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.
Presidents Message: In person conference preparations

I’m sitting at the picnic table without a jacket, so it looks like summer is finally here. Another great season to get out and explore and enjoy Wisconsin’s resources. It could be something as simple as a game of golf with old friends. It could be a slightly more challenging goal with people you love, like camping at unfamiliar locations. My wife and I have always liked short day hikes at parks around the state, now we’re setting a goal to hike the entire Ice Age National Scenic Trail. It’s 1200 miles of trails and connecting routes located entirely in Wisconsin, featuring the beautiful landscapes that the glaciers gave us.

As I’m writing this, the conference in La Crosse is only 5 months away. It’s hard to believe that my term as president is more than half over. With things being the way that they are I regret not being able to get around the state, meeting more of you and learning about your projects during my term.

That can change now that people are getting vaccinated and mandates are being loosened. The WWOA Board has made the decision to allow regional meetings to be in person following local guidelines. Might not be the perfect situation yet, but we’re getting there.

Preparations are going forward for an in-person conference. The website is being updated so some things are a little behind. By the time you read this more detailed conference information should be available on the website. Remember to fill out nomination forms for a deserving person.

Our regions are full of people that have done something outstanding or innovative. Perhaps they have “just” quietly worked to keep their facilities operating well day in and day out to serve the community and protect the waters that we all rely on. This is the opportunity to recognize their contributions. Regional Operator of the Year Award nominations should be submitted to your regional officers by July 24, 2021. All other awards need to be submitted to Rick Mealy, the WWOA Awards Committee Chair by August 1, 2021.

I was saddened to hear of the passing of Past President Tim Nennig. Although I served with Tim on a DNR advisory committee many years ago, I never got the opportunity to know him really well. He seemed like a good person and I respected his knowledge and opinions. I always thought of him as a good example of what dedication to our profession and involvement in WWOA should look like. My prayers go out to his family, he will be missed.

I’ll close this the way that I did in my last message. Keep doing the things that you do to protect the waters of Wisconsin so we can enjoy them all year long.

Take Care Everyone,
Don Lintner

---

Remaining Clarifier Deadlines

- September Issue: August 13
- December Issue: November 12
Tim Nennig

Tim Nennig, a life-time member and a past president of WWOA, passed away April 23, 2021 at the age of 59. Tim left us much too early and our WWOA community is not the same now that he is gone. Tim married his high school sweetheart, Holly and was the proud father of three children, Bailey, Sadie, and Alex.

I first met Tim through a mutual friend outside of WWOA. Tim’s daughter and my friend’s daughter were on the same swim team. As we talked, we realized that we were in the same “profession”; a fraternity of individuals committed to improving the world around us one wastewater treatment plant at a time. It was a bit later, 2011 to be exact, when our professional worlds would join as I shared with Tim an idea on the Milwaukee River that he embraced. And for the next 10 years, we pursued a shared vision to see if we could make a difference.

Tim, like many of us, was very proud of the work he did. He served the Village of Grafton very well as evidenced by the outstanding performance of the treatment plant and the level of respect he received from those around him. I would classify Tim as part of the “old guard”. He served WWOA on the board and then later as president many years ago. He never wavered in his support for the organization and was always willing to back anyone who wished to present on something the Village was doing.

It was at the 51st Annual WWOA conference when Tim’s life would forever change. He told me it was at that conference when he experienced pain like he never had before during the awards banquet. He ended up in the hospital where multiple tests were run.

The source of his pain was discovered but it would take a bit more time to reveal the true cause of Tim’s health problem.

If we have learned anything over the past year is that life is short. Tim set an example of what to do with the life you have. I never heard him complain even when he had every right to. He embraced life, he tried to make things better, he set an example that we can all strive for.

I will miss Tim.

My life is better for having had the chance to work with him. I suspect many of us can say the same.

Jon Butt
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City of Jefferson wastewater treatment facility

Jefferson, Wisconsin is a quiet Wisconsin community that sits at the confluence of the Rock and Crawfish Rivers. Main Street shows off its vintage buildings and steepled churches built by German craftsmen. Located thirty minutes east of Madison and forty-five minutes west of Milwaukee, it provides the small-town atmosphere with access to big city amenities.

