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From: "Tom Van Zoeren" <[tom@vanzoeren.com](mailto:tom@vanzoeren.com)>

Sent: Monday, November 02, 2009 7:50 AM

Subject: More Sewage Talk!

Dear Park Friends,

You may have received Dusty Shultz's and the DEQ's responses to my earlier email about the Homestead sewage system. My return answer to them is attached here, in case you are interested. (It is way more than any sane person would want to read about this.) Otherwise, my apologies; Delete ASAP!

What it all boils down to is this: Sewage spray is clearly illegal outside the prescribed area. It is considered to be pathogenic and hazardous (and definitely disgusting). Sewage spray drifting onto Park lands around the spray area is well documented, but we presently have no way of knowing how much there is, how far it blows, etc. That information could be used to adjust the system to prevent the drift. A system for scientifically monitoring it would provide that information, and would serve as the first step to restore the integrity of the National Park.

I hate to again trouble you over this unpleasant matter, but if you do read the attached comments, etc., and find that you have an opinion about things, a quick note to Dusty ([slbe\\_superintendent@nps.gov](mailto:slbe_superintendent@nps.gov)) would once again be helpful.

Thanks again,  
Tom

PS—If you forwarded my earlier email to others, feel free to also forward this attempt to further clarify things. If those persons wrote to Dusty, they probably received her and the DEQ's responses; I'd like for them to see this further information.

Dusty,

Unfortunately, my thoughts expressed in my previous email apparently have not gone over well with the preparer of the DEQ response. I'm especially sorry about this because I probably know her, have enjoyed working with her during earlier years, and feel that we should still be pulling together. Perhaps through further communication we can bridge some gaps.

I have always found you to be one who listens, considers carefully, then makes a decision based on your best judgment. So, I am addressing these attempted clarifications to you (and will share them with others who may be interested).

Following is your recent email with a few notes inserted by me in maroon. That is followed by the DEQ letter, with more notes inserted.

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Dear Friends:

Thank you for your recent electronic mail expressing concern about The Homestead's sewage spray disposal on land within Sleeping Bear Dunes National Lakeshore. We appreciate your concern and while we share this concern, we wish to make you aware of some other aspects of this issue that you may not know. We hope that by so doing, a better understanding of the situation will result.

While we too would prefer that The Homestead dispose of the sewage in some other way outside the National Lakeshore, legal easements are in place that affords them that right.

Agreed.

As you may remember, in 2005, the National Park Service (NPS) developed The Homestead Wastewater Disposal Environmental Assessment (EA), which was a two-year effort that provided opportunities for public involvement and comment. In response to the Michigan Department of Environmental Quality (MDEQ) and NPS concerns about the spray field, The Homestead developed an Irrigation Management Plan (IMP) to correct problems with their wastewater spray irrigation process. The IMP proposed several options, including clear-cutting and substantial earthwork or moving the spray fields to other locations in the park. The NPS prepared the EA to evaluate the impacts of keeping the easements in their existing location (the No Action Alternative) and two other alternative locations. The goal was to allow The Homestead to exercise their legal rights to use the easements, but in a location and manner that best represented the interests of the public and the NPS. We communicated closely with The Homestead throughout the EA process.

After several public comment periods and public meetings, the NPS selected the No Action Alternative, which was then implemented by The Homestead.

This alternative upgraded the spray system on the current easements instead of moving to other undisturbed areas of the park in exchange for closing down the existing spray fields.

It is true that much of the public expressed the view that, for various reasons, the idea of moving the disposal area to the Thoreson Farm was not a viable option. It was a good attempt by Park Management to creatively resolve the long-standing problems associated with spraying, but in the end proved unviable. This left us where we started—with a seepage area easement on the original 13 acres. (It did not, of course, confer any new privileges to allow drift onto surrounding Park lands.)

Park staff closely monitored the construction process and worked with The Homestead to mitigate concerns as they arose.

I have to take exception to this, however it is not the main issue at hand here (spray drift)—so let's leave it at that for now.

