

OFFICIAL BULLETIN

VOLUME 107

OCTOBER - DECEMBER 2019

NUMBERS 10-12

WINTER ISSUE

NORTH DAKOTA WATER AND POLLUTION CONTROL CONFERENCE

NDWPCC

water | transportation | municipal | facilities

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how do you reach excellence?



Editor
Jake Schafer

Business Manager
Laura Lee

Contributing Authors
Drinking Water Program Staff
NDWPCC Officers
AWWA Officers

OFFICIAL BULLETIN

Official Publication of the
North Dakota Water and Pollution Control Conference

Winter Issue

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NOS. 10-12

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Snowden

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Members of the conference are indebted to those members and others
who have contributed articles and other materials for this publication.

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claims made therein.

Article II of the Constitution of the *North Dakota Water and Pollution Control Conference*

The objectives of this Conference shall be: the advancement of the knowledge of design,
construction, operation and management of water, wastewater systems, and stormwater
systems; the promotion and encouragement, through annual meetings or otherwise, of
an exchange of information and experience among its membership; the promotion and
encouragement of the protection of public health and improved environment through the
construction and efficient operation of water supply, wastewater treatment facilities and
stormwater treatment; and the promotion of water, wastewater, and stormwater system
operator education and certification programs.

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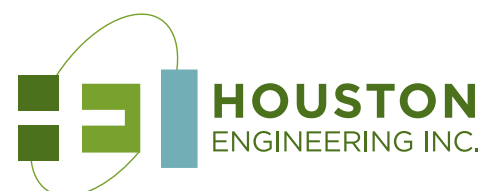
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NDWPCC JOINT BOARD OFFICERS MEETING MINUTES
October 8th, 2019
Bismarck, ND

A meeting of the Joint Board of Directors of the North Dakota Water and Pollution Control Conference (NDWPCC); North Dakota Water Environment Association (NDWEA); North Dakota Chapter of the American Public Works Association (NDCAPWA); North Dakota Section of the American Water Works Association (NDAWWA); and the North Dakota Chapter of the American Stormwater and Erosion Control Association (NASECA-ND) was held on October 8th, 2019, in the Governor's Room of the Ramkota, Bismarck, ND. The following board members and guests were present: Mike Berg, Raj Bhattarai, David Bruschwein, Tracy Eslinger, Sarah Waldron Feld, Joe Ferguson, Bill Gefroh, Rick Gillund, Fred Goetz, Erik Gilbertson, Troy Hall, Marty Haroldson, Shawn Heinle, Jeff Hruby, Barry Johnson, Alan Kemmet, Jasper Klein, Wei Lin, Lance Meyer, Matt Moltzan, Michael Quamme, Meredith Quinn, Jake Schafer, Gabe Schell, Scott Schneider, Dean Sletten, Luci Snowden, Matt Sperry, Don Wald, Greg Wavra, Adam Zach, and Gary Zuroff.

The meeting was called to order at 9:40 a.m. by NDWPCC President Mike Berg. Copies of the meeting agenda and January 1 through October 4, 2019, financial report was provided to those in attendance.

The first order of business President Berg called for a motion to dispense with the reading of the minutes from the May 22, 2019 minutes and approve the copy mailed to all board members. Michael Quamme so moved, Tracy Eslinger seconded, and the motion carried.

Next, President Berg called for the Treasurer's Report. Shawn Heinle read the 2019 NDWPCC financial report, which showed a net gain of \$61,936.00 and total assets of \$212,404.94. President Berg asked for any discussion. Hearing none, President Berg called for a motion to approve the Treasurer's Report. Dean Sletten so moved, Scott Schneider seconded, and the motion carried.

Next, President Berg called for any old business. No old business.

President Berg called for new business. First, Mr. Berg asked for volunteers to serve on the nominating committee. Luci Snowden, Bill Gefroh, and Mike Berg volunteered. Also, the auditing committee needed three volunteers. Alan Kemmet, Scott Schneider, and Tracy Eslinger volunteered. Shawn Heinle then discussed the activities for the 2019 Conference. He indicated that conference booklet contained all the meeting times, presentation times, the golf tournament, and tour. President Berg then asked for nominations of Life Membership, there were none. Mr. Heinle also asked for presenters at the Spring trainings. The dates will be as follows:

March 2-4, 2020
March 9-11, 2020
March 23-25, 2020
March 30 – April 1, 2020
April 13-15, 2020
April 20-22, 2020

Mr. Heinle then proposed the Conference explore its own website. He indicated it would allow him to upload current agendas, meeting dates, and could be linked to the Eventbrite registration site. There was a lot of discussion that followed. Jake Schafer indicated creating a site through an online domain is relatively inexpensive. Tracy Eslinger inquired about just using the Department website. Greg Wavra said the Department sight contains a lot of information and is

not easy to navigate. Sarah Waldron Feld asked if the website could be linked to the Department's website. Bill Gefroh asked if the groups that comprise the conference would be associated with the website. Mr. Heinle indicated that would be a possibility. Tracy Eslinger said we should explore existing website to evaluate what we would want. It was decided to form a committee that will explore various website options and costs. They will present their findings at the Joint Board meeting in January. The committee volunteers include Luci Snowden, Jake Schafer, Shawn Heinle, Alan Kemmet, Tracy Eslinger, and Matt Moltzan.

Next, Jacob Schafer spoke about changes with the Official Bulletin. First, the publication dates. The Spring issue will cover January to April, with publication in May. Articles submitted no latter than April 30th. The Pre-Conference issue will cover May to August, with publication in September. Articles no latter than August 31st. The Winter issue will cover September to December, with publication in January. Articles no latter than December 31. Mr. Schafer then spoke on changes to Adobes tech support and how Adobe is switching to a cloud-based system with a monthly fee of about \$53.00/month or \$636/year. Jake said he can explore other options, and Dean Sletten said to report back on the findings in January. Tracy Eslinger looked at the Adobe cost and said it would not cost the Conference much. Dean agreed. Meredith Quinn suggested that Jake should present his opinion on what option he prefers since he is the editor and will be using the program.

Lastly, Michael Quamme proposed that a representative from each conference group, along with Mr. Heinle, comprise a committee that will review submitted presentation proposals and make presentation selections for upcoming conferences. Meredith Quinn suggested that a form be emailed, with a submittal date range and deadline. Similar to the AWWA's submittal process of March to May with a deadline of June 15. Shawn Heinle seconded. The proposal passed. Each group will present their selected representative at the January joint board meeting.

President Berg then called for a motion to adjourn. Motion made by Dean Sletten, seconded by Rick Gillund. Meeting adjourned.

The meeting adjourned at 10:45 a.m.

