

# AGENDA

2015 June 29

Special Meeting: 6 pm  
Oregon Coast Community College  
3788 SE High School Drive  
Lincoln City, OR 97367



## Quick Look:

- **Lake Contractor**
- **Aeration Design Contracts**

## Devils Lake Water Improvement District

Post Office Box 974, Lincoln City, Oregon 97367  
Phone: (541) 994-5330 Fax: (541) 994-6040  
[www.DLWID.org](http://www.DLWID.org)

### I. Roll Call

**II. Comments from Citizens Present on Agenda/Non-Agenda Items:** *This is an opportunity for members of the audience to bring to the District's attention any item not listed on the agenda for public hearing. Comments are limited to five (5) minutes per citizen and the Board of Directors may use the light system. Speakers may not yield their times to others, and as a general rule this is not a time for exchange of questions. At the conclusion of this agenda item, a board member may discuss or raise questions regarding an item presented by a citizen. The Chair has the authority to reduce the time allowed for comment in accordance with the number of persons present and signed up to speak.*

### III. Lake Contractor Contract

(Agenda Support Item A)

### IV. Harmful Algal Blooms

#### a. Aeration Design Contracts

**V. Additional Comments from Citizens Present on Non-Agenda Items:** *This is an opportunity for members of the audience to bring to the District's attention any item not listed on the agenda for board discussion. Comments are limited to five (5) minutes per citizen, and the Board of Directors may use the light system. Speakers may not yield their times to others, and as a general rule this is not a time for exchange of questions. At the conclusion of this agenda item, a board member may discuss or raise questions regarding an item presented by a citizen. The Chair has the authority to reduce the time allowed for comment in accordance with the number of persons present and signed up to speak.*

### VI. Board Comments & Announcement

### VII. Adjournment

**Agenda Support Item A**

- a. **Lake Contractor Contract:** a 120 contract between BX Sexton Construction, Inc. and DLWID is being considered for \$300 a month. Contract would include only provisions under expiring contract for the following:
- Outlet Control & Maintenance
  - Monitoring and Reporting

A proposed contract is included below without figures.

Note: Bill Sexton of B.X. Sexton Construction has been elected to the DLWID board and will be seated at the July 2015 meeting.

**b. Harmful Algal Blooms: Aeration Design Contracts**

The District received a proposed contract from Alex Horne Associates (AHA) of \$116,000. This included contributions from HBH Consulting and Engineering of Newberg, Oregon, and Atmos a consulting firm registered in the UK. Please note that negotiations at time of this staff report are ongoing. The District has asked to reduce the total contract below the \$100,000 direct appointment limit with a reduction targeted as the amount associated with permitting, as this was not part of the proposed scope of work. The proposal, as sent to the Board previously and included, here are in two parts.

**CONTRACT FOR OUTLET CONTROL MAINTENANCE,  
MONITORING SERVICES & GENERAL CONTRACTING**

This agreement made this \_\_\_\_ day of \_\_\_\_, 2015 between Devils Lake Water Improvement District (“DLWID” or “District”) and B.X. Sexton Construction, Inc. (“Sexton” or “Contractor”).

A. The DEVILS LAKE WATER IMPROVEMENT DISTRICT of Lincoln City, Oregon is a municipal corporation organized under the laws of the State of Oregon, and is hereinafter referred to as "the District."

B. The District sought proposals for the combined roles of (1) outlet control and maintenance; (2) for daily lake level, temperature, and rain gage monitoring and reporting; (3) for the oversight of emergency dredging of the D River as required; (4) for the maintenance of signage and kiosks (5) and for nominal construction, destruction and clean up duties as required.

C. Sexton is a licensed and bonded contractor in the State of Oregon (CCB #171672) for the work they will be doing, and holds a business license for the City of Lincoln City and any other licenses required by law to do the work to be performed hereunder. Contractor, as a business services company available to the public, meets the IRS requirements for independent contractor status.

**SECTION ONE  
DESCRIPTION OF WORK**

Outlet Control & Maintenance

The work to be performed by the Contractor shall include all services generally performed by a maintenance worker. The Contractor shall be responsible for addition and removal of boards and support stanchions in the control structure as needed to maintain lake levels in accordance with the District’s permit and allowing for adequate fish passage.

