

Monday, March 12 - AM Sessions

Time	Paper ID	Industry Segment	Paper Title	Author(s)	Brief
Track 1: Horizontal Directional Drilling Session Leader: Brian Avon, Carollo Engineers					
9:30 AM	A-1-01	Wastewater	Directional Drilling in Mukilteo - Lessons Learned from an HDD with 330-ft. of Elevation Difference	Matt Pease, Staheli Trenchless Consultants and Dan Hammer, Mukilteo Water and Wastewater District	This paper describes the challenges encountered during the design and construction of two HDD bores with significant elevation differences between entry and exit and a high risk of slope destabilization.
9:55 AM	A-1-02	Water	Franklin Falls - The Toughest Trenchless Crossing in New Hampshire	Paul Cote, P.E., Tata & Howard; Tom Pullen and Nick Strater, P.G., Brierley Associates, LLC; Jeff Martin, Henniker Directional Drilling	This paper describes the planning and construction of a very difficult directional drilling project in rural New Hampshire, which encountered an unexpected, buried historic structure.
10:20 AM	A-1-03	Electrical	Installation of Three Parallel Electric Ductbanks beneath the Chelsea River Using Horizontal Directional Drilling in Boston/Chelsea, Massachusetts	Tennyson M. Muindi, P.E. and Bradford Miller, Haley & Aldrich; Michael Tyrrell, TRC; Jeffrey M. Scholl, P.E., J. D. Hair Associates; Henry Oheim, NSTAR Corp.; and Ronald Gorgeout Jr., Project Consulting Services	This paper describes design and construction challenges of three parallel 1600 lf electric conduits across an active river using HDD within a tight easement.
10:45 AM	A-1-04	Water/Wastewater	Improving the Standard of Mud Management	David Bennett and Matthew Wallin, Bennett Trenchless Engineers; Manley Osbak, The Crossing Company	This paper presents key elements of drilling fluid management theory, its application and benefits and performance criteria and testing requirements for a proper drilling fluid program.
11:10 AM	A-1-05	Water	Pittsfield Township Watermain Rehabilitation and Replacement Case Study	Damien Wetzel, Stantec; John Thompson, LiquiForce; and Paul Hanson, Ductile Iron Pipe Research Association (DIPRA)	This paper presents a case study that discusses asset management, cutting-edge advances in pipeline technology such as watermain lining, new installations utilizing HDD with ductile iron pipe and municipal issues such as selection criteria for materials and lessons learned.
Track 2: Auger Boring Session Leader: Matt Pease, Staheli Trenchless Consultants					
9:30 AM	A-2-01	Wastewater	Redesigning for Success - A Challenging Sewer Installation in Kirkland, Washington	Stephen Dennehy, P.E. and Dave Kaiser, P.E., Northshore Utility District	This paper describes the redesign and construction of a sewer bypass pipeline after complications with the original contract led to a change in the trenchless method of installation.
9:55 AM	A-2-02	Wastewater	Charlotte's Paw Creek Force Main Project	Andrew S. Vane, P.E., Hazen and Sawyer, PC	This paper describes the design and construction of a 36-in. force main, which consisted of eight separate jack and bore crossings of railroads, roadways and petroleum pipelines.
10:20 AM	A-2-03	Wastewater	Microtunneling Gives Way to Auger Boring on Challenging Drive	Nicole Murphy, P.E., Kennedy/Jenks Consultants and Rania Sarkis Amen, P.E., City of San Diego	This paper presents the USIU-Miramir Trunk Sewer Project, the replacement of over two miles of 21-in. sewer in City of San Diego, and the challenge of a 600-ft. crossing under I-15 using auger bore construction.
10:45 AM	A-2-04	Wastewater	Challenges and Success of Open Shield Pipe Jacking Construction in a Congested Neighborhood	Christopher Price, Staheli Trenchless Consultants and Glynda Steiner, Seattle Public Utilities	This paper describes the successful trenchless construction of a 2,500-ft. 60-in. stormwater conveyance pipeline for Seattle Public Utilities using open-shield pipe jacking.
11:10 AM	A-2-05	Other	Means and Methods of Construction - Whose Domain is it?	Don Del Nero and Steve Hunt, CH2M HILL	This paper discusses the recent trend of engineers specifying means and methods of construction and provide various points of view from the parties engaged in the same.
Track 3: Cured-in-Place Pipe (CIPP) Lining Session Leader: Joe Lane, SAK Construction LLC					
9:30 AM	A-3-01	Wastewater	Just in Time Rehabilitation of Twin Steel Sewer Siphon	Mark Brand, Insituform Technologies Limited; Siri Fernando and Ray Davies, City of Edmonton, Drainage Services	This paper presents on the Highlands Twin River Crossing (HTRC), which conveys sanitary and combined sewer flows from north half of the City of Edmonton and its rehabilitation using CIPP.
9:55 AM	A-3-02	Wastewater	Back to the Future - The Modernization of A Historic Mill Village Community	Janet Cann, P.E., Spartanburg Water and Dawayne Crite, P.E., CDM	This paper presents a case study examining the issues that led to the selection of the appropriate rehabilitation technology, design, permitting and construction challenges.
10:20 AM	A-3-03	Wastewater	CIPP for Structural Rehabilitation	Randolph D. Fries, P.E., Montgomery County Environmental Services	This paper discusses the Leshur Drive Sanitary Sewer Rehabilitation project, which was funded and completed to determine the feasibility of applying CIPP technology as a repair technique for restoring the structural integrity of a heavily deteriorated sanitary sewer system.
