VOL. 199, FEBRUARY 2013

Wisconsin Wastewater Operators' Association, Inc.

The Clarifier

WISCONSIN WASTEWATER OPERATORS' ASSOCIATION, INC.

Ellsworth Wastewater Treatment Facility, Ellsworth, Wisconsin

47th Annual W.W.O.A. Conference

October 22-25, 2013 Stevens Point, Wisconsin
Holiday Inn Stevens Point Convention Center
Host: Stevens Point Wastewater Treatment Plant

Inside This Issue...

The Clarifier is the publication of the Wisconsin Wastewater Operators' Association and is intended to inform and educate the membership on issues related to the treatment and control of wastewater. The Clarifier is produced five (5) times each year: February, April, June, September, and December. All members are encouraged to contribute to the mission of the Clarifier.

The Wisconsin Wastewater Operators' Association is a non-profit organization dedicated to educating, informing, and advancing the wastewater profession. WWOA has approximately 2,000 members divided throughout six regions: Southeast, Southern, Lake Michigan, North Central, Northwest, and West Central.

2012 - 2013 W.W.O.A. OFFICIAL DIRECTORY

Wade Peterson
President
City of Baraboo
450 Roundhouse Court
Baraboo WI 53913
Work: 608-355-2740
Fax: 608-356-0518
wpeterson@cityofbaraboo.com

Kevin L. Freber
President Elect
Asst. Water Sys. Mgr. WW
City of Watertown WWTP
800 Hoffmann Drive
P.O. Box 477
Watertown, WI 53094
Work: 920-262-4085
Fax: 920-262-4087
kevin.freber@ci.watertown.wi.us

Kelly Zimmer
Vice President
MSA Professional Services
1230 South Boulevard
Baraboo, WI 53913
Cell: 608-963-7385
kzimmer@msa-ps.com

Randy Thater
Past President
Waukesha WWTP
600 Sentry Drive
Waukesha WI 53186
Work: 262-524-3631
Fax: 262-524-3632
Home: 262-549-4059
rthater@ci.waukesha.wi.us

Lyle Lutz
Director (14)
Plover WWTP
4496 Coolidge Avenue
PO Box 37
Plover, WI 54467
Work: 715-345-5259
Fax: 715-345-5253
llutz@ploverwi.gov

Jeff Bratz
Director (13)
Western Racine
2717 Sunnyside Dr.
Kansasville, WI 53139
Work: 262-534-6237
Cell: 262-206-1323
wrcsd@tds.net

Jeff Simpson
Director (13)
Crane Engineering
700 Ford Street
PO Box 38
Kimberly WI 54136
Work: 920-733-4425
Fax: 920-733-0211
Cell: 920-716-3323
j.simpson@craneengineering.net

Jim Bergles
Director (13)
Village of Waterford
123 North River Street
Waterford, WI 53185
Work: 262-534-3980
Cell: 262-206-1317
Home: 262-767-1856
assistantdirector@tds.net

Sharon Thieszen
Director (14)
Sheboygan Regional WWTP
3333 Lakeshore Drive
Sheboygan, WI 53081
Work: 920-459-3464
Fax: 920-459-3463
sharon.thieszen@sheboyganwwtp.com

WWOA
Executive Secretary
PO Box 392
Baraboo, WI 53913
secretary@wwoa.org

Clarifier Staff
Kay Curtin 715-720-6288
kay.curtin@state.mn.us

Jon Butt 414-755-1149
jon.butt@symbiontonline.com

Doralee Piering
262-377-6360
doralee@energenecs.com

Presidents message: 2013 the year of great changes!

Happy New Year! 2013 looks to be another year with great change!! The website will continue to make improvements.

We hope to continue making improvements on the on-line registration. We recently received the results of the evaluation and interest forms from last year's conference. At our next meeting, we will review the results and discuss adding some of the suggestions to this year's conference. Several communities have gotten or have seen the draft of their new WDPES permits. Tonight, I make our phosphorus

Wade Peterson, president

presentation to the City Common Council. I think I might start off the presentation with something like this "Have you ever read the children's book: Everyone Poops?"

We had our first board meeting with our 2012 – 2013 officer line-up in early December. We had several items on our "to-do" list. We reviewed the 2012 financial report, the committee reports, the 2013 budget, and changes to the executive secretary duties along with the position's compensation.

The 2012 financial report hadn't encompassed December's numbers, but as a whole, we were looking pretty good. Some of the highlights for committee reports were:

Nominations – three of the five director positions will be up for election in 2013. Depending on who gets elected vice president, a fourth director position may be open.

Membership – It looks like there will be 49 new life members in 2013!! We are starting to see some large groups of life members and this is starting to have some effects on our budget. At the 2013 annual conference, we will have some discussion on possible changes to life membership.

Operators Training – Director Lutz is working on some more microbiology sessions. Director Bergles has teamed up with AWWA and DNR to sponsor a new training opportunity. "Closing the Loop: Issues Common to Water & Wastewater" will be held at the end of January.

Directory – much was discussed about the future of the directory. When the smoke cleared, it was decided to continue the directory but charge for it. In the 2013 conference registration you will see a check box for the Directory with a $10 fee.

Web-site – Director Bratz and Webmaster Meifert have made some nice improvements to the website. If you haven't been on the site in awhile, check it out!! WWOA.org – the new item added was email alerts.

Technical Program – VP Zimmer updated the board on the events for the annual conference.

Exhibit Committee – T. Mulcahy & J. Shaw presented their report. The main issue was the size of the convention center at Stevens Point. After a walk around, some new ideas about vendor booth locations and areas for technical sessions were brought forth. Then it was on to the 2013 budget. The board worked through every line item to make the budget as complete as possible. Again, look for the new $10 fee for the directory.

The Executive Secretary duties were reviewed and some changes occurred. Then the board discussed the compensation/contract of the executive secretary. It was decided to not offer Richard a two year contract. A one year contract offer was approved by the board. (Much discussion was held about whether this fit within the organization's by-laws). Richard declined the one year offer. The board held discussions on looking for a new executive secretary and then the meeting was adjourned.

The winter round of regional meetings should be in full swing as you read this. I see several meetings listed on the WWOA Events calendar. I hope to make two of these meetings towards my goal of visiting all the regions this year. When you see me this year, feel free to stop and say "hi". Let me know what you think of WWOA and if there is anything we can do to better serve our membership.

continued on page 4

continued from page 3

I'm looking at the flyers for the Government Affairs Seminar and Spring Biosolids Symposium. As usual Kevin Freber, et.al. (GAS) and Lyle Lutz, et.al. (SBS) have done a bang-up job putting together interesting and informative programs.

The Annual Conference will be here before we know it. October 22-25. Get your hotel reservations in! A list of the hotels is on our website. We are looking into setting up bus service for the outlaying hotels.

Lastly, I truly do thank Richard and his family for all their work in the WWOA! This change has drawn a dark cloud over my term as President and for that I am sorry. Some have claimed that I have let politics and arrogance affect my decisions. Nothing could be farther from the truth!

Sincerely,

Wade Peterson
WWOA President

NC Region considers bus to WEF in Chicago

The North Central Region Steering Committee is discussing the possibility of sponsoring a one day bus trip to WEF in Chicago this fall. The trip would provide an opportunity to attend a national wastewater conference for operators that otherwise may not be able.

The bus would do pickup points along the I39 corridor. We would arrive at WEF late morning and stay until late afternoon. The cost of the trip would include transportation and conference registration. We hope to offer CEUs for the day. Participants would be responsible to get to and from the pickup locations. Times, pickup locations, and cost will be determined if sufficient interest is shown.

Anyone interested should contact a steering committee member or send an email to ncr_steering_committee@wwoa.org.

Foth/Cedar team designs Ellsworth wastewater facility upgrade

By: Tim Stockman, P.E. Foth Infrastructure

Background

The Foth/Cedar Team was first contacted by the director of public works (DPW) in May of 2010 because of his concerns that the village might be in jeopardy of losing a Clean Water Fund (CWF) Principal Forgiveness Grant. The 30% grant represented an "once-in-a-lifetime" opportunity for the Village because it was essentially guaranteed due to Ellsworth's "Number 1 Ranking" on the WDNR Funding List. To maintain its eligibility the village was required to submit a "reviewable" construction drawing plans and specifications to the WDNR by June 30, 2010.

After confirming the DPW's suspicions that the village was in a precarious situation, the Foth/Cedar Team identified through multiple discussions with WDNR CWF staff, that there was a recommendation to the Director of the WDNR to extend the June 30, 2010 deadline. If the deadline were to be extended to July 30, 2010, the village could be in a position to meet the new deadline but only if they acted quickly. On June 7th the public works committee authorized the DPW to issue the RFP immediately. The Foth/Cedar Team was hired in mid-June of 2010 to meet the submittal deadlines as required by WDNR Clean Water Funding to be in position to get the grant.

Initially, the village was looking at relocating the discharge further downstream along Isabelle Creek to avoid getting more stringent nitrogen limits. However, during the public comment period, several residents brought to the attention of WDNR and the village that potential sink holes may exist at or near the proposed new discharge location. As a result the village ended up with total nitrogen and chloride limits – regardless of discharge location, and was looking at more stringent limits on other parameters if the discharge point was relocated. Instead the village elected to keep the existing discharge location, and put the money from the planned forcemain into a new oxidation ditch system capable of total nitrogen reduction and phosphorus removal. The oxidation ditch was designed for biological phosphorus removal with a backup chemical feed system. The original plant used a chemical feed system dosing ferric

continued on page 8

continued from page 6

chloride. The new facility incorporates aluminum sulfate or Alum, as backup. The project was bid in early 2011, and awarded to Rice Lake Construction Group in March 2011. The oxidation ditch system was started up in May of 2012.

Original Wastewater Plant

The Village of Ellsworth operated a 0.660 MGD secondary wastewater treatment plant (WWTP) that treats an average wastewater flow of 0.250 MGD generated within the Village of Ellsworth. The original treatment plant was constructed over 50 years ago with the last upgrade occurring in 1977. As part of the 1977 upgrade, RBCs were added to supplement the existing trickling filter. Recently the RBCs were rerated to 0.430 MGD to better reflect their actual treatable design capacity. The treated effluent is discharged to a disappearing stream.

