



**MINUTES
DEVILS LAKE WATER IMPROVEMENT DISTRICT
REGULAR MEETING**

**DLWID OFFICE
November 6, 2008
4:00 P.M.**

- PRESENT:** Jack Strayer
Smokey Aschenbrenner
Otis Winchester
Brian Green
David Juenke
- ABSENT:** None
- AUDIENCE:** Joe Eilers, SolarBees and Chris Knud-Hansen, SolarBees Limnologist
Raylene Erickson, PADL
- STAFF:** Paul Robertson
Michelle Millage, Intern
- MEDIA:** Kate Rowland, Newport News Times

Green called the meeting to order at 4:00 p.m.

Minutes from October.

Strayer asked about his suggestion on Page 3, Line 2, stating that he suggested the dam should be removed. He asked that the statement be clarified to read, "Strayer asked Robertson if he was recommending that the dam be removed."

Juenke asked if [on page 4], Robertson stated that a two-year project of SolarBees would not be effective. Robertson clarified his statement to read, "A two-year project of SolarBees would not completely correct a 100-year accumulation of nutrients."

Approval of the Minutes from October was deferred to the next meeting.

Financial Report.

Questions were asked and there was some discussion about the format of the financial report, which Robertson explained at length. Robertson reported that the amount of \$167,395.05 will be received as income; an additional amount of \$4,475 more that

anticipated will also be received this fiscal year, since the assessor's tax receipts were higher than expected. Aschenbrenner moved and Juenke seconded approving the financial report.

Vote: Unanimous. Motion carried.

Public Comment

None

Unfinished Business

Website Updates/Cyano-toxin/DNA/Cyanobacteria ID and Counts.

Since August 14, an advisory has been in effect for the lake. Robertson placed a green alert on the website indicating that the advisory has been lifted after the 72-day warning. Millage explained some of the testing results from last month displayed on the website. Robertson released final testing results to the media. He explained that they had discovered different species than ever before. Joe Eilers explained the characteristics of some of the bluegreen algae that has been found in the lake.

Robertson said he has been working with OSU and sent a bucket of samples to Dr. Dreher so that he could look at signals from viruses that would be breaking down some of the cyanobacteria. Dr. Dreher has not yet responded.

Since the sun has dissipated and the weather has cooled, sampling will not be continued.

Cyanobacteria Testing.

Millage showed the 46-page PowerPoint she and Robertson created on steps for prep, testing and sampling.

Boat House/Docks.

No update on this item.

Lake Level Update/ Annual Report.

Robertson said that the District is required by permit to report water usage to the WRD. He sent the numbers from April through September totaling 6,206 AF. The boards and I-beams were removed mid-October, the normal time. Boards are inserted in April and removed in October.

There were some complaints this summer about flooding. The dam was removed in May to allow water to pass; it was replaced in June when additional complaints were received. The lake was brought back to 9.6 feet just before the boards were removed mid-October to protect the structure from storm logs. The Parks people have been invited to attend a Board meeting, but have not done so. Instead, they have chosen to have Water Resources Department review the District's water usage per the permit. Robertson has requested a copy of the review from Greg Beaman, WRD Watermaster.

SolarBees.

Joe Eilers and Chris Knud-Hansen, a PhD Limnologist for SolarBees, presented information about SolarBees. According to Eilers, they have units in 300 lakes.

Knud-Hansen began working for SolarBees five years ago when they started working with fresh-water lakes, starting with a 17-acre lake. He said copper sulfate had been placed into the lake, and then problems of bluegreen algae were corrected through circulation with the SolarBees. Knud-Hansen was hired to determine how this occurred.

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Knud-Hansen described the operation of SolarBees—they pull horizontally and the dish allows the flow to go horizontally. The primary flow goes into the intake at 3,000 gallons per minute. One unit can circulate 35 acres and depth does not create a different area of effectiveness. After determining where the thermocline is, the intake is placed above that line. Knud-Hansen displayed the species that have been controlled—anabaena, microcystis and aphanizomenon.

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One hundred lakes in which they have placed their SolarBees are municipal water supply reservoirs; only four of them have data. Knud-Hansen displayed additional graphs and data. He stated that when the bluegreen algae disappear, other algae grow. Zooplankton and fish can feed on the other algae. Bluegreen algae are one of the few organisms that can adapt to stagnation. They can move up and down the water column because of their gasses.

Water clarity improves with SolarBees, as documented by Palmdale Lake data. Shallow stormwater ponds seem to be the only bodies of water with which they have had problems. Pulses—one- or two-day intervals—occur when bluegreen algae appear, and then disappear when the circulation dissipates them.