10:45 AM	A-3-04	Wastewater	Innovative CIPP Relining Methods Reduce Open-cut Spot Repairs in Edmonton	Roger Ficko, IVIS Inc.; Siri Fernando and John Cairns, City of Edmonton, Drainage Services	This paper presents the detail design, execution and follow-up completion of the successful trenchless rehabilitation method and the use of innovative methods in CCTV inspection, pipe conditioning work, installation of void spanning CIPP liner(s), line locating, boring with hydro-excavating equipment and void filling with flow-able cementaceous grout.
11:10 AM	A-3-05	Water/Wastewater	34 Years of Quality Assurance Testing for CIPP in Winnipeg, Manitoba	Chris Macey, P.Eng., AECOM and Kas Zurek, City of Winnipeg	This paper presents the results of 34 years of quality assurance testing carried out on CIPP projects in the City of Winnipeg, Manitoba resulting in the longest history of ASTM D790 testing results for CIPP installation in North America.
Track 4: Current Trenchless Research Session Leader: Alan Atalah, Bowling Green State University					
9:30 AM	A-4-01	Wastewater	An Innovative Alternative - Buoyant Interceptor in a Lake	Pete Oveson, Brown and Caldwell; Joel Komarek, City of Lake Oswego and Rob Lee, Portland B&C	This paper discusses the design and construction of a one-of-a-kind buoyant gravity interceptor that serves the City of Lake Oswego, Oregon.
9:55 AM	A-4-02	Wastewater	Review of QA/QC Procedures Associated with Rehabilitation of Large Diameter Interceptors	John Matthews, Battelle Memorial Institute; Andy Dettmer, Carollo Engineers; Erez Allouche and Jadranka Simicevic, Trenchless Technology Center	This paper describes the findings from a review QA/QC procedures associated with different large diameter pipeline rehabilitation methods and discusses the utility owner lessons learned.
10:20 AM	A-4-03	Water/Wastewater	Assessment of Corroded Corrugated Steel Culverts Using Field Data	Van Thien Mai and Neil A. Hoult, Queen's University; and Ian D. Moore, GeoEngineering Centre at Queen's - RMC	This paper demonstrates the use of ultrasonic transducers to estimate remaining wall thickness of corroded culverts.
10:45 AM	A-4-04	Wastewater	LinerRite - An Optical-Based Sensor for QC of Wet-Out Operations of CIPP Liners	Shaurav Alam and Erez Allouche, Trenchless Technology Center	The paper describes an innovative technology capable of estimating the degree of saturation of CIPP liners during the wet-out process in real-time using optical sensors.
11:10 AM	A-4-05	Gas	Investigating Cross Bores in the Wastewater Collection System	Robert Item, City of Palo Alto	This paper describes the steps taken by the City of Palo Alto to implement a cross bore investigation program.
Track 5: Asset Management Session Leader: Marc Lehmann, CDM					
9:30 AM	A-5-01	Wastewater	St. Albert CCTV Inspection and Sewer Rehabilitation Program	Dan Willems, City of Saskatoon; Dave Krywiak, Stantec Consulting Ltd.; Todd Wyman and Dan Rites, City of St. Albert	This paper describes St. Albert's sewer asset management strategy, which involves an annual inspection program, condition assessment, prioritization of repair needs, an annual sewer rehabilitation program and moving these programs forward into the future.
9:55 AM	A-5-02	Water	Condition Assessment and Management of Critical Watermains in the City of Ottawa	Kevin Bainbridge, Robinson Consultants Inc; Steve Dover, Fern Marcuccio and Shelley McDonald, City of Ottawa	This paper presents the City of Ottawa's approach to the network wide assessment of critical pipes, including their findings and lessons learned.
10:20 AM	A-5-03	Wastewater	Lesson Learned About External Corrosion That Lead to an Outfall Sewer Collapse	Renni Zhao and Steve Bian, DCWATER; John Marshall, J.W. Marshall & Associates Inc.; and Paul Risk, NDT Corp.	This paper describes how to apply a wide range of direct and indirect techniques to determine the reason for the pipe failure and to determine the properties of the soil environment with a sound approach for developing an asset management plan for non-reinforced sewer systems.
10:45 AM	A-5-04	Water	Advances in Water Pipeline Condition Assessment	Carlos A. Espinosa, P.E., Wachs Water Services	This paper addresses the state-of-the industry in condition assessment of water infrastructure in North America using a ten-step model and reviews the latest technologies available for inspecting and condition assessment of watermains.
11:10 AM	A-5-05	Water/Wastewater	Applying Risk Management and Financial Analysis to Asset Management Planning	Pierre Levesque, Solutions Modex and William DiTullio, InfraMetrix, LLC	This paper describes how a long-term master plan can deliver major savings and establish a clear relationship between budget and level of service.
Track 6: Condition Assessment Session Leader: Ernie Ting, Town of Markham					
9:30 AM	A-6-01	Water/Wastewater	Methods for Non-destructive Evaluation of Force Main Condition and the Associated Cost Benefits	Jennifer Steffens, P.E. and Travis Wagner, P.E., Pure Technologies, Ltd.; Deirdre Blackard, Gwinnett County Department of Water Resources	This paper outlines several methods for evaluating force main conditions using non-destructive techniques and technologies in addition to structural analysis methods.
9:55 AM	A-6-02	Wastewater	City of Leduc - Case Study Comparison between Conventional CCTV Sewer Inspection and 360 Degree Digital Pipe Scanning Technology	Piero Salvo, P.Eng., M.Eng., GENIVAR and Kevin Cole, P.Eng., City of Leduc	This paper compares the CCTV results obtained using conventional CCTV sewer inspection method and the 360 degree digital pipe scanning technology on two separate contracts within the City of Leduc's territory.