Old RBC plant

Sludge generated in the treatment process is hauled to the adjacent West Central Wisconsin Biosolids Facility (WCWBF). A proportionate volume of centrate from the WCWBF is returned to the WWTP for treatment. The old RBC WWTP consisted of the following unit processes:

- Influent flow metering channel
- Influent lift station
- Influent mechanical screening
- Rotating biological contactors
- Final clarifiers
- Chlorine disinfection system
- Effluent reaeration tank
- Chemical phosphorus removal
- Aerobic digester
- Sludge holding tanks
- Outfall to Isabelle Creek

The WWTP had historically provided reliable and effective wastewater treatment. The need for the modifications to the existing facilities was based on the WWTP exceeding its design capacity due to projected future flows and loads. In addition, several processes were in need of replacement and modifications were required to meet updated effluent limits, specifically total nitrogen and chloride.

New Upgraded Wastewater Treatment Facilities

Design flows under present and year 2030 conditions, as developed in the facilities plan, are summarized below.

Parameter	Present	2030
Average Annual Flow, MGD	0.271	0.358
Peak Month Flow, MGD	0.495	0.575
Peak Day Flow, MGD	0.897	0.975
Peak Hour Flow, MGD	–	2.160
Average BOD5, lb/day	461	717
Peak Month BOD5, lb/day	819	1,019
Average TSS, lb/day	218	813
Average TKN, lb/day	–	112
Average P, lb/day	–	25

continued on page 10

continued from page 8

Design effluent objectives as listed in the Village of Ellsworth WPDES Permit are:

Effluent Requirements	Monthly Average
BOD, mg/l	20
TSS, mg/l	20
Total Nitrogen, mg/l	10
Ammonia Nitrogen, mg/l	3.6 (summer)
Ammonia Nitrogen, mg/l	7.8 (winter)
Total phosphorus, mg/l	1.0
Fecal Coliform, count/100 ml	400
Dissolved Oxygen, mg/l	4.0

The Village received a chloride limit of 400 mg/l, with a future target of 250 mg/l at the end of the permit life. The Village is eligible to apply for a chloride variance, if the 250 mg/l target cannot be met.

Year-round disinfection is also required to meet a fecal coliform count of 400 #/100 ml. This requirement was based on the classification of Isabelle Creek.

The modifications to the Ellsworth Wastewater Treatment Facility included upgrading the following:

- Elimination of static screens, old clarifier/chlorine disinfection basin and RBC system(s)
- Upgrade the existing control building
- Addition of a new headworks building and process equipment
- New influent raw submersible pumps and flow metering
- Addition of an anaerobic/EQ Selector Basin
- Addition of a new (2) Channel Oxidation Ditch System
- New splitter box for the clarifiers
- Upgrades to the existing (2) clarifier(s)
- Upgrading the existing screening and pump building for oxidation ditch control and RAS/WAS pumping
- Addition of a chemical feed and UV disinfection processes and building.
- Modifications to existing sludge holding basins
- Modifications to outfall structure and use of existing discharge pipe
- Allows for future use of the existing trickling filter

continued on page 12

continued from page 10

Unit Processes

Influent Screening

An influent screen was installed prior to the raw wastewater pumps to remove large solids from the wastewater. Raw wastewater will pass through the fine screen, whereas solid material would be caught and removed from the forward flow. The screen was installed in the new Screening Building, previously the existing metering flume structure, which was modified to accommodate the screen and a bypass channel.

The selected model of screen is an auger-type channel screen from Lakeside Equipment. The screen is mounted into a channel and is positioned at an angle, approximately 35-45° from horizontal. The ¼" mechanical screen collects solids from the wastewater in a basket and uses an auger to draw screenings vertically into the unit, where it washes, dewaters, and compacts the material. This allows some organic matter to be removed from the screenings prior to disposal, which reduces odors. In addition, the screenings are compacted in order to remove water and reduce the overall volume. Screenings are then encased in a plastic bag, to aid in odor reduction, discharged into a trash bin, and stored until they are hauled off-site for disposal.

Raw Wastewater Pumping

Wastewater continues to flow into the Ellsworth WWTP from the Village collection system by gravity via MH-1 at the intersection of Utility Street and Short Street. A 15-inch pipe conveys the wastewater into the headworks building, and through the mechanical screen, or around the screen through a series of slide gates for bypass purposes. Screened wastewater discharges through existing pipes out of the headworks building and into the existing influent lift station wet well. New raw submersible pumps convey wastewater through two force mains to the anaerobic selector tanks.

Design parameters for the influent pumps are as follows:

Parameter	Value
Number of Small Pumps	2
Small Pump Capacity, gpm	250 (1)
Small Pump TDH, ft	24
Small Pump HP	3
Small Pump Motor Control	Variable frequency drive
Number of Large Pumps	2
Large Pump Capacity, gpm	1,000 (1)
Large Pump TDH, ft	21
Large Pump HP	10
Large Pump Motor Control	Transducer/float level
Lift Station Firm Capacity, gpm	1,500
Total Lift Station Capacity, gpm	2,500

(1) Individual pump capacity with two pumps running

Four pumps were installed in the influent lift station: two small pumps and two large pumps. The small pumps operate on VFDs in order to maintain a consistent flow rate to the anaerobic selector and oxidation ditch. The two large pumps are used during storm events to prevent backups in the sewer system and operate at a constant speed.

At normal flow rates, one of the small pumps operates at a variable speed based on the level in the wet well. Variable flow pumping will occur up to an influent flow rate of 500 gpm, or 0.720 MGD. Above this flow rate, the small pumps turn off and one large pump runs at a constant speed of 1,000 gpm and cycles on and off based on the wet well level. If flows rise above 1,000 gpm, or 1.440 MGD, the small pumps will turn on again and run at variable speeds to match the influent flow rate up to 1,500 gpm, or 2.160 MGD.

continued on page 14

continued from page 12

The facilities plan peak hour flow of 1.256 MGD was revised to 2.160 MGD based on operator experience and recent storm events. This is estimated to be the maximum flow rate into the WWTP from the collection system. A second large pump is provided as a backup in order to provide a firm capacity of 2.160 MGD. However, in the event of extremely high flows, the second large pump would be called to run and would send 3.600 MGD through the WWTP. This will be a safeguard against backups in the collection system.

Anaerobic Selector & Oxidation Ditch

The oxidation ditch process was selected for biological treatment of the Village of Ellsworth wastewater. An oxidation ditch is typically an oval shaped activated sludge reactor with surface aerators providing both oxygen and mixing to keep mixed liquor solids in suspension. The oxidation ditch will remove BOD, nitrogen, and phosphorus through biological processes. The biological processes take place under anaerobic, anoxic and aerobic conditions. An anaerobic condition excludes dissolved oxygen and nitrate and is used to select phosphorus accumulating organisms. An anoxic condition excludes

Selector basin

oxidation and is fundamental in converting nitrate compounds to nitrogen gas. Aerobic conditions have dissolved oxygen, and therefore remove BOD and convert ammonia to nitrate. Anoxic and aerobic conditions occur within the oxidation ditch while anaerobic conditions are provided by three (3) separate selector cells.

The anaerobic selector tanks were designed for a solids retention time (SRT) of 3 days. The anaerobic selector is typically sized for an SRT of 0.5 to 1.5 days for wastewater with high amounts of volatile fatty acids (VFAs). For smaller communities, such as Ellsworth, that may not have high VFA concentrations, the SRT in the anaerobic selector should be increased to 2.5 to 3 days. The selector will have multiple cells so the SRT can be varied and tanks can be taken out of service if not required or for maintenance.

The oxidation ditch consists of two concentric, oval-shaped channels. Each channel is equipped with two sets of surface aerators, which introduce oxygen into the mixed liquor through the disturbance of the channel water surface.

Mixed liquor from the anaerobic selector flows into the outer channel, operated in an anoxic state, and then into the inner channel, which is operated in an aerobic state. Nitrification, denitrification, and BOD removal occur in the outer channel, whereas only nitrification and BOD removal occur in the inner channel. Mixed liquor from the second channel flows over a weir to the final clarifiers. An anoxic recycle pump in the outer channel is used to return anoxic mixed liquor to the selector cells.

The oxidation ditch has the flexibility to treat the current loads and future peak month loads. Another important

continued on page 15

continued from page 14

feature is to be able to operate in "storm flow" mode. This operation mode is similar to the contact stabilization process where RAS is discharged into the first tank and raw wastewater is discharged into the second tank. During peak flow events this process will reduce the solids loading to the clarifiers, thereby preventing the mixed liquor from flowing over the clarifier weirs and being discharged to the effluent stream. Having two separate oxidation ditch cells allows the operator to run the plant in "storm flow" mode.

Tank volume and sizing parameters are as follows:

Parameter	Value
Anaerobic Selector	
Dimensions, each cell	11'-0" – 14'-0"
Minimum Side Water Depth, ft	10
Tank Volume, each cell, gallons	11,600
Total Tank Volume, gallons	35,000
Oxidation Ditch	
Channel Width, ft	10
Minimum Side Water Depth, ft	10
Channel Straight Length, ft	45
Outer Channel Radius, ft	26
Outer Channel Volume, gallons	166,000
Inner Channel Volume, gallons	114,000
Total Tank Volume, gallons	280,000

Clarifiers & RAS/WAS pumping

Final clarifiers facilitate solid/liquid separation of the activated sludge system mixed liquor. Solids separation is achieved by way of gravity settling in quiescent tanks. The settled solids are either returned to the head of the activated sludge system as RAS or wasted from the activated sludge system as WAS. Clarified effluent flows by gravity to the UV disinfection system.

Two new final clarifier mechanisms were installed in the existing final clarifier tanks downstream of the activated sludge system. Scum is skimmed from the surface of the clarifiers and routed to the existing sludge holding

continued on page 16

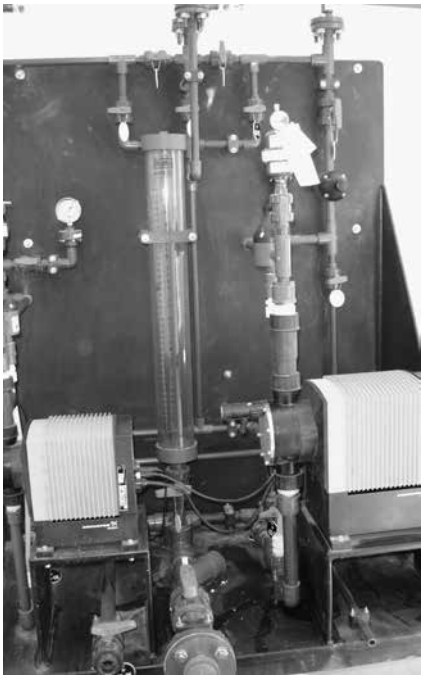
continued from page 15

tanks. Settled solids are withdrawn from the bottom of the clarifiers and pumped either to the oxidation ditch system or the existing sludge holding tanks.

