

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

rockdoctor@optonline.net
September 22, 2008

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

RE: Yukaguni Maitake Revised Site Plan,
Continued Review: August 28 to September 22, 2008

Dear Chairman Piazza and Board Members,

Mid-Hudson Geosciences has been retained by Basha Kill Area Association to review the revised site plan and associated documents from Cornerstone Engineering for the above referenced project with respect to water issues. This report reviews the documents submitted by the applicant on August 26, 2008 less than 24 hours prior to the public hearing on August 27, 2008 in light of the omissions and misinformation identified on August 27.

As mentioned in August, the revised site plan has some new features, specifically a “modified geothermal system” and the “treated process wastewater infiltration area.” The second item has been renamed “process wastewater infiltration basin system.”

Questions about the “Modified Geothermal System”

No written information has been provided defining the function or design of the “modified geothermal system.” Mr. Bazydlo made some comments at the public hearing; however, he can hardly be considered an expert on the system. In the absence of any information, the following questions were posed. Some new information was gleaned from the “Process Wastewater Infiltration Basin System Engineer’s Report” printed August 26, 2008 and the NYS DEC Form NY-2A (SPDES) Application signed August 22, 2008; and those tidbits are summarized below to shed some light on the situation.

◆ *Is the system for heating and cooling the building?*

I suspect the system may actually be for cooling the boiler(s) because the same volume of water is reported to be withdrawn and returned to groundwater 365 days per year. If the system were for building heating and cooling, little water would be needed in spring and fall. The applicant must clarify this issue.

◆ *Will additional water be removed from the ground via the production well?*

338,000 gallons per day

◆ ***Will the water be circulated in the buildings?***

In a letter dated August 26, 2008 from Cornerstone to John Piazza and Town of Mamakating Planning Board, "Re: Response to YMMCA Site Plan Comments", the following was written on page 7 under "Design Issues" item c.

"The general design of the Facility's cooling system has been discussed with the Planning Board and NYSDEC. The plans for the process wastewater disposal system, which is made up of mostly clean non-contact geothermal cooling and heating water, has been submitted to NYSDEC for review. Since the system will be located within the proposed building and have no visual impact on the area, will involve the use of groundwater and with no added chemicals to heat and cool the buildings, and similar systems are in use in New York State, we do not understand the request to review the design."

First of all, that statement indicates that the system is located within the proposed building, which is not true. Other documents indicate that the water comes from the Production Well on the property and the water will be piped outdoors to an infiltration basin. Also, in the first site plans, the water was going to be used for another purpose. The project has changed substantially now that 338,000 gallons per day are to be put back into the ground each and every day of the year for a total handing of 12 Million gallons per year.

That statement suggests that a document was submitted to NYSDEC for review. If that is actually the case, why can't the applicant just provide the document to the town and the public can review it. Since no such document has been submitted to the Town Planning Board, I suggest the public hearing should be kept open for a month beyond the date of submission of such a document to provide time for public review. The groundwater belongs to all of us and the public has a right to know how it will be used and associated environmental impacts.

◆ ***Where and how will heat exchange occur?***

Within the proposed building.

◆ ***How much water will be used by the system on a cold day in winter?***

338,000 gallons per day

◆ ***On a hot day in summer?***

338,000 gallons per day

◆ ***What will be the temperature of input and output water in winter and summer?***

In the "Process Wastewater Infiltration Basin System Engineer's Report" on page 5-1:

"An increase in water temperature of the water leaving the buildings of up to 9°F is anticipated in the summer time when the water is being used to assist with cooling. A decrease in water temperature of the water leaving the buildings of up to 5°F is anticipated in colder months when the water is being used to assist with the heating."

Given that information and the "stable groundwater temperatures of between 50° and 52° F stated in the same paragraph, one would think the logical range of temperatures of output water would be between a minimum of 45°F and a maximum of 61°F. However, in the application for a SPDES discharge permit (outfall 2, Item 8) the temperature range is listed as a maximum of 70°F, which would be a change of 18 to 20 degrees, not 9 degrees.

◆ ***How many BTUs will be added or subtracted from a specific volume of water?***

Could be estimated from the temperature and volumetric data, if those data were correct.

◆ ***What will be done with the used geothermal water?***

The applicant has designed an infiltration basin, which may or may not have the capacity for 338,000 gallons of water to infiltrate into the ground 365 days a year. During flooding and freezing conditions, the system probably will not work. It might not work during normal

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conditions given the potential for basin clogging with leaves and air-borne debris and high water table and poor percolation conditions.