Specifics:

- Operation of the dam is done between June 1<sup>st</sup> and October 15<sup>th</sup> each year.
- The Contractor shall provide his or her own tools for any maintenance required on the outlet structure.
- Any additional materials or supplies required will be obtained and billed by the Contractor to the District with the District Manager’s consent.
- The Contractor will provide a truck, at Contractor’s expense, capable of transporting stanchions and boards used for the dam.
- Installation of the dam requires site prep which may include the movement of logs, cobble, miscellaneous debris, and/or sand. This shall be accomplished without the

use of heavy equipment. Generally the narrow footprint requiring clearing can be accomplished by use of hand powered tools, a chainsaw, and at times use of a vehicle tugging on materials from the shore. Use of heavy equipment if absolutely necessary would occur under a separate contact and may require a permit.

- Installation of the dam requires the retrieval of the stanchions, bolts, plastic sheeting and boards from the Lincoln City Public Works Shop.
  - Stanchions are bolted to the concrete substructure, and the boards are secured between the stanchions with wedges.
  - Plastic sheeting may be used to seal the dam. Additionally the shore of the dam may require the placement of sand bags to insure optimal impoundment. This is an annual maintenance requirement as erosion to the shoreline occurs through the winter.
  - A special fish weir section will be placed in the dam in one section. This structure made of metal and wood, provides for the minimal fish passage during normal operation. Maintenance of this structure is a requirement of the Contractor.
  - Fish passage must be maintained anytime the dam is installed.
  - The Contractor shall remove any debris caught by or on the dam or that is blocking fish passage.
  - At any time that adequate fish passage cannot be maintained, the Contractor shall immediately notify the District's Manager.
  - The Contractor shall immediately report to the District's Manager any damage to the structure or large debris not able to be removed by the Contractor.
  - Impoundment Right: The Contractor will work with the District's Manager to assure that the District remains in compliance with its permit and the impoundment parameters established by the District. A copy of the District's permits are available online ([www.dlwid.org](http://www.dlwid.org) See Projects Page, Section Lake Level).
- Stanchions should be installed on June 1<sup>st</sup> or the next business day. The wood beams are not to be installed until June 15<sup>th</sup> or the next business day, provided the lake remains above 9.0. If the lake drops below 9.0, the wood beams shall be installed to the maximum impoundment determined by the Devils Lake Water Improvement District Board of Directors which is also 9.0' MSL.
  - Summertime lake level management requires that adequate fish passage is maintained through the weir, and that adequate flows move out to the D River.
  - In compliance with the District's permit outflow must equal the inflow into the lake between the months of August and September. Steps shall be taken by the contractor to insure the level of the lake recedes according to the estimated average amount of evaporation as determined by the Water Resources Department and outlined below in Figure 2 and Table 1. It is important to note that even in the event of rain during that period, additional water may not be impounded during this time.
  - Between October 1<sup>st</sup> and October 15<sup>th</sup>, additional water may again be impounded, to the maximum impoundment of 9.0'. At or near October

15<sup>th</sup>, the entire structure shall be removed, transported and placed in storage for the next year.

- The Contractor will be responsible for transporting the stanchions, boards and other materials back to the Lincoln City shop storage where the Contractor will then stack the items for storage during the winter months.

### Monitoring and Reporting

The Contractor will be responsible for obtaining staff gage readings daily at the outlet of Devils Lake to determine lake level, taking daily temperature readings, and be responsible for recording the daily rainfall. These data will be entered into a Microsoft Excel file and emailed to the District's Manager on a weekly basis.

## **SECTION TWO PAYMENT**

The District shall pay Contractor \$300.00 per month on the 21<sup>st</sup> day of each month during the duration of this contract.

The Contractor shall provide his own tools for any maintenance required on the outlet structure.

