

To: Town of Lewisboro Planning Board

From: Paul Lewis



44 Twin Lakes Road
South Salem, NY 10590

Date: February 23, 2014

Re: **Petrucelli Application** for subdivision and wetland permit
Oscaleta Road, South Salem, NY

Dear Chairman Kerner and Members of the Planning Board:

Lake Elevation and Land Elevation and Septic System Issues

After observing the wetland that extends in a westerly direction from the berm to the edge of the lake, I became convinced that lake water levels would not need to be as high to reach the toe of the berm as would appear based on Mr. Petrucelli's drawings, and I wanted to confirm my observations.

The wetland appears to be very flat. The Three Lakes Council had requested that the lake level relative to the property be determined by survey, but we saw no evidence that it was done. The elevation of the lake did appear on the drawings, but it may not have been determined by survey. It shows the USGS value of 471'

I am an engineer and not a licensed surveyor, but when I was an engineering student, I worked for Jim Wilson as his transit man. Jim was a licensed surveyor and Town Engineer who lived in Twin Lakes Village, and in the 1950's he surveyed and mapped much of Lewisboro, including the three lakes area.

Lou Feeney and I rented a builders transit and measured the drop in elevation from the toe of the berm on the Three Lakes Council property to the lake surface. We determined the drop to be 10.75". We weren't confident in the accuracy of the level so we went out again with a water tube level and measured it again and determined that the level change was 10.00", a good agreement. So, if the lake came up another 10", the surface water would be at the berm where the septic system is proposed to be installed.

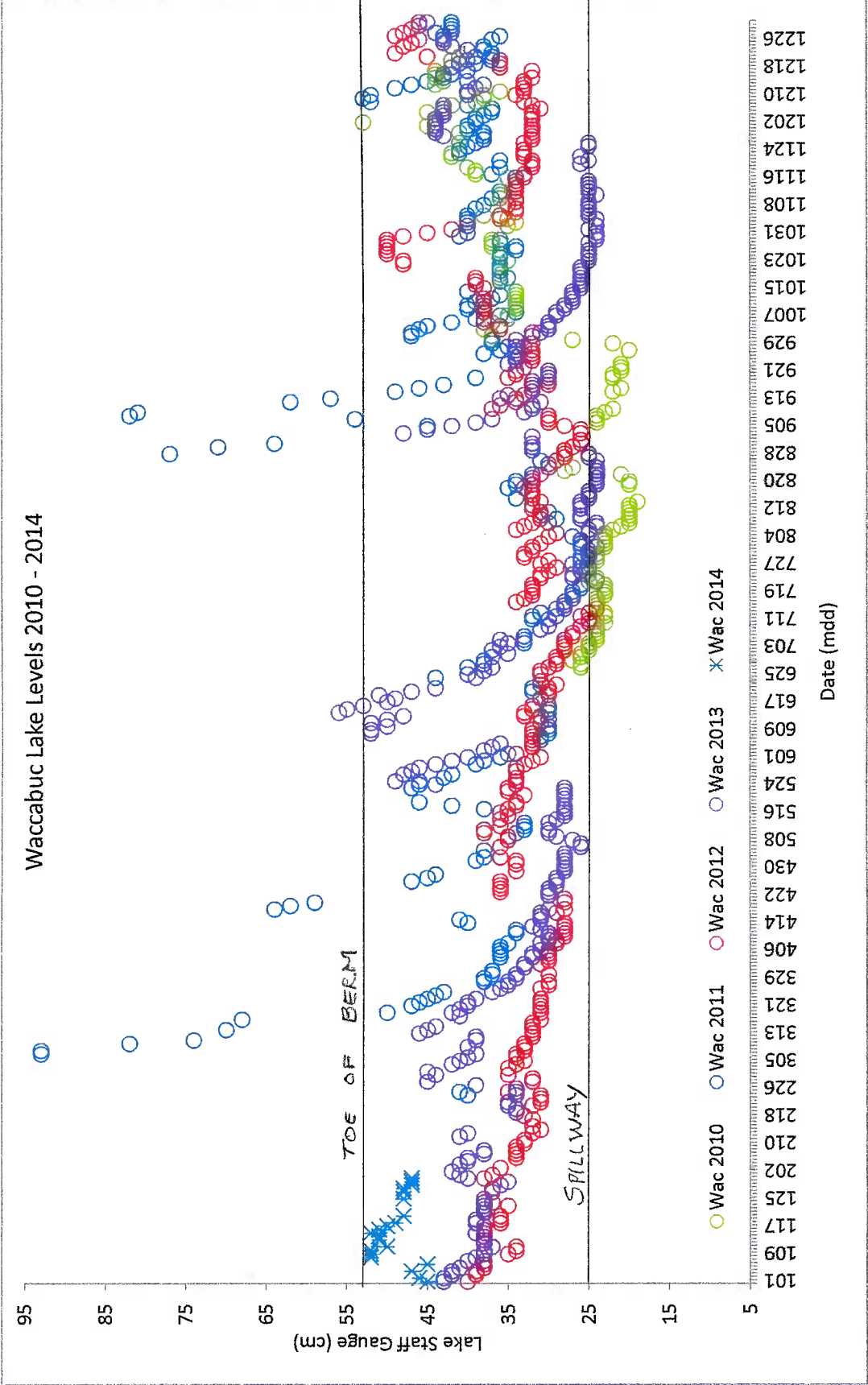
Further, we determined that the plans show an error of about 1.5' in the relationship between the level of the land and the level of the lake. That is, the plans show the land to be 1.5' higher than our measurements relative to the lake. We confirmed this by working from a spot elevation on the Three Lakes Council property that shows on the plans. I recommend all this these levels be professionally surveyed.