The treatment plant serves a population of just under 8,000 and has several commercial and industrial customers. Average daily flow is around 1.2 MGD. The plant is an activated sludge plant with anaerobic digestors for biosolids treatment. The collection system has approximately 41 miles of sewer main with 6 lift stations.

Prior to more recent upgrades and expansions, the current plant was constructed in 1984, when new pumping capacity, biological treatment, bio-solids storage, and administrative facilities were added. In 2004, upgrades to increase hydraulic capacity, improve preliminary treatment, UV disinfection and improvements to bio-solids processing were added.

To accommodate increased flows to the facility pumping capacity was upgraded at three submersible pump stations located at the facility. These include the plant influent wet well where the main interceptors enter the plant. The intermediate wet well that lifts wastewater to the top of the bio-tower. And the effluent pumping station that pumps

continued on page 8
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plant effluent to the Rock River during high river stage levels where the plant cannot gravity flow out from the plant.

Preliminary treatment was upgraded by the addition of a Vulcan mechanical step screen. This greatly helps to minimize plastics and rags typically found in the waste streams of most communities. The screen was also designed and is operated in a way that maximizes collection of grease on the screenings. Grease is an issue at the facility as the City had two major food related industries discharging into the collection system. Screenings are then washed and compacted, and the dried material discharged into a disposable bag to be land filled.

Prior to the 2004 upgrade, effluent disinfection was achieved through chlorine gas. Due to new containment regulations along with safety concerns, a switch to UV disinfection was made. A two bank Trojan 3000 Plus UV disinfection system was installed. This system had proven to be exceptionally reliable and easily achieves extremely low fecal coliform and e Coli results. As well as being safer for personnel and lower operational costs versus the previous chlorine gas.
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Bio solids processing was upgraded with the addition of a dissolved air flotation (DAF) unit to thicken the waste activated sludge before going to the anaerobic digesters. Bio-solids storage was upgraded with three large mechanical mixers that replaced an air mixing system and a new discharge pump was also installed.

In late spring of 2008, the City experienced the worst flood in its history. The Rock River rose well above the 100-year flood stage, compounded by the Crawfish River flooding also. The treatment plant survived thanks to an existing earthen berm that was constructed at 100-year flood stage elevations and the hard work of plant personnel and numerous community members and organizations that helped place sandbags to keep the flood waters out of the plant. At this time, the plant effluent pump station was continued on page 12
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overtaxed as it was only designed for 100-year flood stage and the river had now risen well above that level. In 2010, the earthen berm elevation was increased another three feet and the effluent pump station discharge was also increased and redesigned with an additional outlet for high flood stage conditions. Variable frequency drives and new level controls were also installed at this time.
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Phosphorus levels are reduced to Rock River TMDL permit requirements through chemical precipitation. Jefferson initially used ferric sulfate and ferric chloride. These chemicals had corrosive effects on equipment in the plant as well as forming mineral deposits in the piping surrounding the digester boiler. The switch was made to alum in 2019 with similar results as the ferric, but without the negative side effects.

The plant also has a one-megawatt emergency generator capable of running the entire plant. Through an agreement with WPPI, the generator can also be called to export power outside the plant during times of high demand. Revenues from this agreement help pay for the maintenance of the generator.

In 2021 the City of Jefferson merged its water and wastewater utilities. Staff will be cross trained and encouraged to get licensing for both. This will enable the utilities to have more flexibility with its workforce during times when employees are on vacation, medical/family leave, or if a large percentage of workers would be out due a pandemic, as many of us have experienced this past year. As Jefferson continues to grow, this merger is seen as an evolution to meet current and future needs of both water and wastewater utilities.

Jefferson continues to grow and change with the times. But we never want to lose the friendly small-town atmosphere.

continued on page 16
ADAPTOR was founded by water and sewer contractors with the mission of providing quality solutions to common challenges in the field. Our American-made water and sewer products save municipalities time and money, and have proven effective time and again.

**Jefferson Treatment Plant Design**

<table>
<thead>
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WWOA Board of Directors meeting minutes April 2 & 3, 2020

1. Call to order, Roll Call - President J. Smudde
President J. Smudde called the meeting to order at 1:15 pm on April 2, 2020.


2. Agenda Changes, Additions, or Correspondence
There were no changes or additions to the agenda, or correspondence to review.

