

EXECUTIVE SUMMARY

The New York Rural Water Association (NYRWA) has prepared this Groundwater Protection Plan in cooperation with Community Planning & Environmental Associates of Berne, NY and the Town of Ancram Comprehensive Planning Committee. The plan maps the groundwater resources and aquifers of Ancram, identifies potential sources of contamination, evaluates the susceptibility to contamination and future growth, and outlines potential protection strategies.

Ancram straddles two distinct physiographic regions. The western two-thirds of Ancram is located in the Hudson Valley section of the Valley and Ridge physiographic province and is drained principally by the Roeliff Jansen Kill and its tributaries. The eastern one-third of Ancram lies within the more rugged Taconic section of the New England physiographic province. A significant portion of this area is part of the Tenmile River watershed.

Over ninety percent of residences and businesses in Ancram utilize bedrock wells. These wells have a median depth of 259 feet and a median depth of casing of 28 feet. Nearly one-half of all Ancram bedrock wells (46%) yield less than the 5 gallons per minute, the minimum well yield necessary for Federal Housing Administration (FHA) insured loans for new construction.

Most low-yielding wells are found in areas underlain by the Walloomsac Formation (see Executive Figure 1). This formation consists largely of black slate, and underlies the majority of the upland areas of Town (particularly in the Hudson Valley physiographic section). The median well yield in the Walloomsac Formation is only 3.75 gallons per minute, and approximately one-quarter of residents in Ancram that have wells completed in the Walloomsac Formation report that they have insufficient water. Similarly, 27.5 percent of all wells drilled in the Walloomsac yield one gallon per minute or less and would be deemed unsuitable for four bedroom homes according to New York State Department of Health guidelines (see Executive Figure 1). Many residents relying upon the Walloomsac Formation extend the depth of their wells or provide supplemental storage tank(s) in an attempt to meet peak demand periods.

The other major bedrock unit in Ancram, referred to as the Wappinger-Stockbridge Group carbonates, has a median well yield of 8 gallons per minute. This rock type is found across much of the lower elevations in Ancram such as in the valleys of the Roeliff Jansen Kill, Punch Brook, and the Noster Kill (see Executive Figure 1). Only 5 to 10 percent of residents with wells in the carbonate rocks report water quantity problems and/or yields of one gallon per minute or less. Higher yields are found in the carbonate rocks due to the presence of enlarged openings along fractures, joints, and bedding planes. Documented yields of at least 65 gallons per minute have been found in the Wappinger-Stockbridge Group carbonates in Ancram.

Over 70 percent of households in Ancram report water quality problems, largely the nuisance of hard water. Hard water is particularly common in wells tapping the carbonate rocks. Odor problems are more commonly associated with the Walloomsac Formation. This is likely from sulfide minerals associated with the rock type.

NYRWA has mapped a number of unconsolidated (sand and gravel) aquifers in Ancram (see Executive Figure 2). Although these aquifers are not being widely utilized for water supply purposes, there are two areas where shallow wells are commonly used: near the Lower Rhoda Pond-Long Lake area and in and around Ancramdale (Executive Figure 2). Wells in these areas

produce high quantities of water (in excess of 30 gallons per minute), but are vulnerable to contamination. Deeper sand and gravel aquifer deposits have been documented in the hamlet of Ancram and a few other areas. These deposits are better protected from contamination due to the presence of overlying silt and clay. Subsurface data is lacking in many areas to fully characterize the water-bearing properties of the sand and gravel aquifers. It is apparent that very high yielding wells can be constructed in many of the unconsolidated aquifers if screens are properly installed and developed.

Although the Town of Ancram does not currently own or operate any municipal water system, there are public water systems in Town. These privately-owned systems serve residents in the Long Lake community, as well as employees, patrons, and guests at several other establishments. No health-based violations have been reported at the nine active public water supply systems in Town. It is important to recognize that public water systems do exist in Ancram and the potential impacts on these water systems should be considered when making land use decisions.

Groundwater resources are susceptible to contamination from a variety of manmade sources that can be associated with present or future land uses. An inventory of regulated facilities and higher risk land uses revealed a number of regulated wastewater discharges in the Roeliff Jansen Kill watershed in Town. In addition, there are several past and present sand and gravel mining operations in Ancram.

Development involves a number of potential groundwater resource issues such as water supply, wastewater treatment, impervious surfaces and storm water systems, and improper waste disposal and spills. Based upon estimated recharge rates, NYRWA recommends that the density of equivalent single family residential septic systems should not exceed an average of one per 3.5 acres. In addition, the distance between on-site water wells and septic systems should be closely observed to ensure adherence with New York State standards and to protect water quality.

