AGREEMENT TO PIGGYBACK A CONTRACT FORCE MAIN CONDITION ASSESSMENT SERVICES

THIS AGREEMENT is made and entered into on _____, by the City of Pompano Beach ("City") and Pure Technologies U.S. Inc., a foreign corporation authorized to do business in Florida, whose principal place of business is 8920 State Route 108 Suite D, Columbia, MD 21045 ("Contractor").

WHEREAS, Tohopekaliga Water Authority received bids or proposals in response to competitive solicitation RFP-21-002 to purchase Force Main Condition Assessment Services and

WHEREAS, on January 20, 2025, the Tohopekaliga Water Authority approved the award of RFP-21-002 - Force Main Condition Assessment Services, and an agreement was executed for a term of one (1) year effective January 20, 2025 through Jan 21, 2026; and,

WHEREAS, the City's Utilities Department wishes to enter into an Agreement with Pure Technologies U.S. Inc.; and

WHEREAS, Section 32.41(C) of the City Code provides authority for the City Manager to piggyback the purchase of goods and services with state or local public contracts within certain codified guidelines, of which these guidelines have been met; and

WHEREAS, the parties wish to incorporate the terms and conditions of the solicitation and contractual arrangement with the same terms and conditions set forth in the agreement of RFP-21-002 - Force Main Condition Assessment Services between Tohopekaliga Water Authority and Pure Technologies U.S. Inc., which is attached and incorporated in this Agreement as Exhibit "A" and adopted in its entirety by the City and the Contractor, together with and including contract renewals, amendments and change orders to the extent applicable; and

WHEREAS, the City has determined that piggybacking the agreement of RFP-21-002 - Force Main Condition Assessment Services between Tohopekaliga Water Authority and Pure Technologies U.S. Inc. is necessary for the purchase of Force Main Condition Assessment Services and is the most economically advantageous way to procure these necessary materials, products, and services in a timely and efficient manner.

NOW THEREFORE, in consideration of the mutual covenants set forth in this Agreement and other good and valuable consideration, the receipt and sufficiency of which is acknowledged, the parties agree as follows:

1. RECITATIONS.

The foregoing "WHEREAS" clauses are adopted and incorporated in this Agreement.

2. TERM.
The term of this Piggyback Agreement shall commence on the execution date and expire on January 21, 2026, unless it is terminated sooner pursuant to Section 4(E) of this agreement.

3. RENEWAL.
The Contractor affirms and ratifies the terms and conditions of the Agreement with Tohopekaliga Water Authority and agrees to perform the services in that Contract with Tohopekaliga Water Authority for the City in accordance with the terms for the agreed time period and any available renewal period.

4. AS-NEEDED BASIS.
The Contractor agrees to provide the services to the City of Pompano Beach on an as-needed basis, as requested by the City.

A. City shall pay the Contractor no more than the unit prices set forth in the Agreement and in accordance with the provisions of the Agreement.

B. If permits are required as part of the services being rendered, the Contractor shall submit complete and accurate permit applications to all applicable permitting agencies within five (5) business days of receiving all documents from the City necessary to file such permit applications. The City's Utilities Department shall pay all permit and related fees directly to the permitting agencies, including any permit fees charged by the City.

C. The City of Pompano Beach shall be deemed substituted for Tohopekaliga Water Authority with regard to any and all provisions of the Contract, including, for example and without limitation, with regard to bond requirements, insurance, indemnification, licensing, termination, default, and ownership of documents, including the additional provisions in sections D, E, and F, below. All recitals, representations, and warranties of the Contractor made in the Contract are restated as if fully set forth herein, made for the benefit of the City, and incorporated herein.

D. Contractor shall maintain insurance in accordance with insurance requirements in Exhibit "A" throughout the term of this Agreement. The Contractor shall furnish the City with a certificate of insurance in a form acceptable to the City and will be incorporated into this agreement as Exhibit "B." Such certificate provided by Contractor must state the City will be given thirty (30) days written notice prior to cancellation or material change in coverage. A copy of the additional insured endorsement must be attached and contain language on a form no more restrictive than ISO form CG 20 10 (Additional Insured – Owners, Lessees, or Contractor) combined with ISO form CG 20 37 (Additional Insured – Owners Lessees or Contractors – Completed Operations). The contractor shall not commence work unless and until the Contractor has fully met the requirements for insurance and appropriate evidence, in the City's sole discretion, has been provided to and approved by the City.

E. Both parties agree that the City may terminate this Agreement for any reason with ten (10) business days' written notice to the Contractor.

5. NOTICE.

Notice shall be provided in writing by certified mail return receipt requested, electronic mail, or customarily used overnight transmission with proof of delivery to the following parties, with mandatory copies, as provided below:

For City:
Gregory P. Harrison
City Manager
City of Pompano Beach
100 W. Atlantic Blvd., 4th Floor
Pompano Beach, Florida 33060

Randolph Brown
Utilities Director
City of Pompano Beach
100 W. Atlantic Blvd.
Pompano Beach, Florida 33060

For Contractor:
Ryan McKeon
Director
8920 State Route 108 Suite D
Columbia, MD, 21045

6. GOVERNING LAW; VENUE; WAIVER OF TRIAL BY JURY.

This Agreement shall be interpreted and construed in accordance with and governed by the laws of the State of Florida. The exclusive venue for any litigation arising from, related to, or in connection with this Agreement shall be in the Seventeenth Judicial Circuit in and for Broward County, Florida, or in the United States District Court for the Southern District of Florida, or United States Bankruptcy Court for the Southern District of Florida, as applicable. BY ENTERING INTO THIS AGREEMENT, THE PARTIES HEREBY EXPRESSLY WAIVE ANY RIGHTS EITHER PARTY MAY HAVE TO A TRIAL BY JURY OF ANY CIVIL LITIGATION RELATED TO THIS AGREEMENT.

7. PUBLIC RECORDS.

A. The City of Pompano Beach is a public agency subject to Chapter 119, Florida Statutes. The Contractor shall comply with Florida's Public Records Law, as amended. Specifically, the Contractor shall:

1. Keep and maintain public records required by the City in order to perform the service.

2. Upon request from the City's custodian of public records, provide the City with a copy of requested records or allow the records to be

inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes or as otherwise provided by law.

3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the Contractor does not transfer the records to the City.

4. Upon completion of the contract, transfer, at no cost to the City, all public records in possession of the Contractor or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of the contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure

requirements. If the Contractor keeps and maintains public records upon completion of the contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the City's information technology systems.

B. Failure of the Contractor to provide the above-described public records to the City within a reasonable time may subject the Contractor to penalties under 119.10 Florida Statutes, as amended.

PUBLIC RECORDS CUSTODIAN

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:

CITY CLERK
100 W. Atlantic Blvd., Suite 253
Pompano Beach, Florida 33060
(954) 786-4611
RecordsCustodian@copbfl.com

8. ASSIGNMENT.
Neither party may assign its rights or obligations under this Agreement without the consent of the other.

9. NONEXCLUSIVITY.
No remedy herein conferred upon any party is intended to be exclusive of any other remedy, and each and every such remedy shall be cumulative and in addition to every other remedy given herein, now or hereafter existing at law or in equity or by statute or otherwise.

10. INDEPENDENT CONTRACTOR.
Both the City and the Contractor agree that the Contractor is an independent contractor and not a City employee. City shall not be liable for any wages, salaries, debts, liabilities, or other obligations for Contractor's employees, agents, or other representatives performing obligations of Contractor. Except as otherwise provided, neither party is the agent of the other nor is authorized to act on behalf of the other in any matter.

11. COMPLIANCE WITH ALL LAWS.
In the conduct of its activities under this Agreement, the Contractor shall comply with all applicable federal and state laws and regulations and all applicable county and city ordinances and regulations, including, but not limited to, compliance with the Americans with Disabilities Act. Ignorance on the Contractor's part shall in no way relieve the Contractor from this responsibility. At its sole expense, the Contractor shall purchase all necessary licenses and permits required by the State of Florida, Broward County, and the City.

12. ENTIRE AGREEMENT.
This Agreement sets forth the entire agreement between Contractor and City with respect to the subject matter of this Agreement. This Agreement supersedes all prior and contemporaneous negotiations, understandings, and agreements, written or oral, between the parties. This Agreement may not be modified except by the parties' mutual agreement set forth in writing and signed by the parties.

13. COUNTERPARTS.
This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

14. INDEMNIFICATION.
Except as expressly provided herein, no liability shall attach to the City by reason of entering into this Agreement.

A. Contractor shall at all times indemnify, hold harmless, and defend the City, its officers, officials, employees, volunteers, and other authorized agents from and against any and all third-party claims, demands, suits, damages, attorneys' fees, fines, losses, penalties, defense costs or liabilities suffered by the City arising directly or indirectly from any negligent act, breach, or omission, recklessness or

misconduct of Contractor and/or any of its agents, officers, or employees hereunder, including any inaccuracy in or breach of any of the representations, warranties or covenants made by the Contractor, its agents, officers and/or employees, in the performance of services under this contract. The Contractor agrees to investigate, handle, respond to, provide defense for, and defend any such claims at its sole expense and to bear all other costs and expenses related thereto, even if the claim(s) is/are groundless, false, or fraudulent. To the extent considered necessary by City, any sums due Contractor hereunder may be retained by City until all of City's claims for indemnification hereunder have been settled or otherwise resolved, and any amount withheld shall not be subject to payment of interest by City.

B. Contractor acknowledges and agrees that City would not enter into this Agreement without this indemnification of City by Contractor. The parties agree that one percent (1%) of the total compensation paid to the Contractor hereunder shall constitute specific consideration for the Contractor for the indemnification provided under this Article, and these provisions shall survive the expiration or early termination of this Agreement.

15. SCRUTINIZED COMPANIES.

By execution of this Agreement, in accordance with the requirements of F.S. 287.135 and F.S. 215.473, the Contractor certifies that the Contractor is not participating in a boycott of Israel. The Contractor further certifies that the Contractor is not on the Scrutinized Companies that Boycott Israel list, not on the Scrutinized Companies with Activities in Sudan List, and not on the Scrutinized Companies with Activities in Iran Terrorism Sectors List, nor has Contractor been engaged in business operations in Syria. Subject to limited exceptions provided in state law, the City will not contract for the provision of goods or services with any scrutinized company referred to above. In accordance with Section 287.135, Florida Statutes as amended, a company is ineligible to, and may not, bid on, submit a proposal for, or enter into or renew a contract with any agency or local government entity for goods or services of:

A. Any amount if, at the time of bidding on, submitting a proposal for, or entering into or renewing such contract, the company is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, Florida Statutes, or is engaged in a boycott of Israel; or

B. One million dollars ($1,000,000.00) or more if, at the time of bidding on, submitting a proposal for, or entering into or renewing such contract, the company:

   i. Is on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in Iran Terrorism Sectors List, created pursuant to Section 215.473, Florida Statutes; or

   ii. Is engaged in business operations in Syria.

Submitting a false certification or being placed on a list created pursuant to Section 215.473, Florida Statutes relating to scrutinized active business operations in Iran after the Contractor has submitted a certification shall be deemed a material breach of contract. The City shall provide notice, in writing, to the Contractor of the City's determination concerning the false certification. The Contractor shall have five (5) days from receipt of notice to refute the false certification allegation. If such false certification is discovered during the active contract term, the Contractor shall have ninety (90) days following receipt of the notice to respond in writing and demonstrate that the determination of false certification was made in error. If the Contractor does not demonstrate that the City's determination of false certification was made in error, then the City shall have the right to terminate the contract and seek civil remedies pursuant to Section 287.135, Florida Statutes, as amended from time to time.

16. AFFIDAVIT OF COMPLIANCE WITH ANTI-HUMAN TRAFFICKING LAWS.

In accordance with section 787.06 (13), Florida Statutes, the undersigned, on behalf of the entity listed below ("Entity"), hereby attests under penalty of perjury that:

A. Entity does not use coercion for labor or services as defined in Section 787.06, Florida Statutes, entitled "Human Trafficking."

17. AFFIDAVIT OF COMPLIANCE WITH FOREIGN ENTITY LAWS.

The undersigned, on behalf of the entity listed below ("Entity"), hereby attests under penalty of perjury as follows:

A. Entity is not owned by the government of a foreign country of concern as defined in Section 287.138, Florida Statutes.

B. The government of a foreign country of concern does not have a controlling interest in the Entity.

C. Entity is not organized under the laws and does not have a principal place of business in a foreign country of concern.

D. Entity is not owned or controlled by the government of a foreign country of concern, as defined in Section 692.201, Florida Statutes.

E. Entity is not a partnership, association, corporation, organization, or other combination of persons organized under the laws of or having its principal place of business in a foreign country of concern, as defined in Section 692.201, Florida Statutes, or a subsidiary of such entity.

F. Entity is not a foreign principal, as defined in Section 692.201, Florida Statutes.

G. Entity is in compliance with all applicable requirements of Sections 692.202, 692.203, and 692.204, Florida Statutes.

H. The undersigned is authorized to execute this affidavit on behalf of Entity.

18. ANNUAL BUDGETARY FUNDING/CANCELLATION.
This Agreement and all obligations of the City hereunder requiring the expenditure of funds are subject to and contingent upon annual budgetary funding and appropriations by the City Commission.

19. SEVERABILITY.
Should any provision of this Agreement or the applications of such provisions be rendered or declared invalid by court action or by reason of any existing or subsequently enacted legislation, the remaining parts of this Agreement shall remain in full force and effect.

THE REMAINDER OF THE PAGE IS INTENTIONALLY LEFT BLANK

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed the day and year first written above.

CITY OF POMPANO BEACH

By:_____
REX HARDIN, MAYOR

By:_____
GREGORY P. HARRISON, CITY MANAGER

Attest:

_____ (SEAL)
KERVIN ALFRED, CITY CLERK

Approved as to Form:

_____
MARK E. BERMAN, CITY ATTORNEY

"CONTRACTOR"

Witnesses:

Pure Technologies U.S. Inc.

(Signature)

William J. Craven P.E.
(Print or Type Name)

(Signature)

Jennifer Leone, P.E.
(Print or Type Name)

Pure Technologies U.S. Inc.

By: _____
Ryan McKeon, Vice President

STATE OF Maryland

COUNTY OF Howard

The foregoing instrument was acknowledged before me by means of □ physical presence or ☒ online notarization this 22nd day of April, 2025, by Ryan McKeon, as Vice President of Pure Technologies U.S. Inc., a Delaware Corporation, on behalf of the corporation, who is personally known to me or who has produced as identification.

NOTARY'S SEAL:

TRACY LEANE MILLER
NOTARY PUBLIC
Comm. Exp. Dec 6, 2027
Prince George's County
STATE OF MARYLAND

NOTARY PUBLIC, STATE OF Maryland

Tracy Leane Miller
(Name of Acknowledger Typed, Printed or Stamped)

N/A
Commission Number

RFP-21-002
SECOND AMENDMENT TO AGREEMENT
FOR
FORCE MAIN CONDITION ASSESSMENT SERVICES

THIS SECOND AMENDMENT (the "**SECOND Amendment**") is made and entered into between **TOHOPEKALIGA WATER AUTHORITY**, an independent special district established and created pursuant to Chapter 189, Florida Statutes, by special act of the Florida Legislature, with a principal address of 951 Martin Luther King Boulevard, Kissimmee, Florida 34741 ("**TOHO**") and **PURE TECHNOLOGIES U.S., INC**, a Foreign For Profit Corporation authorized to conduct business in the State of Florida, with a principal address of 8920 State Route 108, Suite D, Columbia, Maryland 21045 ("**CONTRACTOR**"). TOHO and CONTRACTOR may be individually referred to as a "**Party**" or collectively as the "**Parties**".

A. **Extension of Term.** The agreement numbered RFP-21-002 (the **"Agreement"**) and dated January 21, 2024, as amended, which expires on January 20, 2025, is hereby renewed for a period on one additional one-year term, pursuant to Section 1 of the Agreement. The term of this renewal shall begin on January 20, 2025, and expire on January 21, 2026 (the "Renewal Term").

B. **Change in Compensation.** The Agreement, as previously amended, is hereby amended to increase CONTRACTOR's compensation from $2,278,236.00, to an amount not to exceed $2,778,236.00 for the term of the Agreement.

C. **Florida Vendor Eligibility Requirements.** The Parties hereby agree to incorporate the Florida Vendor Eligibility Requirements attached hereto as **Attachment A**.

D. **Full Force and Effect; Conflicts.** This Second Amendment shall be effective upon execution by both Parties. Except as otherwise stated herein, the terms and conditions of the Agreement, as may be previously amended, shall remain in full force and effect during the Renewal Term. In the event of a conflict between this Second Amendment and the Agreement or prior amendments, this Second Amendment shall prevail. The Agreement, as amended, represents the full and complete understanding and agreement between the Parties.

SIGNATURES ON FOLLOWING PAGE

By their duly authorized representatives, the Parties have executed this Second Amendment.

PURE TECHNOLOGIES U.S., INC.

By: _____
Print Name: Ryan McKeon
Title: Vice Pesident

Attest: _____
Print Name: William J. Craven P.E.
Title: Manager of Business Development, East Region

TOHOPEKALIGA WATER AUTHORITY

By: _____
Print Name: ~~Todd Swingle~~ Henry Thacker
Title: ~~CEO/Executive Director~~ Board Chairman

Attest: _____
Print Name: ~~Alison T. Smith~~ Tom White
Title: ~~Executive Assistant~~ Board Secretary.

STATE OF Maryland
COUNTY OF Howard

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☑ online notarization, this 2nd day of December, 2024, by Ryan McKeon, as Vice Pesident of Pure Technologies U.S., Inc.., a Foreign Profit Corporation on behalf of the company/corporation. They ☑ are personally known to me or ☐ have produced _____ as identification.

TRACY LEANE MILLER NOTARY PUBLIC Comm. Exp. Dec 6, 2027 Prince George's County STATE OF MARYLAND

_____
Signature of Notary Public
Tracy Leane Miller
Name of Notary Typed, Printed or Stamped
My Commission Expires: December 6, 2027

RFP-21-002
AGREEMENT
FOR THE
FORCE MAIN CONDITION ASSESSMENT SERVICES

THIS AGREEMENT FOR FORCE MAIN CONDITION ASSESSMENT SERVICES (the "Agreement") is made and entered between Tohopekaliga Water Authority, an independent special district established and created pursuant to Chapter 189, Florida Statutes, by special act of the Florida Legislature, 951 Martin Luther King Boulevard, Kissimmee, Florida 34741 ("TOHO") and Pure Technologies U.S. Inc., a Florida foreign profit corporation, whose address is 8920 State Route 108, Suite D, Columbia, MD 21045 ("CONTRACTOR"). TOHO and CONTRACTOR may be individually referred to as a "Party" or collectively as the "Parties."

WITNESSETH:

WHEREAS, TOHO has competitively solicited for force main condition assessment services pursuant to RFP-21-002 (the "Solicitation"), a copy of which is attached and incorporated by reference as Exhibit "A"; and

WHEREAS, the CONTRACTOR has exhibited by its response to the Solicitation, a copy of which is attached and incorporated by reference as Exhibit "B", that it is capable of providing the required services; and

WHEREAS, the Parties hereto have agreed to the terms and conditions, as set forth herein based on said Solicitation.

NOW, THEREFORE, in consideration of the mutual covenants, terms, and provisions contained herein, the Parties agree as follows:

SECTION 1. TERM.

The term of this Agreement shall become effective upon full execution by both Parties and continue through January 21, 2024, unless otherwise terminated. This Agreement may be renewed subject to written notice of agreement executed by both Parties.

SECTION 2. SCOPE OF SERVICES.

The CONTRACTOR shall provide those services and accessories, as more specifically listed in **Exhibit "A"** (collectively the "Services").

SECTION 3. OBLIGATIONS OF THE CONTRACTOR.

Obligations of the CONTRACTOR shall include, but not be limited to, the following:

A. The CONTRACTOR shall provide and pay for all labor, tools, materials, permits, equipment, transportation, supervision, and any and all other items or services, of any type whatsoever, which are necessary to fully complete and deliver the Services requested by the TOHO. The CONTRACTOR shall not have the authority to create, or cause to be filed, any liens for labor and/or materials on, or against, TOHO, or any property owned by TOHO. Any such lien, attachment, or encumbrance, until removed, shall preclude any and all claims or demands by the CONTRACTOR for any payment expected by virtue of this Agreement.

B. The CONTRACTOR will ensure that all of its employees, agents, sub-contractors, representatives, volunteers, and the like, fully comply with all of the terms and conditions set herein, when providing Services for TOHO under this Agreement.

C. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, safety programs, and procedures necessary to properly and fully complete the work set forth in the Scope of Services.

D. The CONTRACTOR shall maintain an adequate and competent staff, and shall remain authorized to do business within the State of Florida for the term of this Agreement, including renewals. The CONTRACTOR may subcontract the Services requested by TOHO, with prior written approval from TOHO; however, the CONTRACTOR shall remain fully responsible for the satisfactory completion of all subcontracted work.

SECTION 4. STANDARD OF CARE.

A. The CONTRACTOR has represented to TOHO that it possesses a level of knowledge, experience, and expertise that is commensurate with firms in the areas of practice required for the services to be provided. By executing this Agreement, the CONTRACTOR agrees that the CONTRACTOR will exercise that degree of care, knowledge, skill, and ability as any other similarly situated contractor possessing the degree of skill, knowledge, experience, and expertise within the local area, working on similar activities. The CONTRACTOR shall perform the services requested in an efficient manner, consistent with TOHO's stated scope of services and industry standards.

B. The CONTRACTOR covenants and agrees that it and its employees, agents, sub-contractors, representatives, volunteers, and the like, shall be bound by the same standards of conduct as stated above.

SECTION 5. COMPENSATION.

A. The amount to be paid under this Agreement for acceptable performance of the services described in **Exhibit "A"** shall not exceed Five-Hundred Thousand Dollars ($500,000) per year and shall not exceed One Million Five-Hundred

Thousand Dollars ($1,500,000) for the term of the Agreement.

B. Compensation for Services completed by the CONTRACTOR shall be paid in accordance with section 218.70, Florida Statutes, Florida's Prompt Payment Act.

C. Services to be performed in accordance with this Agreement are subject to the annual appropriation of funds by TOHO. TOHO, in its sole discretion, reserves the right to forego use of the CONTRACTOR for any project that may fall within the Scope of Services listed herein. In the event TOHO is not satisfied with the Services provided by the CONTRACTOR, TOHO will hold any amounts due until such time as the CONTRACTOR has appropriately addressed the problem to the satisfaction of TOHO.

SECTION 6. TERMINATION.

TOHO may terminate this Agreement, with or without cause, given thirty (30) days written notice to CONTRACTOR prior to the effective date of such cancellation.

SECTION 7. TERMINATION FOR CAUSE.

TOHO may terminate this Agreement, without further obligation, upon written notice to the CONTRACTOR, if the CONTRACTOR breaches any material term of the Agreement and such breach remains uncured for sixty (60) days after receipt of said notice.

SECTION 8. PAYMENT WHEN SERVICES ARE TERMINATED.

A. In the event of termination of this Agreement by TOHO, and not due to the fault of the CONTRACTOR, TOHO shall compensate the CONTRACTOR for all authorized Services performed prior to the effective date of termination.

B. In the event of termination of this Agreement due to the fault of the CONTRACTOR, or at the written request of the CONTRACTOR, TOHO shall compensate the CONTRACTOR for all authorized Services completed, prior to the effective date of termination, which have resulted in a usable product or otherwise tangible benefit to TOHO. All such payments shall be subject to an off-set for any damages incurred by TOHO resulting from any delay occasioned by early termination. This provision shall in no way be construed as the sole remedy available to TOHO in the event of breach by the CONTRACTOR.

SECTION 9. INSURANCE.

A. The CONTRACTOR shall maintain the following types of insurance, with the respective limits, and shall provide proof of same to TOHO, in the form of a Certificate of Insurance prior to the start of any work hereunder:

1. **Worker's Compensation**: The CONTRACTOR shall provide Worker's

Compensation coverage for all employees at the site location and in the case any work is subcontracted, shall require the subcontractor to provide Worker's Compensation for all its employees. The limits shall be statutory for Worker's Compensation and $1,000,000.00 for Employer's Liability.

2. **Comprehensive General Liability:** The CONTRACTOR shall provide for all operations including, but not limited to Contractual and Products Completed Operations. The limits shall not be less than $1,000,000.00.

3. **Comprehensive Automobile Liability:** The CONTRACTOR shall provide coverage for all owned and non-owned vehicles for limits not less than $1,000,000.00.

4. **Umbrella Liability:** The CONTRACTOR shall provide an umbrella policy in excess to the coverage's provided for in the above paragraphs of not less than $1,000,000.00.

B. The CONTRACTOR shall name "TohopekaligaWater Authority" as a certificate holder and as additional insured, to the extent of the Services provided hereunder, on all required insurance policies, and provide TOHO with proof of the same.

C. The CONTRACTOR, and any authorized sub-contractor(s), shall provide TOHO's Procurement Services with a Certificate of Insurance evidencing such coverage for the duration of this Agreement. Said Certificate of Insurance shall be dated and show:

1. The name of the insured CONTRACTOR;
2. The specified job by name and job number;
3. The name of the insurer;
4. The number of the policy;
5. The effective date;
6. The termination date; and
7. A statement that the insurer will mail notice to TOHO at least thirty (30) days prior to any material changes in the provisions or cancellation of the policy.

D. Receipt of certificates or other documentation of insurance or policies or copies of policies by TOHO, or by any of its representatives, which indicates less coverage than is required, does not constitute a waiver of the CONTRACTOR's obligation to fulfill the insurance requirements specified herein.

E. The CONTRACTOR shall ensure that any sub-contractor(s), hired to perform any of the duties contained in the Scope of Services of this Agreement, maintain the same insurance requirements set forth herein. In addition, the CONTRACTOR shall maintain proof of same on file and made readily available upon request by TOHO.

SECTION 10. TOHO OBLIGATIONS.

At the CONTRACTOR's request, TOHO agrees to provide, at no cost, all pertinent information known to be available to TOHO to assist the CONTRACTOR in providing and performing the required Services.

SECTION 11. DOCUMENTS CONSTITUTING ENTIRE AGREEMENT.

The following documents are hereby incorporated and made part of this Agreement:

1. Exhibit A - Solicitation document
2. Exhibit B -Original proposal submitted by CONTRACTOR
3. Exhibit C – Scrutinized Company Affidavit

In the event of a conflict between the covenants, terms, and/or provisions of this Agreement and **Exhibit "A,"** the provisions of the Agreement shall take precedence.

SECTION 12. APPLICABLE LAW, VENUE, JURY TRIAL.

The laws of the State of Florida shall govern all aspects of this Agreement. In the event it is necessary for either Party to initiate legal action regarding this Agreement, venue shall lie in Osceola County, Florida. The Parties hereby waive their right to trial by jury in any action, proceeding or claim, arising out of this Agreement, which may be brought by either of the Parties hereto.

In all respects, this Agreement is governed by and construed in accordance with the laws of the State of Florida without giving effect to any choice of law rules thereof that may direct the application of the laws of another jurisdiction.

SECTION 13. PUBLIC RECORDS COMPLIANCE.

A. IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT THE FOLLOWING:

Records Retention
951 Martin Luther King Blvd.
Kissimmee, Florida 34741
(407) 483-3822
publicrecordsrequests@tohowater.com

B. The CONTRACTOR understands that by virtue of this Agreement all of its documents, records and materials of any kind, relating to the relationship created hereby, shall be open to the public for inspection in accordance with Florida law.

If CONTRACTOR shall act on behalf of TOHO, as provided under section 119.011(2), Florida Statutes, as amended, the CONTRACTOR, subject to the terms of section 287.058(1)(c), Florida Statutes, as amended, and any other applicable legal and equitable remedies, shall:

1) Keep and maintain public records that ordinarily and necessarily would be required by TOHO in order to perform the Service; and
2) Provide the public with access to public records on the same terms and conditions that TOHO would provide the records and at a cost that does not exceed the cost provided by Florida law; and
3) Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law; and
4) Meet all requirements for retaining public records and transfer, at no cost, to TOHO all public records in possession of the CONTRACTOR upon termination of the contract and destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirement. All records stored electronically must be provided to TOHO in a format that is compatible with the information technology systems of TOHO; and
5) If the CONTRACTOR does not comply with a public records request, TOHO shall enforce the contract provisions in accordance with the Agreement.

SECTION 14. INDEPENDENT CONTRACTOR.

This Agreement does not create an employee/employer relationship between the Parties. It is the Parties' intention that the CONTRACTOR, its employees, sub-contractors, representatives, volunteers, and the like, will be an independent contractor and not an employee of TOHO for all purposes including, but not limited to, the application of the following, as amended: the Fair Labor Standards Act minimum wage and overtime payments, the Federal Insurance Contribution Act, the Social Security Act, the Federal Unemployment Tax Act, the provisions of the Internal Revenue Code, the State of Florida revenue and taxation laws, the State of Florida workers' compensation laws, the State of Florida unemployment insurance laws, and the Florida Retirement System benefits. The CONTRACTOR will retain sole and absolute discretion in the judgment of the manner and means of carrying out the CONTRACTOR's activities and responsibilities hereunder.

SECTION 15. APPLICABLE LICENSING.

The CONTRACTOR, at its sole expense, shall obtain all required federal, state, and local licenses, occupational and otherwise, required to successfully providing the Services set forth herein.

SECTION 16. COMPLIANCE WITH ALL LAWS.

The CONTRACTOR, at its sole expense, shall comply with all laws, ordinances, judicial decisions, orders, and regulations of federal, state, TOHO, and municipal governments, as well as

their respective departments, commissions, boards, and officers, which are in effect at the time of execution of this Agreement or are adopted at any time following the execution of this Agreement.

SECTION 17. INDEMNIFICATION.

To the fullest extent permitted by law, the CONTRACTOR shall defend, indemnify, and hold harmless TOHO, its officials, agents and employees from, and against, any and all third-party claims, suits, judgments, demands, liabilities, damages, costs, and expenses (including, but not limited to, attorneys' fees, paralegals' fees, consultants' fees, and costs at all administrative, pretrial, trial, and appellate levels) of any kind or nature whatsoever, arising directly or indirectly out of or caused , in whole or part, by any act or omission of the CONTRACTOR or its subcontractors (if any), anyone directly or indirectly employed by them, or anyone for whose acts any of them may be liable.

Notwithstanding anything herein to the contrary, neither party hereto will be liable to the other for any loss of production, loss of use of property, loss of revenue or profit, equipment downtime, business interruption, loss of goodwill, loss of anticipated savings, cost of procurement of substitute goods or services, or for any consequential, indirect, incidental, or special loss or damage suffered by the other party or any third party, or for any punitive damages, even if advised of the possibility thereof. CONTRACTOR's cumulative liability hereunder, whether in contract, tort, or otherwise, will in no event exceed the greater of (i) the aggregate consideration paid by TOHO to CONTRACTOR for the portion of the Services that gave rise to the liability, or (ii) $2 million; provided, however, that this clause shall not limit CONTRACTOR's indemnification obligations hereunder.

SECTION 18. SOVEREIGN IMMUNITY.

TOHO expressly retains all rights, benefits and immunities of sovereign immunity in accordance with section 768.28, Florida Statutes. Notwithstanding anything set forth in any section, article or paragraph of this Agreement to the contrary, nothing in this Agreement shall be deemed as a waiver of sovereign immunity or limits of liability that may have been adopted by the Florida Legislature, or may be adopted by the Florida Legislature, and the cap on the amount and liability of TOHO for damages, attorney fees and costs, regardless of the number or nature of claims in tort, equity or contract, shall not exceed the dollar amount set by the Florida Legislature for tort. Nothing in this Agreement shall inure to the benefit of any third party for the purpose of allowing any claim against TOHO that would otherwise be barred under the Doctrine of Sovereign Immunity or operation of law.

SECTION 19. BANKRUPTCY OR INSOLVENCY.

If the CONTRACTOR shall file a Petition in Bankruptcy, or if the same shall be adjudged bankrupt or insolvent by any Court, or if a receiver of the property of the CONTRACTOR shall be appointed in any proceeding brought by or against the CONTRACTOR, or if the CONTRACTOR shall make an assignment for the benefit of creditors, or proceedings shall be commenced on or against the CONTRACTOR's operations of the premises, TOHO may terminate this Agreement immediately notwithstanding the notice requirements of Section 6 hereof.

SECTION 20. BINDING EFFECT.

This Agreement shall be binding upon and inure to the benefit of the Parties hereto, their heirs, personal representatives, successors, and/or assigns.

SECTION 21. ASSIGNMENT.

This Agreement shall only be assignable by the CONTRACTOR upon the express written consent of TOHO.

SECTION 22. SEVERABILITY.

All clauses found herein shall act independently of each other. If any provision of this Agreement is held, by a court of competent jurisdiction, to be invalid, void, or otherwise unenforceable, the remaining provisions shall nevertheless continue in full force without being impaired or invalidated in any way.

SECTION 23. WAIVER.

Failure of the Parties to insist upon strict performance of any of the covenants, terms, provisions, or conditions of this Agreement, or to exercise any right or option herein contained, shall not be construed as a waiver or a relinquishment for the future of any such covenant, term, provision, condition, or right of election, but same shall remain in full force and effect.

SECTION 24. NOTICE.

The Parties hereto agree and understand that written notice, mailed or delivered to the last known mailing address, shall constitute sufficient notice to TOHO and the CONTRACTOR. All notices required and/or made pursuant to this Agreement to be given to TOHO and the CONTRACTOR shall be in writing and given by way of the United States Postal Service, first class mail, postage prepaid, addressed to the following addresses of record:

TOHO: Toho Water Authority
Attention: Procurement Services (Warehouse)
1628 S. John Young Parkway
Kissimmee, Florida 34741

CONTRACTOR: Pure Technologies US, Inc.
William Craven P.E
731 W. Smith Street
Orlando FL 32804
407-408-7631

SECTION 25. MODIFICATION

The covenants, terms, and provisions of this Agreement may be modified by way of a written instrument, mutually accepted by the Parties hereto. In the event of a conflict between the covenants, terms, and/or provisions of this Agreement and any written Amendment(s) hereto, the provisions of the latest executed instrument shall take precedence.

SECTION 26. HEADINGS.

All headings of the sections, exhibits, and attachments contained in this Agreement are for the

purpose of convenience only and shall not be deemed to expand, limit or change the provisions contained in such sections, exhibits, and attachments.

SECTION 27. ADMINISTRATIVE PROVISIONS.

In the event TOHO issues a purchase order, memorandum, letter, or any other instrument addressing the Services, work, and materials to be provided and performed pursuant to this Agreement, it is hereby specifically agreed and understood that any such purchase order, memorandum, letter, or other instrument is for TOHO's internal purposes only, and any and all terms, provisions, and conditions contained therein, whether printed or written, shall in no way modify the covenants, terms, and provisions of this Agreement and shall have no force or effect thereon.

SECTION 28. CONFLICT OF INTEREST.

The CONTRACTOR warrants that the CONTRACTOR has not employed or retained any company or person, other than a bona fide employee working solely for the CONTRACTOR, to solicit or secure this Agreement, and that the CONTRACTOR has not paid or agreed to pay any person, company, corporation, individual, or firm any fee, commission, percentage, gift, or any other consideration, contingent upon or resulting from the award or making of this Agreement. For the breach or violation of this Paragraph, TOHO shall have the right to terminate this Agreement immediately, without liability and without regard to the notice requirements of Section 6 hereof.

SECTION 29. PUBLIC ENTITY CRIMES.

As required by section 287.133, Florida Statutes, the CONTRACTOR warrants that it is not on the convicted contractor list for a public entity crime committed within the past thirty-six (36) months. The CONTRACTOR further warrants that it will neither utilize the services of, nor contract with, any supplier, sub-contractor, or consultant in connection with this Agreement for a period of thirty-six (36) months from the date of being placed on the convicted contractor list.

SECTION 30. EMPLOYMENT ELIGIBILITY VERIFICATION (E-VERIFY)

In accordance with State of Florida, Office of the Governor, Executive Order 11-116 (superseding Executive Order 11-02; Verification of Employment Status), in the event performance of this Agreement is or will be funded using state or federal funds, the CONTRACTOR must comply with the Employment Eligibility Verification Program ("E-Verify Program") developed by the federal government to verify the eligibility of individuals to work in the United States and 48 CFR 52.222-54 (as amended) is incorporated herein by reference. If applicable, in accordance with Subpart 22.18 of the Federal Acquisition Register, the CONTRACTOR must (1) enroll in the E-Verify Program, (2) use E-Verify to verify the employment eligibility of all new hires working in the United States, except if the CONTRACTOR is a state or local government, the CONTRACTOR may choose to verify only new hires assigned to the Agreement; (3) use E-Verify to verify the employment eligibility of all employees assigned to the Agreement; and (4) include these requirement in certain subcontract, such as construction. Information on registration for and use of the E-Verify Program can be obtained via the internet at the Department of Homeland Security Web site: http://www.dhs.gov/E-Verify.

SECTION 31. JOINT AUTHORSHIP

This Agreement shall be construed as resulting from joint negotiation and authorship. No part of this Agreement shall be construed as the product of any one of the Parties hereto.

SECTION 32. EQUAL OPPORTUNITY EMPLOYER

The CONTRACTOR is an Equal Opportunity Employer and will comply with all equal opportunity employment laws. The CONTRACTOR will further ensure that all sub-contractors it utilizes in providing the Services required hereunder will comply with all equal opportunity employment laws.

SECTION 33. AUDITING, RECORDS, AND INSPECTION

In the performance of this Agreement, the CONTRACTOR shall keep books, records, and accounts of all activities, related to the Agreement, in compliance with generally accepted accounting procedures. Throughout the term of this Agreement, hooks, records, and accounts related to the performance of this Agreement shall he open to inspection during regular business hours hy an authorized representative of TOHO, and shall be retained by the CONTRACTOR for a period of three years after termination or completion of the Agreement, or until the full TOHO audit is complete, whichever comes first. TOHO shall retain the right to audit the books during the three-year retention period. All books, records, and accounts related to the performance of this Agreement shall be subject to the applicable provisions of the Florida Public Records Act, chapter 119, Florida Statutes. TOHO also has the right to conduct an audit within sixty (60) days from the effective date of this Agreement to determine whether the CONTRACTOR has the ability to fulfill its contractual obligations to the satisfaction of TOHO. TOHO has the right to terminate this Agreement based upon its findings in this audit without regard to the termination provision set forth herein.

SECTION 34. PROJECT MANAGERS

TOHO and the CONTRACTOR have identified individuals listed below as Project Managers, who shall have the responsibility for managing the work performed under this Agreement. The person or individual identified by the CONTRACTOR to serve as its Project Manager for this Agreement, or any replacement thereof, is subject to prior written approval and acceptance by TOHO. If TOHO or CONTRACTOR replace their current Project Manager with another individual, an amendment to this Agreement shall not be required. TOHO will notify the CONTRACTOR, in writing, if the current TOHO's Project Manager is replaced by another individual.

A. TOHO's Project Manager's contact information is as follows:

Tim Noyes, Asset Manager
Toho Water Authority
951 Martin Luther King Boulevard
Kissimmee, FL 34741
Phone: 407-944-5040
Email: tnoyes@tohowater.com

B. The CONTRACTOR's Project Manager's contact information is as follows:

William J. Craven P.E.
Pure Technologies U.S., Inc.
731 West Smith Street
Orlando FL 32804
Phone: 407-408-7631
Email: William.Craven@xyleminc.com

SECTION 35. SCRUTINIZED COMPANIES.

A. If this Agreement has a cumulative value that meets or exceeds one million dollars, then the CONTRACTOR must certify that it is not a "Scrutinized Company" pursuant to section 287.135(2), Florida Statutes. A "Scrutinized Company" is a company that is:

1. On the "Scrutinized Companies that Boycott Israel List", created pursuant to section 215.4725, Florida Statutes, or is engaged in a boycott of Israel;

2. On the "Scrutinized Companies with Activities in Sudan List" or the "Scrutinized Companies with Activities in the Iran Petroleum Energy Section List", created pursuant to section 215.473, Florida Statutes; or

3. Engaged in business operations in Cuba or Syria.

B. To ensure compliance with section 287.135(5), Florida Statutes, certification requirement, the CONTRACTOR must complete an "Affidavit of Non-Scrutinized Company Status", a copy of which is attached hereto and incorporated by reference as Exhibit "C." The Affidavit must be executed by an individual that is authorized to bind the CONTRACTOR and shall be properly notarized.

C. Pursuant to section 287.135(3)(c), Florida Statutes, TOHO may terminate this Agreement should the CONTRACTOR be found to:

1. have falsified its certification of non-scrutinized company status; or

2. Subsequent to the submittal of the attached affidavit, the CONTRACTOR engages in activities that makes it a "Scrutinized Company."

SECTION 36. SIGNATORY.

Each signatory below represents and warrants that he or she has the full power, and is duly authorized by their respective Party, to enter into and perform under this Agreement. Such signatory further represents that he or she has fully reviewed and understands the terms and conditions set forth in this Agreement, including exhibits, and fully intends to abide by and comply with all of the terms and conditions set forth herein.

SECTION 37. COUNTERPARTS, ELECTRONIC TRANSACTIONS, AND ELECTRONIC SIGNATURES.

This Agreement may be electronically executed by the Parties in counterparts up to but not exceed the number of parties, each of which will be deemed an original and all of which, taken together, shall constitute one agreement. Each Party may deliver its executed signature page by email transmission to the other Parties at the email addresses set forth herein. Delivery shall be effective and complete upon completion of such email transmission. The Parties agree that electronic signatures may be used in the execution of this Agreement, in accordance with Parts I and II of Chapter 668, Florida Statutes.

Signature: _____
Print Name: _____
My Commission No:_____ _____
My Commission Expires: _____

(Stamp)

EXHIBIT “A”

RFP-21-002 SOLICITATION

REQUEST FOR PROPOSAL

BID TITLE:

WASTEWATER FORCE MAIN CONDITION ASSESSMENT SERVICES

BID NO:

RFP-21-002

ISSUE DATE:

NOVEMBER 23, 2020

SUBMIT BID ELECTRONICALLY TO:

https://tohowater.bonfirehub.com

Contact Information

CONTACT PERSON:	Jill Selby, Procurement Services
EMAIL ADDRESS:	procurement@tohowater.com
PHONE:	(407) 944-5180
FAX:	(407) 931-4308

Schedule

PRE - PROPOSAL CONFERENCE:	Not applicable
DEADLINE FOR WRITTEN QUESTIONS:	**MONDAY, DECEMBER 7, 2020 AT 12:00 NOON LOCAL TIME**
PROPOSAL DUE:	**Thursday, December 17, 2020, at 2:00 p.m. local time.**

MISSION STATEMENT:

Provide reliable, cost effective, and responsive water services to our customers while protecting public health and the environment

TOHO WATER AUTHORITY IS A NON-SMOKING AGENCY.
SMOKING IS STRICTLY PROHIBITED IN ALL FACILITIES AND ON ALL AUTHORITY PROPERTIES.

TABLE OF CONTENTS

TOHO WATER AUTHORITY

SECTION 1
SUMMARY INFORMATION

1.0 PURPOSE

Toho Water Authority (Toho) conveys over 27 million gallons of wastewater each day through a network of force mains. Toho has over 430 lift stations that pump this wastewater collected in the gravity sewer system towards one of thirteen water reclamation facilities. Approximately 22% of these mains are metallic or asbestos concrete pipe (ACP) susceptible internal microbial inducted corrosion.

Toho intends to complete a condition assessment on all metallic (> 10" diameter) force mains (approximately 23.5 miles) within the next three fiscal years to identify remaining useful life for these mains. This information will assist in defining the capital investments necessary to reduce the probability of main failures.

1.1 PARTIES DEFINED

A. The term "Authority" or "Toho" used in the bid documents refers to Toho Water Authority.

B. The term "Contractor" refers to the person or firm to whom an award is made to perform the work under this contract.

C. The term "Proposer" refers to the lowest, qualified, responsive and responsible vendor to whom Toho makes an award.

1.2 BACKGROUND

Established in October 2003 by a special act of the Florida legislature, Toho Water Authority (Toho) is the largest provider of water, wastewater and reclaimed water services in Osceola County. Toho currently serves over 100,000 customers in Kissimmee, Poinciana and unincorporated areas of Osceola County. Check out our service area.

Toho owns and operates 13 water plants and 8 wastewater plants. With a 300+ person workforce, Toho treats and distributes approximately 37.5 million gallons of potable water and reclaims 27 million gallons of wastewater each day.

Toho is governed by a five-member board of supervisors responsible for approving all its operating policies and its $124 million operating budget. Toho was established for the sole purpose of providing regional stewardship over water resources in Osceola County.

1.3 INITIAL CONTRACT PERIOD AND OPTION OF RENEWAL

The initial contract period shall be for the period of three (3) years commencing upon date of execution of agreement for this award. The contract may be renewed, subject to written notice of agreement from Toho and the successful Offeror, for one (1) additional two (2) year renewal period for a total of five (5) years. This option shall be exercised only if all terms and conditions remain the same and Toho grants approval.

It is the vendor's responsibility to request any pricing adjustment under this provision. For any adjustment to commence on the first day of any exercised option period, the vendor's request for adjustment should be submitted ninety (90) days prior to expiration of the then current contract term or at the time of renewal request from the Authority. The vendor adjustment request should not be in excess of the relevant pricing index change (Consumer Price Index – All Urban Consumers – South Urban – All Items – Series ID CUUR0300SA0 as published by the Bureau of Labor Statistics of the U.S. Department of Labor – http://www.bls.gov/data/). If no adjustment request is received from the vendor, Toho will assume the vendor has agreed that the optional term

may be exercised without pricing adjustment. Any adjustment request received after the commencement of a new option period may not be considered.

1.4 CLARIFICATION OF REQUIREMENTS

Questions regarding clarification or interpretation of this solicitation should be addressed in writing to Procurement Services no later than the deadline for questions listed on the cover page of this solicitation. Remember, unless modified by a written addendum issued by Procurement Services, the specifications and conditions contained herein stand as stated. Verbal communications are neither authoritative nor binding. Any verbal interpretation in conflict with these specifications as written should immediately be directed in writing to Procurement Services. Any interpretation provided to any vendor in response to inquiries regarding this solicitation which may affect the outcome of this bid will be furnished in writing.

1.5 EXAMINATION OF PROPOSAL DOCUMENTS

It is the responsibility of each Proposer before submitting a proposal:

- To examine thoroughly the proposal Documents
- To study and carefully correlate the Proposer's knowledge and observations of the proposal documents and such other related data
- To promptly notify Toho of all conflicts, errors, ambiguities or discrepancies which the Proposer has discovered in or between the proposal Documents and such other related documents ors conditions.

1.6 INSTRUCTIONS FOR SUBMITTING PROPOSALS

A. The deadline for submitting proposals is shown on the cover sheet. **No proposal shall be considered if it arrives after the scheduled deadline. No exceptions will be considered.**

B. Each Proposer shall submit one proposal through Bonfire at https://tohowater.bonfirehub.com. The submittal shall also include a searchable electronic version containing the entire proposal formatted to be read with Microsoft software products or Adobe PDF software.

C. All proposals must be submitted electronically to Bonfire at https://tohowater.bonfirehub.com. No other form of submission will be accepted (i.e., E-mail, Facsimile, etc.).

1.7 REJECTION OR CANCEL OF PROPOSALS

The right is reserved by Toho at its discretion to reject or cancel any or all proposals or parts thereof. Proposals may be rejected if they show any omission, alteration of form, additions or deductions not called for, conditional or uninvited alternate proposals, or irregularities of any kind; however, Toho also reserves the right to waive any informality on proposals.

1.8 SHAM OR COLLUSIVE PROPOSALS

The submittal of any Proposer or Proposers who engage in collusive bidding shall be rejected. Any Proposer who submits more than one proposal in such a manner as to make it appear that the proposals submitted are on a competitive basis from different parties shall be considered a collusive Proposer.

1.9 NOTICE OF AWARD

Public notice of award will be posted on Bonfire at https://tohowater.bonfirehub.com.

1.10 ADDENDA TO THE RFP

A. Toho reserves the right to amend this solicitation at any time prior to the deadline for submitting Bids or Proposals. If it becomes necessary to revise any part of this RFP, notice of the revision will be posted on Bonfire at https://tohowater.bonfirehub.com, in the opinion of the Procurement Agent, the deadline for the submission of proposals does not provide sufficient time for consideration of any Addendum, then such deadline may be extended at the discretion of Toho.

B. It shall be the responsibility of each Proposer to contact the Procurement Contact identified on the cover page to this solicitation prior to submission of a bid or proposal hereunder in order to determine whether any Addenda have been issued in connection with this procurement. Notwithstanding any provision to the contrary, the failure of any Proposer to receive any Addenda shall neither constitute grounds for withdrawal of its proposal nor relieve such Proposer from any responsibility for incorporating the provisions of any Addenda in its proposal.

1.11 RECIEPT OF ADDENDA

Receipt of any addenda issued must be acknowledged on the addenda and returned with proposal. **Failure to acknowledge your receipt of any addenda may result in your proposal being considered non-responsive.**

1.12 LATE PROPOSALS

Proposals or unsolicited amendments to proposals arriving after the closing date and time will not be considered. Proposals received after the proposal submission deadline will be returned to the Proposer unopened providing that sufficient bid identification information is shown on the outside of the bid envelope.

1.13 PROPOSAL PRICES

In the event there is a discrepancy between the unit prices and the extended totals, the unit prices shall govern. In the event there is a discrepancy between the prices written in words and written in figures, the prices written in words shall govern. In case of error in the Proposer's extended summation, the computed total of Toho shall govern.

1.14 CONTRACTUAL AGREEMENT

A Contract shall be issued to the successful Proposer. The Contract shall consist of the RFP, the successful Proposer's proposal together with any negotiated terms and pricing. The Proposer shall inform himself in full of the conditions relating to the performance of the Contract. Failure to do so shall not relieve the successful Proposer of his obligations to furnish services, materials, and other services necessary to carry out the provisions of this RFP and resulting Contract and to complete the Scope of Services outlined therein.

1.15 DISCLOSURE OF PROPOSAL CONTENT

All material submitted becomes the property of Toho and may be returned only at Toho's option. Toho has the right to use any or all ideas presented in any reply to this proposal. Selection or rejection of any proposal does not affect this right.

Toho is governed by the Public Record Law, Chapter 119, Florida Statutes. Only trade secrets as defined in Section 812.081(1)(c), Florida Statutes or financial statements required by Toho as defined in 119.071(1)(c), Florida Statutes (hereinafter "Confidential Materials"), may be exempt from disclosure. If a respondent submits Confidential Materials, the information must be segregated, accompanied by an executed Non-Disclosure Agreement for Confidential Materials and each pertinent page must be clearly labeled "confidential" or "trade secret'. Toho will not disclose such Confidential Materials, subject to the conditions detailed within the Agreement, which is attached to this solicitation. When such segregated and labeled materials are received with an executed Agreement, Toho shall execute the Agreement and send the respondent a "Receipt for Trade Secret Information".