Design information for the clarifiers based on the above analysis is as follows:

Parameter	Start-up	2030
Number of Clarifiers	2	2
Inside Diameter, ft	28	28
Side Water Depth, ft	10	10
Surface Area, each Clarifier, ft2	616	616
Total Clarifier Surface Area, ft2	1,232	1,232
Average Surface Overflow Rate, gpd/ft2	220	290
Peak Hour Surface Overflow Rate, gpd/ft2	1,750	1,750
Average Solids Loading Rate, lb/day/ft2 (1)	13	38
Peak Hour Solids Loading Rate, lb/day/ft2 (2)	25	26

(1) The indicated SLR rates are based on a MLSS of 3,500 mg/L and an RAS flow rate of 100% of the average day raw wastewater flow rate.
(2) The indicated SLR rates are based on oxidation ditch operation in "Storm Flow Mode" at a MLSS of 1,500 mg/L and an RAS flow rate of 100% of the average day raw wastewater flow rate



Chemical feed

The concentration of biological solids in the activated sludge system must be maintained at a high-enough level to provide adequate biological treatment. Thus, settled biological solids must be returned to the system by mechanical means. If solids are to be recycled in the system, however, solids must also be wasted from the system on a regular basis to cultivate the appropriate microbial community. Thus, return activated sludge (RAS) pumping is required. The RAS pumps recycle activated sludge from the final clarifiers to the activated sludge system. An automatic valve allows a portion of the RAS (or WAS) to be pumped by the pumps to the sludge holding tanks for disposal.

The WAS flow rate must keep pace with the sludge production rate in order to keep the activated sludge system in a steady state with respect to solids. The 2030 average day sludge solids production is estimated to be 700 lbs/day. This corresponds to a waste activated sludge (WAS) flow rate of 10,500 gpd for 0.8% TSS sludge.

Three RAS pumps with VFDs are provided. One pump serves as a standby pump and the other two are used to meet pumping demands – one pump for each operating final clarifier. Each pump is capable of operating from 100 to 250 gpm under the head conditions at the site. Under current flows, one pump is used to pump 50% of the influent flow rate; this is equivalent to 100 gpm. Under future flows, two pumps will be used to pump 200% of the influent flow rate.

continued on page 18

continued from page 16

The RAS pumps are used to pump WAS to the sludge holding tanks by using an automated valve for sludge wasting. The RAS pumps run continuously and when a wasting period is initiated, an automatic valve on the WAS pipe, connected to the RAS discharge header, opens. RAS continues flowing to the oxidation ditch, however, some of the flow is split into the WAS line and be pumped to the sludge holding tanks. Wasting is automated and controlled either by a time-of-day clock or by a percentage of the RAS flow. This degree of control facilitates enhanced performance of the activated sludge system.

Disinfection & Reaeration

A new Trojan ultraviolet disinfection system was installed at the WWTP for disinfection of clarified effluent. Wastewater flows from the final clarifiers by gravity through the UV channel. As the wastewater passes through the UV disinfection system, it is irradiated with UV light and pathogenic organisms are inactivated. After disinfection, the effluent flows through a reaeration channel and is then discharged to Isabelle Creek. The UV system is designed to meet year-round effluent disinfection limits per the WPDES permit.

An automatic cleaning system is included for the UV disinfection system. The cleaning system consists of a hydraulic service center and lamp cleaning device. The lamp cleaning device passes back and forth across the lamps and removes material from the lamp surface using a combination of mechanical and chemical cleaning methods. The hydraulic service center controls the lamp cleaning device and circulates cleaning solution. Automatic cleaning systems save operator time and prolong lamp life.

The UV disinfection system was designed based on the following parameters:

Design Parameter	Value
Peak Hour Flow, MGD	2.160
Effluent TSS, mg/L	20
Disinfection, cfu/100 mL	400
UV Transmittance	65%
Number of Units	1
Number of Banks	1
Number of Modules	3
Total Number of Lamps	18
Channel Depth	2'-3"
Channel Width	1'-0"

A new effluent reaeration system is provided at the WWTP for reaeration of disinfected effluent. Wastewater flows from the final clarifiers by gravity through the UV channel and into the adjoining reaeration channel. As the wastewater passes through the reaeration channel, air is diffused into the effluent and oxygen is transferred from the fine bubbles to the water. After reaeration, the effluent flows to the existing reaeration Tank and then to Isabelle Creek. The effluent reaeration system is required to meet the WPDES permit effluent dissolved oxygen (DO) limit of 4 mg/l.

Sludge and Centrate Handling

Sludge from the Ellsworth WWTP is hauled to the neighboring West-Central Wisconsin Biosolids Facility (WCWBF) for dewatering. A proportionate amount of centrate is returned to the WWTP for treatment.

The existing aerobic digester was removed, and the existing sludge storage tanks no. 1 and 2 were retained for sludge storage. The existing sludge withdrawal piping remains, as was the ability to pump the bottom several feet

continued on page 19

continued from page 18

of sludge from the tanks into a truck. The tank floors were sloped to center sumps to aid in sludge withdrawal. New medium-bubble membrane diffusers were installed in each tank to facilitate more efficient mixing. The existing blowers in the Blower Building remain for continued use.

Centrate is pumped into Tank No. 3 by the sludge hauling trucks via a pipe quick disconnection at the tank. Centrate is released back into the WWTP through the site sewer, which discharges into the existing influent wet well. The top several feet of centrate in the tank is removed using the existing decant piping and a valve. The middle portion of the tank can be removed by draining it through the pump suction pipe in the blower building basement. A 2-inch ball valve is opened to allow gravity flow from the suction pipe into a drain pipe leading back to the front of the plant. The bottom two to three feet of the tank must be pumped out of the tank by a sludge pump.

Four of the five existing blowers located in the basement of the control/pump building were kept in service for use in the sludge holding and centrate tanks.

A progressive cavity sludge pump was installed in the basement of the blower building in order to pump scum from the clarifiers to the sludge holding tanks and also to pump out the bottom several feet of the sludge holding tanks. A 15 HP constant speed pump was provided with a capacity of 200 gpm.

Sludge holding tanks No. 1 and 2 are used to store sludge on-site prior to hauling to the WCWBF. The capacity of these tanks is evaluated as follows:

Parameter	Present	2030
Tank Dimensions, each	20'-0" x 46'-0"	20'-0" x 46'-0"
Side Water Depth, ft	10	10
Max Storage Capacity, each, ft3	9,200	9,200
Total Storage Capacity, ft3	18,400	18,400
Average Annual Influent BOD5, lbs/day	461	717
Net Sludge Wasted, lbs/day	450	700
Average Sludge Volume (2%), gpd	2,700	4,200
Total Storage Capacity, days	51	33

continued on page 20

continued from page 19

Sludge holding tank No. 3 is used to store centrate from the WCWBF. The capacity of this tank is evaluated as follows:

Parameter	Present	2030
Tank Dimensions	20'-0" x 46'-0"	20'-0" x 46'-0"
Side Water Depth, ft	10	10
Max Storage Capacity, gal	68,800	68,800
Design Centrate Load, gpd	3,000	14,000
Total Storage Capacity, days	23	5

Phosphorus removal

Phosphorus removal is required to meet the WPDES effluent limit of 1.0 mg/L total P. The oxidation ditch was designed with the premise for biological nutrient removal, with nitrate removal as the controlling parameter. The design model shows the A2/O process will produce phosphorus concentrations below 1 mg/l and total nitrogen concentrations below 10 mg/l at design flows and peak month load conditions.

However, under average load and startup conditions, achieving both biological phosphorus removal and total nitrogen removal is much more difficult due to a limited supply of easily degradable waste in the influent wastewater. Therefore, a backup chemical feed system was provided for phosphorus removal.

The existing chemical feed system was removed and a new chemical feed building was constructed to house the chemical storage and feed pumps. The use of ferric chloride as the phosphorous removal chemical was discontinued in order to aid in meeting effluent chloride limits.

Aluminum sulfate (alum) is the recommended chemical for phosphorus removal. Chemical will be pumped to the anoxic selector, the final clarifier splitter box, and the sludge holding tanks as dosing points.

Other Improvements

All the existing buildings heating/ventilation, plumbing, and electric components were update to meet building code requirements. A new SCADA system was installed to better monitor and control plant operations.

New oxidation ditch

The Village had recently upgraded the trickling filter distribution system, and wanted to be able to use the trickling filter, if needed in the future. Provisions were made to allow for use of the trickling filter. The Village has treated others centrate from the West Central Biosolids Facility, and wanted to include provisions for treating additional flow from the sludge processing facility.

Project Costs

Total project costs were approximately 3.9 million dollars of which approximately $825,000 were grant funded.

The remaining 3.1 million dollars were funded by a low interest loan from WDNR Clean Water fund (2.4% interest rate).

Wolf Treatment Plant hosts Lake Michigan WWOA meeting

The November 13, 2012 meeting was hosted by The Wolf Treatment Plant and held at The Gathering of Shawano. We had 76 attendees for this meeting. There were 6 members registering at the door and 6 no-shows for the day.

Mike Schuler

Chairman Smudde kicked the meeting off by introducing Mike Schuler, President of the Wolf Treatment Plant Commission, who in turn welcomed us to Shawano and wished us a good meeting day in the City. Following the welcome address, Chairman Smudde introduced us to Grant Weaver of The Water Planet Company. Grant comes to us from Connecticut and is the President of a company that re-engineers O&M practices in order to optimize wastewater treatment – The Water Planet Company. Grant is a licensed P.E. and holds wastewater licenses in several states, while currently residing in Connecticut. Grant's formal education includes post-graduate work at MIT, an MS in Bio-Environmental Engineering from Oklahoma State University and a BS in Biology from Kansas State University. Grant's first presentation was entitled Phosphorus Removal for Wastewater Operators.