◆ *What will be the environmental impact of the system?*

The environmental impact of the subsurface infiltration of 338,000 gallons per day is unknown. The need to quantify the functioning of the infiltration basin is cause for requiring the applicant to prepare a supplementary environmental impact statement. Documentation of working systems in this climate in similar geologic conditions is needed to demonstrate that the system is feasible as designed. Also complete water quality information must be provided in the SPDES application.

◆ *Will there be a sheet in the site plans showing the system layout?* Unknown.

◆ *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?* Unknown.

◆ *When will this information be made available to the public?* Unknown.

Process Wastewater Infiltration Basin System

As mentioned above the "Treated Process Wastewater Infiltration System" has been renamed "Process Wastewater Infiltration Basin System." Also the engineer's report has two different titles on the title page and the signature page printed on August 26 and 25, respectively. My previous questions about the location of the proposed infiltration system were answered. I was looking at Sheet 5 from February 2008 and the infiltration basin was outlined in a later edition dated May 2008.

In the "Process Wastewater Infiltration Basin System Engineer's Report" printed on August 26, 2008, new information was provided. A review of that document indicates there are some errors and omissions. That information relates to the previously posed question:

◆ *Has the applicant done any permeability testing in that area?*

In the report on page 3-1 under "Site Evaluation," the applicant states:

"The percolation rates at PT-9 through PT-12 were observed to be between 1 and 13 minutes per inch in the area of the proposed filtration basin."

However, when the locations of those percolation tests were checked, they are not within the outline of the infiltration basin. The perc test locations were shown on the February 2008 Sheet 12, but they were erased on the May 2008 edition.

◆ *Has the applicant done any calculations to determine if the system will work?*

The applicant did some calculations using the data from outside the area.

Also the site plans show that the basin area will be excavated, so the testing would need to be done with the material at depth on the site and in the proper location.

◆ *What is the effect of the high water table?* Not evaluated.

◆ *What size mound will build up from the infiltration?* Not evaluated.

◆ *Since the water supply well is immediately south and downgradient of the infiltration area, what will be the cumulative effect of recirculating the water?*

Not evaluated.

◆ ***What will be the mineral and contaminant content of the process water?***

Not evaluated with respect to boiler blowdown component, which could involve chemicals for anti-freeze, anti-scaling, anti-corrosion, and anti-rust. Not evaluated with respect to agricultural runoff, floor wash, infectious contamination, and thermal pollution.

◆ ***When will the design and plans be available to the public?*** Currently incomplete.

New questions arising from review of the document printed August 26, 2008:

On page 5-1, a statement is made: "95,000 gpd of evaporation is expected at the facility."

◆ ***Where does this water enter the plant and where does it leave?***

Appendix A of the "Process Wastewater Infiltration Basin System Engineer's Report" is the NYSDEC, Division of Water Application Form NY-2C for Industrial Facilities (SPDES). A review of that document shows additional work is needed to complete the application correctly.

◆ On page 2 item 7: ***the columns "receiving waters" and "type of discharge" have the information reversed.***

◆ On page 3, Item 13: ***do infectious or dangerous organisms grow on mushrooms?***

My cursory research of contaminants on mushrooms has found photographs and descriptions of at least a dozen contaminants for cultivated mushrooms. Given that such contamination does occur, what is the potential for introducing infectious contamination into the groundwater, air, humans, and animals? This potential environmental impact should be addressed in a Supplementary Environmental Impact Statement and a revised SPDES Permit Application.

◆ On page 3, Item 14: ***Is there any leachate from the mushroom growing areas? What is the volume and content of such leachate?***

◆ On page 4, Item 16: ***Application to Delaware River Basin Commission for Well Water was not listed.***

◆ Outfall 2, Item 8: ***Maximum temperature conflicts with numbers in Engineer's Report.***

◆ Outfall 2, Item 9: ***Any analysis of Boiler Blowdown? Floor wash? Agricultural runoff?***

◆ Outfall 2, Item 10: ***Analysis of biological contamination growing on mushrooms?***

◆ Section III, Sampling Information: ***pH of stormwater runoff is likely acidic 4-6. Groundwater may also be acidic. Temperatures disagree with Engineer's Report.***

◆ Appendix C, page 2 of 4, Item D. Pump Design: ***Error in calculation: $704 \times 5 / 376 = 9.4$ feet (not 5.62)***