1.16 CONE OF SILENCE

Firms are hereby advised that a cone of silence applies to this RFP. Accordingly, communications regarding this matter are prohibited between anyone that seeks a contract related to this RFP including firms or each firm's representatives (or any intermediary on their behalf) and any Authority Board member, Authority staff, the Executive Director, counsel, deputies, assistances and support staff, or any advisor or person who evaluates or recommends selection or that may make an award in this solicitation process. The

cone of silence and the prohibition on communication shall begin immediately upon the date of advertising and terminates upon the date of award or termination of this request by Toho. **All questions must be submitted electronically to Bonfire at https://tohowater.bonfirehub.com. The response of any firm who violates the cone of silence may be rejected or disqualified.**

END OF SECTION 1

[THIS SPACE IS INTENTIONALLY LEFT BLANK.]

SECTION 2
SCOPE OF SERVICES

2.0 OVERVIEW

Toho serves customers in the City of Kissimmee, and unincorporated Osceola and Polk Counties in Florida. Osceola County is one of the most rapidly growing counties in the United States. Toho is investing to gain a better understanding the risk presented by its metallic force mains. It is expected that the selected firm would lead activities including but not limited to: planning condition assessment, executing assessment plan, identifying locations for follow up investigations and issuing a technical report including inspection findings, remaining useful life statistics and mitigation or replacement recommendations.

Following receipt of proposals, Toho will develop a short list of qualified firms. The Vendor proposal response will include Vendor's qualifications, experience, methodology and example of final deliverable. The proposal response must also lay out the Vendor's approach to planning and executing field activities, interpretation of collected data and development of conclusions and recommendations. Toho expects the Vendor to provide expert guidance throughout all phases of the condition. Toho will shortlist Proposers based on criteria listed in Section 6. Final selection of the Proposer will be based on the scoring of the presentations/interviews of the shortlisted firms.

The final selected Vendor will assume financial and legal responsibility for the contract. Proposals that include multiple vendors must clearly identify one firm as the "prime contractor" and all others as subcontractors. Toho reserves the right to not short list any or all Proposers whether or not they meet Toho's minimum qualifications (Section 4).

2.1 OBJECTIVES

The firm selected through this RFP will assist Toho by:

1. Providing cost effective and reliable methods to identify the location and extent of gas pockets in in-service force mains;
2. Providing cost effective and reliable methods to identify the existence and location of leaks in force mains;
3. Providing cost effective and reliable methods to perform structural analysis on force mains as necessary to identified risk and estimated remaining useful life.
4. Providing project deliverables that support the development of capital improvement budget needs.
5. Utilizing lessons learned from previous engagements to improve project planning, execution and conclusions.
6. Make available innovative solutions as possible add ons to the condition assessment, such as pipeline mapping.

2.2 SCOPE

The awarded Consultant is expected to provide the following services to Toho:

1. Provide Toho with an overview of the project approach, including necessary support and expectations regarding planning, data gathering, results validation or other standard activity as well as the involvement from Toho staff in each.

2. Perform condition assessments that delivers complete, accurate and verifiable information on the Toho identified critical force mains (> 10" metallic and asbestos concrete force mains) using in industry leading technologies and approaches in a cost effective manner.
3. Project leadership and management of condition assessment from planning through formal report out.

Assessment methodologies must as a minimum include the following characteristics.

Leak and Gas Pocket Detection

- Accurately survey the force main for corrosion inducing gas pockets (including start, end and severity) and leak detection (including location and magnitude)
- Inspections must be performed while mains are in service
- technologies for identifying and locating the extents of all gas pockets are in-line inspection tools acoustic-based leak and gas pocket detection device
- free-flowing tool used to conduct in-line leak and gas pocket screening in pressurized pipelines possible to complete long surveys in a single deployment without disruption to regular pipeline service
- assessment tool is equipped with a highly sensitive acoustic sensor that is able to identify and locate leaks
- during the survey, the acoustic sensor must continuously record all acoustic activity in the pipeline to be analyzed to determine the presence and location of any leaks or pockets of trapped gas
- insertion and extraction points for the equipment (where possible using existing pipeline features) to require minimal modifications to the force main.
- possess the ability to track the tool's movement and location, correlating its position at any time to provide accurate location information for acoustic events recorded during the survey.
- accuracy through varied flow rates (a required flow of 1.0 to 4.0 feet per second)
- typical location accuracy within 6-feet

Pipe Wall Assessment

- direct assessment of the pipe wall by detecting anomalies resulting from changing levels of stress in the pipe wall (stress is increased wherever the wall is thinned, where cracks have developed even if they are not completely through the wall, where the pipe has been damaged or pitted externally or internally, where the pipe is under severe bending, compressive, tensile or torsional stress, where the original construction of the pipe wall is anomalously thin, or where a pipe is under-designed for its current operating pressure)
- detect joints, material changes, some appurtenances, and many other features relevant to the operation and mapping of the pipe
- estimate of the position of the damage, such as at the crown, or at the invert and the longitudinal extent of the damage
- provide qualitative information regarding the condition of each pipe section (joint to joint)
- ranked defects from highest concern to lowest allowing for follow-up action by the Owner
- navigate in-line valves and bends in the pipeline while traveling long distances.
- tool tracking above ground during the entire data collection process.
- possible to deployed for long inspections on several types of pipe to determine baseline condition
- ability to assess that condition of pre-stressed cylindrical concrete pipe (PCCP) identifying broken wire wraps
- ability to navigate butterfly valves and bends in the pipeline

2.3 PROJECT MANAGEMENT

Proposers shall submit a project management plan consistent with the scope and complexity of this engagement. Suggested project management elements may include scheduling, staffing, communications, progress briefings, financial status and work progress tracking.

Proposers must also describe how the project will be conducted in the context of various project planning elements common to most consulting engagements involving a system implementation. Some of the submitted elements may be duplicated in the Project Management plan as described later. These elements may include, but be not necessarily limited, to the elements listed below:

1. Review the goals and objectives for this project
2. Discuss all major roles and responsibilities
3. Confirm timelines, milestones, and deliverables
4. Discuss critical success factors

2.4 PROJECT DURATION

Proposers shall submit a project schedule for each work addendum to the awarded contract that is based on the Vendor's experience with a system of this size and complexity. Project commencement is the date of execution of the addendums to the award contract.

END OF SECTION 2

SECTION 3
RFP SCHEDULE

The **anticipated** schedule for this RFP is as follows:

Release RFP	Monday November 23, 2020
Last Date for Questions	Monday, December 7, 2020 at 12 noon local time
Proposal Due	Thursday, December 17, 2020 at 2:00 p.m. local time
Evaluation Committee Review	January 2021
Interviews	TBD
Board or Executive Director Approval	February or March 2021

END OF SECTION 3

SECTION 4
MINIMUM QUALIFICATIONS

The following are minimum qualifications the Proposer must meet for their proposal submittal to be eligible for evaluation. The Procurement Representative may choose to determine minimum qualifications by reading that single document alone, so the submittal should be sufficiently detailed to clearly show how you meet the minimum qualifications without looking at any other material. Those that are not clearly responsive to these minimum qualifications shall be rejected by Toho without further consideration:

The Proposer must meet the following minimum requirements to be considered responsive. Failure to meet these minimum requirements will cause the Vendor to be rejected from further evaluation.

Organization

- Must have at least 5 years of proven experience executing similar projects and completed a minimum of 100,000 lf of force main condition assessments including but not limited to (gas pocket identification, leak detection, structural wall analysis and risk determination)
- Provide an example of an end of project deliverable that details planning, execution, findings and recommendations completed in the last 24 months.

Project Team – Key Personnel

- Must be available to Toho throughout the course of the project unless mutually agreed to by Toho and the Proposer.
- Must have been assigned to similar projects.

Project Manager

The Consultant's project manager must have managed at least three (3) projects of similar scope and complexity within the last six (6) years. Project Management responsibilities must have included all phases of the referenced projects. Project management activities must have included planning, communication and coordination with Owner's affected organizations, outside contractors and customer issues (as necessary).

END OF SECTION 4

SECTION 5
PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

Proposals shall contain the following information in the order listed below.

B. **Title Page (non-scored)** – Shall show the RFP's subject, title and RFP number; the firm's name; the name, address, and telephone number of a contact person; and the date of the Proposal.

C. **Table of Contents (non-scored)** – Shall provide listing of all major topics, their associated section number, and starting page.

D. **Firm Qualifications and Experience (maximum 20 points)**

- **Overview of firm** - include the location of the office to perform the work and explain the purpose of the firm.
- **Subcontractors** – list any sub-contractors that may be used to accomplish this service.
- **Litigation** – list any past and/or pending litigation or disputes relating to the work described herein that your firm has been involved in within the last five (5) year. This list shall include each project name and the nature of the litigation.
- **Financial Information** – Toho is interested in awarding this RFP only to an organization that is financially sound; to demonstrate financial capacity, the firm may be required, only if requested by Toho, to submit a financial statement prior to final award. This financial information will be kept as confidential, since Section 119.07(t), Florida Statutes exempts financial statements from the public record requirement. The financial statement, preferably audited, shall be for the firm which is submitting the proposal and shall include the following items: current and net fixed assets and any other assets; current liabilities, long term liabilities, and other liabilities; and name and address of firm preparing the financial statement and the date of preparation.
- **Insurance Certifications –** provide a copy of Certificates of Insurance evidencing coverage as required in Section 10.7. **Note:** Policies other than Worker's Compensation shall be issued only by companies authorized to conduct business in the State of Florida, with active certificates of authority issued by the State of Florida, Department of Insurance.

E. **Similar Projects (maximum 25 points)**- Demonstrate the Proposer's experience and success conducting similar work, the proposer shall provide a minimum of three (3) references of similar projects with similar scopes (condition assessment of small to medium diameter (10" – 36") metallic and concrete wastewater force mains. The following reference information shall be included:

- Client name, address, telephone number, and email address
- Description of all services and solutions provided
- Performance period
- Total annual amount of contract

F. **Staff Qualifications and Experience (maximum 25 points)**

- Identify and include qualifications of specific individuals to be assigned to the project (include names, contact information, and specific services of the individuals who will provide services to Toho).
    1. Provide the name, title, years of experience, office location, area of specialty (if applicable) of the consultant who will be designated as the "contact person" for the firm's proposal and who will be the consultant primarily responsible for ensuring the proper performance of the services to be rendered to Toho,

2. Provide an individual resume, name, title, years of experience, office location, area of specialty (if applicable) and description of relevant experience and expertise of each consultant expected to perform services for Toho. The firm shall provide written confirmation (on its letterhead) signed by an officer of the firm that the consultant identified in the proposal will be the staff who will provide the services required by the awarded Agreement. Any substitution must have prior approval of Toho. Any substitution without such prior approval shall be grounds for disqualification or termination of the Agreement as applicable.

G. Project Approach (maximum 20 points)

The Proposer shall provide a detailed implementation plan, including the following:

1. The firm's technical approach to the project and the interpretation of the scope of services.
2. Explanation of the firm's adequacy of resources, including personnel, labor, list of equipment, and supply resources.
3. Information regarding how the Proposer will coordinate and communicate status and completion of services to Toho representative during and after work commencement.
4. Provide information regarding any proposed innovative concepts that may enhance the value and quality of the services to be performed.

Evidence of the project team and project manager's experience, skill, and ability to perform the required services and deliverables in the designated time required will be evaluated. **Please include an approximate timeline for a typical project.**

H. Price (maximum 10 points) – Complete and submit Attachment A.

I. Additional Documents (non-scored) – Complete and submit the forms contained in the following attachments:

- Attachment C – Drug Free Workplace Form (if applicable)
- Attachment D – References Form (At least three)

It is the Proposer's responsibility to clearly identify and to describe the project approach in response to this RFP. Proposers are cautioned that organization of their response, as well as thoroughness is critical to Toho's evaluation process.

Proposals should be in 8 ½" x 11" format and should be prepared simply and economically, providing a straight forward, organized, and concise description of the Proposer's ability to meet the requirements of the RFP. The number of pages should be kept to a minimum. Fancy bindings, colored displays, promotional material, etc. are not desired. Emphasis should be on completeness and clarity of content.

Any information thought to be relevant, but not applicable to the enumerated categories should be provided as an appendix to the proposal. If publications are supplied by a Proposer to respond to a requirement, the response should include reference to the document number and page number. This will provide a quick reference for the evaluators. Proposals not providing this reference will be considered to have no reference material included in the additional documents.

The proposal shall be signed by a representative who is authorized to contractually bind the Contractor.

Electronically submit proposals to Bonfire at https://tohowater.bonfirehub.com by the due date specified on the front page of this solicitation or any subsequently released addenda. Proposals received after the date and time prescribed shall not be considered for contract award and shall be returned to the Proposer.

END OF SECTION 5

SECTION 6
PROPOSAL EVALUATION AND AWARD CRITERIA

A. **Determining Responsibility**

In conjunction with the weighted criteria being used to determine the capability of the proposal, Toho may also consider the Proposer's ability to meet or exceed the following criteria:

1. The Proposer's ability, capacity, and skill to perform the contract or provide the service within the time specified;
2. The quality of performance of previous contracts or services including previous performance with Toho;
3. Previous and existing compliance by the Proposer with laws and ordinances relating to the contract or service;
4. Financial resources of the Proposer's to perform the contract or provide the service; and,
5. Whether the Proposer is in arrears to Toho on a debt or a contract; whether the Proposer is in default on surety to Toho; or whether the Proposer's taxes are delinquent.

B. **Evaluation Committee**

The Evaluation Committee is comprised of qualified and recommended Authority staff members who are appointed by the Executive Director or Designee in coordination with the requesting department. The Evaluation Committee shall consist of members who have experience, knowledge and/or expertise in the program area and service requirements of the solicitation. The Purchasing Office Representative shall be the non-voting chair of the Committee.

C. **Initial Evaluation of Proposals**

The Purchasing Office Representative shall perform the initial review of all proposals submitted for qualifications certification. This process includes, but is not limited to the following:

1. The proposal was submitted by the deadline;
2. All required documents have been submitted;
3. All documents requiring an original signature have been signed and submitted; and,
4. Verification through the professional regulatory agency to ensure proper professional licenses or credentials as required.

D. **Presentations or Interviews**

Toho may request that the Proposer provide presentations to the Evaluation Committee, Executive Director or Board of Supervisors and/or conduct interviews with the selected proposers regarding the qualifications, ability to furnish the required services and all criteria set forth herein. The Purchasing Office will notify all proposers of Toho's decision to request presentations and/or interviews, as applicable. Pursuant to Florida Statute Chapter 286, any portions of a meeting, at which a vendor makes an oral presentation, or answers questions as part of a competitive solicitation, are exempt from Florida Statute 286.011 and Statute 24(b), Article I of the State Constitution.

E. **Best and Final Offer and Negotiations**

Toho may request that the respondents provide a Best and Final Offer submittal before final determination for recommendation of contract award. The contract negotiation will include, at a minimum, a member from the Purchasing Office and a member from the end user department. Toho reserves the right to negotiate any and all elements of a contract resulting from this RFP. Pursuant to Florida Statute Chapter 286, any portion of a meeting, at which negotiation strategies are discussed, or negotiations with a vendor is conducted, are exempt from Florida Statute 286.011 and Statute 24(b), Article I of the State Constitution.

F. **Evaluation Committee Tabulation**

The tabulation of the Evaluation Committee will be posted on Bonfire at https://tohowater.bonfirehub.com. Interested proposers may also contact the Procurement Office for the results.

G. **Evaluation/Award Criteria**

Selection of the successful Proposer shall be based on the following criteria:

Category	**Points**
C. Firm Qualifications and Experience	20
D. Similar Projects	15
E. Staff Qualifications and Experience	25
F. Project Approach (**including technical methods**)	20
G. Price	20
Total Points	**100**

Each committee member will then rank the proposals and the ranking of the proposals will be averaged. All shortlisted firms will be given new scores based on their interview and presentation to determine final selection.

END OF SECTION 6

SECTION 7
GENERAL TERMS AND CONDITIONS

BIDDER OR PROPOSER: THESE CONDITIONS AND INSTRUCTIONS TO BIDDERS shall be binding on all Bidders or Proposers and, except to the extent otherwise provided, are incorporated by reference in all contracts resulting from any written Request for Quotation (RFQ), Invitation for Bid (IFB) or Request for Proposal (RFP) issued, collectively the ("Request"), to which they are attached and response thereto (Bid) or (Proposal). Use of the term "bid" in these General Terms and Conditions and Instructions to Bidders or Proposer is not intended to be restricted to an IFB and shall also affect written RFQ's or RFP's.

These instructions are standard for all contracts for commodities or services issued through the Tohopekaliga Water Authority (the "Authority") Purchasing and Warehouse Division. The Authority may delete, supersede, or modify any of these standard instructions for a particular contract by indicating such change in the IFB Special Conditions, Technical Specifications, Instructions, Proposal Pages, Addenda, and Legal Advertisement.

PART I CONDITIONS OF BIDDING

1.1 CLARIFICATION OF TERMS: If any Bidder or Proposer has questions about the specifications or other solicitation documents in connection with an RFQ, RFP or IFB, the prospective Bidder or Proposer must submit their question through Bonfire at https://tohowater.bonfirehub.com before the question deadline listed on the cover page of the bid documents. Any revisions to the solicitation will be made only by addendum issued by the buyer and posted to Bonfire at https://tohowater.bonfirehub.com. Notifications regarding specifications may not be considered if received in less than five (5) business days of the date set for opening of Bid or Proposals or receipt of Bids or Proposals.

1.2 USE OF AUTHORITY FORM AND TERMS AND CONDITIONS: Failure to submit a solicitation on the official Authority form provided for that purpose or unauthorized modification of or additions to any portion of the solicitation documents may be a cause for rejection of the Bid or Proposal. The Authority reserves the right to decide, on a case-by-case basis, in its sole discretion, whether to reject any Bid or Proposal which has been modified. The Authority shall not be responsible for any errors or omissions of the Bidder or Proposer.

The solicitation shall be signed by a representative authorized to legally bind the firm submitting the Bid or Proposal. By signing the solicitation, the Bidder or Proposer agrees to the terms and conditions of the solicitation and certifies that it has inspected the job site(s) and shall be deemed to be aware of the conditions under which the work must be accomplished. Claims, as a result of failure to inspect the job site, shall not be considered by the Authority.

1.3 EXCEPTIONS: For purposed of Bid or Proposal evaluation, Bidder or Proposer must indicate any exceptions, no matter how slight, from the General Terms and Conditions, Special Conditions, Specifications or Addenda in the space provided on the Bid or Proposal form. No exceptions by a Bidder or Proposer will be considered or deemed a part of the Bid or Proposal submitted unless such exceptions are listed in the Bid or Proposal and referenced in the space provided on the Bidder or Proposer proposal form. If exceptions are not stated or referenced as required, it will be assumed that the product or service fully complies with the Authority's terms, conditions, and specifications.

By receiving a Bid or Proposal, the Authority does not necessarily accept any exceptions contained in the Bid or Proposal. All exceptions submitted are subject to review and approval by the Authority. If any Bid or Proposal contains material exceptions that, in the Authority's sole opinion, make that Bid or Proposal conditional in nature, the Authority reserves the right to reject the Bid or Proposal in its entirety or that part of the Bid or Proposal which contains material exceptions.

1.4 NO BID RESPONSE: Vendors electing not to submit a Bid or Proposal in response to this solicitation should complete the attached Notice to Bidder's or Proposer's form. Failure to return the form may result in your omission from future Bid lists.

1.5 BID OR PROPOSALS FIRM FOR ACCEPTANCE: Bidder or Proposer warrants, by virtue of bidding, that its Bid or Proposal and the prices quoted in its Bid or Proposal will be firm for acceptance by the Authority for a period of ninety (90) days from the date of Bid or Proposal opening unless otherwise stated in the solicitation.

1.6 LATE BID OR PROPOSAL & MODIFICATION OF BID OR PROPOSAL: Any Bid or Proposal modification received at the office designated in the solicitation after the exact time specified for receipt of the Bid or Proposal or the modification is considered a late Bid or Proposal modification and may not be considered.

The Authority is not responsible for delays in delivery of the mail by the U.S. Postal Service, private carriers or the inter office mail system. It is the sole responsibility of the Bidder or Proposer to ensure its Bid or Proposal reaches the Purchasing Office by the designated date and hour.

a. The official time used in the receipt of Bid or Proposals is that time stamped by the automatic time stamp machine in the Purchasing Office. Date/time stamps marked after the designated time of receipt will be rejected.
b. Late Bid or Proposal modifications will be returned to the Bidder or Proposer UNOPENED, if solicitation number, acceptance date, and Bidder/Proposer return address is shown on the container.
c. If the Authority closed its office due to inclement weather, the time for Bid or Proposals opening or receipt of Bid or Proposals will be extended to the next business day, same time.
d. Vendors may modify their Bid or Proposals prior to the date and time specified for the bid opening. Facsimile modification of Bid or Proposals shall not be accepted unless the solicitation allowed submittal by facsimile.

1.7 WITHDRAWAL OF BID OR PROPOSALS: A Bidder or Proposer for a contract may request withdrawal of his or her Bid/Proposal under the following circumstances:
a. Bid or Proposals may be withdrawn on written requests from the Bidders or Proposers received at the address shown in the solicitation prior to the time of acceptance.
b. Requests for withdrawal of Bid or Proposals after opening of such Bid or Proposals but prior to award shall be transmitted to the Authority's Purchasing and Warehouse Division, in writing, accompanied by full documentation supporting the request. If the request is based on a claim of error, documentation must show the basis of error. Such documentation may take the form of supplier quotations, vendor work sheets, etc. If bid bonds were tendered with the Bid/Proposal the Authority may exercise its right of collection.
c. Bid or Proposals shall not be withdrawn after award of a contract or issuance of a purchase order. No plea or claim of mistake in the solicitation or resulting contract or purchase order shall be available as a defense in any legal proceeding brought upon a contract or purchase order awarded to a Bidder/Proposer as a result of the breach or nonperformance of such contract or purchase order.

1.8 ERROR IN BID OR PROPOSALS: When an error is made in extending total prices, the unit bid price will govern. Erasures in Bid or Proposals must be initialed by the Bidder or Proposer. Carelessness in quoting prices or in preparation of bid or otherwise, will not relive the Bidder or Proposer of its responsibilities to provide the good or service. Bidders or Proposers are cautioned to recheck their Bid or Proposal for possible errors. Errors discovered after public opening cannot be corrected and the Bidder or Proposer will be required to perform if his or her Bid or Proposal is accepted.

1.9 IDENTIFICATION OF BID ENVELOPE: Not Applicable. **All bids should be submitted electronically to: https://tohowater.bonfirehub.com.**

1.10 PRICING

a. Bidder or Proposer warrants by virtue of bidding that prices, terms and conditions quoted in its Bid or Proposal will be firm for acceptance for a period of ninety (90) days from the date of Bid or Proposal opening unless otherwise stated by the Authority or Bidder or Proposer.

b. Prices should be stated in units of quantity as specified in the Bid/Proposal form.
c. Life cycle cost analysis may be considered when determining the lowest responsive and responsible Bid or Proposal. This analysis may consider, in addition to purchase price, any proposed upward or downward escalator clauses proposed for the initial contract term and any potential renewal terms; operating and related costs over the life of the item including maintenance, down time, energy costs, salvage value, etc.
d. Bid or Proposal prices shall be fore complete installation ready for the Authority's use and shall include all applicable freight and installation charges; extra charges not allowed.
e. When an annual contract is not requested by the Authority and the Bid or Proposal is for products or services to be delivered on a one-time only or staggered basis, only firm pricing shall be given consideration. General terms such as "price in effect at time of delivery" shall not be considered.

1.11 OPENING: At the time fixed for the opening of responses to a Bid or Proposal, all Bid or Proposals will be opened and the names of the Bidders or Proposers and the amount shall be read aloud and made readily available to the public. If a public opening of a Request for Proposal is held, only the names of the Bidders of Proposers will be read publicly.

1.12 TIE BID OR PROPOSALS: A Drug Free Workplace Statement must be completed, signed, and returned prior to award of Bid or Proposal. This form will be used whenever two or more Bid or Proposals that are identical with respect to price, quality, delivery, and service are received; a Bid or Proposal received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process.

1.13 TAX EXEMPTION: The Authority is exempt from Federal excise and State sales taxes. Tax exemption number is 85-8012897680C-2 and is also stipulated on our Purchase Orders.

1.14 NO CONTACT POLICY: No Bidder or Proposer shall initiate or otherwise have contact related to the solicitation (RFQ, IFB or RFP) with an Authority representative, officer or employee, other than with the Purchasing and Warehouse Division, after the date and time established for receipt of Bids or Proposals. Any contact initiated by a Bidder or Proposer with any Authority representative, officer or employee other than through the Purchasing and Warehouse Division, concerning this solicitation is prohibited and may cause the disqualification of the Bidder or Proposer from this procurement process.

1.15 LICENSES, PERMITS, AND FEES: All Bid or Proposals submitted shall have included a list of any business and professional licenses, permits, or fees required by the Authority.

PART II DEFINITIONS/ORDER OF PRECEDENCE

2.1 BIDDING DEFINITIONS: The Authority will use the following definitions in its these CONDITIONS AND INSTRUCTIONS TO BIDDERS OR PROPOSERS and in its general conditions, special conditions, technical specifications, instructions to Bidders or Proposers, addenda, and any other document used in the bidding process:

a. INVITATION FOR BID – (IFB) when the Authority is requesting Bids from qualified Bidders.
b. REQUEST FOR PROPOSAL – (RFP) when the Authority is requesting proposals from qualified Proposers.
c. REQUEST FOR QUOTATION – (RFQ) when the Authority is requesting quotes from qualified Bidders or Proposers.
d. BID – a price and terms quote received in response to an IFB.
e. PROPOSAL – a proposal received in response to an RFP or RFQ.
f. BIDDER – person or firm submitting a Bid.
g. PROPOSER – person or firm submitting a Proposal.
h. RESPONSIVE BIDDER – a person whose bid conforms in all material respects to the terms and conditions included in the IFB.
i. RESPONSIBLE BIDDER – a person who has the capability in all respects to perform in full the contract requirements, as stated in the IFB, and the integrity and reliability that will assure good faith performance.

j. CONTRACTOR – a successful bidder or Proposer who is awarded a purchase order, award contract, blanket purchase order agreement, or term contract to provide goods or services to the Authority.
k. CONTRACT – a written agreement for the procurement or disposal of equipment, materials, supplies, or services but not for public construction.
l. PUBLIC ENTITY CRIME and CONVICTED VENDOR LIST have the meanings set out in Section 287.133, Florida Statutes.

2.2 SPECIAL CONDITIONS: Any and all Special Conditions contained in this IFB that may be in variance or conflict with these General Conditions shall have precedence over these General Conditions, except as otherwise provided. If no changes or deletions to the General Conditions are made in the Special Conditions, then the General Conditions shall prevail in their entirety

PART III SPECIFICATIONS

3.1 BRAND NAME OR EQUAL: When the technical specifications call for a brand name, manufacturer, make, model, or Proposer catalog number with acceptance of APPROVE EQUAL, it shall be for the purpose of establishing a level of quality and features desired and acceptable to the Authority. In such cases, the Authority will be receptive to any unit that would be considered by qualified Authority personnel as an approved equal. In that the specified make and model represent a level of quality and features desired by the Authority, the Bidder or Proposer must state clearly in its bid any exceptions from those specifications. It is the Bidder's or Proposer's responsibility to provide adequate information in its Bid or Proposal, to enable the Authority to ensure that the Bid or Proposal meets the required criteria. If adequate information is not submitted with the Bid or Proposal, it may be rejected. The Authority will be the sole judge in determining if the item Bid or Proposal qualifies as an approved equal.

3.2 FORMAL SPECIFICATIONS: When a solicitation contains a specification which states no substitutes, no deviation there from will be permitted and the Bidder or Proposer will be required to furnish articles in conformity with that specification.

3.3 EQUIPMENT STANDARDS: Any equipment delivered shall be standard new equipment, latest model, the best quality, and the highest grade work, except as otherwise specifically stated in the Bid or Proposal. Any part of nominal appurtenances which are usually provided in the manufacturer's stock model shall be furnished.

3.4 ANNUAL CONTRACT USAGE REQUIREMENTS: Whenever a Bid or Proposal is sought seeking a source of supply for an annual contract for products or services, the quantities or usage shown are estimates only. No guarantee or warranty is given or implied by the Authority as to the total amount that may not be purchased from any resulting contract. These quantities are for Bidder or Proposers information only and will be used for tabulation and presentation of Bid or Proposals

PART IV BIDDING AND AWARD PROCEDURES

4.1 AWARD OR REJECTION OF BID OR PROPOSALS: The Authority reserves the right to accept or reject any or all Bid or Proposals and to waive minor irregularities or variations to specifications contained in Bid or Proposals, and minor irregularities in the bidding process. The Authority reserves the right to award the contract on a split order basis; lump sum basis, individual item basis, or such combination as shall best serve the interest of the Authority. The Authority reserves the right to make an award to the responsive and responsible bidder whose product or service meet the terms, conditions, and specifications of the IFB and whose Bid or Proposal is considered to best the Authority's interest. In determining the responsiveness of the offer and the responsibility of the Bidder or Proposer, the following shall be considered:
a. the ability, capacity and skill of the Bidder or Proposer to perform as required
b. whether the Bidder or Proposer can perform promptly, or within the time specified, without delay or interference
c. the character, integrity, reputation, judgment, experience and efficiency of the bidder
d. the quality of past performance by the Bidder or Proposer

e. the previous and existing compliance by the Bidder or Proposer with related laws, ordinances, administrative rules and orders and resolutions and requirements of the Authority.
f. the sufficiency of the Bidder's or Proposer's financial resources
g. the availability, quality and adaptability of the Bidder's or Proposer's supplies or services to the required use
h. the ability of the Bidder or Proposer to provide future maintenance, service or parts
i. the number and scope of conditions attached to the Bid or Proposal.

If the IFB or RFQ provides for a contract trial period, the Authority reserves the right, in the event the selected Bidder or Proposers does not perform satisfactorily, to award for a trial period to the next ranked Bidder or Proposer or to award a contract to the next ranked Bidder or Proposer, if that Bidder or Proposer has successfully provided services to the Authority in the past. This procedure to continue until a Bidder or Proposer is selected or the contract is re-bid, at the sole option of the Authority.

4.2 QUALIFICATIONS OF BIDDERS OR PROPOSERS: The Authority may make such reasonable investigations as it deems proper and necessary to determine the ability of the Bidder or Proposer to perform the work/furnish the item(s) and the Bidder or Proposer or shall furnish to the Authority all such information and data for this purpose as may be requested. The Authority reserves the right to inspect Bidder's or Proposer's physical facilities prior to award to satisfy questions regarding the Bidder's or Proposer capabilities. The Authority further reserves the right to reject any Bid or Proposal if the evidence submitted by or investigations of such Bidder or Proposer is properly qualified to carry out the obligations of the contract and to complete the work/furnish the item(s) contemplated herein.

4.3 USE OF OTHER GOVERNMENTAL CONTRACTS: The Authority reserves the right to reject any part of all of any Bid or Proposal received and utilize other available governmental contracts, is such action is in its best interest.

4.4 PUBLIC ENTITY CRIMES: "A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a Bid or Proposal on a contract to provide any goods or services to a public entity, may not submit a Bid or Proposal on a contract with a public entity for the construction or repair of a public building or public work, may not submit Bid or Proposals on leases of real property to a public entity, may not be awarded or perform works as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list."

4.5 PUBLIC RECORDS: Florida law provides that municipal records shall at all times is open for personal inspection by any person. Section 119.01, F.S., the Public Records Law. Sealed Bid or Proposals received by the Authority in connection with an IFB, RFP or RFQ shall be deemed to be public records subject to public inspection upon award, recommendation for award, or 10 days after bid opening, whichever occurs first. However, certain exemptions to the public records law are statutorily provided for in Section 119.07, F.S. If the Bidder or Proposer believes any of the information contained in its response is exempt from the Public Records Law, and then the Bidder or Proposer must in his or her response specifically identify the material which is deemed to be exempt and cite the legal authority for the exemption, otherwise, the Authority will treat all materials received as non exempt. The Authority's determination of whether an exemption applies shall be final, and the Bidder or Proposer agrees to defend, indemnify and hold harmless the Authority and the Authority's officers, employees and agents, against any loss or damages, including but not limited to attorneys' fees, incurred by any person or entity as a result of the Authority's treatment of records as public records.

4.6 PROHIBITION OF INTEREST: No member, officer, agent, or employee of the Authority, either for himself or as agent for anyone else or as a stockholder or owner in any other legal entity, shall participate in or benefit directly or indirectly from any sale, purchase, lease, contract or other transaction entered into by the Authority. No contract will be awarded to a bidding firm in violation of the foregoing provision or in violation of Part III of Chapter 112, Florida Statutes. Any firm in which any member of the Board of Supervisors of the Authority or any officer or employee of the Authority or such individual's spouse or child is an officer, partner, director or

proprietor or in which any such individual or any combination of them has a material interest as defined in Part III of Chapter 112, Florida Statutes, must disclose such interest and must fully comply with state law, including the Authority's governing act and Part III of Chapter 163, Florida Statutes and may be precluded from obtaining an award.. Bidders or Proposers must disclose any such affiliation or material interest. Failure to disclose any such affiliation or material interest will result in disqualification of the Bidder or Proposer and removal of the Bidder or Proposer from the Authority's Bidder's or Proposer's list and prohibition from engaging in any business with the Authority.

PART V BONDS AND INSURANCE

5.1 PERFORMANCE BOND/IRRECOVABLE LETTER OF CREDIT: If a performance bond or irrevocable letter of credit is required in the Special Conditions, the Contractor shall within fifteen (15) working days after notification of award, furnish to the Authority a performance bond or an unconditional irrevocable letter of credit payable to the Toho Water Authority, Florida in the face amount specified in the Special Conditions as surety for faithful performance under the terms and conditions of the contract. If the bond is on an annual coverage basis, renewal for each succeeding year shall be submitted to the Authority thirty (30) days prior to the termination date of the existing performance bond. The performance bond must be executed by a surety company of recognized standing, authorized to do business in the State of Florida and having a resident agent. If a letter of credit is chosen, it must be in a form acceptable to the Authority, drawn on a local bank acceptable to the Authority and issued in favor of the Authority. If the Bidder or Proposer wishes to use a non local bank, he must have prior Authority approval of the requirements to draw against the letter of credit.

5.2 BID SURETY: If Special Conditions require a bid security, it shall be submitted in the amount stated. A bid security can be in the form of a bid bond, postal money order, cashier's check, or irrevocable letter of credit. Bid security will be returned to the unsuccessful Bidders or Proposers as soon as practicable after opening of Bid or Proposals. Bid security will be returned to the successful Bidder or Proposer after acceptance of the performance bond or irrevocable letter of credit, if required; acceptance of insurance coverage, if required; and full execution of contract documents, if required; or conditions as stated in the Special Conditions.

5.3 LETTERS OF CREDIT: Generally, the Authority will require that the bank be rated A or better by a major rating agency. If the rating of the bank is downgraded below investment grade or if due to other circumstances, the Authority has concerns about the credit worthiness of an issuing bank, the Bidder or Proposer may be required to replace the letter of credit with a letter of credit issued by a different bank acceptable to the Authority or with a performance bond or, in the case of Bid Security with a letter of credit issued by a different bank acceptable to the Authority or with a bid bond, postal money order, cashier's check.

5.4 INSURANCE: If the Contractor is required to go on the Authority property to perform work or services as a result of IFB award, the Contractor shall assume full responsibility and expense to obtain all necessary insurance as required by the Authority or specified in the Special Conditions. The Contractor shall provide to the Authority original certificates and coverage and receive notification of approval of those certificates by the Authority's Risk Manager prior to engaging in any activities under this contract. The Contractor's insurance is subject to the approval of the Authority's Risk Manager. **The certificates must list the Authority as ADDITIONAL INSURED** and shall have no less than thirty (30) days written notice of cancellation or material change. Further modification of the insurance requirements may be made at the sole discretion the Authority's Risk Manager if circumstances change or adequate protection of the Authority is not presented.

PART VI PURCHASE ORDER AND CONTRACT TERMS

6.1 CONFIDENTIALITY AND OWNERSHIP OF DATA: Any reports, information, intellectual property, data, drawings, specification estimates and summaries given to or prepared or assembled by the Contractor under the Scope of Work of the contract, shall not be made available to any individual or organization by the Contractor without prior written approval of the Authority. All of these items shall become the property of the Authority upon payment of fees as required by the contract.

6.2 OBLIGATIONS OF THE AUTHORITY AND CONTRACTOR: Authority: The Authority shall furnish to the Contractor all available information as listed in the solicitation that may be useful for the contract work. The Authority shall assist the Contractor in obtaining access to enter upon public and private property as required to perform the contract work. The Authority shall designate a representative who shall serve as the principal contact and give direction to the Contractor throughout the duration of the contract. Contractor: The Contractor represents that he has, or shall secure at his expense, all personnel, including subcontractors required to perform and complete the Scope of Work.

6.3 PAYMENT TERMS: Unless otherwise provided in the solicitation payment will be made thirty (30) days after receipt of a proper invoice with complete supporting documentation, or thirty (30) days after receipt of all goods or acceptance of work, whichever is the latter.

6.4 SAFETY STANDARDS: All manufactured items and fabricated assemblies shall comply with applicable requirements of the Occupational Safety and Health Act of 1970 as amended, and be in compliance with Chapter 442, Florida Statutes. Any toxic substance listed in Section 38F-41.03 of the Florida Administrative Code delivered as a result of this order must be accompanied by a completed Material Safety Data Sheet (MSDS).

6.5 OTHER GOVERNMENTAL ENTITIES: If the Bidder or Proposer is awarded a contract as a result of this RFP, IFB or RFQ he or she will, if has sufficient capacity or quantities available, provide to other governmental agencies so requesting, the products or services awarded in accordance with the terms and conditions of the RFP, IFB or RFQ and resulting contract. Prices shall be F.O.B. delivered to the requesting agency.

6.6 VERBAL INSTRUCTIONS PROCEDURE: No negotiations, decisions, or actions shall be initiated or executed by the Contractor as a result of any discussions with any Authority employee. Only those communications which are in writing from an authorized Authority representative may be considered. Only written communications from Contractors, which are assigned by a person designated as authorized to bind the Contractor, will be recognized by the Authority as duly authorized expressions on behalf of Contractors.

6.7 INDEPENDENT CONTRACTOR: The Contractor is an independent contractor under this Agreement. Personal services provided by the Bidder or Proposer shall be employees of the Contractor and subject to supervision by the Contractor, and not as officers, employees, or agents of the Authority. Personal policies, tax responsibilities, social security, health insurance, employee benefits, purchasing policies unless otherwise stated in this IFB and other similar administrative procedures applicable to services rendered under this contract shall be those of the Contractor.

6.8 INDEMNITY/HOLD HARMLESS AGREEMENT: The Contractor agrees to protect, defend, indemnify, and hold harmless the Authority and its officers, employees and agents from and against any and all losses, penalties, damages, settlements, claims, costs, charges for other expenses, litigation, whether in court or before an administrative body, or liabilities of every and any kind including attorney fees, in connection with or arising directly or indirectly out of the work agreed to or performed by Contractor under the terms of any agreement that may arise due to the bidding process. Without limiting the foregoing, any and all such claims, suits, or other actions relating to personal injury, death, damage to property, defects in materials or workmanship, actual or alleged violations of any applicable Statute, ordinance, administrative order, rule or regulation, or decree of any court shall be included in the indemnity hereunder.

6.9 TERMINATION FOR CAUSE: If, through any cause, the Contractor shall fail to fulfill in a timely and proper manner its obligations under this Agreement, or if the Contractor shall violate any of the provisions of this Agreement, the Authority may upon written notice to the Contractor terminate the right of the Contractor to proceed under this Agreement, or with such part or parts of the Agreement as to which there has been default, and may hold the Contractor liable for any damages caused to the Authority by reason of such default and termination. In the event of such termination, any completed services performed by the Contractor under this Agreement shall at the option of the Authority become the Authority's property and the Contractor shall be entitled to receive equitable compensation for any work completed to the satisfaction of the Authority, not to

exceed an amount equal to percentage of the contract price representing the percentage of the work completed satisfactorily. The Contractor, however, shall not be relieved of liability to the Authority for damages sustained by the Authority by reason of any breach of the Agreement by the Contractor and the Authority may withhold any payments to the Contractor for the purpose of setoff until such time as the amount of damages due to the Authority from the Contractor can be determined.

6.10 TERMINATION FOR CONVENIENCE: The Authority reserves the right, in its best interest as determined by the Authority, to cancel contract by giving written notice to the Contractor thirty (30) days prior to the effective date of such cancellation.

6.11 CANCELLATION FOR UNAPPROPRIATED FUNDS: The obligation of the Authority for payment to a Contractor is limited to the availability of funds appropriated in a current fiscal period and continuation of the contract into subsequent fiscal period is subject to appropriation of funds, unless otherwise authorized by law.

6.12 RECORDS/AUDIT: The Contractor shall maintain during the term of the contract all books of account, reports and records in accordance with generally accepted accounting practices and standards for records directly related to this contract. The form of all records and reports shall be subject to the approval of the Authority's Auditors. The Contractor agrees to make available to the Authority's Auditors during normal business hours all books of account, reports, and records relating to this contract for the duration of the contract and retain them for a minimum period of one (1) year beyond the last day of the contract term.

6.13 LAWS/ORDINANCES: The Contractor shall observe and comply with all Federal, state, local and municipal laws, ordinances rules and regulations as well as all resolutions or directives of the Authority that would apply to this contract.

6.14 NON DISCRIMINATION: There shall be no discrimination as to race, sex, color, creed, age or national origin in the operations conducted under this contract.

6.15 ELIGIBILITY: If applicable, the Contractor must first register with the Department of State of the State of Florida in accordance with Florida Statutes, prior to entering into a contract with the Authority.

6.16 COPYRIGHTS OR PATENT RIGHTS: The Bidder or Proposer certifies by submission of Bid/Proposal that there has been no violation of copyrights or patent rights in manufacturing, producing, or selling the product or services shipped or ordered as a result of this Bid or Proposal. The successful Bidder or Proposer shall, at its own expense defend any and all actions or suits charging such infringement and will save the Authority, its officers, employees, and agents harmless from any and all liability, loss, or expense occasioned by any such violation.

6.17 INVOICES: Invoices for items ordered, delivered and accepted shall be submitted by the Contractor directly to the payment address shown on the purchase order/contract. All invoices shall show the IFB/RFP number and or purchase order number.

6.18 DEFAULT: In case of failure to deliver goods or services in accordance with the contract terms and conditions, the Authority after due oral and written notice, may procure them from other sources and hold the Contractor responsible for any resulting additional purchase and administrative costs.

6.19 DELIVERY: In the appropriate space, the Bidder or Proposer shall state the time of proposed delivery or project completion in number of calendar days. Unless otherwise specified, calendar days shall be presumed. Unless otherwise specified, quote the earliest delivery possible as this may be considered a factor in making award. Delivery expressed in calendar days may be given preference over such general terms as "stock immediately" and "as soon as possible". As time will be of the essence for any orders placed as a result of this bid, the Authority reserves the right to cancel such orders or any part thereof, without obligation if delivery is not made at the time(s) specified on the bid form.

PART VII DELIVERY PROVISION

7.1 SHIPPING INSTRUCTIONS-CONSIGNMENT: Unless otherwise specified in the solicitation of each case, crate, barrel, package, etc., delivered under the contract must be plainly stenciled or securely tagged, stating the Contractor's name, purchase order number, and delivery address as indicated in the order. Where shipping containers are to be used, each container must be marked with the purchase order number, name of Contractor, the name of the item, the item number, and the quantity contained therein. Deliveries must be made within the hours of 8:00 a.m. – 5:00 p.m. Deliveries at any other time will not be accepted unless specific arrangements have been previously made with designated individual at the delivery point. No deliveries will be accepted on Saturdays, Sundays and holidays unless previous arrangements have been made. It shall be the responsibility of the Contractor to insure compliance with these instructions for items that are drop shipped.

7.2 RESPONSIBILITY FOR SUPPLIES TENDERED: The Contractor shall be responsible for loss or damage to materials or supplies covered by the contract until they are delivered at the designated point, a physical inspection is made by the Authority and the material or supplies are accepted by the Authority. The Contractor shall bear all risk of loss or damage to rejected materials or supplies and for all materials and supplies prior to acceptance by the Authority. Rejected materials or supplies must be removed by and at the expense of the Contractor promptly after notification of rejection, unless public health and safety require immediate destruction or other disposal of rejected delivery. If rejected materials are not removed by the Contractor within ten (10) days after date of notification, the Authority may return the rejected materials or supplies to the Contractor at his or her risk and expense or dispose of them as its own property.

7.3 TESTING AND INSPECTION: The Authority reserves the right to conduct any test/inspection it may deem advisable to assure that of supplies and services conform to the specifications. Inspection and acceptance of materials or supplies will be made after delivery at destinations herein specified unless otherwise stated. If inspection is made after delivery at destination herein specified, the Authority will bear the expense of inspection except for the value of samples used in case of rejection. Final inspection shall conclusive except in regard to latent defects, fraud or such gross mistakes as to amount to fraud. Final inspection and acceptance or rejection of the materials or supplies will be made as promptly as practicable, but failure to inspect and accept or reject materials or supplies shall not impose liability on the Authority for such materials or supplies as are not in accordance with the specifications.

7.4 COMPLIANCE: Delivery must be made as ordered and in accordance with the solicitation or as directed by the Purchasing Office when not in conflict with the bid/contract. The decision the Authority as to reasonable compliance with delivery terms shall be final. Burden of proof of delay in receipt of goods by the purchaser shall rest with the Contractor. Any request for extension of time of delivery from that specified must be approved by the Purchasing Office, such extension applying only to the particular item or shipment affected. Should the Contractor be delayed by the Authority, there shall be added to the time of completion a time equal to the period of such delay caused by the Authority. However, the Contractor shall not be entitled to claim damages of extra compensation for such delay or suspension.

7.1 POINT OF DESTINATION: All materials shipped to the Authority must be shipped F.O.B. DESTINATION unless otherwise stated in the contract. The materials must be delivered to the "Ship to" address indicated on the purchase order.

7.2 REPLACEMENT: Materials or components that have been rejected by the Purchasing Office, in accordance with the terms of the contract, shall be replaced by the Contractor at no cost to the Authority.

7.3 PACKAGING SLIPS OR DELIVERY TICKETS: All shipments shall be accompanied by packing slips or delivery tickets and shall contain the following information for each item delivered:

a. purchase order number/contract number
b. name of article and stock number
c. quantity ordered

d. quantity shipped
e. quantity back ordered
f. the name of the Contractor

Contractors are cautioned that failure to comply with these conditions shall be considered sufficient reason for refusal to accept the goods.

7.4 SAMPLES: Evidence in the form of samples may be requested if brand being quoted upon is other than as specified. The Authority reserves the right to request that such samples be furnished at the time of bid opening. The Authority also reserves the right to request samples after the date of bid opening. Requested samples must be furnished free of expense to the Authority and if not used in testing or destroyed, will, upon request, be returned at the Bidder's or Proposer's expense.

PART VIII BIDDER/PROPOSER/CONTRACTOR REMEDIES

8.1 PROTEST OF AWARD OR DECISION TO AWARD/EXHAUSTION OF ADMINISTRATIVE PROCEEDING: Any protest must be made within three (3) days following posting of the bid/proposal award. Protest procedures are available from the Authority Purchasing Department. Notice of decision or intended decision concerning a Bid or Proposal solicitation or award will be given by posting the Bid or Proposal tabulation or recommended award at the location where the Bid or Proposals were opened. The Bidder or Proposer must exhaust this administrative proceeding before bringing suit. Failure to file a protest within the time prescribed herein and to exhaust the remedy provided by the Authority for such bid protest shall constitute a waiver of the right to bring suit.

8.2 DISPUTES: In the case of any doubt or differences of opinion as to the items to be furnished hereunder, the decision of the Authority's Purchasing Agent shall be final and binding on both parties.

8.3 NO CONSEQUENTIAL DAMAGES: Consequential damages shall not be available to a Contractor for breach of contract by the Authority.

8.4 NO DAMAGES REMEDY TO PROPOSER OR BIDDER: An Proposer or Bidder who is unsuccessful shall not have a damages remedy as a result of the rejection of the Bid or Offer but shall be limited to the administrative remedies provided by the Authority and, after exhausting such remedies, the further remedy of declaratory relief or, in a proper case, injunction. Venue shall in all cases be in Osceola County, Florida.

8.5 PERSONAL PRONOUNS AND TERMINOLOGY. The personal pronouns, are used interchangeably regardless of sex and regardless of the legal status or identity of the entity or person to which the terms apply.

END OF SECTION 7

SECTION 8
SPECIAL TERMS AND CONDITIONS

7.0 PRECEDENCE IN TERMS

In the event of a conflict, the Special Terms and Conditions shall take precedence.

7.1 ALTERNATE PROPOSALS NOT ACCEPTED

If two different proposals are included in a single envelope both will be rejected.

7.2 INCURRED EXPENSES

This RFP does not commit the Authority to award a contract, nor shall the Authority be responsible for any cost or expense which may be incurred by the bidder in preparing and submitting the Submittal called for in this IFB, or any cost or expense incurred by the bidder prior to the execution of a contract agreement.

7.3 RIGHT TO REQUIRE PERFORMANCE

The failure of the Authority at any time to require performance by the bidder of any provision thereof shall in no way affect the right of the Authority thereafter to enforce same, nor shall waiver by the Authority of any breach of any provision hereof be taken or held to be a waiver of any succeeding breach of such provision or as a waiver of any provision itself.

In the event of failure of the bidder to deliver services in accordance with the contract terms and conditions, the Authority, after due written notice, may procure the service from other sources and hold the bidder responsible for any resulting additional purchase and administrative costs. This remedy shall be in addition to any other remedies that the Authority may have.

7.4 WORKMANSHIP

All work shall be completed in a satisfactory, efficient and workmanlike manner utilizing high quality standards. Materials shall be returned if typesetting is incorrect, ink colors are inconsistent or trapping is not correct. The Bidder shall be responsible for corrections and revisions resulting from his own errors or misunderstandings.

7.5 BANKRUPTCY/INSOLVENCY

At the time of bid submittal, the bidder shall not be in the process of or engaged in any type of proceedings in insolvency or bankruptcy, either voluntary or involuntary, or receivership proceedings. If the bidder is awarded a contract for six (6) months or longer, and files for bankruptcy, insolvency or receivership, the Authority may, at its option, terminate and cancel said contract, in which event all rights hereunder shall immediately cease and terminate.

7.6 INDEPENDENT CONTRACTOR STATUS AND COMPLIANCE WITH THE IMMIGRATION REFORM AND CONTROL ACT OF 1986

The Contractor is and shall remain an independent Contractor and is neither agent, employee, partner, nor joint venture of Authority. Contractor acknowledges that it is responsible for complying with the provisions of the Immigration Reform and Control Act of 1986 located at 8 U.S.C. 1324 et. Seq., and regulations relating thereto, as either may be amended from time to time. Failure to comply with the above provisions shall be considered a material breach and shall be grounds for immediate termination of the contract, at the discretion of the Authority.

