



Energy & Environmental Research Center

15 North 23rd Street, Stop 9018 • Grand Forks, ND 58202-9018 • P. 701.777.5000 • F. 701.777.5181
www.undeerc.org

October 26, 2022

Ms. Karlene Fine
Executive Director
North Dakota Industrial Commission
State Capitol, 14th Floor
600 East Boulevard Avenue, Department 405
Bismarck, ND 58505-0840

Dear Ms. Fine:

Subject: Quarterly Progress Report Entitled "iPIPE – intelligent Pipeline Integrity Program,"
Contract No. G-046-88; UND Project – Fund 43500-UND0022445
EERC Funds 23121 and 23211

Attached is the quarterly progress on the subject project for the period July 1, 2022 –
September 30, 2022.

If you have any questions, please contact me by phone at (701) 777-5402 or by email at
amcrae@undeerc.org.

Sincerely,

DocuSigned by:
Austin McRae
2CF0ADB88C44D7...

T. Austin McRae
Research Engineer
Integrated Petroleum Systems

TAM/rlo

Attachment

c/att: Brent Brannan, NDIC



IPIPE – INTELLIGENT PIPELINE INTEGRITY PROGRAM

Quarterly Progress Report

(for the period of July 1, 2022 – September 30, 2022)

Prepared for:

Karlene Fine

North Dakota Industrial Commission
State Capitol, 14th Floor
600 East Boulevard Avenue, Department 405
Bismarck, ND 58505-0840

Contract No. G-046-88

Prepared by:

T. Austin McRae
Michelle R. Olderbak
Darren D. Schmidt

Energy & Environmental Research Center
University of North Dakota
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

October 2022

EERC DISCLAIMER

LEGAL NOTICE This research report was prepared by the Energy & Environmental Research Center (EERC), an agency of the University of North Dakota, as an account of work sponsored by the North Dakota Industrial Commission. Because of the research nature of the work performed, neither the EERC nor any of its employees makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement or recommendation by the EERC.

NDIC DISCLAIMER

This report was prepared by the EERC pursuant to an agreement partially funded by the Industrial Commission of North Dakota, and neither the EERC nor any of its subcontractors nor the North Dakota Industrial Commission nor any person acting on behalf of either:

- Makes any warranty or representation, express or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this report or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately owned rights; or
- Assumes any liabilities with respect to the use of, or for damages resulting from the use of, any information, apparatus, method, or process disclosed in this report.

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the North Dakota Industrial Commission. The views and opinions of authors expressed herein do not necessarily state or reflect those of the North Dakota Industrial Commission.

TABLE OF CONTENTS

LIST OF FIGURES i

LIST OF TABLES..... i

EXECUTIVE SUMMARY ii

BACKGROUND 1

ACCOMPLISHMENTS DURING REPORTING PERIOD..... 1

MEMBERSHIP AND FINANCIAL INFORMATION 3

FUTURE ACTIVITIES 5

PARTIAL LISTING OF iPIPE MEDIA MENTIONS.....Appendix A

LIST OF FIGURES

1 Project progress 5

LIST OF TABLES

1 iPIPE Original Budget..... 3

2 iPIPE Updated Budget 3

3 iPIPE Expected Budget and Expenses to Date..... 4

iPIPE – INTELLIGENT PIPELINE INTEGRITY PROGRAM

Quarterly Progress Report July 1, 2022 – September 30, 2022

EXECUTIVE SUMMARY

This document is a quarterly report for activity conducted by the intelligent Pipeline Integrity Program (iPIPE) for the North Dakota Industrial Commission (NDIC) Oil and Gas Research Program (OGRP). The goal of iPIPE is to develop and demonstrate cutting-edge technology that can prevent and/or detect pipeline leaks.

