

Chapter 18: Resource Extraction

INTRODUCTION

Mineral extraction – marble, slate, and gravel in particular – have a long history in the Rutland Region. The industry was a major component of the Region’s economy in the late 19th and early 20th Centuries. Today, mining and quarrying operations in the Region employ many fewer people, but extraction continues. A more recent phenomenon has been large-scale groundwater extraction, used for bottling water.

This chapter examines mineral and water resources in the Region and how they relate to opportunities and challenges presented elsewhere in the Regional Plan. It also addresses the balance between the benefits and impacts of the removal of resources from the Rutland Region, some of which are finite and some of which have limited recharge ability.

CURRENT CONDITIONS

Mineral Extraction

Mineral deposits commonly extracted in the Region include sand and gravel, slate, marble, and crushed rock. There are 18 working mines in Rutland County, as reported by the U.S. Department of Labor, Mine Safety and Health Administration which is responsible for inspection of these facilities. According to the 2000 US Census, mining provides full time jobs to 109 people in Rutland County. There is an ongoing demand for these resources for road construction, home construction and other purposes.

Current mining operations are broadly divided into two basic methods: open pit, and underground.

Open-pit mining is the most common method employed in the Region. The earth’s surface remains exposed during the entire extraction period, where drilling and blasting are used to break up and remove

the product. Sand, gravel, crushed stone, slate, and calcium carbonate (crushed marble) are all extracted this way.

Slate quarrying has a long history along the Taconic Mountains valley in the Region’s New York border towns. Significant deposits exist in Fair Haven, Poultney, Castleton, Wells, and Pawlet. Quarries have operated in each of these communities – at times sporadically – for well over a hundred years. Evidence of this work can be found on roofs throughout the Region and at current or former quarrying sites.



FAST FACT

The Danby quarry is believed to be the largest underground marble quarry in the world. Its white marble has been used the construction of the US Supreme Court, Arlington National Cemetery, and other institutional and private buildings across the world.



Entrance to the Danby marble quarry on Dorset Mountain

RRPC Staff



Resource Extraction has implications on several issues addressed elsewhere in this *Plan*. Notably:

- Water Quality, for potential impacts of mineral and water extraction;
- Economic Activity, for the jobs and taxes generated from operations;
- Transportation, for challenges to economic growth

Sand and gravel pits are dotted throughout the Region and generally operate on a small scale. Within the Rutland Region sand and gravel resources are found on about 10 percent of the land area. Resources classified by the Natural Resource Conservation Service as sand occupy over 14,700 acres, or nearly three percent of the Region. Resources classified as a sand and gravel mixture occupy over 44,900 acres, or 8 percent of the Region.

Omya, Inc. is the world's largest producer of fine ground calcium carbonate; one of its six North American production plants is in Florence. This product is used for food, medicines, paper, paint, and plastic industries. The

plant produces dry and slurry products. The bulk of the marble supplied to the Florence plant is trucked daily from East Middlebury. Processed materials are then taken out of state by rail.

Underground mining in this Region is employed only for marble. Danby has the largest underground quarry in the world, over a mile long with a footprint of twenty-five acres and reaching six levels deep, within Dorset Mountain. Formerly, marble stone produced at the quarry was shipped in blocks to Italy for fabrication. It is now processed on site for better selection, lower cost and quicker scheduling. The Danby Quarry, continually mined for over a century, expects to continue to expand capacity

CASE STUDY: MINING THE DANBY QUARRY

Although Carrarra, Italy, the region where marble has been worked since Roman times, is considered the traditional capital of marble production, the Rutland Region can also claim a long history with this invaluable resource. Marble tends to follow the aptly named "marble belt" in the Vermont Valley: the area between the Taconic Mountains (which lie approximately between Brandon and Bennington) and the Green Mountains.

The Danby Quarry, opened in 1903, is believed to be the largest underground marble quarry in the world, over a mile long with a footprint of twenty-five acres and reaching six levels deep. Through six levels dug into Dorset Mountain, access is gained to every layer of the geologic formation that formed Vermont's Marble Valley, thereby approximating material from almost any historic quarry in the region. Five varieties of marble are produced at Danby Quarry.

