BY FAX 307 - 777 - 6134 EQC Docket 09-4806

FILED

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Jim Ruby, Executive Secretary
Environmental Quality Council

To: Members of the Environmental Quality Council

Re: May 14, 2010 meeting of EQC in Cheyenne, WY

From: Judith Bush ph / fax 307-283-2835
please phone before faxing

cc	Don McKenzie	Director LQD	307-777-5864
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date: May 26, 2010 No. pgs 8

PETITION FOR RECONSIDERATION OF COUNCIL'S DECISION TO DENY REHEARING

My January 14, 2010 letter to the EQC cited the incompleteness of the Croell Redi-Mix Application due to lack of information provided in that application for all but a small portion of the 600 + acre minesite regarding depth of overburden, nature of overburden, and depth and thickness of the Minnekahta limerock. Council voted to seal that letter because it was written and faxed to Council after the period for introducing evidence had passed.

At the May 14, 2010 meeting of the EQC, I again made what I believe is a valid argument for the incompleteness of the application as described above I also pointed out the questionable nature of the drilling study which is the source of the judgment of the LQD that mining on the site will be of an essentially shallow nature. Although pages D.5-4 and D.4-5 of Appendix D.5 of the Croell Redi-Mix application date the study to 2007, the study appears to have been carried out decades ago. In addition, the map of drill holes contains no legal description and no interpretable scale. The legal description noted on one of the accompanying "Material Deposit Layout Sheets" seems to me to be indecipherable. It is not clear how this study ever passed muster with the LQD, and may constitute a lack of good faith on the part of Croell Redi-Mix in its dealings with the LQD. As pointed out at the May 14, 2010 meeting of the EQC, the map forming a part of this study does not comply with LQD rules and regulations specifying what information needs to be included on maps accepted by the LQD [LQD Noncoal Rules and Regulations Chap 2 Sect 1 (c)].

When Council voted to reject my petition for rehearing, one of the reasons I heard repeated was that Council had heard nothing new. The matters presented to Council at its May 14th, 2010 meeting were not presented at the December 21, 2009 public hearing. I was unaware of these issues on December 21, 2009. My January 14, 2010 letter describing the karst nature of the unstudied portion (~ 1/2) of the 600 acre minesite was sealed by council. These matters had never been presented to Council prior to May 14, 2010. If some Council members heard nothing new, they were not listening.

Another reason cited several times for rejecting a rehearing was that I had ample time to inspect the application prior to the December 21, 2009 public hearing and had been negligent in not doing so. As I explained at the hearing, the LQD failed to provide objecting parties with a copy of the application (LQD's exhibit in Docket 09-4806) until immediately prior to the hearing being called to order on December 21, 2009.

The December 8, 2009 Notice of Hearing and Order (which was not mailed to objecting parties, but was mailed to Croell Redi-Mix and e-mailed to the DEQ on December 8, 2009) required that exhibits be exchanged between the parties by Monday, December 14, 2009.

It was pointed out to objecting parties that the public hearing was a very legal process. I complied with the EQC orders regarding the exchange of exhibits, obtaining an extension for the exchange and complying with the December 18, 2009 extension given to me. The LQD made no attempt to comply with the December 8, 2009 Order to exchange exhibits by December 14, 2009. It was the LQD that was negligent by failing to comply with the EQC orders relating specifically to the public hearing as opposed to the public comment period.

As I also told Council on May 14, 2009, I was told by LQD on December 9, 2009 that a CD of the Application was being couriered to me. I waited to receive it. If I had instead been told at that time that the only way I could see the entire application prior to the hearing was to fly to Wyoming earlier, I would have been there in a heartbeat. (As I stated on May 14, 2010, the LQD did eventually courier the CD containing the Croell Redi-Mix Application to me on December 17th, 2009. Delivery was first attempted while the hearing was taking place in Gillette on December 21, 2009.)