Activity to date in 2022 has been focused on two major efforts:

- Realigning the Orbital Sidekick (OSK) project and completing the remaining iPIPE 1.0 projects – The EERC and OSK have agreed upon a contract modification following the mechanical failure of the Aurora satellite. The remaining project funds have been repurposed to continue the scope using the next-generation GHOSat satellite(s). The EERC is also working to finalize independent evaluation reports for the TOKU, Pipeline-Risk, and Satelitycs projects.
- Launching iPIPE 2.0 – Fifteen proposals were received in response to the iPIPE 2.0 request for proposals released in the previous quarter. After thorough review, nine of the proposers were selected to present directly to industry membership. The Technology Selection Event was held in Denver, Colorado, on August 2–3 and hosted by DCP Midstream. The members ultimately selected four projects to pursue and directed the EERC to begin contracting. The contracting process is ongoing, targeting completion by the end of the calendar year.

iPIPE – INTELLIGENT PIPELINE INTEGRITY PROGRAM
Quarterly Progress Report
July 1, 2022 – September 30, 2022

BACKGROUND

During a May 2017 meeting with North Dakota pipeline operators, Governor Doug Burgum challenged industry to apply advanced technologies to eliminate pipeline leaks in North Dakota. In response to the Governor's challenge, industry chose a proactive path and engaged in a 3½-year program to advance development and application of emerging technologies to prevent and detect pipeline leaks. The program intends to assist in the development of multiple emerging technologies to prevent and detect pipeline leaks by engaging with technology providers to refine not-yet-commercial products specifically for buried gathering pipelines in North Dakota and other oil-producing states and then demonstrate technology application on working gathering pipelines.

The goal of this project is to develop and demonstrate cutting-edge technology that can prevent and/or detect gathering pipeline leaks. This goal is supported by accomplishment of the following objectives:

- Select the most promising emerging (near-commercial) technologies for demonstration.
- Assist technology providers in refinement of their products.
- Demonstrate multiple technologies on working gathering pipelines.
- Document results of technology demonstrations.
- Facilitate adoption of technologies into North Dakota pipeline operations.

Multiple demonstrations of emerging technologies on working pipelines will simultaneously assist technology providers in refining designs, pave a path toward full commercialization in the North Dakota market and beyond, prepare pipeline operators for adoption of the new tools, and improve the performance and economics of gathering pipeline operations in North Dakota and beyond. With demonstrated success, additional consortium members (pipeline operators) will join the effort, thus enabling field testing of more technologies and further proliferating new technology among all pipeline operators.

Members of the industry-led consortium during Quarter (Q) 3 2022 include Energy Transfer Partners, DCP Midstream, Enbridge, Equinor, Goodnight Midstream, Hess Corporation, Marathon Petroleum Logistics (MPLx), ONEOK, and TC Energy.

The following quarterly report summarizes the program activities from July 1, 2022, through September 30, 2022.

ACCOMPLISHMENTS DURING REPORTING PERIOD

- Program-level activities
 - Program management

- Program Director Darren Schmidt participated in the Pipeline Technology USA 2022 conference in Houston, Texas, September 7–8. iPIPE continues to remain at the forefront of emerging technologies and share its efforts to reduce the frequency and severity of leaks.
- Program meetings
 - On July 15, August 19, and September 16, 2022, iPIPE held monthly member meetings to update all members on program status. The goal of these meetings is to keep members apprised of a variety of program topics, including recruitment, finances, strategic direction, and technology development project status, and discuss and make decisions regarding the course of the iPIPE Program.
 - On September 2, 2022, iPIPE held an additional member meeting to continue discussion toward project selection and funding.
- Member recruitment
 - On August 30, 2022, iPIPE had an introductory call to discuss current program status and membership with Grayson Mill Energy.
 - The program continued discussion with a number of companies regarding membership in the consortium. Some of these companies have approached the program regarding membership requirements and benefits, while others have been previously approached by the program and/or existing consortium members.
- Program media mentions
 - Since inception, iPIPE has now been highlighted in more than 90 public multimedia and print articles. A partial listing of known media mentions is provided in Appendix A.
- Technology selection
 - Fifteen proposals were received in response to the iPIPE 2.0 request for proposals (RFP). The EERC team thoroughly reviewed and discussed each submittal and selected nine of the proposers to present at the Technology Selection Event.
 - The Technology Selection Event was held August 2–3 in Denver, Colorado, and hosted by DCP Midstream. Each of the nine invited proposers attended and presented to all seven iPIPE 2.0 industry members.
 - The iPIPE 2.0 members ultimately opted to pursue four of the projects and directed the EERC to begin contracting. Assuming this ongoing process is successful on all four fronts, iPIPE will have a total of five projects in 2023.
 - The EERC continues to engage with companies from around the globe, offering emerging (not yet commercial) technologies as they discover or are directed to iPIPE.
- Demonstration execution – Satelitycs Phase IV
 - Satelitycs has completed its analysis of land movement detection using a current stereo pair of images and stereo pairs-generated historical data.
 - The independent EERC evaluation report for this task has been drafted and is under internal review.
- Demonstration execution – Orbital Sidekick (OSK)
 - OSK was able to briefly capture and downlink imagery from its satellite to validate the capabilities of its sensor. However, OSK was unable to task the sensor because of a mechanical failure and eventually lost the limited capabilities because of a second failure at a critical electrical conduit. As a result of the satellite failure, OSK provided a proposal