Fishing around SolarBees has been good because of the water movement—fish love them. The largest lake where SolarBees is currently is 12,000-acre Lake Houston, near Houston. They have 20 units placed around the drinking water plant there—700 acres for a 20-day supply of drinking water. In 2005, problems occurred and units were installed in 2006. All the units survived intact during the estimated 150-mph hurricane Ike. Likewise, Galveston SolarBees survived intact. They are secured with a rounded bottom concrete anchor which can be relocated easily.

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Knud-Hansen displayed a slide with FAQ on “Specific Issues Associated with the Hypothesis for Aquatic Weed Control through Sediment Oxidation.” He showed a list of about 24 lakes that he said were reporting aquatic weed reductions.

He said that for macrophyte control, a fall installation would be best, and plants would not reappear in the spring. Robertson asked if newly installed native plants would have decreased viability if SolarBees were installed, to which Knud-Hansen replied that because native plants root deeper (a few inches deep), they would not be affected. Robertson asked, “What about in pots?” Knud-Hansen said they should not be affected whether they are in a pot or rooted. He said water lilies and hydrillas are not affected; SolarBees affect superficial plants that are not deeply rooted. Green asked if they have any documenting literature; Knud-Hansen said that no literature has been written by anybody except SolarBees. He said that Palmdale, California will present at the NALMs conference this month, which Robertson will be attending.

Knud-Hansen said that a few sites have presented documentation; however, they have created no printed literature.

In “Conclusions,” Knud-Hansen said that circulation is capable of preventing cyanobacteria blooms and negatively impacts submerged aquatic macrophyte.

Joe Eilers presented next. In response to Strayers question, the SolarBees rotate freely. Since they move about, at any one time, one of three panels will face into the sun. They have 80-watt motors and only 30 watts are required to run the motor; the balance of energy is stored in the battery. They can move around 90 feet, and can be anchored with flexibility. There has been no report of fishermen getting caught; on the contrary, fishermen seem to like fishing near the units.

In 2006, installation of 18 units was discussed. Eilers now has proposed 20 units. He says he would set the intake at summer minimum depths. Robertson said he would like to see the fluffy sediment decreased. Eilers said he would check previous tests and core data to see what could be expected. He then showed the grid map information and various models, including three-dimensional models. He mentioned that a SolarBee is being placed into the Roads End water tank. Discussion continued on the gridding for Devils Lake and how it would be sliced. The model represented input areas of Rock Creek and the outlet. Eilers said that Jerry Warner’s son-in-law, Kelly, is a model expert and would be the person for Robertson to confer with on the modeling.

Eilers discussed alternatives to Circulation.

Aluminum sulfate: Cost would be about 1.5 to 2 million dollars for 5 to 12 years duration (which Knud-Hansen said that timeline estimate was very generous). This would not address invasive aquatic macrophyte.

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Herbicides: Cost would be about \$100 to \$200 thousand. Duration is for one season. It doesn’t address cyanobacteria.

Dredging: Cost is \$10 to \$20 million and lasts only five or ten years. Doesn’t necessarily address either issue.

Macrophyte Harvesting: Cost \$250 thousand for a machine, must add diposal cost, wages, and fuel, and would last approximately four weeks. It doesn’t address cyanobacteria.

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Strayer asked who SolarBee’s parent company is. Eilers replied, Medora Environmental. It is a private company. Pump System was sold to another entity and Medora Environmental now owns SolarBees.

Aschenbrenner asked about comparison of Devils Lake to some of the other Lakes SolarBees has worked with. Eilers replied that temperature would be the primary difference. Green asked for the longest period of time SolarBees has been in a lake with cyanobacteria issues. Eilers replied, since 2000. Eilers said that the motor of the unit has a life of 25 years, plus. It runs at a maximum of 80 and is turned down to 40 rpm at night. Based on the design specs and materials, it would have a long life of 25 years, both Eilers and Knud-Hansen agreed. The solar panels would last for about 25 years and

the balance of the machine is stainless steel, so that is no problem. There are two small parts that will not have as long a life—the bushing on the impeller and the shaft coming down. Those would need to be replaced every three or four years and cost \$5.

