



Hubbard County Environmental Services

301 Court Avenue, Park Rapids, MN 56470

Phone: 218.732.3890 Fax: 218.732.7993

www.co.hubbard.mn.us/environmental.htm

April 2013 Board of Adjustment meeting staff report

New Business:

Staff:

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Env. Services Officer
Scott Navratil,
Env. Specialist
Maria Shepherd,
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Kevin Trappe,
GIS Technician

Variance Application 8-V-13 by Greg and Jeanne Mehlhop: The North 150 feet of the North 300 feet of the South 600 feet of Gov't Lot 3, lying East of CR No. 39, Section 32, Township 144, Range 32, Hart Lake Township, on Garfield Lake. Parcel # 10.32.02510. Applicants are requesting a variance from Section 513 of the Shoreland Management Ordinance for part of a geothermal heating system to be located within the required 100' ordinary high water mark structure setback.

In July 2012, the applicants were granted a variance to replace the existing residential structure with a new residential structure at less than the required 100' OHW setback. The accompanying permit for the new structure was issued in October 2012. This winter, it came to the department's attention that an open loop geothermal heating system had been installed for the new structure and the system was operating with a temporary discharge line running atop the ground that was discharging toward the lake. The discharge was creating an erosion problem. Please see the photos of the discharge pipe included with the application along with photos of the discharge pipe Scott took this winter and a copy of a letter Scott sent to the landowners concerning the violation.

Section 513 of the Shoreland Management Ordinance addresses geothermal heating systems and requires all portions of the system to meet the required structure setbacks. One of the main reasons for this is such systems often involve a significant amount of excavation needed to install the system loops (typical in a closed loop system where the water recirculates) and excavation within the OHW structure setback is obviously a concern. An open loop system pulls water from a well, runs it through a heat exchanger, and then dumps the water onto the ground surface. Often a French drain (hole dug in the ground filled with rock) is used to absorb the discharge water. Because the discharge water often has mineral content, over time, the pore space in such drains can clog such that systems employing such a drain have been found to require overhauling the drain within three to five years of its installation. When a water body is nearby, installers often seek to discharge into it to avoid the maintenance issue associated with a French drain. However, there are environmental concerns to be considered with this approach that will be addressed a little later on in this report.

The proposal is to permanently bury a discharge line for this system between the house and lake with the outlet being located over the rip-rap on the shoreline. The excavation area would be 100' long x 1' wide x 2.5' deep which equates to a volume of ~9.25 cubic yards of material being excavated and replaced once the discharge line would be installed. This volume of material falls below the permitting threshold. A variance is required because the discharge line is part of the system and will not comply with the 100' OHW structure setback.



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The system uses 9 gallons of water per minute when it operates. The heating and cooling contractor who installed the system estimates the system's annual water use will be 780,516 gallons (2,138.4 gallons/day).

Such systems are currently not regulated by the Department of Natural Resources or Pollution Control Agency. They seem to be a new technology that agencies have not yet responded to in terms of identifying/implementing any necessary regulations. The DNR does not require a water appropriation permit because the system will fall below an annual usage volume of one million gallons. Surprisingly, the DNR does not yet regulate/prohibit discharge from such a system into a lake – although the Area Hydrologist has indicated that the DNR will likely be studying the issue in the near future and that regulations may be developed as a result of researching the matter.

The department has the following concerns with the proposed system:

1. Erosion potential of a concentrated outflow of a significant volume of water.
2. Impact of discharge water on the lake
 - a. Temperature differences between discharge water and lake water could disrupt/kill aquatic plant/animal life in the littoral zone around the discharge site and cause weak ice-causing a safety hazard for people recreating on the lake in the winter.
 - b. Oxygen level differences between the discharge water and lake water could harm aquatic plant/animal life in the littoral zone around the discharge site.
 - c. The discharge water may contain nutrients such as phosphorus that could significantly disrupt/harm the lake environment in the immediate discharge area and possibly the lake in general.
3. Not enough research on the impact of such systems on lakes has been done yet.
4. We do not know what effect this annual volume of drawdown from this well will have on the aquifer.
5. Ice action and the ice going out could create ongoing maintenance problems with the discharge pipe being damaged. A damaged pipe could result in water being forced out of the pipe prior to the outlet which could cause significant erosion problems and sediment entering the lake as was evidenced this winter before the discharge pipe was extended to the rip-rap on the shoreline.

A closed loop system could be used instead. Open loop systems are often used because of their installation costs being much less than closed loop systems. As there are several other heating system solutions available for the new residence that do not create several potentially significant impacts to the lake and the public safety and welfare, and questions 1-4 and 6 of the findings of fact cannot be answered "yes", the department recommends denial of the request.

Below are proposed findings of fact for your consideration:

1. Is the variance in harmony with the intent of the comprehensive plan, zoning ordinance and State Shoreland Management Rules? Yes () No (X)



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Why or why not? There are too many unknowns in regard to the impact such a volume of water with differing temperature and oxygen levels and composition would have on the lake. Enough information is known about the volume and temperature of the discharge water to know that it will have a harmful effect on at least the littoral area immediately around the discharge outlet. If the discharge pipe would ever be damaged, the volume of water running through it could quickly create a significant erosion problem of the soil between the house and lake which would also pose serious harm to the lake and its inhabitants.