3. Approval of Minutes: December 2019
There were no changes to the minutes except for a minor spelling error requiring correction on page 1. The Board agreed that the layout highlighting motions, decisions and action items is helpful and the practice should be continued.

MOTION: A motion to approve the minutes from the December 5-6, 2019 Board meeting was made by Rick Mealy to include correction of the word “dissitions” to “decisions” on page 1. M. Stephanie seconded. The motion carried.

ACTION: C. Mutrie will correct the minutes as directed and mark as final.

4. October Conference
The Board acknowledged that questions are arising from the membership as to whether the annual conference will be postponed or canceled. It was suggested that a survey be sent out to the membership to learn what their intentions and feelings are around attending given the current COVID-19 situation. At this point in time, the Board agreed to maintain the plans for the October conference as established, monitoring the situation and making adjustments to the plan as needed.

ACTION: C. Mutrie will obtain quotes for event cancellation insurance.
ACTION: C. Mutrie will continue to pursue the amendment for the additional exhibit hall space at the Kalahari.

continued on page 18
continued from page 17

5. Financial Reports
The Board of Directors reviewed and discussed in detail the financial reports current through January 31, 2020. There were no questionable items or variances at this time.

MOTION: A motion to approve the Treasurer’s Report was made by M. Stephanie. R. Mealy seconded. The motion carried.

6. Committee Reports
a. Scholarship – J. Pagel
The website has been updated to include the revised brochure and application. J. Pagel has made contact with various colleges to get postings of our program on their website. She is receiving positive feedback on this request.

b. Awards – D. Lintner
Forms and criteria are being updated. Outreach has also been made to nominators from last year to see if they wish to resubmit names not selected in 2019.

J. Cramer is working on setting up virtual trainings. He anticipates that these will be three-hour trainings from 9:00am-12:00pm.

ACTION: J. Cramer and C. Mutrie will liaise with T. Mulcahy to discuss sponsorship opportunities for the virtual trainings.

d. Regional Coordinator – J. Voigt
All meetings have been cancelled through June 2020. Earlier this year J. Voigt attended several meetings before COVID-19. The regions are looking for guidance from the Board as to future meetings scheduling.

ACTION: The Board will reassess the COVID-19 situation at the end of April and make new recommendations about scheduling of meetings and events at that time.

ACTION: C. Mutrie and J. Voigt will coordinate an e-blast to alert members to the updated position statement on COVID-19.

continued on page 20
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— Greg Lemahieu, Plant Operator at Village of Oostburg
continued from page 18

ACTION: All events through the end of June will be cancelled.

e. Government Affairs – J. Smudder/ J. Pagel
The 2020 GAS was held in Fond du Lac with 223 attendees. It is expected to be profitable in terms of net revenue. WWOA is organizing the meeting in 2020.

f. MWOE – D. Lintner
The 2020 MWOE was successful with 416 total attendees. It is expected to be profitable in terms of net revenue.

g. Biosolids Symposium – B. Brooks/L. Lutz
A unanimous vote by all SBS committee members was made on March 12 to cancel the Spring SBS until 2021. C. Mutrie and L. Lutz will be contacting the hotel to work out financial details and assess and negotiate any damages.

h. Central States Liaison – J. Cramer
The CSWEA conference is being moved to August 2020.

i. Website – J. Cramer/ J. Bratz
The Website Committee recently met and determined that WWOA should generate an RFP to potential hosts for the database and website. It was determined to stay the course with Webfitters for the current year due to the financial uncertainties associated with COVID-19.

j. Technical Program – R. Mealy
Questions were invited on the current layout. A decision with regard to using an online software for program development and management will be discussed at the August Board meeting.

k. Local Arrangements – W. Peterson
A tour venue has been identified: Baraboo.

l. Operators Competition – J. Voigt/R. Mealy
Attention will need to be paid as to how to make this activity safe for participants.

m. Golf Outing – R. Mulcahy
The committee has decided to go with Trappers.

n. Exhibit Committee/ M & C – T. Mulcahy/C. Strackbein
30 exhibitors have registered to date.