Now that the system has been upgraded, park staff and the MDEQ monitor the spray fields. Both agencies strive to ensure the system is properly maintained and operated, and we notify The Homestead when repairs and/or operational changes are needed. The one on-going issue is the treated sewage aerosol spray sometimes drifts outside the easement boundaries, particularly during windy conditions.

In cooperation with the MDEQ and in the interest of being fully responsive to your concerns, we are providing the attached information from MDEQ to the items expressed in Mr. Tom VanZoeren's electronic mail, which most of you received.

We will continue to work with MDEQ and The Homestead to ensure conformance with the terms of the Authorization to Discharge (permit), including the requirement that irrigation shall be stopped immediately if aerosol drift is detected beyond the easement boundaries. In this way, we hope to ensure the safety of the public and park employees, while protecting park resources, through continued oversight and monitoring.

Thank you. I think we are in good agreement on much of this. The main question we seem to have left is how to meaningfully conduct this monitoring.

We hope this information is helpful to you. Your comments and observations are always welcome and we appreciate the opportunity to provide a response. We greatly appreciate your interest in and support of Sleeping Bear Dunes National Lakeshore.

Sincerely,

Dusty Shultz  
Superintendent  
/s/ Signed original on file

Enclosure (See attached file: MDEQ Comments 10-2009.doc)

Cc: Ms. Janice Heuer w/enclosure,  
Michigan Department of Environmental Quality  
120 West Chapin Street  
Cadillac, Michigan 49601

Mr. Robert Kuras w/ enclosure  
The Homestead  
Wood Ridge Road  
Glen Arbor, Michigan 49636

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Following is my original email, in black. The DEQ comments are in blue.  
My responses to the DEQ comments are in maroon.

**Michigan Department of Natural Resources (DEQ)  
Response highlighted in blue text  
October 2009**

**A SHORT HISTORY OF THE HOMESTEAD'S SEWAGE**

- **How it began:** At the time of the beginning of Sleeping Bear Dunes National Lakeshore, the vacant acreage next to The Homestead was owned by the same family who essentially owned The Homestead. Like all other undeveloped land within the Park boundaries, this land was subject to purchase by the Park Service. However, the owners sold an easement to The Homestead (basically themselves) for \$1, allowing for a seepage area on 13 acres of the property—so when the government bought the property (for \$1.3 million) it came encumbered with that easement—thereby skirting the law as it applied to everyone else, and granting The Homestead continued use of the property.
- **What the easement said:** The Homestead may have a “seepage area” for its sewage system within the easement area. At that time, this was, of course, understood to mean an underground system of drain pipes. The above-ground land was to be left as natural as possible.
- **What the easement did not say:** It did not say that the Park is obligated to provide for all of The Homestead’s sewage needs—just to provide a place for a seepage area on those 13 acres.

- **The early years:** For some years, the land was used as intended—Seepage system below ground; trails through the woods and meadows above ground. Because much of the area was not needed for seepage, that area remained covered with forest.
- **Problems:** Over the years, The Homestead grew, and outgrew its sewage system. Sewage oozed from surrounding ground; there were numerous DNR permit violations; the groundwater became polluted; citizens complained; lawsuits were filed. Everyone was desperate to resolve the situation.

*We see no file record documenting sewage oozing from the ground.*

*I can't speak to the DEQ records. This was filmed and publicized by citizens at the time. I'm sure others could tell you more about it. However, I don't think this is an important detail. The main point is that there was widespread concern over violations, groundwater pollution, lawsuits, etc., which all (including Ivan) were anxious to resolve.*

*Part of the history of problems has to do with the evolution of groundwater regulations. The early treatment facility was a wastewater lagoon, followed by sand filters, chlorination and then discharge to the subsurface area on the National Park easements. This met the technology standards of the time which were based on pathogen removal. Later it was observed that a "seepage" discharge (drainfield) did not remove nitrate. The legal motivation for above ground treatment was to provide nitrogen removal (nitrate being a health concern).*

- **Hello, sewage:** In 1992 The Homestead announced a plan to clear-cut the remaining forest and utilize the entire area. Anxious to resolve the many problems, but also wanting to preserve the remaining forest, the Park Superintendent unfortunately agreed to a plan to allow for the partially-treated sewage to be irrigated above ground, so the trees could remain.