Respectfully submitted,

Shawn Heinle
Secretary/Treasurer

SH:ll

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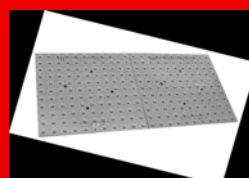
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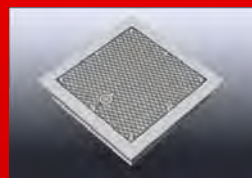
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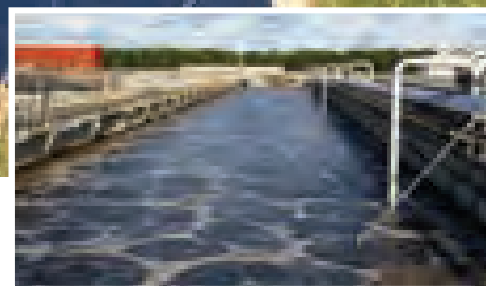
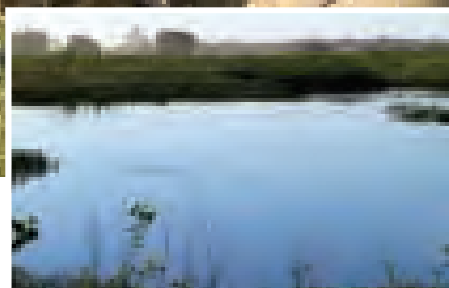
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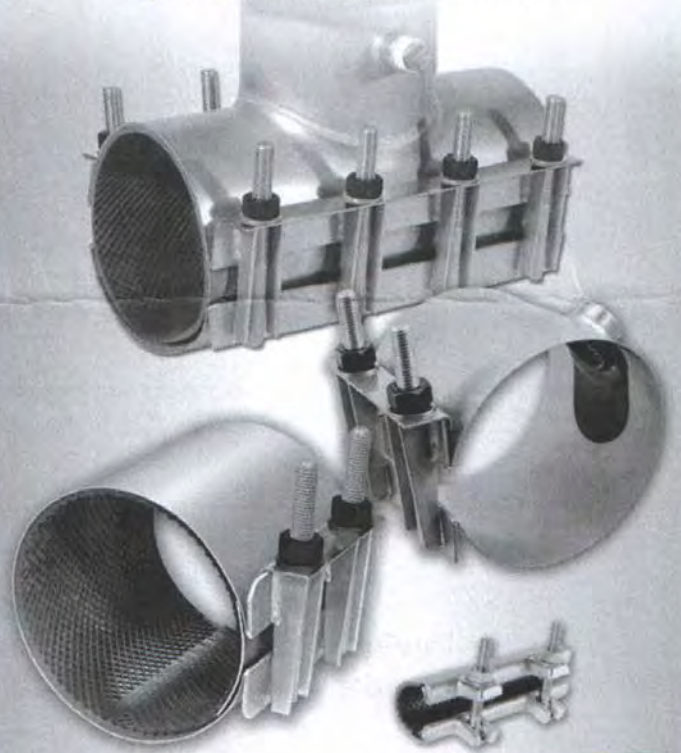
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Operator of the Year Awards

Thank you for your hard work!

The North Dakota Department of Environmental Quality, in an effort to encourage proper operation and maintenance of water and wastewater systems, instituted an annual operator awards program in 1981 at the Annual North Dakota Water and Pollution Control Conference in Jamestown. This year marks the 39th anniversary of the awards program which has honored 200 plus operators and three military units (the U.S. Army Reserve, the ND Army National Guard, and the ND Air National Guard) for outstanding service.

The awards are based on:

1. Field and inspection reports.
2. Compliance with state and federal regulations.
3. Participation in the North Dakota Operator Training and Certification Program.
4. Participation in the North Dakota Water and Pollution Control Conference, North Dakota Chapter of the American Public Works Association, North Dakota Water Environmental Association, the North Dakota Section of the American Water Works Association, and the North Dakota Chapter of the North American Stormwater and Erosion Control Association.

Recipients of the 2019 Operator of the Year Awards are:


James Kershaw – City of Bismarck

Jim Kershaw graduated from the Power Plant Technology course at Bismarck State College in February 1984. In March of 1984 he was hired as an operator for the City of Bismarck Water Treatment Plant. Jim was a shift operator for 29 years. He then became the Water Plant supervisor in February of 2013. Jim has been in the role of Superintendent of the Bismarck Water Treatment Plant since September of 2017. In the past few years he has tried to be as active as possible in the AWWA as a board member for the ND section, and serving on the BSC Water and Wastewater Technology Advisory Committee. Jim has also been a 30 plus year member of the Sterling ND Lion's Club and serves on the board of Directors for the Bismarck Rural Fire Department. In the past he has also competed in many different action shooting competitions. In his spare time, Jim likes to hunt, shoot, reload ammunition, cook and Bar-B-Q. Jim and his wife Lori have 3 grown children and enjoy their 4 grandchildren. Jim looks forward to helping develop the current water plant staff for the future, and he hopes to serve the City of Bismarck for at least another 10 years

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Ronald Narum – City of Rutland

Ronald Narum has served as mayor of Rutland since 1972. In addition, Ron has been the City Water Works Supervisor and manages the municipal waste site, and all water and sewer needs and general building maintenance for the City. Ron has served as state softball commissioner, vice-president of the Rutland Community Development Corporation, President of the Sargent County Job Development Authority and was named Citizen of the Year in 1992 by the ND League of Cities. He worked for Melroe Company for 34 years before his retirement. He was named “City Elected Official of the Year 2008” by the ND League of Cities and he served on the League Board, representing cities under 2,500 population, for several years. Ron is president of the Sargent County Museum Historical Society. He was an active firefighter from 1965-2014 and was the past Fire Chief of the Rutland-Cayuga Rural Fire District and Secretary Treasurer of the Fire District Board. He was fundamental in establishing in the fire district. He was inducted into the ND Firefighter’s Museum Hall of Fame in 2015. He serves on the Lake Agassiz Regional Development Corporation Board. Ron is Chairman of the Sargent County Weed Control Board and has served on many area boards.

Matt Routledge – City of Bismarck

Matt worked as a part-time employee for the City of Minot in the Sewer Department from 2001-2002. After moving to Bismarck, he began working full-time for the city in 2007 as a Water and Wastewater Maintenance Technician. In 2017, Matt was promoted to Water Distribution and Wastewater Collection Supervisor. Matt is a certified Grade 04 Water Distribution and Grade 04 Wastewater Collection Operator.