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Track 6: Condition Assessment Session Leader: Ernie Ting, Town of Markham					
10:20 AM	A-6-03	Wastewater	Decision Logic for Selecting Wastewater Force Main Inspection Program Tools	Henry Derr, Brown and Caldwell	This paper describes the process of developing a force main inspection program for a utility using work flow logic diagrams, technology decision matrices and inspection guideline documents.
10:45 AM	A-6-04	Wastewater	Identifying, Removing and Documenting Inflow/Infiltration Reduction	Dornelle Thomas and John P. Schroeder, P.E., BCEE, CDM	This paper identifies and quantifies private and public sources of I/I and outlines the strategy for immediate repairs, rehabilitation, replacement and maintenance to reduce I/I.
11:10 AM	A-6-05	Water/Wastewater	NDE Techniques for Water and Wastewater Pipe Condition Assessment	Chris Garrett, PICA Corp. USA and Ad Shatat, Russell NDE	This paper discusses remote field testing possibilities for owners/operators interested in the inspection of ferrous pipes by looking at recently completed projects in the United States.

Monday, March 12 - PM Sessions

Track 1: Horizontal Directional Drilling (HDD) Session Leader: Richard (Bo) Botteicher, Underground Solutions, Inc.					
3:45 PM	B-1-01	Gas	50 Ft. of Peat - Design Challenges of Three HDD Crossings of the Sacramento River	Mary Asperger, Matthew Wallin and David Bennett, Bennett Trenchless Engineers	This paper discusses the design challenges of three gas pipeline crossings of the Sacramento River using HDD ranging in diameter from 10 to 36-in. and in length from 3,700 to 4,700-ft. and passing through very soft geotechnical conditions and under flood protection levees.
4:10 PM	B-1-02	Water/Wastewater	Planning, Extensive Monitoring and Good Communication Solves Public Noise Concerns on Two Large HDD Crossings in Sundre, Alberta	James P. Murphy, Complete Crossings Inc.; Ron Baker, Town of Sundre; Tim Burch, WorleyParsons; and Troy McNeil, BSEI Municipal Engineers	This paper outlines the noise mitigation efforts specified and used throughout construction, details the sound monitoring results and the success of the crossing relative to noise and the inhabitants of the town and the apartment block.
4:35 PM	B-1-03	Other	Practical Applications of Hydraulic Fracturing Evaluation in HDD Design	Glenn Duyvestyn and Marc Gelinas, Hatch Mott MacDonald	The paper discusses the current state-of-practice in hydraulic fracturing evaluation, proposes areas in which further development of current methods is needed, and details common mitigation measures, both in design and construction, to minimize the risk of hydraulic fracturing.
5:00 PM	B-1-04	Water	Challenging HDD Watermains Up Steep Slopes	Michelle Ramos, GeoEngineers Inc. and Jackson Dove, Sammamish Plateau Water and Sewer District	This paper details the installation of two new 8-in. diameter watermains up steep slopes in the Sammamish Water and Sewer District using trenchless technology.

Track 2: Pilot Tube Microtunneling Session Leader: Michelle Ramos, GeoEngineers, Inc.

3:45 PM	B-2-01	Wastewater	Guided Boring and the Lafayette/Pleasant Hill Road Trunk Sewer	David Mathy and Robert Lanzafame, GeoEngineers; Wes Adams, Central Contra Costa Sanitary District; and Steven Gallyer, Pacific Boring	This paper describes the design and construction of the trenchless portion of CCCSD's Lafayette/Pleasant Hill Road Trunk Sewer using the Vermeer AXIS guiding boring system in California to install 640-ft. of 15-in. gravity sewer pipeline.
4:10 PM	B-2-02	Other	Challenges and Lessons Learned of Pilot Tube Guided Auger Boring Utility Crossings of the Little River	John J. Struzziery, P.E., Kleinfelder/S E A and Nicholas H. Strater, P.G., Brierley Associates	This paper describes the challenges associated with an unusual utilities crossing project across a river and environmental wetland area using pilot tube auger boring techniques.
4:35 PM	B-2-03	Water/Wastewater	Extensive Small Diameter Pipe Jacking with Concurrent Methods Under the I-15 Core in Provo, Utah	Troy Stokes and Laura Anderson, Akkerman Inc.	This paper presents the I-15 Core Corridor Expansion in Provo, Utah, a design build project that is updating and adding to existing infrastructure to meet the growing population demands in Utah County through 2030.
5:00 PM	B-2-04	Wastewater	Shively Interceptor	Brad Ream, Midwest Mole, Inc.	This paper describes the elements of a multiple crossing pilot tube microtunnel project and the key factors to having a successful project.

Track 3: Cured-in-Place Pipe (CIPP) Lining Session Leader: Kaleel Rahaim, Interplastic Corp.

