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5 November, 1993

Ohio Hazardous Waste Facility Board

Re: Southdown, Inc.
Siting Criteria Demonstration
Case No. 91-NF-0700
Permit to store Hazardous Waste Fuel

To obtain a permit to store hazardous waste fuel an applicant to the Hazardous Waste Facility Board must demonstrate **“minimum risk of contamination of ground and surface water.”**

In the SITING CRITERIA DEMONSTRATION submitted by Southdown there are a number of errors and omissions regarding how the Southdown site meets or fails to meet the criteria of minimum risk of contamination of ground and surface water. In the less than two page discussion of site geology included in SECTION IV - DEMONSTRATION OF MINIMUM RISK OF CONTAMINATION OF GROUND AND SURFACE WATERS included in the main text, Southdown states (Section IV, page IV-2):

“Underlying the facility is the dolomitic limestone or “sugar rock”, **at approximately 120 feet below surface.** ”

In fact, the “sugar rock” is the quarry floor at this site, which is being proposed for hazardous waste storage. The sugar rock is the only aquifer in the immediate vicinity of the proposed facility. Instead of being 120 feet below the quarry floor, as stated in the main text of the SITING CRITERIA DEMONSTRATION, **the sugar rock is the quarry floor at the proposed facility.**

There is a published geologic report discussing the existence of sinkholes and underground streams in Greene County, which uses the location of the proposed hazardous waste storage facility as its type case of rapid karst ground water transport. Although this report is dated 1874, it was written by Edward **Orton**, who soon after writing the report rose to become Chief Geologist of the Ohio Geological Survey, and then became President of Ohio State University. The **Orton** geologic report should be seriously examined, because its synthesis of the geology of this site has serious bearing on the basic geologic premises underlying the risk assessment for this site. The **Orton** geologic report is not mentioned in the Southdown SITING CRITERION DEMONSTRATION, so I will present it here:

The base of the Clinton Formation [now known as the Brassfield Formation, which is the unit quarried here by Southdown], or rather the summit of the Cincinnati group, is a notable water-bearer, as is shown by the fine line of springs that issue from this horizon wherever the drainage allows. It has already been remarked that the lower beds of the Clinton are sandy in texture. At many points they are extremely friable, and are, consequently, very easily removed by the underground streams that are flowing at this level, and, as a consequence, small caves frequently occur at the base of the series. In other cases sinkholes are found, which are due to the same general cause. By the solution of the rocks along the lines of the divisional planes or joints that traverse them, free way is opened from the surface to the water-bearing shales of the Cincinnati group, and streams of small volume sometimes drop suddenly to this horizon to emerge again along the outcrops of the formation..... One of the best known of these sink-holes is found very near the intersection of the Xenia and Fairfield Pike [now Route 235] with the Dayton and Yellow Springs Pike. [This intersection and sinkhole is one mile due north of the proposed hazardous waste storage facility] The stream that here drops from the light of day to these subterranean recesses comes out again a mile or more to the southward, re-enforced, doubtless, by others that have shared a like fate, as the head spring of

Ludlow Creek - one of the finest fountains of the county. [The headwater spring of Ludlow Creek is immediately adjacent to the south side of the quarry where the hazardous waste storage facility is proposed. In other words Orton proposes rapid horizontal karst ground water transport directly below the floor of the quarry where the proposed hazardous waste storage facility is located.]

From: Geology of Greene County, by Edward Orton. In Report of the Geological Survey of Ohio Volume II 1874, pp.663-664.

Also in SECTION IV - DEMONSTRATION OF MINIMUM RISK OF CONTAMINATION OF GROUND AND SURFACE WATERS Southdown states (Section IV, page IV-2):

“A hydrogeologic investigation was performed by **Pantera**, as part of a site assessment. A detailed description of the area geology is included as Attachment 7 to this document.”

Section 7 of the SITING CRITERIA DEMONSTRATION consists of only page 7 through page 19 of the much larger hydrogeologic investigation by **Pantera**. The geologic maps presented in the fragment of the **Pantera** geologic report presented in Section 7 are at a scale of about 1 inch = 1 mile. Much more detailed geology is available at much larger scales. The **Pantera** hydrogeologic investigation includes an unknown number of pages that were not submitted, as well as 5 appendices. The 12 page fragment of the **Pantera** report fails to include any discussion of site geology even remotely suggesting the possibility of sinkholes and rapid subsurface ground water transport from beneath the site.

Although Southdown chose not to submit to the Ohio Hazardous Waste Facilities Board a detailed discussion of the groundwater geology at the proposed hazardous waste storage site, they clearly should be aware of this information. One of the principles of **Pantera**, the Southdown geologic consulting company for this hazardous waste facility application, is Dr. Ron Schmidt. In 1977 Dr. Schmidt submitted a report to Southwest Portland Cement Company (now Southdown) entitled A GEOLOGIC STUDY OF THE BRASSFIELD LIMESTONE IN PORTIONS OF GREENE AND CLARK COUNTIES, OHIO.

This report was sold to the public by the Wright State University Department of Geology as report number 770101. The Schmidt report includes a brief discussion of the 1874 Orton study of ground water flow in the area of the Quarry, and included the following figures that illustrate ground water flow in the area of the Southdown quarries.