to update the subcontract at the EERC's request. The EERC has successfully negotiated with OSK, and a contract modification was executed in July 2022. Update meetings on the status of the next generation of satellites and their path to launch have generally occurred on a biweekly basis.

- Demonstration execution – Pipeline-Risk
 - Pipeline-Risk has delivered its final report, completed its construction of a risk-learning system for gathering lines, and demonstrated its abilities using member-provided data.
 - The independent EERC evaluation report is being drafted.
- Demonstration execution – TOKU
 - TOKU has completed its demonstration of pipeline-monitoring equipment, analysis of leak simulation data, and refinement of algorithms.
 - TOKU has submitted its final report.
 - The independent EERC evaluation report for this task has been drafted and is under internal review.

MEMBERSHIP AND FINANCIAL INFORMATION

The original budget proposed to the North Dakota Industrial Commission (NDIC) Oil and Gas Research Program (OGRP) totaled \$3,714,000, as shown in Table 1. To demonstrate additional resources provided by new members, additional financial commitment from NDIC, and significantly increased in-kind cost share provided by technology providers and program members, an updated budget is presented in Table 2. Table 2 demonstrates the rapid growth of this program. Table 3 presents greater detail on expected budget and actual expenses incurred by the program to date.

Table 1. iPIPE Original Budget

Sponsors	2018	2019	2020	2021	Total
NDIC – Cash	\$403,320	\$405,226	\$393,454	\$398,000	\$1,600,000
Industry – Cash	\$264,000	\$450,000	\$450,000	\$450,000	\$1,614,000
Industry and Technology Provider – In-Kind	\$125,000	\$125,000	\$125,000	\$125,000	\$500,000
Total	\$792,320	\$980,226	\$968,454	\$973,000	\$3,714,000

Table 2. iPIPE Updated Budget

Sponsors	2018	2019	2020	2021	Total
NDIC – Cash	\$565,909*	\$735,730*	\$438,772*	\$859,589	\$2,600,000
Industry – Cash	\$352,000*	\$700,000*	\$850,000*	\$675,000	\$2,577,000
Industry and Technology Provider – In-Kind	\$525,878*	\$1,074,077*	\$949,051	\$500,000	\$3,049,006
Total	\$1,443,787	\$2,509,807	\$2,237,823	\$2,034,589	\$8,226,006

* Reflects actuals for these years.

The program continues to solicit additional members to contribute to this program. As additional members join the program, Tables 2 and 3 will be updated to show the additional financial resources brought to the program.

Table 3. iPIPE Expected Budget and Expenses to Date

Sponsors	Expected Budget	Actual Expenses as of 9/30/22	Balance Remaining of Expected Budget
NDIC Share – Cash	\$2,600,000	\$2,241,258	\$358,742
Industry Share – Cash	\$2,577,000	\$2,431,708	\$145,292
Industry – In-Kind	\$375,000	<i>DCP</i> \$60,500 <i>Enbridge</i> \$126,436 <i>Energy Transfer</i> \$0 <i>Equinor</i> \$153,230 <i>Goodnight</i> \$37,135 <i>Hess</i> \$228,093 <i>MPLx</i> \$17,936 <i>Oasis</i> \$40,069 <i>ONEOK</i> \$5000 <i>TC Energy</i> \$0 <u><i>Whiting</i></u> <u>\$9042</u> TOTAL \$677,441	\$0
Technology Providers – In-Kind	\$3,076,597*	<i>Satellytics</i> \$1,713,450 <i>Direct-C</i> \$185,867 <i>Ingu</i> \$88,266 <i>Orbital Sidekick</i> \$1,321,061 <i>TOKU</i> \$190,990 <u><i>Pipeline-Risk</i></u> <u>\$50,000</u> TOTAL \$3,549,634	\$0
Total	\$8,628,597*	\$8,900,041	\$504,034**

* Includes budget estimates from proposals for 2020 technology development projects and an estimate of anticipated 2021–2022 in-kind from as-yet-unknown technology providers.