Grant Weaver

Grant gave two presentations on this day, with a scheduled break and our business meeting scheduled prior to the second session. I could tell that the topic was interesting, as many of the operators in attendance participated in the question and answer portion of the presentation. Our break today was sponsored by Strand Associates.

The WWOA – LMD business meeting was called to order by Chairman Smudde with the first item up being approving

continued on page 22

continued from page 21

of the August 22 minutes. Copies of the minutes have been placed online at wwoa.org for all to see and review as well as copies made available at the registration desk this morning. A motion by Brian Helminger was made to place the minutes on file and seconded by Dave Hartmann and the minutes were approved. Next up was Bernie Hengels to present the Treasurer's report. This was done and announced that copies were available at the registration table. Following the presentation of the Treasurer's Report, Chairman Smudde asked if there was any old business to discuss. Hearing none, he moved to new business. Chairman Smudde thanked Dave Hartmann, Wolf Treatment Plant and the Gathering for hosting the meeting. And acknowledged again Strand Associates for being our break sponsor.

Chairman Smudde acknowledged the presence of Dick Sachs, Bruce Oman and Bob Hannes of the DNR in attendance today. Dick Sachs was then asked to present his DNR report as follows: Scores from the November 7 Operator Certification exams should be sent out by the end of the month. If you do not receive notification of your exam score(s) by that time then contact Dick Sachs. Chairman Smudde mentioned that LMD fielded 2 of the 3 teams at the annual operator's completion this year. Team members were: Holly Blazer, Ben Varoni, Scott Stebnitz, Matt Hooker, Dustin Jerabek and Kim Williams. The LMD teams took 2nd and 3rd place. Congrats to our two teams. Glen Geurts of Heart of the Valley MSD was our regional operator of the year and received his award at the annual convention in October. The WWOA statewide Newcomer of the Year was presented to Jake Becken of GBMSD. Congrats to both.

Chairman Smudde introduced the incoming LMD officers to the attendees. Incoming officers include: Chairman Aaron Patefield of Coleman, Vice Chair Jesse Hass of Hortonville and the Secretary/Treasurer team of Dale Marsh and Kimberly Kimmes of Robert E Lee and Associates. The 2013 meetings will be; February at Green Bay Packing/Coatings, May to be held in Crivitz, the August meeting will be a joint meeting with SE District and the November meeting will be in Freemont. Upcoming events include: Feb 28, 2013 Government Affairs Seminar and March 13, 2013 Spring Biosolids symposium.

Chairman Smudde then asked for any other new business, hearing none he asked for a motion to adjourn. A motion was made by Brian Helminger and seconded by Aaron Patefield to close the meeting. So moved. Immediately following the business meeting, we welcomed Grant Weaver back to the podium for his presentation entitled Money Saving Ideas that Provide Better Wastewater Treatment. This presentation took us up to the lunch hour which included soup, pulled pork, beef tips, potato salad, some yummy cookies and cold bottles of Sun Drop.

Troy Larson

Following lunch and some time to visit with our vendors, the attendees were presented with Simple, Early Steps to Meeting Lower Phosphorous Effluent Limits by Troy Larson of Strand Associates.

Troy Larson then did a plant introduction and advised of directions to the plant and mentioned that maps were made available at the front registration table. Our next meeting will be February tba, 2013 at Green Bay Packing /Coatings.

Respectively submitted:
Bernie Hengels, Secretary and Treasurer – WWOA / LMD

Columbus WWTF Influent Pump Replacement Yields Energy Savings

By Dave Arnott, P.E., Ruekert/Mielke, Inc. and
Jim Johnson ITT Flygt Corporation

Introduction and Background
The City of Columbus is located in Columbia and Dodge Counties. The treatment facility serves the City of Columbus, Village of Fall River and the Town of Elba with a combined population of approximately 6,000. The average daily flow to the facility is approximately 0.8 million gallons per day (MGD). Organic loading is approximately 1,350 pounds of biochemical oxygen demand (BOD) per day.

The treatment facility consists of an extended aeration, single-stage activated sludge process. Solids are aerobically digested, thickened to 16 percent solids, and stored in a storage building for ultimate application on farm fields as a soil amendment.

The treatment facility was constructed in 1984. Due to several bypass events in the 2000's, the City has recently invested money to reduce infiltration and inflow (I/I) in the collection system and to make changes at the treatment facility to allow blending during and after extreme wet weather events. The updates to the treatment facility took place in 2011. As part of this project, the influent pumps were replaced to allow for additional capacity.

Before the upgrade, there were five Aurora vertical line shaft influent pumps. Each pump was 25 Hp and was rated at 1.3 MGD. One variable speed drive was provided and could be connected to one of two pumps through the pump controls. The pumps conveyed wastewater from an adjacent two-section concrete wet well. These pumps were at the end of their service life with badly worn impellers and mechanical seals that leaked significantly. In addition, maintenance and safety were concerns for the City as the couplings requiring periodic lubrication and alignment were located high above the pump room floor.

The City chose to replace two of the five influent pumps with dry-pit submersible-style pumps. With the dry-pit submersible design, the pump and motor assembly are no longer separated by a shaft. The assembly can be submerged without damage.

continued on page 24

continued from page 23

The new pumps selected were Flygt 12-inch model NT-3202. Each pump is rated at 3.67 MGD at 47 feet total dynamic head with a 45 Hp motor equipped with a variable speed drive. Each pump has a closed loop cooling system. Due to the submersible design, a pressurized seal water is not needed.

These pumps are significantly larger than the old pumps. With the largest pump out of service (one of the two new pumps), the firm capacity of the influent pump station is 7.0 MGD, which is also the current peak hour flow capacity of the plant. For normal flow, the two new pumps alternate and the older backup pumps are not needed. In the future, a third, identical pump will be provided to replace the existing older pumps. The firm capacity of this configuration with two out of three pumps operating will be 7.5 MGD.

Photograph 1 shows the old pumps. Photograph 2 shows a new vertical-mounted dry-pit submersible pump. Other improvements related to the influent pumps as part of this project included replacing the pump controls, installing a second parallel force main to keep velocities reduced at peak flows, replacing an influent magnetic flow meter, replacing fittings that reduced the force main size from 16-inch diameter to 10-inch diameter at the flow meter, and installing a wet well flushing system.

Old pumps

The new pumps incorporated a specialty impeller design by Flygt. The impeller uses a semi-open, back-swept impeller designed to clear rags and debris better than the tradition non-clog sewage pump. The original design of the impeller was to reduce pump clogging.

New vertical-mounted dry-pit pump

However, several years after this impeller was introduced to the market, Flygt noticed an additional benefit of reduced energy usage due to debris not catching and accumulating on the impeller. With this impeller design, Flygt guaranteed a minimum energy savings reduction of 25% compared to the old Aurora pumps. This was another factor in the selection of this pump. The guaranteed energy savings also helped enhance grant funding for the project, which totaled 30 percent principal forgiveness.

The City of Columbus is a public power community and is part of WPPI Energy. WPPI worked cooperatively before and after the influent pump replacement to document the amount of power the old and new pumps were using. Specific services of WPPI included: providing and troubleshooting the installation of meters connected to the pumps, downloading power data from the meter to their field computers, and compiling the power information in tabular and graphical format.

Methodology

The energy comparison was conducted on the basis of specific energy – the amount of energy required to pump a given volume of water.

Old Pump Energy Monitoring

WPPI conducted testing on the blowers used for aeration in late winter of 2011. Since the blowers were set up with an existing energy use meter, an influent pump was monitored after the aeration blower monitoring. An old pump was monitored without the use of a variable speed drive pump motor. The old pump conveyed approximately 900 gallons per minute.

The month of March was used for energy and flow monitoring. The last half of the month was very wet, and more than one pump was operating for most of the second half of the month. The pumping data had to be limited to days when only one pump was operating since it was not clear how much of the total volume was pumped from the one pump with the energy meter on it. The pump controls were set so that the pump with the energy meter would be the lead pump for all cycles. The total volume from the monitoring period was 11.95 MG. The total energy was 2295.2 kW-Hr for a specific energy of 192 kW-Hr per MG.

New Pump Energy Monitoring

After the new pumps, controls, flow meter, force main, and flushing system were installed, one new pump was tested for specific energy. To eliminate differences compared to

continued on page 32

IN CONTROL Successful Operations through Process Control February 2013

By Jack Saltes, Wastewater Engineer, Department of Natural Resources

I. PHOSPHORUS TREATMENT OPTIMIZATION: ANOXIC AND ANAEROBIC CONDITIONS

In my travels and in talking to some operators about biological phosphorus removal, too often I am hearing these two terms, anoxic and anaerobic, being interchanged. It is extremely important to understand the difference between the two environmental conditions because, unlike the removal of BOD under aerobic conditions of activated sludge, these two different conditions usually must also exist in a treatment plant to optimize biological phosphorus removal. It's not just about "simple" BOD removal anymore.

Anoxic is a condition in which oxygen is available in a combined form, most often as nitrate (NO3), but also as nitrite (NO2) or sulfate (SO4) in the wastewater. There is some oxygen present, it is just tied to something else.

One way to remember this are the letters "NOx" in anoxic. We want bacteria in an anoxic zone to denitrify…. remove the NO2 or NO3, so important to optimizing the phosphorus removal process. Anoxic selectors are also sometimes referred to as a "denit" tank. A denitrification tank usually precedes an anaerobic zone and where return activated sludge (RAS), usually high in nitrates, is denitrified, hence the name, denit tank. You don't want oxygen attached to nitrates, or sulfates, or anything else, entering your anaerobic zone.

Now there's the term…..anaerobic. Anaerobic is a condition in which free, dissolved, and combined oxygen is unavailable in the wastewater. There is no oxygen at all in any form in the tank. None . Nada. This is critical for phosphorus removal to work.

Now that you have a better and more clear understanding of these two terms, how do you measure for these conditions? I'm sure many of you are saying, "Well, duh, just use your dissolved oxygen meter!".

While dissolved oxygen is often used to monitor anaerobic, anoxic, and aerobic processes, it is limited in its accuracy in measuring very low levels to zero oxygen in solution, thus true and actual anaerobic or anoxic conditions usually cannot be measured reliably with a dissolved oxygen meter. Measuring oxidation-reduction potential (ORP) may be a better method. ORP measures the movement of electrons in wastewater solution. It is a measurement ofthe ratio of oxidizing and reducing agents in solution. ORP is measured in millivolts (mV).