*State environmental standards evolved to where a lagoon, followed by seepage (drainfield), did not provide adequate treatment to meet standards. One way to improve wastewater treatment is to apply the water to plants which remove the nutrients in the water. The levels of nitrate in the monitor wells began a steady upward trend, therefore the DEQ told The Homestead they needed to upgrade the sewage treatment system to remove nitrate. Maybe it was The Homestead that announced the plan, but it was the DEQ that ordered it.*

*Maybe we can agree that DEQ ordered The Homestead to meet the standards; The Homestead announced their plan for doing so.*

*The national park superintendent did not want to see the second easement clear-cut. (One was already a field.) He requested that the water be applied to existing plants in the woods. This was considered a unique situation due to the National Park Service (NPS) request. Irrigation is generally done on a crop that is harvested to remove nitrogen.*

*Agreed. (And thank you to all involved for trying this innovative approach).*

- **More Problems:** The Park Service and the DEQ documented many problems during following years: the system was not maintained properly; sewage was sprayed beyond the boundaries of the easement area; the ground water was again polluted.

*Irrigation on trees was a failure in many respects including maintenance problems and the fact that the trees did not remove nitrogen as well as a harvested crop. The nitrogen levels in the groundwater continued to rise to within a few parts per billion of the drinking water standard. It should be noted that the groundwater did not exceed the drinking water standard for nitrate however.*

*There were other significant issues with the tree irrigation system. The chlorination unit was not designed properly and access to the spray area was not controlled, which allowed the potential for the public to come in contact with the water as it was irrigated. The lack of fencing was contrary to generally accepted engineering practice for irrigation field design.*

- **Goodbye, trees:** In 2005 The Homestead announced that it had again exceeded its sewage system capacity, and now needed to cut all the trees, replace them with a grass-alfalfa mix, and spray their sewage over the whole area.

*This is misleading. The upgrade was not ordered due to capacity. The DEQ ordered a second upgrade to the wastewater treatment system because irrigating trees were not removing the needed nutrients. The change to a crop that would remove nitrogen was actually a DEQ requirement. The other option would be construction of a mechanical plant that would remove nitrogen in other ways. It was The Homestead's choice as to what type of upgrade would be installed.*

*I'm not sure I understand how my statement was "misleading". As I understood, the system in place (using trees) was not adequately absorbing the volume of nutrients (mainly nitrogen) necessary—The need exceeded the capacity. Of course, there were many maintenance problems that factored in, but in any case, as stated by DEQ, The Homestead chose to clear the forest rather than pursue the other (presumably more expensive) option for resolving the problem through improved treatment.*

Park Management now questioned the legality of above-ground irrigation under the easement for a "seepage area", but was advised by its solicitor (legal advisor) that because "the camel already has its nose in the tent" (meaning the previous superintendent had allowed for above-ground irrigation), it could no longer be prevented.

*Probably one of the key issues is the definition of "seepage". If irrigation was not allowed on the easement, a mechanical plant likely would have been required. Mechanical plants take up a much smaller footprint. It is possible the easement wouldn't have even been needed with this type of technology. There are other difficulties with operating a large plant that has seasonal flows, but I think the technological problems could have been overcome.*

*Agreed again.*

Anxious to prevent drifting of pathogenic sewage spray into the Park, the Park

Service, various environmental organizations, and private citizens requested The Homestead to explore options such as root-zone seepage, drip irrigation, low-profile low-pressure sprinklers, and better pretreatment. The Homestead rejected these options and prepared to install a high-pressure spray system.