** This amount does not include industry in-kind contributions provided in excess of the expected budget.

Project progress, as represented by the project schedule presented in the original NDIC OGRP proposal, is shown in Figure 1.

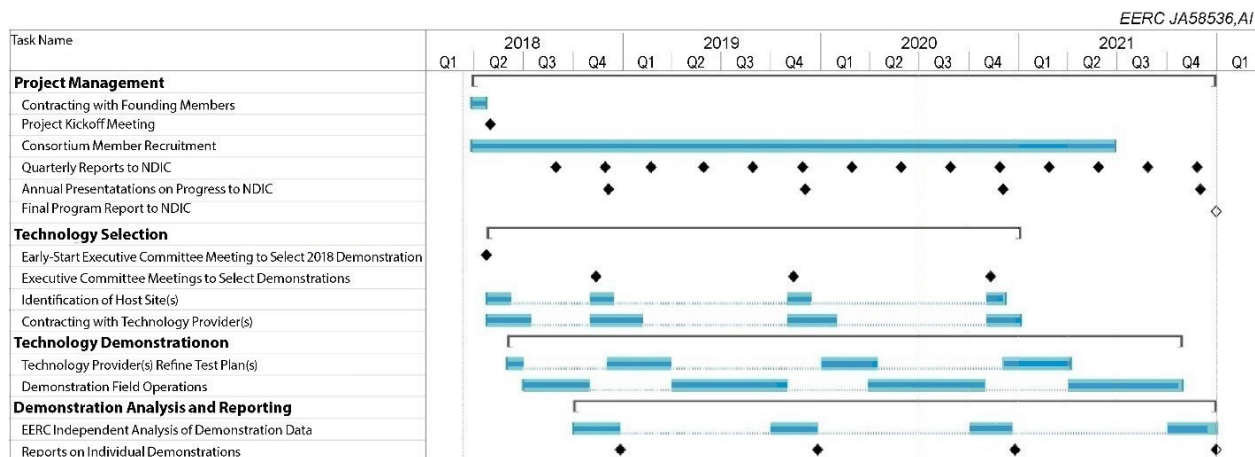


Figure 1. Project progress.

FUTURE ACTIVITIES

The planned activities for the next quarter are detailed below:

- Program-level activities
 - The EERC will work with consortium members and stakeholders to ensure iPIPE 1.0 and 2.0 continue to grow and remain successful.
 - iPIPE will continue to start new discussions with potential program members.
- Demonstration execution – Satelitics Phase IV
 - The EERC will complete and distribute its independent review of this project. This will result in full project completion.
- Demonstration execution – OSK
 - The EERC will continue to track GHOSat satellite preparation progress as the Q1 2023 launch window approaches.
- Demonstration execution – Pipeline-Risk
 - The EERC will complete and distribute its independent review of this project. This will result in full project completion.
- Demonstration execution – TOKU
 - The EERC will complete and distribute its independent review of this project. This will result in full project completion.



APPENDIX A

PARTIAL LISTING OF iPIPE MEDIA MENTIONS

Partial List of Articles Highlighting iPIPE:

Updated October 6, 2022

Title	Date	URL
Industry Responds to Governor's Initiative to Improve Pipeline Technology; Program Funding Approved by North Dakota Industrial Commission	5/18/2018	https://www.ndoil.org/industry-responds-to-governors-initiative-to-improve-pipeline-technology-program-funding-approved-by-north-dakota-industrial-commission/
Satelytics Selected to Participate in the intelligent Pipeline Integrity Program (iPIPE)	5/18/2018	https://mailchi.mp/satelytics/satelytics-chosen-to-participate-in-iPIPE-project?e=922473135e
ND Implements Intelligent Pipeline Project	5/22/2018	http://northamericanshalemagazine.com/articles/2380/nd-implements-intelligent-pipeline-project
North Dakota Governor Doug Burgum Provides Remarks This Morning at the Williston Basin Petroleum Conference in Bismarck, Thanks Hess and the Industry for Innovation Through iPIPE Program.	5/23/2018	https://twitter.com/HessCorporation/statuses/999315208261853185
North Dakota Pipeline Leak Detection Initiative Announced	5/25/2018	https://extension.psu.edu/north-dakota-pipeline-leak-detection-initiative-announced
New Consortium Sets Goal of Improving Pipelines	5/26/2018	https://www.mrt.com/business/oil/article/New-consortium-sets-goal-of-improving-pipelines-12941971.php
Industry Responds to Governor's Initiative to Improve Pipeline Technology; Program Funding Approved by North Dakota Industrial Commission	5/26/2018	https://www.oilandgasonline.com/doc/industry-governors-initiative-pipeline-program-north-dakota-industrial-commission-0001
New Consortium Sets Goal of Improving Pipelines	5/27/2018	https://www.timesunion.com/business/oil/article/New-consortium-sets-goal-of-improving-pipelines-12941971.php
Principal Engineer Jay Almlie Discusses the iPIPE Program on Energy Matters Radio	5/31/2018	https://www.youtube.com/watch?v=ZQuwsK0z2aM
North Dakota Selects Ingu Solutions for Demonstration of Cutting-Edge Leak Detection and Prevention Technology for Oil and Gas Pipelines	5/31/2018	https://ingu.co/iPIPE/
Leak Detection Project Kicks Off This Summer	6/1/2018	https://myemail.constantcontact.com/Here-are-the-week-s-top-North-Dakota-energy-stories-.html?soid=1102657032033&aid=NpwT2Ynl17c
How a Canadian Solution to Detecting Pipeline Leaks Is Being Used in North Dakota	6/5/2018	https://www.bnnbloomberg.ca/video/how-a-canadian-solution-to-detecting-pipeline-leaks-is-being-used-in-north-dakota~1410402
iPIPE Program Helps Solve Pipeline Leaks in ND	6/6/2018	http://www.kfyrvtv.com/content/news/iPIPE-Program-helps-solve-pipeline-leaks-in-ND--484747291.html
Startup Uses Small Sensors to Check North Dakota Oil Pipes	6/10/2018	https://www.alvareviewcourier.com/story/2018/06/10/interesting-items/startup-uses-small-sensors-to-check-north-dakota-oil-pipes/37406.html
Sensors to Monitor Oil, Brine Gathering Lines Coming to ND	6/12/2018	https://www.westfargopioneer.com/news/science-and-nature/4459638-sensors-monitor-oil-brine-gathering-lines-coming-nd
Pipe Sensors to Monitor Gathering Lines	6/12/2018	https://bismarcktribune.com/business/local/pipeline-sensors-to-monitor-gathering-lines/article_cd64586c-1d52-52df-83e6-b661d3b95f0a.html
Startup Uses Small Sensors to Check North Dakota Oil Pipes	6/21/2018	https://www.apnews.com/9d65538034a24711a4a84d4e2bb38efe
Startup Uses Small Sensors to Check North Dakota Oil Pipes	6/21/2018	https://www.usnews.com/news/best-states/north-dakota/articles/2018-06-21/startup-uses-small-sensors-to-check-north-dakota-oil-pipes
Startup Uses Small Sensors to Check North Dakota Oil Pipes	6/21/2018	https://m.washingtontimes.com/news/2018/jun/21/startup-uses-small-sensors-to-check-north-dakota-o/
iPIPE: Taking a Bite Out of Leaks	6/25/2018	http://blogs.und.edu/und-today/2018/06/taking-a-bite-out-of-leaks/
iPIPE: Taking a Bite Out of Leaks	6/29/2018	http://www.northdakotaagconnection.com/story-state.php?id=688&yr=2018
Industry Demonstrates Commitment to Stopping Pipeline Leaks	7/17/2018	http://northamericanshalemagazine.com/articles/2444/industry-demonstrates-commitment-to-stopping-pipeline-leaks
Testing of New Pipeline Inspection Device Begins in Bakken	7/18/2018	https://www.spe.org/en/ogf/ogf-article-detail/?art=4404