3:45 PM	B-3-01	Water/Wastewater	Non-styrene Options for Cured-in-Place Pipe	Bill Moore, AOC, LLC	This paper covers non-styrene options for CIPP applications, including the advantages and limitations of each alternative and discusses a recent non-styrene, VOC free, CIPP installation in Toronto, Ontario.
4:10 PM	B-3-02	Wastewater	Hydrophilic Gasket Sealing Technology - A Solution to Deficiencies in Cured-in-place Pipe Lining	Kristina Kiest, LMK Technologies and John Vose, City of Naperville	This paper presents current CIPP technologies used for rehabilitation of sewers that won't eliminate wastewater treatment plant costs associated with I/I without the inclusion of hydrophilic end seals due to non-bonding and shrinkage during the polymerization of thermoset resin systems.
4:35 PM	B-3-03	Water/Wastewater	Malibu Force Main Rehabilitation	Edmund Lyons, Mladen Buntich Construction Co., Inc. and Terry Henry, Insituform Technologies, Inc.	This paper describes the rehabilitation of twin wastewater and reclaimed water force mains within the City of Malibu using the latest in CIPP technology.
5:00 PM	B-3-04	Wastewater	Measuring Quality Assurance/ Quality Control	Colleen Harold and Steven Burger, Bureau of Environmental Services, City of Portland	This paper presents on the recently revised technical specifications for CIPP developed by the City of Portland and the efforts of a full subcommittee.

Track 4: Lining Materials, Methods & Installation Session Leader: George Kurz, Barge, Waggoner, Sumner & Canon

3:45 PM	B-4-01	Wastewater	Lateral Rehabilitation Options and Their Cost-benefit Comparison - One Utility's Perspective	James Shelton and Tony Dill, Malcolm Pirnie; Dave Hofer, New Castle County	This paper discusses one major sewer utility's perspective of the benefit of various lateral technologies using a lateral technology cost benefit tool developed by New Castle County as a way of illustrating these values.
4:10 PM	B-4-02	Wastewater	High Temperature Aeration Piping - How Can I Rehabilitate It?	Jennifer Glynn, P.E., and Tricia Butler, P.E., RMC Water and Environment; Duane Larson, P.E., Encina Wastewater Authority	This paper presents a case study discussing the options evaluated and the challenges associated with rehabilitation design of a large diameter high temperature aeration pipe as well as lessons learned during construction of this project.
4:35 PM	B-4-03	Wastewater	Cranking up the Delivery - City of Richmond 2011 Sanitary Sewer Lining Project	Russell Eberwein, Harris & Associates and Fadi Alabbas, Veolia Water Operating Services	This paper describes an alternative project delivery method for a sanitary sewer lining program to meet a mandated deadline of sanitary sewer overflow reduction.
5:00 PM	B-4-04	Water	Line Q3 Pipeline - Slipline Rehabilitation	Jeffrey C. Heden, PE, J. C. Heden and Associates, Inc.; Brian C. Dorwart, PE, PG, Brierley Associates; and Brian T. Lee, PE, Rainbow Municipal Water District	This paper identifies the steps taken to quickly identify what alternatives were available to make use of a failed HDD water casing so that it could be quickly cleaned via HDD, sliplined via fused PVC, groundwater in the annular space displaced through 1,000-ft. grout tremie tubes and brought online.

Track 5: Condition Assessment & Pipeline Inspection Session Leader: Dorian Modjeski, Cardno TBE

3:45 PM	B-5-01	Wastewater	Hydraulic Analysis, Inspection and Condition Assessment of the City of San Diego PS65 Force Main	Monika Smoczyński, P.E., City of San Diego and Gary Skipper, P.E., Brown and Caldwell	This paper describes the work efforts and results associated with the pressure gauging, hydraulic analysis, external and internal inspection and structural condition assessment of the City of San Diego Pump Station No. 65 Force Main to accommodate PS65 capacity expansion to adequately handle peak wet-weather flows.
4:10 PM	B-5-02	Gas	Robotic Inline Inspection of Unpiggable Natural Gas Pipeline with Explorer	Rod Lee, Pipetel Technologies Inc.	This paper describes a robotic technology that allows pipeline operators to perform inline inspection of unpiggable natural gas pipelines that cannot be inspected by conventional inline inspection tools (pigs).
4:35 PM	B-5-03	Wastewater	Laser Profiling - A Case Study in Field Accuracy	John Paul Travis and Jim Shelton, Malcolm Pirnie	This paper presents the findings of various laser profiling efforts, their accuracies vs. actual measurements and potential reasons for the differences.
5:00 PM	B-5-04	Wastewater	Are Sewer Lateral Inspections Cost-effective?	Jeffrey Griffiths, Hydromax USA and George Pendleton, Kleinfelder/SEA Consultants	This paper discusses lateral inspection techniques, data output and how data is used to support rehabilitation recommendations that provide the client with a cost-desirable solution.

Tuesday, March 13 - AM Sessions (1st Session)

Track 1: Horizontal Directional Drilling (HDD) Session Leader: Jim Murphy, Complete Crossings Inc.					
8:00 AM	C-1-01	Water/Wastewater	Risk Mitigation Strategies for Directional Drilling Projects	Steven K. Donovan, P.E., Richard Hanford, GE, and Roland Johnson, CEG, SHN Consulting Engineers & Geologists, Inc.	This paper discusses geotechnical investigative goals and soil testing methods, design tools and strategies, contractual arrangements and construction management tools available for design and construction professionals to consider when implementing an HDD project.
8:25 AM	C-1-02	Electrical	Vancouver City Central Transmission Project - Horizontal Directional Drilling and Supply and Installation of High Density Polyethylene Duct	Craig Vandaelle, Michels Canada Co.; Mike Hoyer, Michels Directional Crossings; Tom Bryski, Golder Associates; and Adrian Hansen, Golder Associates	This paper describes the Vancouver City Central Transmission (VCCT) project, BC Hydro's most significant upgrade Vancouver's electrical system in 30 years, including an 850-m HDD crossing beneath False Creek.
8:50 AM	C-1-03	Other	Accuracy and Predictability of Design Parameters in Horizontal Directional Drilling	Abhinav Huli and Dennis J. Doherty, Haley & Aldrich	This paper discusses some contractual and design modifications needed in order to eliminate uncertainties in HDD design and improve predictability of HDD design parameters and the importance of incorporating such engineering parameters as a part of the standard contractual and design practice.

Tuesday, March 13 - AM Sessions (1st Session)