NYRWA delineated areas in Ancram where ground water could be easily and quickly impacted by surface activities (areas with high hydrogeologic sensitivity) (see Executive Figure 3). In order to prioritize subsequent protection efforts, NYRWA further identified privately-held, undeveloped parcels that had areas of high to very high hydrogeologic sensitivity. These areas are at the highest risk of water quality impacts from new development.

The issue of groundwater supply availability and impact should be addressed early in the land development process. NYRWA recommends that the location, yield, and quality of wells should be considered prior to approval of a new subdivision. Relatively large subdivisions, as well as most subdivisions in the Walloomsac Formation, should have a hydrogeological report completed prior to approval. Another possible approach is to use zoning regulations to require a hydrogeological study and minimum standards for some forms of development. For example, any development that uses at least 1,000 gallons per day of water could trigger more technical review. Ancram may also wish to enact an aquifer and/or groundwater protection overlay to limit high-risk uses, etc.

Finally, there are other non-regulatory actions that Ancram can take to protect ground water. These include declaration of Critical Environmental Areas (CEAs), purchase of land or conservation easements, further study of some at-risk areas (including possible well testing), and public education activities.

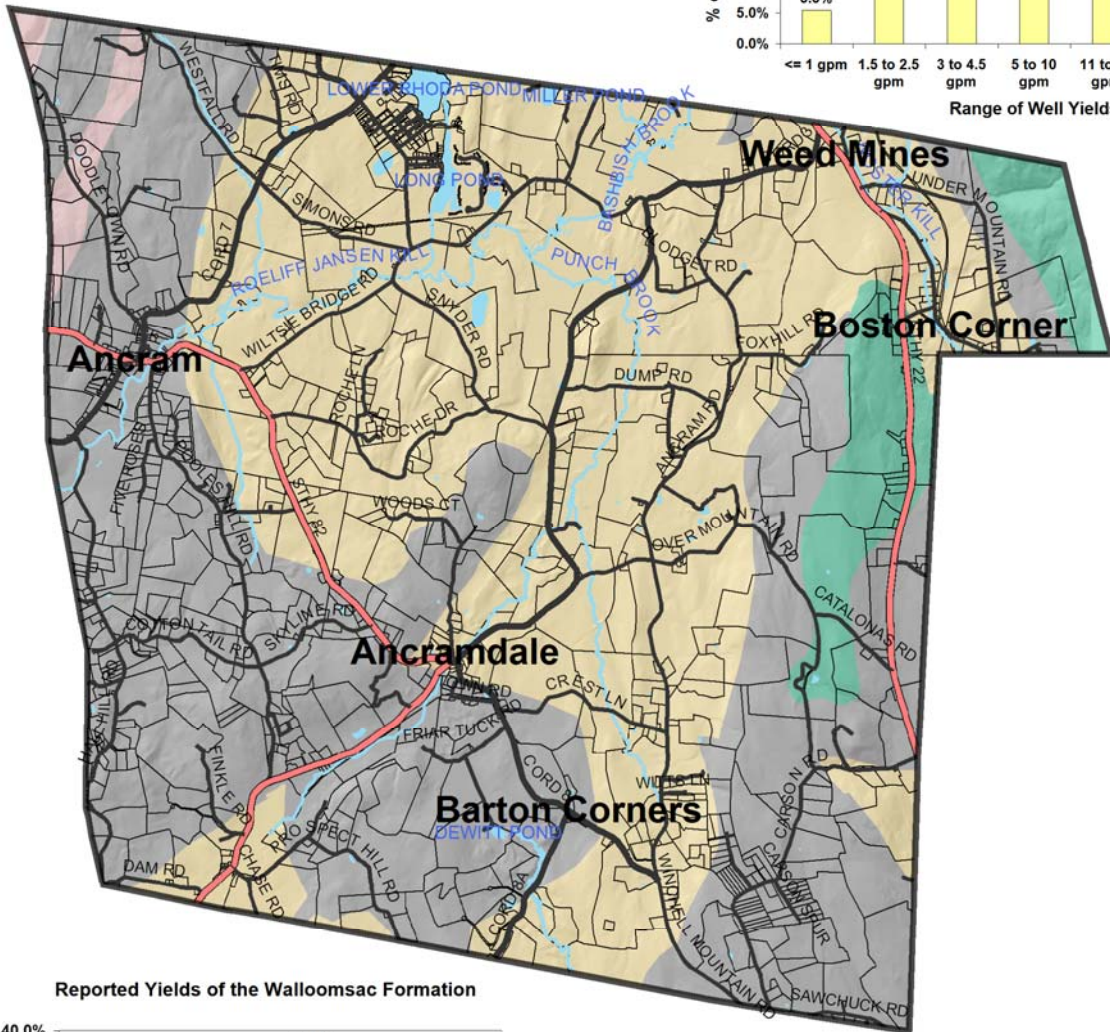
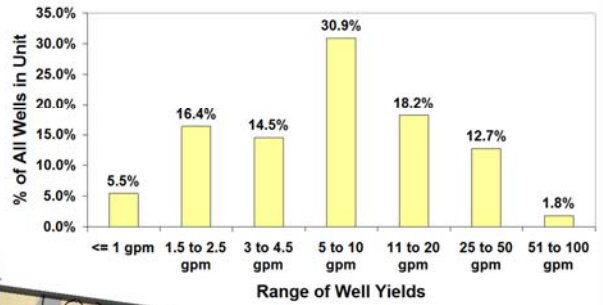
Bedrock Hydrostratigraphic Units