It is an excellent and often preferred method for measuring anaerobic (-200 to -300 mV is a highly reducing environment), anoxic (+50 to -100 mV is a reducing environment), and aerobic (+100 to +300 mV is an oxidizing environment) , all necessary and very important conditions needed in the successful biological removal of phosphorus from wastewater. Measuring the nitrates and phosphorus in these tanks is recommended too.

Wastewater treatment plants are becoming more compartmentalized now with using selector tanks, tanks that select for specific type of bacteria to remove certain pollutants. Simple BOD removal is one thing; biological nutrient removal is another. With many of you facing much more restrictive phosphorus limits in the near future, it will take more knowledge and skills in operating and optimizing plants for nutrient removal whether it is for the removal of nitrogen or phosphorus or both.

It will be very important to know, through in-line monitoring exactly what is happening in these compartments (selectors). Sight and smell alone will no longer suffice. Welcome operators to the new and exciting world of 21st century wastewater treatment. It's pretty cool on how we can, by creating special environments, make certain bacteria work for us and do even more!

Biosolids Composting - Sustainable Solutions through Intergovernmental Cooperation

Appleton, Wisconsin – November 29, 2012: The City of Appleton Wastewater Treatment Plant (AWWTP) has a long standing practice of recycling nutrient rich biosolids back to agricultural soils as part of the facility's Biosolids Management Program (BMP). The AWWTP serves a population of approximately 75,000 and each year produces approximately 20,000 wet tons of biosolids that are recycled to agriculture permitted through the Wisconsin Department of Natural Resources (WDNR). Permitted sites are located as far as 75 miles west of the City of Appleton to accommodate land application when local clayey soils prohibit access in the spring following snow melt. The AWWTP BMP focuses on protecting public health and the environment, meeting regulatory requirements, and strengthening relationships with agricultural partners. The facility is recognized by the WDNR as being a leader in biosolids management within the state.

Compost pilot testing

The AWWTP's commitment to the success of its BMP has meant continued investment in research and initiatives that evaluate not only the current land application practices but to look to other environmentally sound management alternatives for organic waste streams that compliment biosolids recycling. In the late 1990's, the City of Appleton and other area communities investigated composting as a viable recycling alternative for leaves, brush, yard materials, biosolids, and other "waste" materials. However, the idea did not transition beyond the conceptual stage due to many challenges including siting an acceptable facility location, the costs for operations, establishing a viable market, lack of return on investment, and regulatory permitting of a facility. In 2008, the AWWTP again looked to composting as a low-tech option to diversify its BMP, help control long-distance biosolids transportation costs, and alleviate on-site biosolids storage limitations. The option also held promise for the Appleton Department Public Works (DPW) by providing a reliable outlet for the City's leaves and yard brush.

In 2009, the AWWTP sought out partners that shared common goals and understood challenges both past

Stormwater basin construction

and present which could impede large-scale composting from moving forward. This led to the intergovernmental formation of the "Compost Advisory Group". The group consists of representatives from the AWWTP, Appleton DPW, and Outagamie County Department of Solid Waste. The group's shared mission was to "seek long-term, cost-effective, and environmentally sound alternatives for management of organic waste streams." The formation of the Compost Advisory Group was a pivotal first step in developing a pilot project that could produce shared benefits while methodically approaching and resolving challenges that caused former composting efforts to fall short.

Funded by the AWWTP, the goal of the compost pilot project was to determine the feasibility and cost effectiveness of converting Class B biosolids into a Class A biosolids compost that could be utilized for multiple applications including reclamation or restoration projects such as landfill cover systems, erosion control best management practices, commercial landscaping, and agriculture. Proving success first here would have tangible benefits to the needs and goals of the partners involved. The group members recognized that there were no other working biosolids

continued on page 27

continued on page 26

composting models to point to in the state of Wisconsin and biosolids composting regulations were somewhat undeveloped at the time. Therefore, WDNR presence throughout the process was vital to get buy-in and support for the project.

In June of 2010 following years of meetings, correspondence, planning, contracts, and approvals ground breaking for the construction of the 4.5-acre compost pilot facility took place at the Outagamie County landfill. Built at a cost of less than $85,000, the engineered compost processing area was constructed from clay diverted from local stormwater projects and recycled (milled) asphalt from area road projects. The clay compacted in lifts to a total thickness of 18 to 24 inches serves as the liner diverting contact water and leachate to a catch basin where it is pumped back to the AWWTP for treatment.

The 8-inch thick layer of recycled asphalt provides suitable working surface for large equipment while protecting the underlying clay liner. A filter stone layer, comprised of ballast rock diverted from a county roofing project, was

Dumping biosolids in windrow

placed the entire wide of the pad was used to prevent material from entering the catch basin. Coordinating available recycled materials into the design and construction of the compost pad greatly reduced costs which were economically necessary to effectively demonstrate large-scale outdoor windrow composting.

continued on page 28

continued from page 27

Construction was completed in late September 2010. By the end of October 2010 approximately 6,500 cubic yards of leaves, brush, and biosolids were placed in windrows and referred to as Trial #1. Various ratios of leaves, brush, and biosolids were evaluated to determine the optimum

AWWTP windrow turner

blend to move forward with. Due to the limited success of the first trial of this project, three subsequent trials were completed to optimize feedstock volumes. The process was further improved to maximize available footprint, refine process techniques, improved process logistics, and evaluate variations in finished quality as a function of end use.

The AWWTP realizes that in order to appeal to various compost markets it must provide analytical support that biosolids compost produced at the Appleton-Outagamie County pilot facility meets or exceeds some recognized standards. Therefore it was decided from the offset that all finished compost must meet test methods and parameters

Screening

developed by U.S .Compost Council (USCC) Seal of Testing Assurance (STA) program, as the STA testing requirements were more extensive than the WDNR requirements at the time. Compost industry producers and users from across the country recognized the STA program as the standard for evaluating compost quality. Furthermore, contacts and resources available through the USCC were and continue to be relied upon whether for active composting or product marketing. Compost trial results have consistently indicated that windrow composting can be successful in creating a Class A product even during winter months, as the results verified that the compost met criteria established by the WDNR and USCC.

Concurrent to refining compost processes over the past two years, there has been a focus to develop resources and gather data that would address potential concerns both large and small volume users might have. In 2012, the University of Wisconsin Oshkosh (UWO) was contracted to evaluate the physical, chemical, and biological parameters of compost. Primary elements of the UWO research is to look into the Appleton compost properties for erosion prevention and sediment control; nutrient loss and migration evaluation;

Compost facility

plant vigor evaluation; and plant nutrient & metals uptake. A final report is expected by early 2013. This information along with various compost use demonstration projects to date have been brought together to formulate a marketing brochure and informational packet. These materials are being used to engage potential area markets or users of compost. A recent residential give-away was well received by residents including some area community gardens with a larger event being planned for spring 2013. UW-Extension's Market Garden assisted with the UWO project by providing land for display and research with the results being well received by garden administrators. There continues to be a growing interest with area landscapers with some now trialing the material on their own. Communication with larger volume users such as soil blenders and highway department remain ongoing but positive. The final UWO compost research report will be invaluable in providing the product specific information large and small volume compost users desire.

Although many challenges remain, this project is an excellent example of government entities working together along with the state regulatory agency to develop sustainable alternatives and to improve the overall community's fiscal and environmental conditions. Contact Chris Stempa for more information at chris.stempa@appleton.org.

MANAGEMENT MATTERS

Leggo the Ego

By: Kay Curtin and contributing writer, Charles Thompson, MPCA

The word "ego" comes from the Latin term for "I", or self-interest. But is it our friend or our enemy? The corporate world tells us that we should always toot our own horns, louder than our co-workers, in order to get ahead. A of mine friend that works for a large and famous medical center just told me that they were instructed to not make small talk, but instead "always tell the patient how capable you are, and what great care that they are receiving".

Dozens of self-help manuals tell us to say our daily affirmations that we are unique and the most wonderful creature ever developed. Other dozens give us instructions on freeing ourselves from our ego. One thing that I've noticed over the years is that some of our best leaders don't seem to have large egos. Not that they let anyone walk all over them, but they are never caught bragging, over-talking, correcting, and being otherwise obnoxiously egotistical " Self-esteem is good, confidence is even better, but when does it start to get in the way? At what point does it start to make people resentful? Does it get in the way of listening to other people's possibly great ideas? I asked for advice from my current supervisor, a very good manager and extremely nice person. This is what he said:

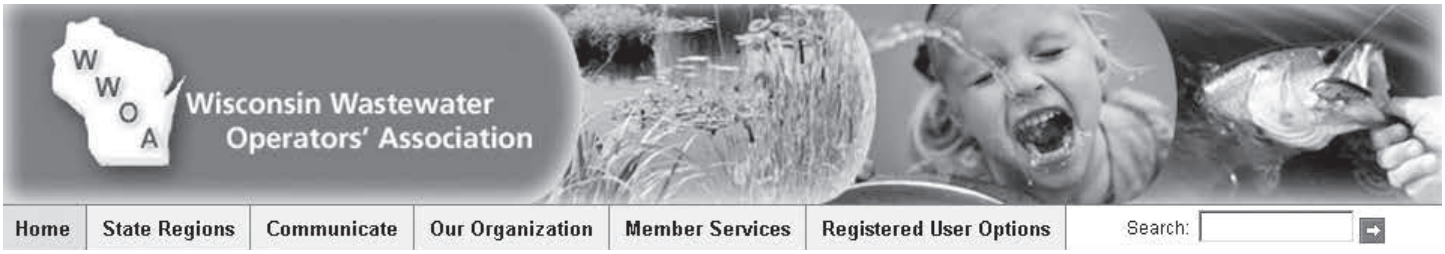
"In my short time as a manager and a long time as a situational leader, I've found that life and those who work with you will treat you better if you check your ego at the door. I often tell people that I work with that I never look for blame, only solutions. I also like to give credit where credit is due. In other words, I respect and treat the people I work with as human beings.