Past Recipients: Operator of the Year Awards

2018	Roger Kristiansen, Napoleon Dan Schaefer, All Seasons WD Donald Vetter, South Central RWD Allan Weiand, Wahpeton	2013	Darrell Haman, Towner Don Hartman, Wildrose Bradley Moser, Medina Dale Neubauer, Fargo	2007	Duane Golliet, Fargo Raymond Peterson, Fargo Terry Rust, West Fargo Jerome Olson, Traill Rural Water District
2017	Kenny Bergstrom, Williston Mike Hall, Lake Metigoshe Recreation Service District Alice Pekarski, Montpelier Stephen Weiser, Richardton	2012	Alan Beyries, Garrison Frank Mosser, Maddock Sam Shutt, Minto Michael Tank, Medora	2006	Kelly Berentson, Westhope Jerry Imhoff, Elgin Jay Haugen, Michigan
2016	Dane Fuchs, New Salem Brian Harrington, Carrington Grace Rixen-Handford, Southwest Water Authority Jerry Tufte, Glenfield	2011	Kent Bickler, R&T Water Supply Mike Houska, Grafton Rick Larson, Rugby William “Bill” McQuiston, Williston	2005	Keith Olson, Harvey Bob Weninger, Harvey Ken Blilie, Kindred Del Kindelspire, LaMoure
2015	Kelly Jemtrud, Velva Barry Schulz, Missouri West Water System John Silvenail, Lisbon Dell Widmer, Kulm	2010	Wade Hesch, Valley City Mark Peterson, Fargo Donald Wald, Wahpeton Keith Winson, Maddock	2004	Ron Hendrickson, Fargo Pete Bilstad, Fargo Delvin Stemen, Burlington Mark Paddock, Burlington
2014	Clay Kruger, Riverdale Wayne Offerdahl, Fargo Lyle Quenzer, South Central Water District Adam Thomas, Washburn	2009	Dennis Larson, Park River Ken Miskavige, Grafton Gary Neuberger, Beulah Jason Sorenson, Minot	2003	Rick Anderson, Central Plains Water District Keith Fulsebakke, Bottineau Don Horning, Zap
		2008	Bill Gefroh, Bismarck Steve Himmelspace, Mandan Richard Jacobson, Hazen Roy Hayes, Hazen	2002	Arlis Bischoff, Grafton Allan Kraft, Cavalier Doug Neibauer, South Central Regional Water District Gary Zander, Mandan

2001	Verdeen Backstrom, Minnewaukan Jerome Broz, Fairmount Jack Knudson, Jamestown Paul Lacina, Barnes Rural Water	City of Grand Forks Water Treatment Plant Operators and Employees Brian Borden Jason Coyle Andy Job Greg Batzer Steven Bolton David Brose James Evenson John Ferguson Larry Hadland Erik Johnson, Jr. Richard Jurgens Rodney Kalis Ken Mather Robert Peterson Wayne Tunseth Dan Tupa Craig Lacher Steve Kolar Linda Schumacher Hazel Sletten	City of Grand Forks Wastewater Operators (Storm and Wastewater Departments) Thomas Helle Kenneth Stevenson Peter Aamold Dennis Dunn Robert Fetsch Duane Fontaine Gary Goetz Dennis Gunderson Edward Haskell David Kresel Thomas Mikelson Lawrence Morrison Carl Sherlock Richard Winkels
2000	Tim Gjovig, Crosby Jim Fixen, Alexander Ed Rekkedal, Arvilla Reuben Grosz, Bismarck		
1999	Richard Wanner, Bismarck Tom Sieg, Anamoose Ron Kleven, Grafton Bill Emerson, Minot		
1998	Bill Link, Walsh Water Users Ross Carter, Sherwood Bob French, Bismarck Terry Leingang, Riverdale		1996 Randy Seelig, Lisbon Skip Rapp, Dickinson Larry Thomas, Washburn Gary Hager, Upper Souris Water Users
1997	Staff Members of the 348th Quartermaster Detachment (Water Purification) United States Army Reserve	City of Grand Forks Water Distribution Operators Ron Borden Darrel Danielson Robert Deitz Perry Hart Jackie Heidrich Michael Klemisch David Kratochvil Dennis Kulas Shirley Litchy John Scheffer Mark Skow Peter Stoute Randy Thompson Dwight Wurzbacher Donald Zhorela	1995 Brad Moser, Medina Les Sigette, McVile Don Olafson, Valley City Charles Jaszowskiak, Bismarck
	Staff Members of the 136th Quartermaster Battalion North Dakota Army National Guard		
	Staff Members of the 119th Civil Engineering Squadron North Dakota Air National Guard		1994 Gregg Christensen, Cass Rural Water Users Gordon Johnson, North Valley Water Assoc. Kerry Miller, Stanton Virgil Sund, Oakes
	Operators of Grand Forks-Traill Water Users Randy Loeslie Mike Thompson Neil Breidenbach Ray Rakoczy		1993 Jeff Huwe, Columbus Clay Pettys, Lake Metigoshe Recreation Service Dept. Richard Resell, Williston
	Operators of Agassiz Water Users Gus Cronquist Clark Cronquist		1992 Dave Auch, Mandan Joel Heitkamp, Southeast Water Users Michael Schneider, Jr., Strasburg Joseph Leo Tupa, Grand Forks

- | | |
|--|--|
| <p>1991 Jim Moe, Devils Lake
Lyle Mitzel, Wahpeton
Joe Manning, Fargo
Howard Plum, Maddock</p> <p>1990 Keith Demke, Bismarck
Rick Gillund, Enderlin
Greg Nordsven, Killdeer
Byron Thronson, Minot</p> <p>1989 Ed Braunagel, Harvey
Greg Larson, R&T Water Supply
Ingram Opp, New Salem
Dale Townsend, Carrington</p> <p>1988 David Burckhard, Minot
Ray Feltman, Minto
Dale Hanson, Valley City
Robert Job, Linton</p> <p>1987 Don Erickson, Watford City
Dave Johnson, Washburn
Marvin Johnson, Jamestown
Harland Peterson, Carrington</p> <p>1986 Dan Reiter, Minot
Larry Thelen, South Central Regional Water
District
Bill Werle, Velva
Jerry Zander, Mandan</p> | <p>1985 Ray Foss, Hillsboro
Phil Furaus, Harvey
Francis Leintz, Lisbon
LaRay Reis, Lisbon
Dwight Wurzbacher, Grand Forks</p> <p>1984 Larry Boepple, Halliday
Lester Carman, Bismarck
Joe Roshau, Killdeer
Beven Shaw, Williston</p> <p>1983 Gary Armstrong, Rolla
Cliff D'Heilly, Neche
Virgil Houim, Rugby
Bud Lund, Bismarck
Arnonld Stokkeland, Cooperstown</p> <p>1982 Fred Clark, Grafton
Harry Hanks, Beulah
Don Larson, Gwinner
Bill Mendewald, Hankinson
John Muus, Grand Forks</p> <p>1981 Marvin Baska, Mohall
Alvin Carlson, Langdon
Al Swanson, Jamestown
Gene Thomas, McVile
Casper Volk, Rugby</p> |
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91st ANNUAL MEETING OF THE NORTH DAKOTA WATER AND POLLUTION CONTROL CONFERENCE

The 91st Annual Meeting of the North Dakota Water and Pollution Control Conference (NDWPCC) was held October 8, 9, and 10, 2019, at the Ramkota, Bismarck, North Dakota. The annual meeting/convention was held jointly with the North Dakota Chapter of the American Public Works Association (NDCAPWA), the North Dakota Water Environment Association (NDWEA), the North Dakota Section of the American Water Works Association (NDAWWA), and the North Dakota Chapter of the North American Stormwater and Erosion Control Association (NASECA-ND).

There was a pre-conference Workshop on The Power of Partnership: Sharing Resources with Neighboring Systems, Monday, October 7, 2019, from 9:00 a.m. to 4:30 p.m. in the Governor's Room of the Ramkota, 800 S. 3rd Street, Bismarck, ND.