7.7 INSURANCE

By signing and submitting a bid, the bidder shall have the insurance coverage as outlined below at the time the work commences. Additionally, they must maintain the same coverage during the entire term of the contract. All insurance coverage will be provided by insurance companies authorized to sell insurance in the State of Florida. All limits will be made available which are in excess of the amounts below.

Certificates of Insurance shall be furnished to the Authority within ten (10) working days of the notification of award of the contract. Certificates of Insurance shall provide a minimum of thirty (30) calendar day notice of cancellation to the Authority.

A. Worker's Compensation: The Contractor will provide Worker's Compensation coverage for all employees at the site location and in case any work is subcontracted, will require the subcontractor to provide Worker's Compensation for all his employees. The limits will be statutory for Worker's Compensation and $1,000,000.00 for Employer's Liability.
B. Comprehensive General Liability: The Contractor will provide for all operations including, but not limited to Contractual and Products Completed Operations. The limits will not be less than $1,000,000.00.
C. Comprehensive Automobile Liability: The Contractor will provide coverage for all owned and non-owned vehicles for limits not less than $1,000,000.00.
D. Umbrella Liability: The Contractor will provide an umbrella in excess to the coverage in paragraphs B and C of not less than $1,000,000.00.

Requirements for bidder that qualify for an exemption under the Florida Worker's Compensation law in Chapter 440 Florida Statutes are detailed below:

- Incorporated or unincorporated firms with fewer than four (4) employees shall be required to sign a Hold Harmless Agreement relieving the Authority of liability in the event they and/or their employees are injured while providing goods and/or services to the Authority.
- Incorporated or unincorporated firms with four (4) or more employees shall be required a copy of their "Notice of Election to Exempt" along with valid proof of coverage for non-exempt employees.

The Hold Harmless Agreement mentioned above is included as an attachment to this proposal. Said Agreements shall be returned with this proposal.

The Authority reserves the right to request a copy of the complete insurance policy(ies) and any endorsements for the insurance referenced above. A certificate of insurance indicating that the bidder has coverage in accordance with the requirements herein set forth shall be furnished by the bidder to the Authority prior to the execution of the contract and annually upon renewal thereafter. **The bidder shall either cover any subcontractors on its policy or require the subcontractors to obtain coverage to meet all requirements for insurance contained herein.**

Bidder agrees that the Authority will make no payments pursuant to the terms of the contract until all required proof or evidence of insurance has been provided to the Authority representative. Bidder agrees that the insurer shall waive its rights of subrogation, if any, against the Authority on Commercial General Liability and Worker's Compensation insurance coverage. The ACORD certificate of Liability Insurance, with endorsements shall be completed by the authorized Resident Agent and returned to the Purchasing Department. This certificate shall be dated and show:

- The name of the insured bidder, the specified job by name, name of insurer, the number of the policy, its effective date and its termination date.
- Statement that the Insurer will mail notice to the Authority at least thirty (30) days prior to any material changes in provisions or cancellation of the policy.
- **The Authority shall be named as an additional insured on Commercial General Liability Insurance.**

Loss Deductible Clause: The Authority shall be exempt from, and in no way liable for, any sums of money that may represent a deductible in any insurance policy. The payment of such deductible shall be the sole responsibility of the bidder and/or sub-consultant providing such insurance.

7.8 WORK STOPPAGE

The Authority representative shall have the authority to require that work be stopped to allow inspections as he/she deems appropriate.

7.9 CONTRACTOR RESPONSIBILITIES

Employees of the contractor must be able to work within a public setting without creating a disruption and conform to all policies, rules and to use loud or profane language, and to work as quietly as possible. Contractor shall require that its employees shall not trespass, loiter, cross property to adjoining premises, or tamper with property not covered by the contract resulting from this solicitation. It is the Contractor's responsibility to have equipment of suitable type and in proper condition to operate and maintain uninterrupted schedules.

It is the Contractor's responsibility to follow schedules and instructions provided by designated Authority contacts. The contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work.

7.10 SUBCONTRACTING

The hiring or use of outside services or subcontractors in connection with the performance of the Contractor's obligations under this contract shall not be permitted without prior written approval of the Authority. The Contractor shall promptly pay all subcontractors and suppliers. Any subcontracting so permitted by the Authority shall be subject to all terms and conditions and other provisions of this contract.

Notwithstanding any such subcontracting, the Contractor shall remain obligated and responsible to the Authority for the performance of all terms and conditions and other provisions of this contract.

END OF SECTION 8

ATTACHMENT A
PRICE SCHEDULE

TO: Https://tohowater.bonfirehub.com

Toho Water Authority
Procurement Services Department
1628 S. John Young Pkwy
Kissimmee, FL 34741

DATE: _____, 2020

FEE SCHEDULE HERE

Have you supplied all the Submittal Requirements outlined below?

- ☐ One (1) electronic copy of proposal package in searchable pdf format
- ☐ Any addenda pertaining to this solicitation
- ☐ Drug Free Certification
- ☐ References (5)
- ☐ List of possible subcontractors
- ☐ Certificate(s) of Insurance (evidencing coverage as required)
- ☐ Detailed information on the solutions proposed

[SEE NEXT PAGE.]

BID FORM
RFP-21-002

Condition Assessment Technologies and Analysis						
Item	**Description**	**Unit**	**Assessment of PCCP Mains**	**High Resolution Structural Assessment of Metallic Mains**	**Low Resolution Structural Assessment of Metallic Mains**	**Acoustic Leak and Gas Packet Detection**
1	Mobilization and Project Planning	EA				
2	Inspection and Data Analysis (up to 5 miles)	LF				
3	Inspection and Data Analysis (after 5 miles)	LF				
4	Field Verifications (minimum of 2 days)	DAY				
5	Transient Pressure Monitoring	EA				
6	PVC Fatigue Analysis (up to 10 Lift Stations)	EA				
7	PVC Fatigue Analysis (after 10 Lift Stations)	EA				
8	Structural Analysis (AWWA Design Check, per diameter and pipe class	EA				
9	Structural Analysis (FEA, per diameter and pipe class)	EA				
10	Statistical Analysis (RUL), per diameter and pipe class	EA				
11	Reporting	EA				
12	Pipe Route Mapping	MI				
13	Maintenance of Traffic	LS				
14	Confined Space Entry Planning, Permitting, Equip. Rental and Top Support	LS				
15	Stand-by-Rate	DAY				

Failure to submit this form may disqualify your response.

Respondent does not need to complete all areas requested in RFP-21-002, however, it will reflect on the selection process.

Notes:

Item 1: Mobilization and Project Startup item must as a minimum includes project document review; preliminary site visit and review (including travel costs); pre-inspection coordination meetings; planning document development; equipment and staff logistics to and from the project sites; tool calibration; pre-inspection activities required in advance of the scheduled inspection date.

This is a lump sum fee for the engagement that may comprise of multiple force mains.

Item 2 – 3: Inspection and Data Analysis includes all cost associated with the in-field execution of the project plan, with the exception of any required contractor support for mechanical modifications necessary to insert and/or extract the assessment instrumentation. These items also include review of the data to ensure that it meets the standards required to support findings and recommendations.

Paid per linear foot of assessed force main.

Item 4: Field verification includes all activities required to perform additional field investigation of the assessed main to correlate the data collected in item 2-3 and support further recommendations. Does not include excavation costs required to facilitate external examination of main.

Paid per day of verification.

Item 5: Pressure Transient Monitoring includes all costs associated with installation of pressure sensors; pressure data collection, validation and analysis; and removal of the pressure sensors.

Paid per assessed force main.

Items 6 – 7: PVC Fatigue Analysis includes all cost associated with planning, data / sample acquisition, testing / modeling, and reporting results. This unit cost represents the per force main cost of performing this assessment.

Paid per assessed force main.

Items 8 – 10: These line items represent all costs associated with the additional analytics performed and included in addition to the standard inspection reporting. These are only offered when the data collected by the inspection method is sufficient to support them.

- Structural Analysis – determine required minimum wall thickness utilizing pressure transient data and industry standard design requirements. Must present information at localized as well as systematically across main.
- Finite Element Analysis (FEA) to provide detailed information of stress and strain based on geometric modeling of the system or components of the system. Used to pinpoint failure risks.
- Remaining Useful Life (RUL) – utilizes statistical modeling to provide a span of expected remaining life span and its associated confidence interval.

Paid per assessed force main.

Item 11: Reporting includes providing a draft, addressing Owner's comments and issuance of a final draft report. Report shall include all information, conclusion and recommendations from the completed assessments.

This is a lump sum fee for the engagement that may comprise of multiple force mains.

Item 12: Includes horizontal mapping of force mains from data derived from items 2 – 3. Required accuracy is +- 2-feet.

Paid per mile of force main mapped.

Item 13: Maintenance of Traffic as necessary and as required by the governmental jurisdiction.

This is a lump sum fee for the engagement that may comprise of multiple force mains.

Item 14: Confined Space Entry as required.

Paid per day of required access. Owner must be presented with invoices documenting actual costs. This is a not to exceed daily amount.

Item 15: Stand-by Rate may be charged for idle "DAYS" resulting from the Owner's inability to provide the support called out for and agreed to in the Inspection Plan.

Paid per day of delay.

All prices quotes are good for a period of 90 days.

☐ We do not take exception to the Scope of Work

☐ We take exception to the Scope of Work as follows:

_____

_____

The Undersigned Agrees:

A. To accept the stipulation of all Terms and Conditions and Specifications including delivery and other provisions.
B. To enter into and execute a Contract if awarded on the basis of this Bid.
C. To accomplish the work in accordance with the Bid documents and Specifications.

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Print Name: _____ Title: _____

Telephone: _____Fax: _____Email: _____

Federal Tax ID: _____

Signature: _____Date: _____

ATTACHMENT B
"NO PROPOSER" RESPONSE FORM

If for some reason you are not participating in this solicitation, PLEASE complete the following and return to:

https://tohowater.bonfirehub.com
Procurement Services Office
Toho Water Authority
1628 S. John Young Pkwy
Kissimmee, FL 34741

Company Name: _____
Address: _____
_____
_____
Phone Number: (____) _____
Fax Number: (____) _____

Reason for no response to the solicitation:

_____ Cannot supply at this time
_____ Conflict of Interest
_____ Suitable, but engaged in other work
_____ Quantity too small
_____ Cannot meet required minimum
_____ Opening date does not allow sufficient time to complete
_____ Equivalent not presently available
_____ Other reasons or remarks: _____
_____
_____
_____

_____
Print Name

_____
Signature

ATTACHMENT C
DRUG FREE WORKPLACE COMPLIANCE FORM

IDENTICAL TIE BIDS

Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids which are equal with respect to price, quality, and service are received by the state or by any political subdivision for the procurement of commodities or contractual services, a bid received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. Established procedures for processing tie bids will be followed if none of the tied Proposers have a drug-free workplace program. In order to have a drug-free workplace program, a business shall:

1) Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2) Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3) Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).

4) In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than 5 days after such conviction.

5) Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community by, any employee who is so convicted.

6) Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

_____
Print Name

_____
Signature

ATTACHMENT D
REFERENCES

The following information is required in order that your Bid may be reviewed and properly evaluated.

Company Name: _____

Length of Time Company has been in Business: _____

Business Address: _____

Telephone Number: _____ Fax Number: _____

Total number of current employees: _____ Full-time _____ Part-time _____

Number of employees you plan to use to service this contract: _____

1. COMPANY NAME: _____
   ADDRESS: _____
   CONTACT PERSON: _____
   TELEPHONE: (_____) _____ - _____
   FAX: (_____) _____ - _____
   E-MAIL: _____
   DESCRIPTION OF WORK PERFORMED:
   _____
   _____
   DATE RANGE: _____
   CONTRACT AMOUNT: _____

2. COMPANY NAME: _____
   ADDRESS: _____
   CONTACT PERSON: _____
   TELEPHONE: (_____) _____ - _____
   FAX: (_____) _____ - _____
   E-MAIL: _____
   DESCRIPTION OF WORK PERFORMED:
   _____
   _____
   DATE RANGE: _____
   CONTRACT AMOUNT: _____

3. COMPANY NAME: _____
ADDRESS: _____
CONTACT PERSON: _____
TELEPHONE: (_____) _____ - _____
FAX: (_____) _____ - _____
E-MAIL: _____
DESCRIPTION OF WORK PERFORMED:
_____
_____
DATE RANGE: _____
CONTRACT AMOUNT: _____

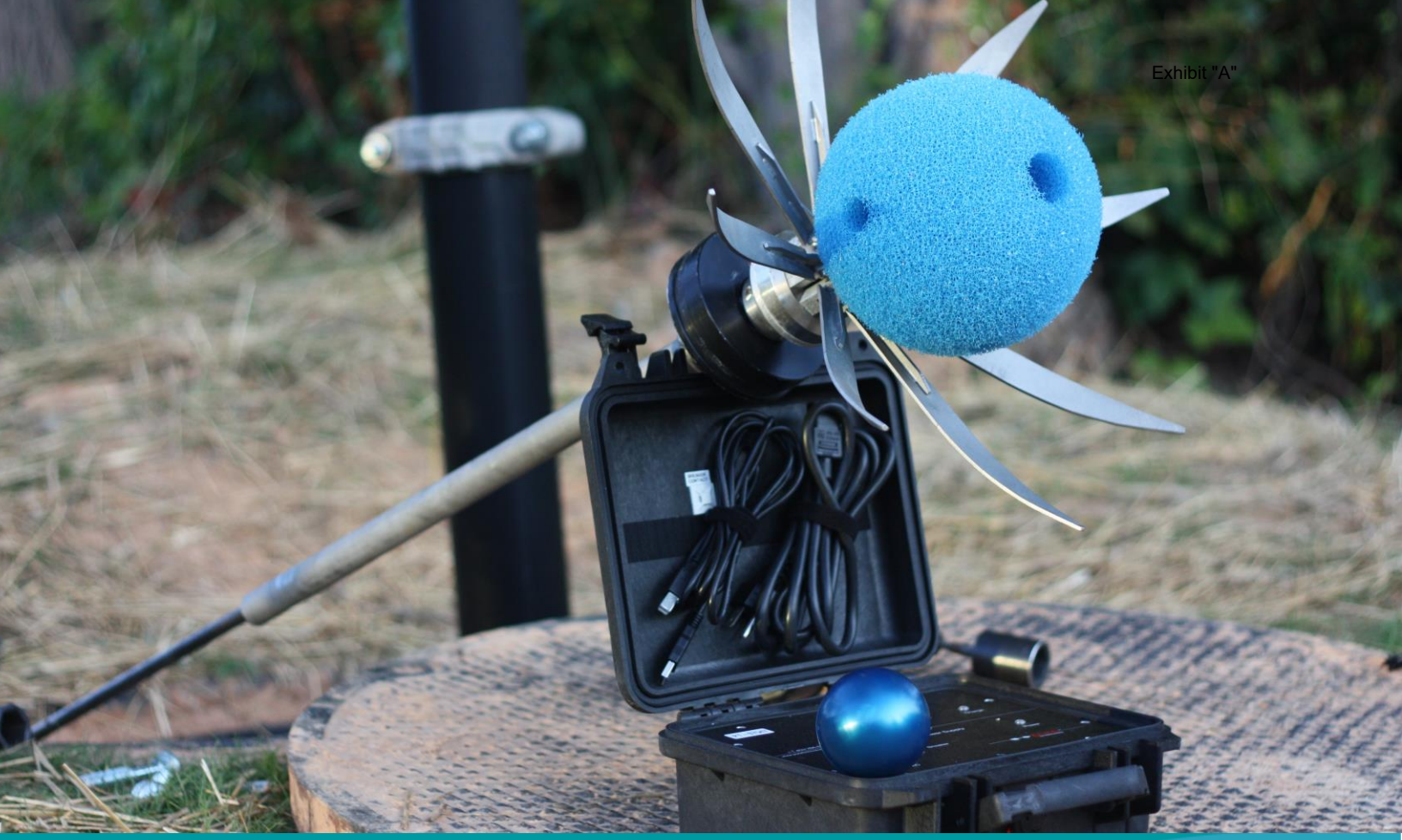
4. COMPANY NAME: _____
ADDRESS: _____
CONTACT PERSON: _____
TELEPHONE: (_____) _____ - _____
FAX: (_____) _____ - _____
E-MAIL: _____
DESCRIPTION OF WORK PERFORMED:
_____
_____
DATE RANGE: _____
CONTRACT AMOUNT: _____

5. COMPANY NAME: _____
ADDRESS: _____
CONTACT PERSON: _____
TELEPHONE: (_____) _____ - _____
FAX: (_____) _____ - _____
E-MAIL: _____
DESCRIPTION OF WORK PERFORMED:
_____
_____
DATE RANGE: _____
CONTRACT AMOUNT: _____

EXHIBIT “B”

CONTRACTOR PROPOSAL

Exhibit "A"



Toho Water Authority

Wastewater Force Main Condition Assessment Services

RFP # 21-002

Date: 17 December 2020

Prepared for:
Toho Water Authority
Procurement Services Department
1628 S. John Young Pkwy
Kissimmee, FL 34741

Prepared by:
Pure Technologies U.S. Inc.

Contact Information for this RFP:
William J. Craven, P.E.
731 W. Smith Street
Orlando, FL 32804
M: 407.408.7631

pure TECHNOLOGIES
a xylem brand

Table of Contents

COVER LETTER

December 17, 2020

Jill Selby
Procurement Services
Toho Water Authority

Subject: RFP No. 21-002 – Wastewater Force Main Condition Assessment Services

Dear Ms. Selby

Pure Technologies is a recognized industry leader in the inspection and assessment of pressurized pipelines and has built a reputation of providing state-of-the-art innovative solutions for our clients. We have a strong team engineers and scientists dedicated to condition assessment and proactive management of pressure pipe that would be available for your project needs. This is demonstrated by the following highlights of our team:

- **Experience**: Pure Technologies has managed the condition assessment of over 25,000 miles of pressure pipe including over 4,000 miles of wastewater force mains. In addition to individual force main condition assessment projects, Pure Technologies has developed or managed system wide force main condition assessment programs for utilities such as the Metropolitan St. Louis Sewer District, Miami-Dade Water and Sewer Authority, and the Baltimore County Bureau of Utilities. No other firm has more experience in force mains condition assessments.

- **Expertise:** Our engineers and scientists have written national standards on condition assessment of force mains, pressurized water mains, numerous technical papers, and involvement on national committees including the 2010 Water Environment Research Foundation Report Condition Assessment of Wastewater Force Mains. **This experience will translate to solutions for Toho Water Authority that address specific requirements of this RFP.**

- **Project Team**: Pure Technologies key staff members have extensive experience in managing large, multifaceted pipeline management programs. Specifically, our team is led by Alan Bair, P.E. (Miami, FL) and supported by Parvesh Deonarinesingh, P.E. (Miami, FL) and C.J. Roebuck, P.E. (Atlanta, GA). Not only has our team completed inspections for Toho Water Authority's critical effluent and wastewater pipelines, but also have managed and/or provided QAQC oversight on numerous force main condition assessment projects throughout the Southeast. We understand the importance of maintaining schedule and budget all while delivering a defensible program to Toho Water Authority customers.

Enclosed is our detailed proposal with primary RFP documentation provided in **Appendix A**. We are looking forward to the opportunity to working again with Toho Water Authority on this important project. If you have any questions or comments, please do not hesitate to contact me at (407) 408-7631.

Best Regards,

William J. Craven, P.E.
Business Development Director
M: +1.407.408.7631
William.craven@xyleminc.com

John G. Galleher, Jr., P.E.
Vice President
M: +1.760.644.1535
John.Galleher@xyleminc.com

FIRM QUALIFICATIONS AND EXPERIENCE (SECTION 5D)

Overview of Firm

At Pure Technologies, we strive to provide peace of mind by showing utilities the true lifecycle of their pipeline infrastructure. **Our best in class dataset collection, the largest inspection results database in the industry and analytical portfolio provides the actionable information and solutions utilities need to cost effectively focus resources with precision, by prolonging asset life, improving safety, and increasing reliability.** That means you can focus your resources in the right place, and eliminate budget waste, lost hours, and disruption.

Pure Technologies - Largest Pipeline Data base in Industry
30+ years of pressure pipe management experience
25,000+ miles of pressure pipe condition data
14,000 +Miles of leak detection surveys
4,000+ miles of force main condition assessment
5,300+ miles of PCCP pipeline condition assessment
57,500+ wire breaks detected

The tools utilized by Pure Technologies are effective condition assessment systems to identify early indicators of deterioration. Combining technologies and engineering analysis, baseline conditions of pressurized mains can be determined with very little disruption to service, the location of pipeline defects such as leakage, wall loss identified, and the cost of complete replacement can be avoided, enabling a more informed decision to selectively rehabilitate, replace or monitor specific pipes.

Our non-destructive leak detection technologies can accurately locate leaks, allowing for immediate repairs that reduce non-revenue water and prevent leaks from leading to failure. Pure Technologies' pipe wall condition assessment solutions are effective on a variety of pipe materials and can locate distressed sections along a pipeline allowing for proactive, scheduled repairs with minimal service disruption.

The environments our technologies and tools operate in are pressurized, hostile and often lack redundancy. These unique operational challenges have pushed Pure Technologies' research and development efforts to refine our technology platforms to serve a wide variety of clients with varying pipe materials and operational constraints. As critical infrastructure continues to age around the world, Pure Technologies will continue to develop services that help mitigate risk and extend the useful life of pipelines.

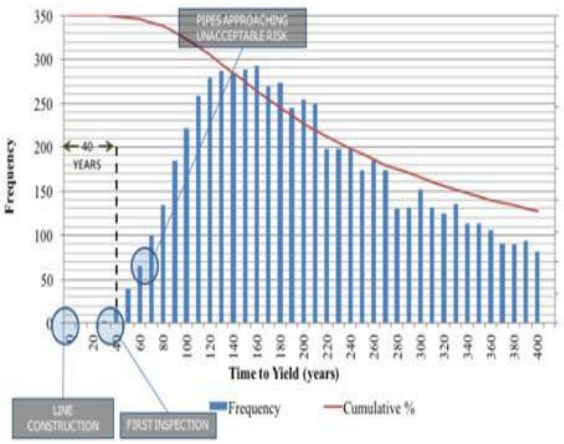
Pure Technologies has a long history of conducting inspections and has developed a reputation for honesty and integrity while improving the state-of-art for pipeline assessments. In addition, Pure Technologies has developed several advanced structural and statistical analyses that are part of the suite of engineering services provided. The purpose of these analytical methods is to provide data-driven decision support to clients when evaluating pipeline alternatives associated with whole life management of these assets.

Why Pure Technologies?

- ✓ Florida Resources: Toho Water Authority will have access to the engineers, technology team-leads and operations staff **located in our Miami, Florida office** (7400 Corporate Center Drive, Suite E, Miami, FL 33126). Our proposed Project Manager (Alan Bair, P.E.) and Project Engineer (Parvesh Deonarinesingh, P.E.) are located in this office. In addition, William Craven, P.E., responsible for Client Service, is also located nearby in Orlando, FL and available for immediate response to site visits, meetings or any concerns related to any aspects of ongoing work.
- ✓ Unmatched in the Pressure Pipe Industry: Pure Technologies has assessed more than 25,000 miles of pressurize water and wastewater pipelines in the past 30 years.
- ✓ Unmatched Experience in PCCP Assessment: We have evaluated more PCCP than any firm in the industry. Pure Technologies has significant experience in force main inspections and we are

industry leaders in PCCP condition assessment. Our extensive inspection data base provides the highest level of confidence available with over 5,300 miles of PCCP inspected.

- ✓ New and high-resolution metallic Assessment Tools: PureEM, our proven 24D (detectors) array platform which can be mounted on either our tried and proven PipeDiver® platform or our 4th generation robotic crawler platform. PipeDiver® Ultra provides high resolution pipe wall assessments utilizing Ultrasonic Thickness (UT) measurements on critical water infrastructure.
- ✓ Actionable Information: Our proposal focuses on providing you actionable information -- specifically the extent and location of pipeline deterioration. This actionable information will allow your utility to avert future pipeline failures in a financially responsible way.



Remaining Useful Life Analysis Output

- ✓ Innovative Pipe Engineering, Science, and Technology: Pure Technologies uses the latest state-of-the-art solutions to assess PCCP and metallic pipe. We provide data on individual pipe sections that have low to high levels of damage so the Toho Water Authority can make the "right" decisions in managing the pipeline. In addition, support engineering services are available to provide transient pressure monitoring, pipe wall structural analysis and a statistical analysis of remaining useful life (RUL) assessments to significantly to help manage and extend the life of your critical assets.

Subcontractors

Based on our experience working with Toho Water Authority, it is anticipated civil works (tapping, excavation, flange removal/replacement, bypass pumping, etc.) and potentially specialty diving services for high risk confined space may be required to perform the anticipated scope of work outlined in this RFP. Due to uncertainty in level of effort required (based on information known at the time of this proposal), uncertainty in market conditions/pricing for unknown quantities, Pure Technologies recommends that specialty contractors be incorporated on "as needed basis". This will allow Pure Technologies to request multiple quotes for specialty construction services/vendor to supplement assistance provided by Toho Water Authority and ultimately provide the most cost effective solution to executing the proposes scope of work.

Litigation

Pure Technologies, affiliates and project team do not have any litigation or open disputes related to the scope of work outlined in this Request for Proposals (RFP) in either the public or private sector during the past five (5) years.

Financial Information

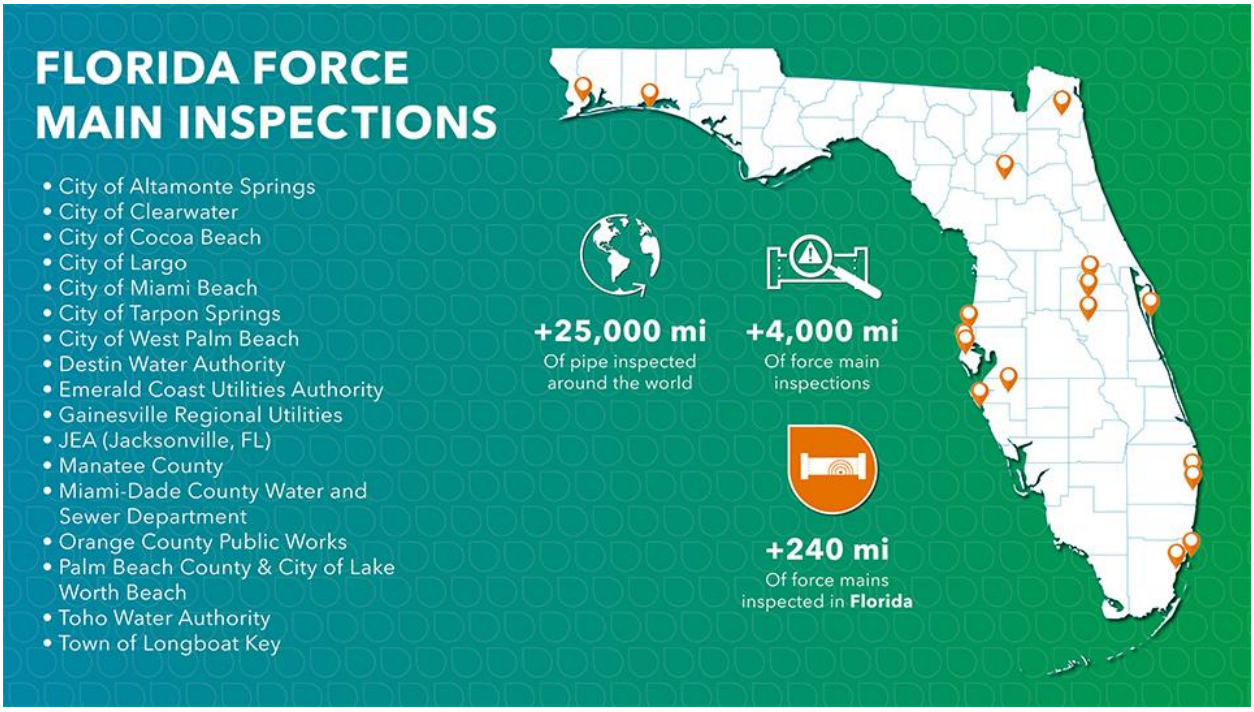
Pure Technologies understands that Toho Water Authority intends to award this RFP only to an organization that is financially sound. As such, Pure Technologies acknowledges the need to demonstrate financial capacity and will submit a financial statement, if requested, prior to final award in accordance with Section 5.D of this RFP.

Insurance Certifications

A copy of Certificates of Insurance evidencing coverage as outlined in this RFP, as required in Section 10.7, is provided in **Appendix B**.

SIMILAR PROJECTS (SECTION 5E)

Pure Technologies was created in 1993 to provide improved methods for managing major civil infrastructure. Originally, the firm was dedicated to detecting and tracking corrosion in commercial buildings and long-span bridges. In the late 1990s, Pure Technologies implemented an initiative to assess large diameter pressurized pipe in the water and wastewater sector. This led to significant growth of our water and wastewater related business, which now represents 90% of the company's revenue. Pure Technologies has more than 30 years of experience in pressure pipe assessment and trenchless technology. No other firm has this wealth of experience and expertise in the assessment of pressurized pipelines, including wastewater force mains.



Project References Similar to the Scope of Services Anticipated

The following are three recent clients who have engaged Pure Technologies to provide in-line leak/gas pocket detection and condition assessment services for in support of their asset management programs.

Reference No. 1

Toho Water Authority
Contact: Tim Noyes, Asset Manager
Address: 951 MLK Blvd, Kissimmee, Florida 34741
Phone: 407-944-5040
Email: TNoyes@tohowater.com

Description of Services: The purpose of this project was to perform in-line inspections and condition assessments along approximately 56,160 linear feet (LF) of Ductile Iron Pipe (DIP). The project was comprised of six (6) separate force mains ranging from 12-inches to 30-inches in diameter. The force mains transmit wastewater from various lift stations to the South Bermuda Water Reclamation Facility or gravity discharge manholes within the Toho Water Service Area. **Leak and gas pocket data, identified using the**

SmartBall platform, was used to assist in identifying high likelihood of failure locations along each force main and locations for external wall thickness measurements. This information, along with transient pressure data was incorporated into structural and remaining useful life analyses of the individual mains.

Key Team Responsibilities:

- ✓ Project Oversight and QA/QC – Alan Bair
- ✓ Project Managers – Parvesh Deonarinesingh and C. J. Roebuck
- ✓ Structural Engineer – Masood Hajali
- ✓ Statistical Analysis – Craig Daly

Project Information:

- ✓ Project Costs – $533,032
- ✓ Project Period – Sept. 2018 to Nov. 2020

Reference No. 2

Palm Beach County Water Utilities
Contact: Krystin Berntsen, P.E., Director of Engineering
Address: 8100 Forest Hill Blvd, West Palm Beach, FL 33413
Phone: 561-493-6027
Email: KBerntsen@pbcwater.com

Description of Services: The purpose of this project was to perform **in-line leak/gas pocket detection using the SmartBall platform** on approximately 4.45 miles of 36-inch prestressed concrete cylinder pipe (PCCP); 4.45 miles of 42-inch ductile iron pipe (DIP); 2.10 miles of 48-inch DIP; and 3.10 miles of 54-inch DIP. The force main transmits wastewater from the City of Lake Worth; Unincorporated Palm Beach County; and, the Towns of Atlantis, Lantana, Manalapan, Palm Beach, and South Palm Beach to the East Central Regional Water Reclamation Facility (ECRWRF). Transient pressure monitoring was also provided along multiple locations of the inspection due to the length and number of manifolded force mains prior to discharge ECRWRF.

Key Team Responsibilities:

- ✓ Project Oversight and QA/QC – Alan Bair
- ✓ Project Manager – Parvesh Deonarinesingh

Project Information:

- ✓ Project Costs – $220,150
- ✓ Project Period – March 2020 to Aug. 2020

Reference No. 3

Gainesville Regional Utilities
Contact: Roberto Rosario, P.E., Utility Engineer, IV
Address: 4747 N Main St., Station E3-F, Gainesville, FL 32609
Phone: 561-493-6027
Email: ROSARIORA@gru.com

Description of Services: The purpose of this project was to perform **in-line leak/gas pocket detection using the SmartBall platform** on approximately 7 miles of 36-inch diameter ductile iron pipe (DIP); The force main transmits wastewater from 34th St. lift station to the Kanapaha Water Reclamation facility.

Key Team Responsibilities:

- ✓ Project Oversight and QA/QC – Alan Bair
- ✓ Project Manager – C.J. Roebuck

Project Information:

- ✓ Project Costs – $138,775
- ✓ Project Period – Jan. 2020 to July 2020

Reference No. 4

Township of Hamilton Water Pollution Control
Contact: Tina Stack, Environmental Scientist
Address: 300 Hobson Ave, Trenton, NJ 08610
Phone: 609-581-4140
Email: TStack@hamiltonnj.com

Description of Services: The purpose of this project was to perform **condition assessment (PipeDiver platform) coupled with leak and air pocket detection on the SmartBall platform**. The assessments covered approximately three miles of 18-inch Ductile Iron Pipe (DIP). The inspections identified locations with high likelihood of failure along the force main. This information, along with transient pressure monitoring data was incorporated into structural analysis (FEA Curves – AWWA C150) on three pipes showing the most significant wall loss. This information allowed the utility to make management decisions for this critical force main.

Key Team Responsibilities:

- ✓ Project Manager – Alan Bair
- ✓ Structural Engineer – Masood Hajali

Project Information:

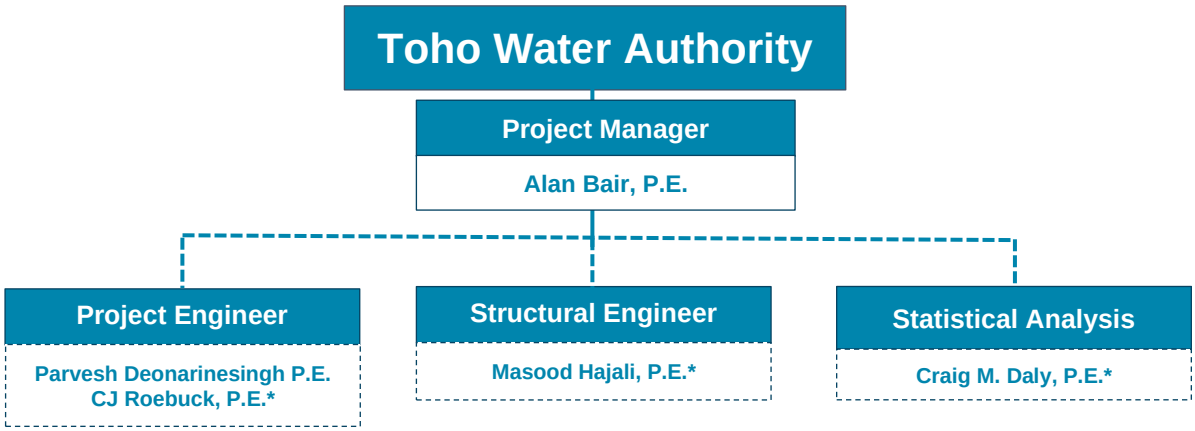
- ✓ Project Costs – $324,063
- ✓ Project Period – Sept. 2019 to Jan. 2020

STAFF QUALIFICATIONS AND EXPERIENCE (SECTION 4 AND 5F)

As shown below, our team of experts is comprised of engineers and specialized technologists that have delivered numerous successful projects together that parallel the depth and breadth of this proposed scope. Our strategy involves establishing clear lines of responsibility to ensure that the Toho Water Authority receives the best technical support while maintaining efficiency to keep the project on schedule and budget. In addition to these staff members, the team will have access to a qualified team of specialized engineers, scientists and field personnel who are experts in the area of condition assessment of pipelines. Alan Bair, P.E. will serve as the Project Manager for this contract and will be the point of contact for project delivery.

The chart below describes our proposed team structure. We understand that the scope of this RFP is limited to leak and gas pocket detection along four critical force mains with additional mapping requirements to verify the alignment of these pipelines. In addition to these services, we have included specialty engineers that can be called upon, as requested by the Toho Water Authority, to further evaluate structural integrity and remaining useful life of these force mains as additional data is collected the Toho Water Authority. Brief descriptions of key staff and the roles they will play in the project team are provided below with complete resumés provided in **Appendix C**. *Also included in Appendix C is a letter of certification indicating the staff identified in the proposal will be the staff who will provide the services required by the awarded agreement.*

Organizational Chart



**Not a Registered Professional Engineer in the State of Florida*

Alan L. Bair, P.E., Senior Project Manager
Year of Experience: 16
Office Location: Miami, FL

Why selected: Mr. Bair is an engineer with extensive experience in civil engineering, including the inspection of wastewater force mains of multiple materials. He joined Pure Technologies in 2008. Before joining Pure Technologies, he worked as a resident civil engineer on various large civil projects. During this time Mr. Bair gained experience in many of aspects of civil engineering such as on-site observations and consultation as well as, project analysis, report preparation, geotechnical investigations, soil analysis, and foundation design. Mr. Bair's experience includes pipeline evaluations ranging in diameter from 8- to 132-inches, involving internal pipeline inspections, pipe dissection, material sampling, and external examinations. Mr. Bair currently serves as the Area General Manager for the South Region. **Mr. Bair's project responsibilities will include directing all aspects of the project and having ultimate responsibility for delivery of all inspections for Toho Water Authority.**

Parvesh Deonarinesingh, P.E., Project Engineer
Year of Experience: 7
Office Location: Miami, FL

Why selected: Mr. Deonarinesingh has provided exceptional project management and engineering oversight of buried infrastructure asset management solutions and projects in water ,wastewater and storm water systems. During his tenure in the engineering industry, Mr. Deonarinesingh developed an increasing range of experience in the area of water and wastewater design, operation and condition assessment of buried infrastructure, design and preparation of plans and specifications, permitting, construction observation, and construction phase engineering for water transmission mains, sewer force mains and pumping stations. He has extensive experience in the inspection and condition assessment of buried infrastructure using state of the art inspection technologies.

C.J. Roebuck, P.E., Project Engineer
Year of Experience: 15
Office Location: Atlanta, GA

Why selected: Mr. Roebuck is a registered environmental engineer with over 14 years of project experience working for private consultants designing wastewater treatment facilities, conducting remedial investigations and managing projects. Over the past three years he has been involved in managing small to complex inspection projects for public utilities and design consultants utilizing various tools from Pure Technologies resources to access small to large diameter pipelines. Mr. Roebuck's primary focus is to deliver exceptional service and results that help clients maximize the life of their pipeline assets.

Masood Hajali, PhD, P.E., Senior Structural Engineer
Year of Experience: 10
Office Location: Miami, FL
Area of Specialty: Structural Engineering

Why selected: Dr. Hajali is an expert in the evaluation of the remaining useful life of damaged pipelines. He is responsible for development of new structural models for pipe design and failure modes of damaged pipelines. Dr. Hajali has led several innovative projects dealing with the development of methods for condition assessment of water and wastewater pipelines. Dr. Hajali has played a major role in the design and analysis of advanced materials and structures and has already made significant contributions to the field. Dr. Hajali has authored several full-length publications on the modeling of foundations, steel and concrete structures, and pipelines that were accepted by prestigious journals and manuscripts. Additionally, Dr. Hajali has extensive experience working with real world failures of various pipe designs, thus having the ability to correlate advanced structural models to actual failure mechanisms in a variety of scenarios, particularly buried assets.

Craig M. Daly, P.E., Senior Decision Scientist
Year of Experience: 22
Office Location: Columbia, MD
Area of Specialty: Statistical Analysis

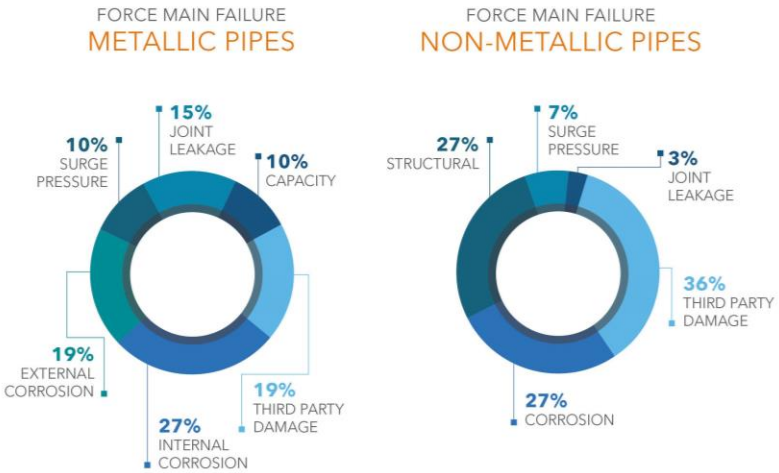
Why selected: Mr. Daly is a registered civil engineer with experience working for public utilities as well as private consultants developing and managing Capital Improvement Programs; including development of multi-year rehabilitation plans and preparation of long-term prioritized inspection plans. He has developed a comprehensive, data driven, risk assessment approach and life cycle analysis that utilizes statistical

methods to better identify assets that should be investigated to clearly identify actual condition which is subsequently used to justify repair and replacement decisions. Mr. Daly formed, and currently leads Xylem's analytical decision support group. The group is focused on using statistical methods for pipeline condition assessment and developing stochastic models that incorporate condition data for identifying and managing risk.

PROJECT APPROACH (SECTION 5G)

Project Understanding

While there are several mechanisms for the failure of sewer pressure pipe, research conducted as part of the Water Environment Research Foundation: 2010 Guidelines for the Inspection of Wastewater Force Mains, shows that the most common failure mode is internal hydrogen sulfide corrosion. This form of corrosion starts by a gas pocket forming in the pipeline, which develops the environmental conditions necessary to corrode the pipe wall, eventually leading to a failure.



Ductile Iron Pipe (DIP) ordinarily does not undergo mechanical failures such as circumferential or longitudinal cracks that have been observed in CIP. The more common mode of failure is a leak or burst due to corrosion. In force mains, the cause of corrosion is from the bacterial creation of dilute sulfuric acid at hydrogen sulfide (H_2S) gas pockets in the line. The acid will destroy the cement mortar lining and eat away at the DIP itself. With the exception of deflection and fatigue, these potential failure modes can be evaluated using inline leak and gas pocket detection tools and pipe wall condition assessment tools.

Gas pockets can also impact the operation of a pump station system by reducing capacity of the pipeline. Pure Technologies has performed an analysis of force mains inspected using acoustic based technologies in order to better characterize the frequency and location of gas pockets. Based on the analysis, it was found that 72% of gas pockets were not at known high points or air release valves. Pipeline leaks are of concern for all pipe materials as they are often found to be the precursor of major failures. A pipeline failure can begin with weakening of the joint or barrel that may include a small leak. As constant use of the pipeline continues and pressure surges occur, the leak may grow possibly leading to a catastrophic failure or undermining the support of the pipeline. Therefore, identification of both gas pockets and leaks may eliminate these potential failures.

Resources to Execute the Scope of Services (Section 5G, Part 2)

As shown above, our Florida team of experts is comprised of engineers and specialized technologists that have delivered numerous successful projects together that parallel the depth and breadth of this proposed scope and will ensure that Toho Water Authority receives the best technical support. In addition to our Florida team, Pure Technologies has over 230 employees encompassing all aspects of the proposed work including specialized engineers, scientists, field technicians, technology leads, mechanical design engineers for specialty fabrication, GIS specialists, tool support, logistics and data analysts to complement our local team.

The following is a list of equipment currently available to execute the scope of work:

- ✓ 70 transient pressure monitors (TPMs)
- ✓ 105 SmartBall inspection tools
- ✓ 9 PipeDiver inspection tools

Technical Approach to Force Main Management (Section 5G, Part 1)

Based on our understanding of this RFP and the intent of Toho Water Authority's force main management program, Pure Technologies recommends the following general approach:

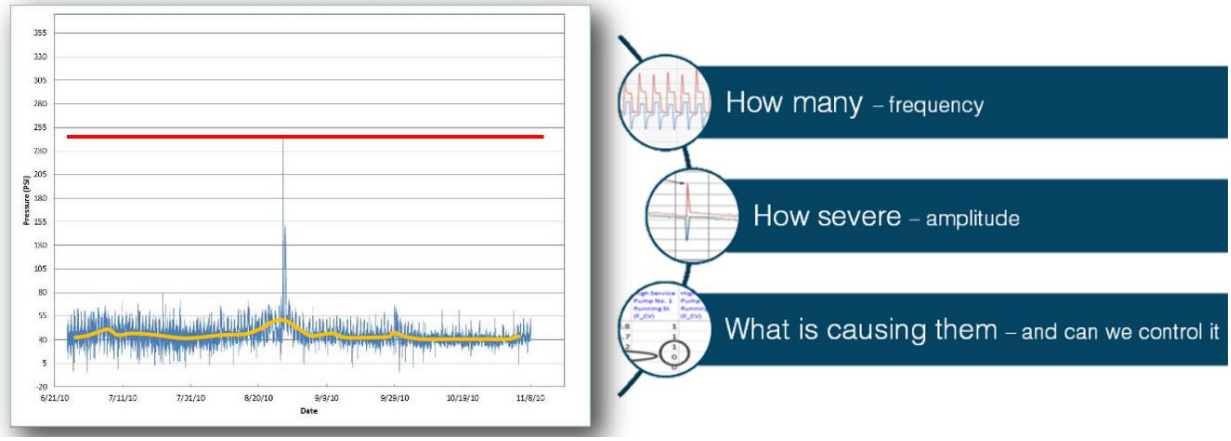
- ✓ Transient pressure monitoring;
- ✓ Leak and gas pocket detection utilizing the SmartBall® tool;
- ✓ Identify broad areas of corrosion using electromagnetics (EM) on the free-swimming PipeDiver® platform when field verifications are cost-prohibitive;
- ✓ Field Verification of wall thickness at critical locations identified by leak/gas pocket detection; and,
- ✓ Structural and statistical analysis to determine remaining useful life of the force main.

Transient Pressure Monitoring

One of the initial phases of any leak detection or condition assessment project should include monitoring for short duration pressure transients. Traditional pressure monitors collect data in intervals of minutes while transients or events of specific interest may occur in fractions of a second. A transient pressure monitor addresses the sampling frequency issue by continuously monitoring pressure while under normal operating conditions and recording operating data every few minutes (based on user-defined time intervals). However, when a transient event occurs in a pipeline, the monitor detects the sudden change in pressure and records data at a higher sampling rate (typically in intervals of 50 milliseconds).

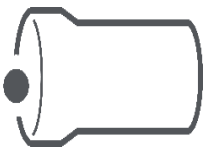
Collection of the transient data is critical for the hydraulic evaluation of the force main and ultimately the condition assessment of the pipeline. If a pipeline owner or operator relies solely on traditional pressure monitoring data, the actual pressures that influence a pipeline may not be documented, limiting an accurate condition assessment of the pipeline.

Pure Technologies will install one self-contained pressure-monitoring device to record transient events for up to 30 days on each inspected pipeline. Pure Technologies will then remove the temporary monitor and incorporate the results in the final report. Transient monitoring will be performed concurrently with project planning and implementation to maintain project schedule.



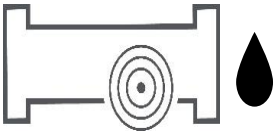
Acoustic Leak and Gas Pocket Detection

SmartBall®
BY THE
NUMBERS



7,000+
Miles of pipeline inspection data

15
Years of experience acros the globe



3,000+
Leaks identified

As shown below, the SmartBall® inspection platform proposed for this RFP, meets all of the technical specifications outlined in Section 2.2 of the Scope of Services.

Leak and Gas Pocket Detection

- ✓ Accurately survey the force main for gas pockets (including start, end and severity) and leak detection (including location and magnitude).
- ✓ Acoustic-based in-line inspections are performed while mains are in service
- ✓ Technologies identify and locate the extents of all gas pockets are in-line inspection tools acoustic-based leak and gas pocket detection device.
- ✓ SmartBall® platform is a free-flowing tool used to conduct in-line leak and gas pocket screening in pressurized pipelines,
- ✓ SmartBall® can complete long surveys in a single deployment without disruption to regular pipeline service.
- ✓ assessment tool is equipped with a highly sensitive acoustic sensor that is able to identify and locate leaks
- ✓ During the survey, the acoustic sensor continuously records all acoustic activity in the pipeline and is analyzed to determine the presence and location of any leaks or pockets of trapped gas.
- ✓ Insertion and extraction points for the equipment utilize, to the extent possible, existing pipeline features to require minimal modifications to the force main.
- ✓ The technologies proposed possess the ability to track the tool's movement and location, correlating its position at any time to provide accurate location information for acoustic events recorded during the survey.
- ✓ Accuracy of the tool is compatible with varied flow rates of 1.0 to 4.0 feet per second.
- ✓ Typical location accuracy is within 6-feet.

SmartBall® Inspection Platform Description

The SmartBall inspection platform is an acoustic-based, non-destructive inline inspection technology that detects acoustic activity associated with leaks and pockets. The SmartBall core is an aluminum sphere secured inside a foam shell and contains electronic components and instrumentation that collects the following data as it traverses the pipeline, propelled by the hydraulic flow:

- ✓ Acoustic (Leaks and Gas Pockets)
- ✓ Magnetic (Pipe Joints and Features)
- ✓ Relative pressure (Elevation Changes and Blockages)
- ✓ Temperature
- ✓ Heading (Changes in direction)
- ✓ Acceleration (Rolling motion)
- ✓ Location and Velocity (Calculated through external tracking sensors)

SmartBall can be used in all pipeline materials carrying water, wastewater, or oil. It can be inserted into live pressurized pipelines and only requires only a 4-inch access point. Available access points for insertion include existing or newly installed full port flanged valves (e.g., an isolation valve under an air release valve), and check valves within in a pump station (insertion only). Once deployed, SmartBall can move through inline valves and reducers as well as navigate 90-degree bends, profile changes, and vertical sections. Extraction is typically at transitions to gravity (manholes) or a screening facility located at the headworks of wastewater treatment facilities.

To actively and continuously track the SmartBall during the inspection, proprietary tracking devices are synchronized with the SmartBall and tracking sensors are attached along the pipeline prior to deployment. The tracking devices detect an ultrasonic signal emitted by the SmartBall and calculate its location and velocity as it traverses the pipeline. The tracking sensors function best when they are installed as close as possible to the water column in the pipeline and are attached to metal surfaces of pipeline appurtenances, such as existing air release valves, flanges, valves, or any other contact point on the pipeline.

The collected data is evaluated by experienced analysts using proprietary software and methods to report the presence and location of leaks and gas pockets where the potential for H_2S corrosion may occur, as well as a qualitative estimate of the leak magnitude. Gas pocket and leak locations are determined using a combination of datasets collected from the gyroscope (heading), accelerometer (rolling motion) and magnetometer (pipe joints and features). The magnetometer data is also used to determine if a leak is occurring at a pipe joint or the barrel. Leaks occurring on the barrel of the pipe may indicate the pipe has been structurally weakened and in danger of failing. These datasets are used in combination with data recorded by the synchronized tracking devices to locate leaks and gas pockets along the pipeline.