Town of Ancram, New York

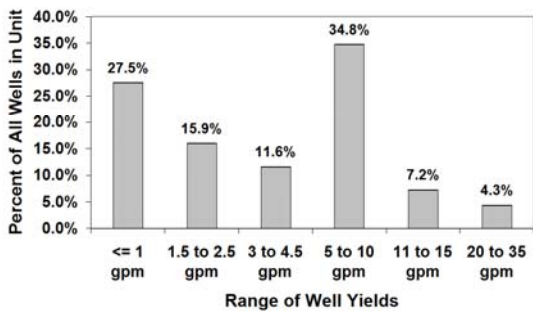
Steven Winkley

2008

Reported Yields of Wappinger-Stockbridge Group Carbonates



Reported Yields of the Walloomsac Formation

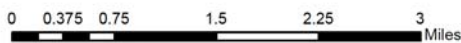


Legend

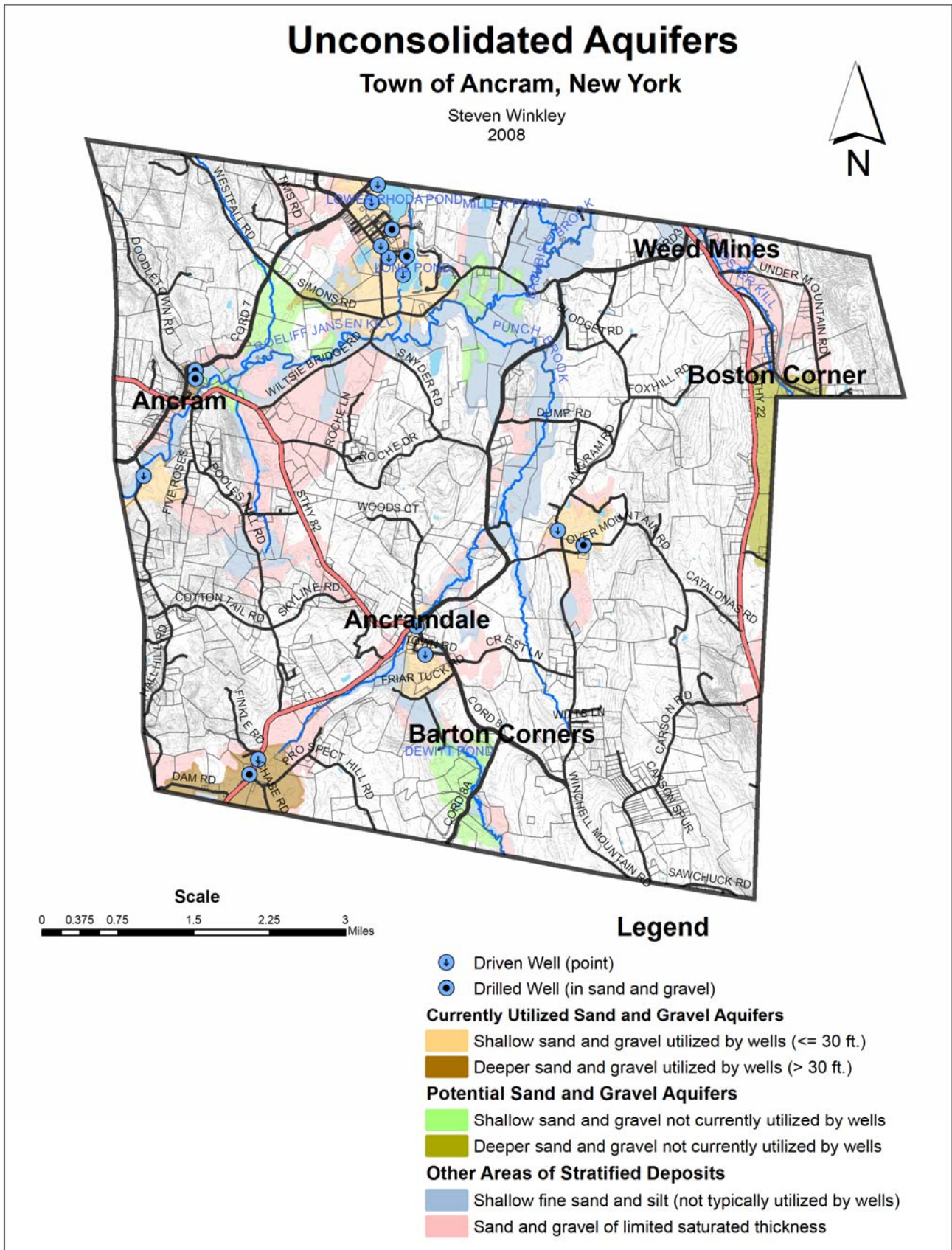
Bedrock Unit

- Everett Schist
