MID-HUDSON GEOSCIENCES
1003 Route 44/55
P.O. Box 332
Clintondale, NY 12515-0332
Phone & FAX (845) 883-5866

rockdoctor@optonline.net

August 27, 2008

Mr. John Piazza
Chairman, Planning Board
Town of Mamakating
2948 Route 209
Wurtsboro, NY 12790

RE: Yukaguni Maitake Revised Site Plan, February 15, 2008

Dear Chairman Piazza and Board Members,

Mid-Hudson Geosciences has been retained by Bashakill Area Association to review the revised site plan and other documents from Cornerstone Engineering for the above referenced project with respect to water issues.

The revised site plan has some new features, specifically a "modified geothermal system" and the "treated process wastewater infiltration area."

Questions about the "Modified Geothermal System"

No information has provided defining the function or design of the "modified geothermal system." In the absence of any information, the following questions are posed:

- Is the system for heating and cooling the building?
- Will additional water be removed from the ground via the production well?
- Will the water be circulated in the buildings?
- Where and how will heat exchange occur?
- How much water will be used by the system on a cold day in winter?
- On a hot day in summer?
- What will be the temperature of input and output water in winter and summer?
- How many BTUs will be added or subtracted from a specific volume of water?
- What will be done with the used geothermal water?
- What will be the environmental impact of the system?
- Will there be a sheet in the site plans showing the system layout?
- Was this system the reason the Planning Board approved more groundwater withdrawal than proven by pumping tests in the past by allowing 600,000 gallons per day?
- When will this information be made available to the public?

Treated Process Wastewater Infiltration System

It is my understanding that approximately 335,000 gallons per day of process water will be disposed of into a subsurface infiltration system. On Sheet 5 of the Site Plan, the location of the disposal area is indicated by words to the east of the buildings and south of the proposed subsurface sanitary/septic disposal system. A word description said that the process water would be delivered via a pipe to a rip-rap field.

Disposal of water into the ground is not a trivial problem. For every production well, it takes at least two injection wells to put water back into the ground. Often the water has to be injected under pressure. The proposed system suggests that the system will work by gravity infiltration of water at the surface. According to my research:
There is about 70,000 square feet of area available for the infiltration.
The 335,000 gallons per day is equivalent to 8 inches of water over the 70,000 sq ft.
That would require a permeability of at least 0.33 inches per hour.
The soils in the location of the infiltration field are Chenango gravelly loam (CnB).
The soil survey lists septic absorption fields as “Severe” conditions and “Poor Filter.”

That information brings up the following questions:
♦Has the applicant done any permeability testing in that area?
♦Has the applicant done any calculations to determine if the system will work?
♦What is the effect of the high water table?
♦What size mount will build up from the infiltration?
♦Since the water supply well is immediately south and downgradient of the infiltration area, what will be the cumulative effect of recirculating the water?
♦What will be the mineral and contaminant content of the process water?
♦When will the design and plans be available to the public?

Subsurface Sanitary/Septic Disposal System (SSDS)

On the site plan, the subsurface sanitary/septic disposal system (SSDS) is located immediately upgradient of the process water infiltration area. The SSDS area is underlain by Pompton Gravelly Fine Sandy Loam (PtB). For use as septic absorption fields, the soil survey lists that soil as “Severe” due to “Wetness” and “Poor Filter.”

The same questions asked about the process water infiltration area apply to the SDSS. However, a more important question is:
♦What will be the effect of the SDSS upon the quality of well water when the septic discharge is upgradient of the well?

Why Have a Public Hearing Now?

As a member of a planning board, I was wondering the purpose of today’s hearing (August

27, 2008). Because the environmental quality review had not been done for the project changes, a Supplemental Environmental Impact Statement is needed. The designs of the three water systems discussed above need to be prepared and available for public review. Environmental impacts and the interactions of those three systems need to be identified and evaluated.

Yours truly,

Katherine J. Beinkafner, Ph.D.
Certified Professional Geologist #6611