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Track 1: Horizontal Directional Drilling (HDD) Session Leader: Jim Murphy, Complete Crossings Inc.					
9:15 AM	C-1-04	Electrical	North LRT Expansion at MacEwan - 72 KV Cable Relocation Project	Dave Krywiak and Dean Charleson, Stantec Consulting Ltd.; and Brian Choma, EPCOR Transmission Inc.	This paper describes the design constraints and construction challenges faced in relocating three high voltage electrical cables necessitated by the expansion of Edmonton's LRT system and the siting of a transit station near an existing substation.
9:40 AM	C-1-05	Wastewater	The Birkdale 'B' Project: 3,420 lf of At-grade HDD in New Zealand	Ian Jonkers, PipeWorks, Ltd. and Richard (Bo) Botteicher, Underground Solutions, Inc.	This paper illustrates a recent case study in New Zealand, where a very long, curvilinear, at-grade storm sewer installation was completed using HDD.
Track 2: Microtunneling Session Leader: Matthew Wallin, Bennett Trenchless Engineers					
8:00 AM	C-2-01	Water	Microtunneling of Large Diameter Watermain in Hard Rock-Manhattan, City of New York	Gurdip Saini, NYC Dept. of Design and Construction	This paper describes how the use of appropriate trenchless technology can overcome the economic and social challenges and meet the community needs while satisfying the engineering criteria in a very sensitive work environment.
8:25 AM	C-2-02	Water/Wastewater	Microtunneling through Abrasive Soil with Hard Cobbles and Boulders - Construction of the Santa Ana River Interceptor (SARI) Replacement	Rory P.A. Ball and David J. Young, Hatch Mott MacDonald; To Be Determined, Orange County Sanitation District	The paper discusses the correlation of soil abrasivity test results with equipment wear and tool life on the Santa Ana River Interceptor (SARI) Replacement Project, which included 4,500-ft. of microtunneling.
8:50 AM	C-2-03	Water	City of East Chicago Raw Water Pipeline - Microtunneling in Clean Sands Beneath the Water Table	Paul Headland, Jason Chin and Stephen O'Connell, Black & Veatch Corp.; and Jim Kabat, Michels Tunneling	This paper describes how the City of East Chicago used microtunneling to install a new raw water intake pipeline beneath seven sets of railroad tracks, multiple utility lines and a highway on and off ramp all through flowing clean sands.
9:15 AM	C-2-04	Other	Chemical Grout - The Settlement Solution for Microtunneling	Michael Vargo, Prime Resins, Inc. and Steve Pollack, Huxted Tunneling	This paper presents projects involving tunneling under railroad tracks and a underwater extraction of a tunneling machine using polyurethane resins to stop water infiltration and soil loss.
9:40 AM	C-2-05	Water/Wastewater	Unconventional Subsurface Investigation Methods for Tunnel/Trenchless Projects	Tracy J. Lyman, Nate Soule and Alan Howard, Brierley Associates, LLC	This paper discusses the advantages of non-conventional subsurface investigation methods to characterize ground conditions for tunnel/trenchless projects to provide better data for contractor success.
Track 3: Lining Materials, Methods & Installation Session Leader: John Matthews, Battelle Memorial Institute					
8:00 AM	C-3-01	Wastewater	Sewer Rehabilitation in the City of Atlanta - Past, Present and Future	Mikita Browning, City of Atlanta, Department of Water-shed Management and Ray Hutchinson, MWH	This paper reviews the City of Atlanta's Clean Water Atlanta program, lessons learned and future strategy.
8:25 AM	C-3-02	Wastewater	Lessons Learned During Sewer Rehabilitation on Public and Private Property	Scott E. Belz, URS Corp.; Robert P. Kelly and James J. Smolik, City of Westlake, Ohio	This paper describes the lessons learned over four sewer rehabilitation projects conducted from 2001 to 2011.
8:50 AM	C-3-03	Wastewater	A New UV Sensor Method for Sewer Renovation	Michael Roeling, BKP Berolina Polyester GmbH & Co. KG	This paper reviews rigorous procedures for process monitoring developed for UV cured CIPP and discusses the quality control parameters and the development of measurement techniques to qualify performance..
9:15 AM	C-3-04	Water/Wastewater	World's First All Electronic Toll Highway Uses Trenchless Technology to Maintain High Standards	Ian Doherty, Trenchless Design Engineering; and Tony Angelo, 407ETR	The paper describes 407ETR Express Toll Route's rehabilitation program for over 1000 culverts, sized 600 (24-in.) to 2,700 (108-in.) .
9:40 AM	C-3-05	Other	Rehab of a Stormwater Culvert Through Contaminated Soil and Groundwater	Datta Shirodkar, P.E., Boyer, Inc. and Michael Spero, P.E., Danby, LLC	This paper describes the rehabilitation of 1400-ft. of a 90-year-old concrete 7-ft. by 11-ft. stormwater culvert in an area of contaminated soil and groundwater resulting from a former petroleum refinery.
Track 4: Pipe Bursting & Pipe Ramming Session Leader: Craig Camp, Jacobs Associates					
8:00 AM	C-4-01	Water/Wastewater	Failing 96-in. Diameter CMP Replaced Utilizing Pipe Ramming Technology	Dave Holcomb, TT Technologies, Inc. and Jim Robinson, Jim Robinson Contracting	This paper describes the installation of a 96-in. diameter steel pipe to replace a failing 96-in CMP line located under HWY 21 north of Goderich, Ontario along the eastern shore of Lake Huron.
8:25 AM	C-4-02	Gas	Estimating Hammer Stresses for Pipe Ramming and HDD Assists	Mathew Francis, P.E., Curtis Tanner, P.E. and Michael Sharp, P.E., URS Corp	This paper provides an example adaptation of GRLWEAP pile driving software to estimate hammer stresses during pipe ramming and HDD assist projects with considerations for high pressure oil and gas regulations.
8:50 AM	C-4-03	Electrical	Conductor Barrel Installation Makes Boston's Logan Airport HDD Project a Success	Collins Orton, TT Technologies, Inc. and Mel Olson, Southeast Directional Drilling	This paper describes the use of conductor barrel casings to isolate contaminated soil for the successful crossing of the Chelsea River.
9:15 AM	C-4-04	Water/Wastewater	Hillsborough County Florida Utilizes Varied Trenchless Methods with Success	Richard Kirby, Hillsborough County Public Utilities	This paper details the design and construction lessons learned with multiple trenchless installation methods for new construction and rehabilitation/replacement of existing water and wastewater pipelines that Hillsborough County has utilized over the last several years with success and efficiency.
9:40 AM	C-4-05	Water/Wastewater	Case Studies in Regulatory, Legal and Design Issues in Pipe Bursting	Mark Kwilinski and James Withers, JRGO, LLC	This paper discusses two ongoing pipe bursting projects and describes the regulatory, legal and design issues that have been encountered to date on each project.
Track 5: Condition Assessment Session Leader: Peter Oram, AECOM					
8:00 AM	C-5-01	Water/Wastewater	Separating the Forest from the Trees - The Use of GIS Decision Tool to Make Intelligent Asset Decisions	Marc A. Lehmann, P.E. and Rod Moeller, P.E., CDM; and C. Timothy Fallara, City of Columbus, DOSD	This paper shares lessons learned from several Midwest sewer projects that managed complex data sets to develop a cost-effective and prioritized long-term plan.
8:25 AM	C-5-02	Wastewater	Direct Benefits of Undertaking Multi-sensor Inspections for Large Diameter Sewers	David Crowder and Gerry Bauer, R.V.Anderson Associates Ltd.; and Harry Krinas, City of Hamilton	This paper reviews the direct benefits of undertaking a multi-sensor inspection for large diameter sewers, the challenges that were overcome and the information that was discovered during the inspections.
8:50 AM	C-5-03	Water/Wastewater	Using the State-of-the-art Pipeline Condition Assessment Tools to Proper Advantage	Ed Kampbell, Jason Consultants	This paper shows the range of technologies available, the engineering information they can produce, the relative cost of producing this information, the precision of the information and how to turn this survey information into actionable information for the system owner.
9:15 AM	C-5-04	Water/Wastewater	Risk-based Condition Assessment of Aqueduct Pipelines Using Multiple Inspection Technologies	Andy Dettmer, Mike Fleury and Rick Wheadon, Carollo Engineers; and Adam McKnight, Weber Basin Water Conservancy District	This paper presents a risk and condition assessment case study for 26 miles of large diameter raw water pipelines constructed in 1955 near Salt Lake City, Utah.
9:40 AM	C-5-05	Wastewater	Pipeline Inspection and Locating	Harry R. Price, P.E., John R. Kosnak, P.E. and Fritz J. Klingler, P.E., NTH Consultants, Ltd.; Adam Slifko, RedZone Robotics; Michael McMahon, P.E., Oakland County Water Resources Commissioners Office; and James Pistilli, P.E., Macomb County Publics Works Commissioners Office	This paper discusses the re-inspection and locating of the Edison Corridor Interceptor (ECI) portion of the Oakland Macomb Interceptor Drain through the use of a multi-sensor mounted tracked robotic unit.
Track 6: Current Trenchless Research & Environmental Issues Session Leader: Cindy Preuss, Harris & Associates					
8:00 AM	C-6-01	Wastewater	Interactive Web Portal for Supporting Decision Making Related to Technical, Financial and Legal Issues	Jadranka Simicevic, Umesh Dhital, Ashikul Islam and Erez Allouche, Trenchless Technology Center; and Walter Graf, Water Environment Research Foundation	This paper describes new online software that has been developed to identify applicable methods for the rehabilitation of sewer laterals in real site conditions.
8:25 AM	C-6-02	Water/Wastewater	Trenchless Technology Applications for Culvert Installations	Saeed Rahjoo, University of Texas at Arlington	This paper provides a method selection process and suggests recommendations for culvert installations by deploying trenchless technology.
8:50 AM	C-6-03	Water	Comparison of the Carbon Dioxide Emissions Between HDD and Open-cut in the Construction of One Mile Watermain and its Ancillary Structures	Alan Atalah and Tao Xie, Bowling Green State University	This paper presents the calculations of carbon dioxide emissions during the construction of one mile of watermain and it ancillary structures using two pipeline construction methodologies - open-cut and HDD.
9:15 AM	C-6-04	Other	Carbon Reduction and the Trenchless Industry	David O'Sullivan, PW Trenchless Construction Inc.	This paper discusses the development of a carbon protocol to allow cities to offset their day-to-day operations against their trenchless program.
9:40 AM	C-6-05	Wastewater	Fiberoptic Cure Verification (FCV) Ensures Quality, Longevity of CIPP Liner Installations	Prof. Dr. Ulrich Glombitza, OSSCAD GmbH & Co. KG	This paper describes an innovative method for monitoring thermal curing of CIPP using a sensor cable contained within the liner tube fabric.