My job as a manager is to provide the time, opportunity and tools to my coworkers and then to get out of their way. I don't have people who work for me, but with me. Every morning I get up and take a look at myself in the mirror and try to see who I really am. I think if you're honest with yourself, your coworkers recognize that you are genuine and sincere and will respond accordingly. If you're a manager, do yourself a favor and develop relationships with your staff and you and your staff will be happier, more productive people. After all, projects are managed and people are lead."

"Our egos are very stubborn and resilient, and, as leaders, the size of our egos can get in the way of real leadership when we are challenged. In a December issue of Harvard Business Review, Jeff Kehoe talks about "The Primacy of Personality." His point is that when we lead, it is with our personality. Can personality and ego be used interchangeably in leadership? Most of us think of ourselves as magnanimous, generous and genial. Some of us will admit to being ambitious, adventurous and adversarial. Few of us like to admit that we can be greedy, selfish and stubborn. None of us likes to admit to being arrogant, opinionated or wrong. All of these describe ego and personality." – Manager's Minute Newsletter."

So, please join me in taking a good long look in the mirror. If I can get past the newly developing wrinkles, I'm going to try to try to put my insecurities, self-centeredness and ego aside and start being a better listener, co-worker, and friend.

WWOA website committee working to better serve members



The WWOA Web Committee has been busy this past year making the wwoa.org website work better for the membership. From the Events Calendar to Employment Postings to Regulatory News and Links, WWOA.ORG is a valuable resource for WWOA Members. Look up past issues of "The Clarifier." Join or renew your membership. Register for the annual conference and download all information. Get information on WWOA Scholarships and Grants. Sell your plant's used equipment. Search the Vendor or Plant Databases. Check out Regional News. View past presentations and Published Papers.

WWOA EMAIL ALERTS
WWOA can now send email alerts to your registered email address.

Receive alerts of regional or all meetings, employment listings, used equipment ads, news or homepage announcements, and membership renewal reminders.
1. Log in and go to your Personal Info page for notification options and settings. Select "Registered User Options" to go to the Login Page, or click the login link on the left sidebar. If you have difficulty, it is recommended that you use the "Registered User Options" link.
2. Once you have logged in, the box "Registered User Options" will become a pull-down menu.
3. Under "Registered User Options", select "Personal Info." (This takes you to your Personal Info Edit page from which you can change your email address, password, address and select whether or not you wish to receive email alerts.)
4. At the bottom of the form, select which alerts you wish to receive or not by clicking the associated boxes. A check mark indicates you will receive the alert.
5. When you are finished, click "Save Notification Preferences."
* Be sure to add wwoa.org to your spam filter whitelist.

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Click on "Registered User Options."

If this is the first time you are logging in to WWOA.org, please use your LAST NAME for the user name and your WWOA member number for the password.
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Future visits to the site will require:
username -- your email address
password -- whatever you selected

FORGOTTEN PASSWORDS:
Click on "Registered User Options".
If you are sure your registered email address is correct, but simply cannot recall your password, click on the "Forget Your Password? Click HERE" link. You will be instructed to enter your registered email address, first and last names. This will reset your password and send it to your registered email address. You should find your new password in your email box a few moments later. Once you are logged in, you are free to change your password again to whatever you wish.

As always, if you have any questions or problems logging in please contact the webmaster at webmaster@wwoa.org.

continued from page 24

the old condition, the new 10-inch diameter parallel force main was isolated and pumping took place exclusively through the existing 16-inch force main. In addition, with the wet well flushing system and new pumps, a portion of the pumped wastewater was routed back to the wet well at a high velocity without flow metering for approximately two to three minutes twice per day. The flushing system was disabled so that wastewater would not be rerouted back to the wet well during the test period. The pump controls were set to ensure the same pump started for each pump cycle. The test period took place from late December 2011 to early January 2012.

The pump motor variable speed drive (VFD) was used for this testing. The new pumps were equipped with VFDs to extend their runtime. Energy savings was not expected from the VFDs since the total dynamic head was dominated by static head. The minimum speed of the VFDs was set to approach the minimum specific energy based on manufacturer pump test information. In general, VFDs have a minimum speed below which a pump will use more specific energy compared to an "across the line"

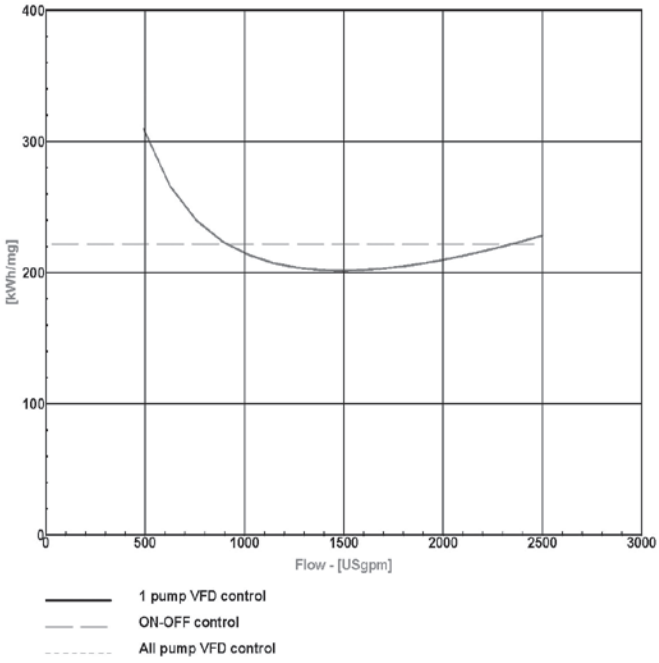


Figure 1 – Specific energy

configuration. Figure 1 depicts the specific energy of this pump as a function of the pumping rate in gallons per minute. The minimum speed was 42 Hz, which corresponded to a pumping rate of approximately 1,100 gallons per minute. Even at this minimum pumping rate, the pump would cycle on and off. As flow rates increase to the Columbus treatment facility, pump run times will be extended.

Figure 2 shows the power readings for this test period. The total volume from the monitoring was 9.14 MG. The total

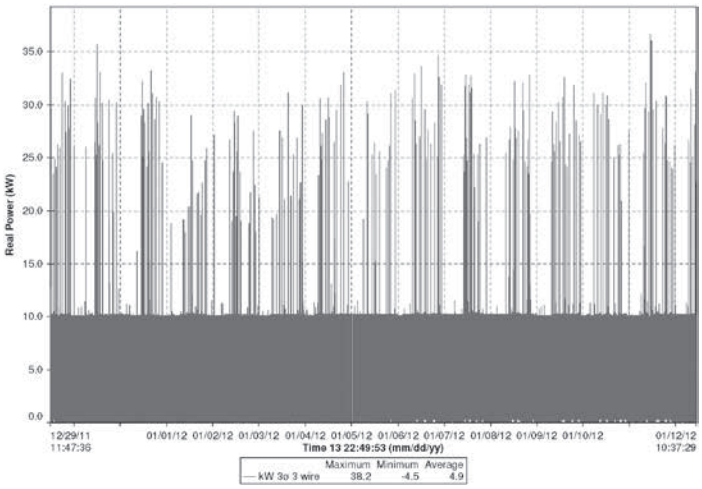


Figure 2 – New Pump Energy Usage

energy equaled 1636.4 kW-Hr for a specific energy of 179.0 kW-Hr per MG.

continued on page 33

continued from page 32

Comparing the old pumps and the new pumps, the specific energy was reduced from 192 kW-Hr per MG to 179.0 kW-Hr per MG. This represented a decrease of approximately 7 percent–well off the guaranteed level of 25 percent.

Upon a review of the testing methodology, it was clear that there were two variables that changed from the old pumps to the new pumps. These were the pumps controls and the flow meter. It was plausible that the pump control elevations could be slightly different with the new control configuration, which would impact the static head.

In addition, it was plausible that there were differences in the flow meter accuracy. Since the new flow meter was factory calibrated, the City felt that the new flow meter was more accurate than the old flow meter. It was decided to re-test an old influent pump with the new controls and the new flow meter.

Old Pump Energy Monitoring - Retest

The retest of the old pumps was setup to take pace in late January 2012. The energy meter was placed on one old pump, and the pump controls were set up to make this pump the lead pump for all cycles. There were never any times during the test period where more than one pump was needed. For this test period, the second force main was not used and the wet well flushing system was disabled.

Figure 3 depicts the power readings for this test period. WPPI experienced a problem with their meter from January 27th to January 31st, omitting energy data from this time period. The total volume for the monitoring period, subtracting off the flow from when energy usage was not available, was 2.67 MG. The total energy was 693 kW-Hr for a specific energy of 259 kW-Hr per MG.

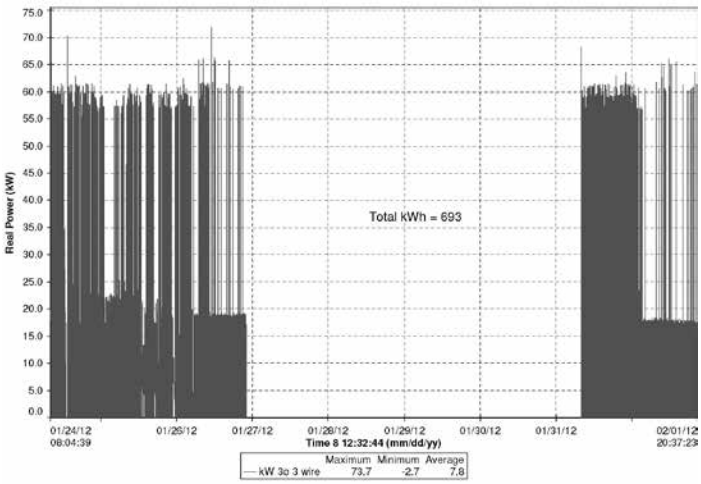


Figure 3 – Old Pump Energy Usage

Results and Conclusions

When the flow meter and pump control elevation variables were eliminated as differences in the testing methodology, there was a more pronounced difference in specific energy of the pumps. The specific energy was reduced from 259 kW-Hr per MG with the old pumps to 179 kW-Hr per MG with the new pumps. This represents a decrease of approximately 31 percent. This is in excess of the manufacturer-guaranteed level of 25 percent energy reduction.

In addition, comparing Figures 2 and 3, it is clear that the peak power demand decreased significantly with the new pumps. Figure 1 with the new pumps using variable speed drives shows a peak power demand of 30 kW. The peaks shown in Figure 2 are associated with the step screen operation and industrial discharges in the collection system. Figure 3 represents the old pump with a peak power demand of 60 kW.