Assessment of PCCP and Metallic Mains (High and Low Resolution)

PipeDiver®
BY THE NUMBERS

1,500+
Miles of pipeline inspection data

10+
Years of Experience across the globe

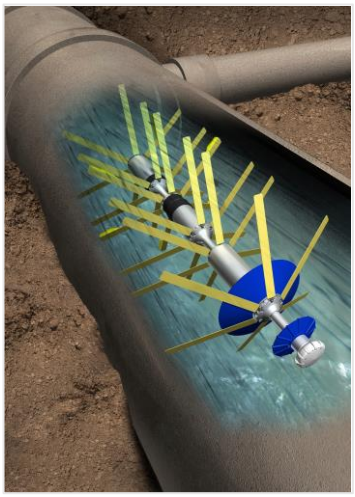
8,000
Damaged pipes identified

As shown below, the PipeDiver® inspection platform proposed for this RFP, meets all of the technical specifications outlined in Section 2.2 of the Scope of Services.

Pipe Wall Assessment

- ✓ Direct assessment of the pipe wall
- ✓ Ability to detect joints, material changes, some appurtenances, and many other features relevant to the operation and mapping of the pipe
- ✓ Analysts are able to estimate the position of the damage, such as at the crown, or at the invert and the longitudinal extent of the damage
- ✓ Data analysis can provide qualitative information regarding the condition of each pipe section (joint to joint)
- ✓ Project reporting can prioritize defects from highest concern to lowest allowing for follow-up action by Toho Water Authority
- ✓ Inspection platform can navigate in-line valves and bends in the pipeline while traveling long distances.
- ✓ Tool tracking above ground during the entire data collection process
- ✓ Inspection platform can be deployed for long inspections on several types of pipe to determine baseline condition (wall defects and broken pre-stressing wires on PCCP)

PipeDiver® Inspection Platform Description



PipeDiver is a free-swimming tool that consists of a battery module, EM module and a tracking module. The system is neutrally buoyant and has flexible fins that are used to center the tool within the pipe and provide propulsion. Its flexible design allows PipeDiver to navigate in-line valves and bends in the pipeline while traveling long distances.

The tool is tracked above ground during the entire data collection process. The tracking module includes an acoustic emitter within the PipeDiver that emits high frequency, timed acoustic signals that are detected by proprietary tracking sensors originally designed for the SmartBall leak detection tool (described above). The receivers are located at the surface and track movement of the tool, correlating its continued position in time in reference to acoustic events recorded on the acoustic sensor contained within the PipeDiver.

The PipeDiver platform is ideal for critical larger diameter pipelines that cannot be removed from service due to lack of redundancy or operational constraints. It can be effectively deployed for long inspections on several types of pipe to determine baseline condition. On concrete pressure pipe, the tool can identify and locate broken wire wraps, which are the main indication that this type of pipe will eventually fail. For metallic pipes, the technology ascertains a magnetic signature for each pipe section to identify anomalies that are produced by areas of corrosion or reduced wall thickness. When inserted into a live pipeline, the tool travels with the product flow and is able to navigate most butterfly valves and bends in the pipeline. The inspection tool is neutrally buoyant and is carried by the flow of water, travelling at approximately 90% of the flow rate. Therefore, after insertion it is allowed to travel with the flow until it reaches the desired capture and extraction location (bends, valves and tees may affect distance achieved). The tool will traverse through the pipeline and induce a magnetic field on the bars and cylinder of the pipe. Receiving sensors placed near the pipe wall will record a resulting magnetic signature that is influenced by the presence of broken bars (in PCCP) or defects in metallic pipe. The signature is recorded on the inspection tool and data from the inspection is subjected to a detailed data analysis process that identifies and quantifies damage on the pipe. Data is recorded and interpreted offsite by experienced analysts to pinpoint and locate areas of distress.

The proposed tool is specifically designed for this program accommodates pipelines 16- to 60-inches in diameter and has a cross-sectional area of about 8-inches. A minimum 12-inch opening is recommended to insert or extract the tool. Data is recorded and interpreted offsite by experienced analysts to pinpoint and locate areas of distress. Pure Technologies analysts determine pipe wall loss relative to other pipe sections identified. Without physical verification measurements taken of the actual pipe wall, quantification of pipe wall loss is not possible. As such, Pure Technologies recommends external validation of results and assumptions following the data analysis.

External Wall Thickness Measurements

Advanced structural and statistical analysis on metallic pipelines requires wall thickness measurements in order to determine the remaining useful life of a pipeline. External testing/pipe thickness measurements is accomplished by exposing the pipe stick at select test pits. The test pits are chosen at statistically significant locations based on data obtained during a previous SmartBall or PipeDiver inspection. Additionally, thickness measurements can be taken at existing ARV locations or where leaks or pockets of trapped gas are being externally repaired**.** A summary of the field verification protocols is summarized below:

- ✓ Prior to external testing, pipe diameter and length will be measured by Pure Technologies. The pipe's identification, station location, or length to known reference point will be boldly marked or painted on the pipe so as to be clearly seen in photographs. Photographs will be taken of the in-situ pipe from various angles.
- ✓ Burial depth will be measured as well as notation made on potential live loading.

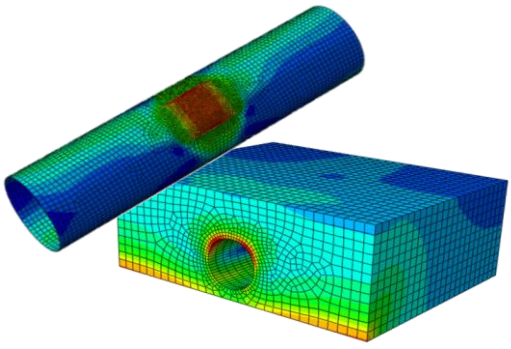
- ✓ GPS points will be captured using Trimble 7-Series GPS equipment or better of pipe and excavation including elevations and multiple photographs.
- ✓ External testing will be performed to determine wall thickness and areas of internal and external corrosion. This will be done using one or more of the following techniques; pulsed-eddy current, ultrasonic thickness testing, magnetic particle testing or dye penetrant testing.

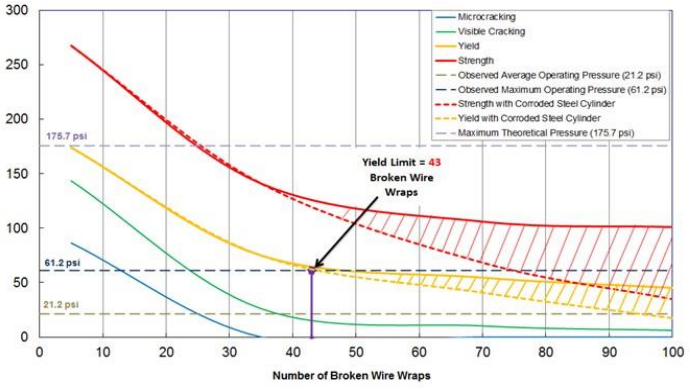
Structural Analysis

In order to develop actionable information from data generated during an inspection, Pure Technologies has developed an innovative series of condition-based pipeline management models. These models incorporate hydraulic evaluation data from pressure transient monitoring, if applicable, as well as industry design specifications for each pipeline being inspected. These structural models are presented in a pipeline condition curve that allows for both the localized and systemic condition evaluation of a pipeline. These models look at the original design conditions versus current operating conditions to identify potential areas where the pipeline section, as designed, is no longer sufficient to meet changed conditions.

Finite Element Analysis (FEA)

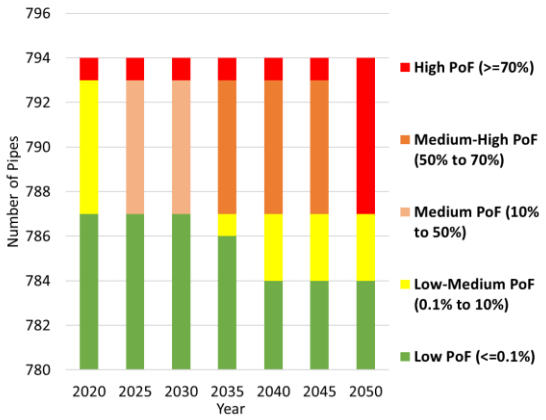
Finite Element Analysis (FEA) is the most accurate way to determine a pipe's expected behavior once it is no longer performing nominally. Using the design specifications as a baseline, the pipe stick is modeled with different levels of distress. The model can consider the actual geometry and position of a defect, interaction of multiple defects, internal pressure, external loading, and soil interactions for each analyzed pipe. FEA also allows for the application of various loading conditions and creation of accurate defect profiles that reflect the current condition of the pipe. The FEA model developed determines the structural consequence of damage in a particular pipe.





Advanced Statistical Analysis (Remaining Useful Life)

Pure Technologies has developed a statistical simulation that utilizes multiple asset attributes such as failure history, inspection data, and structural analysis to provide data-driven decision support to utilities when evaluating pipeline alternatives associated with whole life management of these assets. Wall thickness data for metallic pipe or wire break information from PCCP can be statistically analyzed to evaluate the failure probability for the pipeline. A Monte Carlo simulation is used to estimate remaining wall thickness and rate of loss based on the results of the inspection tool used, field validations, and the structural evaluation. Using this simulation, pipe management strategies can be developed that address the short-term management and long-term renewal strategies for the pipeline.



PVC Fatigue Analysis

PVC pipes are susceptible to failure by fatigue caused by both transient and cycling effects from pump stations. Pure Technologies has developed a fatigue modeling service for PVC pipes that calculates remaining useful life using standard design equations and data analysis techniques developed from over a decade of pressure monitoring and engineering experience. PVC Remaining Useful Life helps utilities avoid disruptive and costly failures, and plan for proactive mitigation.

Project Management and Communications (Section 5G, Part 3)

Pure Technologies has a well-developed project management practice focused on establishing and achieving goals set forth by each Client. Pure Technologies' project managers are trained in company and industry-standard project management practices. Pure Technologies believes project communications start and remain effective by initiating each project with a "kick-off meeting." Designed with each inspection's specific goals in mind, the kick-off meeting seeks to:

- ✓ Identify and include all project stakeholders, including members of Pure Technologies' project team;
- ✓ Establish the project's critical success factors for each stakeholder;
- ✓ Confirm project schedule, budget and deliverables;
- ✓ Set forth a communications plan to be used for the duration of the project.

This process gets each project started off smoothly, whether the project is small and short in duration, or complex with multiple technologies and stakeholders. The Project Manager, Alan Bair, will clearly define the roles and responsibilities of staff. Action items, milestones and deadlines will be established and reviewed on a regular basis and as needed. Project engineers will support each task by coordinating field assessments and potentially subcontractor(s) to realize efficiencies of on-going and future projects. Key milestones are established with the goal of developing a Project Planning Document that outlines roles and responsibilities during each inspection.

Pure Technologies has detailed standard operating procedures (SOP's) to ensure coordination between disciplines. These include forms and tools for communicating project background, scope, deliverables, deadlines and critical success factors. They detail methods and requirements of internal communication for project updates, data transfer, escalation, and more. In addition, the Regional Operations Manager ensures that all projects are adequately staffed with the appropriate equipment and personnel.

Additional communication occurs throughout the project. Of significance to Toho Water Authority, at each milestone throughout the project, Pure Technologies will request a meeting (in person or via remote presentation) to review the Project Planning Document developed for each inspection as well as a presentation of DRAFT results to assist with the review of reporting documents.

Value Added Services (Section 5G, Part 4)

Pipeline Mapping

Confirming the location of underground pipelines helps pipeline managers better understand the alignment relative to other critical assets, plan maintenance work more efficiently, reduce the likelihood of third-party damage and conduct more accurate hydraulic modelling. To help utilities determine the horizontal position of a pipeline, Pure Technologies has developed a solution which utilizes the latest accelerometer and gyroscope technology and advanced location algorithms to calculate directional data that is combined with field-collected GPS points and pipeline bearing data, at known locations, to create a field generated X and Y map called the “SmartBall-GIS Line”.

- ✓ With inertial mapping technologies, there is always an inherent but predictable drift. As the SmartBall moves further away from a GPS control point, the horizontal accuracy decreases steadily; GPS control points help reduce this drift and the more accurate these points are, the less error is created by this drift.
- ✓ A constant flow rate for the duration of the survey(s) is preferred to keep rolling consistent and avoid the potential for drift. As such, Pure Technologies will request flow control and pump manipulation to confirm the requisite velocity during tool deployment.
- ✓ Mapping accuracy is the greater of +/- 2 feet or 0.5% of the distance from a known point.

The accuracy of the mapping will depend on the quality and consistency of the rolling as well as the number and distance between GPS control points. Sections where the accuracy is expected to be less than the stated accuracy will be identified and suggestions to improve the accuracy will be made. ***It should be noted that the accuracy of the mapping is an iterative process and can be continually updated at no cost to Toho Water Authority based on additional, verified data points obtained subsequent to the initial inspection and draft reporting.***

System Control

The operability of critical valves is essential to a successful inspection project. Pure Technologies’ subsidiary, Wachs Water Services (Wachs), has the capabilities to provide staff to perform valve exercising and rehabilitation (if needed), should Toho Water Authority be unavailable to support an inspection effort. Field crews will locate and identify the valve, clean out the valve box, inspect the valve, operationally test the valve, map the valve with GPS, and make any repairs.

Because this RFP focuses on force mains, Wachs also has the capabilities to locate and inspect Air Release Valves (ARVs) on force mains. Field crews will isolate the ARV and visually inspect piping and other appurtenances in the vault. The ARV backflush valve will be opened to relieve pressure and then open the drain line. Once the ARV is empty, the field crew will re-close both the backflush and drain valves and recharge it. Crews will note whether air discharges from the valve and whether the valve seals without leakage.

Should Toho Water Authority wish to perform condition assessment on larger diameter critical raw, and potable pipelines, Wachs can also provide Level 1 assessments of large diameter valves located on these lines. A Level 1 General Assessment consists of recording the location of valve with a GPS recorder, photographing the existing condition of the valve actuator, recording any visible nameplate data, inspecting the actuator for lubricant leakage, operating the valve at the lowest torque and proceeding through one full cycle of fully closed and fully open and record the number of turns and torque values. All data will be reported to the City. Level 2 and Level 3 assessments of large diameter valves can also be performed by Wachs on an “as-needed” basis.

Section References: *Thomson, J.C., Morrison, R.S. and Sangster, T. (2010). Inspection Guidelines for Wastewater Force Mains. 04-CTS-6URa. Water Environment Research Foundation (WERF): Alexandria, VA.*

TYPICAL PROJECT SCHEDULE AND DELIVERABLES (SECTION 5G)

Project Schedule

The proposed schedule for this condition assessment project is outlined below:

✓ Confirmation Site Visit	1-2 weeks after Notice to Proceed (NTP)
✓ Project Planning Document	2 weeks following NTP
✓ Inspections	2-3 weeks following Project Plan approval
✓ Draft Report	4-12 weeks from inspection(s) - technology dependent
✓ Review Period	2 weeks from receipt of the draft report
✓ Final Report	2 weeks from receipt of review comments

Pure Technologies recommends implementing multiple inspections under a single project mobilization so that Toho Water Authority may recognize significant cost efficiencies. Recognizing the level of support required to execute inspection projects, we will work in collaboration with Toho Water Authority to develop an inspection schedule contingency days to accommodate, to the extent possible, normal operational requirements.

Project Deliverables

✓ A detailed Project Planning Document will be submitted to Toho Water Authority prior to the inspection in electronic PDF format. The project plan will be provided approximately two weeks prior to the inspection, dependent on the receipt of project data.

✓ Draft Report (electronic PDF) will be generated and delivered to Toho Water Authority based on the schedule noted below and technology selected for the project. The engineering report will contain the information outlined below:

- SmartBall® - Identification and geospatial reference (provided in shapefile format) of any leaks and/or gas pockets detected along the force mains as well as ARV installation recommendations. An AWWA C150 structural design check will also be performed based on current load and operating conditions which will include results of the transient pressure monitoring (if include in the scope of services).
- PipeDiver® - Identification and location of broad areas of corrosion and relative wall loss along the entire length of the force mains inspected.
- If included under the scope of services, Pure Technologies will also provide field verifications/wall thickness measurements, engineering, structural modeling (AWWA Design check and/or FEA) and perform a statistical analysis of the remaining useful life (RUL) of the force mains.
- Pure Technologies typically provides a presentation summarizing draft results to stakeholders to facilitate review of the draft report.

✓ A Final Report will be submitted within two weeks of the receipt of comments from Toho summarizing the findings based on the proposed inspection. The Final Report shall be delivered in electronic format (PDF format).

Services Requested of Toho Water Authority

In order execute this project cost effectively, Pure Technologies requests support during the planning process and inspections. The following will be requested of Toho Water Authority for the preparation and execution of the work:

- ✓ Information about the pipeline, prior to inspection, including, but not limited to, GIS, plan and profile drawings, lay sheets, shop drawings, manufacturing details, and details of access structures, air valves, blow-offs, and main line valves – if available;
- ✓ Provision of any required legal right-of-entry on the property for insertion/extraction and tool tracking, including environmentally sensitive areas;
- ✓ Provide support personnel during the inspections for access to system features typically restricted to client personnel;
- ✓ Provide opportunity to verify flow velocities recommended in this document prior to performance of the inspections;
- ✓ Authorize or assist in the operation of valves for insertion, extraction and tracking of the inspection platforms; and,
- ✓ Render confined space areas safe for the services, including locking and tagging pumps, valves, and motors, if required.

APPENDIX A – PROPOSAL FORMS

Attachment A – Price Schedule
Attachment C – Drug Free Workplace Form
Attachment D – References Form

ATTACHMENT A PRICE SCHEDULE

TO: Https://tohowater.bonfirehub.com

Toho Water Authority
Procurement Services Department
1628 S. John Young Pkwy
Kissimmee, FL 34741

DATE: December 17, 2020

FEE SCHEDULE HERE

Have you supplied all the Submittal Requirements outlined below?

- ☐ One (1) electronic copy of proposal package in searchable pdf format
- ☐ Any addenda pertaining to this solicitation
- ☐ Drug Free Certification
- ☐ References (5)
- ☐ List of possible subcontractors – ***(See Section Firm Qualifications and Experience of the Proposal)***
- ☐ Certificate(s) of Insurance (evidencing coverage as required)
- ☐ Detailed information on the solutions proposed

[SEE NEXT PAGE.]

BID FORM
RFP-21-002

Condition Assessment Technologies and Analysis						
Item	**Description**	**Unit**	**Assessment of PCCP Mains**	**High Resolution Structural Assessment of Metallic Mains**	**Low Resolution Structural Assessment of Metallic Mains**	**Acoustic Leak and Gas Packet Detection**
1	Mobilization and Project Planning	EA	$78,750.00	$78,750.00	$78,750.00	$26,250.00
2	Inspection and Data Analysis (up to 5 miles)	LF	$15.66	$11.36	$11.36	$3.13
3	Inspection and Data Analysis (after 5 miles)	LF	$14.62	$10.61	$10.61	$2.29
4	Field Verifications (minimum of 2 days)	DAY	Included w/ Inspection Cost	$6,500.00	$6,500.00	$6,500.00
5	Transient Pressure Monitoring	EA	$5,250.00	$5,250.00	$5,250.00	$5,250.00
6	PVC Fatigue Analysis (up to 10 Lift Stations)	EA	NA	NA	NA	$5,500.00
7	PVC Fatigue Analysis (after 10 Lift Stations)	EA	NA	NA	NA	$4,500.00
8	Structural Analysis (AWWA Design Check, per diameter and pipe class	EA	NA	$2,500.00	$2,500.00	$2,500.00
9	Structural Analysis (FEA, per diameter and pipe class)	EA	$9,975.00	$12,975.00	NA	NA
10	Statistical Analysis (RUL), per diameter and pipe class	EA	$11,600.00	$11,600.00	$11,600.00	$11,600.00
11	Reporting	EA	$15,000.00	$15,000.00	$15,000.00	$10,500.00
12	Pipe Route Mapping	MI	NA	NA	NA	$6,000.00
13	Maintenance of Traffic	LS	$3750.00	$3750.00	$3750.00	$3750.00
14	Confined Space Entry Planning, Permitting, Equip. Rental and Top Support	LS	$20,000.00	$20,000.00	$20,000.00	$20,000.00
15	Stand-by-Rate	DAY	$15,000.00	$12,500.00	$12,500.00	$5,500.00

Failure to submit this form may disqualify your response.

Respondent does not need to complete all areas requested in RFP-21-002, however, it will reflect on the selection process.

Notes:

Item 1: Mobilization and Project Startup item must as a minimum includes project document review; preliminary site visit and review (including travel costs); pre-inspection coordination meetings; planning document development; equipment and staff logistics to and from the project sites; tool calibration; pre-inspection activities required in advance of the scheduled inspection date.

This is a lump sum fee for the engagement that may comprise of multiple force mains.

Item 2 – 3: Inspection and Data Analysis includes all cost associated with the in-field execution of the project plan, with the exception of any required contractor support for mechanical modifications necessary to insert and/or extract the assessment instrumentation. These items also include review of the data to ensure that it meets the standards required to support findings and recommendations.

Paid per linear foot of assessed force main.

Item 4: Field verification includes all activities required to perform additional field investigation of the assessed main to correlate the data collected in item 2-3 and support further recommendations. Does not include excavation costs required to facilitate external examination of main.

Paid per day of verification.

Item 5: Pressure Transient Monitoring includes all costs associated with installation of pressure sensors; pressure data collection, validation and analysis; and removal of the pressure sensors.

Paid per assessed force main.

Items 6 – 7: PVC Fatigue Analysis includes all cost associated with planning, data / sample acquisition, testing / modeling, and reporting results. This unit cost represents the per force main cost of performing this assessment.

Paid per assessed force main.

Items 8 – 10: These line items represent all costs associated with the additional analytics performed and included in addition to the standard inspection reporting. These are only offered when the data collected by the inspection method is sufficient to support them.

- Structural Analysis – determine required minimum wall thickness utilizing pressure transient data and industry standard design requirements. Must present information at localized as well as systematically across main.
- Finite Element Analysis (FEA) to provide detailed information of stress and strain based on geometric modeling of the system or components of the system. Used to pinpoint failure risks.
- Remaining Useful Life (RUL) – utilizes statistical modeling to provide a span of expected remaining life span and its associated confidence interval.

Paid per assessed force main.

Item 11: Reporting includes providing a draft, addressing Owner's comments and issuance of a final draft report. Report shall include all information, conclusion and recommendations from the completed assessments.

This is a lump sum fee for the engagement that may comprise of multiple force mains.

Item 12: Includes horizontal mapping of force mains from data derived from items 2 – 3. Required accuracy is +- 2-feet.

Paid per mile of force main mapped.

Item 13: Maintenance of Traffic as necessary and as required by the governmental jurisdiction.

This is a lump sum fee for the engagement that may comprise of multiple force mains.

Item 14: Confined Space Entry as required.

Paid per day of required access. Owner must be presented with invoices documenting actual costs. This is a not to exceed daily amount.

Item 15: Stand-by Rate may be charged for idle "DAYS" resulting from the Owner's inability to provide the support called out for and agreed to in the Inspection Plan.

Paid per day of delay.

All prices quotes are good for a period of 90 days.

☑ We do not take exception to the Scope of Work

☐ We take exception to the Scope of Work as follows:

_____

_____

The Undersigned Agrees:

A. To accept the stipulation of all Terms and Conditions and Specifications including delivery and other provisions.
B. To enter into and execute a Contract if awarded on the basis of this Bid.
C. To accomplish the work in accordance with the Bid documents and Specifications.

Company: Pure Technologies US Inc.

Address: 8920 State Route 108, Suite D

City: Columbia State: Maryland Zip: 21045

Print Name: John J. Galleher Jr., P.E. Title: Vice President

Telephone: 443-766-7873 Fax: 443-766-7877 Email: John.Galleher@xyleminc.com

Federal Tax ID: 86-0853190

ATTACHMENT C
DRUG FREE WORKPLACE COMPLIANCE FORM

IDENTICAL TIE BIDS

Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids which are equal with respect to price, quality, and service are received by the state or by any political subdivision for the procurement of commodities or contractual services, a bid received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. Established procedures for processing tie bids will be followed if none of the tied Proposers have a drug-free workplace program. In order to have a drug-free workplace program, a business shall:

1) Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2) Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3) Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).

4) In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than 5 days after such conviction.

5) Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community by, any employee who is so convicted.

6) Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

John J. Galleher Jr., P.E.

Print Name

Signature

ATTACHMENT D
REFERENCES

The following information is required in order that your Bid may be reviewed and properly evaluated.

Company Name: Pure Technologies US Inc.

Length of Time Company has been in Business: 23 Years

Business Address: 8920 State Route 108, Suite D

Telephone Number: 443-766-7873 Fax Number: 443-766-7877

Total number of current employees: 205 Full-time 205 Part-time

Number of employees you plan to use to service this contract: 5

1. COMPANY NAME: Toho Water Authority
   ADDRESS: 951 MLK Blvd, Kissimmee, Florida 34741
   CONTACT PERSON: Tim Noyes, Asset Manager
   TELEPHONE: (407) 944 - 5040
   FAX: ( ) -
   E-MAIL: TNoyes@tohowater.com

   DESCRIPTION OF WORK PERFORMED:

   The purpose of this project was to perform in-line inspections and condition assessments along approximately 56,160 linear feet (LF) of Ductile Iron Pipe (DIP). The project was comprised of six (6) separate force mains ranging from 12-inches to 30-inches in diameter. The force mains transmit wastewater from various lift stations to the South Bermuda Water Reclamation Facility or gravity discharge manholes within the Toho Water Service Area. Leak and gas pocket data, identified using the SmartBall platform, was used to assist in identifying high likelihood of failure locations along each force main and locations for external wall thickness measurements. This information, along with transient pressure data was incorporated into structural and remaining useful life analyses of the individual mains.

   Key Team Responsibilities:
   Project Oversight and QA/QC – Alan Bair
   Project Manager– Parvesh Deonarinesingh
   Structural Engineer – Masood Hajali
   Statistical Analysis – Craig Daly

   DATE RANGE: September 2018 to November 2020
   CONTRACT AMOUNT: $533,032

2. COMPANY NAME: Palm Beach County Water Utilities
ADDRESS: 8100 Forest Hill Blvd, West Palm Beach, FL 33413
CONTACT PERSON: Krystin Berntsen, P.E., Director of Engineering
TELEPHONE: (561) 493 - 6027
FAX: ( ) -
E-MAIL: KBerntsen@pbcwater.com

DESCRIPTION OF WORK PERFORMED:

The purpose of this project was to perform in-line leak/gas pocket detection using the SmartBall platform on approximately 4.45 miles of 36-inch prestressed concrete cylinder pipe (PCCP); 4.45 miles of 42-inch ductile iron pipe (DIP); 2.10 miles of 48-inch DIP; and 3.10 miles of 54-inch DIP. The force main transmits wastewater from the City of Lake Worth; Unincorporated Palm Beach County; and, the Towns of Atlantis, Lantana, Manalapan, Palm Beach, and South Palm Beach to the East Central Regional Water Reclamation Facility (ECRWRF). Transient pressure monitoring was also provided along multiple locations of the inspection due to the length and number of manifolded force mains prior to discharge ECRWRF.

Key Team Responsibilities:
Project Oversight and QA/QC – Alan Bair
Project Manager – Parvesh Deonarinesingh

DATE RANGE: $220,150
CONTRACT AMOUNT: March 2020 to August 2020

3. COMPANY NAME: Gainesville Regional Utilities
ADDRESS: 4747 N Main St., Station E3-F, Gainesville, FL 32609
CONTACT PERSON: Roberto Rosario, P.E., Utility Engineer, IV
TELEPHONE: (561) 493 - 6027
FAX: ( ) -
E-MAIL: ROSARIORA@gru.com

DESCRIPTION OF WORK PERFORMED:

The purpose of this project was to perform in-line leak/gas pocket detection using the SmartBall platform on approximately 7 miles of 36-inch diameter ductile iron pipe (DIP); The force main transmits wastewater from 34th St. lift station to the Kanapaha Water Reclamation facility.

Key Team Responsibilities:
Project Oversight and QA/QC – Alan Bair
Project Manager – C.J. Roebuck

DATE RANGE: January 2020 to July 2020
CONTRACT AMOUNT: $138,775

4. COMPANY NAME: Township of Hamilton Water Pollution Control

ADDRESS: 300 Hobson Ave., Trenton NK 08610

CONTACT PERSON: Tina Slack, Environmental Scientist

TELEPHONE: (609) 581 - 4140

FAX: (609) 581 - 4094

E-MAIL: TStack@hamiltonnj.com

DESCRIPTION OF WORK PERFORMED:

The purpose of this project was to perform condition assessment (PipeDiver platform) coupled with leak and air pocket detection on the SmartBall platform. The assessments covered approximately three miles of 18-inch Ductile Iron Pipe (DIP). The inspections identified locations with high likelihood of failure along the force main. This information, along with transient pressure monitoring data was incorporated into structural analysis (FEA Curves – AWWA C150) on three pipes showing the most significant wall loss. This information allowed the utility to make management decisions for this critical force main.

Key Team Responsibilities:
Project Manager – Alan Bair
Structural Engineer – Masood Hajali

DATE RANGE: September 2019 to January. 2020

CONTRACT AMOUNT: $324,063

5. COMPANY NAME: Fayetteville Public Works Commission

ADDRESS: 955 Old Wilmington Road, Fayetteville, NC 28301

CONTACT PERSON: J. Vance McGougan P.E,

TELEPHONE: (910) 233 - 4738

FAX: (910) 829 - 0203

E-MAIL: Vance.mcgougan@gaypwc.com

DESCRIPTION OF WORK PERFORMED:

The purpose of this project was to perform condition assessment (PipeDiver platform) coupled with leak and air pocket detection on the SmartBall platform. Pure Technologies performed an inspection and condition assessment of approximately 8,410 linear feet (LF) of 20-inch diameter and approximately 7,785 LF of 24-inch diameter Prestressed Concrete Cylinder Pipe (PCCP) transmission mains. Transient pressure monitoring was incorporated into an FEA structural analysis to evaluate service life of the mains under current operational loads.

Key Team Responsibilities:
Project Oversight and QA/QC – Alan Bair
Project Manager – Masood Hajali

DATE RANGE: $706,250

CONTRACT AMOUNT: May 2019 to January 2020

APPENDIX B – INSURANCE CERTIFICATIONS

Exhibit "A"

CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YYYY) 05/28/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Aon Risk Services Northeast, Inc.
New York NY Office
One Liberty Plaza
165 Broadway, Suite 3201
New York NY 10006 USA

CONTACT NAME:
PHONE (A/C. No. Ext): (866) 283-7122 **FAX (A/C. No.):** (800) 363-0105
E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE		NAIC #
INSURER A:	Lloyd's Syndicate No. 623	AA1126623
INSURER B:		
INSURER C:		
INSURER D:		
INSURER E:		
INSURER F:		

INSURED
Pure Technologies U.S. Inc.;
PureHM U.S. Inc;
Pure Holding Inc.
8920 State Route 108, Suite D
Columbia MD 21045 USA

COVERAGES **CERTIFICATE NUMBER:** 570081902739 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS. **Limits shown are as requested**

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE	
	☐ CLAIMS-MADE ☐ OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	
							MED EXP (Any one person)	
							PERSONAL & ADV INJURY	
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	
	☐ POLICY ☐ PRO-JECT ☐ LOC						PRODUCTS - COMP/OP AGG	
	☐ OTHER:							
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	
	☐ ANY AUTO						BODILY INJURY (Per person)	
	☐ OWNED AUTOS ONLY ☐ SCHEDULED AUTOS						BODILY INJURY (Per accident)	
	☐ HIRED AUTOS ONLY ☐ NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	
	☐ **UMBRELLA LIAB** ☐ OCCUR						EACH OCCURRENCE	
	☐ **EXCESS LIAB** ☐ CLAIMS-MADE						AGGREGATE	
	☐ DED ☐ RETENTION							
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						☐ PER STATUTE ☐ OTH-ER	
	ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER EXCLUDED? ☐ **(Mandatory in NH)**	N / A					E.L. EACH ACCIDENT	
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE-EA EMPLOYEE	
							E.L. DISEASE-POLICY LIMIT	
A	E&O-MPL-Primary			FSCEO2000583 Claims-Made SIR applies per policy terms & conditions	06/01/2020	06/01/2021	Each Loss Retention	$10,000,000 $500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Professional Liability Limit Shown is in the Aggregate and Per Claim.
Coverage applies to Xylem Inc., and all of its regional subsidiaries worldwide.

CERTIFICATE HOLDER

Toho Water Authority
Attn: Procurement Services
1628 S. John Young Parkway
Kissimmee FL 34741 USA

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Aon Risk Services Northeast, Inc.

Holder Identifier :

Certificate No : 570081902739

©1988-2015 ACORD CORPORATION. All rights reserved.

Exhibit "A"

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 12/11/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Marsh USA, Inc. 1166 Avenue of the Americas New York, NY 10036 CN108453421-Pure-GAWU.-20-21	**CONTACT NAME:** **PHONE (A/C, No, Ext):** **FAX (A/C, No):** **E-MAIL ADDRESS:**
INSURED Pure Technologies U.S. Inc. PureHM U.S. Inc. Pure Technologies U.S. Inc. dba Wachs Water Services 8920 State Route 108, Suite D Columbia, MD 21045	**INSURER(S) AFFORDING COVERAGE** — **NAIC #** **INSURER A :** AIU Insurance Co. — 19399 **INSURER B :** National Union Fire Ins. Co. — 19445 **INSURER C :** Allianz Global Risks US Insurance Company — 35300 **INSURER D :** New Hampshire Insurance Company — 23841 **INSURER E :** **INSURER F :**

COVERAGES **CERTIFICATE NUMBER:** NYC-011003365-01 **REVISION NUMBER:** 1

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
B	X **COMMERCIAL GENERAL LIABILITY** CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY PRO-JECT LOC OTHER:			GL 1729028	10/31/2020	10/31/2021	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG SIR: $500,000	$ 1,000,000 $ 1,000,000 $ 10,000 $ 1,000,000 $ 10,000,000 $ 6,000,000 $
B B B	**AUTOMOBILE LIABILITY** X ANY AUTO OWNED AUTOS ONLY SCHEDULED AUTOS HIRED AUTOS ONLY NON-OWNED AUTOS ONLY			CA 4594485 (AOS) CA 4594486 (VA) CA 4594487 (MA)	10/31/2020 10/31/2020 10/31/2020	10/31/2021 10/31/2021 10/31/2021	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 5,000,000 $ $ $
C	X **UMBRELLA LIAB** X OCCUR **EXCESS LIAB** CLAIMS-MADE DED X RETENTION $ 10,000			USL00109920	10/31/2020	10/31/2021	EACH OCCURRENCE AGGREGATE	$ 5,000,000 $ 5,000,000 $
A D A A	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** Y / N ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? N **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		WC 046912946 (AOS) WC 046912947 (MA,OH,WA,WI,WY) WC 046912945 (FL) WC 046912944 (CA)	10/31/2020 10/31/2020 10/31/2020 10/31/2020	10/31/2021 10/31/2021 10/31/2021 10/31/2021	X PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 2,000,000 $ 2,000,000 $ 2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: RFP-21-002, Wastewater Force Main Condition Assessment Services

Toho Water Authority is included as additional insured (except workers' compensation) where required by written contract. Waiver of Subrogation is applicable where required by written contract and as permissible by law.

CERTIFICATE HOLDER

Toho Water Authority
Attn: Procurement Services
1628 S. John Young Parkway
Kissimmee, FL 34741

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE of Marsh USA Inc.

Lauren Giagrande

© 1988-2016 ACORD CORPORATION. All rights reserved.

ADDITIONAL REMARKS SCHEDULE

AGENCY Marsh USA, Inc.	**NAMED INSURED** Pure Technologies U.S. Inc. PureHM U.S. Inc. Pure Technologies U.S. Inc. dba Wachs Water Services 8920 State Route 108, Suite D Columbia, MD 21045
POLICY NUMBER	
CARRIER / **NAIC CODE**	**EFFECTIVE DATE:**

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,
FORM NUMBER: 25 **FORM TITLE:** Certificate of Liability Insurance

Each of the insurance policies referenced above provides that should such policy be cancelled by the insurer before the expiration date thereof for any reason other than nonpayment of premium, the insuring company will endeavor to mail 30 days written notice thereof to the certificate holder (except 10 days for non-payment of premium), but failure to provide such notice shall impose no obligation or liability of any kind upon the insurer or its agents or representatives, will not extend any policy cancellation date and will not negate any cancellation of the policy.

© 2008 ACORD CORPORATION. All rights reserved.
The ACORD name and logo are registered marks of ACORD

POLICY NUMBER:
GL 1729028

COMMERCIAL GENERAL LIABILITY

CG 20 26 04 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – DESIGNATED PERSON OR ORGANIZATION

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s): ANY PERSON OR ORGANIZATION WHOM YOU BECOME OBLIGATED TO INCLUDE AS AN ADDITIONAL INSURED AS A RESULT OF ANY CONTRACT OR AGREEMENT YOU HAVE ENTERED INTO.
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

A. **Section II – Who Is An Insured** is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by your acts or omissions or the acts or omissions of those acting on your behalf:

1. In the performance of your ongoing operations; or
2. In connection with your premises owned by or rented to you.

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or
2. Available under the applicable Limits of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

© Insurance Services Office, Inc., 2012

APPENDIX C – RESUMÉS

Letter of Staff Certification
Alan L. Bair, P.E.
Parvesh Deonarinesingh, P.E.
C.J. Roebuck, P.E.
Masood Hajali, Ph.D., P.E.
Craig M. Daly, P.E.

Exhibit "A"

December 17, 2020

Toho Water Authority
Procurement Services Department
1628 S. John Young Pkwy
Kissimmee, Fl 34741

Reference: **RFP-21-002 Force Main Condition Assessment Services**

Subject: **Pursuant to Section 5.F of the Request for Proposals**

Pure Technologies US Inc., certifies that the proposed staff for the Toho Water Authority – RFP#21-002 Force Main Condition Assessment Services will provide the required services upon award. Any substitution will have prior approval of Toho Water Authority. We acknowledge that any substitution without such prior approval shall be grounds for disqualification or termination of the Agreement as applicable.

Best Regards,

John J. Galleher Jr., P.E.
Regional Vice President
O: +1.619.272.7041 M: +1.760.644.1535
John.Galleher@xyleminc.com

ALAN L. BAIR, P.E., SENIOR PROJECT MANAGER

Education
Bachelor of Science in Mechanical Engineering, Rutgers University, New Jersey, 2003

Master of Science in Engineering Management, New Jersey Institute of Technology, 2011

Certifications/Registrations
Professional Engineer (Mechanical) – Florida (74731)

Years of Experience: with this Firm 12 with other Firms 3

Professional Background
Mr. Bair is an engineer with experience in civil engineering, including the inspection of wastewater force mains of multiple materials. He joined Pure Technologies in 2008. Before joining Pure Technologies, Alan worked as a resident civil engineer on various large projects. During this time he had been exposed to a wide variety of aspects of civil engineering such as on-site observations and consultation as well as, project analysis, report preparation, geotechnical investigations, soil analysis, and foundation design. Mr. Bair's experience includes pipeline evaluations ranging in diameter from 8- to 132-inches, involving internal pipeline inspections, pipe dissection, material sampling, and external examinations. His work has also included upholding the proper requirements of supervising confined space entry rope support and the installation of fiber optic cable in water mains. Alan's most recent work includes engineering project management, involving budgeting, cost estimating, scheduling and project control, report preparation and client relations, in regard to these types of engineering evaluations. Mr. Bair currently serves as Program Manager for the Miami-Dade Water and Sewer Department's large diameter pipeline management program, which includes condition assessment of force mains.

Professional Experience
Pipeline Management Program, Miami-Dade Water and Sewer Department, Miami, FL

Program Manager for Miami-Dade Water and Sewer Department's pipeline management program that includes inspection, condition assessment, and development of long-term management solutions for more than 250 miles of large diameter PCCP water and wastewater pipelines. The program is frequently regarded as one of the most innovative and successful buried pipeline management programs in the world. The inspection and condition assessment program has found less than 2.5% of all pipe segments inspected have any deterioration while less than 1% require repair or replacement.

Condition Assessment Program for PCCP, Tampa Bay Water, Clearwater, FL

Program Manager for Tampa Bay Water's PCCP management program that includes inspection, condition assessment, and development of management solutions for raw water supply mains. Tampa Bay Water is responsible for delivering wholesale water safely and effectively via several methods; including groundwater and surface water collection, and reverse osmosis seawater desalination.

Pipeline Inspection and Engineering Services, City of Miami Beach, Miami Beach, FL

Program Manager for Miami Beach's PCCP management program that includes inspection, condition assessment, and development of management solutions for large diameter PCCP potable water transmission mains and sewer force mains. Leak detection and electromagnetic evaluations with structural performance analysis to pinpoint distressed areas for rehabilitation. Provides rehabilitation strategies and remaining capacity and useful life evaluations. The program has allowed Miami Beach to better understand

the serviceable life of their mains and stay connected to Miami-Dade County, successfully transmitting potable water and sewer effluent.

Condition Assessment Program for DIP Force Mains and PCCP Reclaimed Water Mains, Toho Water Authority, Kissimmee, FL

Program Manager for inspection and management of a 16-inch ***diameter*** ductile iron force main and a 36-inch diameter reclaimed water main. Toho Water Authority operates potable, reclaimed, and sewer transmission and collection systems. The program has allowed Toho Water Authority to effectively and efficiently manage its pipeline assets.

Condition Assessment Program for PCCP Force Main, City of West Palm Beach, FL

Program Manager for inspection and management of 42- and 48-inch diameter prestressed concrete cylinder pipe force main that travels from the Town of Palm Beach to the City of West Palm Beach. WPB manages aging force mains that have been impacted by numerous above ground capital improvement and expansion projects over the City's years of development. Several of their force mains travel through highly sensitive residential, commercial and environmental areas.

PCCP Inspection and Engineering Services, City of Cocoa, Cocoa, FL

Project Manager for the condition assessment of the City of Cocoa's 36-inch diameter PCCP State Route 520 Transmission main. The project included inspection, condition assessment, and development of risk mitigation and asset management solutions. Experience included the delivery of free-swimming leak detection and electromagnetic technologies, pipe material sampling, structural analysis and repair recommendations. The project has allowed the City of Cocoa to effectively allocate funding and safely prolong the useful life of their transmission main. Similar challenges regarding aging infrastructure, proximity to a sensitive environment, and a lack of pipeline redundancy; are challenges faced by many coastal utilities in Florida.

Condition Assessment Program for Steel and DIP, Florida Keys Aqueduct Authority, Key West, FL

Senior Project Manager for inspection and management of 24-. 30-. And 36-inch diameter steel and ductile iron potable water transmission main that travels from Florida City to Key West. FKAA manages a unique, high-pressure system with advanced monitoring technologies to safely deliver potable water within a highly protected ecosystem to a functional population that includes permanent residents, seasonal and daily visitors.

PCCP Inspection and Engineering Services, Washington Suburban Sanitary Commission, Laurel, MD

Project Engineer for WSSC's PCCP management program that includes inspection, condition assessment, and development of pipeline management solutions. Experience includes internal visual and sounding of PCCP, assessment of leak detection, electromagnetic, and sonic/ultrasonic inspections; combined with finite element performance analysis to provide engineering recommendations and acoustic fiber optic management solutions. The program has managed several hundred miles of PCCP and DIP, allowing WSSC to effectively allocate funding and prolong the useful life of their transmission and collection systems.

Parvesh Deonarinesingh, P.E.

Education
MS, Engineering Management, Florida International University, 2017

BS, Civil Engineering, Florida International University 2012

Certifications/Registrations
Professional Engineer #86394, FL, 2019

OSHA Confined Space Entry, Fall Training, CPR/AED for Professional Rescuers

Member of American Water Works Association (AWWA)

Years of Experience: with this Firm 5 with other Firms 2

Professional Background
Mr. Deonarinesingh has provided exceptional project management and engineering oversight of buried infrastructure asset management solutions and projects for both water,wastewater and storm water systems.

During his tenure in the engineering industry, Mr. Deonarinesingh developed an increasing range of experience in the area of water and wastewater design, and operation and condition assessment of buried infrastructure. He has been involved in the design and preparation of plans and specifications, permitting, construction observation, and construction phase engineering for water transmission mains, sewer force mains and pumping stations. In addition, he has extensive experience in the inspection and condition assessment of buried infrastructure using state-of-the-art water inspection technology.

Professional Experience
Miami-Dade Water and Sewer Department (WASD)– Route 11 Transmission Main, Route 9 Transmission Main, Route 3 Wellfield Raw Water Main, Golden Beach Force Main.

Project Manager for the inspection of large diameter prestressed concrete cylinder pipe (PCCP) water and wastewater mains. Specific Services included:

- SmartBall® and PipeDiver® inspections of the 54- and 60-inch Route 11 Transmission Main (24,975 ft), July 2019
- SmartBall and PipeDiver inspection of the 60-, 54- and 48-inch Route 9 Transmission Main (55,970 ft), February 2019
- PipeWalker® inspection of the 36-, 48-, 54-, 60-, 66-, 72-, 84- and 96-inch Route 3 Wellfield Raw Water Main (9,610 ft), April 2019
- SmartBall inspection of the 8-inch metallic Golden Beach Force Main- (5,280ft), August 2019
- SoundPrint® Acoustic Fiber Optic (AFO) Installation/Maintenance- 54- and 48-inch Red Road Transmission Main pipeline intervention to repair ten significantly distressed pipe sections

Orange County Public Works (OCPW), Orlando, Florida – Long Lake PS Force Main and Westside Manor PS Force Main

Project Manager for the Smartball and Robotics (Electromagntic and Visual) inspection of two storm water force mains within the Long Lake and Westside Manor basins. Specific services included:

- SmartBall Inspection (Leak and Gas Pocket Detection, Pipeline Mapping), 48-inch Long Lake PS Force Main (5,280ft), August 2019

- Robotics Inspection (Visual and Electromagnetic, Pipeline Mapping), 48-inch Long Lake PS Force Main- (5,280ft), August 2019
- SmartBall Inspection (Leak and Gas Pocket Detection, Pipeline Mapping), 42-inch Westside Manor PS Force Main (1,300ft), August 2019

Newport News Water Works (NNWW), Lanexa, Virginia - Chickahominy Transmission Main

Project Manager for the excavation and pipe investigation of the 36-inch Chickahominy Transmssion Main. Specific services included:

- Pipe Dissection: Sample Collection of Concrete Mortar, Prestressing Wires and Steel Cylinder, March 2019
- Condition Assessment Report: Wire Class Confirmation, Tensile and Torsion Test of Steel Wires, Hydrogen Embrittlement, Summary of Findings of failed pipe.

Project Experience with Previous Employer

Sanitary Sewer Evaluation Survey (SSES), City of Miami Beach, Florida

Project Manager for the rehabiliation phase of the SSES program amounting to $4.5 million in lining, spot and manhole repairs of the city-wide sanitary sewer system. Met Miami-Dade County Regulatory and Economic Resources (RER) requirements by meeting compliance in all 31 basins to satisfy the Infiltration and Inflow (I&I) FDEP Consent Decree.

Neighborhood Improvements, City of Miami Beach, Florida - West Ave. Neighborhood, La Gorce Neighborhood, 1ST Street Area and 19th St. and Miami Beach Convention Center Stormwater Pump Stations.

Junior Engineer in the design of city wide improvements by complete replacement of buried utilties (water, wastewater) and addition of stormwater infrastructure to combat flooding. Specific services included

West Avenue Neighborhood Improvement: Underground (water, wastewater and stormwater pipeline) design and above ground (roadway, lighting, landscaping) design for a total neighborhood improvement estimated at $60 million.

La Gorce Neighborhood Improvement: Underground (Water, Wastewater and Stormwater Pipeline, Pump Stations) design and above ground (roadway, lighting, landscaping) design for a total neighborhood improvement estimated at $100 million.

1st Street Area: Complete redesign of a two directional, business and residential split accessway. Underground and Streetscape Design including a 100 GPM pump station to serve the local stormwater basin (analyzed with ICPR).

19th Street Pump Station- Managed the construction of design build 80GPM pump station serving the Holocaust Memorial, Botanical Gardens Miami Beach City Hall, Miami Beach Convention Center and the surrounding district. Included the design and construction of a seawall (590 feet). Project valued at $7 million.

C.J. Roebuck, P.E.

Education
BS Chemical Engineering, The Ohio State University, 2004

Master of Environmental Engineering, The Ohio State University, 2005

Certifications/Registrations/Training
Registered Professional Engineer, Georgia (#036171)

Years of Experience: with this Firm 4 with other Firms 11

Professional Background
C.J. Roebuck is a registered environmental engineer with over fourteen years of project experience working for private consultants designing wastewater treatment facilities, conducting remedial investigations and managing projects. Over the past three years he has been involved in managing small to complex inspection projects for public utilities and design consultants utilizing various tools from Pure Technologies resources to access small to large diameter pipelines. Mr. Roebuck's primary focus is to deliver exceptional service and results that help clients maximize the life of their pipeline assets.

Professional Experience
Mr. Roebuck has managed and participated in numerous water infrastructure projects. Relevant project experience includes the following:

Water and Wastewater Condition Assessment for CDM-Smith, Kings Bay Naval Base, Kingsland, FL

This project was a multi-tool approach condition assessment to assess the condition of the ductile iron water and wastewater pipelines present on the Naval Base. Mr. Roebuck managed this project while coordinating with the onsite base consultant to make sure everything on the base stayed operational. Approximately 23,000 feet across six different force mains were inspected and approximately 31,000 feet across 16 different water mains were inspected throughout the Naval Base.

Albermarle County Force Main Assessment, Albemarle County Service Authority, Charlottesville, VA

This project was part of a focused effort to gather inspection data on pipes 6 to 16-inches in diameter and use that data to support repair, rehabilitation, or replacement decisions. Mr. Roebuck managed this project which included the inspection of eight (8) separate force mains and validation of the results of a subset of the force mains. Transient pressure monitoring was also conducted at ten different pump stations to determine if current installed pumps are causing fatigue on the force main from pressure spikes.

Force Main Condition Assessment for American Water Military Services, Fort Belvoir Military Base, Fort Belvoir, VA

This project was a multi-tool approach condition assessment to assess the condition of the ductile iron force main along with mapping the location of the force main. Due to a recent failure of the pipeline, Mr. Roebuck was engaged with the client to perform a forensic study of the failed pipe to determine possible cause. Mr. Roebuck then managed the condition assessment to locate the pipe and determine where it differed from the current contract drawings along with determining the overall condition of the force main.

Maner Road Transmission Main for Cobb County-Marietta Water Authority, Marietta, GA

Mr. Roebuck managed this project as part of a multi-year inspection analysis to determine the rate of degradation for the 36-inch transmission main due to recent failures over the past ten years. Mr. Roebuck was closely involved with the client to ensure they were receiving the information they needed to make decisive decisions regarding the management of this pipeline.