Please note that my December 14, 2009 Pre-hearing Memorandum contained a motion requesting that objecting parties be permitted to purchase copies of the Application at cost. The EQC failed to take this up at its December 16, 2009 Pre-Hearing Conference.

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In addition, as I point out in my January ~~10~~, 2010 letter which Council sealed, I contacted LQD in June of 2009 regarding this application when it received its initial publication. I was told at that time that it was not yet time for public input, and that the project would be changing to such an extent that I should wait until matters were finalized before requesting more specific information than was included in the public notice . According to Mr. Mooney's testimony at the December 21, 2009 pubic hearing, this is the normal response to public enquires made early in the application process (transcript page 23 line 21 -> page 25 line 10). This kind of advice is contrary to 35-11-406 (m) (x) which states that a written response to an application made at this time can be cause to deny a mining permit application. (I brought this matter up in my March 3, 2010 Response to the Proposed Findings of Fact, Conclusions of Law and Order.)

I left a telephone message for Kim Waring yesterday (May 24, 2010, asking how to obtain a copy of the portions of the May 14th, 2010 EQC meeting transcript which dealt with matters relating to Docket 09-4806 (my petition for Rehearing as well as error(s) of fact contained in the March 12, 2010 Findings of Fact, Conclusions of Law and Order which Council chose not to correct in order to avoid the possibility of further requests for rehearing.

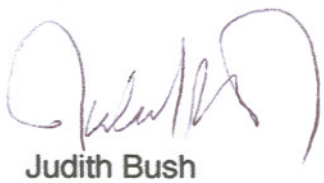
I am still waiting for a response to my May 18, 2010 "Petition to Correct the Record of EQC Docket 09-4806" to the EQC. Because the EQC determined, I believe incorrectly, that matters relating to the operation of the Croell Redi-Mix LMO at the Rogers Pit were irrelevant to the approval or disapproval of the application to expand the LMO operations at the Rogers Pit, there are matters which I believe are relevant which Council has so far refused to hear.

I have noticed that the two pages I had intended to attach to my May 12, 2010 "Response to Croell Redi-Mix, Inc's Objection to petition for Rehearing ..." regarding the Spearfish Formation were not faxed along with this 20 page document. I am attaching four pages at this time, all of which describe the characteristics of the Spearfish Formation. You will see that these pages bear out the information presented to the EQC by Mr. and Mrs.

Turgeon and myself on May 14, 2010. These pages are intended to show reasonable cause to investigate the potential harm of mining through the Spearfish Formation at the Rogers Pit. It is the responsibility of Croell Redi-Mix and the LQD to look into this. There is a lot of information out there. Les Turgeon correctly pointed out on May 14, 2010, that the LQD did not review all information available. They may have reviewed all information provided to them by Croell Redi-Mix, but in the case of matters relating to geology, that information was inadequate and did not begin to meet the standards set out in LQD's Rules and Regulations. In addition, the general information and research regarding the Spearfish Formation needs to be applied specifically to an on the ground assessment of the 600 acre minesite. Objecting parties cannot do this.

Mining through the Spearfish Formation in the "Racetrack" which surrounds the Black Hills poses risks to water supply and water quality. This needs to be assessed not only with respect to the Croell Redi-Mix Rogers Pit expansion, but with respect to similar projects seeking to mine through the Spearfish Formation to reach the Minnekahta limerock and / or other oil or mineral deposits. The Croell Redi-Mix Application failed to address this issue; the LQD did not catch this omission; and the EQC did not hear this issue at any time prior to its May 14, 2010 meeting. Water is by far the most important as well the limiting factor in the future development of this region. Matters described in this petition and at the May 14, 2010 meeting of the EQC regarding EQC Docket 09-4806 deserve a closer look.