Board meetings were held Tuesday, October 8, 2019, by NDAWWA at 7:30 a.m. in the Governors Room, NDCAPWA at 8:00 a.m. in Room 2160, NDWEA at 8:00 a.m. in Room 3130, and Wednesday, October 9, 2019, by NASECA-ND at 8:00 a.m. in Room 3130. The associations planned their business meetings, gave committee reports, and accepted volunteers for committees. Association business meetings were held Tuesday, October 8 (NDCAPWA); Wednesday, October 9 (NDAWWA); and Thursday, October 10 (NDWEA and NDWPCC).

Midwest Assistance Program held an Emergency Response/Vulnerability Assessment training Tuesday, October 8, 2019, from 7:30 to 11:30 a.m. in the Cannonball Room. Wastewater Operator pH Certification training was held 9:00 to 11:00 a.m. at the Environmental Training Center. Registration opened at 8:00 a.m., Tuesday, October 8, 2019, with Patty Carman, Laura Lee, Stacey Herreid, Alexis Steinman, Jacob Stokes, Jake Schafer, Bob Markhouse, Mike Trythall and Shawn Heinle welcoming all attendees. A total of 380 preregistered with final attendance being 385.

A meeting of the Joint Board of Directors of the North Dakota Water and Pollution Control Conference (NDWPCC); North Dakota Water Environment Association (NDWEA); North Dakota Chapter of the American Public Works Association (NDCAPWA); North Dakota Section of the American Water Works Association (NDAWWA); and the North Dakota Chapter of the American Stormwater and Erosion Control Association (NASECA-ND) was held on October 8th, 2019, in the Governor's Room of the Ramkota, Bismarck, ND. The following board members and guests were present: Mike Berg, Raj Bhattarai, David Bruschwein, Tracy Eslinger, Sarah Waldron Feld, Joe Ferguson, Bill Gefroh, Rick Gillund, Fred Goetz, Erik Gilbertson, Troy Hall, Marty Haroldson, Shawn Heinle, Jeff Hruby, Barry Johnson, Alan Kemmet, Jasper Klein, Wei Lin, Lance Meyer, Matt Moltzan, Michael Quamme, Meredith Quinn, Jake Schafer, Gabe Schell, Scott Schneider, Dean Sletten, Luci Snowden, Matt Sperry, Don Wald, Greg Wavra, Adam Zach, and Gary Zuroff.

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April 13-15, 2020
April 20-22, 2020

Mr. Heinle then proposed the Conference explore its own website. He indicated it would allow him to upload current agendas, meeting dates, and could be linked to the Eventbrite registration site. There was a lot of discussion that followed. Jake Schafer indicated creating a site through an online domain is relatively inexpensive. Tracy Eslinger inquired about just using the Department website. Greg Wavra said the Department sight contains a lot of information and is not easy to navigate. Sarah Waldron Feld asked if the website could be linked to the Department's website. Bill Gefroh asked if the groups that comprise the conference would be associated with the website. Mr. Heinle indicated that would be a possibility. Tracy Eslinger said we should explore existing website to evaluate what we would want. It was decided to form a committee that will explore various website options and costs. They will present their findings at the Joint Board meeting in January. The committee volunteers include Luci Snowden, Jake Schafer, Shawn Heinle, Alan Kemmet, Tracy Eslinger, and Matt Moltzan.



Next, Jacob Schafer spoke about changes with the Official Bulletin. First, the publication dates. The Spring issue will cover January to April, with publication in May. Articles submitted no later than April 30th. The Pre-Conference issue will cover May to August, with publication in September. Articles no later than August 31st. The Winter issue will cover September to December, with publication in January. Articles no later than December 31. Mr. Schafer then spoke on changes to Adobes tech support and how Adobe is switching to a cloud-based system with a monthly fee of about \$53.00/month or \$636/year. Jake said he can explore other options, and Dean Sletten said to report back on the findings in January. Tracy Eslinger looked at the Adobe cost and said it would not cost the Conference much. Dean agreed. Meredith Quinn suggested that Jake should present his opinion on what option he prefers since he is the editor and will be using the program.

Lastly, Michael Quamme proposed that a representative from each conference group, along with Mr. Heinle, comprise a committee that will review submitted presentation proposals and make presentation selections for upcoming conferences. Meredith Quinn suggested that a form be emailed, with a submittal date range and deadline. Like the AWWA's submittal process of March to May with a deadline of June 15. Shawn Heinle seconded. The proposal passed. Each group will present their selected representative at the January joint board meeting.

President Berg then called for a motion to adjourn. Motion made by Dean Sletten, seconded by Rick Gillund. Meeting adjourned.

The meeting adjourned at 10:45 a.m.

Water samples for the 28th Annual Water Taste Test, sponsored by NDAWWA were accepted throughout the day Tuesday with nine public water systems competing. The Tuesday luncheon and NDCAPWA business meeting were held in the Courtyard with NDCAPWA Chair, Erik Gilbertson, presiding. Bismarck Mayor, Steve Bakken, welcomed all attendees on behalf of Bismarck.

The annual golf tournament was held at Hawktree Golf Course on Tuesday, October 8, 2019 with Alan Kemmet from the local arrangement committee in charge.

Tuesday sessions started at 1:30 pm and were held in the Heart Room, the Missouri Room and the Cannonball Room. Tuesday's sessions were moderated David Bruschwein, NDDEQ, Michael Quamme, Apex, and Gary Zuroff, Dickinson.

Tuesday topics included:

- “Fluoridation Facts and Fiction” – Johnny Johnson, President, American Fluoridation Society
- “H₂O-Why Water is Different than Other Molecules” – Todd Seibel, Bismarck State College
- “AWIA: The Law You Need to Know if You Serve Over 3,330 Customer” – Kyle St. Clair, EPA Region 8
- “Are Your Bugs Happy? Treatment Optimization and Stabilization” – Harvey Gullicks, AE2S
- “Backflow Prevention” – Mitch LeBas, Backflow Prevention Services
- “Collection System Fundamentals” – Ben Julson, AE2S
- “Odor and Corrosion Fundamentals” – Harvey Gullicks, AE2S
- “Asbestos Pipes” – Justin Otto, NDDEQ
- “Implementing Single Stream Recycling in Western ND” – Rachel Shumaker, City of Dickinson
- “Small Cell Wireless” – Gabe Schell, City of Bismarck
- “Biosolids Dewatering Case Studies” – Delron Peters, HDR
- “Electrical Use Tracking and Cost” – Troy Hall, City of Fargo and Adam Wahler, AE2S

The 3:00 p.m. break was held at the Lobby Area with all breaks sponsored by the business firms, vendors, and commercial suppliers listed in the program.

