The exposed Silurian Rondout series (RS) include SR: Silurian Rosendale member, SC: Silurian Cobleskill member and the SW: Silurian Whiteport member and are located in Rosendale, upstate New York. Two of the three members of the RS were extensively quarried and mined out for natural cement production in the past, and include Whiteport and Rosendale. These two members were mined out because of the slightly argillaceous, calcitic to dolomitic component with lesser silica content. The repetitive nature of SR due to intense folding associated with the Acadian orogenic event that caused vertical stacking of thick strata and enabled mining companies to excavate entire units and supply raw materials for natural cement production in Rosendale. SR limestone is also rich in MgO and CaO, and poor in silica. Overall depositional environment associated with SR and SW is indicated to be shallow marine to intertidal to supratidal based on lithofacies characteristics. The Cobleskill is a fossiliferous limestone and is well-known in the outcrop to possess a very distinct index fossil Halysites. The deconstruction of the limestone to turn into a cement requires soft materials to be broken down easily, which is why the Rosendale and Whiteport members were mined out for cement. However, the Cobleskill was left alone as a “pillar” to hold up all the mined out Rosendale and Whiteport members. In addition, Cobleskill consists of dense material that cannot be broken down easily to be used in natural cement. As observed, the Whiteport member and Rosendale member would require less heating energy for it to be reduced to its cement form.

Rondout Cement Series with various Formations

Figure 1. Cobleskill Limestone (Silurian). It is a highly fossiliferous limestone with index fossil Halysites (chain coral).

Figure 2. Fragment of Rosendale Limestone (Silurian) that was broken off from the Cobleskill. Member in Rosendale, Ulster County, NY.

Figure 3. Portion of Whiteport Limestone (Silurian) that was left and not mined out.

Map 1. Area of study was conducted between the fourth and fifth lakes (as depicted in black box) The area of Rosendale Latitude 41°52′07″N, Longitude 74°04′53.9″W

Map 2. Shows the Bedrock Geology formations of Rosendale, Ulster County, NY.

Map 3. A hand made GIS map using Google earth and Microsoft paint 3D, to depict the surficial geology of Rosendale, Ulster County, NY.

Figure 3. Portion of Whiteport Limestone (Silurian) that was left and not mined out.

Geologic History

Only formation named the Hudson River Shale (Ordovician Period -390, 443 Ma) was subjected to two orogenic episodes namely the Taconic and Acadian. All other exposed units were deformed during the Acadian event (theovman). The Ordovician witnessed the approach of a chain of volcanic islands. These islands, called a volcanic island arc, were formed by the subduction of oceanic crust off the coast of Laurentia. A modern analogue are the Aleutian Islands off Alaska where the Pacific seafloor is subducting beneath the Bering Sea.

Between the volcanic island arc and the coast of Laurentia, a narrow, deep marine basin formed which accumulated mud in an anoxic environment. These later formed black shales. Interbedded with the shales are volcanic ash layers and thick sandstone beds from submarine turbidity current sandbars.

Toward the latter part of the Ordovician Period; this volcanic island arc collided with Laurentia resulting in the Taconic Orogeny. This mountain building event severely folded and thrust faulted the black marine shales which can now be seen adjacent to the Hudson River north of the Hudson Highlands up through Albany.

Study Site

The exposed formations in Rosendale are (from oldest to youngest): Hudson River Shale, High Falls Shale, Binnwater Sandstone, Rondout Formation, Maunus and Coeymans Formations, Bercraft Limestone, Aiken, Port Ewen, and Glencrete Formations, Kalkberg and New Scotland Formations, and Esopus Shale. The Rondout formation, as it occurs in this area, consists of three members: SR: SC and SW: SR. Rondout formation. SR group has SW, whiteport dolomitic limestone member, SC: Cobleskill limestone member, SR: Rosendale dolomitic limestone member. Many of these stratigraphic units are complexly folded, faulted and repetitions of strata, particularly in the cement series (Rondout) made these units economically feasible due to increased thickness.

Abstract

The exposed Silurian Rondout series (RS) include SR: Silurian Rosendale member, SC: Silurian Cobleskill member and the SW: Silurian Whiteport member and are located in Rosendale, upstate New York. Two of the three members of the RS were extensively quarried and mined out for natural cement production in the past, and include Whiteport and Rosendale. These two members were mined out because of the slightly argillaceous, calcitic to dolomitic component with lesser silica content. The repetitive nature of SR due to intense folding associated with the Acadian orogenic event that caused vertical stacking of thick strata and enabled mining companies to excavate entire units and supply raw materials for natural cement production in Rosendale. SR limestone is also rich in MgO and CaO, and poor in silica. Overall depositional environment associated with SR and SW is indicated to be shallow marine to intertidal to supratidal based on lithofacies characteristics. The Cobleskill is a fossiliferous limestone and is well-known in the outcrop to possess a very distinct index fossil Halysites. The deconstruction of the limestone to turn into a cement requires soft materials to be broken down easily, which is why the Rosendale and Whiteport members were mined out for cement. However, the Cobleskill was left alone as a “pillar” to hold up all the mined out Rosendale and Whiteport members. In addition, Cobleskill consists of dense material that cannot be broken down easily to be used in natural cement. As observed, the Whiteport member and Rosendale member would require less heating energy for it to be reduced to its cement form.