*Rootzone irrigation was rejected when it was apparent that the trees weren't removing enough nitrogen.*

However, once The Homestead decided to remove the forest (rather than upgrade their treatment system), if root-zone irrigation or one of the other low-pressure discharge alternatives had been pursued, rather than spraying, the whole drift issue would have been avoided. (and it still could, fairly easily.)

*The seepage (subsurface drainfield) to a vented area was an option proposed by The Homestead to the NPS and rejected due to public comments regarding construction of a subsurface drainfield within the view shed of an historic farm.*

However, this might have been used in the original location in conjunction with an improved treatment system.

*Also, the "high-pressure" system is actually a much lower pressure system than what is traditionally installed at sewage irrigation sites.*

Nevertheless, the pressure is high enough to shoot the effluent high in the air, where it visibly blows, becomes aerosolized, and drifts.

*Besides a lower pressure spray, the ability to remove sections of the spray field from service was a flexibility added to the system to allow for maintenance and to reduce spray from the perimeter on windy days. This was done to reduce aerosol drift.*

Good idea, thank you. Now let's just make sure it's working adequately.

- **Buffers?:** It is universally accepted in the field that, when using high-pressure sprayers, aerosol drift is inevitable. Additionally, winds can blow even the non-aerosolized spray over significant distances. For that reason, a buffer zone of at least 100' from all property lines is required by state law. The Park Service requested the Homestead to abide by this safety measure. The Homestead instead made the legal case that easement boundaries are not technically "property lines". They declined to include the buffers.

*A 100-foot buffer is required of most irrigated sewage systems, but the size of the easement areas did not allow for buffer area. There is not enough land provided by the easement to remove the required amount of nitrogen utilizing a crop plus have an isolation zone that would take care of aerosol drift.*

This seems to indicate the common misunderstanding that the Park is somehow obligated to provide for all The Homestead's sewage needs. We are only obligated to provide the 13 acres for seepage. It's up to The Homestead to come up with the systems, any other needed land,

whatever is needed to get the job done legally, and without polluting surrounding lands—just like the rest of us. That’s why the alternatives (upgraded pretreatment, trickle irrigation, etc.), were suggested.

*Before the groundwater permit was issued, the DEQ requested an opinion from the attorney general’s office to determine if the State should require the buffer zone. It was determined that the buffer zone could not be required by the permit. Should the attorney general have ruled that a buffer zone can be required, it is likely that the current irrigation technologies would not have been allowed. The technical requirement for a buffer zone is basic to good engineering practice, but it is difficult to shoe-horn a technology into a difficult legal ruling.*

All true. The Homestead found a loophole by making the argument that easement boundaries (even in the case where NPS derives absolutely no benefit from the easement property) are not technically “property lines”. However, the laws prohibiting drift, including aerosol drift, remain. The Homestead is free to pursue any system they wish, so long as they don’t impact surrounding lands. That is illegal both under state wastewater law, and also under property law relating to the easement (according to the solicitor’s opinion).

- **Here it is:** In 2006 the remaining forest was clear-cut and a high-pressure spray system was installed to spray sewage up to within a few feet of the easement boundaries. (In the process, the bull-dozers illegally denuded hundreds of feet of Park land, created wash-outs and silt deposits, etc.)

*According to the NPS, damage to property not part of the easement was minimal, appeared to be inadvertent, and consisted simply of tracks where dozers turned around.*

I’m sorry to say this is all definitely not true. There must have been some misunderstanding. Contact me if you need further information, photos, etc.

*Washouts were unintentionally created when the forest was denuded and cleared areas re-contoured on Parcel B. Silt fences and coco mats were installed by the contractor to mitigate that.*

The silt fences washed out during the first rain storm. They were not repaired all summer, as the silt deposits grew up to 200’ beyond the easement boundary. (Some are still in place, still broken down.) This is all documented in NPS files with narratives and photos taken over the course of the summer.