SolarBees would provide a training program with the lake manager and show him what requires attention. A squeegee could be used to clean the unit's solar panels and he could keep an eye on the bushing. There is a 20-amp fuse that goes into the controller box, plus there is a navigator beacon on the top and it could fail, but is easy to replace. One person cannot replace the plastic intake tube. There is an induction plate at the bottom. In calm settings, the tubes last longer. If they are battered by the wind, they will have a shorter life span. The company is always in a testing mode to come up with optimum configuration to minimize wear on the units. For the first two years, SolarBees covers the cost of replacing the tubes. After that, they can set up an extended warranty program or repair on an as-needed basis. He would propose for Devils Lake a high-wave kit.

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Green asked for an estimated level of confidence that SolarBees would be successful on Devils Lake. Eilers replied: The first year, you would get half to two-thirds of your objective, the second year, 80 to 90 percent and the third year would be at full expectation for good water quality. Based on the number of units, the best way to express it would be an overall success rate of 95%. In a situation like Devils Lake, nearly all the factors or conditions are right to expect good performance. Knud-Hansen said only 15 lakes out of 300 have had problems. These are related to timing, number and level of the units installed. Small storm water ponds have some problems and also areas with a series of lakes. In terms of confidence, Knud-Hansen expressed 95% confidence of success.

Strayer asked what depth the units should be installed. Eilers and Knud-Hansen both agreed 10 to 12 feet would be optimum. Knud-Hansen said there is a stainless steel plate on the bottom; the intake tube will contort and continue operating even if the units move to a more shallow area, and all that is required is to reposition the unit. Sometimes legs have been installed in shallow water.

Eilers said they do not want an ambiguous test. They have had some partial lake appointments and some success with partial lake application. One was where the object was to improve taste and odor of the water. Those objectives were met. In going into a test situation where the performance of the units is judged based on reduction of cyanobacteria, they would want a fair test. A fair test would be to partition a portion of the lake that you want to treat and keep the water away from the rest of the lake. For SolarBees to be successful, everyone has to perceive it as being successful without benefit of any scientific data.

Eilers said that Metro had requested him to write a report on the success of their SolarBees program. Metro will pay for half of the project and the lakeshore owners are paying for the other half. Bluegreen algae has been reduced as well as a reduction on macrophyte on the west end of the lake. The east end of the lake is shallower. Eilers said he is opposed to treating just one of the arms in Devils Lake. He doesn't feel it would be dramatic enough. He said they would offer performance guarantees of

meeting specific targets, assuming that they can come to some sort of agreement. Targets could be for controlling bluegreen algae and one for controlling invasive macrophyte. They could structure it so that the company would guarantee 20% of the outlay if they don't meet those targets. Green replied that 20% sounded kind of "skinny." He said that earlier Eilers had said they could expect 50, then 80, then 100 percent success the third year. Eilers said those could be used as targets.

Knud-Hansen said he feels that the philosophy of the company is that they want to see success. No customer has ever asked for removal of the SolarBees that the company has refused. Joe said they now have more professional people working for them—three certified lake managers, PhD's and other technical people and scientists. He said they are learning as they go and are constantly making minor adjustments. They want no unsatisfied customers who feel they have not received their money's worth. For instance, Steilacoom had to pay installation costs only. Robertson asked if that was a one-year or two-year test. Eilers said the company has made intentional decisions to go into areas where they were uncertain how the units would perform against objectives—out of the bounds of typical installations—maybe a dozen.

Robertson asked if there was a problem on one lake up near Astoria. Eilers said that Chinook Water District had a small drinking water supply across from the Columbia. Eiler's predecessor made that sale. When Eilers visited the site and sampled the water, they did not have bluegreen algae, but green algae. He said he took samples of zooplankton and phytoplankton. They had a watershed that they could not control—a timber company with high levels of nitrate.

Aschenbrenner asked how much the test would apply while the carp are present. Eilers said that there is an advantage to installing the units prior to the carp disappearing so that they will have a head start before the weeds return. Eilers said there will not be a total elimination of plants, since boats, birds and others invaders will bring invasives plants. The idea is to suppress the major infestation of invasives. There could still be some in some areas, but they would be small. Knud-Hansen said that if the bottom of the lake is not level, there might be some invasives growing in the lower areas.

Strayer said it appears many of the lakes with SolarBees do not have recreational areas. Eilers said there is a lot of use on some of the lakes. Strayer asked about vandalism. Eilers said there was very little. The solar panels could be a concern. Knud-Hansen said there had only been one incident of a boat running into a SolarBee.

Grant Programs.

