



PHELPS ENGINEERING, INC.

Frog Hollow Mill • 3 Mill Street
P.O. Box 367
Middlebury, VT 05753
www.phelpseng.com

99003/99020

November 8, 2002

Mr. Bill Bryant
Town of Waitsfield
9 Bridge Street
Waitsfield, VT 05673

NOV 12 2002

Subject: Tucker Property Gravel Site Evaluation

Dear Bill:

The following letter is intended to summarize our findings and recommendations regarding the Tucker property located north of Old Center Fayston Road and the Quackenbush property and west of Route 100 across from the Kenyon Property. The site was evaluated as a potential source of sand and gravel extraction for the Town and secondly as a potential water supply or wastewater disposal site.

On August 26, 2002 we walked the property with Green Mountain Boring to identify sites conducive to drilling based on NRCS soil information, topography, and other natural features. On September 5th and 6th, Green Mountain Boring conducted a total of 11 solid stem auger borings as indicated on the attached orthophoto sketch. The results of the borings are attached to the report. Based on the borings conducted, we followed with a series of backhoe test pits performed by the Town of Waitsfield to further analyze soil conditions on October 21, 2002. The results of those test pits are also attached to this letter. Based on the soil evaluations and site visits we offer the following summary.

Sand and Gravel Extraction Potential

The Tucker property had been used previously as a source of sand and gravel but was discontinued. Borings were conducted surrounding the existing gravel extraction area and other areas deemed as potential gravel sources. Generally we found areas where there was thin fine sand and gravel deposits ranging in depth from three to ten feet deep. The majority of the deposits consisted of a mixture of fine to very fine silts and sand with some clay and cobbles. Borings 02-1 and 02-2 represented the best areas of gravel; however, these deposits are relatively thin and have a small footprint. They are also in close proximity to surface water to the west at the toe of the steeper slope, and to the northeast where an existing stream

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exists. Their final limitation is groundwater that was seeping into the test pits at a depth of five to seven feet.

There are other locations on the property that have sparse areas of coarser material but it is mixed with very fine material and has similar site constraints as listed above. We estimate approximately 5,000 cubic yards of material may exist on the site assuming the material is consistent with test pits and borings conducted. However, some if not all material will need to be screened and/or crushed in order to make a usable product. Generally it appears that the previous contractors extracting gravel from the site stopped because the site was nearing the end of its usefulness as a gravel resource.

Another issue regarding the use of the site for sand and gravel extraction is the limited site access and the condition of the existing drive. Currently the only motor vehicle access to the site is through the Armstrong property. This is a private access and we understand a new access will need to be constructed. Several portions of the existing drive on the Tucker property are in disrepair including a section that has eroded near an existing stream channel. The amount of material needed to rebuild the road and provide a new access will nearly exceed the available Tucker gravel resource.

Lastly, due to the existing secondary agricultural resources, surface and groundwater features and potential deer wintering areas, the site would be difficult to permit with Act 250. For the reason listed above we do not recommend acquiring the Tucker site for a gravel extraction resource.

Water Supply/Wastewater Disposal

During the boring and test pit investigations the site was also evaluated for a potential water supply or wastewater disposal area. Portions of the property were conducive to both however not on a scale that would be economical for the Town's use. Sporadic areas of coarser material were evaluated by Ted Morine of the D.L. Maher Company while backhoe test pits were open. Borings 02-8 and 02-9 had a shallow gravel pocket that was saturated but the yield was estimated to be less than 10 gallons per minute. There was also iron and manganese staining on the native material, which can indicate poor water quality.

Wastewater disposal areas could easily be identified on the site for smaller developments or single family homes; however, due to the irregular topography and proximity to surface water, disposal systems of a larger scale (above 6,500 gallons per day) would be more difficult and require extensive testing. For those reason we would not recommend consideration of the Tucker site for either a large-scale water supply or wastewater disposal system. However, the site may be conducive to a smaller development provided better access is developed.

Per discussion with the Town road crew I understand there is an immediate need for sand and gravel for Waitsfield. I spoke to Nathan Donahue yesterday who is a consultant for

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the U.S. Geological Survey. He is currently evaluating the Mad River Valley for sand and gravel potential and I think he may have several ideas about where to look. I would suggest meeting with Nathan and the road crew to share ideas and develop a priority list of sites to review. He could also help with sites conducive to gravel well development. I ask you to consider this and call me to discuss. I will be sending Nathan information that we have obtained thus far in the Valley in exchange for what he has found. Thank you for the opportunity to assist you with this evaluation. As always, if you have any questions please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read "Luther H. Tenny". The signature is stylized and cursive, with a large, sweeping flourish at the end.

Luther H. Tenny, P.E.
Project Manager

LT:kw

Enclosure



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99020

November 8, 2002

Nathan Donahue
36 Vine Street, Apt. #1
Northfield, VT 05663

Subject: Town of Waitsfield soil information

Dear Nathan:

Enclosed is information we have compiled regarding soil information in the Mad River Valley. This information has been gathered by several methods including backhoe test pits, solid auger borings, hand probes and test well drilling. I hope this information helps you with your work. I would be interested in your findings as the Town of Waitsfield is currently searching not only for potential sand and gravel extraction areas but also for gravel well aquifers for a municipal water supply. When you have gathered your information, I would like to sit down with you to discuss your results and compare notes. If you have any questions please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Luther H. Tenny', written over a white background.