2. Without the variance, is the owner deprived of a reasonable use of the property?
Yes () No (X)

Why or why not? There are several other heating systems available to the landowner that do not pose the same environmental risk to the lake and safety risk to people recreating on the lake in the winter months (potential for weak ice from above freezing water entering the lake from the discharge outlet.)

3. Is the stated practical difficulty due to circumstances unique to this property?
Yes () No (X)

Why or why not? The request has nothing to do with any unique circumstances on the property. It involves the landowners' desire to save money by using an open loop geothermal heating system instead of installing a closed loop geothermal system or using a different heating system (such as LP or electric) to heat/cool their residence.

4. Were the circumstances causing the practical difficulty created by someone or something other than the landowner?
Yes () No (X)

Why or why not? The difficulty is entirely created by the landowners as it is their voluntary desire to use an open loop geothermal system to heat/cool their home. No one is making them use this heating/cooling system and the characteristics of the lot clearly are not requiring this form of heating system to be used.

5. Will the issuance of the variance maintain the essential character of the locality?
Yes (X) No ()

Why or why not? The area consists of single family seasonal and year-round homes with a resort located a ways off. A geothermal system discharge pipe buried under the ground surface exiting at the shoreline would not alter the locality's character.

6. Does the stated practical difficulty involve more than economic considerations?
Yes () No (X)



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Why or why not? The only reason for the landowners wanting to install an open loop geothermal system is cost. A closed loop geothermal system could be installed that would comply with Section 513 of the Shoreland Management Ordinance and provide the landowners with the desired geothermal heating/cooling system. The sole reason for wanting to use an open versus a closed loop system in this situation is cost.

Variance Application 9-V-13 by Doug Scaper: Lots 4-6, Birch Point, Section 16, Township 140, Range 33, Nevis Township, on Lake Belletaine. Parcel # 21.38.00400. Part 1: Applicant is requesting an after-the-fact variance from Section 704 of the SMO for a deck addition to a structure previously altered by variance. Part 2: Applicant is requesting a variance from Sections 502.2 and 704 of the Shoreland Management Ordinance (SMO) for a proposed addition to a structure previously altered by variance.

In 2006, a variance was granted to allow a 612 sq. ft. addition to this residence along with a lakeside deck in front of the addition. With the addition, the house consists of 1886 sq. ft. on a single level. The landowner now wants to add another 485 sq. ft. to the non-lakeside portion of the residence and obtain an after-the-fact approval for a portion of the lakeside deck that was constructed despite not being part of the 2006 variance that was approved. The landowners want to make the residence their year-round home and the proposed addition is said to enable them to have space for a laundry room and other amenities typically found in a year-round residence, but that are not in this structure that has historically been a seasonal residence.

The house sits at a 66.5' OHW setback as measured by our office. A variance is required for the proposed addition and the after-the-fact (ATF) portion of the lakeside deck because Section 704.7 of the Shoreland Management Ordinance requires that any structure constructed or modified by variance requires a variance for any subsequent alteration(s).

Given the scope of the proposed addition relative to the existing cabin and the fact that it is on the non-lakeside portion of the cabin, the department does not object to part 1 of the application. The department is also not opposed to part 2 as the portion of the deck that was not part of the original variance is not large in size and protects a high traffic area that if left as lawn, would be very difficult to maintain in vegetation and thus would likely prove to be susceptible to erosion. A possible condition to consider as a mitigating measure to the increased deck and cabin size requested is to look at the shoreline vegetation and see if a "no mow zone" or vegetative planting along the shore in front of the cabin would be appropriate to absorb any increase in runoff that results from the larger cabin and deck.

Two sets of findings of fact are shown below for your consideration. First, proposed findings for Part 1 (ATF deck) are shown. Then, findings for Part 2 (cabin addition) are provided.

Part 1 - Below are proposed findings of fact for your consideration:



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1. Is the variance in harmony with the intent of the comprehensive plan, zoning ordinance and State Shoreland Management Rules? Yes (X) No ()

Why or why not? The portion of the lakeside deck that was not part of the 2006 variance, but that was constructed does not encroach further waterward than the portion of the deck approved in the 2006 variance or the existing lakeside screened-in porch on the cabin. The unauthorized portion of the deck also covers a high traffic area adjacent to the home that would likely be susceptible to erosion due to an inability to maintain vegetation if the deck were required to be removed because of this being a high foot traffic area.

2. Without the variance, is the owner deprived of a reasonable use of the property? Yes (X) No ()

Why or why not? A lakeside deck with a portion thereof that is large enough to accommodate a table and chairs is a reasonable use on a lakeshore property where it is typical for landowners to want to be able to enjoy a view of the lake from a deck or platform.

3. Is the stated practical difficulty due to circumstances unique to this property? Yes (X) No ()

Why or why not? The cabin was constructed prior to the ordinance and was modified by variance in 2006 so that Section 704.7 of the ordinance requires a variance for any subsequent alteration to the structure.