MASOOD HAJALI, PH.D., P.E., SENIOR STRUCTURAL ENGINEERING

Education

Ph.D. Civil Engineering, Structural Engineering, Florida International University, Miami, FL

Graduate Study, Structural Engineering, Pennsylvania State University, PA

M.Sc. Civil Engineering, Structural Engineering, Sharif University of Technology, Tehran, Iran

B.Sc. Civil Engineering, K.N.Toosi University of Technology, Tehran, Iran

Certifications/Registrations/Training

Professional Engineer (P.E.), Florida, License number 82038

Years of Experience: with this Firm 8 with other Firms 2

Professional Summary

Dr. Hajali's is expert in the evaluation of the remaining useful life of damaged pipelines. He is responsible for development of new structural models for pipe design and failure modes of damaged pipelines. Dr. Hajali has led several innovative projects dealing with the development of methods for condition assessment of water and wastewater pipelines. His doctoral research was focused on modeling of soil-structure interaction through numerical and analytical approaches. Dr. Hajali has played a major role in the design and analysis of advanced materials and structures and has already made significant contributions to the field. Dr. Hajali has authored several full-length publications on the modeling of foundations, steel and concrete structures, and pipelines that were accepted by prestigious journals and manuscripts. Additionally, Dr. Hajali has extensive experience working with real world failures of various pipe designs, thus having the ability to correlate advanced structural models to actual failure mechanisms in a variety of scenarios, particularly buried assets.

Project Experience

Dr. Hajali has played a key role in the development of advanced technology used to evaluate the remaining useful life of pipelines. He is responsible for structural analysis using non-linear finite element analysis models and points of which damaged pipe sections require repair or replace. He performs the creation of new and innovative structural models for a variety of pipeline scenarios in water, sewer, gas and oil pipelines. His experience includes the following:

Structural Engineer, Pure Technologies,

- C301-C304 Analysis of Prestressed Concrete Cylinder Pipelines (PCCP)
- Condition Assessment of Pipelines to Predict the Remaining Useful Life of the pipe
- Structural Evaluation of Pipelines using Finite Element Modelling (ABAQUS)
- Assessing the Remaining Strength of Corroded steel Pipelines
- Evaluate the Effect of Broken Prestressing Wires Wraps on the Structural Integrity of PCCP
- Evaluate Remaining Life of Damaged PCCP using Risk Curves Methodology
- Overloading Analysis of Pipelines under External Loading
- Design of Carbon Fiber Reinforced Polymer (CFRP) Composites for the Repair of PCCP
- Nonlinear Finite Element Modeling of soil-pipe interaction
- Managed various projects in risk assessment of damaged pipes (PCCP, BWP, Metallic)
- Managed various projects that evaluated the remaining useful life of metallic pipe and BWP

- Led various projects in finite element modeling and condition assessment of PCCP, Reinforced Concrete Pipes (RCP), and double wrap PCCP
- Developed advanced computational models used to analyze PCCP with broken prestressing wire wraps. Provided performance curves of Non-Cylinder Pipe (NCP), Bar-Wrapped pipes (BWP), Lined Cylinder Pipe (LCP) and Embedded Cylinder Pipe (ECP) based on FEA to evaluate the risk of failure as a function of number of broken wires and internal operating pressure for the following projects all around the US.:
    - Washington Suburban Sanitary Commission (WSSC) River Road, MD, 66-inch ECP
    - Miami-Dade, FL, 48 inch LCP; 60-inch, 72-inch, 96-inch ECP
    - Cleveland Breckville, OH, 30-inch LCP, Woodhill - 30-inch, 36-inch LCP
    - WSSC Greenville, MD, 48-inch ECP and LCP, Rockville 24-inch LCP
    - Hyattsville Maryland, Rock Creek 54-inch ECP
    - San Diego, CA, 66- inch 69- inch ECP
    - Middlesex County Utilities Authority 102-inch ECP and Double Wrap Pipe
    - North Richland Hills, TX, 36-inch BWP, risk assessment
    - Excel Energy, Colorado, 84-inch ECP, Live Load assessment of the pipe

CRAIG M. DALY, P.E., SENIOR DECISION SCIENTIST

Education

B.Sc. Forest Engineering, University of New Brunswick, 1998

Master of Environmental Engineering, Johns Hopkins University, 2004

Certifications/Registrations

Registered Professional Engineer, Maryland (#36036)

Years of Experience: with this Firm 8 with other Firms 14

Professional Summary

Craig is a registered civil engineer with experience working for public utilities as well as private consultants developing and managing Capital Improvement Programs; including development of multi-year rehabilitation plans and preparation of long-term prioritized inspection plans. He has developed a comprehensive, data driven, risk assessment approach and life cycle analysis that utilizes statistical methods to better identify assets that should be investigated to clearly identify actual condition which is subsequently used to justify repair and replacement decisions. Mr. Daly formed, and currently leads Xylem's analytical decision support group. The group is focused on using statistical methods for pipeline condition assessment and developing stochastic models that incorporate condition data for identifying and managing risk.

Project Experience

Mr. Daly has managed and participated in numerous water infrastructure projects. Example analytical project experience includes the following:

Quantitative Risk Analysis, Great Lakes Water Authority

Mr. Daly coordinated the development of a comprehensive monetized risk model to establish a baseline understanding of risk for the formation of a pipeline integrity program. System criticality and failure consequence was developed using a level of service approach that built on the concept that customer hours of outage resulted in a monetized social impact. Economic and environment impacts were similarly modeled based on time associated with outage. Liklihood of failure was modelled using a Bayesian-Poisson statistical model.

Quantitative Risk Analysis, Santa Clara Valley Water District

Mr. Daly coordinated the deployment of a comprehensive monetized risk model similar to the model developed for the Great Lakes Water Authority. This model was modified to account for higher local sensitivity to environmental concerns. The model was also modified to include political impacts associated with failures and to include consequence mitigation associated with back-up groundwater supplies.

Pipeline Condition Assessment Program, DC Water, Washington, DC

Under the EPMC 2E Water program, Mr. Daly is managing the large diameter transmission main pipeline condition assessment program. As part of this comprehensive program, he is responsible for providing engineering services including preparation of the pipeline risk prioritization report, as well as technical expertise in technology selection and implementation, transient pressure monitoring programs, structural analysis and condition assessment, as well as forensic engineering and analysis. Mr. Daly's primary function is to provide strategic decision support services with respect to the preparation of long term and short-term inspection planning and helping implement this plan as part of DC Water's Asset Management Initiative and Capital Improvement Program.

Howard County Wilde Lake Water Main Study and Rehabilitation, Howard County, Maryland

This project was part of a focused effort to gather inspection data on pipes 12-inches and smaller and use that data to support repair, rehabilitation, or replacement decisions. Mr. Daly provided a preliminary risk prioritization of buried assets throughout the County. This prioritization supported the decision to focus the study in the Village of Wilde Lake and also provided an initial baseline of risk within the Village. Following the inspection, Mr. Daly developed analytical processes that were used to update the initial risk score based on inspection data results. This updated risk score was then used to help identify appropriate repair, rehabilitation, or replacement alternatives for consideration to minimize risk and reduce the likelihood of failures within this Village.

BOA for PCCP Inspection and Engineering Services, Washington Suburban Sanitary Commission, Maryland

This Program is a large-scale condition assessment effort that collects condition data from periodic inspections and real-time monitoring of WSSC's large diameter PCCP transmission main inventory. Real-time monitoring provides a data stream that allows WSSC to actively monitor pipe condition and perform interventions on an as needed basis. Mr. Daly helped develop predictive analytical methods that utilize this data to estimate future condition that allows WSSC to analyze the potential interventions several months in advance of the need to intervene allowing necessary time to appropriately plan work rather than having to react to an emergency situation. Mr. Daly is also working towards providing advanced business analytics solutions that will allow WSSC to access, and interact with their condition data to better support repair, replacement, and maintenance decision making.

PCCP Management Program, Miami-Dade Water and Sewer Department, Miami, FL

As part of the comprehensive PCCP management program Mr. Daly directed the development of a long-term predictive stochastic model that leverages acoustic fiber optic and electromagnetic condition data to estimate the possible future condition of pipelines. The purpose of the model is to act as an asset management support tool for determining if continued management of the pipeline remains economically feasible compared to capital replacement or rehabilitation alternatives.

St Louis Metropolitan Sewer District Force Main Assessment Program, St. Louis, Missouri

As part of St. Louis's consent decree they are required to assess and monitor the condition of their sanitary sewer pressurized force mains. St. Louis had performed a preliminary risk assessment on these assets and prioritized condition assessment of these assets. Pure Technologies had completed inspection of these assets using multiple technologies that provided data regarding the condition of these assets. Following these inspections St. Louis is required to perform re-inspection in order to monitor the condition of these assets. Mr. Daly developed analytical methods that takes the preliminary risk evaluation performed by St. Louis and updated the scores based on the inspection data. This prioritization was then used to re-prioritize the force-main assets for re-inspection over a 3-year period.

Condition Assessment of the 54-inch Euclid Transmission Main, Cleveland, Ohio

Utilized Pulsed-Eddy Current data to evaluate the failure probability of 7,500 lf of 54-inch mortar lined steel water main installed in 1956. Data was collected from approximately 1,750 lf of the interior of the pipe to avoid the cost of test pitting. Performed a statistical analysis to determine the pipe wall thickness based off signal loss recorded by the pulsed-eddy current inspection. Descriptive statistics were utilized to reveal if signs of corrosion were present based on the data collected. Following this, a structural assessment and Monte Carlo simulation were utilized to estimate remaining wall thickness and rate of loss along 7,500 linear feet of pipe. Using this simulation a pipe management strategy was developed that addressed the short-term management and long term.

Condition Assessment of the 24-inch East Side Force Main, City of St. Joseph, St. Joseph, Missouri

Utilized Broadband Electromagnetic (BEM) and Linear Polarization Resistance Soil Test (LPR) data to evaluate the failure probability of a 24-inch ductile iron force main installed in 1975. Developed Monte Carlo simulation to estimate remaining wall thickness and rate of loss along approximately 2.5 miles of pipe based on the results BEM test pit data taken at 6 test pits. Using this simulation a pipe management strategy was developed that addressed the short-term management and long-term rehabilitation/replacement strategy for this pipe.

Condition Assessment of the 1500 mm Silverthorn Feeder Main, Region of Peel, Ontario

Utilized Pulsed-Eddy Current data to evaluate the failure probability of a 1500 mm mortar lined steel water main installed in the 1970s. Performed a statistical analysis to determine the pipe wall thickness based off signal loss recorded by the pulsed-eddy current inspection. Following this, a Monte Carlo simulation was utilized to estimate remaining wall thickness and rate of loss along approximately 2.5 miles of pipe based on taken from inside the main. Using this simulation a pipe management strategy was developed that addressed the short-term management and long-term rehabilitation/replacement strategy for this pipe.

Financial Alternatives Analysis of the Red Road PCCP Water Main, Miami, Florida

This alternatives analysis utilized enhanced electromagnetic inspection data and acoustic fiber optic data as inputs into a predictive PCCP model to estimate the number of pipes reaching their yield limit each year for the next 20-years. The output of this model was then utilized to perform a financial evaluation comparing the cost of replacement versus the cost of continuing a rehabilitation management strategy for a portion of this water main. Using this simulation and financial evaluation along with taking into consideration other external opportunistic costs it was decided that the best strategy was to replace the portion of the water main that was assessed.

Condition Assessment Master Plan, Honolulu, HI

Mr. Daly utilized available GIS and Maximo data sets to develop a risk based master plan that prioritized small and large diameter water mains for inspection. This approach assigned consequence of failure factors to linear assets based impact to system operations and potential to cause damage to other assets. Likelihood of failure factors were assigned following a root cause and life cycle analysis of available failure data.

Force Main Condition Assessment Program, Baltimore County, MD –

Technology manager for a multi-year, multi-million dollar Consent Decree driven wastewater force main inspection program for Baltimore County, Maryland. Primary responsibilities include project coordination for the inspection and assessment of Baltimore County, Maryland's Bureau of Utilities' wastewater force main inventory using multiple technologies and techniques in accordance with the guidelines established in the Consent Decree. Mr. Miles is providing technical expertise in technology selection and implementation. Force mains inspected to date include cast iron, ductile iron, and PCCP ranging in size from six (6) inches to 54 inches in diameter.

PVC Fatigue Analysis, Various National and International Location

Mr. Daly coordinated the development of a PVC fatigue model that estimates the remaining useful life of PVC pipelines. The model utilizes high frequency transient pressure data collected from transient pressure monitors in such a way that the data inputs to the Vinson and Moser equations are not limited to average, max and minimum. Compressing the data (to average, max and min values) for input to these equations limits the output such that the analysis ignores the effect that the frequency of pressure fluctuations has on remaining useful life. Mr. Daly's method explicitly accounts for the effect of frequency as well as magnitude of pressure events on the remaining useful and also uses binomial probability analysis to estimate the expected number of failures an asset may experience over an expected timeframe. This information was then used to help support decisions on which assets should be included within a 10-year capital improvement program along associated budget estimates.

APPENDIX D – TYPICAL PROJECT INSPECTION PLAN

Data Gathering and Project Planning Documentation

Existing information as it related to the specific assets will be collected and reviewed. As part of the review, existing information must be compared with what is necessary to develop the assessment plan and ultimately the condition assessment of each asset. This "gap analysis" will provide a summary of the available information related to the Toho's pipelines as well as what is currently not available. Data collected during this phase of the project will be used to determine necessary improvements to the water mains for deployment of technology. This information is also critical in the structural modeling and analysis phase that assist in estimating remaining useful life are developed from data collected.

Prior to developing any planning documents, Pure Technologies will perform a site visit to verify and inspect access locations and potential challenges. Pure Technologies will meet with Toho Water Authority to formulate a plan on how the inspections should be performed. Based on this site visit and data review, Planning Documents will be prepared that will describe execution of the inspection processes for all proposed technologies. The Planning Documents will be submitted to Toho Water Authority for review and comment. The Planning Document improves preparation and communications with all involved parties and is an important aspect of a successful project. It is anticipated that the planning document will be reviewed and amended annually based on any changes to the water distribution system and/or operation.

Pure Technologies recognizes the project planning process as a critical component to successful inspections. ***Pure Technologies will meet with the Toho Water Authority to perform a site visit for each force main to identify potential challenges and risks.*** Project Planning Document will then be developed and submitted for review/approval by all stakeholders prior to the inspection.

Insertion, Extraction and Tracking Locations

A minimum 4-inch or greater diameter full access port is needed for insertion and extraction of the SmartBall tool. Typically, the inspection platform can be inserted at a check valve within a pump station and extracted downstream at a discharge manhole or screening system within a treatment facility

Prior to the inspection, tracking sensors will be installed along the pipeline to track the position of the SmartBall. The tracking sensors function best when they are installed as close as possible to the water column in the pipeline and are attached to metal surfaces of pipeline appurtenances, such as air release valves, flanges, valves, or any other contact point on the pipeline. At these locations, Pure Technologies staff will adhere the tracking sensors to the pipeline using a fast-drying epoxy. Computers that are synchronized with the SmartBall will be attached to the tracking sensors to calculate the location and velocity of the SmartBall as it approaches and passes the tracking location. Tracking teams will set up at tracking sensors before the deploying the SmartBall and will leap-frog to subsequent tracking locations as the SmartBall traverses the pipeline on its way to the extraction point. A tracking plan and details for installing tracking sensors will be included in the Project Planning Document submitted to the Toho Water Authority prior to the inspection.

Access will be confirmed during the site visit and in consultation with the Toho Water Authority. Brief shutdowns of the pipeline will be required for insertion and/or extraction of the inspection equipment. Specific requirements including roles, responsibilities and estimated inspection schedule will be detailed in the Project Planning Document.

Flow Requirements

The SmartBall requires a minimum fluid velocity of 0.5 feet per second to traverse flat sections of pipeline. The ideal fluid velocity for most pipelines is 2 to 4 feet per second for traversing slopes and allotting the tracking teams to relocate to the next tracking location. The maximum fluid velocity before data quality is impacted is 6 feet per second for leak and gas pocket inspection and 3 feet per second for pipeline mapping. The SmartBall usually travels at approximately 70% of average fluid velocity. Based on the estimated

velocity data provided by Toho Water Authority, augmented flow and or storage may be required for Brier Creek service area pump stations to meet the minimum required flow. Pure Technologies will evaluate pumping rates, estimated velocities and cycle times to determine if supplemental water will be required to complete the inspection and mapping requirements. These details will be further described within the Project Planning Document.

The PipeDiver platform requires an average velocity of 1 foot per second for DIP and occasionally 2 feet per second for navigating smaller diameter 90-degree bends. The tool has an inspection rate of approximately 90% of the average liquid velocity. ***A total of two inspection runs may be required for proper data collection on each DIP force main using the PipeDiver platform.***

Toho Water Authority staff will control the flow rate to confirm the requisite velocity during tool deployment as requested in the Project Planning Document. It should be noted that gas pocket and leak detection surveys should be performed as close to typical operating conditions as feasible.

Pipeline Pressures

A minimum pressure differential of 15 psi is necessary for acoustic leak detection. This is the difference in pressure between internal and external conditions. For pipelines in high water tables, and river crossings, the resultant hydrostatic head should be taken into consideration. Toho Water Authority staff will operate the system to maintain pipeline pressures as necessary to accommodate typical operations. A review of the pipeline will be performed as part of the planning process to identify potential areas where the pressure may drop below the minimum required pressure differential. If approved during project scoping TPMs will be installed and data collection will be performed concurrently with project planning and implementation to maintain project schedule.

APPENDIX E – EXAMPLE END OF PROJECT DELIVERABLE (SECTION 4)

Exhibit "A"

Force Main Condition Assessment Report

Lift Stations 6, 35, 57, 72, 79 and 116

Report Prepared for:

[redacted]

By:

Pure Technologies

January 2020

7400 Corporate Center Drive Suite E | **Miami, FL** 33126 | **puretechltd.com**

Force Main Condition Assessment Report

Lift Stations 6, 35, 57, 72, 79 and 116

Prepared for

[redacted]

By

Pure Technologies

January 2020

By my signature I attest that this report has been prepared and reviewed in accordance with Xylem Inc.'s Quality Assurance/Quality Control procedures:

P D'Singh 01/25/2020

Parvesh Dsingh, P.E. Project Manager Date

DISCLAIMER

The information contained in this report is provided 'as is' without warranty of any kind, either express or implied. Pure Technologies is not liable for any lost profits, lost savings, or other incidental, special, or consequential damage arising out of the inspection results or the information contained in this report.

NOTICE

This report contains confidential commercial information regarding proprietary equipment, methods, and data analysis, which is the property of Pure Technologies. It is for the sole use of [redacted] *and is not to be distributed to third parties without the express written consent of Pure Technologies.*

Table of Contents

Executive Summary

[redacted] retained the services of Pure Technologies to perform inspections of the Lift Station 6 (LS-6), Lift Station 35 (LS-35), Lift Station 57 (LS-57), Lift Station 72 (LS-72), Lift Station 79 (LS-79) and Lift Station 116 (LS-116) ductile iron pipe (DIP) force mains.The six (6) force mains are a critical part of [redacted] sewer collection network and were inspected in September and October of 2018.

The scope of the project was to detect and locate leaks and gas pockets within the force mains using the SmartBall® inline acoustic inspection tool. Transient pressure monitoring was performed at each of the respective lift stations to identify the operating conditions of the force main and to detect if pressure transient events were occurring within the force main. Structural analysis was performed to identify the tolerance of the force main to withstand wall loss based on operational pressures and external loading.

The second project phase involved excavations for direct pipe wall measurements using Insolated Component Testing (INCOTEST) and ultrasonic thickness testing (UT) that took place on November 2019. The excavations were guided by the findings of the gas pocket detection inspection and the results of that testing is provided in Appendix F- Pipe Wall Thickness Testing. Furthermore, the field acquired thickness data was used to statistically calculate and predict the remaining useful life of the force mains, Appendix G- Remaining Useful Life (RUL).

Based on the results of the inspections from September and October 2018 and the wall thickness testing from November 2019, Pure Technologies presents the following conclusions and recommendations:

Conclusions:

No leaks were detected within the inspection limits of the force mains. Several stationary gas pockets and acoustic events resembling migratory gas were detected. Table ES.1 lists the acoustic anomalies that were detected. Each of the anomalies can also be reviewed in aerial maps provided in Appendix A or in attached GIS mapping files.

Table ES.1: SmartBall Inspection Results

	LS-6	LS-35	LS-57	LS-72	LS-79	LS-116
Total Length Inspected (feet):	11,951	9,293	3,179	2,306	9,698	20,184
Diameter (inch):	30	24	30	16	16	24/30
Total Number of Gas Pockets:	0	6	1	1	20	33
Total Number of Gas Slugs:	0	4	0	0	2	15
Total Number of Entrained Gas Events:	4	7	2	0	0	11

The majority of the gas pockets (97%) were detected within the LS-116, LS-35, and LS-79 force mains. The results suggest that the larger lift stations, LS-6 and LS-57, convey a greater amount of volumetric flow and, being connected to the headworks at South Bermuda Water Reclamation Facility, typically remain at full capacity and most migratory gas is being exhausted from the main. The more outlying lift stations, LS-116, LS-35, and LS-79 each gather less volumetric flow in longer pump cycles and have multiple other smaller stations that tie into the mains, giving more opportunity

for gas to be introduced through the pumping process. It is important to note that each gas pocket has a unique impact on the respective pipe wall. Despite the infrequency of gas pockets in LS-57, the criticality at the localized gas pocket remains, which was evidenced when the LS-57 Force Main experienced a failure where the only gas pocket was identified from the Smartball inspection. As a result, LS-57 Force Main was prioritized for higher resolution assessment using enhanced electromagnetics.

Transient pressure monitors were installed on November 28, 2018 and monitored pressures at the above six (6) referenced lift stations. Table ES.2 lists the minimum, maximum, and average maximum pressure recorded at each of the sites.

Table ES.2: Transient Pressure Data – 11/28/18 to 12/19/2018 – 22 Days

	LS-6	LS-35	LS-57	LS-72	LS-79	LS-116
Maximum Pressure (psi):	43	25	35	26	21	37
Average Maximum Pressure (psi):	29	19	16	10	13	18
Minimum Pressure (psi):	-10	-4	-1	-7	-1	-1

A preliminary review of the data, overall, shows that most transient activity occurs with a typical range of operation for each station.

An American Water Works Association (AWWA) C150-14 structural analysis was performed on the 16-, 24-, and 30-inch diameter DIP designs. The 16-, 24-, and 30-inch diameter design thicknesses, assuming the most conservative pressure classes, exceeded the required thickness from the AWWA C-150 analysis in most cases. These calculated wall thicknesses are the minimum thicknesses required to prevent yielding of a pipe section. The minimum wall thickness, dependent on depth of earth cover, which is required for each of the pipe designs to minimize deflection from earth loading to 3%, was also satisfied throughout.

The DIP pressure class typically utilized in a force main varies depending on the fluctuating depths and earth covers. This can be seen occasionally when drawings indicate “Class B” or show the installation of a concrete encasement. Otherwise, information regarding the utilized pressure classes (150, 200, 250, etc.) were unknown at the time of this report. Upon external verification from measured wall thickness, the assumed pipe class was used as the calibration reference point where the relative thickest location on the excavation would be set as the nominal thickness.

The RUL evaluation generated using the structural analysis and pipe wall thickness measurements is summarized below in Table ES.3.

Table ES.3: RUL Analysis Results Summary

Pipe Number	Average RUL to Structural Failure (Years)
LS-35	31
LS-72	13
LS-79	19
LS-116	41

Recommendations

Pure Technologies makes the following recommendations regarding the management of the force mains:

1. Locate and check the operability of existing air release/vacuum valves along the force main.
    - In doing so, release trapped gas that remains within the force mains;
    - Rehabilitate or replace any inoperable air valves;
    - Make modifications and/or add new air valve locations, as necessary, to minimize risk associated with trapped gases and maintain the normal operation of the force mains.
2. Check the collection and pumping process associated with each of the lift stations, particularly those associated with LS-79 and LS-116. Excess gas may be introduced in the pumping process that could be reduced with adjustment of the duration of the pumping cycles.
3. Investigate the details regarding pump start-up and shut-down at each station including the use of variable frequency drives or VFDs to improve the pumping process. Vacuum and surge pressures may be detrimental to the operation of a force main.
4. Perform remaining proposed external verifications on LS-79 Force Main (Excavation#8) and LS-35 Force Main (Excavation #9). Due to pipe failure on LS-57 Force Main at identified gas pocket location from Smartball inspection, continue efforts to inspect the pipeline with higher resolution capability using PipeDiver electromagnetics.
5. Add more locations for external verification on LS-72 to increase sample size in the RUL evaluation to improve confidence of the probability of failure, as it currently reflects a 33% chance of failure in 10 years and an 83% chance of failure in 10-20 years.

1. Introduction and Background

1.1. Project Background

[redacted] requisitioned the services of Pure Technologies to perform an in-line condition assessment of six (6) force mains within their sanitary sewer network. These critical force mains were prioritized by [redacted] for inspection due to their relatively elevated consequence of failure (flow capacity, lack of redundancy, connection to treatment facility, etc.) and increasing likelihood of failure as the pipelines age, demand increases, and construction near the pipelines continues. The six (6) force mains are comprised of DIP with pipe diameters ranging from 16 to 30 inches and have been in service for approximately 20 years. Figure 1.1 through 1.6 depict the general alignment of the pipelines and the extents of the inspections.

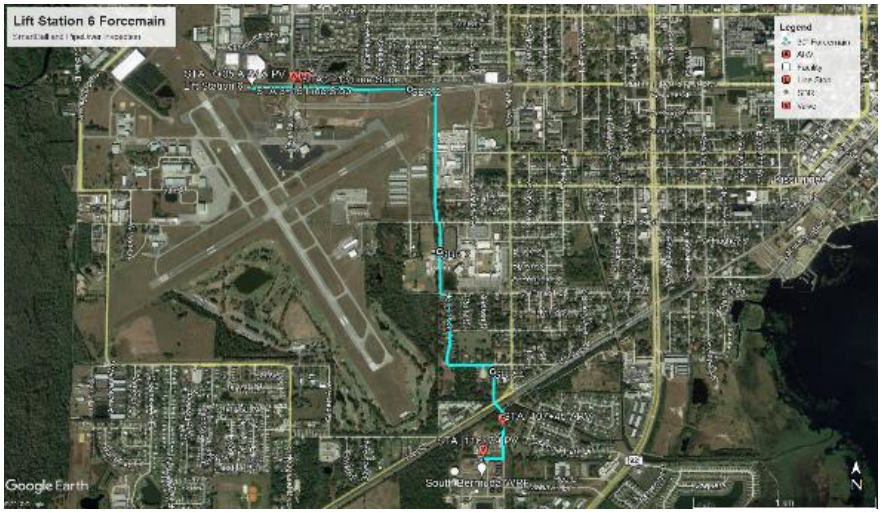


Figure 1.1: LS-6 Force Main, General Alignment and Extents of Inspection

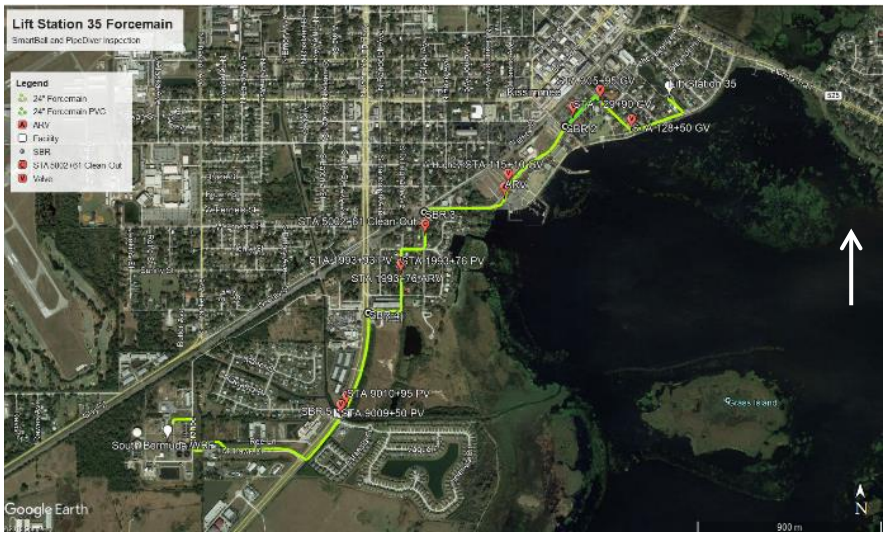


Figure 1.2: LS-35 Force Main, General Alignment and Extents of Inspection

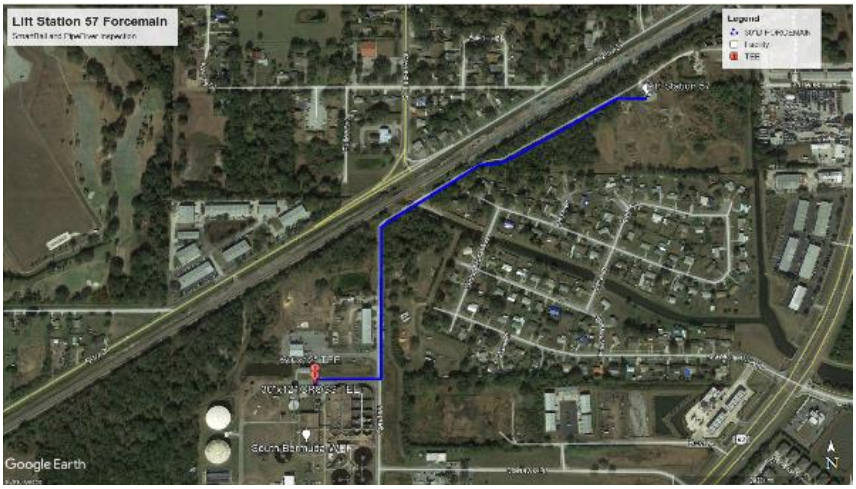


Figure 1.3: LS-57 Force Main, General Alignment and Extents of Inspection

Figure 1.4: LS-72 Force Main, General Alignment and Extents of Inspection

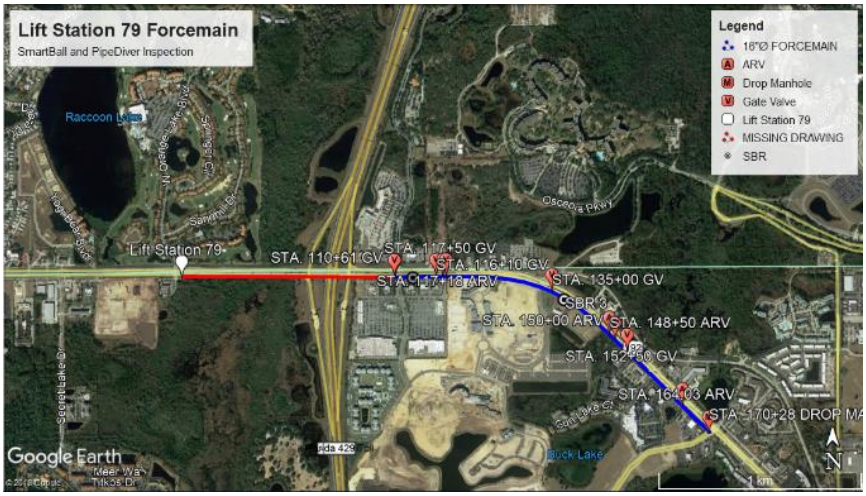


Figure 1.5: LS-79 Force Main, General Alignment and Extents of Inspection

Figure 1.6: LS-116 Force Main, General Alignment and Extents of Inspection

1.2. Project Scope

The scope of this project was to perform an inspection and condition assessment of six (6) DIP force mains. Each force main was inspected for leaks and gas pockets utilizing the SmartBall acoustic technology. A detailed inspection plan was provided to [redacted] on September 21, 2018. The inspection subsequently started on September 27, 2018 with five of the six lines inspected by October 3, 2018. It was decided by Pure Technologies and [redacted] to postpone the sixth inspection of the LS-116 Force Main as the extraction point in the wet well was not clearly depicted on the plans which afforded the opportunity to utilize on-site divers to confirm the actual piping. The necessary modifications were identified, presented to and agreed by [redacted] and the inspection of LS-116 force main was completed on October 24, 2018.

A transient pressure analysis was performed for each of the six force mains. Real-time high-frequency pressure loggers were installed on November 28, 2018 and continue to record as of the date of this report. A minimum of 30 days of data is required prior to removal of the monitors.

In addition, an AWWA C-150 structural analysis was performed to identify minimum required design thicknesses and whether the assumed installed designs meet the criteria.

Based on the results of the SmartBall analysis, Pure Technologies identified 18 locations to perform test pit verifications and provide visual distress confirmation and pipe wall thickness measurements. 14 of the 18 excavations and thickness testing were carried out on site on November 2019 that allowed for an advanced statistical remaining-useful-life analysis. Of the 4 postponed locations until further notice, 2 belongs to LS-57 Force Main (Excavation #11, Gas Pocket 1 and Baseline) which has been prioritized for a higher resolution electromagnetic inspection due to a pipe failure. The remaining 2 locations are Excavation #9 and Excavation #8 belonging to LS-35 Force Main and LS-79 Force main respectively.

This report details the results of the inspections, structural analysis of the 16-, 24-, and 30-inch diameter pipe designs using the AWWA C150 Design Standard and in-situ wall thickness testing with advanced statistical remaining-useful-life analysis. The results from the various components intend to provide information to assist [redacted] in their management of the inspected force mains.

1.3. Discussion of Ductile Iron Pipe

Commercial introduction of DIP occurred in the mid-1950s and became the material of choice in place of cast iron for ferrous pressure pipe by the early 1970s. Ductile iron is produced by adding specified amounts of magnesium, cerium, or sodium alloy to the molten iron with low phosphorus and low sulfur content. The magnesium alloy changes the microstructure by causing the elemental carbon to form spheroidal or nodular graphitic shapes, contrasting with the flake form found in spun-cast iron. This consistent microstructure of spheroidal graphite, when combined with an annealing process, increases both the strength of the iron and its ductility. Therefore, the wall thickness of DIP is significantly less than its predecessor while providing the same structural capacity.

The design of ductile iron pressure pipe is controlled by ANSI/AWWA C150/A21.50. The net thickness required is determined from three (3) considerations: limiting stress in the pipe wall due to internal pressure (working and surge), external load (soil and traffic), and limiting the horizontal deflection of the pipe. The latter is primarily intended to prevent cracking of a cement mortar lining. For internal pressure, the hoop tensile stress is limited to 50% of the minimum yield strength (42 ksi), and for external load the bending stress is limited to either 50% of the design bending stress (48 ksi) or 66.7% of the minimum yield strength.

One of the challenges in assessing DIP is determining if the pipe has undergone any loss of wall thickness due to internal or external corrosion. The reason for this difficulty relates to the manufacturing process and the casting thickness tolerances established in AWWA C151. Table 1.1Table 1.1: DIP Casting Tolerance compares the casting thickness tolerance for various diameters.

Table 1.1: DIP Casting Tolerance

Diameter Range, inches	Casting Tolerance, inches
3-8	0.05
10-12	0.06
14-42	0.07
48	0.08
54-64	0.09

There is also an allowance for a further thickness variation of 0.02 inches within 12 inches.

Ductile iron pipe manufacturers do not publish or release information on actual manufacturing tolerances. However, Pure Technologies has observed through multiple condition assessment projects for DIP that most of the variance is apparent along the length of the barrel rather than around the circumference. This occurrence is related to the casting process, in which the molten iron is fed into a spinning mold and centrifugal force is employed to distribute the iron around the circumference. There is no maximum thickness tolerance in AWWA C151; therefore, it is reasonable to expect to see a similar thickness distribution on the plus side of the nominal. This wide variance makes it difficult to obtain in-situ wall thickness (or stiffness) measurements and produce conclusive evidence that wall loss has occurred without visual confirmation. Measured thicknesses would have to be in excess of this manufacturing tolerance to conclusively determine that wall loss has occurred. Therefore, unless significant wall loss is observed through initial condition assessment activities, the data should be used as a baseline and compared to future inspection results in order to develop a higher confidence in management and rehabilitation/replacement strategies.

2. Transient Pressure Monitoring

2.1. Methodology

A hydraulic evaluation is conducted in order to understand the operational and surge pressures within a pipeline. When pipe wall degradation is combined with surge pressures, the likelihood of pipe failure can be significantly increased. Evaluation of the pump station operation, such as pump startup mode, typical and peak flows, operating and surge pressures, and surge protection, can provide important information on the stresses imparted on the pipeline.

Hydraulic pressure transients occur in pipelines when the steady-state conditions of the system change due to pressure and/or flow disturbances (e.g., the rapid closure of a valve, pump start-up/shutdown, gas pockets). The magnitude of a transient is related to several factors including the flow rate within the pipeline, the time (how fast) in which the change in steady-state condition occurs, and pipe hoop rigidity. During a transient event, the kinetic energy of the flow momentum is converted into potential energy, a rise in pressure, and strain energy in the pipe walls with the propagation of pressure waves. The resultant pressure transient is superimposed on the existing, steady-state pressure within the pipeline. Gas pockets combined with pressure transients can also have a significant impact on the structural integrity of the pipeline as vacuum conditions may be created. The rapid collapse of these gas pocket vacuum regions may cause cavitation as the transient passes, resulting in mechanical wear on the pipe wall and thereby increasing the risk of failure if the structural capacity has been compromised.

Conventional pressure monitors collect data in intervals of seconds or minutes while transients may occur in fractions of seconds and may be missed by traditional equipment. The pressure monitors, utilized on this project, continuously sample pressure at a high rate and transmit the data wirelessly to an online dashboard where it is viewed and analyzed.

2.2. Results

A hydraulic evaluation of the subject pipelines was conducted to understand the operational and surge pressures. Pressure data starting from November 28, 2018 was collected in order to identify the hydraulic stresses acting on the pipeline.

The data has been reviewed and some of the pertinent information is provided in Table 2.1.

Table 2.1: Transient Pressure Data – 11/28/18 to 12/19/2018 – 22 Days

	LS-6	LS-35	LS-57	LS-72	LS-79	LS-116
Maximum Pressure (psi):	43	25	35	26	21	37
Average Maximum Pressure (psi):	29	19	16	10	13	18
Minimum Pressure (psi):	-10	-4	-1	-7	-1	-1

While the maximum recorded pressures vary from the average maximum recorded pressures, those pressure fluctuations are within normal operation of these specific lift stations. Total pressure differentials, from low to high, are recorded at appropriate intervals and are cataloged to identify how often they occur. Table 2.2 shows how frequently each station experiences a certain pressure differential.

Table 2.2 Absolute Pressure Differential															
LS	Absolute Pressure Differential (psi)														Avg Max Pressure (psi)
	2	5	10	15	20	25	30	35	40	45	50	55	60	>60	
6	919	229	471	183	409	372	561	605	858	821	388	21	0	0	28.32
57	765	153	108	285	2036	1431	1130	3	0	0	0	0	0	0	16.2
35	248	361	423	1302	2017	186	1	0	0	0	0	0	0	0	18.87
79	4080	1097	495	153	0	1	0	0	0	0	0	0	0	0	12.99
116	835	559	2332	1432	52	1	0	0	0	0	0	0	0	0	18.13
72	2757	141	95	702	294	9	1	0	0	0	0	0	0	0	9.82

For example, LS-6 has recorded maximum pressure differentials measuring approximately 55 psi. The maximum recorded pressure on the pipeline was 43 psi, while a minimum pressure of -10 psi was also recorded (Figure 2.1). For perspective, that has occurred 21 times since November 28, 2018 while a pressure differential of 50 psi has occurred 388 times.

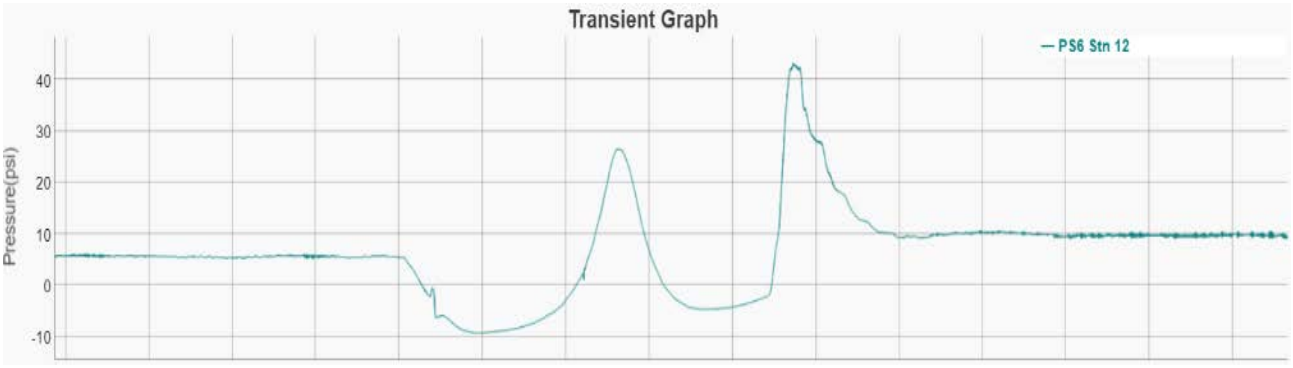


Figure 2.1: Pressure (psi) Recorded Over 3 Minutes – Dec 16, 2018

Figure 2.1 paints a particular picture of the operation at LS-6. Likely one pump is stable pumping at 5 psi and shuts off, creates a vacuum pressure, and the wave propagates back to the station and then away before the pump again turns on, spiking the pressure to 43 psi. This is a typical pressure differential of 55 psi (rounded to nearest 5 psi). This wave occurs over a 3-minute interval, so it is not instantaneous. For further perspective, the pump start up brings the pressure to 43 psi in 5 seconds and settles at 10 psi in approximately another 30 seconds. From information provided, variable frequency drives are installed at LS-6 and LS-57. Figure 2.2 depicts the same phenomenon repeated.

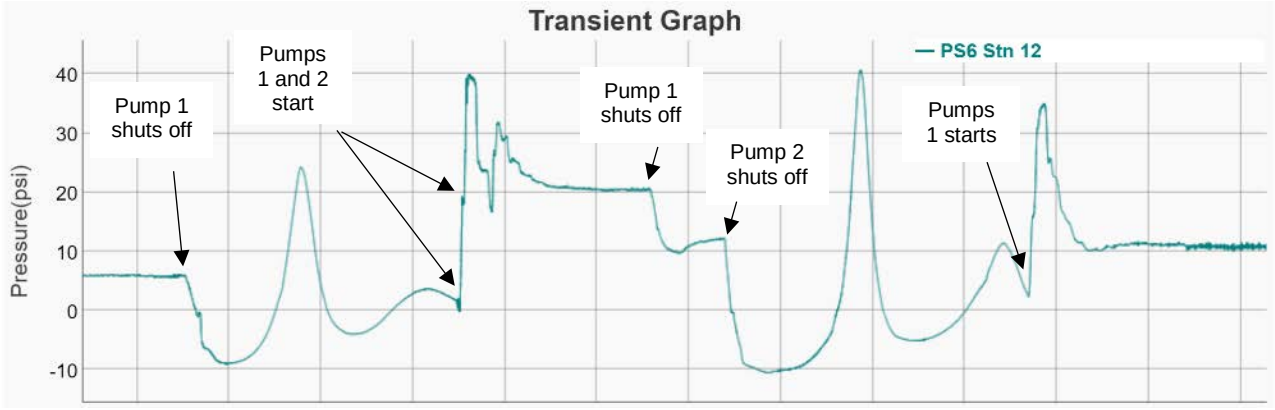


Figure 2.2: Pressure (psi) Recorded Over 10 Minutes at LS-6

Though not quite instantaneous, the resulting pressure wave oscillations after the pumps shut off occur over larger pressure differentials than the pump start up process. This phenomenon was also experienced at LS-6 as the pressure monitor was installed at the above ground air release/vacuum valve in the station. Air flow switched from release to vacuum several times during the installation. Measuring 2-inch, the ARV could potentially be upsized to 4-inch to compensate for the pump cycle pressure fluctuations. In addition, variable frequency pump operation may be improved. Figures 2.3-2.8 display maximum pressures recorded from the remaining lift stations during the 22-day period.

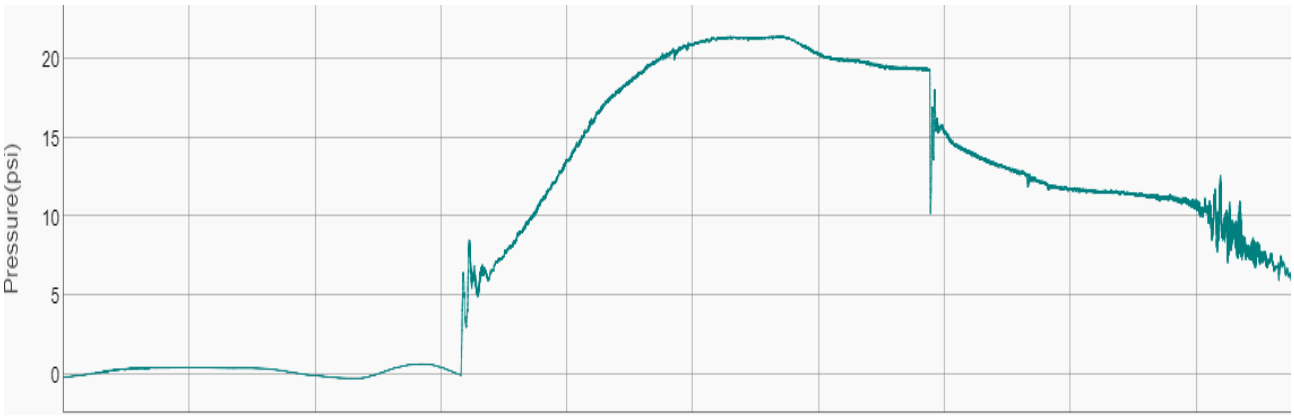


Figure 2.3: Pump Start-up at LS-79 (10-min period)

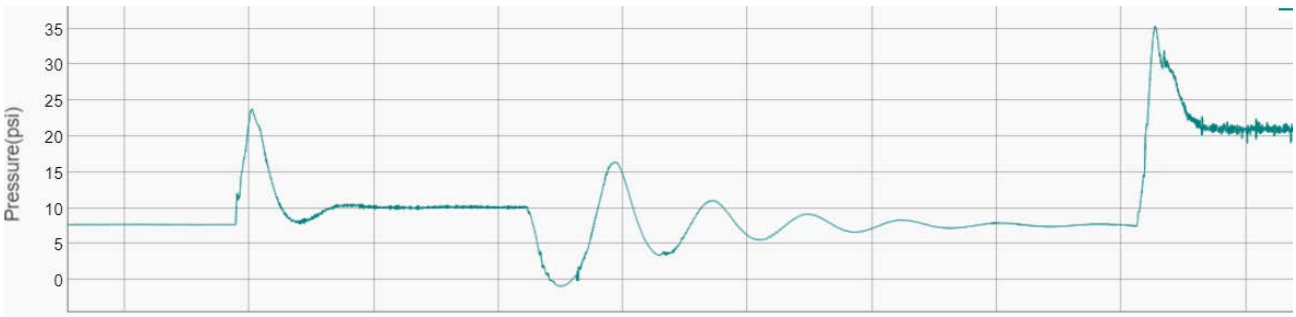


Figure 2.4: LS-57 Pump Shut-down and Start-Up (10-min period)

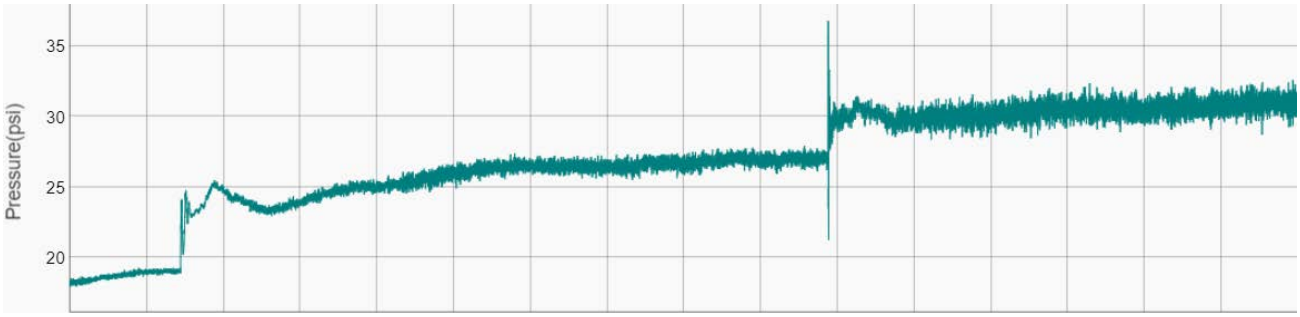


Figure 2.5: LS-116 Additional Pump Start-up Transient (10-min period)

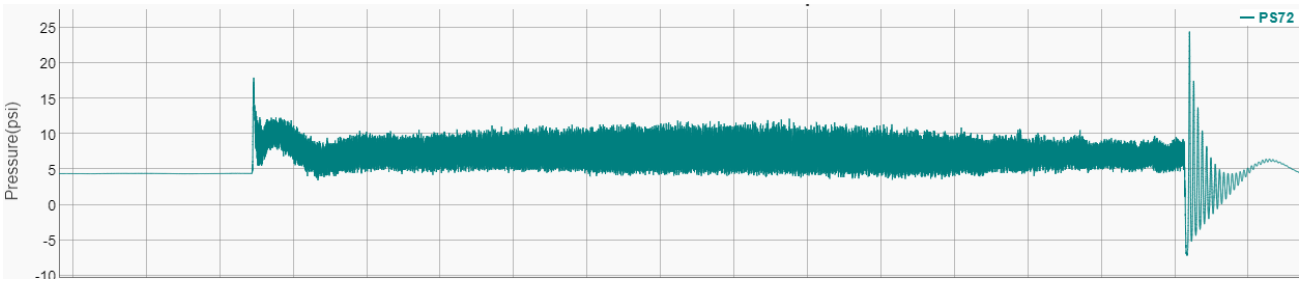


Figure 2.6: LS-72 Pump Start-up and Shut-down (10-min period)

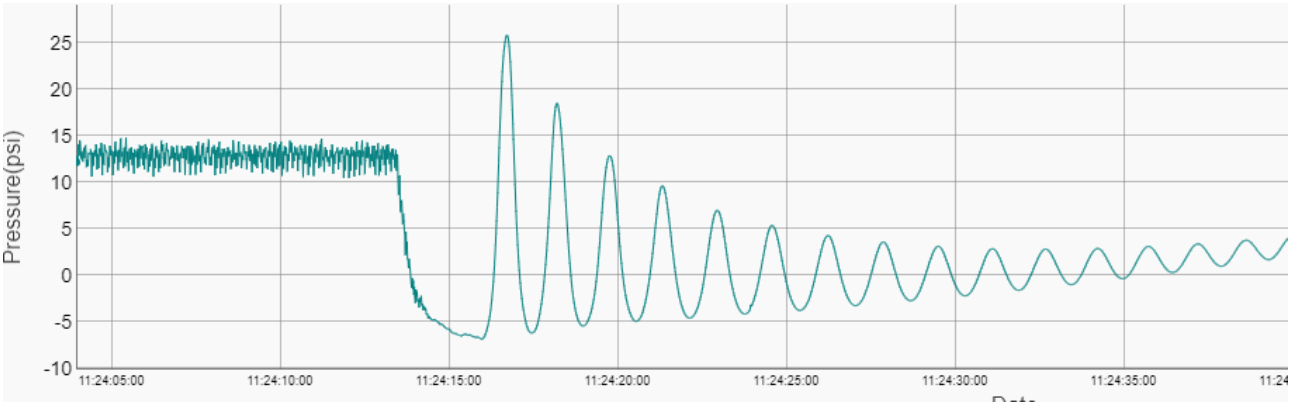


Figure 2.7: LS-72 Shut-down Water Hammer Oscillations (30-sec period)

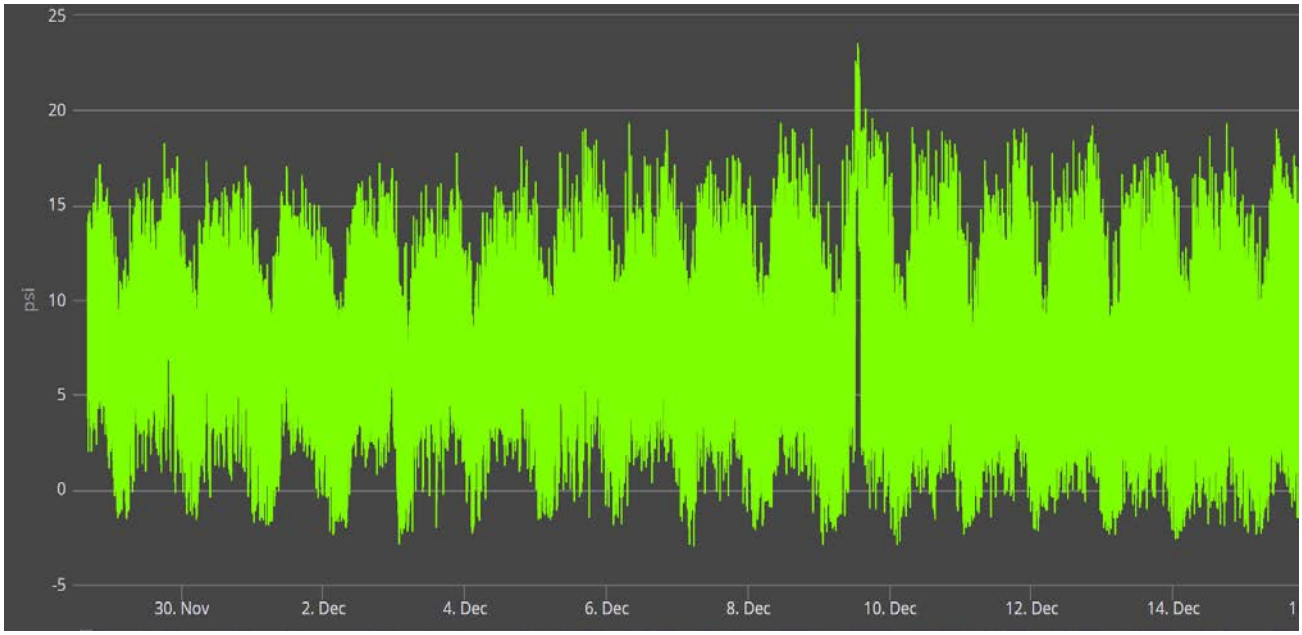


Figure 2.7: LS-35 Daily Pressure Fluctuations – Impulse December 9, 2018

A detailed report will be included in Appendix C when the overall report is finalized. The transient pressure report will highlight the operation for all six stations. A preliminary review of the data, overall, shows that most transient activity occurs with a typical range of operation for each station. The details regarding pump start-up and shut-down at each station, including the use of variable frequency drives or VFDs, should be investigated to improve the pumping process.