Early set up for the 31st Annual Exhibitor Program was from 4:00 to 9:00 p.m. on Tuesday in the Dakota Ball Room. Late set up was from 6:30 to 7:30 a.m. on Wednesday, October 9, 2019. Display hours were from 7:30 to 11:30 a.m. with 60 firms/suppliers reserving 65 booths. A breakfast buffet sponsored by the exhibitors was held from 8:00 to 10:00 a.m. along with a breakfast buffet poker game. Poker hands were turned in at the registration desk and the registration table, with winners announced at the Wednesday Banquet. Poker dealers included; AE2S; Apex Engineering Group; Backflow Prevention Services; Bolton & Menk; Core & Main; HDR; Interstate Engineering; K LJ; Moore Engineering; and American Fluoridation Society. The following business firms, suppliers and associations participated in the exhibitor program: NDAWWA; NDWEA; NDCAPWA; Ackerman-Estvold; AE2S; American-USA; Apex Engineering Group; Bartlett & West; Bolton & Menk; Braun Intertec; Core & Main; Dakota Pump & Controls; Dakota Supply Group; ESS brothers; Ferguson Waterworks; Flow Control; Great Northern Environmental; Hancock Concrete; Hawkins; HDR; Houston Engineering; Innovative Foundation Support works; Interstate Engineering; Kamstrup; K LJ; KLM Engineering; Larson Data Communications; Leonard Rice; Metrohom USA; Moore Engineering; MNX Inc/Triplepoint; MVT L; NDRWSA; ND Sewage Pump & Lift; NDSU/NDLTAP; Normont Equipment; Novaspect; Oral Health; Sanitation Products; SEH; Tech Sales; Sherwin Williams; Thein Well; Themec Coating; Treatment Resources; Ulteig; USDA-Rural Development; Vector Construction; Vessco; Widseth Smith Nolting; and William E Young.

The Annual Public Works Directors’ and City Engineers’ meeting was held Wednesday, October 9, 2019, at 9:00 a.m. in the Govenors Room.

The NDAWWA luncheon and business meeting was held at 12:00 p.m. in the Courtyard with NDAWWA President, John Goetz, presiding. Also, Guest Speaker, Elizabeth Carter, Vice-President, AWWA, updated the members on AWWA activities.

The Wednesday concurrent sessions started at 1:30 p.m. with Rick Gillund, Enderlin, Sarah Waldron Feld, NDDEQ, and Erik Gilbertson, Moore moderating.

Wednesday's topics included:

- "SCADA Security Strategies to Ensure Reliability" – Michael Chorne, AE2S
- "Planning for the Future: The Role of Water Distribution Modeling in Master and Capital Improvement Planning" – Michael Quamme, Apex
- "Metal Eating Bugs: A Case of Microbiologically Influenced Corrosion" – Jim Lennington, Bartlett & West
- "NAWS Biota Water Treatment Plant" – Alan Kemmet, Houston Engineering
- "Wahpeton Pond Study" – Don Wald, Wahpeton
 - "Mandan Diesel Fuel Remediation Project" – Jim Neubauer, Mandan
- "Wipes and Grease Control" – Dean Woehl, Bismarck
- "Dental Amalgam" – Bill Gefroh, Bismarck and Marty Haroldson, NDDEQ
- "H2S in Wastewater" – Bill Gefroh, Bismarck
- "Using New Aeration Technology to Rehabilitate Wastewater Lagoon Systems" – Brady O'Leary, TriplePoint Environmental
- "UAV in Public Works" – Brian Simmons and Kyle Mullen, Bolton & Menk
- "Medora Wastewater Treatment Improvements" – Mike Berg, Apex
- "Endless Configurations – Elements of Well Field Design" – Mike Plante, Leonard Rice, Inc.

Attendees met at 3:00 p.m. in the Registration Area for an afternoon break.

A social hour was held from 5:30 to 6:30 p.m. in the Courtyard prior to the awards banquet. The following companies graciously sponsored the social hour, door prizes, coffee breaks, and golf tournament:

Platinum Level: Bartlett & West, Bolton & Menk, Hawkins, and Moore Engineering

Gold Level: Apex Engineering, Ferguson Waterworks, Great Northern Environmental, HDR, Interstate Engineering, Jet-Way Services, and Novaspect

Silver Level: Ackerman-Estvold, SHE, Travis Cummings, Vector Construction, and Williams Young.

The annual banquet and awards ceremony were held in the Dakota Ballroom with 155 members and guests in attendance. Mike Seminary served as master of ceremonies introducing the officers and dignitaries at the head table and calling on Chaplain Greg Carr to deliver the invocation.

After dinner, Mr. Seminary called on the visiting dignitaries to present the 2019 awards. Elizabeth Carter, Vice-President, AWWA presented the Operator Meritorious Award to Randy Seelig, City of Lisbon. She then presented the Fuller Award to Joe Ferguson, City of Grand Forks.

Then Michael Quamme, NDAWWA, announced Kris Knutson as the 2019 poster winner.

Next, Mr. Zach indicated that nine public water systems participated in the 28th Annual Water Taste Test with the City of Lisbon being the 2019 winner.

Next, Erik Gilbertson, President, NDCAPWA, announced the 2018 APWA Project of the Year Awards with the City of Langdon receiving the small system award and the City of Minot Water Treatment Plant receiving the large system award.

Raj Bhattarai, WEF Trustee, presented the Bedell Award to Gary Zuroff, City of Dickinson. He then presented the Hatfield Award to Don Wald, City of Wahpeton.

Next, Bill Gefroh, NDWEA, present the 5S pins to Steve Himmelspace, City of Mandan, Jessica Wagner, KLJ, and Gary Zuroff, City of Dickinson. An Honorary pin was also presented to Raj Bhattarai, WEF Trustee.

Next, Shawn Heinle, NDDOH, presented Operator of the Year Awards to James Kershaw, Water Treatment Plant Superintendent, City of Bismarck; Ronald Narum, City Superintendent, City of Rutland; and Matt Routledge, Water Distribution and Wastewater Collection Supervisor, City of Bismarck.

Mr. Heinle also announced the winning poker hands.

The three Thursday morning concurrent sessions started at 8:00 a.m. with Shawn Heinle, NDDEQ; Marty Haroldson, NDDEQ; Brett Mock, AE2S, moderating.

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Thursday's topics included:

- "Backflow Prevention" – Mitch LeBas, Backflow Prevention Services
- "Solids Precipitation and Water Quality in a Home" – Bill Gefroh and Michelle Klose, Bismarck
- "Distribution/Premise Plumbing Panel Discussion" – Mitch Lebas, Backflow Prevention Services, Brent Beechie, ND Plumbing Board, Greg Wavra, NDDEQ, Bill Gefroh, Bismarck, and Michelle Klose, Bismarck.
- "Speed Dating" – NDWEA Members
- "NDDEQ Regulation Updates" – Marty Haroldson and Sarah Waldron Feld, NDDEQ
- "Bismarck Southside Stormwater Improvements" – Scott Schneider, Apex
- "Better Prediction of Urban Flood Risk Using 2D Models" – Justin Klabo, AE2S
- "Alternative Approaches to Sizing Multiple Water Quality BMP's in Large Watersheds" – Jeff Hraby, AE2S
- "What is Water? The Evolving Definition of Water in the U.S." – Daniel DeJoode, Braun Intertec
- "City of Bismarck Stormwater Approval Process Panel Discussion" – Gabe Schell, Bismarck Mike Greer, Bismarck Ken Nysether, SHE, Brad Krogstad, KLJ, and Hunt Boustead, Trademark Reality

A break was held at the Registration Area at 10:00 a.m.