(o. Permanent Arrangements – K. Freber
Expanded space at the Kalahari as discussed earlier is being negotiated. As well the proposed contract for 2024 in Appleton is under review.

p. Resolutions and Bylaws – D. Falkner, R. Mealy, J. Hawley
The committee has met twice. The proposed redline versions of the Articles of Incorporation and Bylaws are included with the agenda for this meeting and should be reviewed by members before tomorrow's discussions.

7. Adjournment
MOTION: A motion to adjourn the meeting was made by J. Voigt. Seconded by B. Brooks. The motion carried.

WISCONSIN WASTEWATER OPERATORS’ ASSOCIATION, INC.
BOARD OF DIRECTORS MEETING
April 3, 2020

continued on page 21
continued from page 20

1. Call to order, Roll Call - President J. Smudde
President J. Smudde called the meeting to order at 8:05 am on April 3, 2020.


2. Old Business:
   • WWOA Bylaws Review
     The Board discussed the plan for moving forward with the Bylaws. A two-phase approach is suggested. In Phase I only the most critical items will be marked for amendment. Phase II will involve a complete overhaul of both documents.

     MOTION: A motion to approve the two-phase approach to amending the Articles of Incorporation and Bylaws with Phase I addressing only the most critical amendments and Phase II to look at more comprehensive revision to bring in line with best practices and state requirements was made by Rick Mealy. Seconded by D. Lintner. The motion carried.

   • Service Award Naming Recommendation
     The Board revisited the proposal to rename the Service Award to the Leo Templeton Service Award.

     MOTION: A motion to approve changing the name of the Service Award to the Leo Templeton Service Award was made by J. Simpson. Seconded by J. Cramer. The motion carried.

     MOTION: A motion to revise the awards policy to reflect this name change was made by R. Mealy. Seconded by M. Stephanie. The motion carried.

     ACTION: Criteria, related policy and nomination form will be updated to reflect the change.

   • Storage Unit/Trailer
     Discussion tabled until August 2020.

   • WWOA Banner
     Discussion tabled until August 2020.

continued on page 22
continued from page 21

- Computer and Projector Needs
Discussion tabled until August 2020, when identified needs and estimated pricing will also be available.

3. New Business
- COVID 19
ACTION: An e-blast will be sent that (1) alerts members to the WRWA program to identify individuals who would be willing and able to stand in for operators affected by COVID-19 and (2) notifies facilities to consider donating any unused N-95 masks to the healthcare community.

4. August BOD Meeting – August 12-13, 2020 Kalahari Resort
A decision will be made at the next Board meeting proposed for May whether to hold the August meeting in-person.

5. Adjournment
MOTION: A motion to adjourn the meeting was made by J. Simpson. Seconded by M. Stephanie. The motion carried.

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September 23, 2021
33rd Annual
Classic Collection System Seminar
Watertown, WI

Morning Session:
Collection System Technical Presentations (8:00AM – Noon)

Tentative Topics:
Weather forecasts & effects on collection system
Case Study: Superior, WI- CIPP in brittle unreinforced concrete
Microbial Induced Corrosion (MIC) of Concrete
Safety: Required OSHA certifications for overhead hoists
Cured-In-Place Manhole Lining (CIPM)
Collection Systems and GIS
DNR –Update/safety

Afternoon Session: (1:00PM – 3:00PM)
Vendor presentations, equipment displays, product demonstrations & raffle prizes.

DNR Credit Hours: 6 Credit hours will be available for Wastewater & Septage.

CO-Sponsors: Wisconsin Section – Central States Water Environment Association
Wisconsin Wastewater Operators Association

Online Registration when available- www.cswea.org

Information Contact:
Mark Kolczaski 262-763-7834 Ext. 3359
(Baxter & Woodman)
WWOA Board of Directors meeting minutes March 19, 2020

1. Call to order, Roll Call - President J. Smudde
President J. Smudde called the meeting to order at 9:30 am.

Apologies: J. Cramer

2. Board Meetings and COVID-19 Related Follow Up
The Board acknowledged the April meeting cancelled by the Kalahari in the wake of the COVID-19 situation. Members
are in favor of remote meetings for the association for the near future. A remote Board of Directors meeting via Zoom
will be held April 2-3, with the timing abbreviated both days.

ACTION: J. Smudde will finalize the schedule into two-hour increments over the two-day meeting. He will also prior
to the meeting circulate a draft agenda focusing on critical issues requesting further input from members.
The Board also discussed regional issues around cancellation of meetings and overall guidance from the leadership about
COVID-19.