## **SECTION THREE INSURANCE AND INDEMNITY**

For the duration of this contract, Contractor shall carry public liability insurance in the sum of \$100,000 per person to whom Contractor may become liable for reason of a condition caused by the movement of the boards or support stanchions at the outlet control structure; \$100,000 per occurrence resulting in such liability, and \$50,000 property damage liability coverage. The Contractor agrees to provide Workers' Compensation insurance coverage for all persons employed by the Contractor. The Contractor agrees to indemnify the District for any and all liability or loss arising in any way out of the performance of this contract, including reimbursing the District for any attorney fees incurred by the District in defending any claim or action. The Contractor shall provide a certificate of insurance to the District and other reasonable proof of the terms of coverage if requested by the District.

## **SECTION FOUR RELATIONSHIP OF PARTIES**

The Contractor will be an independent contractor, and is not to be considered to be an agent or employee of the District for any purpose. Employees of the Contractor are to be considered solely as Contractor's employees and not those of the District. The District

shall not set the working conditions, or working time of the Contractor, except with respect to daily maintenance and monitoring schedules, reporting activities, and meeting certain deadlines for the District. The work to be performed by the Contractor under this contract shall be performed entirely at Contractor's risk, and Contractor assumes all responsibility of the condition of, and maintenance and repair of, the equipment to be used in performance of this contract. It is understood that the Contractor is free to contract with others for similar work while the Contractor is under contract with the District.

**SECTION FIVE  
TERM OF CONTRACT**

This contract shall be for a term 120 days beginning July 1, 2015 and ending October 29, 2015. Either party to this contract may terminate the contract with 30 days written notice.

DEVILS LAKE WATER  
IMPROVEMENT DISTRICT

B.X. SEXTON CONSTRUCTION, INC.

By: \_\_\_\_\_

By: \_\_\_\_\_

# **PROPOSAL TO DESIGN AN AERATION-MIXING SYSTEM TO REDUCE BLUE-GREEN ALGAL (CYANOBACTERIAL) BLOOMS IN DEVILS LAKE, OREGON**

## **Proposal for the Devils Lake Water Improvement District**

Paul Robinson  
Lake Manager  
PO BOX 974  
Lincoln City OR 97367  
(541) 994-5330

By: Alex Horne Associates (AHA)  
867 Bates Avenue, El Cerrito CA 94530  
(510) 525-4433  
anywaters@comcast.net

&  
HBH Consulting Engineering  
2316 Portland Road, Suite H  
Newberg OR 97132  
(503) 537-9554

**Amount needed to prepare bid documents \$108,600**

**Bid assistance \$7,600**  
**Total Amount: \$116,000**

Date: 18 June 2015

## **REDUCTION OF BLUE-GREEN ALGAL (CYANOBACTERIAL) BLOOMS IN DEVILS LAKE, OREGON**

### **Background: eutrophication**

Devils Lake, Oregon is a shallow, eutrophic lake covering about 650 acres. It is managed by the Devils Lake Water Improvement District (DLWID). Although close to the Pacific Ocean a small hill shelters it from ocean breezes so it is somewhat warmer than its location predicts. The area has been occupied for over 100 years, first in farming and

Devils Lake Water Improvement District  
Staff Reports: 2015-06-29

logging and then recreational use of the area. The resultant land disturbance and wastewater inflows have caused cultural eutrophication defined by an increased the nutrient supply to the lake. Eutrophic waters are characterized by low dissolved oxygen in deeper waters, low water clarity and extensive nuisance algae blooms, particularly blue-green algae (Cyanobacteria). Devils lake is not used for drinking water but blue-green blooms can form concentrated harmful aquatic blooms (CHABs) which can kill domestic animals if they drink the water and may indirectly cause problems for water contact use. Excess algae blooms die and sink where they decompose and use up oxygen in the bottom waters, causing problems for fish such as salmon. In addition, anoxic bottom water can produce foul odors in late summer and the fall.

Given the lake's history and bathymetry there are likely two main nutrient sources for algal growth; legacy nutrients in the sediments and nutrients flowing into the lake between spring and fall. *Internal loading* occurs in the lake's deeper areas (15-22 feet). When these become anoxic in summer they release phosphate, iron and ammonia that reach the surface waters and stimulate algal blooms. There are also extensive shallow area, especially at the southern outlet end that were formerly covered with submerged aquatic vegetation (SAV) which are now mostly absent due to grazing by grass carp. These fish contribute to internal loading by rapidly recycling nutrients that would otherwise be retained in the SAV. However, too much SAV can interfere with boating and swimming so full replacement is not planned.