The energy savings from the reduced specific pumping energy and reduced peak–hour charges is anticipated to save the City approximately $2,000 to $3,000 per year.

The City also saved money on maintenance. The new pumps no longer require shaft alignment checks and coupling lubrication. This task required a significant amount of time since the couplings were located high off the pump room floor. With dry-pit pumps, there is a pressurized seal water system to maintain. With the new dry-pit submersible style pumps, there is no need for a pressurized seal water system. ○

ATI welcomes Hein

Applied Technologies, Inc. is proud to welcome Will Hein to its municipal engineering department.

With over 25 years of experience, Mr. Hein will focus on providing civil engineering services to the firm's municipal clients.

He is a registered professional engineer and registered land surveyor who holds a civil engineering degree from the University of Wisconsin-Platteville. ○

Register for 31st annual spring biosolids symposium, March 13

sponsored by WWOA, CSWEA, and Wisconsin Dept. of Natual Resource – Contributing Organization

General Information
For more information contact:
Rich Boden at 715-345-5259
Pre-registration deadline - March 6, 2013

Enrollment is limited to 300! Onsite registration may be limited. Pre-registration is strongly encouraged! Pre-registration fee covers program materials, breaks, and lunch. Lodging is not included.

Cancellations/Refunds: Contact CALS Conference Services at 608-263-1672, no later than March 6, 2013. No refunds will be given after this date.

Location: Holiday Inn Hotel, Convention Center & Water Park, 1001 Amber Avenue, Stevens Point, WI 54481 715-344-0200.

Lodging: A block of rooms will be held at the Holiday Inn until Feb. 17, 2013. Make your reservations directly at 715-344-0200, or http://www.holidayinn.com/stevenspointwi. Use Group Block Code: WWO.

Parking: Ample free parking is available at the Holiday Inn Hotel Convention Ctr.

Credits: CEUs available after the last presentation; 6 CEU's for wastewater and septage; 3.25 septage compliance hours.

Why Should You Attend?
The Symposium provides information on current issues related to biosolids and septage management, enabling municipal officials, plant operators, contractors, and consultants to respond proactively to new challenges.

Registration form on page 35

Symposium Agenda

7:15 am	Registration Opens
8:00 am	Welcome – Rich Boden
8:05 am	The Minnesota Program and Approach for Compliance – Jorja DuFresne
8:35 am	Nutrient Management – Sue Porter, Paul Sturgis
9:15 am	DNR Update – Fred Hegeman
9:45 am	Break
10:05 am	Septage Enforcement/Economic Trends – Fred Hegeman
10:50 am	Heat Drying Biosolids – Dale Doerr, Mike Gerbitz
11:30 am	Class A Biosolids Process – Chuck Wanstrom
12:00	Lunch/Lunch Speaker
12:15 pm	Perspective on Growing Illegal Drugs – Brian Knepper
1:00 pm	Morning Speaker Q&A Panel
1:30 pm	New Land Application Technologies – Chris Searle
2:00 pm	Break
2:15 pm	Controlling Pharmaceuticals in the Environment – Cheryl Wittke
2:45 pm	Cogeneration for Energy Production – Joe Zakovec, Jeremy Cramer
3:20 pm	Closing Remarks – Jay Kemp
3:25 pm	Adjourn

Program Committee
Rich Boden – Plover WW Utility;
Fred Hegeman – WI DNR/Madison;
Alan Kaddatz – Pat's Services, Inc.;
Jay Kemp – AECOM;
Lyle Lutz – Plover WW Utility;
Bill Marten – Donohue & Associates;
Mike Northhouse – Madison MSD
Paul Schlecht – Milwaukee MSD

Symposium Participants
Jorja DuFresne– Minn Pollution Control Agency
Sue Porter – DATCP
Paul Sturgis - Croptech Agronomics LLC
Fred Hegeman – WI DNR
Dale Doerr – Sheboygan WWTF
Mike Gerbitz – Donohue & Assoc
Chuck Wanstrom - Schwing Bioset, Inc
Brian Knepper – WDNR Homeland Sec Coordinator
Chris Searle – Kuhne Industries
Cheryl Wittke - Safe Communities - Dane Co
Joe Zakovec – Janesville WWTF
Jeremy Cramer- Stevens Point WWTF

Registration Form
Spring Biosolids Symposium
Wednesday, March 13, 2013

Pre-registration deadline is March 6, 2013
Pre-registration (no onsite registrations) online at:
www.cals.wisc.edu/ccs/CurrentPrograms

_____
Name

_____
Title

_____
Affiliation

_____
Address

_____
City/State/Zip

_____
Daytime Phone

_____
Email

_____ $65 Pre-registration
_____ $85 On-site Registration
(CASH or CHECK ONLY)
_____ $15 Student Registration
Total Amount Enclosed $_____

Complete a separate registration form for each participant OR register online.

Enclose Fee. Check payable to: UW-Madison.
Check enclosed (pre-payment required).
Or charge on the following account:
___VISA ___Mastercard ___American Express
___Discover Exp. Date _____
Card Number_____
Name on Card_____
Signature_____

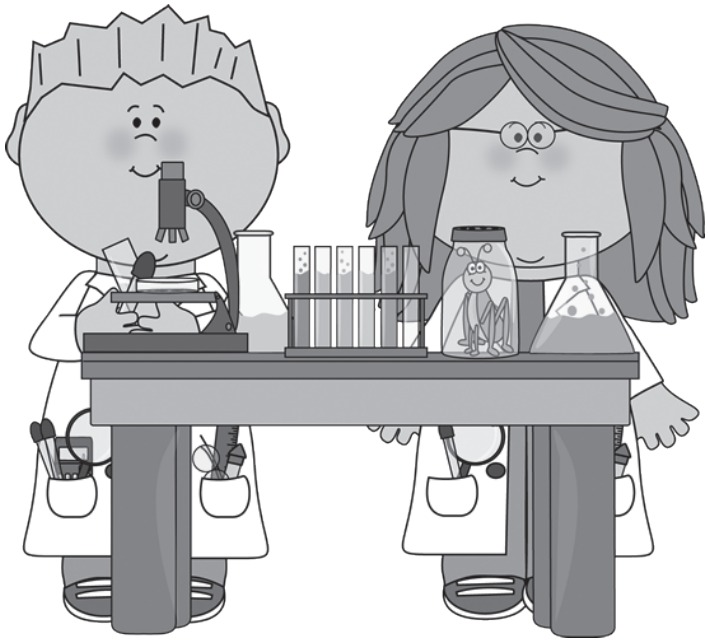
Mail to: CALS Conference Services, 640 Babcock Drive, Madison, WI 53706. Fax: 608-262-5088. For registration questions, please call 608-263-1672.

MPTC offers many water/wastewater classes – register now

Courses are starting again at the end of January at Moraine Park Techncial College. This is a great time to plan on either a continuing education course or a certification exam preparatory course. If you know of anyone desiring to take a course, please share this article with them and or post for other colleagues to see. There are still seats available, so register ASAP. Use the course number on the schedule for ease of registration. If having a problem registering, please feel free to ask me for help.

The following is a link to our certification preparatory courses http://libs.morainepark.edu/docs/academic-affairs/ww-operator-schedule.pdf Not only will they prepare you for the exam with specific exam related information, the courses can also be used for continuing education.

Moraine Park also has a two year Water Quality Technology Associate of Applied Science Degree program. This is an online program, so you can complete it in the comfort of your home, or where your computer takes you. This is a great program for those wishing to enter the profession as well as those in the profession that hope to advance their standing within an organization or to increase their potential for desired career placement. Advanced standing is available to those already working in the career field. If you have interest in furthering your education our accredited program is also transferable to a number of four year colleges. Water Quality Technology program link: http://www.morainepark.edu/programs-and-courses/programs-of-study/Water+Quality+Technology/



If you have problems accessing the links, try the MPTC website at: www.morainepark.edu

If you are an employer and desire interns, we may have the student to fit your need. Just let me know, and I will relay the information, as many students are now setting up spring and summer internships. I can be reached at 920-924-3283 or mschmidt15@morainepark.edu.

If you have any questions, do not hesitate to call or email. To register for a course call 1-800-472-4554 or 920-924-3207. See you in class.!

Mark A. Schmidt
Water Quality Technology Instructor
Moraine Park Technical College
235 North National Avenue
PO Box 1940
Fond du Lac, WI 54936-1940
920-924-3283
mschmidt15@morainepark.edu.

First in Wisconsin: Pilot Youth Apprenticeship Program in Green Bay reaches 500th hour

GREEN BAY (December 28, 2012) – The state of Wisconsin's first Youth Apprenticeship Program in Wastewater Treatment has reached its 500th hour, and exemplifies business, education, and government collaborating to create a thriving workforce for tomorrow. Brandon Burton, 16, a junior at Southwest High School, is reaching his 500th hour on the job at the Green Bay Metropolitan Sewerage District (GBMSD), through the Green Bay Area Chamber of Commerce's Youth Apprenticeship Program, which also includes coursework at Northeast Wisconsin Technical College (NWTC).
"I'm really honored to be part of this program," said Brandon. "It's cool to combine school with job training to prepare me for the so-called 'real-world' when I graduate." As part of Brandon's curriculum at the Green Bay Area Public Schools, Brandon takes Environmental Engineering: Waste and Water Technology courses during the week at NWTC, and then works a few hours a week at GBMSD.

"The Green Bay Area Chamber of Commerce's Youth Apprenticeship Program is excited to be an instrumental part of the creation of this Wastewater Treatment pilot," said Laurie Radke, President of the Green Bay Area Chamber of Commerce. "The program is a great success, which we hope to replicate with other businesses throughout the area."

Recently, Brandon was able to troubleshoot a problem while working in the plant at GBMSD, using knowledge he'd just gleaned during coursework at NWTC. He was tasked with doing a routine clean of the "dissolved oxygen analyzer," when the cleaning brush head got stuck in the analyzer piping. "I'd just learned how to create a vacuum," Brandon said. "And I wondered if it would work in this case." It did. That knowledge and Brandon's quick thinking prevented a work order from having to be filled out.