Title	Date	URL
Testing of New Pipeline Inspection Device Begins in Bakken (link not active)	7/18/2018	https://www.spe.org/en/print-article/?art=4404
6 Companies Collaborating on Pipeline Leak Detection	8/15/2018	https://www.willistonherald.com/news/companies-collaborating-on-pipeline-leak-detection/article_bbce3194-a098-11e8-8bac-1b765123019e.html
More Skin in the Game: New Technology to Find, Fix Leaks	8/20/2018	https://pgjonline.com/magazine/2018/august-2018-vol-245-no-8/features/more-skin-in-the-game-new-technology-to-find-fix-leaks
Burgum Highlights Oil Industry's Progress, Challenges at ND Petroleum Council's Annual Meeting in Fargo	9/25/2018	https://www.governor.nd.gov/news/burgum-highlights-oil-industry%E2%80%99s-progress-challenges-nd-petroleum-council%E2%80%99s-annual-meeting
Burgum Highlights Oil Industry's Progress, Challenges at ND Petroleum Council's Annual Meeting in Fargo	9/25/2018	https://votesmart.org/public-statement/1287849/burgum-highlights-oil-industrys-progress-challenges-at-nd-petroleum-councils-annual-meeting-in-fargo#.XDz9tVxKjmE
The Digital Oilfield: How Digital Technologies Are Changing the Oil Industry in ND and Nationwide	9/30/2018	http://www.prairiebusinessmagazine.com/business/energy-and-mining/4506605-digital-oilfield-how-digital-technologies-are-changing-oil
API Banquet Salutes Stars of Bakken Oil and Gas	11/19/2018	https://www.willistonherald.com/news/api-banquet-salutes-stars-of-bakken-oil-and-gas/article_a006f78e-cb98-11e8-a353-abe9fc1170fc.html
Energy Matters: iPIPE Receives Industry Innovation Award	12/3/2018	https://www.youtube.com/watch?v=L2lEr2Xu4aw
Energy Matters with iPIPE	12/12/2018	https://www.satelytics.com/blog/oil-gas-solutions/2018-energy-matters-with-iPIPE/
Developing Technology to Prevent Pipeline Leaks	1/3/2019	https://mydigitalpublication.com/publication/?i=547462&p=&pn=#{%22issue_id%22:547462,%22page%22:34%22}
Innovative Pipeline Consortium Marks New Highlights	1/8/2019	http://undeerc.blogspot.com/2018/12/innovative-pipeline-consortium-marks.html
2018 State of the State Address	1/23/2019	https://www.governor.nd.gov/events/2018-state-state-address
North Dakota Eyes Expanded Use of Drones for Oil and Natural Gas Operations	2/8/2019	https://www.naturalgasintel.com/articles/117347-north-dakota-eyes-expanded-use-of-drones-for-oil-and-natural-gas-operations
The Crude Life Interview: Joe Dancy, Energy Expert & Educator	5/18/2019	http://www.thecrudelife.com/podcast/the-crude-life-interview-joe-dancy-energy-expert-educator/
The Big Data Revolution: Detecting Pipeline Leaks, Encroachments and More Using Satellites	6/15/2019	https://www.pipeline-journal.net/journal/pipeline-technology-journal-32019
Energy Matters Radio: iPIPE	9/6/2019	https://youtu.be/4tTA_WEsM18
iPIPE Program Assisting in Detection of Pipeline Leaks in the Pipeline & Gas Journal September Edition (page 50–52)	9/10/2019	https://www.nxtbook.com/nxtbooks/gulfpub/pgj_201909/
iPIPE Receives IOGCC Chairman's Stewardship Award for Environmental Partnership	9/10/2019	https://www.am1100theflag.com/news/10755-iPIPE-receives-iogcc-chairman%E2%80%99s-stewardship-award-environmental-partnership
iPIPE Receives Chairman's Stewardship Award	9/10/2019	http://undeerc.blogspot.com/2019/09/iPIPE-receives-chairmans-stewardship.html
iPIPE Receives Chairman's Stewardship Award	9/13/2019	https://www.willistonherald.com/news/business/iPIPE-receives-stewardship-award/article_e7c45bf0-d636-11e9-b069-739139b5d75b.html
API Award Winner Shares What Recognition Has Meant	10/14/2019	https://www.willistonherald.com/news/oil_and_energy/api-award-winner-shares-what-recognition-has-meant/article_ec10b56a-eccc-11e9-a94a-0f17a0778d95.html
AI Raising Drone Game in Oil, Gas but FAA Challenges Remain	10/15/19	https://www.naturalgasintel.com/articles/119892-ai-raising-drone-game-in-oil-gas-but-faa-challenges-remain
Almlie and Helms: Where Innovation Leads, Regulation Follows	10/18/19	https://trib.com/opinion/columns/almlie-and-helms-where-innovation-leads-regulation-follows/article_ee198ef8-05aa-599f-9df9-67bfd8492bc0.html
Shared on Drilling Info's Social Media Site: Almlie, Helms: Innovation Leads, Regs Follow	10/20/19	https://www.grandforksherald.com/opinion/columns/4728897-Almlie-Helms-Innovation-leads-regs-follow
Almlie, Helms: Innovation Leads, Regs Follow	10/20/19	https://www.grandforksherald.com/opinion/columns/4728897-Almlie-Helms-Innovation-leads-regs-follow
Where Innovation Leads, Regulation Follows	10/21/19	https://bismarcktribune.com/opinion/letters/where-innovation-leads-regulation-follows/article_6018311c-49fd-5744-b815-2a485b881e59.html
Bakken Backers E-Mail: Almlie, Helms: Innovation Leads, Regs Follow	10/25/19	https://www.grandforksherald.com/opinion/columns/4728897-Almlie-Helms-Innovation-leads-regs-follow
Cleanup Continues after Keystone Pipeline Oil Spill near Edinburg, ND	11/4/19	https://www.grandforksherald.com/news/accidents/4754456-Nearly-half-of-the-oil-has-been-recovered-in-Keystone-Pipeline-incident-says-TC-Energy