*External loading* in the immediate lake drainage comes from the septic tanks feeding the shallow groundwater and inflowing streams. Much of the domestic wastewater is diverted, treated and discharged to the ocean but there are still active septic tanks close to the shore and some streams bring nutrients into the lake during the algal growth season. More wastewater treatment is planned but effects on the lake will take at least a decade due to buildup in the soils.

### Possible solutions for CHABs

There are 5 watershed and 17 in-lake methods for lake restoration. There are sufficient water quality data in the DLWID files to determine which of the available methods for lake restoration are possible. The Devils Lake Water Improvement District (DLWID) has informally reviewed most of these methods and concluded that some form of oxygenation, aeration or a blend of these methods is the most likely method for Devils Lake. Preliminary discussion between Alex Horne and Paul Robinson in April supported a blend of a conventional aeration-oxygenation system in the deeper water along with Vigorous Epilimnetic Mixing (VEM) in the shallower areas. The Achilles Heel of blue-green algae is their intolerance to lake mixing. This is why they are common in warm, thermally-stratified waters and rare in cool well-mixed ones. This proposal will review the 17+5 available methods to check that aeration-VEM is the appropriate choice. The proposal will then prepare a bid document to install an aeration-oxygenation system. It will include much of the initial design of an aeration-VEM system, the location and size of the compressors and piping. It will also cover the permitting of the project including project management, permitting and land use services, civil and electrical-mechanical design, project specification and bidding documents, and bid assistance.

**Administration** Alex Horne will work with all interested parties to specify the conceptual design and rationale for the project. HDH Consulting Engineering will be a subcontractor providing the bulk of the the required Oregon Certified Engineering work as well as the other civil services needed. Ken O'Hara working with Richard Steele at billing via Atmos will work directly with AHA to produce required design specs and drawings to submit to HBH for approval or any further modification needed based on their local experience. Costs for projects with several groups can be increased if each is processed through a central prime contractor. To reduce such costs, it is proposed that AHA and HBH submit invoices directly to DLWID. AHA will check and attach the Atmos invoices as part of AHA invoices with no added fee. The project is quite small and Paul Robinson is experienced in most aspects of the project and will work with HBH and AHA to smooth meetings with the regulators and local planning agencies. Other contracting arrangements are possible if desired by DLWID.

### BUDGET

Task description	Consultant	Cost \$
Review data, determine methods to be used	AHA	3,000
Conceptual design of system, initial layout	AHA	7,000
Preparation of drawings to CAD scale, specification of pipes, compressors, regulators, diffusers size & shape	AHA-Atmos	10,000
Project supervision	AHA	4,000

Travel to the site (one trip)	AHA	500
Bid assistance	AHA	2,000
<i>Sub-total AHA</i>	AHA-Atmos	26,500
Project management	HBH	1,600
Permitting services	HBH	22,000
Survey services	HBH	7,500
Civil Design Services	HBH	24,500
Electrical-mechanical services	HBH	7,800
Project Specs & bidding docs	HBH	14,900
Bid assistance services	HBH	5,400
Reimbursables	HBH	2,800
<i>Sub-total HDH</i>	<i>HBH</i>	<i>89,500</i>
<b>Overall TOTAL</b>	<b>All</b>	<b>116,000</b>
Amount requested for bid assistance later	AHA+HBH	7,400
<b>Total required to complete biddable documents</b>	<b>All</b>	<b>108,600</b>

### Other information

**Expected method of operation.** Professor Horne will examine the data, continue cooperation with Paul Robinson and Dr. Ken O'Hara, make recommendations and provide the initial conceptual design. Dr. Ken O'Hara who has extensive experience of aeration installation in lakes and VEM in Europe and the USA will take that design and specify the kinds of hose, diffusers, regulators, pumps and other connections needed. Atmos will turn those into the kind of CAD designs needed for a bid document. HBH will then take that information, check it and modify as needed in consultation with the other contractors and incorporate it into a final bid document.