Subsurface Sanitary/Septic Disposal System (SSDS)

With respect to the SSDS, the following question remains unanswered:

◆ ***What will be the effect of the SDSS upon the quality of well water when the septic discharge is upgradient of the well?***

Stormwater Pollution Prevention Plan

With respect to the "Stormwater Pollution Prevention Plan" printed August 19, 2008, the following questions arise:

◆ *In Table 1, what is the source, definition, and units of measure of the "K-values" listed in column 6?*

◆ *Starting on page 6-3, "SQMB" is used, but not defined.*

Conclusions

.1. As a member of a planning board in my Town of Plattekill, I believe this Board brought the site plan to public hearing prematurely prior to the application being complete.

.2. Starting with a detail which should have been addressed some time ago, has a second production well been drilled and tested? I noticed two wells on the site plan, but I have not read any reports of drilling and testing a second well. At least two wells are required by NYS Department of Health, one to backup the first, if it is out of service. Both require pumping tests to demonstrate their yields.

.3. The applicant has changed the project significantly from 2006 to 2008 with the introduction of a modified geothermal system and a process wastewater infiltration basin system.

.4. With respect to the modified geothermal system, the applicant has not provided any written information for public review. In fact, the applicant is balking at the request for such information, although the applicant claims to have submitted something to NYSDEC for review. Mr. Bazydlo said the system would be used for heating and cooling the building, but I assert that it will function as a cooling tower for the boiler(s).

.5. The applicant has prepared and submitted incomplete SPDES permit applications to NYSDEC for 4 outfalls. The omissions and errors in the application relate to potentially serious environmental impacts of discharge water with respect to

Thermal pollution,
Infectious contamination,
Boiler blowdown,
Floor wash compounds, and
Agricultural runoff.

.6. Appendix K of the original DEIS presented 95 pages describing hazardous and environmental fate of 10 chemical compounds to be used at the facility. For those chemicals, the uses were listed as

water-based cleaner,
potable water treatment chemical,
internal boiler treatment,
oxygen scavenger,
microorganism control chemical,
pH stabilizer

boiler water internal treatment,
cooling water inhibitor, and
corrosion inhibitor.

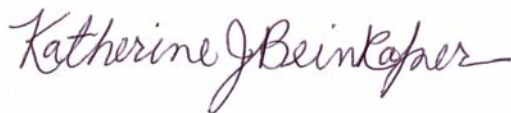
One chemical, called "NALCO 7346" was so hazardous that no application was given. The description did warn: "This product is toxic to fish. Do not discharge into lakes, streams, ponds, or public waters." None of these chemicals were listed in the SPDES permit application where content of wastewater should be characterized.

.7. The applicant has not used perc tests from within the proposed infiltration basin to estimate vertical permeability or infiltration capacity. The applicant has not demonstrated that the system of infiltration will work 365 days a year. Serious concern arises with respect to freezing weather, flooding conditions, clogging of the infiltration surface, mounding of water beneath the basin, and thermal pollution. How will the applicant prevent a skating pond from developing in frigid weather? Once the water is frozen, how would the applicant defrost it? Examples of similar working infiltration basins in comparable climate and geologic conditions must be provided to support the feasibility of such a system. The public must be assured that 338,000 gallons per day (that is 12 million gallons per year) will percolate through the bottom of the proposed infiltration basin.

.8. A serious matter of public health has not been addressed. Three subsurface design elements are lined up from upgradient to downgradient, including (1) the septic disposal system (2) process wastewater infiltration basin, and (3) the water production well. The applicant has not addressed the potential for bacteria to travel from the two infiltration systems to the well and back into the building.

.9. Because of the new project elements, specifically the modified geothermal system and the process wastewater infiltration basin system, heretofore unidentified and unstudied environmental impacts will result from the disposal of geothermal water into the infiltration basin at a rate of 338,000 gallons per day. Such uncharted environmental impacts require the submittal of a new Supplemental Environmental Impact Statement by the applicant. The SEQR process requires that the planning board take a hard look at all environmental impacts and that the public have the opportunity to review and comment on detailed studies of such impacts. To date, the impacts of these new project elements have not been defined in sufficient detail to evaluate potential environmental impacts.

Yours truly,

A handwritten signature in cursive script that reads "Katherine J. Beinkafner". The signature is written in dark ink and is positioned below the typed name.

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