Tuesday, March 13 - AM Sessions (2nd Session)					
Time	Paper ID	Industry Segment	Paper Title	Author(s)	Brief
Track 1: Horizontal Directional Drilling (HDD) Session Leader: David Bennett, Bennett Trenchless Engineers					
10:20 AM	D-1-01	Wastewater	Garry Creek Emergency Construction Using HDD	Brian Avon and Ryan Hook, Carolo Engineers; and Ken Cook, West County Wastewater District	This paper describes the planning, design and construction of a double-barreled siphon using HDD and stresses the importance of design flexibility when facing multiple project challenges.
10:45 AM	D-1-02	Other	Multiple HDD Applications, Portland Airport Deicing Enhancement Project	Barry Sarin, CDM	
11:10 AM	D-1-03	Wastewater	Constructing Twin 24-in. Force Mains in a Highly Sensitive Environment Utilizing HDD	Todd Perimon, AECOM; Rick Zavitz, Mears Group Inc.; Kim Staheli, Staheli Trenchless Consultants; and Scott Woodbury, Clean Water Services	This paper presents challenges encountered and solutions developed during design and construction of twin 24-in. force mains using HDD.
11:35 AM	D-1-04	Water	Tulalip Tribe and City of Everett Bring Regional Water to the Pacific Northwest with Massive HDD Project	Kimberlie Staheli and Matt Pease, Staheli Trenchless Consultants; Daniel Williams, P.E., MWH Americas, Inc.; Debbie Bray, Tulalip Tribes; and Souheil Nasr, City of Everett, WA	This paper presents details on the challenges encountered and overcome during the design and construction of four HDD bores totaling over 10,000-ft. of drilling near Everett, Washington.
Track 2: Pilot Tube Microtunneling & Microtunneling Session Leader: Brenda Kingsmill, Region of Halton					
10:20 AM	D-2-01	Wastewater	Unique Location and Ground Conditions Call for Innovative Approach to On-grade Boring	Catherine Morley P.E., RJN Group Inc; Joseph Butor P.E., Midwest Mole; and John Milligan, Vermeer	This paper describes the relocation and upsizing of sanitary sewers at the Fermi National Accelerator Laboratory complex in unstable soils with a high groundwater table at a shallow grade.
10:45 AM	D-2-02	Water/Wastewater	Pilot Tube Microtunneling within Variable Ground Conditions in Cleveland, Ohio	William Bergeson, Verva Nasri and Steve Benton, AECOM ; and Brian Page, NEORS	This paper describes the state-of-the-art review of pilot tube microtunneling to include the considerations from the Dugway West Interceptor Relief Sewer Project in Cleveland, Ohio.
11:10 AM	D-2-03	Other	Laser-guided Microtunneling in Non-traditional Pipe Installation Applications	Arvid Veidmark III, Specialized Services Company and John Milligan, Vermeer Corp.	This paper discusses microtunneling projects in which a laser-guided gravity sewer boring system was used in non-traditional applications.
11:35 AM	D-2-04	Water/Wastewater	Pilot Tube Microtunneling in City of Edmonton - Challenges and Successes	Fangyi Zhou, S.M.A. Consulting Ltd.; Siri Fernando and Ray Davies, City of Edmonton Asset Management and Public Works; and Simaan M. AbouRizk, University of Alberta	This paper presents the evolution of pilot tube microtunneling applications with Akkerman machine, Bohrfec machine and Akkerman/BohrTec hybrid machine on four trenchless projects constructed by the Drainage Design and Construction Dept. at the City of Edmonton.
Track 3: Lining Materials, Methods & Installation Session Leader: Kevin Nagle, TT Technologies, Inc.					
10:20 AM	D-3-01	Wastewater	One Million ft. of Trenchless in Los Angeles	Keith Hanks, City of Los Angeles	This paper discusses the milestone of one million ft. of trenchless construction and rehabilitation that has been reached by the City of Los Angeles, and the trenchless methods that have been used to achieve this.
10:45 AM	D-3-02	Wastewater	Lining of a 2.4-m ID Inverted Siphon Tunnel for Zero Leakage	Junhao Zou, Siri Fernando, Arbind Mainali and Frank Policicchio, Design & Construction, City of Edmonton	This paper describes how the City of Edmonton selected and installed 96-in. ID HOBAS pipe in a siphon tunnel with 118-in. ID rib and lagging liner to achieve zero leakage.
11:10 AM	D-3-03	Wastewater	The Conversion of 24-in. Storm Sewer to a Sanitary Sewer Through Trenchless Technology in a Highly Urbanized Area for the City of Laredo	Temple Williamson and Chau Bao, Lockwood, Andrews & Newnam, Inc.; and Riazul Mia, City of Laredo	This paper discusses the challenges, evaluation, solutions and lessons learned from converting an existing storm sewer to sanitary sewer to eliminate points of illicit discharges.
11:35 AM	D-3-04	Wastewater	Buckling of Plastic Pipes and Pipeline Rehabilitation Liners on Chosen Examples	Andrzej Kuliczowski, Emilia Kuliczowska, and Maria Gierczak, Kielce University of Technology	This paper studies the buckling of plastic pipes and pipeline rehabilitation liners on chosen examples and includes conclusions and recommendations concerning elimination of buckling failure of plastic pipes newly laid in ground or rehabilitation liners.
Track 4: Pipe Bursting & Pipe Ramming Session Leader: Jack Burnam, CH2M Hill					
10:20 AM	D-4-01	Water/Wastewater	Pipe Bursting Pressurized Waterlines - To Burst or Not to Burst	Tracy Weaver and Michael E. Woodcock, Portland Utilities Construction Co., LLC	This paper describes the renewal techniques available for water rehabilitation and presents the pros and cons of pipe bursting pressurized waterlines and lessons learned using the Liverpool Watermain, Auburn Hills, Michigan and Liberty Road, Roanoke Virginia projects.
10:45 AM	D-4-02	Wastewater	Large Diameter Pipe Bursting Case Study - City of Dallas, Texas	Matt Werth, Inland Pipe Rehab and Dave Holcomb, TT Technologies, Inc.	This paper discusses the difficult and extensive repair needed to replace a 60-year-old wastewater main collapse in the City of Dallas, Texas, resulting in an upgrade in pipe size from 36-in. to 42-in.
11:10 AM	D-4-03	Water	Pipe Bursting - Addressing Social and Environmental Impact in Madison, Wisconsin	Alan Goodman, HammerHead Trenchless Equipment and Scott Zimmerman, Terra Engineering	This paper reviews the current methods of pipe bursting and replacing waterlines with pre-chlorinated pipe with an emphasis on a case study of a project completed at the University of Wisconsin in Madison, Wisconsin.
11:35 AM	D-4-04	Water/Wastewater	Pipe Bursting and Sliplining Reach New Levels of Production in the City of Oxnard, California, Through New Innovative Design, Planning, Equipment and Construction Methods	Ahmad Habibian, Ph.D., P.E., and Andy Stanton, Black & Veatch Corporation; George C. Mallakis, TT Technologies, Inc.; Daniel Rydberg, City of Oxnard, CA; and Jim Creager, AECOM	This paper discusses how pre-design planning, innovative design methods, equipment and construction techniques were used to burst 9,000 lf of existing 15-in. and 18-in. VCP and slipline 15,000 lf of 21-in. to 30-in. VCP.
Track 5: Condition Assessment & Pipeline Inspection Session Leader: Ariamalar Selvakumar, USEPA					
10:20 AM	D-5-01	Wastewater	If Finding and Removing I/I Were Easy	Timothy Fallara, P.E., City of Columbus, DOSD and John Schroeder, P.E., CDM	This paper discusses how the City of Columbus has made great strides with sewer investigations and engineering evaluations to understand its sanitary sewer systems under dry and wet-weather conditions and the removal of I/I.
10:45 AM	D-5-02	Water/Wastewater	Manhole Inspection: Way Beyond Surface Level	Eric Sullivan, RapidView-IBAK North America	This paper describes typical manhole design, the role of the manhole in collection systems, the need for manhole inspection as part of a comprehensive maintenance program, traditional inspection methods, emerging technologies and specific case studies and applications.
11:10 AM	D-5-03	Water/Wastewater	Implementing Inertial Navigation Technologies	Ashan McNealy and Travis Wagner, Pure Technologies Ltd.; and Greg Fisk, WSSC	This paper describes inertial navigation systems and implementation and key advantages for use in asset management or rehabilitation programs.
11:35 AM	D-5-04	Water/Wastewater	Combined Application of Pipe Penetrating Radar and LIDAR for Large Diameter Pipe Inspection	Csaba Ekcs and Borislav Neduczka, SewerVUE Technology Corp.	The paper illustrates the advantage of combined application of Pipe Penetrating Radar and LIDAR for the inspection of large diameter water and sewer pipes.
Tuesday, March 13 - PM Sessions					
Track 1: Rehabilitation/CIPP Session Leader: Mo Najafi, University of Texas at Arlington/CUIRE					
3:30 PM	E-1-01	Gas	Winter Wonderland Does Wonders to CIPP Renewal of a High Pressure Gas Main in New Jersey	Mario Carbone, Progressive Pipeline Management; Mo Ehsani, Ph.D., P.E., PipeMedic, LLC; and George Ragula, Public Service Electric & Gas	This paper describes the challenges related to robotically removing an inline drip and installing a carbon fiber bridge so the rehabilitating liner can traverse.
3:55 PM	E-1-02	Wastewater	A Sure Bet at Greentown Casino	Fred Tingberg, Lanzo Lining Services	This paper presents the successful installation of a green, non styrenated, Iso Polyester Resin in an indoor casino sewer collection system where there was no allowance for downtime and any impact to the public was unacceptable.
4:20 PM	E-1-03	Wastewater	Caught Between a Bridge and a River	Jeff Twardzik, Philadelphia Water Dept.	This paper discusses the rehabilitation of a 36-in. sewer that ran under the soon to be replaced South St. Bridge, active tracks and was an outfall to the Schuylkill River, the issues and restrictions during the replacement of the bridge.
4:45 PM	E-1-04	Water	Water Pipeline Deterioration Prediction Utilizing a Markov Chain Methodology	Alison St. Clair and Sunil Sinha, Virginia Tech	This paper presents a Markov chain methodology in the prediction of water pipeline deterioration curves which is useful where there is a limited historical database.
5:10 PM	E-1-05	Wastewater	A Hydraulically Limited Interceptor 30-ft. Deep Under I-5	Robert Lee, P.E. and Vanessa Adams, P.E., Brown and Caldwell; Patty Nelson, P.E., City of Portland	This paper describes the challenges and considerations faced by the City of Portland when designing reinforced CIPP to rehabilitate a hydraulically-restricted pipe 30-ft. deep underneath I-5 and lessons learned during construction.