3. SmartBall Inspection

3.1. Methodology

The SmartBall system uses acoustic sensors to detect the presence of leaks and gas pockets within a pipeline. Leaks and gas pockets produce different and distinct acoustic signatures (sounds) in the pipe that are recorded by the SmartBall tool as it traverses the pipeline. The tool consists of an inner aluminum alloy core containing an acoustic sensor and circuitry. The aluminum core is encapsulated inside a foam ball to provide the appropriate mass, size and overall weight that allows the SmartBall device to be propelled by the water flow. The foam ball also dampens any sound that the SmartBall device might generate as it traverses the pipeline. The SmartBall assembly is inserted into a fully flowing and operational pipeline and released to allow the flow to carry the ball downstream. While the SmartBall device is traversing the pipeline, it continuously records all acoustic activity in the pipeline. This data is then analyzed to determine the presence and location of any leaks or areas of trapped gas.

Figure 3.1: SmartBall Tool

An acoustic emitter within the SmartBall assembly emits high frequency, timed acoustic signals that are detected and tracked by proprietary SmartBall Receivers (SBRs) at the surface. The SBRs track the SmartBall device's movement and location, correlating its position at any time in reference to acoustic events recorded on the acoustic sensor contained within the SmartBall assembly. Once deployed, it can move through in-line valves, reducers, and other fittings, as well as navigate turns and profile changes. Once the SmartBall tool has traversed the entire pipeline length, it is typically captured and retrieved by a custom engineered net or reservoir. Data from the tool is downloaded and analyzed.

3.2. SmartBall Inspection Summary

The SmartBall tool was inserted through check valves at each of the corresponding lift stations. The check valves were isolated, the blind flanges atop removed, and the SmartBall inserted. Once the check valves were restored, flow was supplied from the associated pump, propelling the SmartBall along the force main.

The SmartBall tool was tracked at the strategically identified locations by which the velocity of the tool could be instantaneously calculated, which is then used to set expectations of how long the inspection would take and ultimately an expected time of arrival at the previously determined extraction point.

The extraction points varied for each of the pipelines depending on the most convenient location and access which included wet wells and drop manholes. Depending on the dynamic of the extraction, bar screens in conjunction with a rake or net would be used to obstruct the tool from continuing downstream and coincidingly remove inspection tool from the sewer system.

3.3. SmartBall Inspection Results

After reviewing the survey, Pure Technologies detected zero (0) anomalies characteristic of leaks on all six (6) force mains. Anomalies that characterized fully developed gas pockets and migratory slugs of gas were identified from the acoustic inspection on each of the lines. Typically, gas slugs are not of concern as they are migratory in nature, however, gas slugs may accumulate at localized high points and create fully formed gas pockets or add to existing gas pocket locations. Appendix A includes aerials of the force mains indicating the anomaly locations. In addition, GIS mapping files are attached which depict the locations spatially. The anomalies are summarized in Table 3.1 below:

Table 3.1: SmartBall Inspection Results

	LS-6	LS-35	LS-57	LS-72	LS-79	LS-116
Total Length Inspected (feet):	11,951	9,293	3,179	2,306	9,698	20,184
Diameter (inch):	30	24	30	16	16	24/30
Total Number of Gas Pockets:	0	6	1	1	20	33
Total Number of Gas Slugs:	0	4	0	0	2	15
Total Number of Entrained Gas Events:	4	7	2	0	0	11

The following tables list the gas pocket locations and their size with approximate GPS coordinates and nearest above ground intersection. Migratory gas slugs and entrained gas are not listed. For quick visual reference, refer to Appendix A which shows aerial maps of each individual force main and the relevant findings marked on each. GIS mapping files offer a precise locating method.

LS-116

Table 3.2: Gas Pocket Locations – LS-116

Gas Pocket Number	Length of Gas Pocket (feet)	Approximate GPS Coordinates	Nearest Intersection
1	27	28°20'23.61"N 81°25'50.35"W	Dyer Blvd and W Osceola Pkwy
2	12	28°20'22.74"N 81°25'50.29"W	Dyer Blvd and W Osceola Pkwy
3	11	28°20'22.02"N 81°25'50.23"W	Dyer Blvd and W Osceola Pkwy
4	11	28°20'21.68"N 81°25'50.21"W	Dyer Blvd and W Osceola Pkwy
5	7	28°20'21.04"N 81°25'50.15"W	Dyer Blvd and W Osceola Pkwy
6	13	28°20'19.81"N 81°25'49.99"W	Dyer Blvd and W Osceola Pkwy
7	19	28°20'12.41"N 81°25'51.15"W	Dyer Blvd and Ball Park Rd
8	14	28°20'11.82"N 81°25'51.37"W	Dyer Blvd and Ball Park Rd
9	8	28°20'11.59"N 81°25'51.47"W	Dyer Blvd and Ball Park Rd

Table 3.2: Gas Pocket Locations – LS-116			
Gas Pocket Number	**Length of Gas Pocket (feet)**	**Approximate GPS Coordinates**	**Nearest Intersection**
10	21	28°20'9.54"N 81°25'52.62"W	Dyer Blvd and Ball Park Rd
11	45	28°20'1.83"N 81°25'59.06"W	Dyer Blvd and Flora Blvd
12	18	28°20'0.45"N 81°26'0.21"W	Dyer Blvd and Flora Blvd
13	31	28°19'46.45"N 81°26'10.54"W	Dyer Blvd and Mt Vernon Way
14	42	28°19'45.33"N 81°26'10.85"W	Dyer Blvd and Mt Vernon Way
15	13	28°19'36.20"N 81°26'11.00"W	Dyer Blvd and W Carroll St
16	22	28°19'35.52"N 81°26'11.00"W	Dyer Blvd and W Carroll St
17	24	28°19'32.69"N 81°26'10.99"W	Dyer Blvd and W Carroll St
18	26	28°19'32.19"N 81°26'10.99"W	Dyer Blvd and W Carroll St
19	41	28°19'27.11"N 81°26'11.81"W	Dyer Blvd and W Carroll St
20	31	28°19'0.67"N 81°26'11.85"W	Dyer Blvd and Chantilly Ave
21	31	28°18'42.53"N 81°26'11.36"W	Dyer Blvd and Kensington Rd
22	29	28°18'34.25"N 81°26'11.28"W	Dyer Blvd and Polo Club Dr
23	9	28°18'25.64"N 81°26'11.17"W	Dyer Blvd and W Columbia Ave
24	44	28°18'20.25"N 81°26'11.27"W	Dyer Blvd and W Irlo Bronson Hwy
25	32	28°18'17.54"N 81°26'11.54"W	Dyer Blvd and W Irlo Bronson Hwy
26	47	28°18'15.02"N 81°26'12.24"W	Dyer Blvd and W Irlo Bronson Hwy
27	19	28°18'13.41"N 81°26'12.19"W	Dyer Blvd and W Irlo Bronson Hwy
28	7	28°18'8.87"N 81°26'12.16"W	Dyer Blvd and W Irlo Bronson Hwy
29	29	28°18'7.39"N 81°26'12.18"W	Dyer Blvd and W Oak St
30	25	28°18'3.75"N 81°26'12.36"W	Dyer Blvd and W Oak St
31	18	28°18'3.19"N 81°26'12.35"W	Dyer Blvd and W Oak St
32	37	28°17'52.46"N 81°26'12.20"W	Dyer Blvd and Martin Luther King Blvd

LS-79

Table 3.3: Gas Pocket Locations – LS-79			
Gas Pocket Number	**Length of Gas Pocket (feet)**	**Approximate GPS Coordinates**	**Nearest Intersection**
1	17	28°20'48.36"N 81°37'21.58"W	US-192 and W Orange Lake Blvd
2	7	28°20'48.36"N 81°37'21.21"W	US-192 and W Orange Lake Blvd
3	20	28°20'48.36"N 81°37'20.94"W	US-192 and W Orange Lake Blvd
4	26	28°20'48.37"N 81°37'19.85"W	US-192 and W Orange Lake Blvd
5	11	28°20'48.37"N 81°37'19.37"W	US-192 and W Orange Lake Blvd
6	17	28°20'48.41"N 81°37'2.50"W	US-192 and FL-429
7	23	28°20'48.42"N 81°36'59.51"W	US-192 and FL-429
8	30	28°20'48.42"N 81°36'58.64"W	US-192 and FL-429
9	22	28°20'48.42"N 81°36'58.24"W	US-192 and FL-429
10	21	28°20'48.43"N 81°36'56.49"W	US-192 and FL-429
11	13	28°20'48.45"N 81°36'49.45"W	US-192 and E Orange Lake Blvd
12	23	28°20'48.40"N 81°36'26.97"W	US-192 and Inspiration
13	50	28°20'47.22"N 81°36'21.68"W	US-192 and Inspiration
14	10	28°20'46.21"N 81°36'18.74"W	US-192 and Inspiration
15	22	28°20'44.92"N 81°36'15.63"W	US-192 and Inspiration
16	31	28°20'36.33"N 81°36'4.23"W	US-192 and Formosa Gardens Blvd
17	8	28°20'33.85"N 81°36'1.30"W	US-192 and Formosa Gardens Blvd
18	33	28°20'32.76"N 81°36'0.01"W	US-192 and Formosa Gardens Blvd
19	14	28°20'31.25"N 81°35'58.22"W	US-192 and Formosa Gardens Blvd
20	19	28°20'23.64"N 81°35'49.77"W	US-192 and Formosa Gardens Blvd

LS-35

Table 3.4: Gas Pocket Locations – LS-35			
Gas Pocket Number	**Length of Gas Pocket (feet)**	**Approximate GPS Coordinates**	**Nearest Intersection**
1	91	28°17'11.89"N 81°24'47.32"W	W Penfield St and S Clyde Ave
2	29	28°17'9.97"N 81°24'47.28"W	W Penfield St and S Clyde Ave
3	33	28°17'2.83"N 81°24'51.43"W	W Palmetto Ave and S Dillingham Ave
4	29	28°17'2.29"N 81°24'51.43"W	W Palmetto Ave and S Dillingham Ave
5	22	28°16'57.45"N 81°24'54.02"W	W Palmetto Ave and S John Young Pkwy
6	201	28°16'57.66"N 81°25'4.99"W	Harrelson Ln and Determination Way

LS-57

Table 3.5: Gas Pocket Locations – LS-57			
Gas Pocket Number	**Length of Gas Pocket (feet)**	**Approximate GPS Coordinates**	**Nearest Intersection**
1	35	28°16'56.62"N 81°25'13.73"W	SBWRF Driveway and LS-57

LS-72

Table 3.6: Gas Pocket Locations – LS-57			
Gas Pocket Number	**Length of Gas Pocket (feet)**	**Approximate GPS Coordinates**	**Nearest Intersection**
1	56	28°19'56.48"N 81°35'12.36"W	W Irlo Bronson Hwy and N Old Lake Wilson Rd

4. Structural Analysis and Remaining Useful Life Evaluation

4.1. AWWA C150 Pipeline Design Analysis

To develop actionable information from data generated during the non-destructive field testing, Pure Technologies has developed a condition-based pipeline management model based on structural evaluation of ductile iron pipe. This model incorporates data from the operation of the force main, as-built drawings, depth of cover, and industry design specifications. Prior to the implementation of any inspection techniques or technologies, a preliminary structural evaluation of the force mains was conducted. The results of this model are presented in a pipeline condition curve that allows for both the localized and systemic condition evaluation of the force mains. This curve represents the Yield Limit of the ductile iron force main along its length, which identifies the specific wall thickness required to remain in the elastic zone.

The establishment of minimum wall thickness of ductile iron pipe for water and wastewater services is typically performed using ANSI/AWWA C150/A21.50, which provides guidance for the minimum wall thickness based on several operational factors including operating and surge pressure, pipe embedment type, depth of cover, and live load conditions. Prior to 1991, ductile iron pipe was classified based on thickness class rather than by today's standard of pressure class. Thickness class designations include Classes 50 through 56 and generally as the thickness class increases, so does the minimum wall thickness and associated pressure/loading capacity. The provided as-built drawings did not indicate the thickness class of DIP utilized. From the designed internal diameter and the installation date, it was ascertained that the minimum wall thickness and pipe dimensions could be retrieved from the AWWA C150 design standard.

Along with depth of cover, pressure is one of the primary data inputs when conducting a structural evaluation of ductile iron pipe. While most force mains operate below the design capacity of a particular material, when pipe wall degradation is combined with the operational pressure or surge pressure, the likelihood of failure can be significantly increased.

4.1.1. Design Specifications and Assumptions

The design properties used in the calculations are summarized in Table 4.1. An important input for the structural evaluation is the actual operating pressure of the pipeline. The maximum operating pressure for each force main (per pressure monitoring results) and maximum surge pressure of 100 psi (assumed based in design standard) was utilized within the calculations to determine the resulting minimum wall thickness.

Table 4.1. Constants Used for Structural Analysis							
Parameter	**LS-116**		**LS-6**	**LS-57**	**LS-79**	**LS-72**	**LS-35**
Inside Diameter of the Pipe (inch)	24	30	30	30	16	16	24
Assumed Pipe Class	200	150	150	150	250	250	200
Assumed Design Thickness (inch)	0.33	0.34	0.34	0.34	0.30	0.30	0.33
Pipe Effective Length (inch)	36	36	36	36	36	36	36
Yield Strength (psi)	42,000	42,000	42,000	42,000	42,000	42,000	42,000
Volumetric Flow (cfs)	8.9	8.9	13.4	17.4	2.1	2.1	8.0
Design Bending Stress (psi)	48,000	48,000	48,000	48,000	48,000	48,000	48,000
Gamma of the Soil (pcf)	120	120	120	120	120	120	120
Weight of Fluid (pcf)	87.4	87.4	87.4	87.4	87.4	87.4	87.4
Gravity (ft/s^2)	32.2	32.2	32.2	32.2	32.2	32.2	32.2
Young's Modulus (ksi)	24,000	24,000	24,000	24,000	24,000	24,000	24,000
Bulk Modulus (ksi)	290	290	290	290	290	290	290
Max. Allowable Deflection (%)	3	3	3	3	3	3	3
Manning Coeff	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115
Initial Pressure into the Pipeline (psi)	37	37	40	35	21	26	25
Initial Elevation (ft)	91	77	83	68	109	98	67
Specific weight of liquid (lb/cu in)	0.0506	0.0506	0.0506	0.0506	0.0506	0.0506	0.0506
Depth of water table (ft)	0	0	0	0	0	0	0
Impact Factor	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Bedding Moment Coefficient	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Deflection Coefficient	0.105	0.105	0.105	0.105	0.105	0.105	0.105
Modulus of Soil Reaction (psi)	300	300	300	300	300	300	300

Using the equations in C150, the minimum required thickness, including a +/- 0.07-inch service allowance, for each pipe was calculated. Figure 4.1 illustrates the required pipe wall thickness along LS-35 Force Main. The charts depict the minimum required wall thickness to satisfy certain criteria: required thickness for deflection (red), minimum required thickness for internal pressure (black), and the C150 thickness with factor of safety (pink) etc.

Actual wall thickness measurements from direct external verifications (Appendix F) can be compared to the charts in Figures 4.1 to understand the significance of the defects found. A finite element model can subject the distressed pipes to internal and external loading to achieve a similar chart that will depict the pipe design's Yield and Ultimate Strength Limits based on pressure, earth/live loading, and pipe wall defect depth and dimension. The Yield Limit identifies the specific wall thickness required to maintain an un-deformed state, the elastic zone. This parameter is used to determine the safety of the pipeline. Any wall thickness measurements less than this limit should be considered for rehabilitation or replacement. The red line in Figure 4.1, representative of deflection is chosen as a conservative yield limit. See Appendix E for figures of the required pipe wall thickness for each pipe class in all 6 force mains.

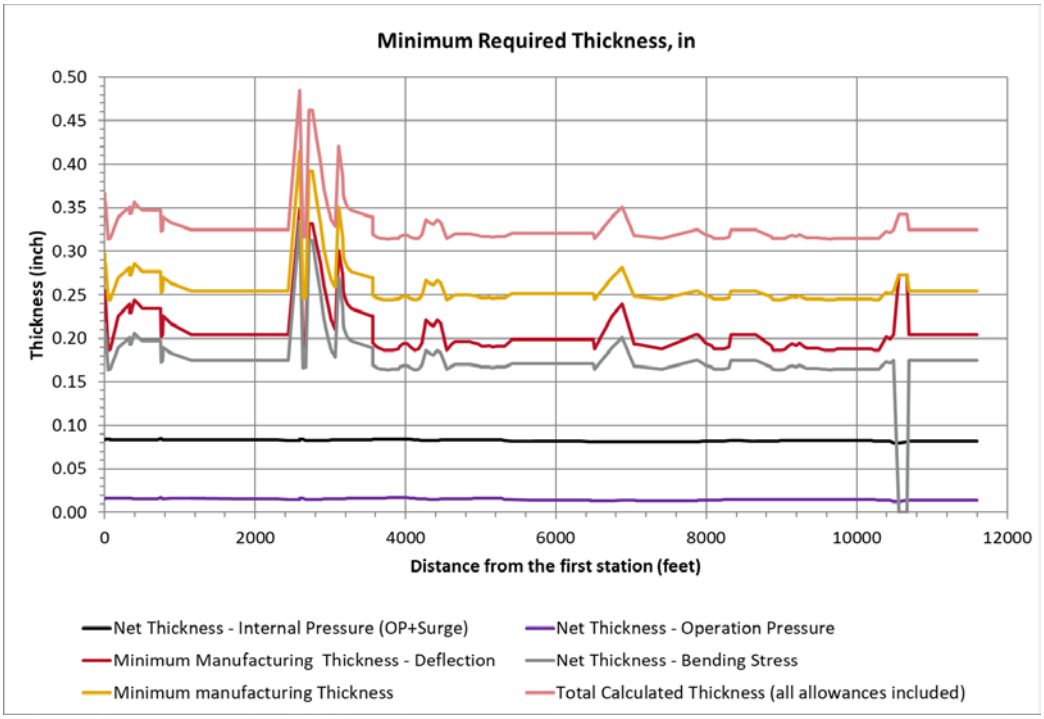


Figure 4.1: AWWA C150 structural design evaluation results for LS-35.

4.2. Remaining Useful Life Analysis

RUL, also referred to as time-to-yield, is calculated using a statistical model that produces a distribution of probability of failure (PoF) values for a singular pipe. This model is based on the measured wall thickness from the inspection of that pipe and a computed minimum required thickness from the AWWA C150 design standard. In this case, the pipe wall thickness measurements collected during inspections during 2019 provide a data set for specific locations along the pipe and not for the full length of the pipe.

The RUL calculations have been performed for each dig location using the pipe wall measurements from the inspection, known nominal thickness based on the design specifications, and minimum required thickness based on the structural analysis. Table 4.2 is a summary of the values used for each location in the RUL calculations.

Table 4.2. Pipe Information Used in RUL Analysis

Pipe Number	Excavation Location		Nominal Thickness (inch)	Yield Thickness (inch)	Casting Tolerance (inch)
LS-116	Excavation 1	Dig 5, GP #1	0.33	0.19	0.07
LS-116	Excavation 2a	Dig 6, GP #16	0.33	0.19	0.07
LS-116	Excavation 2b	Dig 6, Baseline	0.33	0.19	0.07
LS-116	Excavation 3	Dig 7, GP #25	0.33	0.19	0.07
LS-116	Excavation 4a	Dig 9, GP #32	0.34	0.19	0.07

LS-116	Excavation 4b	Dig 9, Baseline	0.34	0.19	0.07
LS-79	Excavation 5a	Dig 1, GP #4	0.30	0.17	0.07
LS-79	Excavation 5b	Dig 1, Baseline	0.30	0.17	0.07
LS-79	Excavation 6	Dig 2, GP#10	0.30	0.17	0.07
LS-79	Excavation 7a	Dig 4, GP#13	0.30	0.17	0.07
LS-79	Excavation 7b	Dig 4, Baseline	0.30	0.17	0.07
LS-35	Excavation 10a	Dig 8, GP #5	0.33	0.21	0.07
LS-35	Excavation 10b	Dig 8, GP #5	0.33	0.21	0.07
LS-72	Excavation 12a	Dig 3, Baseline	0.30	0.19	0.07
LS-72	Excavation 12b	Dig 3, GP #1	0.30	0.19	0.07

Figure 4.2 below shows the distribution of RUL to structural failure for Pipe LS-35: Dig #8, Excavation 10A. The rest of the RUL curves for the other dig locations are attached in Appendix G.

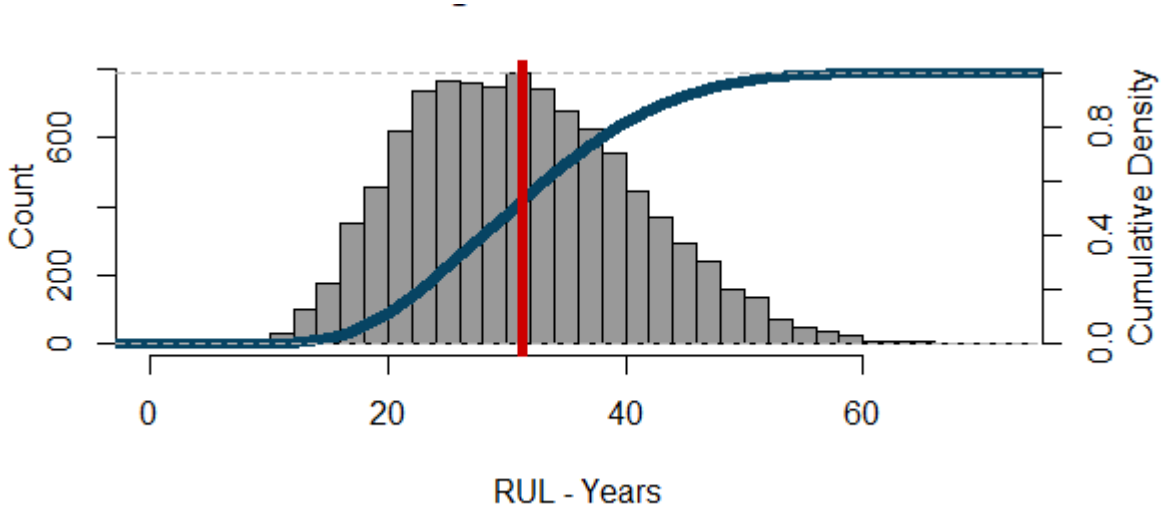


Figure 4.2: RUL for Pipe LS-35, Dig#8, Excavation 10AB

The histogram bars represent the simulated count of pipes reaching the minimum required thickness each year (left y-axis). The “Count” is the count of outcomes from the Monte Carlo simulations for the subject excavation. The blue line represents the cumulative percentage of pipes reaching yield in percentage (right y-axis) and the red line represents the average of the RUL.

Rather than using the field measurements directly, we select a simulation approach to better account for uncertainty in the inspections. However, the measurements from the field are still directly involved in the proposed method. We first build a best-fit statistical distribution using the field readings, and over 10000 trials we iteratively draw a thickness value from this distribution and estimate RUL. From this we can compile and summarize the estimated RUL’s. See Figure 4.3 below for the simulation of Pipe LS-35, Dig#8, Excavation 10B.

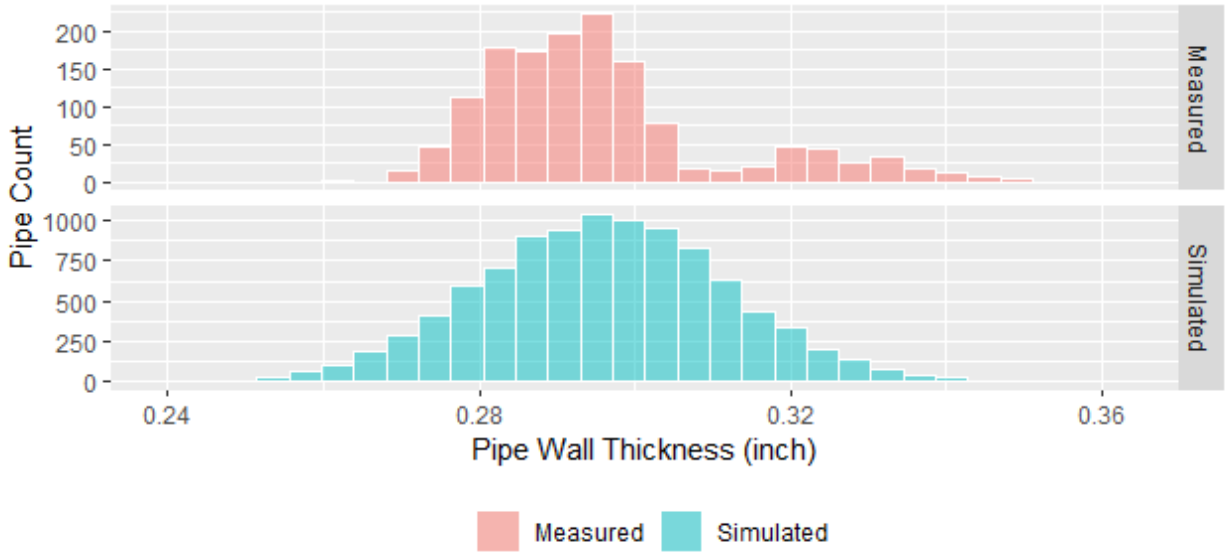


Figure 4.3: Pipe LS-35, Dig#8, Excavation 10B: Measured and Simulated Thickness

The RUL for each pipe is considered the smallest RUL from all its excavation locations. A summary of the average RUL for each of the inspected pipes are tabulated in Table 4.3.

Table 4.3. RUL Analysis Results Summary

Pipe Number	Average RUL to Structural Failure (Years)
LS-35	31
LS-72	13
LS-79	19
LS-116	41

This model, along with structural analysis, provides insight as to the probability of failure of the pipeline. The results of this evaluation are based on the pipe wall thickness testing and statistical inferences of these locations and does not account for unforeseen factors such as manufacturing, installation, or operational defects that could lead to premature failure of the pipe. The probability of structural failure by years for each pipe and dig location are summarized in Table 4.4.

Table 4.4. Probability of Structural Failures by Years

Pipe Number	Probability of Structural Failure	
	In 10 Years	10 20 Years
LS-35	<1%	3%
LS-72	33%	83%
LS-79	12%	56%
LS-116	15%	34%

5. Conclusion and Recommendations

Based on the results of the leak and gas pocket detection inspection, transient pressure analysis and structural analysis, Pure Technologies presents the following conclusions and pipeline management recommendations:

5.1. *Conclusions*

1. No leaks were detected within the inspection limits of the force mains. Several stationary gas pockets and acoustic events resembling migratory gas were detected. Table 3.3 lists the acoustic anomalies that were detected. Each of the anomalies can also be reviewed in aerial photographs provided in Appendix A or in attached GIS mapping files.

2. The majority of the gas pockets (97%) were detected within the LS-116, LS-35, and LS-79 force mains. The results suggest that the larger lift stations, LS-6 and LS-57, convey a greater amount of volumetric flow and, being connected to the headworks at South Bermuda Water Reclamation Facility, typically remain at full capacity and most migratory gas is being exhausted from the main. The more outlying lift stations, LS-116, LS-35, and LS-79 each gather less volumetric flow in longer pump cycles and have multiple other smaller stations that tie into the mains, giving more opportunity for gas to be introduced through the pumping process. It is important to note that each gas pocket has a unique impact on the respective pipe wall. Despite the infrequency of gas pockets in LS-57, the criticality at the localized gas pocket remains, which was evidenced when the LS-57 Force Main experienced a failure where the only gas pocket was identified from the Smartball inspection. As a result, LS-57 Force Main was prioritized for higher resolution assessment using enhanced electromagnetics.

3. Transient pressure monitors were installed on November 28, 2018 and monitored pressures at the six (6) referenced lift stations. Table 2.1 lists the minimum, maximum, and average maximum pressure recorded at each of the sites. A preliminary review of the data, overall, shows that most transient activity occurs with a typical range of operation for each station.

4. An American Water Works Association (AWWA) C150-14 structural analysis was performed on the 16-, 24-, and 30-inch diameter DIP designs. The 16-, 24-, and 30-inch diameter design thicknesses, assuming the most conservative pressure classes, exceeded the required thickness from the AWWA C-150 analysis in most cases. These calculated wall thicknesses are the minimum thicknesses required to prevent yielding of a pipe section. The minimum wall thickness, dependent on depth of earth cover, which is required for each of the pipe designs to minimize deflection from earth loading to 3%, was also satisfied throughout.

5.2. *Recommendations*

1. Locate and check the operability of existing air release/vacuum valves along the force main.
    - o In doing so, release trapped gas that remains within the force mains;
    - o Rehabilitate or replace any inoperable air valves;
    - o Make modifications and/or add new air valve locations, as necessary, to minimize risk associated with trapped gases and maintain the normal operation of the force mains.

2. Check the collection and pumping process associated with each of the lift stations, particularly those associated with LS-79 and LS-116. Excess gas may be introduced in the pumping process that could be reduced with adjustment of the duration of the pumping cycles.

3. Investigate the details regarding pump start-up and shut-down at each station including the use of variable frequency drives or VFDs to improve the pumping process. Vacuum and surge pressures may be detrimental to the operation of a force main.

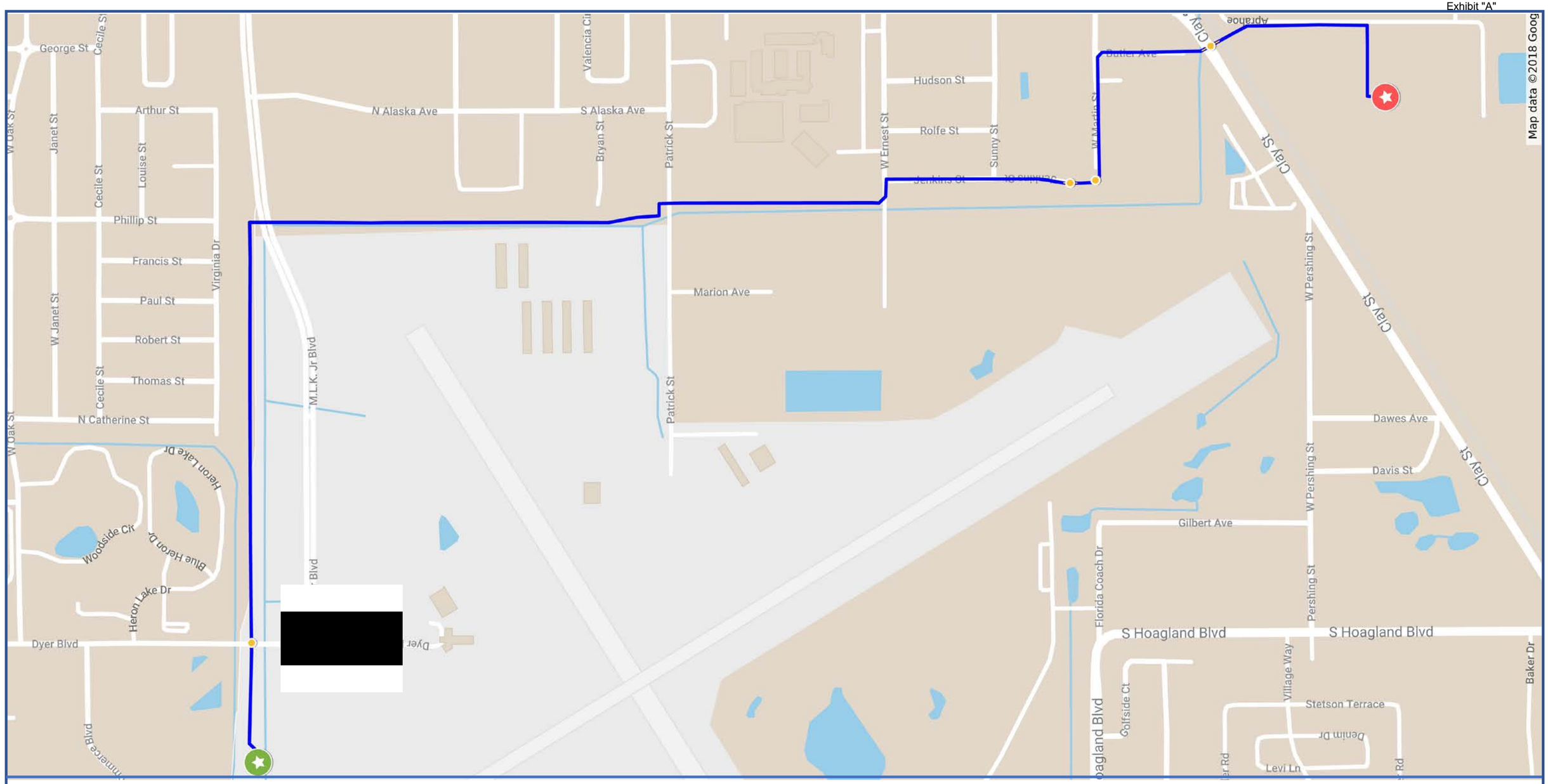
4. Perform remaining proposed external verifications on LS-79 Force Main (Excavation#8) and LS-35 Force Main (Excavation #9). Due to pipe failure on LS-57 Force Main at identified gas pocket location from Smartball inspection, continue efforts to inspect the pipeline with higher resolution capability using PipeDiver electromagnetics.

5. Add more locations for external verification on LS-72 to increase sample size in the RUL evaluation to improve confidence of the probability of failure, as it currently reflects a 33% chance of failure in 10 years and an 83% chance of failure in 10-20 years.

   Excavations at “non-gas pocket” locations are for calibration purposes on assumed non-deteriorated pipe. For economic and accessibility purposes, these excavations are expected to be an extension of those associated with gas pockets. Appendix B provides aerial photographs of the 18 pipe verifications combined at 12 excavation locations. The 18 verifications represent the minimum that Pure Technologies requires to evaluate the remaining useful life of the force mains.

APPENDIX A
Leak and Gas Pocket Results

Exhibit "A"



Map Legend

- Insertion
- Extraction
- Entrained Air

N

LS-6 FORCE MAIN INSPECTION	
LENGTH	11,951 FT
MATERIAL	DIP
DIAMETER	30 IN
AS-BUILT YEAR	1990
ENTRAINED AIR	4

pure TECHNOLOGIES
a xylem brand

Exhibit "A"

Map Legend

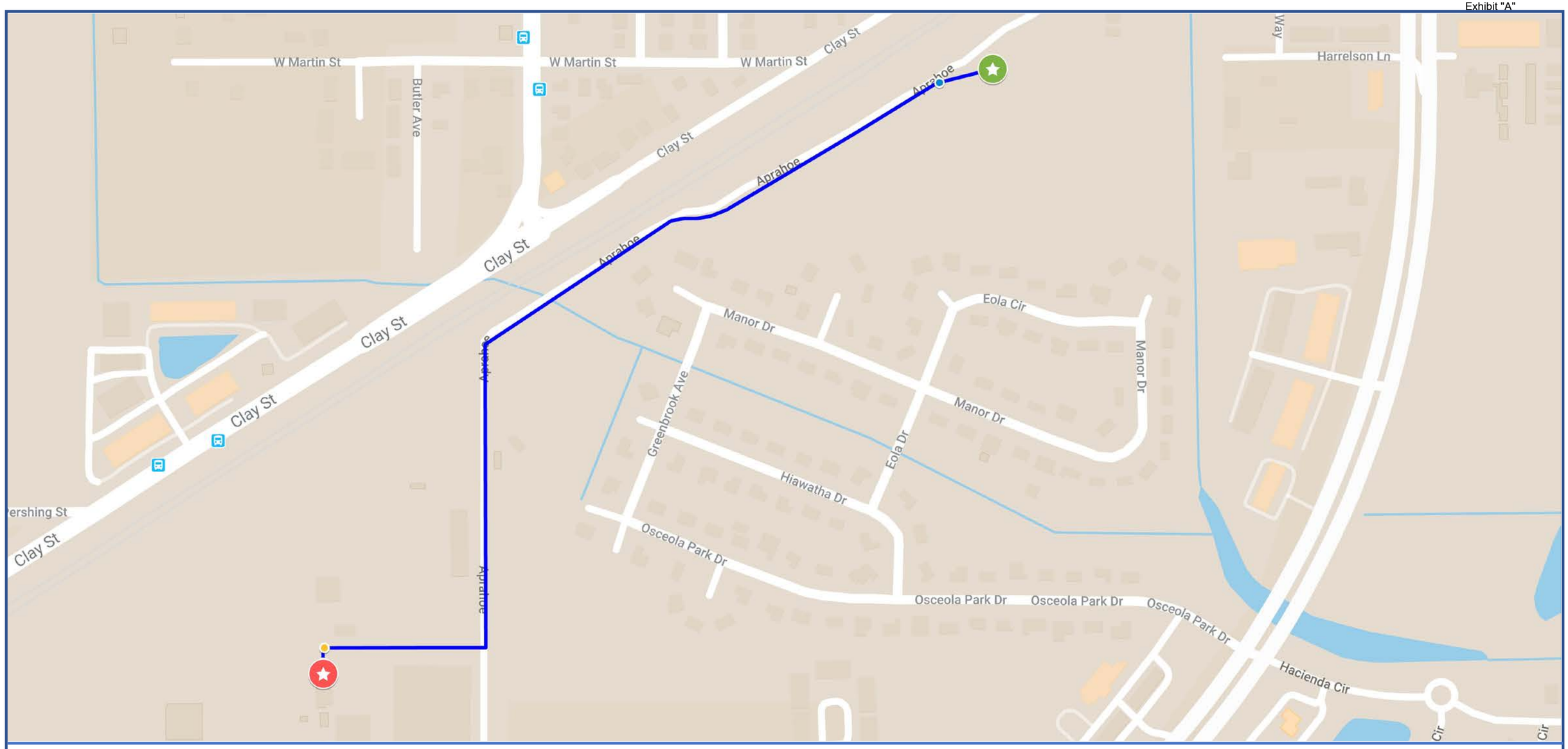
- Insertion
- Extraction
- Gas Pocket
- Slugs
- Entrained Air

N

LS-35 FORCE MAIN INSPECTION	
LENGTH	9,9293 FT
MATERIAL	DIP
DIAMETER	24 IN
AS-BUILT YEAR	1996
GAS POCKETS	6
SLUGS	4
ENTRAINED AIR	7

pure TECHNOLOGIES
a xylem brand

Exhibit "A"



Map Legend

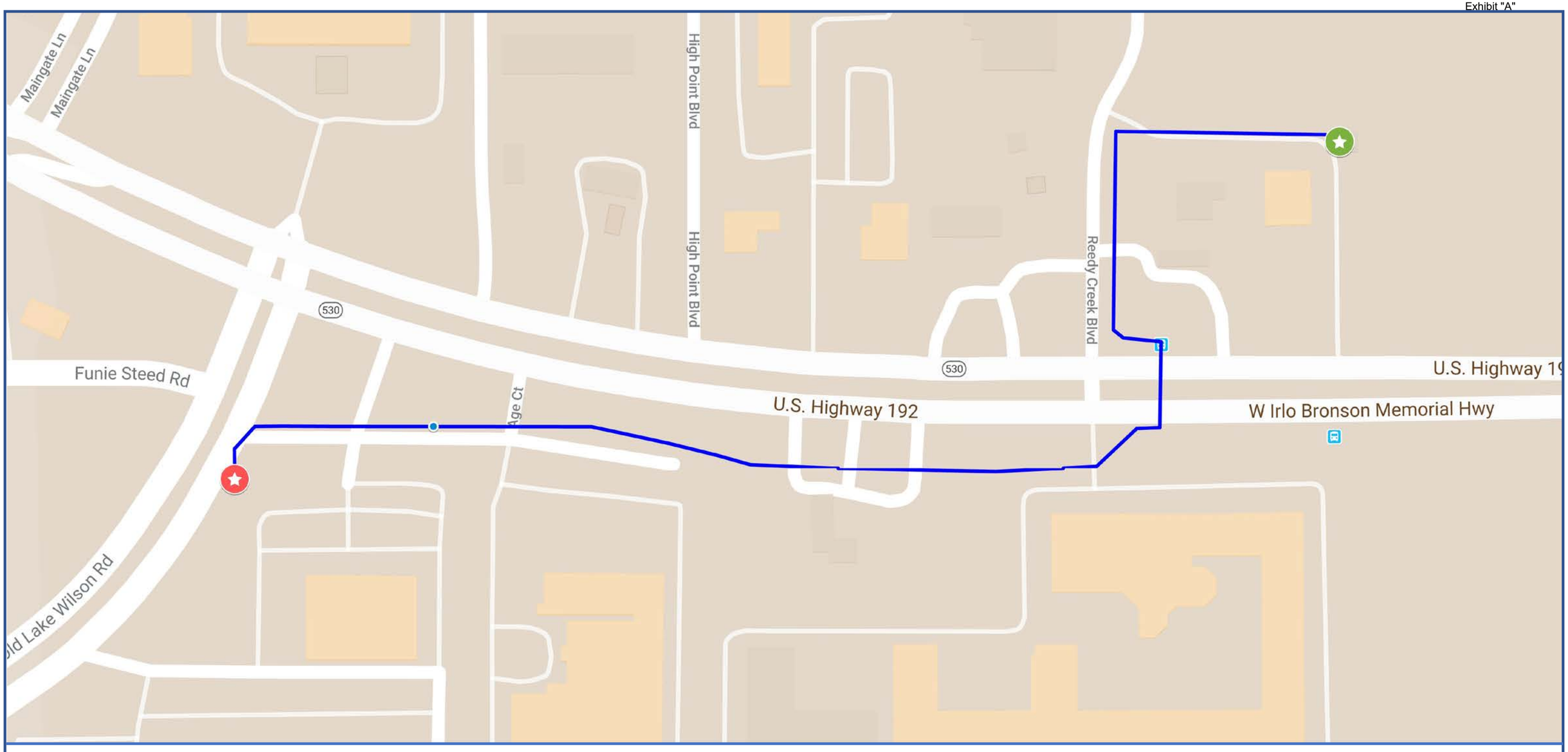
- Insertion
- Extraction
- Gas Pocket
- Entrained Air

N

LS-57 FORCE MAIN INSPECTION	
LENGTH	3,179 FT
MATERIAL	DIP
DIAMETER	30 IN
AS-BUILT YEAR	1986
GAS POCKETS	1
ENTRAINED AIR	2

pure TECHNOLOGIES
a xylem brand

Exhibit "A"



Map Legend

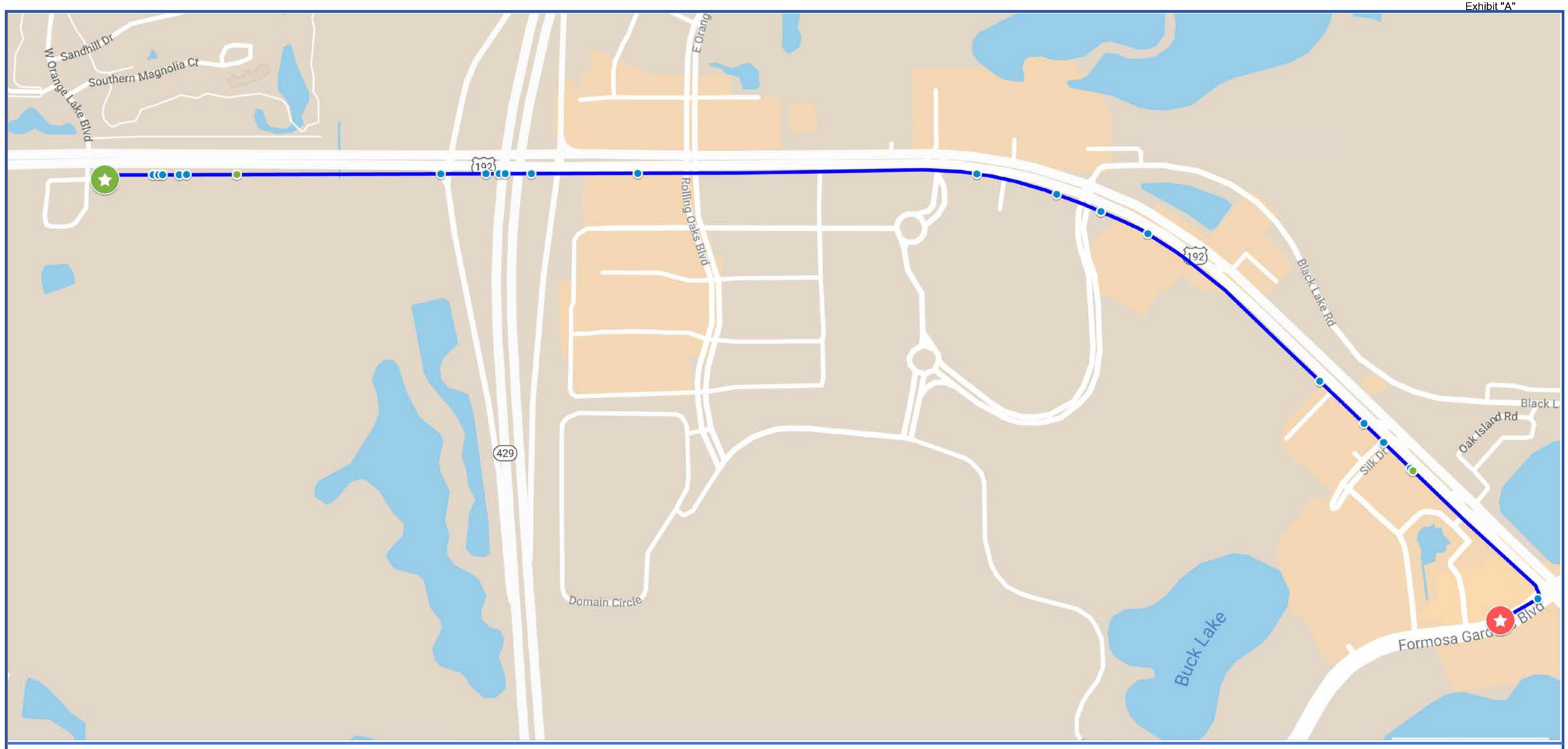
- Insertion
- Extraction
- Gas Pocket

N

LS-72 FORCE MAIN INSPECTION	
LENGTH	2,306 FT
MATERIAL	DIP
DIAMETER	16 IN
AS-BUILT YEAR	1999
GAS POCKETS	1

pure TECHNOLOGIES
a xylem brand

Exhibit "A"



