Town Plan, 2005). The portion of the Mad River between the covered bridge in Waitsfield Village and the river's mouth remains listed on the state's impaired waters list (also known as the "303(d) list") for *E. coli* contamination (Vermont DEC, 2008).

2.2.3. Soils

There is a range of soil types in the study area. Soils vary based on geologic material, slope, hydrology, human disturbance, and other factors. The best generalized source of soils data for this area is the Soil Survey Report of Washington County prepared by the Natural Resource Conservation Service (NRCS). The NRCS data was derived by mapping the landscape with spot field checks to arrive at an approximate level of resolution of 3 acres, with acknowledged inclusions of other soils. This report describes the soil series, or groups of soils with common properties, found in the study area.

The NRCS soils information is planning-level data, and the 3-acre resolution means that it is not intended to be precise for parcel-specific soil conditions. Site-specific testing, including backhoe test pits and/or percolation tests, would be required to determine the proper wastewater treatment options for an individual property.

For the purposes of this assessment, we are primarily concerned with soil properties that determine suitability for the siting of onsite wastewater systems: depth to seasonal high groundwater, depth to bedrock, soil permeability, and slope. Figure 3 shows the soils in the study area and vicinity, and soil characteristics are summarized in Table 4.

In the Waitsfield Village area, most of the existing historic development is clustered to take advantage of soils that are best suited to onsite wastewater treatment and dispersal (Figure 3). The area along Vermont Route 100 through most of both villages is apparently underlain by Colton gravelly loamy sands, which are well drained and have few limitations with regard to shallow seasonal groundwater or bedrock. Based on the NRCS soils information, about 32% of the land in the study area appears to be suitable for conventional wastewater treatment systems, though 2% of that may be limited by the presence of steep slopes. Some of the development pattern in Irasville—but by no means all of it—is similarly clustered on these well-drained soils.

There are also significant portions of both village areas that appear to have limited suitability for conventional subsurface wastewater dispersal systems. Approximately 10% of the study area is likely to require either at-grade systems or conventional systems with pretreatment, primarily to overcome limitations due to shallow seasonal groundwater. The soils with this limitation are primarily Waitsfield

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About 7% of the study area is likely to require both some form of advanced pretreatment and a mound dispersal system.

About 17% of the land is likely to require some form of 'best fix' solution.

silt loam soils (Table 4), which surround the better-drained soils near Route 100 in Waitsfield Village and underlie most of the Fiddlers' Green development in Irasville (Figure 3). Another 32% of the study area is likely to require either mound systems or at-grade systems with pretreatment. Although most of the soils in this grouping, the Tunbridge-Lyman complex soils (Table 4), are limited by shallow bedrock, only a small portion is located where development is concentrated (on the north side of Route 100, along the break in slope between Waitsfield Village and Irasville). The other soils within this grouping are primarily limited by shallow seasonal groundwater, and underlie much of Flemer Green (the former "Polo Field") in Waitsfield Village, as well as much of the area immediately north and west of the Mad River in Irasville. About 7% of the study area, primarily located near the Town-owned pond in Winter Park and north-northwest of the Flemer Green in Waitsfield Village, is likely to require both some form of advanced pretreatment and a mound dispersal system, primarily to overcome limitations due to high seasonal water tables. Finally, about 17% of the land in the study area, mostly in Irasville extending in an arc from east of the town-owned pond beneath Allen Lumber and south beneath the Irasville Business Park and Shaw's grocery, is likely to require some form of 'best fix' solution. 'Best fix' means that if the property is already developed and its wastewater treatment system fails, it may not be possible to construct a replacement system that meets all of the conditions of Vermont's current wastewater treatment rules. If a property with these difficult soils is undeveloped, it may not be developable for uses that generate wastewater.

2.2.4. Water Supplies

Onsite wells and springs can limit onsite wastewater capacity because of the required protective setbacks between water supply wells and wastewater dispersal systems. Currently, all properties within both village areas are served by individual or shared water supplies. Information about the location and type of potable and non-potable water supply wells in the study area, as well as the protective buffer distance or "well shield" for each water supply, is shown on Figure 4. In order to construct this figure, we began with the existing water supply and wastewater treatment inventory compiled by the staff of Phelps Engineering, Inc. during the completion of the Town's 2004 *Wastewater Facilities Plan*. This inventory was provided by Phelps Engineering in AutoCAD format, and was converted into feature classes within an ArcGIS geodatabase. We then updated the inventory with information from Vermont DEC potable water supply and wastewater system permits issued since the inventory was compiled in 2001-2002, as well as with information provided by respondents to the property owner surveys.