ACTION: J. Voigt, Regional Coordinator, and C. Mutrie will update the statement to reflect the Board’s advice to cancel all meetings through June 15th. Further guidance will be provided as the situation around COVID-19 is monitored and the WWOA position is reevaluated and updated as needed. Members will also be advised to contact the WDNR directly with questions about certification. J. Voigt will communicate this information and all future guidance and updates to the Regional Directors.

ACTION: C. Mutrie will work with the webmaster to organize an e-blast that also relates this guidance to WWOA members.

3. Adjournment
MOTION: A motion to adjourn the meeting on March 19, 2020, was made by M. Stephanie. Seconded by D. Lintner. The motion carried.
Reminder: Recognize a deserving individual for 2021!

Recognition is something that shows someone the value of their contributions and inspires them and others to continue to work harder at their jobs.

Please, please, PLEASE...nominate someone today for the annual conference awards. There are many people in our industry that are deserving of these awards.

We are looking for nominees for the following awards:

ASSOCIATION AWARDS (Note: WWOA Board members are not eligible for these awards)
George F Bernauer Award:
Koby Crabtree Award:
Albers-Templeton Service Award:
Newcomer of the Year Award:
Membership Award:

REGIONAL AWARD:
Regional Operator of the Year Awards

The nomination form and instructions for all the awards can be found on the WWOA website or by contacting Rick Mealy, Awards Committee Chair, at (608) 220-9457 or email at awards@wwoa.org.

Please note, the Regional Operator of the Year Award nominations should be submitted by July 24, 2021.

All other awards need to be submitted by August 1, 2021.

Feel free to contact me if you would like any further information on the awards, the nomination procedure, or if you have a question if a potential nominee meets specific award criteria.

Thank you in advance for taking the time and effort to nominate individuals and allowing WWOA to recognize these deserving recipients!

Sincerely,
Rick Mealy, Awards Committee Chair

Renew Your Membership

If you haven’t paid your membership dues yet, please do so ASAP!!

You wouldn’t want to miss out on all the exciting news that is in each issue of the Clarifier, now would you?

If you have questions on your membership number, renewal date, or want to pay your renewals, contact c.harris@wwoa.org or call 414-908-4950 x125.
Troubleshooting Corner: Zoogloea and Thauera
by Ryan Hennessy, Microbiology and Operations Specialist for Midwest Contract Operations
rhennessy@mco-us.com

Zoogloea: Zoogloea bacteria are a morphotype/phenotype of bacteria that are commonly viewed within flocs in wastewater treatment processes that are large producers of exoececellular polysaccharide (slime). Zoogloea bacteria types are traditionally associated with low molecular weight organic acids and certain alcohols favoring high F/M (food to microorganism) ratio at the beginning of the aeration basin. (Jenkins, 2004). Zoogloea bacteria types may appear as fingered zoogloea or globular zoogloea with no currently recognized cause for variations of these morphological traits. Fingered and globular zoogloea types are found across municipal plants and various types of industrial wastewater processes. At low to moderate abundance zoogloea bacteria types are believed to be beneficial for floc formation due to their polysaccharide (acts like “glue”) while at higher abundance zoogloea bacteria can create viscous flocs causing poor settling and contributing to foaming.

The MIDAS field guide https://www.midasfieldguide.org/guide recognizes the Zoogloea genus as containing 6 individual species including Zoogloea ramigera, Zoogloea oleivorans, Zoogloea caeni, Zoogloea oryzae and two currently unnamed species. Using phase contrast microscopy zoogloea bacteria types cannot be readily differentiated from the Thauera bacteria genus, which is closely related to zoogloea and suspected to occur at similar growth conditions. Both the genus Zoogloea and Thauera are classified within the Rhodocyclaceae family of the Proteobacteria phylum. The MIDAS field guide references 6 known species within the Thauera genus including Thauera aminoaromatica, Thauera terpenica, and 4 currently unnamed species.