Yours truly,



Judith Bush

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USGS Groundwater Information

Hydrology, Hazards, and Geomorphic Development of Gypsum Karst in the Northern Black Hills, South Dakota and Wyoming

By Jack B. Epstein
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Abstract

Dissolution of gypsum and anhydrite in four stratigraphic units in the Black Hills, South Dakota and Wyoming, has resulted in development of sinkholes and has affected formational hydrologic characteristics. Subsidence has caused damage to houses and water and sewage retention sites. Substratal anhydrite dissolution in the Minnelusa Formation (Pennsylvanian and Permian) has produced breccia pipes and pinnacles, a regional collapse breccia, sinkholes, and extensive disruption of bedding. Anhydrite removal in the Minnelusa probably dates back to the early Tertiary when the Black Hills was uplifted and continues today. Evidence of recent collapse includes fresh scarps surrounding shallow depressions, sinkholes more than 60 feet deep, and sediment disruption and contamination in water wells and springs. Proof of sinkhole development to 26,000 years ago includes the Vore Buffalo Jump, near Sundance, WY, and the Mammoth Site in Hot Springs, SD. Several sinkholes in the Spearfish Formation west of Spearfish, SD, which support fish hatcheries and are used for local agricultural water supply, probably originated 500 feet below in the Minnelusa Formation. As the anhydrite dissolution front in the subsurface Minnelusa moves down dip and radially away from the center of the Black Hills uplift, these resurgent springs will dry up and new ones will form as the geomorphology of the Black Hills evolves. Abandoned sinkholes and breccia pipes, preserved in cross section on canyon walls, attest to the former position of the dissolution front. The Spearfish Formation, mostly comprising red shale and siltstone, is generally considered to be a confining layer. However, secondary fracture porosity has developed in the lower Spearfish due to considerable expansion during the hydration of anhydrite to gypsum. Thus, the lower Spearfish yields water to wells and springs making it a respectable aquifer. Processes involved in the formation of gypsum karst should be considered in land use planning in this increasingly developed part of the northern Black Hills.

INTRODUCTION

The Black Hills of western South Dakota (fig. 1) is experiencing increased urban development requiring an assessment of ground-water contamination potential. Detailed bedrock and surficial geologic mapping, in cooperation with the Lawrence County Planning Commission and the City

Role of Artesian Springs in Regional Hydrogeology in the Black Hills Area, South Dakota

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In the Black Hills area, artesian springs originate primarily from the Madison and Minnelusa aquifers and occur in many locations downgradient from streamflow loss zones. Most artesian springs occur within or near the outcrop belt of the Spearfish Formation, which acts as a confining unit to the underlying bedrock aquifers. These artesian springs are an important source of base flow in many streams beyond the periphery of the Black Hills and were studied extensively for the recently completed Black Hills Hydrology Study.

Interactions between the Madison and Minnelusa aquifers have been identified as a probable factor in the development of artesian springs. Higher hydraulic head in the Madison aquifer relative to the Minnelusa aquifer creates potential for upward leakage in many locations. Water with low dissolved sulfate concentrations leaking upward from the Madison aquifer dissolves anhydrite in the Minnelusa Formation. Breccia pipes then form by gravity collapse. Exposed breccia pipes are believed to be the throats of abandoned artesian springs. Artesian springs probably develop preferentially in locations with large secondary porosity and high permeability. Dissolution then further enhances porosity and permeability in somewhat of a self-perpetuating process. Artesian springflow and general leakage are important factors in governing water levels in the Madison and Minnelusa aquifers. Artesian springs act as a relief mechanism that provides an upper limit for hydraulic head, with springflow increasing in response to rising water levels. Artesian springs have migrated outward over periods of tens of thousands of years in response to declining water levels in the Madison and Minnelusa aquifers, essentially keeping pace with regional erosion.

Cascade Springs, which is a group of artesian springs that originate primarily from the Madison aquifer, provides an example of hydrogeologic interactions in the southern Black Hills. Water from Cascade Springs normally is quite clear; however, periodic discharges of red, suspended sediment have been documented. The red sediment originated as the fine-grained fraction of Minnelusa aquifer rocks and is probably released in collapse brecciation episodes.