- **But--** Although the solicitor had said that above-ground irrigation could not be prevented per se, he emphasized that any drifting, including aerosol drift, of effluent beyond the easement boundaries would be clearly illegal. This is also stipulated in the DEQ permit for the system.
- **Our Sewage:** The Homestead’s filtration/disinfection system is considered to be only a “partial” treatment process; the effluent can contain viable pathogens, viral and bacterial, even when the system is working properly. Studies have definitively

shown that these pathogens are carried for considerable distances (hundreds of feet in some cases) in aerosol spray. Humans and animals exposed to this aerosol drift are subject to infection (not to mention those who eat the berries and mushrooms in the area). (Park Service safety guidelines require the Rangers to wear Tyvek coveralls and full-mask respirators when approaching the area for observation.)

*The hazard to public health from treated, chlorinated sewage is exaggerated here. According to the NPS, the actual requirement in the Job Hazard Analysis is for rangers to wear coveralls (Tyvek is mentioned, but not required) and a half mask respirator only when the spray field is operating in windy conditions.*

I apologize for any errors. I was going by the draft of the Job Hazard Analysis that I was given by the Chief Ranger a couple years ago, and a conversation I had with him recently. I may have misunderstood. Still, (as I understand) *the respirator (which is a custom-fitted, professional-quality device) is required for being in areas of Park land outside the easement area—the same areas where the public is (and should be) free to go.* I understand that the idea behind the Tyvek coveralls is that they are disposable, because of possible contamination.

Please note that *NPS Regional public health specialist Bob Reiss studied this situation and wrote, "there are pathogens in wastewater, and separation of the public is necessary."* Many other reputable sources reinforce this.

Further, there have been numerous past instances of failure of The Homestead's disinfection system. One DEQ report stated, "Monitoring reports show that fecal coliform counts have been reported in excess of 6,000 counts per hundred ml [600 times the allowable limit]...bacteria in the spray on land to which the public has access is a public health hazard."

*It is true that there were problems with the chlorination system. The chlorinator has been upgraded, however and is performing quite well now.*

Nevertheless, malfunctions with various parts of The Homestead's wastewater treatment and disposal systems *have been documented numerous times in the past by DEQ and NPS, and are certainly possible in the future—one of the reasons why drift needs to be prevented.*

### **To Sum Things Up:**

- The easement began as a questionable way to allow for underground disposal on 13 acres in the Park. The land above was to be left as natural as possible—available for trails, etc..
- Above-ground irrigation was later permitted in order to save the remaining forest. (The trails were then abandoned.)
- 12 years later, the forest was razed and replaced with sewage-sprayed grasses and alfalfa. The Homestead effectively assumed all use of the property; the public now cannot enter the property we bought.

- By not providing the buffers needed for sewage spray, The Homestead has also effectively taken control of many additional acres surrounding the easement area (partly in or around the Port Oneida Historic District). The Park has installed red & white warning signs advising the public against approaching within 25' of the area. They should include at least 75' more.

*We understand the sentiment expressed by the summary. It seems unfair that the public can't enter public lands due to an easement that allows "seepage." Irrigation is not the same as seepage, and if you read the easement, it states that access to trails and trees would continue. However, the NPS will not act contrary to their solicitor's opinion that seepage includes irrigation.*

*Or at least that we're stuck with it because the camel got its nose into the tent as part of "saving the trees".*

*And the DEQ will not require a buffer zone when the attorney general's office dismisses this as a requirement.*

*Right, all good points. That is why we need to achieve protection through diligent enforcement of the absolute illegality of spray drift crossing the line. **That is the one tool we have for effectively defending the Park; and it is a good one, waiting to be used.***

- **What Now?** Before installing this system, The Homestead was advised by the Park Service and numerous environmental organizations & individuals that, although we may not be able to say what type of system they can build, we can and will ensure that the law and the public's rights are upheld: none of their sewage, including aerosolized spray, is allowed in our Park.

*(Sewage is allowed in the park. The Homestead has a legal easement in the park and the NPS solicitor has found it legal to irrigate on the easement.)*

*I am sorry, I was not clear. By "Park", I was referring to the area surrounding the easement.*

Whether they can somehow achieve this with their present spray system, or whether the system needs to be modified, or whether it needs to be replaced—that is up to them. What we and the Park Service can do is take a stand to ensure that, one way or another, our surrounding Park is not violated.