Title	Date	URL
ND Keystone Spill about Half Recovered, Official Says	11/4/19	https://www.bemidjipioneer.com/business/energy-and-mining/4755069-ND-Keystone-spill-about-half-recovered-official-says
DAPL 2.0 Pipeline – Doug Burgum, North Dakota Governor (Governor mentioning iPIPE on “What’s on Your Mind”)	11/7/2019	https://www.am1100theflag.com/news/12229-11719-dapl-20-pipeline-doug-burgum-north-dakota-governor
Previewing the PSC’s DAPL 2.0 Expansion Hearing	11/11/2019	https://www.am1100theflag.com/news/12320-previewing-psc%E2%80%99s-dapl-20-expansion-hearing
Oasis Petroleum’s Jared Iverson Talks about the Next 20 Years in the Bakken	12/4/2019	https://www.willistonherald.com/news/oil_and_energy/oasis-petroleum-s-jared-iverson-talks-about-the-next-years/article_2368a346-16f1-11ea-81ad-d3443353be3e.html
DCP Midstream LinkedIn Mention	~Sept 2019	https://www.linkedin.com/posts/dcp-midstream_dcp-wearcdcp-transformation-activity-6577940399116038144-orkP/
iPIPE Looks to Enhance Pipeline Safety	12/17/2019	https://www.kfyrtv.com/content/news/iPipe-looks-to-enhance-pipeline-safety-566298741.html
Burgum, Sanford Reflect on Significant Progress Made During Administration’s Third Year	12/19/2019	https://www.thedickinsonpress.com/incoming/4830773-Burgum-Sanford-reflect-on-significant-progress-made-during-administration%E2%80%99s-third-year-Site-and-date-announced-for-2020-State-of-the-State-address
Burgum, Sanford Reflect on Significant Progress Made During Administration’s Third Year	12/19/2019	https://www.nd.gov/news/burgum-sanford-reflect-significant-progress-made-during-administrations-third-year
Companies Aim to Prevent, Detect Pipeline Leaks with New Technologies	1/5/2020	https://bismarcktribune.com/bakken/companies-aim-to-prevent-detect-pipeline-leaks-with-new-technologies/article_0cac7e82-c49a-5c86-9267-ad8beb5b9799.html
Podcast: iPIPE with Jay Almlie — Real Technology, Real Pipelines, Real Progress	1/7/2020	https://pipelinerspodcast.com/episode-109-iPIPE-jay-almli/
iPIPE Welcomes New Consortium Member	1/10/2020	https://mailchi.mp/undeerc/news-release-iPIPE-receives-chairmans-stewardship-award-585605
DAPL Owner Joining North Dakota’s iPIPE Consortium to Help Advance Leak Detection Technology	1/13/2020	https://www.willistonherald.com/news/regional/dapl-owner-joining-north-dakota-s-iPIPE-consortium-to-help/article_ab8d13a8-3652-11ea-9117-ef358444f87f.html
Energy Transfer Joins Pipeline Spill Consortium	1/14/2020	https://bismarcktribune.com/bakken/energy-transfer-joins-pipeline-spill-consortium/article_5f983ae5-109c-596e-a254-f09974b1f8c1.html