Figure 4 displays water supplies and their protective buffers, as well as current knowledge about the location and components of onsite wastewater treatment systems (which are discussed in more detail in Section 3). This figure clearly illustrates the overlap on many parcels between well buffers, within which soil based wastewater dispersal should not occur, and onsite wastewater treatment and dispersal components. (The wastewater treatment aspects of this map are discussed in Section 3 of this report.)

An important aspect of this study was to evaluate how individual property owners' decisions regarding connection to the municipal water system currently under construction in the Waitsfield Village and Irasville areas might affect future decisions about wastewater management. In order to illustrate how connections to the municipal water system may increase the wastewater treatment capacity located on existing properties in the study area, we obtained a spreadsheet of water project connection status and anticipated water demands from the Town's Municipal Project Manager. The connection status for each property within the study area, as reported in that master spreadsheet, was linked to a parcel polygon in GIS by the parcel's unique Parcel ID.

Within the Irasville Village area, approximately 78% (46 of 59 respondents) of the property owners have opted to connect to the municipal water system. In contrast, within the Waitsfield Village area, about 53% (28 of 53 respondents) opted to connect to the municipal water system.

Figure 5 shows the status of connections to the municipal water project on a parcel-by-parcel basis, as of November 2010. Green-shaded parcels on Figure 5 denote properties that have currently committed to connect to the municipal water system. Within the Irasville Village area, approximately 78% (46 of 59 respondents) of the property owners have opted to connect to the municipal water system. In contrast, within the Waitsfield Village area, about 53% (28 of 53 respondents) opted to connect to the municipal water system.

In order to illustrate how the implementation of the municipal water project alters the picture regarding onsite wastewater treatment capacity, the well buffers associated with water supplies that will be decommissioned after connections to the municipal water system are made were hidden in the infrastructure inventory (Figure 6). It is apparent that the incidence of wastewater treatment infrastructure potentially interfering with potable water supplies in the Irasville area will be significantly reduced once the project is complete. Within the Waitsfield Village area, however, a significant number of well shields will remain once the municipal water project is complete, and many of the remaining well shields will still overlap with onsite wastewater treatment components on the same or neighboring parcels. Connection to the municipal water system is voluntary for existing properties; therefore, where owners have opted not to connect to the municipal system, wellhead protection areas for public or private water supplies will remain in effect after the municipal water project is complete.

2.3. Zoning Districts

The study area covers three different zoning districts: the Village Business District, the Village Residential District, and the Irasville Village District (Figure 3).

Waitsfield's 2009 Zoning Bylaws state the purposes of each of these districts, as follows:

The purpose of the Village Business District is to promote a mix of uses in the traditional center of Waitsfield Village while preserving the area's historic character, architectural resources and ability to function as a livable community, as described in the Waitsfield Town Plan. A mix of residential, civic, cultural, and commercial uses are allowed, providing such uses are compatible with existing uses.

The purpose of the Village Residential District is to maintain and enhance the residential and historic character of Waitsfield Village outside of the commercial core, as described in the Waitsfield Town Plan, and to allow for additional residential, public, institutional, and very limited commercial uses in a manner that supports the historic settlement pattern of the Village and maintains the Village's ability to function as a livable community.

The purpose of the Irasville Village District is to function as the town's growth center as defined in the Waitsfield Town Plan, to enable coordinated expansion of residential development, shopping facilities, and other commercial uses that minimize traffic impacts, and which concentrate development into a more compact village setting.

Minimum lot sizes in the Village Business and Village Residential districts are $\frac{1}{4}$ and $\frac{1}{2}$ acre, respectively, for each family dwelling unit or principal structure—significantly smaller than other districts in the Town. Interestingly, although the stated purpose of the Irasville Village District is to also allow concentrated development in a compact village setting, the minimum lot size in this district is 1 acre.

Zoning district and bylaw changes have been proposed for the Irasville Village District for some time, but these changes are on hold primarily due to a lack of supporting municipal utility infrastructure. The *Master Development Plan for the Irasville Growth Center* (2002), the resultant proposed zoning revisions (Town of Waitsfield, 2007), and the Town of Waitsfield's attempt to gain designation as a growth center for the Irasville area (Town of Waitsfield, 2008) were all conditioned upon the provision of municipal, centralized water supply and wastewater treatment infrastructure. The lack of a growth center designation also stopped the Town from applying for the formation of a Tax Increment Financing (TIF) district, which had the potential to encourage public and private real property development or redevelopment while providing some revenue to the Town in the form of property taxes that would be utilized to pay the debts incurred to provide municipal water supply and wastewater infrastructure.