Envision endless dimly lit galleries with thirty foot ceilings supported by massive roof pillars,

ten-foot marble chainsaws, massive loaders traversing winding roads throughout the quarry and a gang saw big enough to park a small car inside. In the early years of its operation, marble blocks were finished in the Region. Later, blocks were shipped to Italy for fabrication. Today, those operations have returned to the Region, with a full scale processing facility which includes state-of-the-art Italian technology for cutting and polishing slabs and for producing any kind of cut to size, all located within the Quarry itself.

The facility is operated by Vermont Quarries Corp., founded in 1992 by R.E.D. Graniti Group and another Italian firm, which own a 99-year lease on the 30 acres inside Dorset Mountain. Quarried by the Vermont Marble Co. for 150 years, Danby marble has been used in prestigious buildings across the world, including the Jefferson Memorial, Supreme Court building and US Senate Office Building in Washington, D.C. and the United Nations building in New York, others.

and production to meet the demand for this building stone. In the estimate of a former general manager of the quarry, Luca Mannolini, there is enough marble left inside Dorset Mountain to rebuild the entire existing marble built environment. (www.restorationtrades.com/articles/vermontmarblequarry.shtm)

Water Extraction

Large-scale water extraction – that is, removal of water from its natural watershed, is slowly gaining popularity in Vermont. In 2007, there were seven permitted operations statewide, including one in Rutland County (Tinmouth). For permitting purposes, these systems are treated as community water systems and are subject to the same standards (including the receipt of a source permit, a construction permit, and an operational permit) and inspection requirements.

The 2006 Legislature enacted a law that begins to address large-scale water extractions for bottling purposes. Under the new law, applicants must submit develop and submit a groundwater contour map for any proposed bottling of more than 50,000 gallons of water daily. The law also created a committee to explore potential regulatory programs to protect the groundwater resources of the State. The results of the group’s work are to be examined by House and Senate Committees.

Within the Rutland Region, use of groundwater is widespread. Approximately 51 percent of the Region's

households rely on groundwater for drinking water supplies. The Region's 61 public community water systems are supplied by 95+ wells and 15+ springs (some for emergency purposes only) and are found throughout.

Agricultural operations in the Region are also dependant on the supply of groundwater, as are some forms of mineral extraction. Finally, pumping water to operate is critical to the functions of Killington/Pico Ski Areas during the winter. For the most part, these operations return the water they use to their watersheds of origin. It is important that such water extractions are monitored to help control impacts to ponds, rivers, wells and springs.

UNMET NEEDS

How to balance the economic benefit (employment and resource production) against the environmental costs (noise, air and water pollution) of resource extraction remains a complex subject of debate in the Rutland Region. The environmental impacts of resource extraction are numerous, particularly if done improperly. And while the majority of operators within the Rutland Region have followed regulations and addressed key concerns, there remain key environmental issues associated with mineral extraction:

- Improper management of sand and gravel pits has led, in some cases, to increased soil erosion in and around sites as well as digging in ways that make site restoration difficult or



FOOD FOR THOUGHT

In 1970, Vermont passed Act 250 which protects land with high potential for the extraction of earth resources. It covers the actual impacts of a resource extraction project and also requires planning for future rehabilitation of the site. The goal is to protect important resources from being destroyed by development and to make sure that extraction does not impair water quality, visual resources and future alternate uses of the area. Noise, dust and traffic impacts are addressed.

SAND AND GRAVEL RESOURCES IN RUTLAND COUNTY (2005)

Resource Category	Acres	Percent
Sand	14,700.81	2.47
Sand and Gravel mixture	44,883.63	7.52
Total Sand and Gravel Areas	59,584.44	9.98

SOURCE: RRPC Digital Soil Coverage (Percentages Based on total of all soil types compared to sand and gravel in Rutland Region.)



FOOD FOR THOUGHT

Vermont State Statute Act 144, a ground water protection act, requires that a permit be obtained from the Agency of Natural Resources in order to withdraw more than 50,000 gallons of ground water a day. This forces the ANR to determine if the applicant meets applicable requirements. The act establishes a committee to examine the potential regulatory programs to protect the groundwater resources of the state.

impossible. Furthermore, the practice of undertaking proper site restoration following the extraction of resources is not universal in the Region.