The joint business meetings and luncheon of the NDWEA and NDWPCC were held at 12:00 noon Thursday, October 10, 2019, with the NDWEA Past President Marty Haroldson and NDWPCC President Mike Berg presiding. Past President Haroldson opened the NDWEA meeting at 12:30 p.m. with the NDWEA financial report and announcement the slate of officers.

Next, Raj Bhattarai, WEF Trustee, spoke on current WEF programs.

President Berg called the NDWPCC meeting to order at 1:05 p.m. As the first order of business President Berg called for a motion to dispense with the reading of the minutes from the 2018 annual meeting in Grand Forks and approve the minutes as published in the Official Bulletin, October-December 2018, Volume 106, Numbers 10-12. Luci Snowden so moved. Sarah Waldron Feld seconded, and the motion carried.

Next, Mr. Heinle presented the 2018 NDWPCC financial report, showing a net income of \$61,936.00 and total assets of \$212,404.94. President Berg, called for a motion to approve the financial report. Jake Schafer so moved. Gary Zuroff seconded, and the motion carried.

Next, President Eslinger ask for nominations for life membership. Hearing none, President Berg called for a motion to close nominations. Jake Schafer so moved. Karla Olson seconded, and the motion carried.

Next, Chair of the Nominating Committee, Bill Gefroh, read the slate of officers received from the nominating committee:

Wei Lin, President
Michael Quamme, President Elect
Jim Lennington, Vice-President
Lance Meyer, Director
Scott Schneider, Director
Gabe Schell, Director
Luci Snowden, Director
Jeannie Shultz Mock, Associate Director
Shawn Heinle, Secretary-Treasurer

President Berg called for other nominations from the floor. Hearing none, President Berg called for a motion to close nominations and the secretary to cast a unanimous ballot. Tim Paustian so moved. Matt Sperry seconded, and the motion carried.

Next, President Wei Lin presented outgoing President Berg the NDWPCC President's Service Award and thanked him for his dedicated service.

President Wei Lin called for a motion to close the meeting. Michael Quamme so moved. Matt Sperry seconded, and the 91st Annual Meeting of the NDWPCC adjourned at 1:30 p.m., Thursday, October 10, 2019.

Respectfully submitted,

Shawn Heinle
Secretary-Treasurer

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NDSU Students Win 2019 Environmental Challenge



A team of students from the NDSU Department of Civil and Environmental Engineering won the 2019 Environmental Challenge. The competition was held at the Minneapolis Convention Center Nov. 7 as part of the annual Conference on the Environment.

This year's competition was focused on reducing chloride discharge from ion exchange water softeners used by residents and industries in a hypothetical small town. Teams are judged on written reports, table-top displays and formal presentations.

"This event gave our students the chance to use the knowledge they learned in the classroom to solve a real-world problem," said Wei Lin, associate professor of civil and environmental engineering.

Students were asked to analyze existing data and establish a chloride reduction goal; present and evaluate alternatives for chloride reduction; propose capital improvements at the water treatment plant and wastewater treatment plant; propose changes to industrial user agreements and city ordinances; and provide cost estimates and analyses.

Eight teams from four universities participated in the 2019 Environmental Challenge. NDSU's team included students Troy Borud, Dustin Grandbois, Mara Roteliuk and Arianna Christian.

The event is sponsored by the Air & Waste Management Association-Upper Midwest Section and Central States Water Environment Association-Minnesota Section.

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2019 Conference Attendance List

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Pete Aamold Grand Forks	Mark Blonigen Fargo	Ryan David Houston Engineering	Brent Erickson AE2S
Justin Ahmann Ackerman-Estvold	Brian Borden Grand Forks	Tyson Decker Bartlett & West	Tracy Eslinger Moore Engineering
Nikomaldeus Alvira Jamestown	Lisa Botnen Grand Forks	Tyler Dehne Bismarck	Joe Ferguson Grand Forks
LeahRae Amundson Grand Forks	Andy Brunen New Salem	Jeremy Deitz Grand Forks	Mike Fischer Bismarck
Lisa Ansley AE2S	David Bruschwein NDDEQ	Jordan DeLorme Minot	Shannon Fisher NDDEQ
Craig Batholomay NDDEQ	Steve Carroll Cass RWD	Grace Demars Watford City	Todd Flynn Ellendale
Zach Bartholomew Grand Forks	Travis Carufel Bismarck	Thomas Demke Apex	Tim Folden Sawyer
Jesse Berg Minot	Mike Chorne AE2S	Sam Devries NDDEQ	Matt Fredrickson Fargo
Mike Berg Apex	Scott Christie Buxton	Randall Dietz Beach	Curt Frey Bismarck
Beau Bergeron Williston	Garrett Clark Bismarck	Travis Dillman Interstate Engineering	Matthew Friesen Oberon
Jody Bertrand Fargo	Curt Clarys Williston	Paul-Djamen Djamen NDDEQ	Duane Friesz Mandan
Rajendra Bhattarai WEF	Patricia Carmen NDDEQ	Eric Dodds AE2S	Justin Froseth Mandan
Mike Bibow AE2S	Elizabeth Carter AWWA	Mike Dora Ulteig	Jeron Fueller Bismarck
Russ Binstock Bismarck	Dean Corcoran Fargo	Megan Dunbar Bismarck	Todd Fugere Fargo
Bart Bishop Beach	Nic Cullen Houston Engineering	Tony Eback Oberon	Doug Gahner Fargo

Brock Garaas Bismarck	Jason Grzadzieleski Mandan	Ward Heidbreder NDRWSA	Derek Houim Fargo
Steven Gee Fargo	Harvey Gullicks AE2S	Shawn Heinle NDDEQ	Corey Houim Fargo
Bill Gefroh Bismarck	Daryn Gullickson Mandan	Jeff Heintz Bismarck	Darrell Hournbuckle Interstate Engineering
Erik Gilbertson Moore Engineering	Steve Gylten Hatton	Dan Heitzman Houston Engineering	Kasey Hudson Minot
Rick Gillund Enderlin	Toni Haider Barr Engineering	Gary Helland Pembina	Emily Huettl Minot
Brad Glass Mandan	Troy Hall Fargo	Karson Henke New Salem	Tom Huncovsky NDDOT
Casey Gleich NDDEQ	Terry Halstengard Bismarck	Yoel Heredia Dickinson	Floyd Hurt South Heart
John "Fred" Goetz Grand Forks	Daniel Haman Fargo	Stacey Herreid NDDEQ	Carl Jackson
Christine Goldader Minot	Robert Hanson Williston	Wade Hesch Valley City	Barry Johnson Bolton & Menk
Paula Gores MVTL	Stacey Hanson NDDOT	Devonno Heupel Fargo	Dan Jonasson Minot
Allen Grasser Grand Forks	Marty Haroldson NDDEQ	Steve Himmelspace Mandan	Thomas Jones Minot
Kellen Grubb AE2S	Susan Hazelett Apex	Laith Hintz AE2S	Ben Julson AE2S
Ryan Grubb AE2S	Keith Hegney NDRWSA	Bruce Hirschert New Rockford	Josh Kadrmas Braun Intertec