**Alex Horne Associates AHA)** is a small consulting company founded in 1971 and based in the San Francisco Bay Area. AHA has carried out almost 400 projects ranging from lake and reservoir restoration, treatment wetlands design and heavy metal and organic pollution. Though generally working as a sub-contractor to larger consulting firms AHA often works as a prime contractor with local, federal and international government agencies and private individuals. AHA has a Federal Tax ID # 68-0077282. AHA carries errors & omissions insurance (Hartford). Billing will be monthly following work done. [anywaters@comcast.net](mailto:anywaters@comcast.net); 510-525-4433.

**Atmos** is a small consulting company registered in the UK and works closely with and provides CAD design and other services for Dr. Ken O'Hara, the co-inventor (with Dr. Horne) of the VEM technology expected to be recommended for Devils Lake. Richard Steele is the Technical Director ([www.atmosconsulting.com](http://www.atmosconsulting.com), [E\\_richard.steele@atmosconsulting.com](mailto:E_richard.steele@atmosconsulting.com); 01144-1352748256). Mr. Steele has worked with Dr. Horne and Dr. O'Hara on reservoir aeration and wetlands projects. Atmos costs will be billed via AHA with no added admin costs.

**HBH** is a mid-sized multi-disciplinary firm based in Newburg, Oregon that works on a variety of public and private projects. HDH provides quality, economical engineering services to clients throughout the Pacific Northwest. Billing policy is shown in the attached HHH documents.

**Field Work.** Dr. Horne has already spent a full day with Paul Robertson on the lake and its surroundings and has examined much of the available water quality day so only one further trip to the lake is envisaged in this budget. HBH is close to the lake and will make numerous trips for meetings with wildlife agencies, surveying and planning and is budgeted above.

**Disclosures.** *Dr. Ken O'Hara* is the patent holder of the regulators that will probably be needed to make the VEM-aeration system work in a large water body like Devils Lake. He will thus receive financial compensation if the diffusers are used in the final installation. The situation is similar to the Speece Cone oxygenation method where Prof. Dick Speece holds a patent. *Alex Horne* has no financial or other interests in any of the consultants or likely suppliers of equipment for Devils Lake. As an independent consultant he has, when appropriate, recommended most of the consultants and suppliers in the field of lake, reservoir, river, estuary and ocean mixing and oxidation.



2316 Portland Road, Suite H ■ Newberg, Oregon 97132  
503-554-9553 ■ fax 503-537-9554

June 16, 2015

Alex Horne  
Alex Horne Associates  
867 Bates Avenue  
El Cerrito, CA 94530

Re: Design Services for Aeration System in Devils Lake, Lincoln City, Oregon

Dear Alex,

HBH Consulting Engineers, Inc is pleased to assist Alex Horne Associates with Design Services to provide for an aeration system for Devils Lake, located in Lincoln City, Oregon. The aeration system is meant to decrease the level of algae in the lake. It is our understanding the aeration system is to consist of one blower housed in one building on the lake shore connected to approximately 30,000 feet of aeration piping and 300 diffusers in the lake.

#### Task 1 – Project Management

This project will involve management of design activities and coordination with the design team, as well as various stakeholders. HBH will have various administration costs for filling and project related costs. The basis for project management is tied to the stated activities, tasks and overall project development.

A kickoff meeting with the pertinent stakeholders will be scheduled. Its purpose will be to review and discuss project elements of the design and other aspects of the project execution, roles, coordination, etc. Informal communication with various design teams will occur as needed to coordinate design work.

Consultant administrative staff will provide assistance as needed during this project, including invoicing, document editing, and other work.

#### *Deliverables:*

- Kickoff meeting summary, invoicing, pertinent communications or memorandum, project scheduling

#### Task 2 – Permitting Services

HBH will assist in obtaining the following permits\*:

- Application for conditional use permit from City of Lincoln City or Lincoln County @ 30% design

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- Joint Permit Application from Oregon Division of State Lands and the US Army Corp of Engineers @ 50% design
- NOAA Fisheries permit @ 50% design
- Oregon Department of Fish and Wildlife permit @ 50% design
- Oregon DEQ permit @ 50% design
- \*Environmental report by others, if required

### Task 3 – Survey Services

A sub-consultant will perform a topographic survey for one building site location along the lake shore.