Green asked if they had any experience in obtaining grants. Eilers replied affirmatively. One of their managers in California said that 80 percent of her work on applications is on obtaining fresh water grants. Eilers said he knows of some entities in Oregon that can be pursued--there is a "pot" of money in Oregon available. It will be easier once their publications are printed. Strayer asked if they had any drafts of their publications and Eilers said that Knud-Hansen has not completed his portion of the draft. Knud-Hansen said he hopes to complete it by the end of the year. Asked where these would be

published, they said the *Journal of Lake Management* or *Limnology* or the *Science of Total Environment*. They belong to the North American Lake Management Society.

Green asked for a time frame between when carp stopped controlling the weed growth and when the weeds will return. Eilers replied that when spring comes, they will return immediately. Strayer said they need to get the native vegetation inserted before the carp die.

Robertson asked if SolarBees has any standard signage that could be installed and Eilers replied that they do have signage to educate and inform the public. He said that once people understand why the units have been installed, they are not likely to steal anything. Strayer asked if the units are welded or bolted. They are welded except for the solar panels that are bolted on, but there is a heavy-duty cable that goes into the box.

Juenke asked what the procedure should be at this time. Eilers replied that it would be easier for him to submit a proposal based on their design. He also informed the Board that their president had informed the staff that there would be a price increase in January.

Juenke asked how long it would take to install the units. Eilers replied that they could be available within four to five weeks and installed within four or five days. They are manufactured in Dickinson, North Dakota in a facility that operates year round. [At this point, both SolarBees representatives left.]

Millage said she had been searching for grants to apply to for the purchase of the SolarBees. She searched under wetland restoration, fish passage, solar energy, alternative energy, renewable energy and anything that might relate to the SolarBees project. Many of the grants' dates were either past due or due immediately. She was referred to grants.gov. Green suggested that clean water grant might be an option. Millage said she had not found anything that would apply.

Loan Programs

Robertson received a quote from SDAO Flex-Lease program for 20- and 15-year loans of \$550,000. Green said he has also talked to them. Their rules allow financing at 125% of useful life, so they could finance the SolarBees for 30-plus years, since the useful life is 25 years. Green said 15 or 20 years of financing should be the optimum time. Strayer asked for a cash flow analysis prior to putting the project into action.

Green said the actual vs. the budget provides a pretty good analysis. Green suggested that they rely on the expertise of SolarBees to make their suggestion on the number needed. Robertson indicated that 20 would be the number. Green said he feels they have about a year before the units need to be installed. They can use that year to investigate a grant since most grant cycles are one year or less. Green said he does not see any other option for improving the lake that the District can afford. Signs seem to indicate the sooner, the better.

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Aschenbrenner is leery of going with the 20 units because they do not know what kind of financing can be obtained. What would be the possibility of asking for an increase in the

tax base? He said that if the District goes for a partial installation, people will see the units in the lake and ask about them. He does not feel that there has been enough interest from the public on lake issues. It's a big step to take with no guarantee of success. Green responded that SolarBees has installed units in 300 lakes and they have indicated that the conditions in Devils Lake are good for success. Aschenbrenner was concerned about their durability in the wind. Green asked what other option is available.

Strayer said that he feels if the District phases into the total amount of units slowly, it might show viability for the rest of the lake. Four or five could be purchased each year. Aschenbrenner asked if they could obtain some before and after photos that might help promote the project.

Robertson said that he felt Eilers was saying that if you did a ten percent treatment, you might see a lake-wide ten percent benefit. Green asked how the results could be interpreted if there were not enough units to perform a good test. Robertson said it is interesting that the company is selling and growing. He feels that both Eilers and Knud-Hansen have good reputations and are likely being forthright.

Green said he feels the public has been set up to read and accept the articles in the newspaper about the cyanobacteria problems. Robertson said this is a solution for the nutrients that are in the lake. After 40 to 50 years, it never gets back to the high quality water that it once was.

Aschenbrenner asked if there would be enough financial resources remaining to take care of other issues. Robertson said that in looking at all the projects that have been completed through the years, if you spend \$800,000 you would get more for your money to repair the lakebed than addressing the water shed. Progress has been lost with people developing their properties.

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Green said he feels if the SolarBees succeed, they would create significant improvement in inhibiting cyanobacteria and invasive weeds. If that's the only thing we could do, he said, it's the best way to spend our money.

Winchester said he would like to see the proposal.

Strayer said he would like to see a cash-flow analysis.

Aschenbrenner confirmed that they would be borrowing \$550,000 and take the rest out of reserve. Green said they could do the cash flow analysis and make the payments fit.

Strayer said they would have to figure in some extra funds for native vegetation.

Additional discussion was had on native vegetation.