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Alan Kemmet Houston Engineering	Richard Lachenmeier Bismarck	Jeffrey McElwain West River	Bobby Newland Grand Forks
Brian King HDR	James Landenberger Bartlett & West	Nick McNelis Grand Forks	Shawna Nieraeth NDDEQ
Paul King American Crystal Sugar	Stephen Latham Minot	Lance Meyer Minot	Wayne Offerdahl Fargo
Justin Klabo AE2S	Mitch LeBas Backflow Prevention Services	Bill Middleton Dickinson	Nathan Olmsted Wyndmere
Jerod Klabunde Moore Engineering	Laura Lee NDDEQ	Dennis Miranowski Wahpeton	Keith Olson Harvey
Tom Klabunde Moore Engineering	Jim Lennington Bartlett & West	Chuck Mischel NDRWSA	Karla Olson Apex
Jasper Klein AE2S	Justin Libig Jamestown	Jeffrey Moberg Tioga	Todd Olson Jamestown
Michelle Klose Bismarck	Allison Lightfoot NDDEQ	Matt Moltzan Fargo	Karlain Olstad Granville
Roger Kluck Fargo	Wei Lin NDSU	Jeff Monson Great River Energy	Daniel Overmoe Mayville
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Steve Kopp Fargo	Sadie Maly Minot	Brett Morlok AE2S	Lee Piatz Napoleon
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Joseph Rowell Jamestown	Wade Senger Interstate Engineering	Elizabeth Tokach- Duran NDDEQ	AJ Waller Surrey
Brian Royer Bowbells	Robert Skurdahl Williston	Jame Todd Bartlett & West	Josh Wanner-Koper Braun Intertec
Nick Rutschke Bismarck	Dean Sletten Apex	Mike Trythall NDDEQ	Brian Warren Minot
Darwin Saari Turtle Lake	Timothy Sloboden Minot	Ryan Tunge Hazen	Greg Wavra NDDEQ
Randel Sand Tuttle	Luci Snowden Knife River	James Uhlman NDDEQ	Dylan Weber Ackerman-Estvold
Blake Sander Apex	Jason Sorenson Minot	Shannon Utke Wyndmere	Aaron Wellman NDDEQ
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Boyd Schmaltz Bismarck	Rachel Strommen NDDEQ		

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Bill Jordan
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KLJ Engineering

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What Makes a Utility Resilient?

By incorporating resilience into a risk management framework, a utility can improve its response and recovery strategies, thereby mitigating the potential for loss of service.

BY KEVIN M. MORLEY

Kevin M. Morley is AWWA's federal relations manager at the association's Government Affairs office (www.awwa.org) in Washington, D.C.

Resilience is defined by an array of indicators that characterize a desired end state or goal. According to Section 2013 of America's Water Infrastructure Act (AWIA) of 2018, resilience is the "ability of a community water system or an asset ... to adapt to or withstand the effects of a malevolent act or natural hazard without interruption to the asset's or system's function, or if the function is interrupted, to rapidly return to a normal operating condition." AWIA requires community water systems serving populations of 3,300 or more to perform two tasks: (1) conduct a risk and resilience assessment and (2) prepare or revise an emergency response plan on a prescribed schedule every five years, starting in 2020. For more information, see Priority Action on Risk and Resilience, *Journal AWWA*, February 2019 (<https://doi.org/10.1002/awwa.1229>).

Drinking water and wastewater systems have been designed to be resilient given the critical functions they provide to the communities they serve. However, various incidents have revealed the need for a more strategic perspective to resilience that goes beyond some of the tactical actions typically defined in an emergency response plan. This need led to the development of the Utility Resilience Index (URI) as a means to provide an all-hazards, system-level assessment of resilience.

PUTTING THE URI INTO PRACTICE

The URI is based on 12 indicators of resilience that a utility can readily and quickly assess to determine where potential gaps or opportunities exist to improve its capacity to respond and recover from an incident. These resilience indicators were selected based on findings from historical records, after-action reports, best practices, and lessons learned from multiple incidents. When considered as a whole, the indicators provide a snapshot of a utility's resilience capacity.

The URI includes two classes of indicators that either affect utility functions or the community served:

- *Operational* (O) indicators reflect the utility's tactical capacity to react quickly and/or cope with various incidents that have the potential to disrupt service.
- *Financial* (F) indicators reflect the utility's fiscal capacity to react quickly and/or cope with various incidents that have the potential to disrupt revenue and costs.



Let's apply the URI to a medium-size mid-Atlantic utility that is considering AWIA and what actions may be beneficial after some close calls in recent years. The utility's manager inputs the utility profile to the URI and finds the utility scored a 44 out of 100. What does that mean? It means there is a lot of opportunity for improvement, including accepting certain limitations that should inform strategies for alternatives, as it may not be feasible to "fix" all the limiting indicators. Consider the following URI inputs, as reflected in the accompanying table:

01: *Emergency Response Plan (ERP)* shows that while the utility has a plan, it hasn't been exercised with tabletop or functional exercises. In addition, the utility hasn't prepared any resource typing for its system that could help the utility's staff determine what they may need to request from others and what they may be able to provide others during an incident. This is all about pre-incident planning and

preparedness, which reduces the stress and chaos associated with an actual incident. Training, exercises, and resource typing are examples of strategies, plans, and procedures that support the intent of AWIA's ERP provisions. For more information, download AWWA's new *Water Sector Resource Typing Guidance* manual at <https://bit.ly/2G7hczw>.

02: National Incident Management System (NIMS) Compliance is voluntary, but it's an eligibility requirement for certain federal homeland security grant programs. The utility has participated in basic awareness training available from the Federal Emergency Management Agency and the US Environmental Protection Agency (USEPA). However, staff who are most likely to lead (i.e., the incident commander) would benefit from higher-level training to facilitate engagement with other stakeholders during a significant incident. Understanding the process for incident management tracking and documentation pre-incident is much better than learning it while trying to manage an emergency.

03: Mutual Aid and Assistance has been critical to water-sector resilience for years. The value of these agreements has been demonstrated time after time, spanning myriad incidents from hurricanes to earthquakes to blizzards. This utility is part of its state's Water/Wastewater Agency Response Network (WARN), which provides state-level support and means by which interstate mutual aid can be facilitated.

04: Emergency Power for Critical Operations is often the rate-limiting factor in recovery following an incident that affects power supply. This utility reports the ability to sustain power for critical operations for up to 24 hours, which is likely limited by fuel capacity. Regulation can also hamper investment in backup power generators, as their use during nonemergency periods often triggers stringent Clean Air Act limits. The cost of generators has made them a key shared resource among WARN utilities, especially in regions depending on multiple booster pump or lift stations.