iPIPE Welcomes New Consortium Member: Dakota Access Pipeline	1/16/2020	http://undeerc.blogspot.com/2020/01/iPIPE-partnership-welcomes-new-member.html
TC Energy Will Join North Dakota’s iPIPE Consortium to Help Advance Leak Detection	1/16/2020	https://www.willistonherald.com/news/oil_and_energy/tc-energy-will-join-north-dakota-s-iPIPE-consortium-to/article_2a52fa3e-38b7-11ea-aca2-23bfb860113c.html
iPIPE Partnership Welcomes New Member: TC Energy	1/16/2020	http://undeerc.blogspot.com/2020/01/iPIPE-partnership-welcomes-new-member.html
Podcast: iPIPE — Inside the Tech Pitch with Jay Almlie	1/21/2020	https://pipelinerspodcast.com/episode-111-iPIPE-tech-pitch-jay-almli/
Enbridge Joins Consortium Evaluating Next-Generation Technology in the Pipeline Industry	1/27/2020	https://www.enbridge.com/stories/2020/january/iPIPE-consortium-evaluating-next-generation-pipeline-technology
Monique Roberts LinkedIn Post	1/29/2020	https://www.linkedin.com/posts/monique-roberts-81a84527_pipelinesafety-iPIPE-pipelineintegrity-activity-6628411257315741697-cUBx/
iPIPE Mentioned in 2019 State of the State Address	1/29/2020	https://www.youtube.com/watch?v=5vllkqT6DaE Link to 1:02 time: https://youtu.be/5vllkqT6DaE?t=3731
Bakken Oil, Gas to Energize North Dakota’s Global Impact, Governor Says	2/3/2020	https://www.naturalgasintel.com/articles/120930-bakken-oil-gas-to-energize-north-dakotas-global-impact-governor-says
iPIPE with Jay Almlie on the Pipeliners Podcast: Episode 111	2/4/2020	https://pipelinerspodcast.com/episode-113-iPIPE-operators-perspective-brian-epperson-greg-tilley/
iPIPE on Energy Matters Radio (beginning at 9:15)	2/15/2020	https://www.am1100theflag.com/news/14840-2-15-20-energy-matters-hour-1#volume
iPIPE on the Pipeliners Podcast: Episode 115	2/18/2020	https://pipelinerspodcast.com/episode-115-iPIPE-vendor-perspective-john-van-pol-sean-donegan/
On the Path to Zero Pipeline Spills	2/27/2020	http://blogs.und.edu/und-today/2020/02/on-the-path-to-zero-pipeline-spills/
iPIPE with Jay Almlie on the Pipeliners Podcast: Episode 117	3/2/2020	https://pipelinerspodcast.com/episode-117-iPIPE-high-tide-floats-all-boats-jay-almli/
iPIPE with Jay Almlie on the Pipeliners Podcast: Episode 119	3/17/2020	https://pipelinerspodcast.com/episode-119-future-technology-today-jay-almli/
Pipelines Take on Their Biggest Enemy	3/30/2020	https://www.hartenergy.com/exclusives/pipelines-take-their-biggest-enemy-186778?mkt_tok=eyJpIjoiTjJFek5UUmI0ekEzTW1WbSlSnQ0iJUNINxSmdiOHAwN081ZFdrTjRZRGR0y

A-4