This preparation for post-high school education and real-world job experience in partnership with the community is just the kind of initiative the Green Bay Area Public School District is eager to foster. "Brandon is a prime example of what our students can achieve through hard-work,

continued on page 38

continued from page 37

dedication, great mentoring, and the leadership of our teachers," said Dr. Michelle Langenfeld, Superintendent of Schools and Learning. "We have many more students like Brandon waiting to be placed."

Brandon Burton on the job at GBMSD

Professor John Katers from the University of Wisconsin-Green Bay (UWGB) has served on the advisory committee for the program and has praised the collaboration of the various partners. UWGB offers undergraduate and graduate degrees in environmental sciences, with several alumni from UWGB's environmental programs employed at GBMSD. GBMSD Treatment Manager Bruce Bartel has praised the community-wide collaboration, and said the program is a great investment for the future.

"We're really proud of the work Brandon is doing here at GBMSD, and we look forward to having other young apprentices join us in the future to learn the ropes as well," Bartel said. "Let's face it – our industry isn't getting any younger! As we've got several retirements coming up, we need to be prepared to pass the baton so that this great wealth of knowledge is passed on. Each day, we treat 38 million gallons of water – and replace it back into the environment cleaner than it came to us. That's a responsibility we take very seriously, and investing in our youth is one way to ensure that we continue our mission."

If you are interested in getting involved in the Youth Apprenticeship Program in your area, you can contact Scott Thompson (sthompson@gbmsd.org) or Bruce Bartel (bbartel@gbmsd.org) for information on how to get started. This is a great way to promote the wastewater industry, get involved in your community, and get younger people interested in the wastewater profession.

WWOA Board of Directors meeting notes Oct. 8 and 9

Minutes from the WWOA Board of Directors Meeting, Monday October 8, 2012 and Tuesday 9, 2012 at the Kalahari Resort and Convention Center, Wisconsin Dells, WI.

1. Call to order, Roll Call- President R. Thater called the meeting to order at 9:10 a.m. on Monday October 8, 2012 at the Kalahari Resort and Convention Center, Wisconsin Dells, Wisconsin. Roll call was taken. All board members were present except for Past President Dave Carlson.

2. Approval of the Minutes of August 21, 2013- After review, W. Peterson made a motion to approve the minutes as presented, K. Freber seconded the motion. Motion carried.

3. Financial Report- McKee presented the Financial Statement for the Board to review and approve. McKee stated that as of September 15, 2012 the WWOA had revenues totaling $111,625.04 and expenditures of $75,495.07 with excess revenues of $36,129.97.

After discussion K. Freber made a motion to approve the financial statement as presented, J. Bratz seconded the motion. Motion carried.

4. Committee Reports

a. Nomination- President R. Thater reported for D. Carlson. R. Thater stated the nominations are the same as at the August meeting. "Office of Vice President Kelly Zimmer. Three candidates for directorship, Lyle Lutz, Sharon Thieszen, and Jeff Simption."

b. Promotional Item- J. Bergles provided the Board with a look at his promotional inventory for sale this year at the conference. He also distributed the Board of Directors shirts for this year.

c. Membership- McKee reported that we have 36 lifetime members this year.

d. Scholarship- S. Thieszen reported that WWOA will award two scholarships. Shawn Jandrey is the recipient of the $1,000.00 Crane Engineering and Krystal Woda is the recipient of one of the WWOA Scholarship. Krystal Woda will be at the Banquet on Thursday night. S. Thieszen will announce the winners at the Banquet. Tuition Reimbursements- S. Thieszen reported to date one application has been received for Tuition Aid but was rejected based on the criteria.

e. Executive Committee- No report.

f. Clarifier- No report.

g. Career Development- No report.

h. Awards- W. Peterson provided the Directors with a list of award winners. Peterson has provided J. Bratz with the information for Publicity. All presenters for all awards.

i. Operator Training- L. Lutz reported that the session with Toni Glymph was held at MSA office on August 14, 2012. 33 people were in attendance which was a full house. The Committee will look at having Toni do an advanced session next year. Katie Karow from Kenosha has expressed interest in hosting a similar training session in the SE area. She would be willing to help set up the meeting. Chuck Soltis from Union Center approached L. Lutz and offered to host the training session.

j. Directory- R. McKee informed the Board that next year is when the Directory will be reprinted. A discussion ensued regarding the future format of the Directory. R. Thater will discuss it at the Annual Business Meeting and asked the membership for some input.

k. Publicity- J. Bratz reported announcement of the 46th WWOA Annual Convention was sent to the Baraboo News, Wisconsin Dells Visitor Bureau, and Baraboo

continued on page 41

continued from page 40

radio station B102. Local TV stations were notified of the Conference. The envelopes for the awards and scholarships are prepared and ready.

l. Regional Coordinator- K. Zimmer provided the Board with a list of the new regional officers contact information and a copy of the agenda for the regional officers meeting.

m. Government Affairs- No report.

n. Biosolids Symposium- L. Lutz informed the Board the Spring Biosolids is scheduled for March 13th 2013 at the Holiday Inn and Convention Center in Stevens Point, Wisconsin. WWOA is chairing the symposium.

o. Liaison- S. Thieszen 85th Annual CSWEA Meeting was held May 14-17, in St. Charles IL., and was well attended. CSWEA has stated that they will no longer distribute the $5.00/member to the state section. S. Thieszen provided

2013 WWOA Board

the Board with a list of upcoming events for the Wisconsin Section.

p. Web-Site- J. Bratz provide the Board with a list of things that the committee is going to this year and into next year. J. Bratz informed the Board that the photo gallery is no longer on the web-site and has been moved to Flickr. Flickr is easier to use and it is free.

q. Technical Program- K. Freber thanked K. Zimmer for handling the spouses program and local arrangements. Had one presenter back out but he found a replacement. Moderator packets are completed and ready to go. WDNR credit slips are printed and will be available on Wednesday afternoon.

r. Exhibit Committee and M&C Committee- McKee reported for C. Strackbein. C. Strackbein provide the Board with a list of exhibitors and a layout of the exhibit hall.

s. Operators Competition- J. Bratz informed the Board that everything was set for the Competition. The judges have been selected. The events will be: Process Control and Collection System, Maintenance Event, Lab Event, and Plant Operation Event.

t. Local Arrangements- K. Zimmer informed the Board that everything is set.

u. Spouse Program- K. Zimmer reported that she has been in contact with the Baraboo site that the spouse will be visiting on Thursday and all is set to go.

v. Golf Outing- Randy Herwig reported that the golf outing is all set and there are 76 golfers this year. There are 19 donations for prizes. Things are ready to go for a shotgun start on Tuesday morning.

w. Sporting Clays- Jim Thalke reported that there are 40 plus for the sporting clays.

x. Permanent Arrangement- Dean Falkner provided the Board with a report. The primary reason for the meeting at Stevens Point was to get the housing forms for next year. The Committee also investigated the Patriot Center Wausau area and the Marriott Hotel in Middleton for future conference site. The committee will report back to the Board.

y. Resolutions and Bylaws- No report.

z. Historical- No report.

aa. Others

A motion was made by K. Freber and seconded by J. Bratz to accept the Committee reports as presented. Motion carried.

5. Old Business- No old business

6. New Business- No new business

7. Adjournment- There being no further business, J. Bratz made a motion to adjourn, L. Lutz seconded the motion. Motion carried.

The meeting was adjourned at 1:00 p.m. Monday, October 8, 2012.

North Central Region steering committee meeting minutes Schofield, WI, December 4, 2012

Attendees: Matt Saloun, Ken Bloom, Terry Vanden Heuvel, Rich Boden, Katie Gruber, Andy Ott.

Vanden Heuvel called the meeting to order at 12:15 pm. 2013 Officer Assignments: All officers agreed to continue in their present positions. Terry Vanden Heuvel – Chairman; Matt Saloun – Vice Chairman; Ken Bloom – Treasurer; Rich Boden – Secretary. Ken Bloom and Matt Saloun are serving the final year of their terms. Future Meetings: Stevens Point is hosting the winter meeting. Jeremy Cramer is working on the program. The meeting will be held Feb 12, 13, or 14. The date and location will be finalized soon. The theme of the meeting is digestion and energy production. Registrations will be mailed in early January. NCL will host the spring meeting on April 24. The program is set. The theme will be primarily laboratory related. The fall meeting is not scheduled. Several possible sites were discussed. The Steering Committee will contact several communities to find a host. Rhinelander is hosting the 2014 winter meeting. Other possible venues for 2014 were discussed. The committee also discussed holding a joint meeting with either the West Central region or the Lake Michigan Region. Future topics include a half or full day on nutrient removal, the Bioset process, operator certification changes, alternative discharges vs low level phosphorus upgrades, or a safety theme with equipment displays and demonstrations.

Operator Competition: The Steering Committee congratulates Jason Schill, Chris Lefebvre, and Dan Dvorak on their first place finish in the 2012 competition. Bloom will obtain gifts cards for the competitors as has been done in the past. Two of them are willing to compete in the 2013 event. The committee would like to field a second team from the region. Members will try to convince a few more operators to compete. The committee discussed printing team t-shirts with advertising patches from vendors as a way to generate some revenue.

Training Events: The committee discussed setting up a one day bus trip to the WEF conference in Chicago. Saloun will check into the bus rental cost. Boden will discuss with Lutz to determine if the State board would be willing to help coordinate. Efforts will be made to publicize the possibility of the event and gauge interest over the next few meetings.

The region will sponsor another Microscopic Exam training session in 2013. Vanden Heuvel will work on the arrangements. It is expected to be held again in August. Vanden Heuvel is arranging hands on training event in Merrill on March 5. The morning session will involve pump maintenance and the afternoon session will address grit removal equipment. The event is limited to 30-40 people depending on the final arrangement of the room. The session is expected to run from 8:30 to 3:30 with lunch. The vendors will cover the breaks. Registration will cover the meal.

Social Media: LinkedIn has shown a better response than Facebook. Gruber would like to post more articles and possible blog on related issues. Vanden Heuvel suggested starting a Q&A section to encourage exchange of information.

Financial Report The financial report was reviewed. The region continues to have a large fund balance. Boden will get the email set up on the WWOA mail server before the next meeting. The meeting adjourned at 1:15 pm.

Submitted by Rich Boden, NCR Secretary

Wisconsin Wastewater Operators' Association, Inc.

24184 Fawn Meadow Lane
Richland Center, WI 53581

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