Map Legend

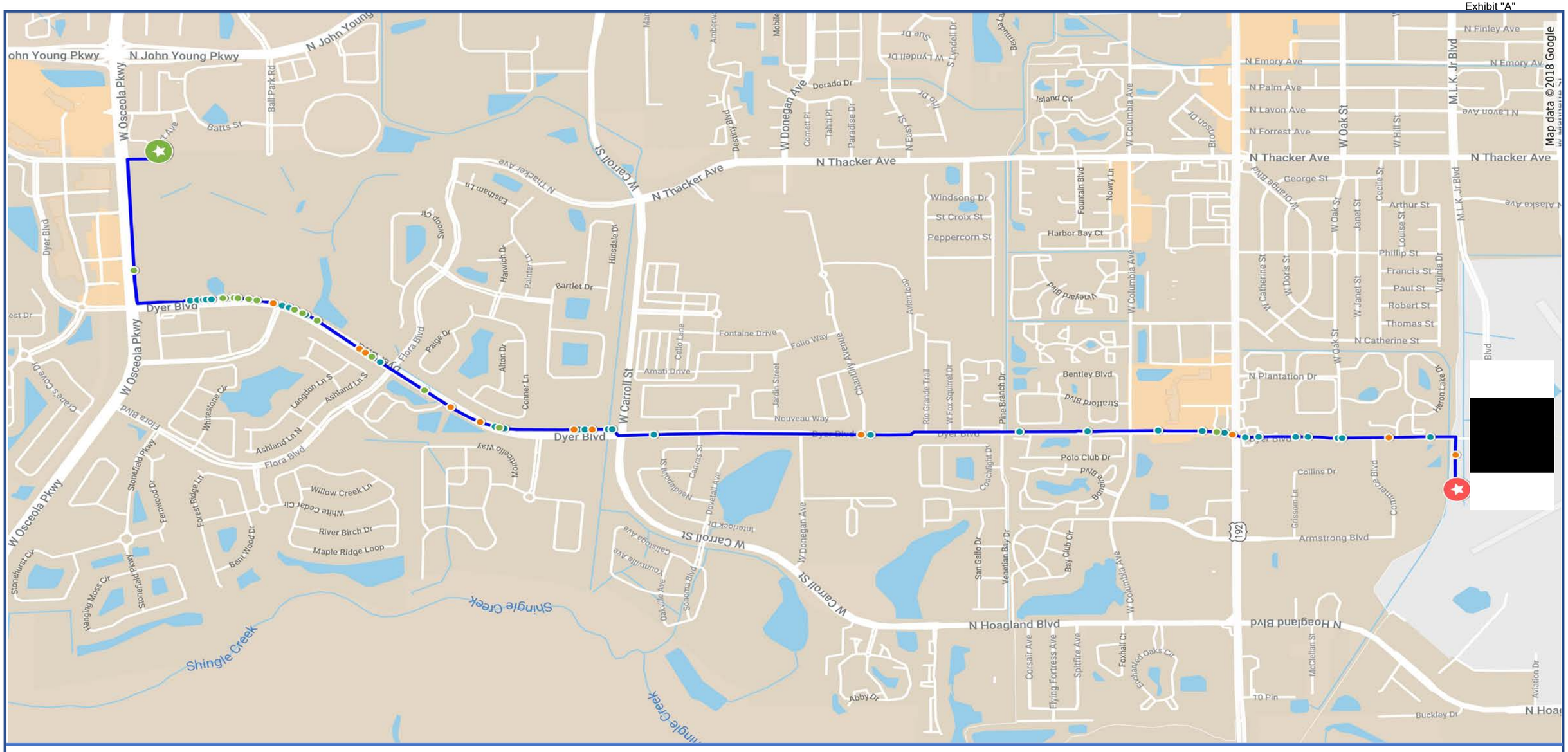
- Insertion
- Extraction
- Gas Pocket
- Slugs

N

LS-79 FORCE MAIN INSPECTION	
LENGTH	9,698 FT
MATERIAL	DIP
DIAMETER	16
AS-BUILT YEAR	1993
GAS POCKETS	20
SLUGS	2

pure TECHNOLOGIES
a xylem brand

Exhibit "A"



Map Legend

- Insertion
- Extraction
- Gas Pocket
- Slugs
- Entrained Air

N

LS-116 FORCE MAIN INSPECTION	
LENGTH	20,184 FT
MATERIAL	DIP
DIAMETER	24/30
AS-BUILT YEAR	1994
GAS POCKETS	33
SLUGS	15
ENTRAINED AIR	11

pure TECHNOLOGIES
a xylem brand

APPENDIX B
Completed/Proposed Excavations

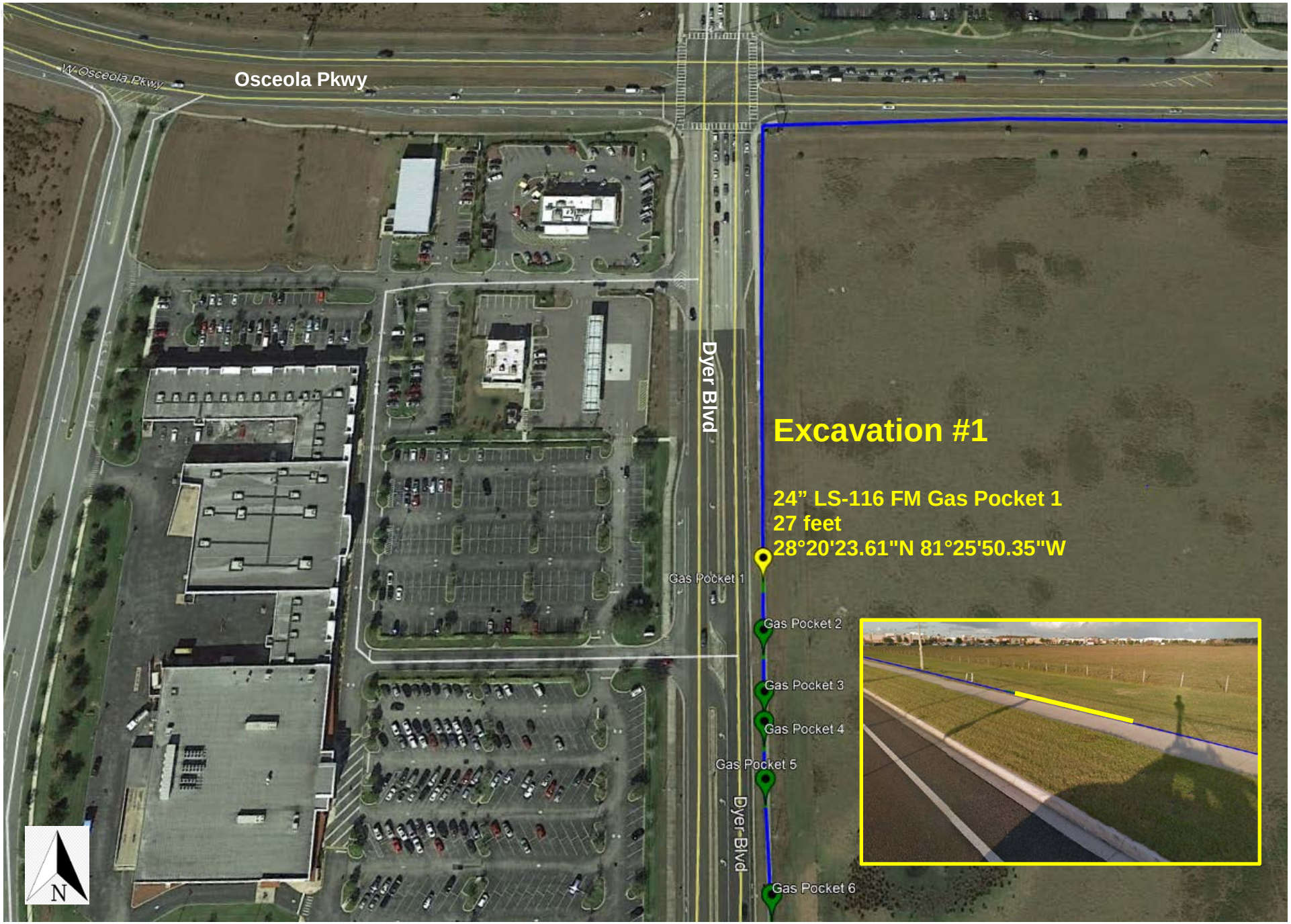

W Osceola Pkwy
Osceola Pkwy
Dyer Blvd
Excavation #1
24” LS-116 FM Gas Pocket 1
27 feet
28°20'23.61"N 81°25'50.35"W
Gas Pocket 1
Gas Pocket 2
Gas Pocket 3
Gas Pocket 4
Gas Pocket 5
Gas Pocket 6
Dyer Blvd
N

Exhibit "A"

Excavation #2

24” LS-116 FM Gas Pocket 16
22 feet
28°19'35.52"N 81°26'11.00"W
INCLUDE ADDITIONAL 20 FT FOR TESTING

Exhibit "A"


Gas Pocket 24
Dyer Blvd
Gas Pocket 25
Excavation #3
24" LS-116 FM Gas Pocket 25
32 feet
28°18'17.54"N 81°26'11.54"W
US-192
192
N
© 2018 Google

Exhibit "A"

Excavation #4

30” LS-116 FM Gas Pocket 32
37 feet
28°17'52.46"N 81°26'12.20"W
INCLUDE ADDITIONAL 20 FT FOR TESTING

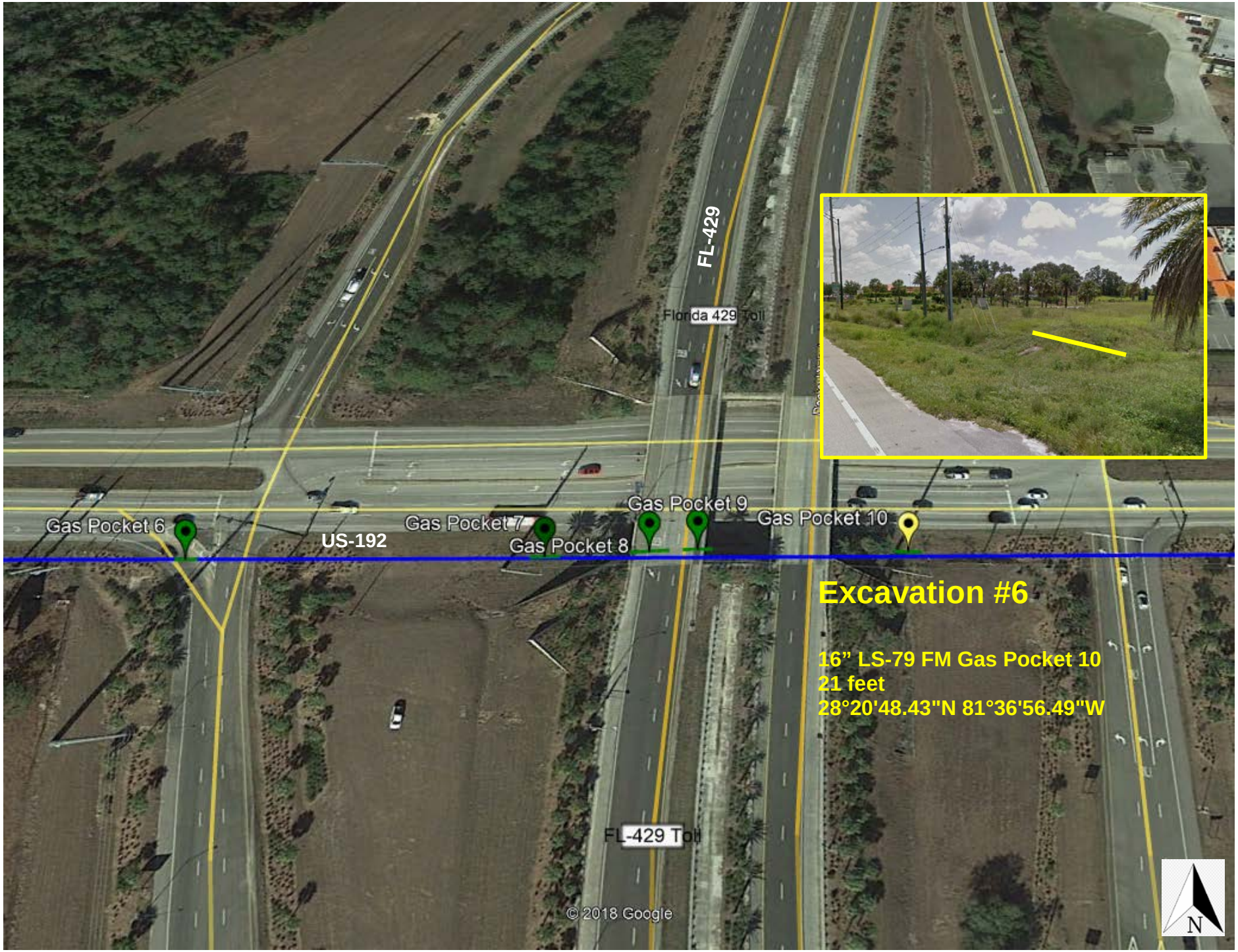
T

F

LS-6 Driveway

Exhibit "A"


W Orange Lake Blvd
US-192
W Irlo Bronson Memorial Hwy
192
Gas Pocket 2
Gas Pocket 3
Gas Pocket 4
Gas Pocket 5
Excavation #5
16” LS-79 FM Gas Pocket 4
26 feet
28°20'48.37"N 81°37'19.85"W
INCLUDE ADDITIONAL 20 FT FOR TESTING
N



Excavation #6

16” LS-79 FM Gas Pocket 10
21 feet
28°20'48.43"N 81°36'56.49"W

Exhibit "A"

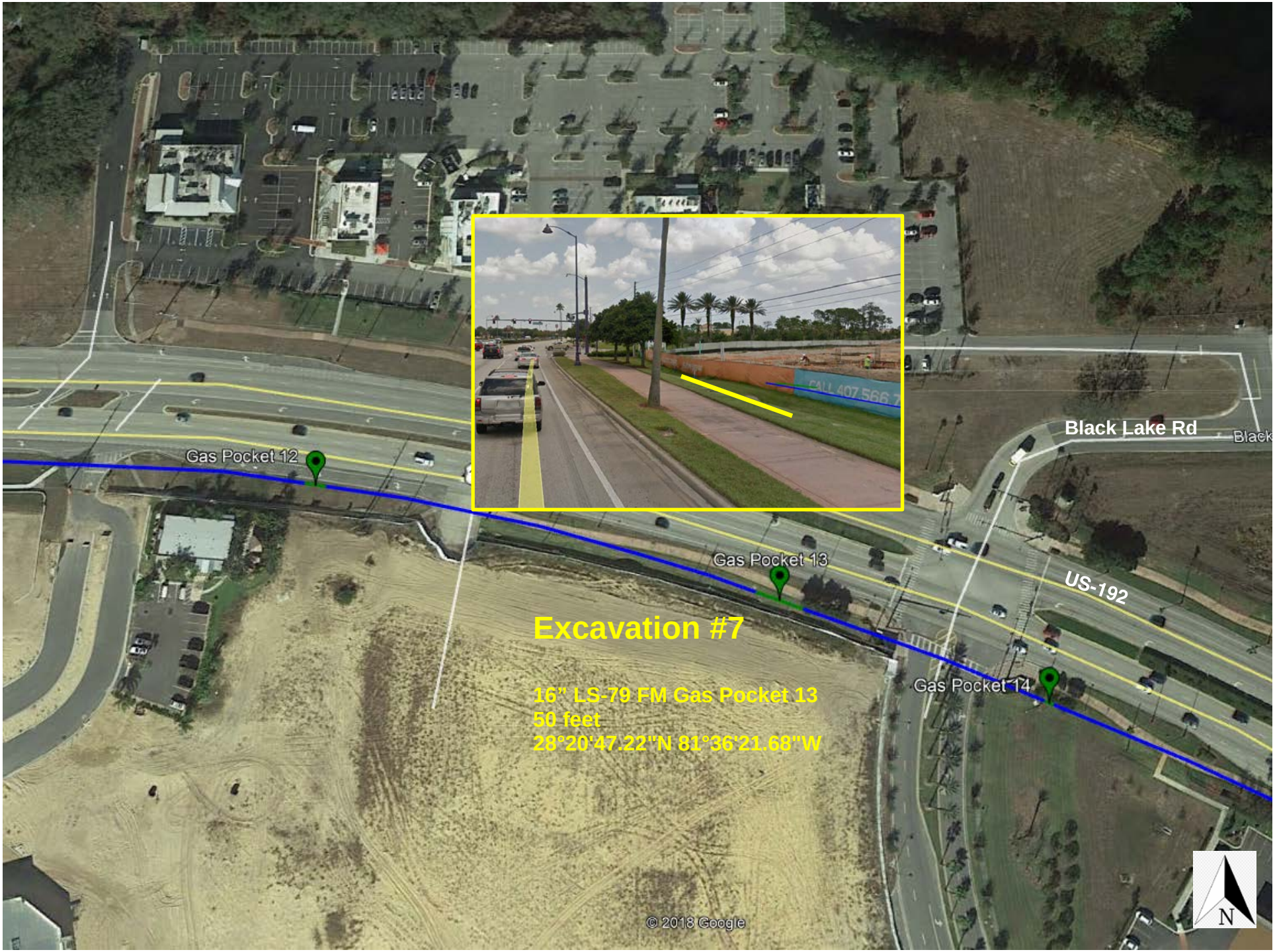

Gas Pocket 12
Gas Pocket 13
Gas Pocket 14
Black Lake Rd
US-192
Excavation #7
16" LS-79 FM Gas Pocket 13
50 feet
28°20'47.22"N 81°36'21.68"W
© 2018 Google
N

Exhibit "A"

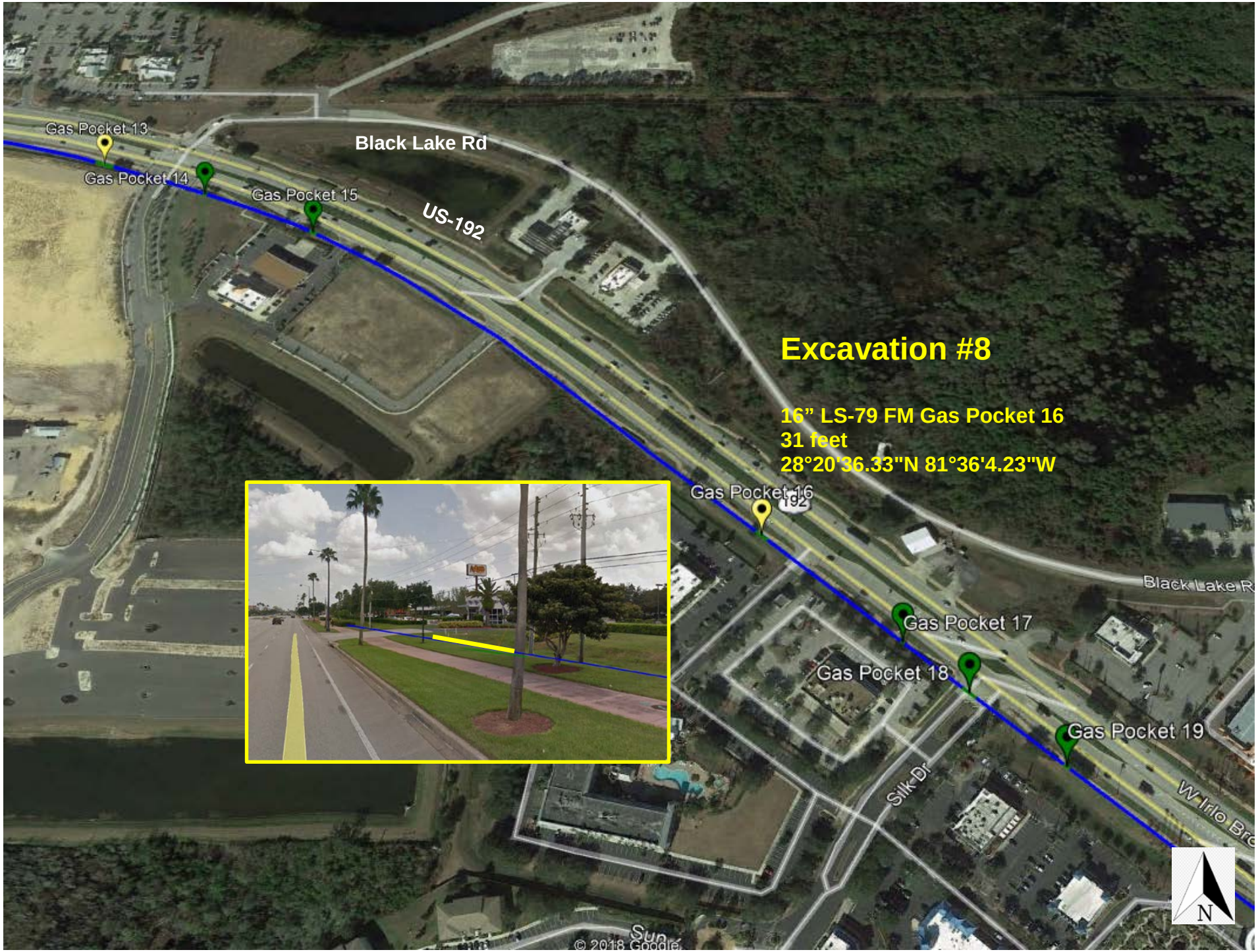

Gas Pocket 13
Gas Pocket 14
Gas Pocket 15
Black Lake Rd
US-192
Excavation #8
16” LS-79 FM Gas Pocket 16
31 feet
28°20'36.33"N 81°36'4.23"W
Gas Pocket 16
192
Black Lake R
Gas Pocket 17
Gas Pocket 18
Gas Pocket 19
Silk Dr
W Irlo Bro
N
© 2018 Google

Exhibit "A"


W Penfield St
Excavation #9
24” LS-35 FM Gas Pocket 1
91 feet
28°17'11.89"N 81°24'47.32"W
Gas Pocket 1
Gas Pocket 2
S Clyde Ave
Mound Ave
Conte
W Portage St
W Hughey St
Canterbury Ln
N

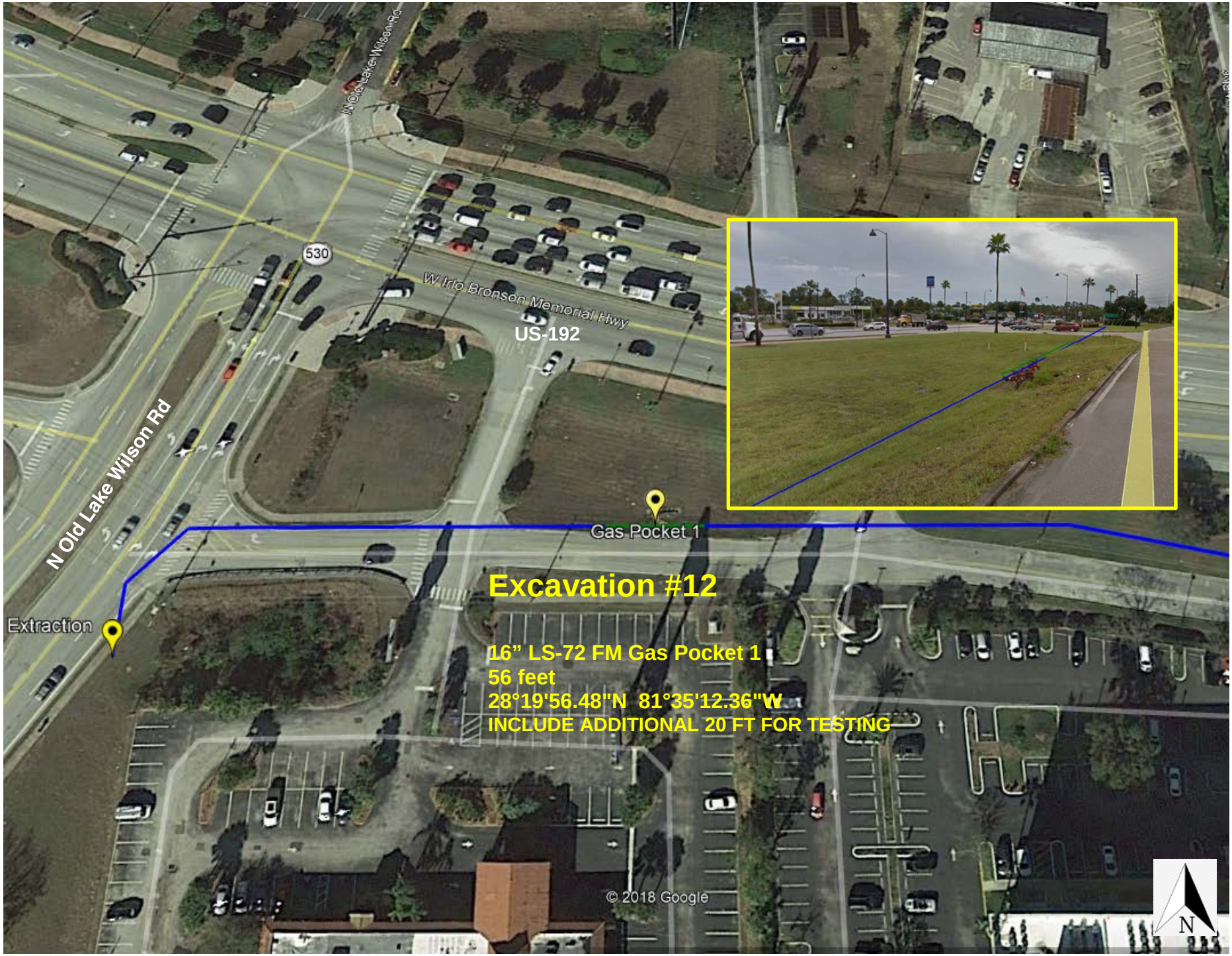
Exhibit "A"


Gas Pocket 6
Excavation #10
24” LS-35 FM Gas Pocket 6
201 feet
28°16'57.66"N 81°25'4.99"W
INCLUDE ADDITIONAL 20 FT FOR TESTING
Harrelson Lane
S John Young Pkwy
92
© 2018 Google
N

Exhibit "A"


W Clay St
Clay St
Gas Pocket 1
LS 57 Driveway
Excavation #11
30” LS-57 FM Gas Pocket 1
35 feet
28°16'56.62"N 81°25'13.73"W
INCLUDE ADDITIONAL 20 FT FOR TESTING
© 2018 Google
N

Exhibit "A"


530
W Irlo Bronson Memorial Hwy
US-192
N Old Lake Wilson Rd
Gas Pocket 1
Extraction
Excavation #12
16” LS-72 FM Gas Pocket 1
56 feet
28°19'56.48"N 81°35'12.36"W
INCLUDE ADDITIONAL 20 FT FOR TESTING
© 2018 Google
N

APPENDIX C
Transient Pressure Analysis

APPENDIX D
Advantages and Limitations of the SmartBall Tool

D.1 Anomaly Locating

The on-board accelerometer records the rotation of the SmartBall tool, this data can be translated to a rate of rotation. From there a velocity profile for the device can be generated as it travels the entire length of the pipeline. This data is aligned with the acoustic recordings to give a precise location of any recorded anomaly. To correlate the accelerometer data to an absolute position and time, a reference point is required. Tracking the position of the SmartBall tool via SmartBall Receivers (SBRs) provides a time and position to be stamped on the velocity profile, resulting in a position versus time relationship for the entire run of the device that is used to report the location of a leak, pocket of trapped gas or PWA stress anomaly.

D.2 SmartBall Tool Tracking

The SBR is a device that is used to track the position of the SmartBall tool as it traverses the pipeline. The SBR comprises a GPS receiver, and a processing computer. Both the SmartBall tool and the SBR are synchronized to standard GPS time.

Surface mounted sensors (SMS) are mounted to the pipeline at planned locations and are connected to an SBR via coaxial cable. The SBR and SMS combination detects ultrasonic pulses emitted from the SmartBall tool. The SBR determines the time taken for the pulse to travel from the SmartBall tool to the SBR and calculates the location of the SmartBall tool at any given time. Figure D.1 shows an SMS, which is typically mounted to the pipeline itself or pipeline appurtenance.

Figure D.1: SMS Adhered to a Flange

This locational data is paralleled with the data extracted from the SmartBall tool. This combination is then used to identify the locations of leaks and pockets of trapped gas.

D.3 Advantages and Limitations of the SmartBall PWA Technology

The SmartBall technology acquires high quality acoustic data that is evaluated to identify leaks, pockets of trapped gas and PWA stress anomalies as well as magnetometer data related to varying levels of stress in the pipeline. While other leak detection and condition assessment techniques such as noise loggers and correlators may identify anomalies between sensors, they cannot accurately locate the limits of an anomaly nor identify multiple anomalies. The SmartBall tool travels directly past each pipe section of interest and thus significant advantages are recognized.

SmartBall Tool:

1. Length of Survey: SmartBall technology has the ability to record data for over 18 hours. Depending on flow rates, the tool can inspect long pipelines during a single deployment. The longest single recording within a water pipeline with a single deployment had the SmartBall tool recorded data for a length of pipeline exceeding 30 miles.

2. Reported Locations: Reported locations contained in this report are believed to be accurate to within +/- 6 feet. However, there are several factors that would decrease the accuracy of locating leaks and gas pockets along with the PWA anomaly locations; placement of SBR locations or the drawings or dimensions provided by the client are incorrect. All reported location are based off of drawing provided. If distance between known locations are incorrect, the error in the location is affect by the same ratio.

Leak and Gas Pocket Detection:

1. Medium and Large Diameter Pipes: SmartBall technology has successfully inspected and detected leaks on a wide range of medium and large diameter pipelines (12 to 96 inches in diameter) (300 millimeters to 2400 millimeters in diameter). Many conventional leak detection technologies (e.g., correlators) have limitations that preclude their use on medium and large diameter pipes. PWA stress anomalies can be detected on pipes up to 48-inches in diameter.

2. Pipe Material: The SmartBall tool's leak detection ability is not affected by pipe material, however, PWA data is collected only on metallic pipelines. Because the tool passes by the point at which the acoustic event is being created, the pipe wall is not relied on to transmit the acoustic event through the line to a sensor located far away from the actual event of interest. This greatly increases the SmartBall tool's sensitivity and ability to distinguish between separate acoustic events.

3. Sensitivity: The sensitivity of all leak detection technologies is a function of several variables and as a result, no resolute thresholds can be established. However, the acoustic sensor inside the SmartBall tool always passes within one (1) pipe diameter of an acoustic anomaly; therefore, it can be used to identify very small leaks due to the proximity of the SmartBall tool to the leak. It should be noted that the SmartBall technology cannot differentiate between a true leak, a simulated leak, and the potential noise of a pressure reducing valve. As such, acoustic anomalies corresponding to features on a main should be investigated further in the field.

4. Minimum Pressure: The acoustic activity associated with a leak is derived from the pressure differential across the pipe wall. With little to no pressure differential, the SmartBall tool will not detect leakage as there will be no associated acoustic activity. Pure Technologies recommends a minimum pressure of 15 pounds per square inch (psi) 1.03 Bar for leak detection inspections; however, under ideal conditions leaks have been detected in pipelines with pressures as low as 5 psi 0.34 Bar. There is no minimum pressure recommendation for the detection of areas of trapped gas.

5. Ambient Noise: The SmartBall technology detects and reports anomalies that have acoustic characteristics similar to leaks on pressurized pipelines. However, other forms of ambient noise may be identified during the data analysis. For medium and large leaks, there is very little that can match these acoustic characteristics; therefore, these events are reported with a high degree of certainty. For small leaks, there may be other forms of ambient noise with

similar acoustic signatures, making these signals more difficult to evaluate. Pure Technologies has invested significant resources into characterizing acoustic anomalies and consequently asserts that leaks described in this report are leaks, unless otherwise noted. However, unknown pressure reducing valves, cracked valves in close proximity to the subject pipeline, interconnected pipelines that have not been completely isolated, and leaks in pipelines immediately adjacent to the subject pipeline can contain a similar acoustic signature and could be reported as leaks. Cars, pumps, boat traffic, and other forms of common ambient noise should not be reported as leaks as they generate different acoustic signatures.

APPENDIX E
AWWA C-150 Structural Analysis

Exhibit "A"

C-150 Structural Analysis

[redacted] Ductile Iron Pipe

Report Prepared for:

[redacted]

By:

Pure Technologies U.S. Inc.
January 2020

3040 Route 22 West, Suite 130 | Branchburg, New Jersey 08876 | 908-526-6600 | www.puretechltd.com

Exhibit "A"

C-150 Structural Analysis

[redacted] Ductile Iron Pipe

Prepared for

[redacted]

By

Pure Technologies U.S. Inc.

January 2020

Quality Assurance and Quality Control Statement

By my signature, I attest that this report has been prepared and reviewed in accordance with the Pure Technologies U.S. Inc. Quality Assurance and Quality Control procedures:

01/25/20

Parvesh Dsingh, Project Manager — Date

NOTICE

This report contains confidential commercial information regarding proprietary equipment, methods, and data analysis, which is the property of Pure Technologies U.S. Inc. and Pure Technologies Ltd. It is for the sole use of [redacted] and its engineering consultants and is not to be distributed to third parties without the express written consent of Pure Technologies U.S. Inc.

Table of Contents

1. Objective

The primary purpose of this project is to calculate the minimum required thickness of ductile iron pipe (DIP) to withstand internal and external loads based on AWWA C150 Standard.

2. Pipeline information

The [redacted] pipeline consists of six regions: LS-6 (30-inch), LS-35 (24-inch), LS-57 (30-inch), LS-72 (30-inch), LS-79 (16-inch), and LS-116 (20-inch, 24-inch, and 30-inch). There is no information available regarding the thickness/pressure class of any of these pipelines. Table 2.1 to Table 2.6 list the design specification used by Pure Technologies for the structural analysis of the [redacted] ductile iron pipe (DIP).

Region LS-6 has an earth cover of 1.75 ft at station 66+00. Such a low earth cover causes a high live load at that station. A concrete block mat is placed there to prevent transferring live load to the pipe (Figure 2.1). The live load is considered to be zero for this station. Bedding/Laying condition of each region is as follows:

1- LS-6 region: Bedding is reported as Class C which (conservatively) is comparable to Type 3.
2- LS-35: Bedding Type 2.
3- LS-57: Bedding Type 2.
4- LS-72: Bedding Type 2.
5- LS-79 region: Bedding is reported as “crushed stone if wet, 98% of AASHTO T-180”. Considering the existence of crushed stone, most likely it is Type 4.
6- LS-116 region: Bedding Type 2.

Table 2.1: Dimensions and Material Properties of LS-6			
Diameter of Pipe (in)	30	Volumetric Flow (cfs)	13.36
Wall Thickness of the Steel Pipe (in)	Unknown	Young’s modulus of pipe (psi)	24000000
Operating pressure (psi)	30		

Table 2.2: Dimensions and Material Properties of LS-35			
Diameter of Pipe (in)	24	Volumetric Flow (cfs)	7.13
Wall Thickness of the Steel Pipe (in)	Unknown	Young’s modulus of pipe (psi)	24000000
Operating pressure (psi)	25		

Table 2.3: Dimensions and Material Properties of LS-57			
Diameter of Pipe (in)	30	Volumetric Flow (cfs)	17.4
Wall Thickness of the Steel Pipe (in)	Unknown	Young’s modulus of pipe (psi)	24000000
Operating pressure (psi)	35		

Table 2.4: Dimensions and Material Properties of LS-72			
Diameter of Pipe (in)	16	Volumetric Flow (cfs)	3.5

Wall Thickness of the Steel Pipe (in)	Unknown	Young's modulus of pipe (psi)	24000000
Operating pressure (psi)	26		

Table 2.5: Dimensions and Material Properties of LS-79			
Diameter of Pipe (in)	16	Volumetric Flow (cfs)	3.5
Wall Thickness of the Steel Pipe (in)	Unknown	Young's modulus of pipe (psi)	24000000
Operating pressure (psi)	21		

Table 2.6: Dimensions and Material Properties of LS-116			
Diameter of Pipe (in)	20, 24, 30	Volumetric Flow (cfs)	8.912
Wall Thickness of the Steel Pipe (in)	Unknown	Young's modulus of pipe (psi)	24000000
Operating pressure (psi)	37		

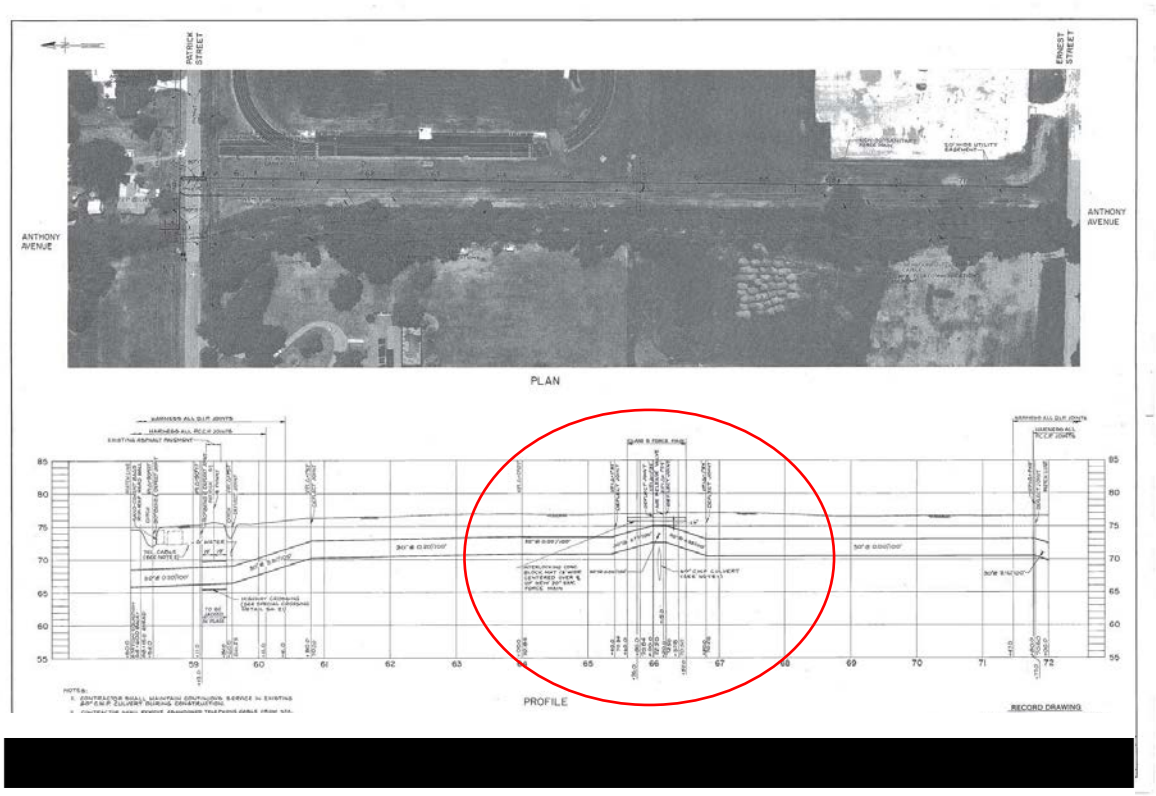


Figure 3.1: AWWA C150 structural design evaluation results.

3. AWWA C150 Analysis

The first edition of C150/A21.50, *American National Standard for Thickness Design of Ductile-Iron Pipe* was issued in 1965. The revisions were made in 1971, 1976, 1981, 1991, 1996, 2002, and 2008. The standard was reaffirmed in 1986 without any revision. The latest version was approved in 2014. The standard is now known as the AWWA C150 standard. The C150 standard provides general and technical information to be used as an aid in the design of ductile iron pipe.

Pure Technologies uses AWWA C150 design standard to evaluate the structural integrity of ductile iron pipe under its current working condition. AWWA C150 analysis compares pipe current or design thickness with calculated minimum required thickness to resist different criteria such as operating pressure, internal pressure (operating pressure plus surge pressure), deflection, and bending stress. If the calculated thickness is lower than the current/design thickness, the pipe meets the minimum requirement for that specific criterion. If not, it fails to meet the minimum requirement.

To prevent the complexity of combined loading and to be more conservative, AWWA C150 analyzes the internal and external loading separately. Therefore, one set of the equations only considers the effects of the internal pressures and the other set of equations only considers the impact of the external loading in the absence of internal pressure.

As the only structural component of a ductile iron pipe is the actual ductile iron wall itself, any loss of cross-sectional area due to corrosion has an immediate impact on the overall strength of the pipe. Calculating the critical thickness and comparing that to the measured thicknesses for each pipe can determine the maximum allowable corrosion in the damaged pipe. Mentioned criteria are discussed below per AWWA C150 design standard.

3.1. Internal Pressure

The pipe wall thickness to resist internal pressure is determined using Barlow's equation which calculates the net thickness:

$t = \frac{pD_o}{2s}$	(1)

Where:

t = pipe wall net thickness, in.

p = internal pressure, psi

D_o = outside diameter of pipe, in.

s = allowable design stress, psi

Allowable stress equals half of yield strength.

3.2. Trench Load (External Load)

Trench Load is expressed as vertical pressure in pounds per square inch and is equal to the sum of earth load P_e and truck load P_t. Earth load P_e is computed from Eq.2 for the weight of the unit prism of soil with height equal to the distance from the top of the pipe to the ground surface, the unit weight of soil is taken to be 120 lb/ft3. The truck loads were computed by Eq.3 using the surface load factors from Table 6 and reduction factor of R from Table 4 in the AWWA C150 standard. Truck load is calculated using a single AASHTO H-20 truck.

$$P_e = \frac{wH}{144}$$	(2)
$$P_t = RF\frac{CP}{bD_o}$$	(3)

Where:

w = unit weight of fill, lb/ft^3

H = Height of fill on top of pipe, ft

R = Reduction factor (AWWA C150, Table 4)

F = Impact factor (1.5)

C = Surface load factor (AWWA C150, Table 6)

P = Wheel load, lb

b = Effective pipe length (36 in)

3.3. Deflection

The minimum pipe wall thickness to resist trench load (dead load plus live load) is determined as follows:

$$P_v = \frac{\frac{\Delta x}{D_o}}{12K_x}\left[\frac{8E}{\left(\frac{D_o}{t_1}-1\right)^3}+0.732E'\right]$$	(4)

Where:

P_v = Trench load, psi

Δx = Design deflection, in

K_x = Deflection coefficient (AWWA C150, Table 2)

E = Elastic modulus of ductile iron, psi

E' = Modulus of soil reaction, psi

t_1 = Minimum manufactures thickness, in

Please be advised that minimum manufactured thickness (t_1) is different than net thickness (t).

3.4. Bending Stress

Minimum required thickness to withstand the bending stress is evaluated using following equation:

$$P_v = \frac{f}{3\left(\frac{D_o}{t}\right)\left(\frac{D_o}{t}-1\right)\left[K_b - \frac{K_x}{\frac{8E}{E'\left(\frac{D_o}{t}-1\right)^3}+0.732}\right]}$$	(5)

Where:

F = Design bending stress, psi (48000)

K_b = Bending moment coefficient (AWWA C150, Table 2)

3.5. Results

Using the equations presented in the AWWA C150 design standard, Pure Technologies calculated the minimum pipe wall thickness required to withstand both internal pressure and external loading along the length of the pipeline. The design check results are based on the latest edition (2014) of C150. The C150 Analysis results are shown in Figure 3.1 to Figure 3.6 for LS-6, LS-35, LS-57, LS-72, LS-79, and LS-116, respectively.

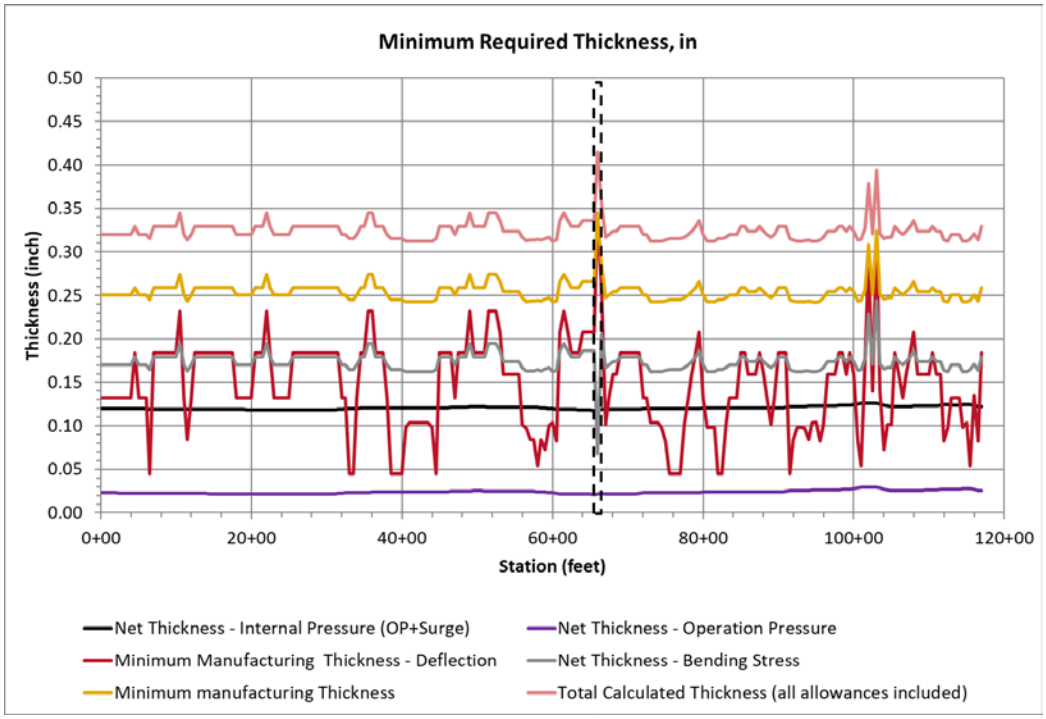


Figure 3.1: AWWA C150 structural design evaluation results for LS-6.

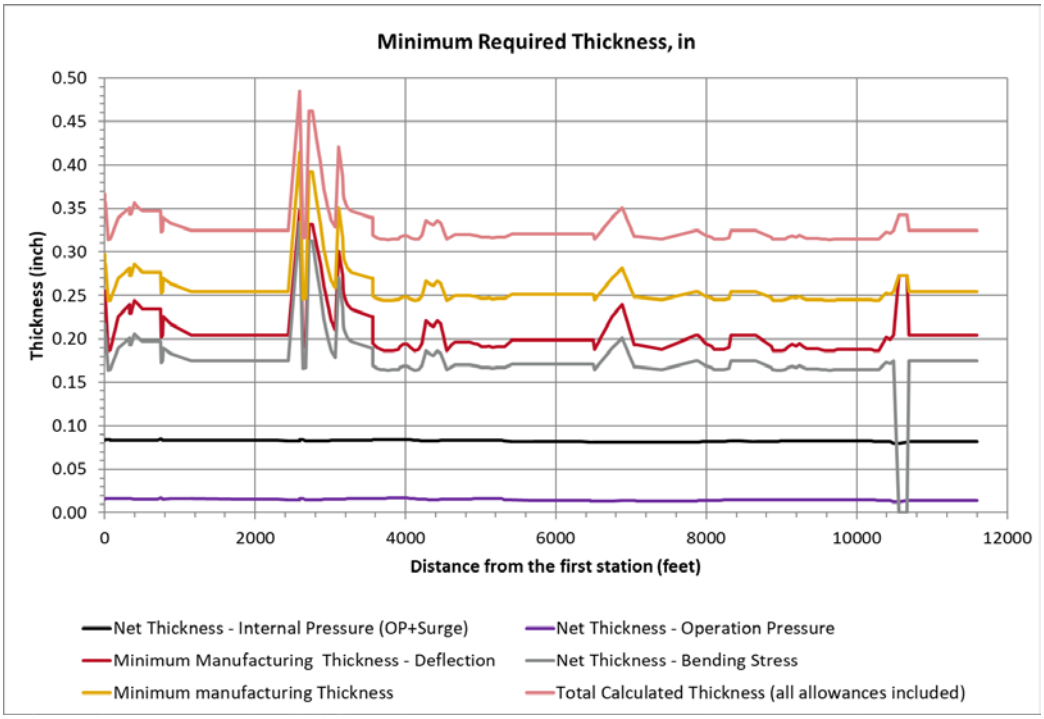


Figure 3.1: AWWA C150 structural design evaluation results for LS-35.

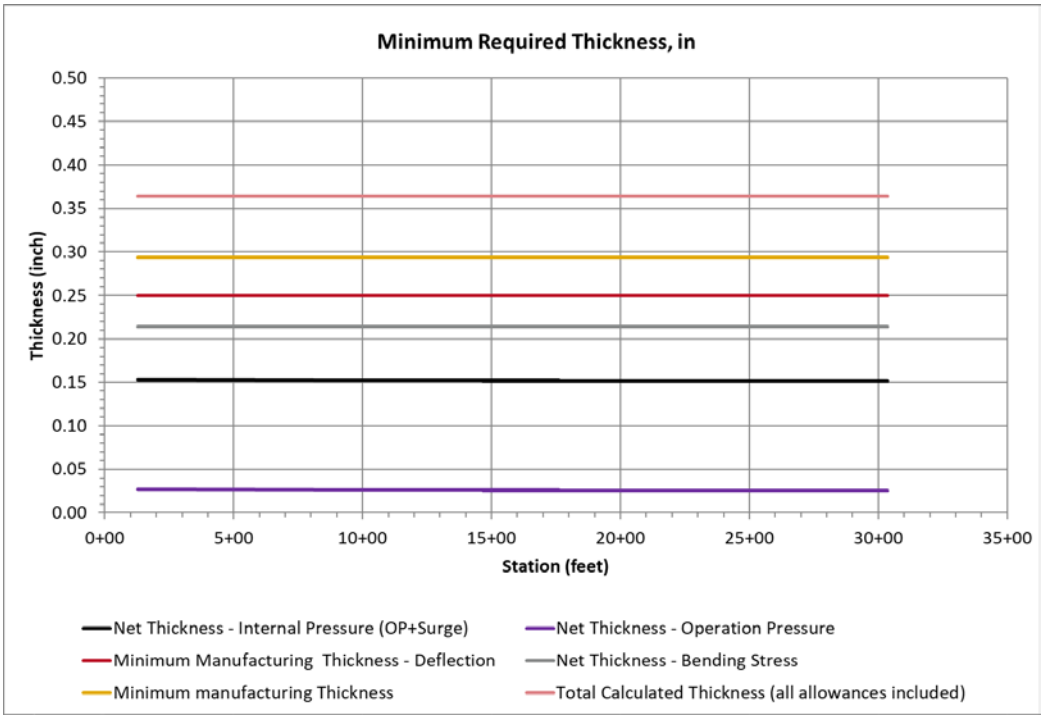


Figure 3.1: AWWA C150 structural design evaluation results for LS-57.