05: Ability to Meet Minimum Daily Demand or Treatment is at the core of a utility's function. In the case of a drinking water system, how long can typical daily demand be sustained? The answer depends on a combination of finished water storage and, where applicable, the ability to service customers with gravity. Whatever the threshold, this represents a critical planning decision point at which alternative water supply options may become necessary. This is one of the new provisions in AWIA that a utility is expected to determine. Resources such as the USEPA's report *Planning for an Emergency Drinking Water Supply* (<https://bit.ly/32zADL0>) can be used to assess options and consider how distribution would be achieved in coordination with state/local partners. In less than 24 hours this utility would be in crisis, which could be caused by source water contamination, cyanotoxins, or the plant's physical impairment from a natural or man-made incident. This low threshold suggests that some critical planning is needed to ensure options to mitigate the impacts on the

community are developed and ready to be implemented if necessary. AWIA requires systems to develop alternative source water options.

O6: Critical Parts and Equipment is an important factor in recovery, especially in this era of just-in-time delivery. A robust asset management program may aid a utility considering this indicator. This utility has a moderate maintenance yard with a limited stock of critical spares, meaning it could take several weeks to locate and deliver a replacement. Mutual aid has facilitated the location and delivery of unique parts. It's important to consider these limitations within a risk and resilience assessment, and staff knowledge should support preparation of a "what if" strategy if a spare part isn't economically feasible. Resource typing can also help a utility assess the limitations of its capacity to assist others and identify resources it may need to request.

O7: Critical Staff Resilience is the percentage of response-capable staff available for critical operations and maintenance positions who have cross-trained backups. Given the size of this utility, there is a fair amount of cross-training—likely out of necessity. Utilities that have prepared for staffing outages for pandemic planning or work stoppage may have a higher level of capability in this category.

F1: Business Continuity Plan (BCP) provides an indication of the integration of risk management into the utility's culture. A BCP is often where/how a utility has addressed some level of cybersecurity risk management as part of a disaster recovery plan. In addition, a BCP is typically where continuity of enterprise functions like payroll and accounting are documented. This utility hasn't developed a BCP, suggesting there is likely a need to address critical AWIA provisions related to securing cyber assets and financial infrastructure.

F2: Utility Bond Rating indicates a utility's financial stability and capacity to repay debt. This utility has received a good rating from an independent bond agency, and the utility's fiscal health is sound.

F3: GASB Assessment entails determining how the utility has evaluated its infrastructure risk. Specifically, it determines how much of the system has undergone a condition assessment to evaluate the remaining life of its assets so rehabilitation and replacement investments can be properly considered with financial risk management plans. This utility has assessed a small proportion of its system, meaning it doesn't have a complete estimate of prospective future financial obligations.

F4: Unemployment and *F5: Median Household Income* are included to reflect the capacity of the community to react quickly and/or cope with various incidents that have the potential to disrupt utility revenue and/or influence operational response. Research has demonstrated that communities with high levels of unemployment and low median household income are more vulnerable. Although a utility can't directly alter such measures, it can provide key indicators of the potential impact a

loss-of-service incident may have on the population served.

Utility Resilience Index (URI) Worksheet

The URI is the product of the weighting developed for each indicator (V_{ij}) and the maximum value indicated in the utility profile (w_j).

Utility Resilience Indicators (j)	Utility Profile	w_j	V_{ij}	$MAX w_j \cdot V_{ij}$
O1: Emergency Response Plan (ERP)			0.1389	0.0347
No ERP		0.00		
ERP developed and/or updated	x	0.25		
Staff training on ERP (i.e., Tabletop)		0.50		
Resource typed assets/teams defined and inventoried		0.75		
Functional exercises on the ERP conducted		1.00		
O2: National Incident Management System (NIMS) Compliance			0.1561	0.0781
No ICS/NIMS training		0.00		
ICS 100/200 provided to key staff	x	0.25		
ICS 700/800 provided to key staff	x	0.50		
ICS 300/400 provided to key staff		0.75		
Utility certified as NIMS compliant		1.00		
O3: Mutual Aid and Assistance			0.1868	0.1401
None		0.00		
Mutual aid/intramunicipal (within own city/town agencies)		0.25		
Mutual aid/local-local (with adjacent city/town)		0.50		
Mutual aid/intrastate (e.g., Water/Wastewater Agency Response Network [WARN])	x	0.75		
Mutual aid/interstate and intrastate		1.00		
O4: Emergency Power for Critical Operations			0.0595	0.0149
None		0.00		
Up to 24 hrs	x	0.25		
25—48 hrs		0.50		
49—72 hrs		0.75		
Greater than or equal to 73 hrs		1.00		
O5: Ability to Meet Minimum Daily Demand (Water) or Treatment (Wastewater)			0.0966	0.0483
None		0.00		
Up to 24 hrs		0.25		
25—48 hrs	x	0.50		
49—72 hrs		0.75		
Greater than or equal to 73 hrs		1.00		
O6: Critical Parts and Equipment			0.0878	0.0220
3—4 weeks or greater		0.00		
1 — <3 weeks	x	0.25		
3 — <7 days		0.50		
1 — <3 days		0.75		
Less than 24 hrs		1.00		
O7: Critical Staff Resilience			0.0605	0.0303
<10%		0.00		
10—25%		0.25		
>25—50%	x	0.50		
>50—75%		0.75		
>75—100%		1.00		

Utility Resilience Indicators (j)	Utility Profile	w_j	V_{ij}	$MAX w_j \cdot V_{ij}$	Utility URI
F1: Business Continuity Plan (BCP)			0.0463	0.0000	
No BCP	x	0.00			
BCP under development		0.25			
BCP completed		0.50			
BCP fully implemented		0.75			
Annual commitment of resources and BCP exercised		1.00			
F2: Utility Bond Rating			0.064	0.0480	
Caa, less than or equal to		0.00			
B-Ba		0.25			
Baa-A		0.50			
AA	x	0.75			
AAA		1.00			
F3: GASB Assessment			0.0176	0.0044	
Less than 20% assessed		0.00			
20—40% assessed	x	0.25			
41—60% assessed		0.50			
61—80% assessed		0.75			
Greater than 81% assessed		1.00			
F4: Unemployment			0.0459	0.0115	
>5% national average		0.00			
>2—4% national average	x	0.25			
±2% national average		0.50			
<2—4% national average		0.75			
<5% national average		1.00			
F5: Median Household Income			0.04	0.0100	
<10% state median		0.00			
<5—10% state median	x	0.25			
±5% state median		0.50			
>5—10% state median		0.75			
>10% state median		1.00			
					44.2%

Source: Morley, Kevin. Evaluating Resilience in the Water Sector: Application of the Utility Resilience Index (URI). PhD diss. George Mason University, 2012.

LOOKING AHEAD

Collectively, the URI provides a utility with a high-level assessment of its general resilience status. Preparing the URI is also a good opportunity to consider risk and resilience management options to ensure AWIA compliance. Also, AWWA has developed free training on AWIA and offers resources that facilitate compliance, all of which are part of the association's Utility Risk & Resilience Certificate Program (www.awwa.org/risk).

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