- The majority of communities in the Rutland Region have not expressly planned for the extraction of mineral resources (which may include blasting), giving rise to difficult debate at the local and State level over proposed operations. The challenge of undertaking such advanced planning however, may be beyond the resources of communities.
- Though GIS mapping suggests that there are abundant mineral resources in the Rutland Region, many are inaccessible because of existing development above ground in those areas. It is important to recognize the actual limitations of resource extraction.
- In some parts of the Region, conflicts have arisen between mineral extraction and residential land uses. Permitting for quarries in Vermont allows for sites to remain dormant for several years before re-initiating work. In the meantime, houses may be built in the area.
- There is a lack of publicized information regarding the economic benefits to a community that host resource extraction activities. Lack of such information further fuels debate over the operations.
- Groundwater resources have not been mapped for the majority of locations in

the Rutland Region. As a result, the impact of extraction of these resources is speculative. There is concern that continued large-scale withdrawal of groundwater resources, coupled with ongoing housing development in some communities might lead to the depletion of the resource.

Concerns on the part of the mineral extraction industry relate primarily to the presence of regulation and availability of infrastructure in the Region. For example, Conditions of OMYA, Inc.'s operating permits include a limitation on the number of trucks carrying marble from East Middlebury to Pittsford on a daily basis. No more than 115 round-trips may take place through the urban compact of Brandon. Individual rail cars carrying processed marble from the plant are only partially loaded due to the condition of tracks and bridges in the state. These are seen as challenges to economic development.

FUTURE TRENDS

Resource extraction is, by definition, an activity based upon continued territorial expansion and impacts on the environment. It is not expected that the mineral extraction industry will undergo widespread growth over the next twenty years. It is possible, however, that operators will seek to begin extraction of minerals at individual sites.

ADDITIONAL RESOURCES

One of the objectives of this Plan is to provide communities with the tools, and the framework, for developing effective local plans and policies. This Plan should be used as a resource for communities preparing plan updates. In addition to the plan, however, a number of other resources are available:

- U.S. Geological Survey – (www.usgs.gov) USGS is an unbiased, multi-disciplinary science organization that focuses on biology, geography, geology, geospatial information, and water; They are dedicated to the timely, relevant, and impartial study of the landscape, our natural resources, and the natural hazards that threaten us.
- Vermont Agency of Natural Resources – (www.anr.state.vt.us) This site is the home page for all the other Natural Resources websites - The Agency of Natural Resources involves Vermont citizens in a broad range of decisions and actions that affect our environment.

Large-scale water extraction may increase in the Region. The national market for bottled spring water increased by 42% between 1999 and 2004 (see sidebar for source). Despite recent efforts by some states and municipalities, the industry is continuing to grow. The Region's rural nature and high water quality may be attractive to companies seeking new sites from which to tap water, especially "spring water".

MEETING CURRENT AND FUTURE NEEDS

Greater advance planning for issues related to resource extraction would be beneficial at the local level. A community could work with landowners to identify factors which might make those uses a priority, including having direct access to appropriate roads for transporting materials, employing technologically advanced extraction techniques that do not damage the quality of the site and surrounding land uses, and a requiring a reclamation plan that serves to minimize adverse impacts on residents, wildlife and existing or future land uses.

Though resources are plentiful at this point, it would be appropriate to plan with the understanding that natural non-renewable resources can be subject to depletion if not managed properly.

Mapping of groundwater resources throughout the Region will become increasingly critical in the future, including understanding the potential impacts of large-scale commercial water extraction.

Groundwater extraction has repercussions extending beyond the site and identification of protection areas. Appropriate zoning and other land use regulations as well as nonregulatory methods should be employed to ensure the proper management of these resources.

RUTLAND RPC ACTIONS

- Advocate the State of Vermont to undertake comprehensive groundwater mapping in Rutland County.
- Assist towns with the identification of groundwater protection areas and ensure zoning protects these with compatible set backs and land uses.
- Assist towns with the identification of transportation routes for transporting materials.
- Educate towns on best management practices to minimize pollution in areas of mineral extraction.
- Map mineral resources to help towns identify areas for future mineral extraction and ensure land use compatibility.
- Assist with the development of plans and standards for reclamation of mineral resource sites to minimize impacts on residents, wildlife and existing and proposed land uses.
- Look at conflict resolution processes used in resource extraction situations (Omya v. Middlebury) as a model for the Rutland Region.



FAST FACT

The national market for bottled spring water increased from an average of 16.8 gallons per person per year in 1999 to 23.9 gallons per person in 2004.

(Source: Beverage Marketing Corporation, cited in John G. Rodwan, Jr., "Bottled Water 2004: U.S. and International Statistics and Developments," Bottled Water Reporter, April/May 2005.)

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