Thus far, only rough, hit-or-miss monitoring has been done. If you feel that accurate, scientific monitoring is needed as a first step to ensure that Sleeping Bear is again free of The Homestead's sewage and safe to enjoy, now is the time to let it be known.

Thanks for your interest.

*Additional DEQ comments: A 2007 inspection found that aerosol drift can be a problem.*

Yes--NPS public health specialist Bob Reiss wrote, "It was apparent during this assessment that the spray fields overspray into the adjacent properties. **Spray mist was observed drifting (approximately 30 to 50 yards) into the wooded areas near parcel C. It was also evident that spray from the irrigation fields had killed some adjacent trees** and also provided enough moisture and nutrients to grow plants outside of the fenced areas."

*The groundwater permit requires The Homestead to turn off sprinklers as needed to prevent aerosol drift from blowing over the easement boundary. If The Homestead is not operating the system to stop drift when it occurs, it is a permit violation. Weather being what it is, air currents may shift during the day and drifting may occur. Then the operator must modify which spray heads are used. If NPS staff or anyone else observes mist beyond the easement boundary, The Homestead should be immediately notified to turn off the offending sprinklers. If the system is operated with consistent disregard to spray drift and the operator is unresponsive to complaints, the DEQ can take appropriate action under the permit.*

Unfortunately, NPS cannot possibly personally monitor this to a significant degree. **Occasional visual checks, and advising the operator to make adjustments on those occasions when drift is noticed, will not solve any overall problem of chronic drifting from a system that runs many hours each week.** However, a scientific monitoring system, such as possibly one utilizing controlled swab tests, could easily provide very meaningful data, indicating whether spray heads needed to be adjusted, etc..

I am obviously not an expert in this field, but I have discussed this with people who are. (Tom Ulrich asked me to research this at one point.) The consensus I have heard is that swab tests could be simple, inexpensive, scientifically valid, and meaningful. It's just one suggestion; perhaps another type of system would be even better.

I can't speak for anyone else in the Friends of Sleeping Bear Dunes, but I believe there would be some support for a contribution to help fund a pilot monitoring program, if requested by you.

Of course, any such monitoring system would be unneeded and impractical in the great majority of spray irrigation facilities, because they normally have buffers around them. Ours is very unusual for having sprayers aimed to within a few feet of public parkland.

*Beyond the aerosol question is the improvement provided by the redesigned irrigation system. Now that the fields are fully vegetated, the irrigation of sewage on the easements appears to be removing nitrogen successfully. Nitrate in the groundwater monitoring wells appears to be decreasing. The improved chlorination system is also operating well. While we all chafe at restricting public access from areas within the National Park, a new fence keeps the public aware and out of the irrigation area, adding a factor of safety to the design. The NPS restricts public access from many locations, including cliffs, erosion areas, unstable rock formations, and so forth. **Sewage spray poses a hazard that justifies restricted access.***

We're in agreement again; I've highlighted this as a reminder for all. Fortunately, the easement area is fenced. However, until testing is done, we have no idea how much more surrounding Park land is receiving

the hazardous spray, and to what degree. (Recall Mr. Reiss' observation above.)

*The DEQ will continue to inspect the sewage treatment system to monitor compliance with the conditions of the groundwater permit. Recently the DEQ conducted a joint inspection of the spray fields with NPS staff to clarify NPS observations of runoff, an uneven irrigation pattern on the easement, and aerosol drift. The DEQ continues to suggest improvements to the treatment system as needed to comply with State environmental law.*

That is appreciated. However, the DEQ has huge responsibilities state-wide. Sleeping Bear Dunes is only one small part of their job. Particularly with the present economy in Michigan, they must be strapped to fulfill even their most basic responsibilities. We (NPS and its supporters) are the ones who ultimately must ensure that our Park is protected.