Tuesday, March 13 - PM Sessions						
Time	Paper ID	Industry Segment	Paper Title	Author(s)	Brief	
Track 2: Large Diameter Tunneling Session Leader: Don Del Nero, CH2M Hill						
3:30 PM	E-2-01	Water	Tapping the Mighty Missouri Using Trenchless Methods	Clay Haynes, Black & Veatch Corp.; Wynn Morgan, Missouri American Water; and Ashley Quinn, W.L. Hailey	This paper describes an existing river intake structure experiencing problems with leaky suction lines, low river levels in drought conditions and a naturally deepening river channel, and blockages due to fazzle ice that was successfully replaced with a deeper tunnel and water tap through dolomite.	
3:55 PM	E-2-02	Water	Installation of Two Water Tunnels Through Limestone Using a 60-in. Diameter Hard Rock Shielded TBM	Kenny Clever, The Robbins Co. and Rick Ryon, W.L. Hailey; and Ross D. Fann P.E., Metro Water Services of Nashville	This paper discusses the design and setup of a self-propelled TBM for use on 1,500-ft. of water tunnels at the local Powell Avenue Project.	
4:20 PM	E-2-03	Water/Wastewater	Jervis Force Main Tunnel - A Case Study in Urban Tunnelling	Colin Meldrum, P.E. and Redgenald Musana, P.E., Metro Vancouver; Bruce Downing, P.E., ; and Jennifer Chu, P.E., Golder Associates	This paper describes the challenges faced, including site conditions and public impacts, the steps taken to mitigate them, what worked well and what could have worked better during the construction of a 300-m sewer tunnel to connect to an existing 20-m deep sewer.	
4:45 PM	E-2-04	Wastewater	Tunneling Under the Overland Park Arboretum	Timothy Schneller, P.E., George Butler Associates, Inc.; and James Finnigan, P.E., PB Americas, Inc.	This paper describes the evaluation used in the selection of tunneling to preserve the beauty of the community park, the process for defining the tunneling method and an evaluation of the green aspects of tunneling versus open-cut construction.	
5:10 PM	E-2-05	Water/Wastewater	Trenchless Installation of 60-in. Sanitary Sewer Using a 72-in. Robbins Rockhead Hard Rock TBM	Stephen Abernathy, Midwest Mole, Inc.	This paper describes how a 72-in. rock TBM was used to excavate 13,000 psi limestone for jacking 550 lf of a 72-in. casing liner and 60-in. carrier pipe for a flat .05% sanitary sewer installation in blocky ground with high levels of petroleum contamination in Louisville, Kentucky.	
Track 3: Water Rehabilitation Session Leader: Keith Hanks, City of Los Angeles						
3:30 PM	E-3-01	Water	Trenchless Renewal of Watermains Beneficial to Both the Existing Watermain and the Asphalt Pavement	Anna Polito, City of Dillard-Des-Ormeaux and Joseph Loiacono, Sanexen Environmental Services	This paper presents the decision criteria used by the City of Dillard des Ormeaux to choose and prioritize the renewal of its watermains and discusses how sidewalk and street paving considerations often impact their watermain renewal priorities.	
3:55 PM	E-3-02	Water	Trenchless Rehabilitation of Pressure Pipelines	Matt Wassam, SAK Construction, LLC and Sean E. O'Dell, P.E., Baxter & Woodman, Inc.	This paper uses recent case studies to illustrate the use of fully structural rehabilitation methods and specialized robotics to rebuild very difficult and critical water mains.	
4:20 PM	E-3-03	Water	Structural Rehabilitation of Aging Pipes - Does It Really Prevent Failures?	Kevin Bainbridge, Robinson Consultants Inc. and Michael Zantingh, City of Hamilton	This paper presents the City of Hamilton's history in the rehabilitation of water distribution pipes, their selection criteria and most importantly the impact that has been seen in the required pipe repairs pre- and post-rehabilitation over the past ten years.	
4:45 PM	E-3-04	Water	QA/QC Procedures for Structural Rehabilitation of PCCP with CFRP Composites	Michael Gipsov, P.E., WSSC/TSG	This paper discusses the QA/QC procedures for structural rehabilitation of PCCP with CFRP composites.	
5:10 PM	E-3-05	Water	Using CIPP Lining and Cathodic Protection to Rehabilitate and Protect Water Lines	David Rosenberg, Insituform Technologies, Inc.	This paper presents the construction and materials of the fiber-reinforced CIPP product, benefits of the torpedo launcher installation method and also provides an overview of cathodic protection and how anodes may complement lining projects to help prevent future pipe problems.	
Track 4: Trenchless Risk Issues Session Leader: Brian Dorwart, Brierley Associates, LLC						
3:30 PM	E-4-01	Other	Investigation of Horizontal Directional Drilling Construction Risks	Manley Osbak, The Crossing Company Inc.; Hossein Akbarzadeh and Alireza Bayat, University of Alberta	This paper examines the risk events that have occurred on some 150 medium and large HDD projects.	
3:55 PM	E-4-02	Wastewater	The Benefits of Post-construction Warranty Inspections for Long-term Sanitary Sewer Overflow Control Program Success	Jonathan Kunay and Paul Ross, CDM	This paper details the findings of post-construction warranty inspections, focusing on products used, failure rates, lessons learned and benefits, specifically for long-term programs, where consistent, long-lasting solutions are critical to the success of a consent order driven program.	
4:20 PM	E-4-03	Gas	Creating High Confidence - Essential Elements for Cross Bore Elimination Projects	Mark Bruce, Cross Bore Safety Association	This paper discusses the elements for successful cross bore elimination including GPS, GIS, data verification, data storage and ready retrieval of data.	
4:45 PM	E-4-04	Wastewater	Construction Failure Case Study: City of Sedro-Woolley InneReam Sewer Line Replacement Project Grade Failure	Arne Hedeem, Hedeem & Caditz, PLLC	This paper presents a case study of a construction failure for the City of Sedro Woolley, which arose out of the failure of the drilling contractor to achieve grades on a 24-in. sewer line replacement using the InneReam process.	
5:10 PM	E-4-05	Water/Wastewater	Paying Small Trenchless Projects Their Dues - A Discussion on Risk Reduction Strategies for Small Trenchless Projects	Stephen O'Connell, Paul Headland and James McKelvey, Black & Veatch Corp.	This paper presents a holistic approach to risk management for smaller trenchless projects which show a disproportionate amount of risk compared to overall construction value leading to cost overruns and legal disputes.	
Track 5: Condition Assessment Session Leader: David Crowder, R.V. Anderson Associates Ltd.						
3:30 PM	E-5-01	Water/Wastewater	Holistic Approach to Condition Assessment of Two Florida Coastal Communities Force Mains - A Case Study	Don McCullers and Dorian Modjeski, P.E., BCEE, Cardno TBE; Jim Murphy, City of Treasure Island, FL; Steve Hallock, City of St. Pete Beach, FL	This paper discusses a cost-effective, holistic approach in performing a condition assessment of 4.2 miles of force mains, which included several subaqueous water crossings including the Intracoastal Waterway, an Outstanding Florida Waterway.	
3:55 PM	E-5-02	Wastewater	Large Diameter Force Main Investigations - Two Level Approach	Kenneth Eyre, P.E., PACP and Paul D. Huston, Greeley and Hansen; Gayle Moomaw, PACP, DC Water/Greeley and Hansen; and Renni Zhao, Ph.D., P.E., DC Water	This paper presents case study application of a two-level approach for field investigations followed by corrective measures.	
4:20 PM	E-5-03	Wastewater	Sustainable Infrastructure Planning For Long-term Wastewater Force Main Programs	Andrew Clothier and Peter Oram, AECOM; and Andrew Kubek, City of Virginia Beach	This paper describes the development of a wastewater force main evaluation program including field inspection approach, data analysis and condition assessment results and focuses on the methodology utilized to translate inspection data into a long-term infrastructure management program.	
4:45 PM	E-5-04	Water	Asset Management of Asbestos Cement Pipes Using Acoustic Methods; Theory and Case Studies	Marc Bracken, Echologics Engineering Inc.	This paper educates water service providers on how they can non-invasively detect leaks and assess the condition of underground water pipes that are lined with asbestos cement to improve their ability to reduce non-revenue water and cost-effectively address asbestos cement in their water systems.	
5:10 PM	E-5-05	Water/Wastewater	Condition Assessment of Conveyance Tunnels - Effective Approaches to Managing Reliability	Thomas Hennings and Blake Rothfuss Jacobs Associates and Brian Lakin, South Central Connecticut Regional Water Authority	This paper presents several case histories discussing the challenges faced by water and wastewater agencies in maintaining reliability of their conveyance tunnels and the effective methods used today for inspecting, assessing and rehabilitating them.	
Wednesday, March 14 - AM Sessions						
Track 1: Horizontal Directional Drilling (HDD) Session Leader: Dennis Doherty, Haley & Aldrich, Inc.						
8:00 AM	F-1-01	Water	Water HDD Methodology Applied to New Waterline Under Historic Erie Canal	Robert D. Klavon, P.E., Wendel	This paper discusses the use of HDD techniques to install a new waterline under the Historic Erie Canal.	
8:25 AM	F-1-02	Gas	Optimum Method Selection for Trenchless Technology - Case of Horizontal Directional Drilling	Vijay Agrawal, Ahmedabad and Jyoti Trivedi, CEPT University	This paper presents a Decision Support System (DSS) to facilitate the decision-making process for the selection of trenchless technologies to assist designers, contractors and owners during the early stages of utility and pipeline infrastructure projects.	
8:50 AM	F-1-03	Other	Comparison of Buried Pipe Behavior - Open-cut vs. Directional Drilling	Jinsung Cho, Jason S. Lueke and Samuel T. Ariaratnam, Arizona State University	This paper examines pipe floatation behavior for HDPE pipe installed by traditional open-cut construction and HDD techniques in saturated submerged soil conditions typical of river crossings by conducting real-scale laboratory experiments.	
9:15 AM	F-1-04	Water	Impact of Earth Loads on Polyethylene Pipes Installed by Horizontal Directional Drilling	Hossein Akbarzadeh and Alireza Bayat, University of Alberta	This paper discusses the ASTM F 1962 arching model for polyethylene pipes design and clarifies inconsistencies shown in this model.	