Thauera are versatile in their substrate uptake utilizing aromatic compounds, monoterpenes, amino acids and organic substrates such as sugars, acetate, lactate, pyruvate and ethanol, and can use nitrate, nitrite or oxygen as electron acceptor. Thauera can denitrify when utilizing nitrate as electron acceptor. Zoogloea appear to

continued on page 28
continued from page 27

be less versatile in use of available substrate behaving as chemoorganotrophs (while Thauera can also utilize stored inorganic compounds). Zoogloea are known to use oxygen or nitrate as electron acceptors (when using nitrate they are denitrifiers). While in situ zoogloea bacteria utilize organic acids and at lab scale they have also utilized proteins/amino acids and sugars. Both Zoogloea and Thauera produce PHA (fat storage) which allow them to compete well in conditions of high F/M ratio (in addition to immediate oxidation- treatment they may also store food for later on). From a process control standpoint reduction of zoogloea bacteria types is often successful upon increasing the MLSS concentration or reducing the concentrations of readily available substrate/organic acids. Chlorination is not effective in controlling zoogloea bacteria types and can worsen conditions (killing viable bacteria increases F/M ratio promoting further zoogloea type growth). In conditions of polysaccharide-slime settling issues (viscous weak floc structure) increasing the WAS rate often also worsens the problem. Sludges with high zoogloea bacteria types are often an excellent example of why lowering the MLSS/wasting more does not always equate with improved settling/floc characteristics and why microscopic evaluation/diagnosis of the root cause of a problem is recommended before any operational changes are made. Ongoing research comparing 16SrRNA sequencing results to microscopy reporting also suggest the potential of other genera capable of possessing zoogloea morphology. These candidates include the genus Rhodobacter, Ulginosibacterium, and Aster Bio Tax ID # 31989, 1775411, 75787, 1236 (unclassified Gammaproteobacteria), and 2007894.
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### Clarifier index of advertisers

<table>
<thead>
<tr>
<th>Advertiser</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA Blue Book</td>
<td>5</td>
</tr>
<tr>
<td>Mulcahy Shaw Water-Boerger</td>
<td>6</td>
</tr>
<tr>
<td>Cady Aquastore</td>
<td>7</td>
</tr>
<tr>
<td>B&amp;M Technical Service</td>
<td>8</td>
</tr>
<tr>
<td>B&amp;M Technical Service-Crane</td>
<td>9</td>
</tr>
<tr>
<td>OXBO</td>
<td>10</td>
</tr>
<tr>
<td>Xylem-Flygt</td>
<td>11</td>
</tr>
<tr>
<td>Applied Technologies</td>
<td>12</td>
</tr>
<tr>
<td>LW Allen</td>
<td>13</td>
</tr>
<tr>
<td>Mulcahy Shaw Water-Teledyne ISCO</td>
<td>14</td>
</tr>
<tr>
<td>Dorner</td>
<td>15</td>
</tr>
<tr>
<td>Adaptor</td>
<td>16</td>
</tr>
<tr>
<td>Strand Associates</td>
<td>16</td>
</tr>
<tr>
<td>Staab Construction</td>
<td>17</td>
</tr>
<tr>
<td>Ruekert-Mielke</td>
<td>18</td>
</tr>
<tr>
<td>Badger Labs</td>
<td>18</td>
</tr>
<tr>
<td>Energenecs-Huber</td>
<td>19</td>
</tr>
<tr>
<td>MSA</td>
<td>20</td>
</tr>
<tr>
<td>McMahon</td>
<td>21</td>
</tr>
<tr>
<td>Symbiont</td>
<td>22</td>
</tr>
<tr>
<td>Energenecs</td>
<td>23</td>
</tr>
<tr>
<td>JF Ahern</td>
<td>25</td>
</tr>
<tr>
<td>Donohue</td>
<td>26</td>
</tr>
<tr>
<td>B&amp;M Technical Service-ShinMaya</td>
<td>27</td>
</tr>
<tr>
<td>Clark Dietz</td>
<td>28</td>
</tr>
<tr>
<td>Visu-Sewer</td>
<td>28</td>
</tr>
<tr>
<td>Clearas</td>
<td>29</td>
</tr>
<tr>
<td>Process Equipment Repair Services</td>
<td>30</td>
</tr>
<tr>
<td>Crane Engineering</td>
<td>31</td>
</tr>
<tr>
<td>North Central Laboratories</td>
<td>Back cover</td>
</tr>
</tbody>
</table>

---

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