ACTA CARSOLOGICA	29/2	7	103-122	LJUBLJANA 2000

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GYPSUM-KARST COLLAPSE IN THE BLACK HILLS, SOUTH DAKOTA-WYOMING, USA

KRAŠKI UDORI V SADRI, BLACK HILLS, SOUTH DAKOTA-WYOMING, ZDA

JACK B. EPSTEIN[1]

[1] U.S. Geological Survey, National Center, MS 926a, Reston, VA, 20192, USA

Prejeto / received: 29. 8. 2000

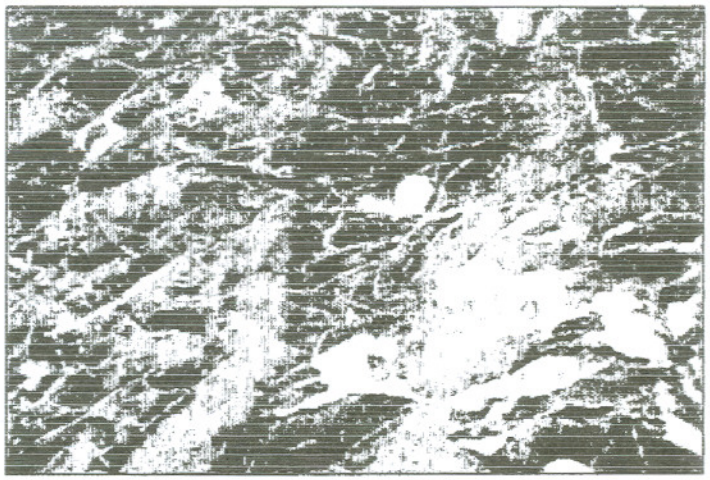

Fig. 12: Thin gypsum veinlets, averaging less than 1 cm thick, extending down from parent gypsum bed and filling a multitude of fractures in the lower part of the Spearfish Formation in the southern Black Hills.
Sl. 12. Tanke žilice sadre, ki so v povprečju debele manj kot 1 cm, lahko najdemo navzdol od matičnih plasti sadre, kjer zapolnjujejo razpoke v sp. delu Spearfish formacije v J delu Black Hills.

OPECHE FORMATION

The Opeche Formation, consisting of approximately 30 m of poorly exposed red shale, siltstone, and fine-grained sandstone, is a confining unit between the aquifers in the Minnelusa Formation and Minnekahta Limestone. Gypsum is not abundant.

SPEARFISH FORMATION

The Spearfish Formation consists of about 250 m of red shale, siltstone, and fine-grained sandstone with several beds of gypsum in the lower 60 m, aggregating less than 30 meters thick. Anhydrite, which probably was the original form of calcium sulphate to be deposited, underwent about a 40 percent expansion when it was hydrated to form gypsum. As a result, beds of gypsum in the Spearfish Formation are commonly highly folded (Fig. 11). Some gypsum became mobile during dissolution and was injected into many thin variably oriented fractures in the underlying red beds (Fig. 12). These veinlets are generally less than 1 cm wide and they contain gypsum fibers lying perpendicular to the fracture walls. Thus, the lower 60 m or so of the Spearfish has developed secondary fracture porosity. This part of the formation supplies water to wells, has many dolines developed in it, and resurgent springs are numerous. Ground water flows through the fractures and solution cavities in the gypsum. Although the entire Spearfish is generally considered to be a hydrologic confining unit because of the presence of shale, the lower 60 m of the formation is an aquifer because of the enhanced permeability. This is not surprising since high ground-water flow has been reported in gypsum in many areas of the United States (Thordarson 1989). The upper part of the Spearfish, about 180 m thick, lacks gypsum. Bedding is regular and the unit lacks the fractures seen in the lower part of the formation. This part of the Spearfish is a confining unit.