Green Acres Riparian Grant

The property owner is going with a different program—one from the Farm Bureau that will offer him more money toward the project plus pay him for his lost acreage.

Robertson will keep an eye on the project.

The Devils Lake Plan Native Revegetation

Strayer discussed Lake Conroe, near Houston, a 21,000-acre reservoir that had a hydrilla program and used the grass carp. In a short time, they had no vegetation. The grass carp had been dying but they are now using small numbers of grass carp and planting vegetation. Strayer is trying to contact the manager and will follow up on it. They have a website that shows natives and exotics. They have corrals that go up to the surface. They have a homeowners association.

Tetra Tech

Strayer sent the Tetra-Tech proposal to all Board members and identified the parts that he recommended, those requiring modification and those not necessary. Robertson reviewed the proposal and made recommendations as well. They walked everyone through the seven tasks and all three options. They agreed that Option C of Task 1 would be the best at a cost of \$6,417. Option C includes the regional native plant surveys. Strayer stated Dr. Sitsma's 40-page document completed for the Willamette National Forest on lakes from Florence to Reedsport might be useful. It includes native plants, growth type, adaptation, life cycles, etc. It would provide information to create a nursery. Robertson said Strayer's document was well done. He agreed that they should go with Option C. He also thinks that information on the shoreline would be beneficial. Strayer said they should negotiate.

Various types of enclosures were discussed. Some are flimsy and are made for reservoirs and are taking a fence and putting it in a circle. Robertson feels the gabions would be strong enough. Green asked if enclosures would be required. If SolarBees are used and they can revegetate with native vegetation, why are they useful? He said the more native plants that are placed in the lake, the better chance they have to propagate. He asked what the cost of the enclosures would be. Strayer said a 3 x 3 x 12 would be \$89. They would use four to a site with five sites. Bill Sexton could probably install them for under \$5,000. Strayer said there are a lot of unanswered questions, but, hopefully, the project will be a success.

Strayer and Robertson continued through each item of Strayer's document, identifying which Tasks would be useful and which would not be needed.

Green asked Robertson if he could do a revision and get the Board's approval prior to sending it to Tetra-Tech.

DSL Removal Fill Permit.

Application is in and has been narrowed down to specific tax lots. ODFW asked questions regarding the proposal.

DSL Easement.

Robertson stated that the District would be required to apply for an easement at a cost of \$750, plus the annual lease, similar to a boat dock. The \$750 would be for the entire project. They will want to know what part of the lake the project will encompass. The Board asked Robertson to go ahead and apply for the easement.

USACE.

Robertson received the DSL permit letter and provided information and replied on behalf of the NOAA Marine Fisheries. Biological assessment will take two months to two years.

Model: DEQ 319 Grant.

Robertson said he completed a draft. He will compile all the data and come up with a model. Strayer asked if they should obtain information on all the spills that emanated from the sewage plant. Robertson said he would add another task to the grant. He reported that for a \$23,000 grant, it would take about 212 hours, plus 1,000 miles for travel to Newport—about \$550, plus about \$50 for supplies. He has received in-kind contributions from SDCWC, Lincoln City and Lincoln County. He broke the draft into tasks and has submitted it to Eilers for his input. The real benefit from this grant will be the production of a clear mathematical model with which water quality improvements can be measured. The application deadline is November 18.

The Board asked Robertson to complete the application and submit it for the grant.

New Business

Blog.

Robertson reported that he has been working on a blog with three questions about the lake level. It will be reviewed by the Board and discussed at the next Board meeting. It is at dlwid.blogspot.com/

***E. Coli* Monitoring 2008 Summary.**

On the website is a summary on the water quality page. Robertson said he has added the map with all the values from the sampling, along with the results for the times that water quality exceeded safety margins.

Temperature Sensors.

Paul Katen and Robertson have installed temperature sensors in the watershed. He said they resemble a pen and are attached to the river bottom in a stake tied to a log. In the lake, they are on the chains on the 5 mph buoys. The sensors are owned by DLWID from a grant to which the District contributed; the Watershed Council controls them. They record data for 180 days and the data is retrieved with an infrared signal. They were placed in late June to determine if the temperature is healthy for fish.

Non-Agenda Items

Robertson brought up a property casualty insurance form that the District could complete and save some funds. He gave the form to Green to complete by the December 15 deadline.

Robertson requested the day after Thanksgiving and the day after Christmas as vacation days. The Board approved his request.

Public Comment

None

Announcements

NALMS – Lake Louise, November 10 – 15, 2008

The meeting adjourned at 10:06 p.m.

Respectfully submitted,
Linda Burt