Wednesday, March 14 - AM Sessions

Time	Paper ID	Industry Segment	Paper Title	Author(s)	Brief
Track 1: Horizontal Directional Drilling (HDD) Session Leader: Dennis Doherty, Haley & Aldrich, Inc.					
9:40 AM	F-1-05	Wastewater	Triple Barrell Siphon Installed in Tight Quarters	Greg McCorkhill, GHD Consulting Engineers, LLC and Karl Lux, Village of Springville, Dept. of Public Works	This paper reviews the design and construction of a replacement inverted siphon following the failure of the existing siphon due to stream bed erosion and poor unstable soil conditions.
Track 2: Tunneling Session Leader: Glenn Duyvestyn, Hatch Mott MacDonald					
8:00 AM	F-2-01	Wastewater	Planning, Design and Constructability Aspects of Longer Trenchless Drives for Gravity Sewer Installation	Raghendra Bhargava, Parsons Brinckerhoff	This paper presents an approach adopted in prediction of jacking forces, selection of alignment and lubrication system to design longer distance jacking drives for gravity flow installations and highlights opportunities and challenges faced by the planners and microtunneling contractors.
8:25 AM	F-2-02	Wastewater	The Axis of New Trenchless Technology	Kyle Boyle and Brandon Vatter, SD#1 of Nothern Kentucky	This paper describes how the AXIS Boring System was used to remove an overflowing pump station and the difficult design constraints that were overcome to successfully complete this project ahead of schedule.
8:50 AM	F-2-03	Wastewater	Support of Tunneling with Chemical Grouting in New Jersey	Guy Dicks, Constellation Group LLC and Giovanni Scotto, Northeast Remco	This paper discusses the SRVSA project in New Jersey required stabilizing the soil with sodium silicate grout prior to tunnel boring operations.
9:15 AM	F-2-04	Wastewater	Dugway East Interceptor Relief Sewer Hand Tunnel Crossing Installation	Thomas Hessler, P.E., DLZ Ohio, Inc.; Brian Page, P.E. and Robert Auber, Northeast Ohio Regional Sewer District; and Glenn Harrah, Terracon, Inc.	This paper describes the use of large diameter hand tunneling under a main railroad and the obstructions encountered during operation.
9:40 AM	F-2-05	Water/Wastewater	Instrumentation and Monitoring of Pilot Tube Microtunneling Installations	Jason S. Lueke, Arizona State University and Matthew Olson, Bore Master Inc.	This paper describes the results of instrumenting pilot tube frames to record thrust and rotational torque for installations of varying length and pipe diameter.
Track 3: Lining Materials, Methods & Installation Session Leader: Chris Schuler, Miller Pipeline Corp.					
8:00 AM	F-3-01	Wastewater	Old Pipe/Renewed Pipe - How New Technology Enhances the Rehabilitation of a 140-Year-Old Sewer	Charles Wilson and Frank Aytotte, Hazen and Sawyer; Edward Duggan and Irene McSweeney, Boston Water and Sewer Commission	This paper discusses the use of spiral wound lining to rehabilitate one of Boston Water and Sewer Commission's oldest and largest sewers, a 108-in. by 156-in. brick arch-shape pipe failing at the crown.
8:25 AM	F-3-02	Wastewater	CIPP Lateral Rehabilitation - Business as Unusual	Jonathan Pearce, City of Waterloo and Mike Near, Liquiforce Services	This paper presents a review of the creation, modifications and implantation of the program, as well as lessons learned by the City of Waterloo to rehabilitate 200 black pipe laterals in the Lincoln Heights area.
8:50 AM	F-3-03	Wastewater	Cured-in-place Liner Defects - Three Studies of Installed Liner Performance Quality	James Shelton, Malcolm Pirnie	This paper presents the data and findings of three field studies, including statistics on defect findings, potential root cause conjecture, and potential corrective measures based on various field trials.
9:15 AM	F-3-04	Wastewater	Trenchless Sewer Lateral Rehabilitation Pilot Project in Calgary, Alberta	Ron Snoddon and Bill Boyes, City of Calgary Water Services	This paper describes the successful pilot project to install trenchless T-Liners to rehabilitate sanitary service lines.
9:40 AM	F-3-05	Wastewater	96-in. Brick Nashville CSO Outfall Relined After Flood Damage	George E. Kurz, P.E., DEE and Ed Walker, P.E., Barge Waggoner Sumner & Cannon and Phil Regen, P.E. and Greg Ballard, P.E., Metro Water Services	This paper describes the work to repair and line 800-ft. of a large diameter brick combined sewer outfall and the environmental and installation complications which must be solved by the contractor.
Track 4: Trenchless Research Session Leader: Jason Lueke, Arizona State University					
8:00 AM	F-4-01	Water/Wastewater	Pipeline Repair Technologies, Current and Future	Tim Kennedy, Jay Thomas and Tarek Alkhrdaji, STRUCTURAL	This paper presents new technologies as alternatives to conventional restoration.
8:25 AM	F-4-02	Water	Evaluation of the Carbon Footprint of Innovative Watermain Rehabilitation Technologies vs. Open-cut	John C. Matthews and Wendy E. Condit, Battelle Memorial Institute; Samuel T. Ariaratnam, Arizona State University; Ariamalar Selvakumar, U.S. Environmental Protection Agency (EPA)	This paper describes the carbon footprint evaluation of two innovative trenchless technologies and compares the results against traditional open-cut methods for projects of a similar size.
8:50 AM	F-4-03	Other	Development of a Carbon Calculator Tool to Compare Trenchless and Standard Pipeline Activities	Angelo Fabiano, NYSEARCH	This paper highlights an overview of the program, the associated challenges and a brief overview of the calculator tool.
9:15 AM	F-4-04	Water/Wastewater	Baseline Condition Data Collection for Pipes and Pipeliners	L. Grant Whittle and Sunil Sinha, Ph.D., Virginia Tech; and David Burke, WSSC	This paper describes the data essential for accurate predictive modeling of the life-cycle performance of pipes and pipeliners.
9:40 AM	F-4-05	Wastewater	A New Approach in Pipe Structural Condition Scoring	Mary Cate Opila and Nii Attoh-Okine, University of Delaware	This paper presents a new approach to pipe structural condition scoring in which the economic concept of discounting is applied to the mean time to failure of a pipe.
Track 5: Inflow & Infiltration Session Leader: John Schroeder, CDM					
8:00 AM	F-5-01	Wastewater	Sewer Rehab Pays in Brentwood Tennessee	George E. Kurz, P.E., DEE, and Drew Muirhead, Barge Waggoner Sumner & Cannon and Chris Milton and Kevin Colvett, City of Brentwood	This paper describes how a strategically planned sewer rehabilitation program will improve system operation, meet regulatory requirements and save money.
8:25 AM	F-5-02	Wastewater	Flood Grouting Sanitary Sewers for Infiltration Control	Robert Jacobsen, P.E., Brown and Caldwell and Martha Burke, MPA, Seattle Public Utilities	This paper describes how the Seattle Public Utilities has initiated a pilot project using flood-grouting to reduce infiltration in the sanitary sewer system to eliminate wet weather overflows.
8:50 AM	F-5-03	Wastewater	Flow Monitoring and I/I Reduction - Beyond Plain Vanilla	Travis E. Wilson, P.E., Littlejohn Engineering Associates, Inc.	This paper illustrates the steps taken and results achieved by a Tennessee utility district, which constitutes a complete cycle of a comprehensive I/I reduction program including long-term planning, temporary and permanent flow monitoring, system prioritization, trenchless rehabilitation techniques and innovative electronic documentation.
9:15 AM	F-5-04	Wastewater	Effective Inflow/Infiltration Reduction Utilizing Cured-In-place Pipe Lining	Jon Putnam, GHD Consulting Engineers, LLC	This paper discusses the benefits, advantages and lessons learned in utilizing CIPP lining to effectively reduce I/I, reduce project costs, and minimize social and environmental impacts.
9:40 AM	F-5-05	Wastewater	Ways of Reducing I&I During Hard Economic Times	Vanessa Nedrick, P.E., MSEM, Remington, Venick & Beach	This paper describes how the owners of infrastructure can inspect their sanitary sewer systems to assess the condition while reducing inflow and infiltration in a cost effective way.
Track 6: Cured-in-Place Pipe (CIPP) Lining Session Leader: Joe Loiacono, Sanexen/Aqua-Pipe					
8:00 AM	F-6-01	Wastewater	Northwest Arm Trunk Sewer Rehabilitation - Case Study	Greg Rice and Jamie Hannam, Halifax Water; and Piero Salvo, GENIVAR Inc.	This paper presents a case study of the rehabilitation of approximately 468-m (1,535-ft.) of a 1200-mm (48-in.) interceptor sewer along the Northwest Arm (NWA) in Halifax, followed by the findings of a study dealing with the future rehabilitation options for the remaining 4,100-m.
8:25 AM	F-6-02	Wastewater	CIPP Rehab of Sewers in the Beaver State - Design, Construction and Lessons Learned	Jim Hansen, P.E., Robert Lee, P.E., and Vanessa Adams, P.E., Brown and Caldwell and John Kennedy, P.E., Clean Water Services	This paper describes the challenges Clean Water Services faced when rehabilitating 1,500 lf of 21-in. trunk sewer in a rapidly-changing environmentally-sensitive area and the steps that were taken to work with the public and environmental agencies to ensure a successful project.
8:50 AM	F-6-03	Wastewater	Rollercoaster in the Underground - Rehabilitation of 30-in. and 40-in. Sewer Pressure Pipelines Poses Special Challenges	Andreas Huettemann, Karl Weiss Technologies GmbH	This paper presents the CIP lining technology of a 40-in. sewer pressure pipeline with an MAOP of 150 psi using the Starline®HPL-S technology.
9:15 AM	F-6-04	Wastewater	Are You Receiving the CIPP Thickness You're Paying For?	Thomas Porzio, MWH Americas and Brian Dorwart, Brierley Associates	This paper discusses a process for ensuring that specified CIPP thickness is delivered in a manner that accommodates the realities of the design process and production in the field.
9:40 AM	F-6-05	Water	Quality Assurance and CIPP Lining	Kevin O'Keefe, Fer-Pal Ltd.	This paper describes how a construction-oriented business adopted the continuous improvement quality strategies of the automotive industry to improve the reliability of installation and improve the quality of their product that is produced underground