As you know, the Three Lakes Council has been monitoring lake water levels for the past 3-1/2 years which Jan Andersen plotted on the attached graph. This graph shows that the water reaches the berm about twice per year on average, and considerably exceeds that by a foot or more every couple of years. Knowing that there can be over a 2' foot variation in lake levels, it is critically important that the topography be accurately represented, especially since septic fields don't function properly in flooded soils. With the wetlands being flooded and the water lapping up against the berm at times, phosphorus from the septic system will get into the lake more readily than the applicant leads one to believe.

No information has been presented stating the nature of the fill in the berm as there is no deep test hole data available to us in the septic field area. Therefore the phosphorus binding ability is unknown. With the short distance from the leaching field trenches to the edge of the berm, the phosphorus will reach the edge of the berm in only a short period of time. This bank is not proposed to be sealed off. The plans show only the southerly end will be sealed where new fill will be added. It is not a question of if the septic system fails but when. Monitoring wells should be placed in the berm to monitor coliform and phosphorus transport and they would have to be monitored. It appears to me that it would nearly impossible to replace the fill in the fields after construction due to the lack of equipment access.

This proposed septic system is far from "state of the art". A "state of the art" system would be designed to prevent phosphorus and nitrates from leaching into the lake. A "state of the art" system would include a phosphorus affinity filter or be an evaporative system sealed off from the soil below.

"Old-timers" remember when, in the 1950's, a hurricane dumped so much rain that Oscaleta Road and the bridge were under water, and the two bridges to the north were washed out! People in this area could not drive out in either direction. With climate change, we can expect an increase in such unusual weather patterns, so it is essential that the effect of flooding on septic tank function be taken into account.



Measured Lake Elevation
relative to
Petruccelli's Plans

Wetland Staff Gauge to surface of Lake water

From Staff to Lake	Water Level Inches	Elevation Change	Water Level Inches	Elevation Change	From Lake back to Staff Elevation Change
Staff Gauge to Point 2	19.13	19.75	-0.63	22.25	0.38 Point 2 to Staff gauge
Point 2 to Point 3	20.88	25.00	-4.13	19.00	4.00 Point 3 to Point 2
Point 3 to Point 4	23.13	25.13	-2.00	26.75	1.88 Point 4 to Point 3
Point 4 to Point 5	22.13	23.13	-1.00	21.38	1.13 Point 5 to Point 4
Point 5 to Lake	16.63	18.50	-1.88	16.75	2.00 Lake to Point 5
Water Level below ice		-0.5			0.5
		-10.13			9.88

10.00 Avg
0.83 feet

or

Wetland Staff gauge to Spot elevation near WLF 14

From Wetland Staff to Ice at flag 14	Elevation Change
Wetland Staff gauge to point 6	38.50 4.50 34.00 inches
	29.88 4.50 25.38
	29.25 17.63 11.63
Total	71.00

From Ice at Flag 14 to approximate spot elevation half way to Tulip tree:

Ice at Flag 14 to Spot. 23.75 21.00 2.75

Spot El. To Wetland Staff gauge 73.75 inches
or 6.15 Feet

Measured Lake Elevation
relative to
Petruccelli's Plans

Measured Lake elevation relative to the Spot Elevation

Spot Elevation	479.50 Feet	
Drop to Wetland Staff gauge	6.15	
Drop to Lake	0.83	
Calculated Elevation of Lake	472.52 feet	Water at depth 2.5 - 3" at Spillway at time of measurements.
Accepted elevation of Lake	471.00 feet	Also elevation on Petruccelli's Drawings
Error	1.52 feet	Elevation of Plans is higher than actual

Water will reach foot of berm when lake level is 12" at spillway which happens about 2 times per year.

Wetland Staff Gauge to surface of Lake water

	Wetland Staff in feet & inches	Lake in inches	Staff	Lake in inches	Drop
TP 1 midway to lake	4' 10-3/4"	5' 9"	58.75	69	10.25 on ice 0.50 Water below ice
					10.75 to water level

Wetland Staff gauge to Spot elevation near WLF 14

TP 2 - on Ice at WLF 14

Stadia rod reading at Wetland Staff (7' 8.6"	92.6
Length of wood 2 x 4		30
Width of Clipboard		8.875
Total =		131.475

Transit above Ground	58.375	to 360 ring
	2.9375	360 ring to scope centerline
		61.3125

Elevation Change 70.1625 Wetland Staff gauge spot to Flag WLF 14