Luther H. Tenny, P.E.
Project Manager

LT:kw

c: Bill Bryant (w/o enclosure)

Enclosure



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99020

November 8, 2002

Mark Bannon, P.E.
Bannon Engineering
P.O. Box 1087
Waitsfield, VT 05673

Subject: Town of Waitsfield Boring Results

Dear Mark:

Per our recent telephone conversation, I am enclosing our ledge boring results and field notes associated with the ledge probes conducted along Route 100 in Waitsfield. I hope this information is helpful to you. I will be sending the preliminary archaeological evaluation report from the University of Vermont when I receive it from them. If you have any questions please feel free to call.

Sincerely,

Luther H. Tenny, P.E.
Project Manager

LT:kw

c: Bill Bryant (w/o enclosure)

Enclosure

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SOIL TEST PIT LOG

Project: Town of Waitsfield – Tucker Property Evaluation

Project Number: 99020.92

Location: Tucker Property, Waitsfield, Vermont

Date: 10/21/02

Time: 1:00-5:00 p.m.

Weather Conditions: Sunny, Cool

Method of Excavation: Rubber Tire Backhoe – Provided by Town

Ground Surface Slope: Varies %

Logged By: Luther H. Tenny, P.E.


Test Pit #	Depth (inches)	Texture	Consistence or Density	Color	Mottles	Comments
1	0-8	Topsoil	Loose	Dark Brown		Adjacent to Boring 02-1
	8-60	Bank run gravel with fines, stones 2-12" in size	Firm for gravel	Orange Brown		
	60-84	Bank run gravel, stones ¼-3"	Loose	Med. Brown		
	84-108	Washed gravel, no fines		Med. Brown	Water seeps at 2gpm at 7 feet in depth.	
2	0-3	Topsoil				120' north of Boring 02-1
	3-24	Silt loam	Med. Firm	Light Grey	Faint (Capillary?)	
	24-60	Weathered stone with gravel	Fractured stone, difficult to dig	Dark Brown		
	60+	Glacial till	Very firm	Light Grey	Water seeps	
3	0-3	Topsoil				Between Boring 02-2 and 02-4
	3-34	Bank run gravel with fines	Firm for gravel	Orange Brown		
	34-50	Gravel with cobbles		Light Brown		40% cobbles
	50+	Glacial till	Very firm	Grey		
4	0-6	Topsoil	Loose	Dark Brown		Adjacent to Boring 02-8
	6-28	Sandy loam with stones				
	28-108	Clean gravel with some stones	Very loose	Med. Brown	Water flows into pit at 5'	Quantity of water approximately 5 gpm ±
	108+	Silt and clay layers each 1" thick				
5	0-6	Topsoil	Loose	Dark Brown		Adjacent to Boring 02-9
	6-32	Sandy loam with stones				
	32-135	Clean gravel with stone and cobbles	Very loose	Med. Brown	Saturated with water flowing at 6'	Quantity of water approximately 9 gpm ±

99003.17

GREEN MOUNTAIN BORING

PO Box 218
East Barre, VT 05649

To: Phelps Engineering
ATTN: Luther Tenney
PO Box 367
Middlebury, Vermont 05753

RECEIVED	
PHELPS ENGINEERING, INC.	
	SEP 13 2002
FILE 99029.92 Tucker SITE	

Date	9/11/02
Job Name/Site	Waitsfield Sewer
Job Number	02058
Crew	Michael McGinley and Tom Wood

HOLE #	OFFSET	STATIC LEVEL	SOILS	AUGER REFUSAL	DEPTH
B-02-1	-	12' +	0'-10' Coarse gravel and silty sand 10'-18' Fine gravel and silty sand 18'-25' Silt, some sand, few stones -very wet at 18'		25'
B-02-3	-	12'	0'-10' Fine silty sand and gravel 10'-15' Sand, gravel, some silt 15'-20' Silty sand, some gravel, trace of clay		20'
B-02-2	-	-	0'-8' Silty sand and gravel 8'-10' Gray silt 10'-15' Glacial till		15'
B-02-4	-	24'	0'-10' Silty sand and gravel 10'-25' Gray silt and till - Refusal on Rock	25'	25'
B-02-5	-	-	0'-3' Silt, trace of sand 3'-10' Glacial till - 1 hour for 7' discontinued		10'
B-02-6	-	14'	0'-10' Fine silty sand and gravel 10'-20' Silt (gray)		20'
B-02-7	-	6'	0'-3' Silty sand and gravel 3'-15' Gray silt, some clay, some sand, trace of gravel		15'
B-02-8	-	6'	0'-20' Silty sand, cobbles, trace of clay (very wet)		20'
B-02-9	-	6'	0'-15' Silty sand, cobbles (very wet)		15'
B-02-10	-	-	0'-6' Silty sand, some gravel 6'-15' Glacial till (gray)		15'
B-02-11	-	7'	0'-7' Silty sand, some gravel 7'-10' Gray silt, trace of clay		10'

TOTAL FOOTAGE: 190 feet

AUGERS USED: Solid