#### *Deliverables:*

- Topographic survey

### Task 4 – Civil Design Services

HBH will review a conceptual design of the Vigorous Epilimnetic Mixing (VEM) system provided by Alex Horne Associates. HBH will review a detailed design of the VEM piping and compressor array provided by Ken O'Hara. An Oregon registered professional engineer will perform the review and any necessary revisions of the design information provided by these two parties prior to stamping the final design plans.

HBH will provide a design of the blower building, related above ground piping, building site development, design of aeration piping system, diffusers, regulators, and blower/compressor based on preliminary drawings and calculations provided by Alex Horne Associates, as well as Ken O'Hara. HBH will provide bid-ready construction drawings stamped by an Oregon registered professional engineer.

#### *Deliverables:*

- Informal, in progress prints
- Preliminary design plans
- 100% Submittal of design plans, sealed by Oregon PE, ready for bid

### Task 5 – Electrical/Mechanical Design Services

Sub-consultant Camtronics, Inc. will provide the following electrical/mechanical design services.

- *Drawings.* Prepare construction drawings for the electrical installation ready for construction. Includes one site visit.
- *Specifications.* Prepare electrical division specifications.
- *Utility Company.* Coordinate with PP&L and initiate the work order process.
- *Coordination with other design.* Coordinate electrical design with other design work to be done by HBH.
- *Construction Cost Opinion.* Prepare an electrical construction cost opinion.

*Deliverables:*

- Informal, in progress prints
- 100% Submittal (plans & technical specifications), sealed by Oregon PE, ready for bid
- Opinion of Construction Cost and Bid Form

**Task 6 – Project Specification & Bidding Documents**

HBH will prepare technical specifications to supplement the Oregon APWA Standard Specifications. Preliminary design specifications of the aeration system provided by Alex Horne Associates will be reviewed, revised, and stamped by an Oregon registered professional engineer. A bid form with proposed bid items and estimated quantities will be provided, in addition to an opinion of estimated construction cost. The preliminary documents will represent a substantially complete set of project construction documents from the Consultant team perspective.

*Deliverables:*

- Preliminary project specifications
- 100% Submittal of project specifications, sealed by Oregon PE, ready for bid
- Opinion of Construction Cost and Bid Form

**Task 7 – Bid Assistance Services**

Consultant will provide technical assistance during the bidding services, including but not limited to; answering general contractor questions during the bidding process, provide technical language for clarifications and addendums as necessary.

Not included are the following:

- Soils investigation or design
- Structural design
- Environmental design and report, including Environmental Impact Statement
- Telemetry design
- Offsite improvements (including electrical) unless noted
- Lighting, landscaping and irrigation design
- Agency fees and permits
- Stormwater report
- Construction services, inspection, and testing
- Operation and maintenance manuals
- As-built services

COMPENSATION

HBH will complete these tasks on a lump sum basis. The fee will be billed monthly based on the percentage of completion. In consideration of the mutual promises exchanged herein, our fee for the above scope of work shall be as follows:

Task 1 Project Management.....	\$ 1,600
Task 2 Permitting Services.....	\$22,000
Task 3 Survey Services.....	\$ 7,500
Task 4 Civil Design Services.....	\$27,500
Task 5 Electrical/Mechanical Design Services.....	\$ 7,800
Task 6 Project Specification & Bidding Documents.....	\$ 14,900
Task 7 Bid Assistance Services.....	\$ 5,400
Reimbursables.....	<u>\$ 2,800</u>
Total HBH Fee.....	\$ 89,500

Reimbursables and sub-consultant services are at cost plus 10 percent. Mileage will be billed at the IRS mileage rate, which is currently at \$0.575/mile. Payment is due within 10 days of receiving payment from the Devils Lake Improvement District on a monthly basis or be subject to 1.5 percent monthly interest. Administrative work requested above the scope listed will be billed at hourly rates.

If the above fee is acceptable to you please sign and date below, keep a copy for your records, and return the original to our office. We are able to begin work as soon as we receive a signed contract.

Accepted by: \_\_\_\_\_

Date: \_\_\_\_\_

Sincerely,

HBH Consulting Engineers, Inc.

Michael D. Henry, PE  
President