- Austin Glen Formation
- Walloomsac Formation
- Stockbridge-Wappinger Group including Balmville Limestone

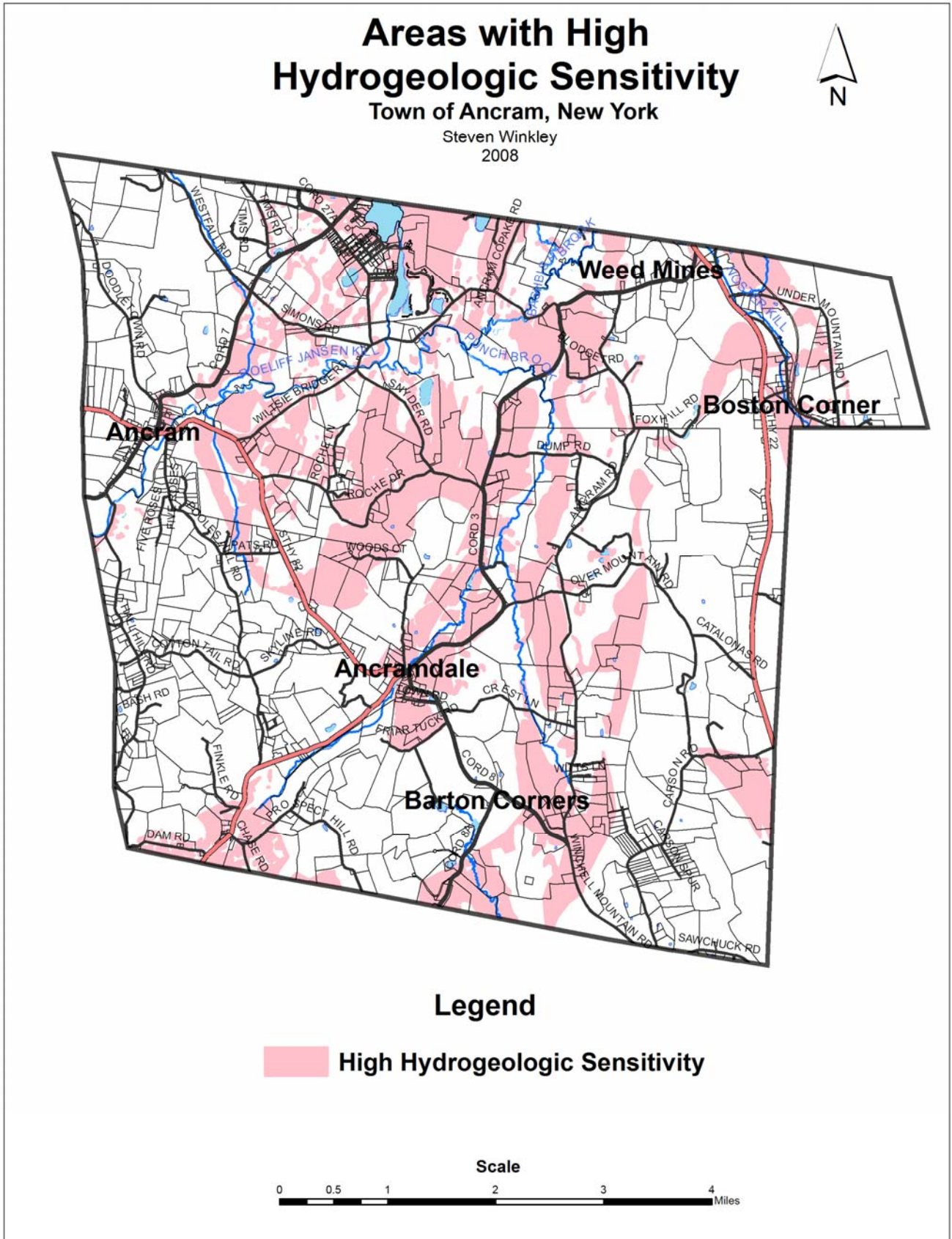
Scale



Executive Figure 1. Bedrock Hydrostratigraphic Units.



Executive Figure 2. Unconsolidated Aquifers.



Executive Figure 3. Areas with High Hydrogeologic Sensitivity.