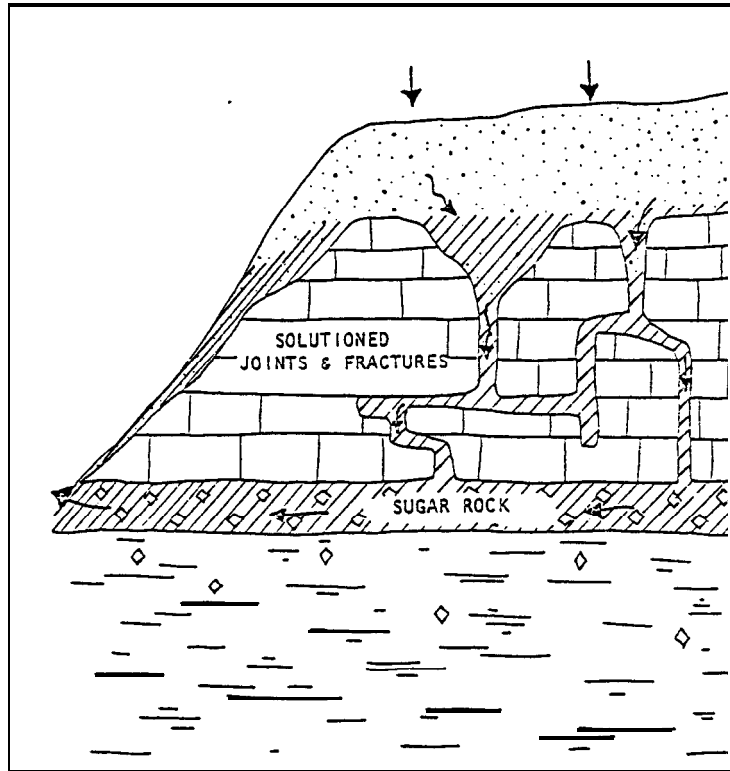


FIG. 13b ILLUSTRATES CONDUIT FLOW CONDITION

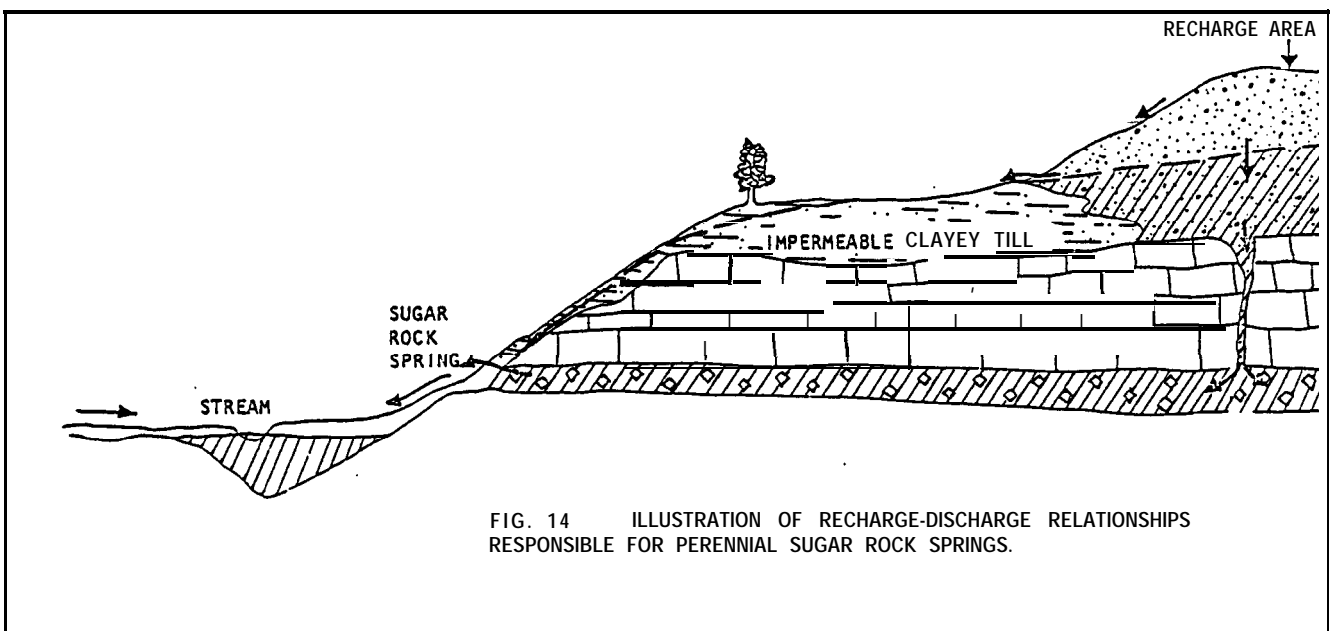


FIG. 14 ILLUSTRATION OF RECHARGE-DISCHARGE RELATIONSHIPS RESPONSIBLE FOR PERENNIAL SUGAR ROCK SPRINGS.

The 1977 Schmidt report concludes (p.82)

“Many of the hydraulic effects illustrated by the previous examples would certainly prove deleterious to any attempts at quarry development. Development without a careful understanding of the hydrogeology in an area might jeopardize the success of the operation and create serious effects over a much larger area in terms of affecting Brassfield Sugar Rock recharge and discharge relationships. It appears that the importance of the shallow Sugar Rock aquifer was not appreciated prior to this study.”

If the Orton and Schmidt geologic reports are correct, uncontained toxic waste spills at this site will rapidly be absorbed by the sugar rock aquifer exposed on the quarry floor beneath the storage facility. After traveling 4 to 9 feet vertically through the porous dolomite sugar rock, the toxic wastes would flow horizontally through open conduits at the base of the aquifer, and issue in about 2500 feet “as the head spring of Ludlow Creek - one of the finest fountains of the county” (Orton, p.664). It is hard to see how, with such site geology, this site meets the Ohio Hazardous Waste Facilities Board criteria of “minimum risk of contamination of ground and surface water.”

Respectfully submitted,
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and Geology
