Toxic Trial

Beatrice defends groundwater model

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By DAN KENNEDY

BOSTON — Groundwater pressure measurements taken from only one depth in an aquifer do not provide an accurate picture of the direction in which groundwater is moving, a hydrogeologist hired by Beatrice Foods Co. testified Thursday.

Ellis Koch of Geraghty & Miller, a groundwater consulting firm, said a cross examination conducted Wednesday by Jan R. Schlichtmann, attorney for the plaintiffs in the Woburn leukemia trial, was based on incorrect assumptions.

The plaintiffs, eight East Woburn families, charge that chemically contaminated groundwater at a property formerly owned by Beatrice flowed 700 feet to the east, under the Aberjona River, and into municipal wells G and H.

The wells were closed in 1979 after 15 years of use. The plaintiffs say using the water led to six deaths and two illnesses, a charge the defendants deny.

Thursday was the seventh and final day of Beatrice's defense in the 60-day-old trial in U.S. District Court. After a day off today, the other defendant, W.R. Grace & Co., will begin presenting its case Monday.

The Beatrice property is part of the Riley Leather Co. tannery, 228 Salem St., which Beatrice owned from 1978 to 1983. The Grace property is the Cryovac manufacturing plant, 369 Washington St.

The six-member, five-alternate jury is expected to begin deliberations by the end of the month.

On Wednesday, Koch testified that a pump test conducted in December 1985 showed water is drawn from the river into the aquifer when wells G and H are pumping.

That water under the river, he said, forms a ridge that forces groundwater west of that ridge to flow to the west. Such a pattern makes it impossible for groundwater at the Beatrice site to flow east toward the wells, he added.

Later on Wednesday, Schlichtmann said Koch had based his testimony on water-pressure readings taken from test wells at a depth of 15 feet.

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● Groundwater

Pressure readings taken from a depth of 40 feet, Schlichtmann said, showed groundwater flowed from west to east, toward wells G and H.

On Thursday, however, Koch said he based his model on neither 15-foot readings nor on 40-foot readings but, rather, on readings taken from varying depths throughout the aquifer. Those measurements, he said, enabled him to put together a three-dimensional concept of what happens in the East Woburn aquifer when wells G and H are in use.

Using a cross-section he prepared of the river valley between the Beatrice site and well G, Koch said groundwater flow is dictated by pressure gradients at all depths.

When wells G and H are turned on, he said, river water is pulled down into the aquifer. Water near the west bank of the river moves down into the sand-and-gravel layer under the river and flows toward the west, he added.

Upon hitting the bedrock, though, the water changes direction and starts moving east, Koch said, adding that was the phenomenon Schlichtmann was pointing to when he used 40-foot-depth readings.

While Schlichtmann was accurate in portraying a west-to-east flow at that depth, Koch said, his selective use of data failed to make it clear that that groundwater originally came from the river.

The vertical pressure gradients generated by the river water, he added, act as a barrier to groundwater to the west, such as that on the Beatrice site.

During re-cross examination, Schlichtmann asked Koch to read off groundwater elevation levels taken before and after the pumping test of wells G and H. The levels showed a drop of more than two feet at the Beatrice property.

Schlichtmann then asked Koch if he believed the water table at the Beatrice site dropped because of the pumping action of wells G and H. Koch replied the pumping changed the equilibrium of the aquifer, causing the groundwater to drop — but added that did not mean groundwater was flowing to wells G and H.

Dr. George Pinder, a hydrogeologist from Princeton University hired by the plaintiffs, has testified that the Aberjona River does not play a major role in the behavior of the aquifer because the bottom of the river is covered with a relatively impermeable layer of peat.

It is Koch's opinion, though, that the peat layer acts more as a "seive" than as a seal. On Thursday, he brought in two pails of peat from the river bottom which he said he collected Wednesday afternoon. The peat — decayed plant matter — consisted mainly of twigs and roots that he said water could flow through with ease.

Schlichtmann asked whether highly compressed peat near the bottom of the river might act as an impermeable layer. Koch replied the peat in the aquifer is uncompacted and porous.

Beatrice attorney Jerome P. Facher concluded Beatrice's defense by offering as evidence a report by the U.S. Environmental Protection Agency concerning contamination of soil on Hemingway Transportation property, north of the Beatrice site.

Facher has contended that, since groundwater flow is to the south, chemical contaminants found on the Beatrice site could have come from Hemingway.