4. Were the circumstances causing the practical difficulty created by someone or something other than the landowner? Yes (X) No ()

Why or why not? As mentioned in the answer for question # 3, the cabin was built before the ordinance at a nonconforming OHW setback and it was modified by variance in 2006 so that Section 704.7 of the ordinance requires that any subsequent modification to the structure be only done by an approved variance.

5. Will the issuance of the variance maintain the essential character of the locality? Yes (X) No ()

Why or why not? The locality will remain single family seasonal and year-round residences and the addition of a slightly larger deck to this residential structure will not alter the locality's character in any negative way as decks are typical accessory components of such structures.

6. Does the stated practical difficulty involve more than economic considerations? Yes (X) No ()



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- Why or why not? Economic considerations were not cited by the applicant as a difficulty. The difficulty is the fact the structure was modified by variance in 2006 and the ordinance requires that any subsequent alteration to the structure can only be made if authorized by further variance proceedings.
7. Why did the applicant fail to obtain a variance/or comply with the applicable requirements before commencing work? Did the applicant act in good faith?
- Why or Why not? The application narrative states that the landowner was not aware when constructing the deck that the deck had to comply with the exact dimensions presented and approved in the 2006 variance application.
8. Did the applicant attempt to comply with the law by obtaining the proper permits?
- Why or Why not? Yes. He obtained a variance in 2006 for the cabin addition and a lakeside deck and then also obtained the accompanying permit on September 7, 2006.
9. Did the applicant obtain a permit from another entity that violated the law? Provide explanation below.
- Not that we are aware of. (Again, ask the applicants.)
10. Did the applicant make a substantial investment in the property? Provide details below.
- No. The deck, while nicely done, does not constitute a "substantial investment" in our mind. (Staff recommends asking the applicant for the cost of the deck so that figure can be cited in this answer to show that it was not substantial.)
11. Did the applicant complete the repairs/construction before the applicant was informed of the impropriety? Please provide details below.
- Yes. The application states the deck was constructed in 2007. The fact that the deck was constructed larger than what was authorized in the 2006 variance was not identified until this past winter in the course of staff reviewing this variance application after Mr. Scrapper submitted it.
12. Are there other similar structures in the neighborhood? Please provide details below.
- Yes. Many of the homes along the lake in this area have lakeside decks/platforms.
13. Would the minimum benefits to the county appear to be far outweighed by the detriment the applicant would suffer if forced to remove the structure? Why or why not?



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Yes. The additional deck square footage that was not part of the 2006 variance approval is not very large and protects a high traffic area adjacent to the house. Removing this portion of the deck would expose the underlying soil to high foot traffic and thereby increase the erosion potential. The deck surface is protecting the site from greater erosion potential.

14. In light of all of the above factors, would denying a variance serve the interests of justice? Why or why not?

No. The landowner states that he did not knowingly build the deck in violation of the 2006 variance. The deck does not go any closer to the lake than the portion of the deck approved in the 2006 variance or the existing screened-in porch on the cabin. It covers and protects an area around the house that sees high foot traffic and would thus be exposed to greater erosion potential if the deck were removed.

Part 2 - Below are proposed findings of fact for your consideration:

1. Is the variance in harmony with the intent of the comprehensive plan, zoning ordinance and State Shoreland Management Rules? Yes (X) No ()

Why or why not? The proposed addition is to the rear (non-lakeward) portion of the cabin and it is very reasonable in size (485 sq. ft.) relative to the existing cabin's size of 1886 sq. ft.

2. Without the variance, is the owner deprived of a reasonable use of the property? Yes (X) No ()

Why or why not? The proposed addition is very modest in size and appears to be kept to just what is needed to reasonably provide the landowners with enough elbow room to make the home feasible as a year-round retirement residence.

3. Is the stated practical difficulty due to circumstances unique to this property? Yes (X) No ()

Why or why not? The structure was originally constructed prior to enactment of the Shoreland Management Ordinance and Section 704.7 of the Shoreland Management Ordinance requires a variance for any alteration made to a structure that has previously been modified by variance – which is a circumstance unique to this property and beyond the landowner's control.

4. Were the circumstances causing the practical difficulty created by someone or something other than the landowner? Yes (X) No ()



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Why or why not? As mentioned in the answer to question # 3 above, the difficulty is the fact that the house was originally constructed prior to enactment of the ordinance and Section 704.7 of the ordinance only allows the structure to be altered by having any alterations approved through further variance proceedings.

5. Will the issuance of the variance maintain the essential character of the locality?
Yes (X) No ()

Why or why not? The area consists of single family seasonal and year-round residences and this minor addition to the rear of the cabin that does not increase in height will not change the locality's character in any way.

6. Does the stated practical difficulty involve more than economic considerations?
Yes (X) No ()

Why or why not? The application does not cite economics as a difficulty. The difficulty is related to the cabin predating the ordinance and having been previously modified by variance such that Section 704.7 of the ordinance requires a variance for any addition to the cabin.