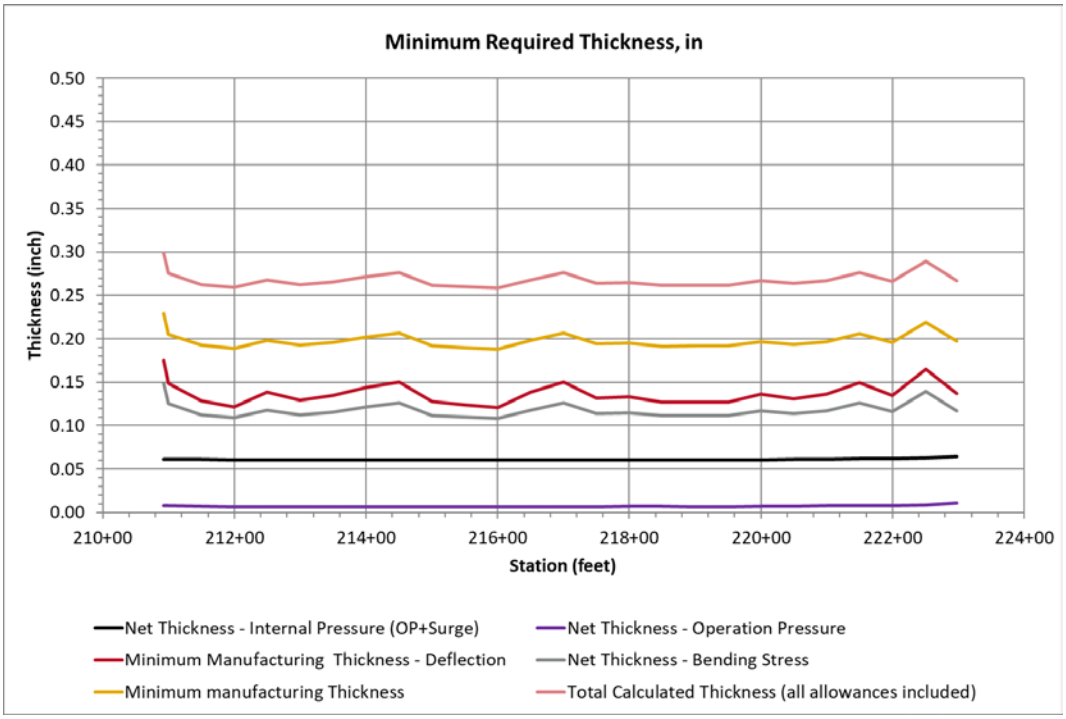


Figure 3.4: AWWA C150 structural design evaluation results for LS-72

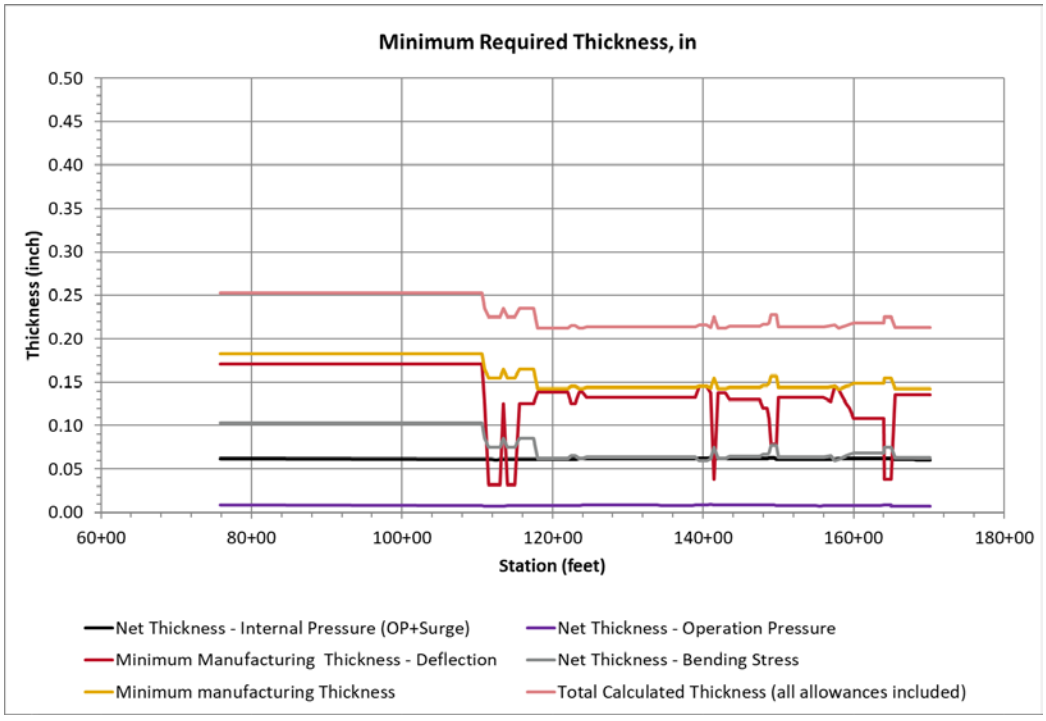
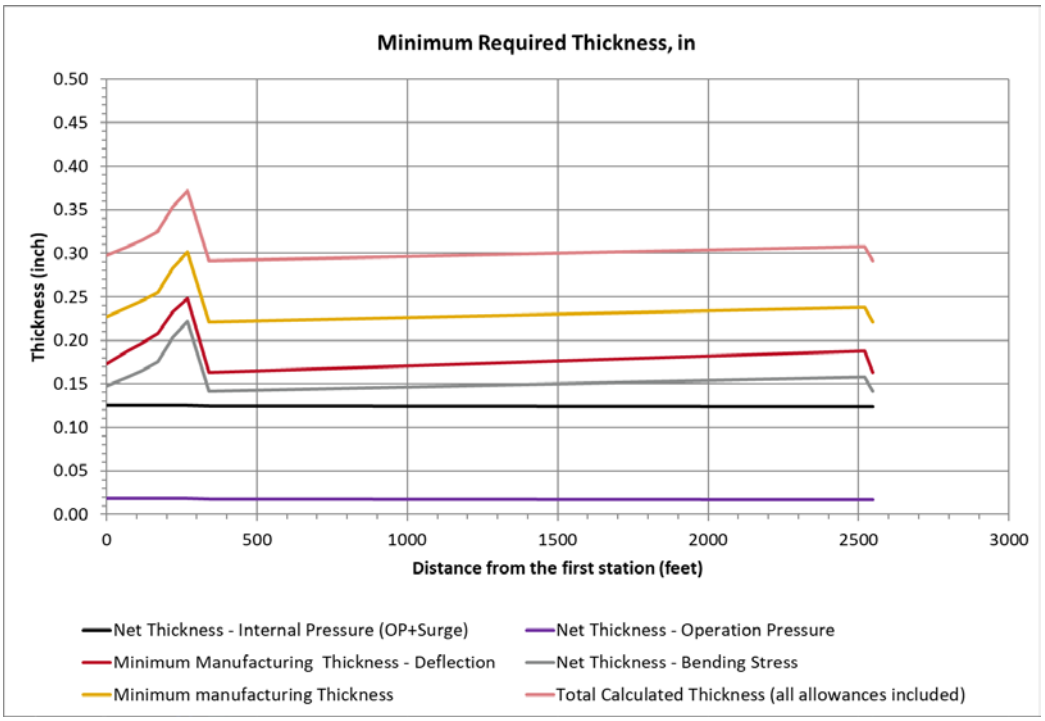
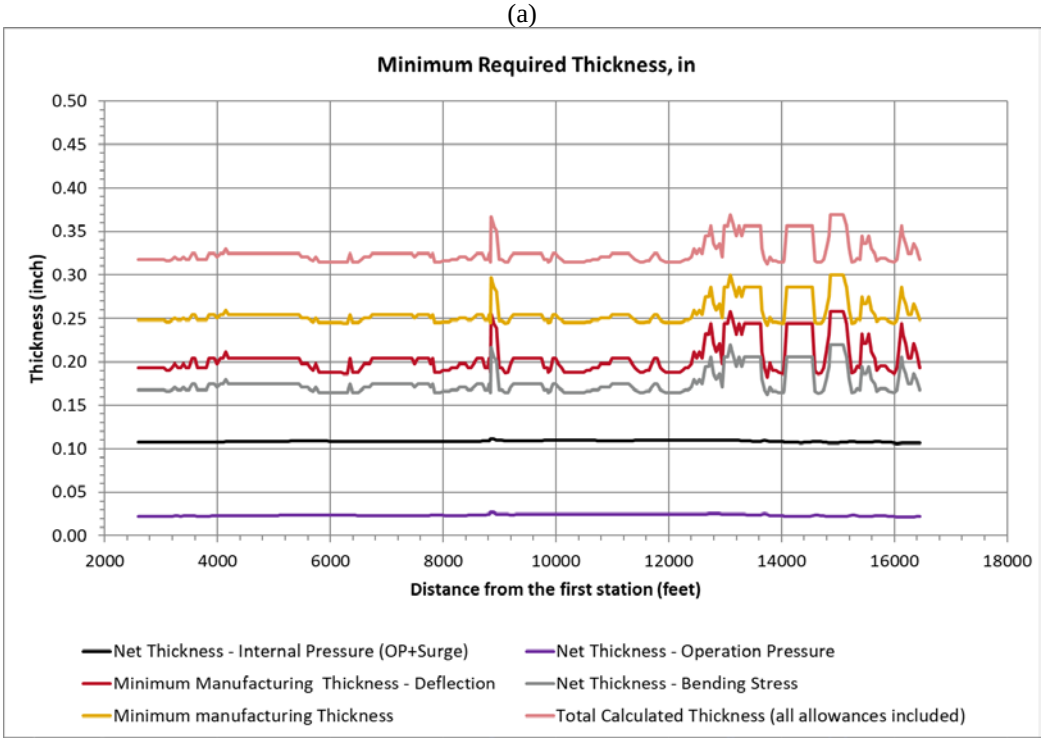


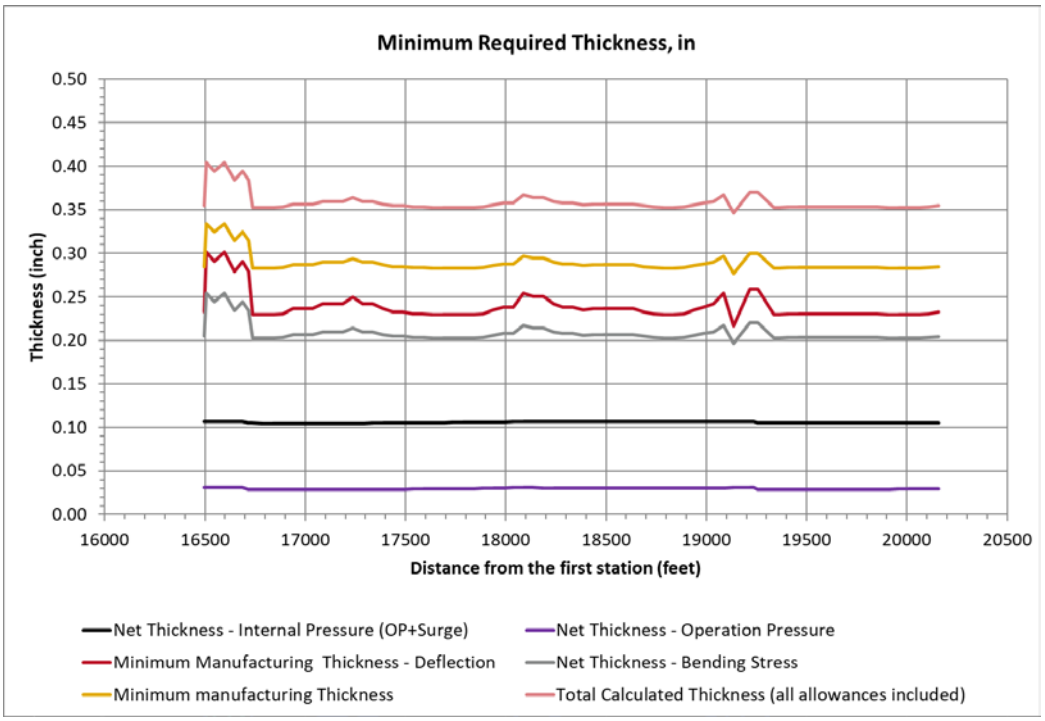
Figure 3.4: AWWA C150 structural design evaluation results for LS-79



(a)



(b)



(c)

Figure 3.2: AWWA C150 structural design evaluation results for LS-116. (a) 20-inch; (b) 24-inch; (c) 30-inch.

The x-axis displays the stationing along the entire length of the inspected section of the pipeline while the y-axis indicates the minimum required thickness. The purple line and black line show the thicknesses required to withstand the internal operating and operating plus surge pressures, respectively. The grey line is the required thickness for bending stress, the red line is the required thickness to resist deflection and the yellow line is the minimum required manufacturing thickness considering the service allowance of 0.08 in. Since the calculation of minimum required thickness to withstand deflection has the service allowance in it, the service allowance was just added to internal pressure, internal pressure plus surge pressure, and bending stress thickness requirements. The pink line represents the total calculated thickness (minimum required thickness to withstand the internal and external loads) by considering service allowance and casting tolerance (0.07 inch). Black dashed box shows location of concrete block pad.

Since the LS-116 consists of different contract with different station numbering, it is requested (by Parvesh Dsingh) that the provided results for this region to be based on distance rather than station numbering.

Due to lack of information about the pressure/thickness class of these pipelines, just the minimum required thickness was reported. Passing or failing to meet criteria in AWWA C150 Manual is not a valid discussion here due to lack of information.

4. Conclusion

The AWWA C150 Design Manual was used to evaluate the structural integrity of ductile iron pipe. Due to the lack of available data about bedding, two different types of bedding were studied, and results were reported.

Due to lack of information about the pressure/thickness class, just the minimum required thickness was reported.

APPENDIX F
External Verifications-Pipe Wall Thickness

(ATTACHED VIA EXCEL WORKSHEET)

APPENDIX G
Remaining Useful Life Analysis

Exhibit "A"

Remaining Useful Life Analysis

Lift Stations 35, 72, 79, and 116

Report Prepared for

[redacted]

By:

Pure Technologies, a Xylem brand

January 2020

Remaining Useful Life Analysis
Lift Stations 35, 72, 79, and 116

Report Prepared for

[redacted]

By:

Pure Technologies, a Xylem brand

January 2020

Quality Assurance and Quality Control Statement

By my signature I attest that this report has been prepared and reviewed in accordance with the Pure Technologies Ltd. Quality Assurance and Quality Control procedures:

	01/25/20
Parvesh Dsingh, Project Manager	Date

NOTICE

This report contains confidential commercial information regarding proprietary equipment, methods, and data analysis, which is the property of Pure Technologies, a Xylem brand. It is for the sole use of the [redacted] and its engineering consultants and is not to be distributed to third parties without the express written consent of Pure Technologies.

1 Introduction and Background

1.1 Purpose

[redacted] engaged Pure Technologies, a Xylem Brand (Pure) to develop a group of statistical models for a series of force mains. These models estimate the remaining useful life (RUL) of pipes as part of a pipe replacement program to be included in the capital budget.

The goal is to provide [redacted] with pipe RUL information that can then be used as a tool to identify a long-term management strategy, such as the frequency of periodic re-inspections, repairs, a continuous monitoring program, or a data driven schedule for replacement or twinning of the main.

1.2 Background

[redacted] requisitioned the services of Pure to perform inspections of the Lift Station 6 (LS-6), Lift Station 35 (LS-35), Lift Station 57 (LS-57), Lift Station 72 (LS-72), Lift Station 79 (LS-79) and Lift Station 116 (LS-116) ductile iron pipe (DIP) force mains. After detecting and locating leaks and gas pockets within the force mains using the SmartBall ® inline acoustic inspection tool, 15 locations on four force mains (LS-35, LS-72, LS-79, and LS-116) were excavated and inspected for direct pipe wall measurements using Insolated Component Testing (INCOTEST) and ultrasonic thickness testing (UT). The measured wall thicknesses from the testing were used for RUL calculations. A summary regarding the inspected force mains are reported in Table 1-1 below; basic information regarding pipe age and pipe size is also reported.

Table 1-1. Force Main Information Summary

Pipe Number	Excavation Count	Excavations at Gas Pocket Locations	Excavations at Non Gas Pocket Locations	Installation Year	Pipe Diameter (inch)
LS-35	2	2	0	1996	24
LS-72	2	1	1	1999	16
LS-79	5	3	2	1993	16
LS-116	6	4	2	1994	24, 30

Pure Technologies uses the AWWA C150 Standard to evaluate the structural integrity of ductile iron pipe under its current working conditions. The minimum required thickness, known as yield thickness, was drawn and combined with excavation locations by station number. The structural yield limit of each pipe has been chosen as its critical limit and the time span of reaching or exceeding yield limit is considered the pipe RUL.

2 Remaining Useful Life Analysis

By combining the structural analysis with condition data, estimates of when the pipeline should next be inspected along with a remaining service life of the asset can be completed. Pure Technologies recommends that RUL estimates should be used as guidance for re-inspection interval planning. Once additional inspections are completed, the data collected in that inspection can be analyzed in conjunction with the data presented in this report to provide a more accurate and robust RUL evaluation. It is important to note that these models are predictive in nature and as such are not explicit estimators of exact time to failure.

2.1 Methodology

RUL, also referred to as time-to-yield, is calculated using a statistical model that produces a distribution of probability of failure (PoF) values for a singular pipe. This model is based on the measured wall thickness from the inspection of that pipe and a computed minimum required thickness from the AWWA C150 design standard. In this case, the pipe wall thickness measurements collected during inspections during 2019 provide a data set for specific locations along the pipe and not for the full length of the pipe.

Rather than using the field measurements directly, we select a simulation approach to better account for uncertainty in the inspections. However, the measurements from the field are still directly involved in the proposed method. We first build a best-fit statistical distribution using the field readings, and over 10000 trials we iteratively draw a thickness value from this distribution and estimate RUL. From this we can compile and summarize the estimated RUL's.

2.2 Assumptions

Prior to the analysis, the following assumptions were considered.

1. The degradation rate is considered to be linear over the life of the pipe. The wall loss trend can be re-evaluated if future inspection data is collected.

2. The degradation rate is assumed to be uniform across the pipe. The degradation rate is assumed to be independent from one pipe to another.

Table 2-1. DIP Casting Tolerance

Diameter Range (inches)	Casting Tolerance (inches)
3-8	0.05
10-12	0.06
14-42	0.07
48	0.08
54-64	0.09

3. The nominal thickness is assumed to follow a normal distribution within the casting tolerance, since nominal thickness can vary due to the limitations within the manufacturing process. Table 2-1 shows the casting tolerances established in AWWA C151.

4. Based on the structural design standard results, the minimum required pipe wall thickness is considered the minimum manufacturing thickness of deflection.

5. The calculated RUL values are limited to the pipe wall thickness measurements gathered in the field in a pre-defined resolution.

6. RUL to Structural Failure is defined as the time at which the pipe wall has reached the minimum required thickness (yield thickness) based on the structural design standard. RUL to Structural Failure does not mean the pipe has or will fail, but that it no longer meets the minimum required design standards to withstand its current loading.

The remaining useful life is calculated based on the following formulas:

$$RUL\ to\ Structural\ Failure = \frac{Simulated\ Measured\ Thickness - Yield\ Thickness}{Degradation\ Rate} \quad (1)$$

$$Degradation\ Rate = \frac{Nominal\ Thickness - Simulated\ Measured\ Thickness}{(Inspection\ Year - Installation\ Year)} \quad (2)$$

Where the simulated measured thickness is the result given from the Monte Carlo simulations and the minimum required thickness is defined by the structural analysis results. Appendix A

Table 2-2. Pipe Information Used in RUL Analysis

Pipe Number	Excavation Location	Nominal Thickness (inch)	Yield Thickness (inch)	Casting Tolerance (inch)
LS-35	Dig 8, excavation 10A, Gas Pocket #5	0.33	0.21	0.07
LS-35	Dig 8, excavation 10B, Gas Pocket #5	0.33	0.21	0.07
LS-72	Dig 3, excavation 12a, Baseline	0.30	0.19	0.07
LS-72	Dig 3, excavation 12b, Gas Pocket #1	0.30	0.19	0.07
LS-79	Dig 1, excavation 5a, Gas Pocket #4	0.30	0.17	0.07
LS-79	Dig 1, excavation 5b, Baseline	0.30	0.17	0.07
LS-79	Dig 2, excavation 6	0.30	0.17	0.07
LS-79	Dig 4, excavation 7a	0.30	0.17	0.07
LS-79	Dig 4, excavation 7b, Baseline	0.30	0.17	0.07
LS-116	Dig 5, excavation 1, Gas Pocket #1	0.33	0.19	0.07
LS-116	Dig 6, excavation 2a, Gas Pocket #16	0.33	0.19	0.07
LS-116	Dig 6, excavation 2b, Baseline	0.33	0.19	0.07
LS-116	Dig 7, excavation 3, Gas Pocket #25	0.33	0.19	0.07
LS-116	Dig 9, excavation 4a, Gas Pocket #32	0.34	0.19	0.07
LS-116	Dig 9, excavation 4b, Baseline	0.34	0.19	0.07

shows the simulated measured thickness comparing to the actual measured thickness. Table 2-2 summarizes the values used in the RUL analysis for each dig location.

2.3 Results

The RUL calculations have been performed for each dig location using the pipe wall measurements from the inspection, known nominal thickness based on the design specifications, and minimum required thickness based on the structural analysis.

Figure 1 below shows the distribution of RUL to structural failure for Pipe LS-35 Dig Location 8 Excavation 10A. The rest of the RUL curves for the other dig locations are attached in Appendix B.

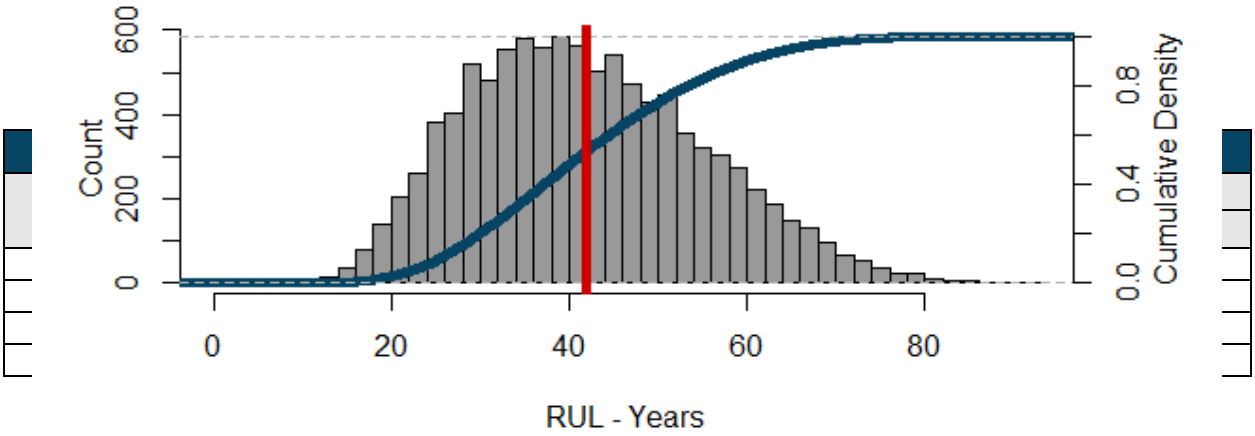


Figure 1: RUL for Pipe LS-35, Dig 8, Excavation 10A

The histogram bars represent the simulated count of pipes reaching the minimum required thickness each year (left y-axis). The “Count” is the count of outcomes from the Monte Carlo simulations for the subject excavation. The blue line represents the cumulative percentage of pipes reaching yield in percentage (right y-axis) and the red line represents the average of the RUL.

The RUL for each pipe is considered the smallest RUL from all its excavation locations. A summary of the average RUL for each of the inspected pipes are tabulated in Table 2-3.

Table 2-3. RUL Analysis Results Summary	
Pipe Number	**Average RUL to Structural Failure (Years)**
LS-35	31
LS-72	13
LS-79	19
LS-116	41

This model, along with structural analysis, provides insight as to the probability of failure of the pipeline. The results of this evaluation are based on the pipe wall thickness testing and statistical inferences of these locations and does not account for unforeseen factors such as manufacturing, installation, or operational defects that could lead to premature failure of the pipe. The probability of structural failure by years for each pipe and dig location are summarized in Table 2-4.

3 Conclusions and Recommendations

The fifteen (15) dig locations were evaluated by calculating across four (4) pipelines the RUL to structural failure and the probability of failure in 10 years and 20 years. Each of the pipelines have at least one dig location at a targeted gas pocket location. Results indicate that pipelines LS-72, LS-79, and LS-116 have excavation points where the calculated PoF within 20 years is significantly higher than the rest (>30%). These same locations have moderately high PoF within 10 years (12-33%), but the rest of the structure is relatively healthy based on the analysis of other dig locations. LS-35 has RUL greater than 30 years across all dig locations and low probability of structure failure until 20 years from the time of inspection.

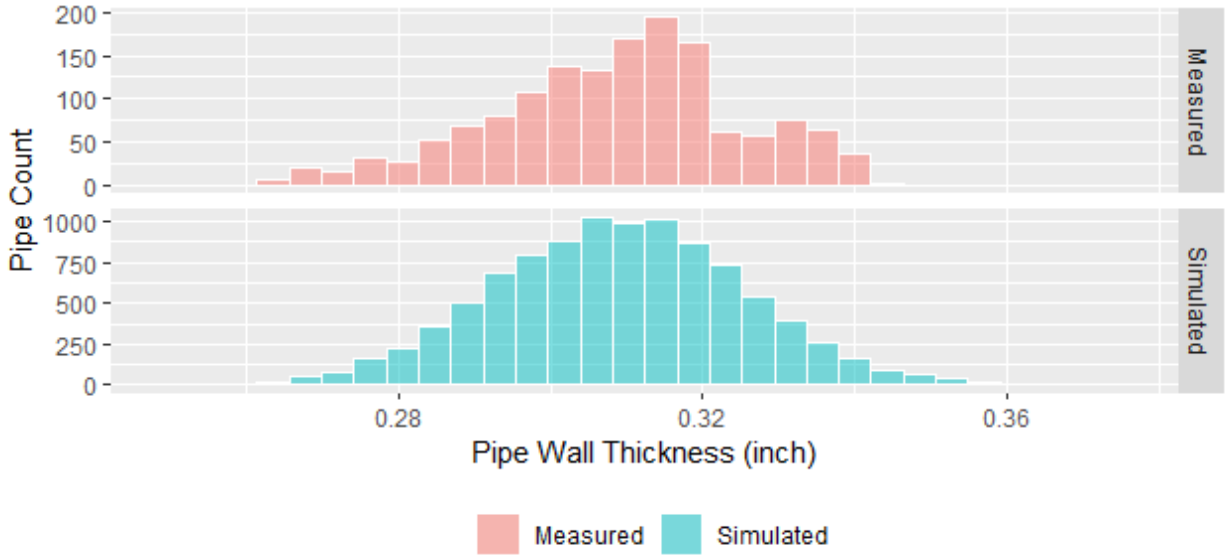
These results are reflective of the pipe wall measurements taken in discreet locations along the pipeline and are not representative of the condition of the full length of the pipeline. In order to understand the condition of the entire pipeline, either additional test pits or full inline assessment is recommended.

Exhibit "A"

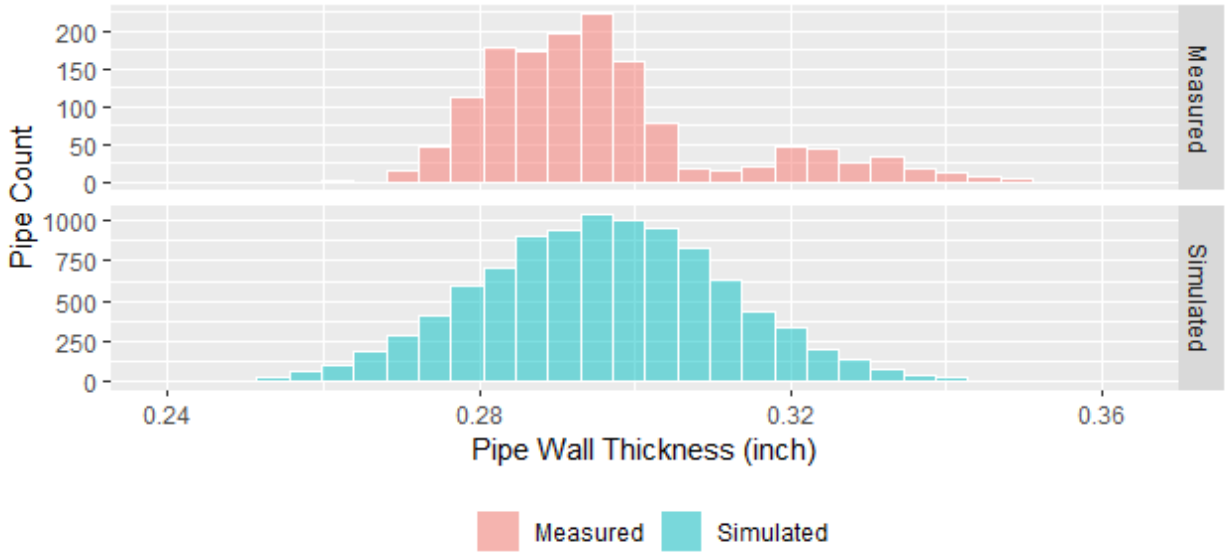
pure TECHNOLOGIES
a xylem brand

APPENDIX A

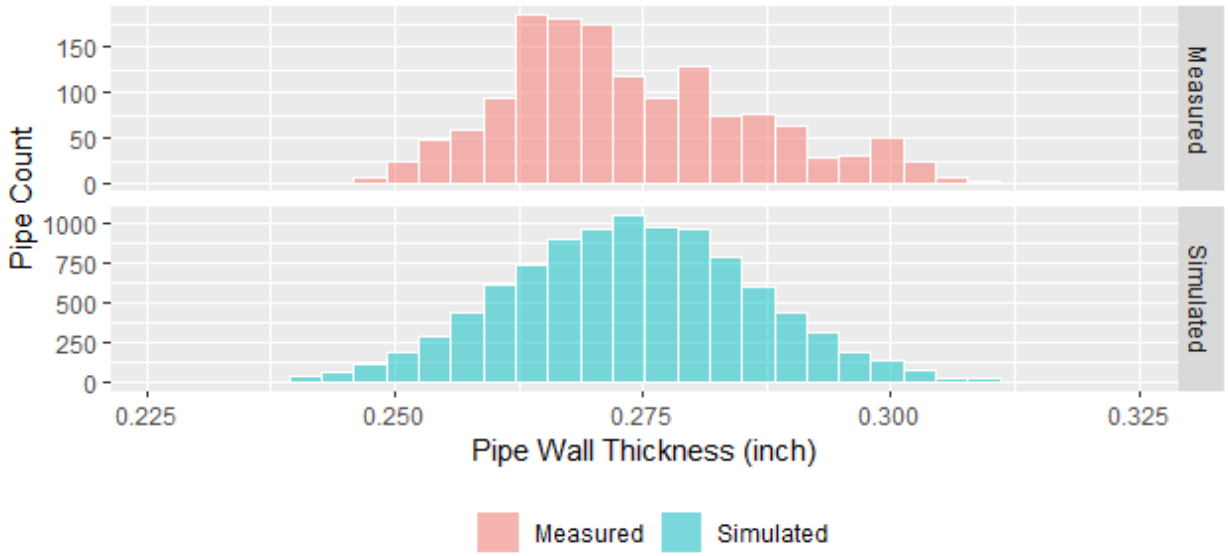
Histogram of Simulated Thickness and Measured Thickness



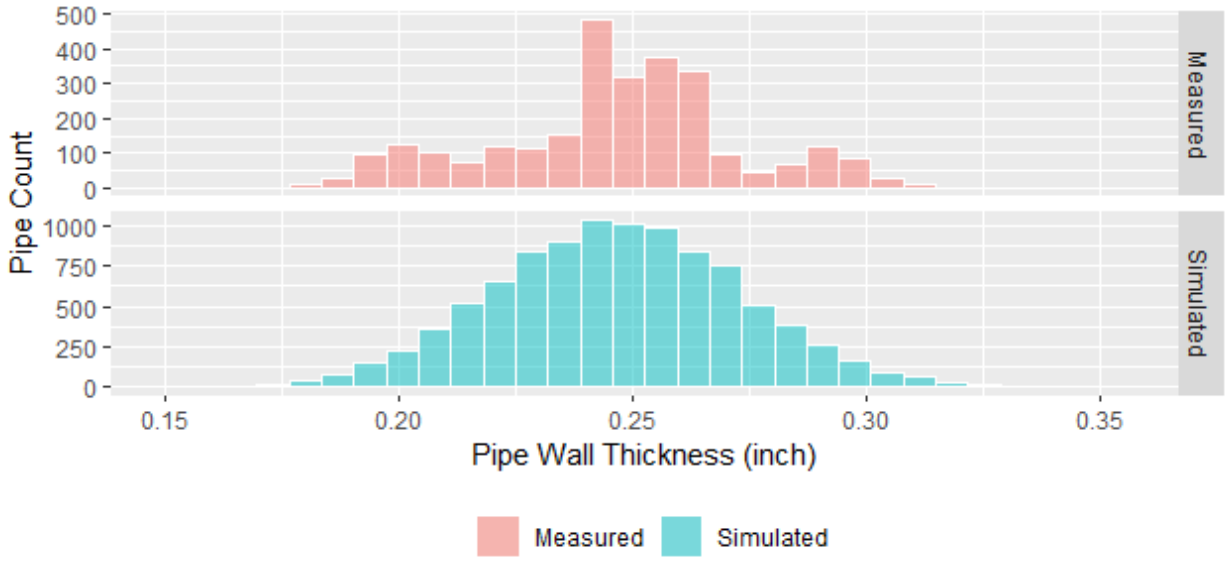
Pipe LS-35, Dig 8, Excavation 10A: Measured Thickness and Simulated Thickness



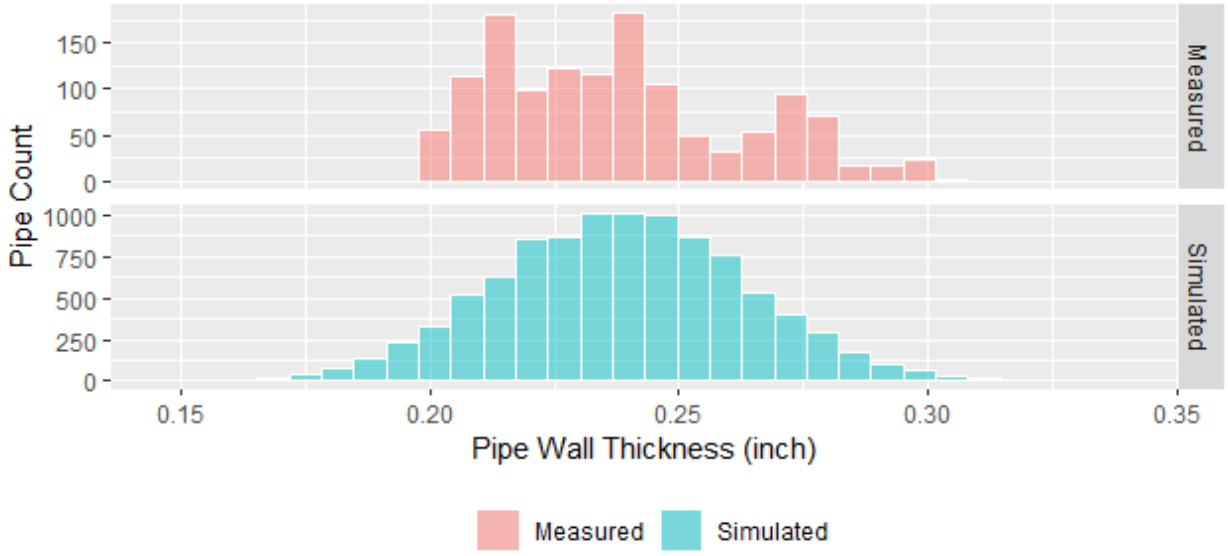
Pipe LS-35, Dig 8, Excavation 10B: Measured Thickness and Simulated Thickness



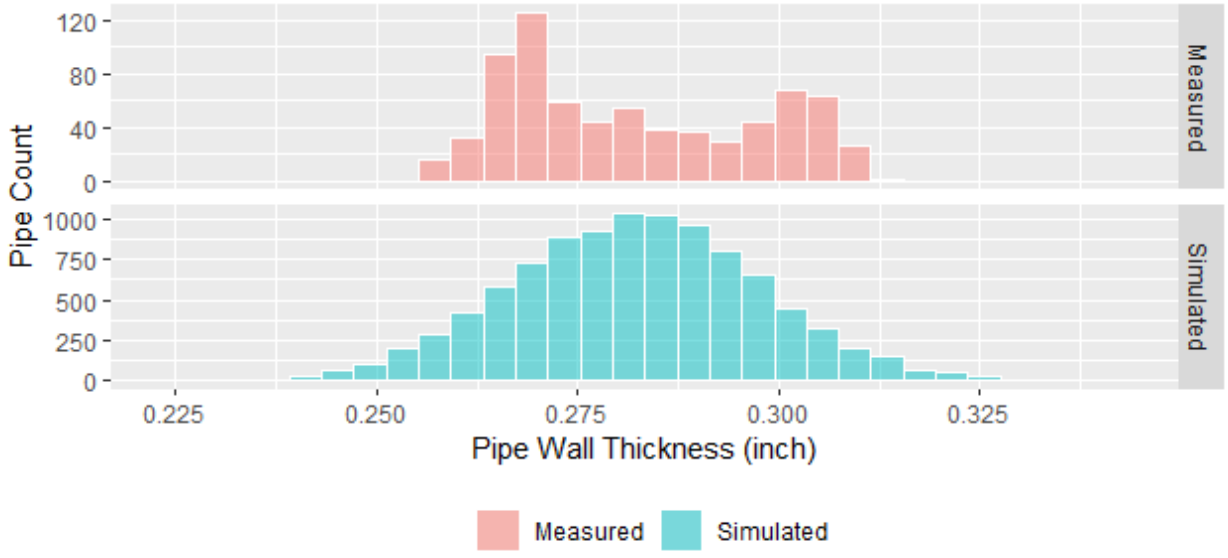
Pipe LS-72, Dig 3, Excavation 12A: Measured Thickness and Simulated Thickness



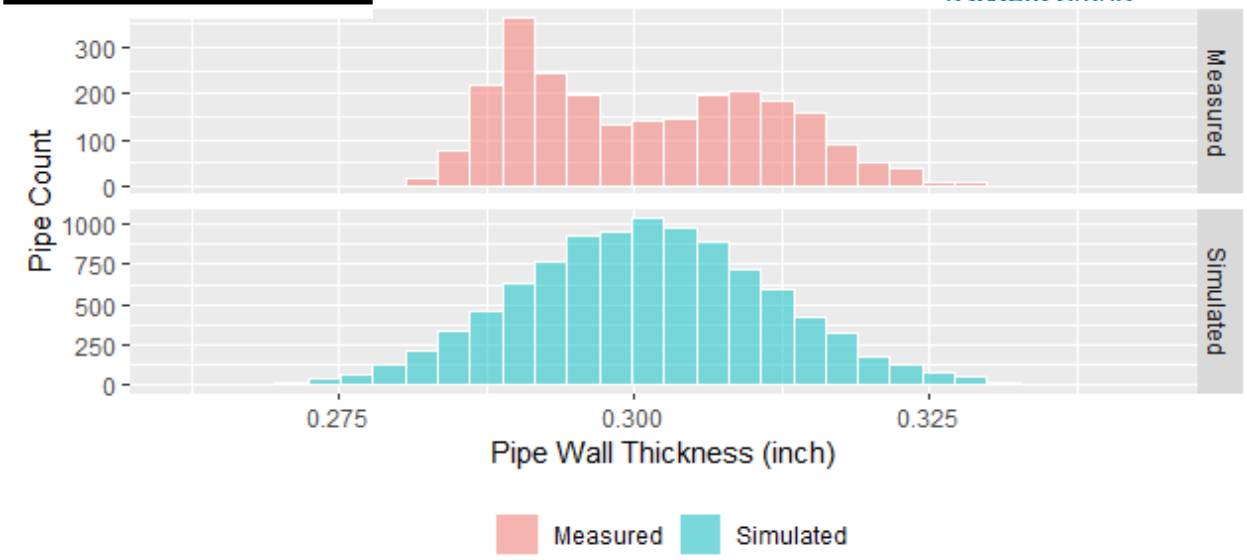
Pipe LS-72, Dig 3, Excavation 12B: Measured Thickness and Simulated Thickness



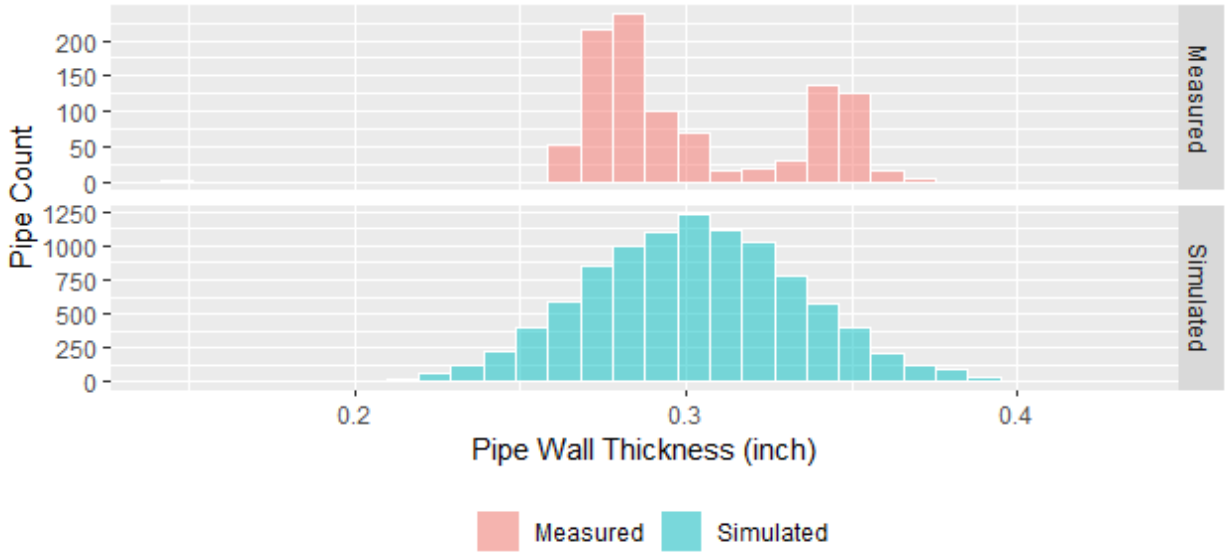
Pipe LS-79, Dig 1, Excavation 5A: Measured Thickness and Simulated Thickness



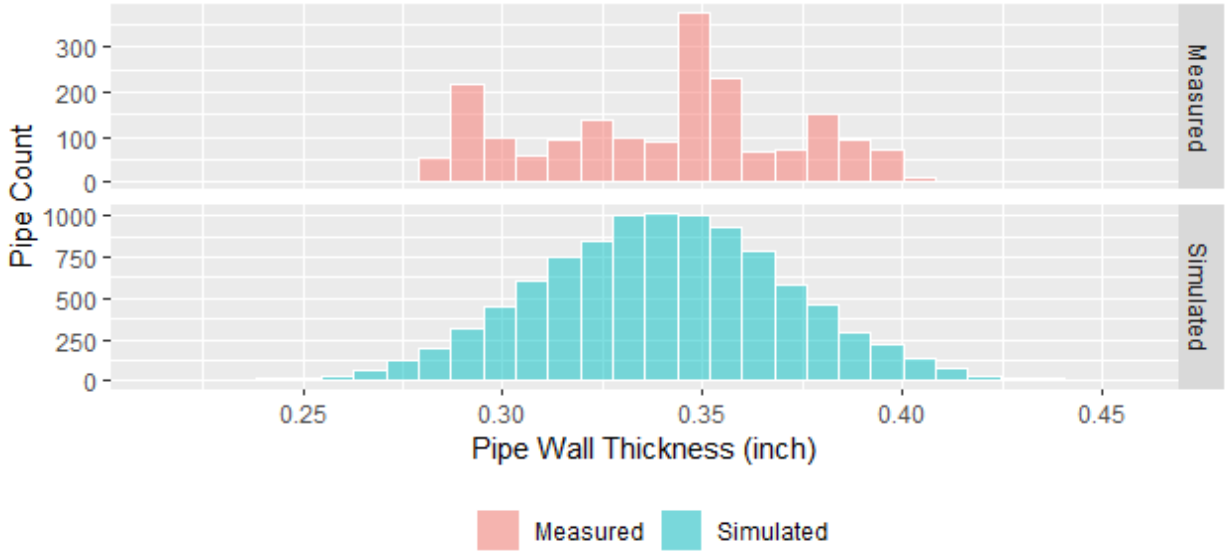
Pipe LS-79, Dig 1, Excavation 5B: Measured Thickness and Simulated Thickness



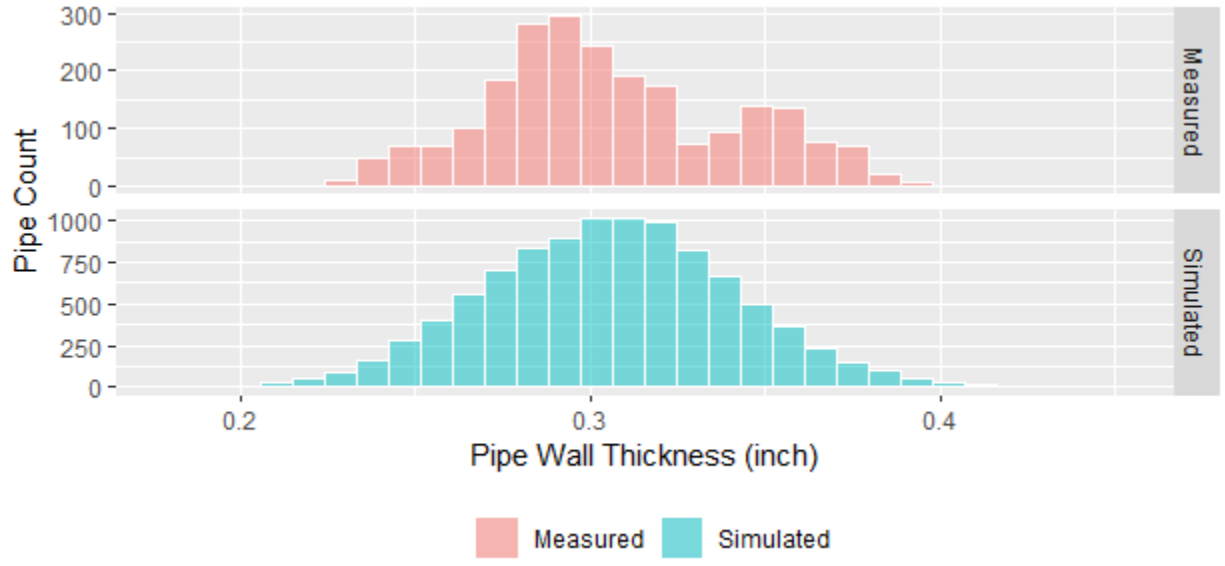
Pipe LS-79, Dig 2, Excavation 6: Measured Thickness and Simulated Thickness



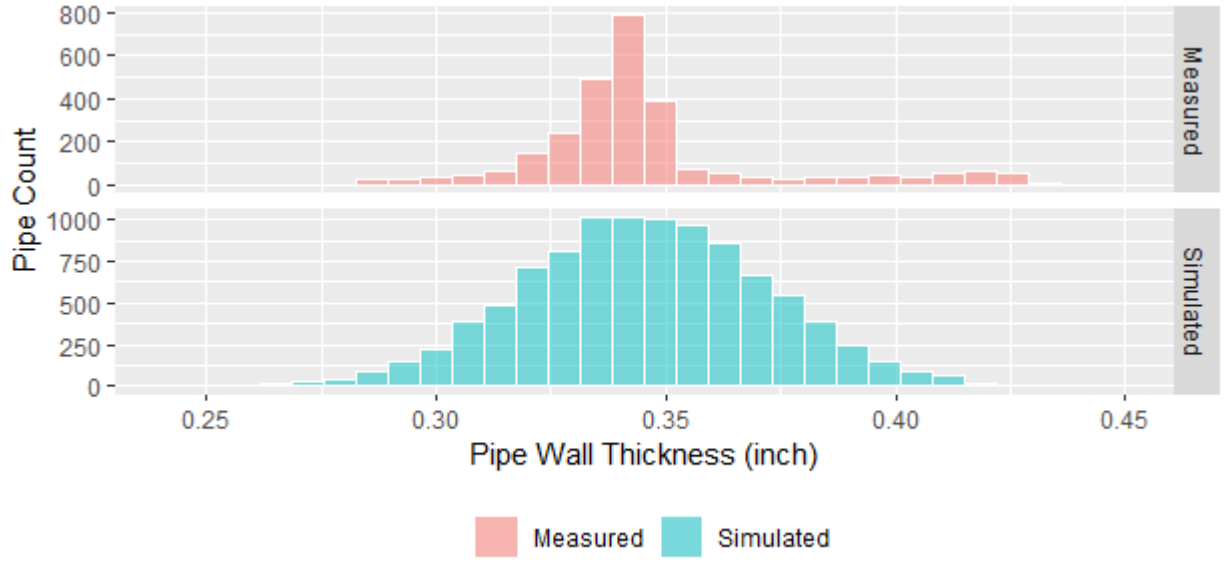
Pipe LS-79, Dig 4, Excavation 7A: Measured Thickness and Simulated Thickness



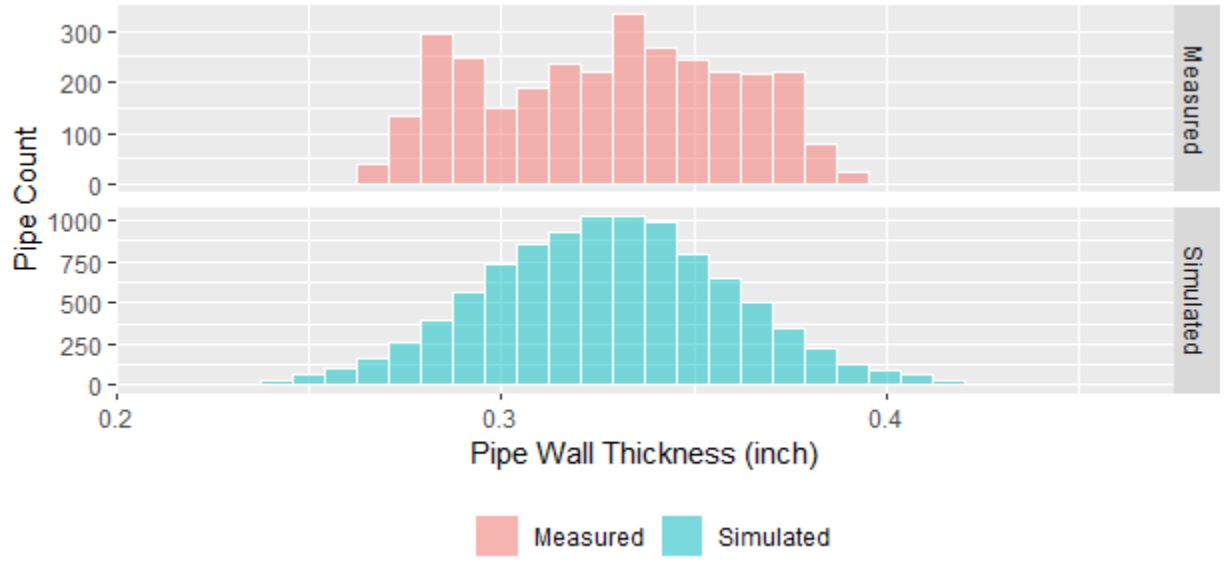
Pipe LS-79, Dig 4, Excavation 7B: Measured Thickness and Simulated Thickness



Pipe LS-116, Dig 5, Excavation 1: Measured Thickness and Simulated Thickness

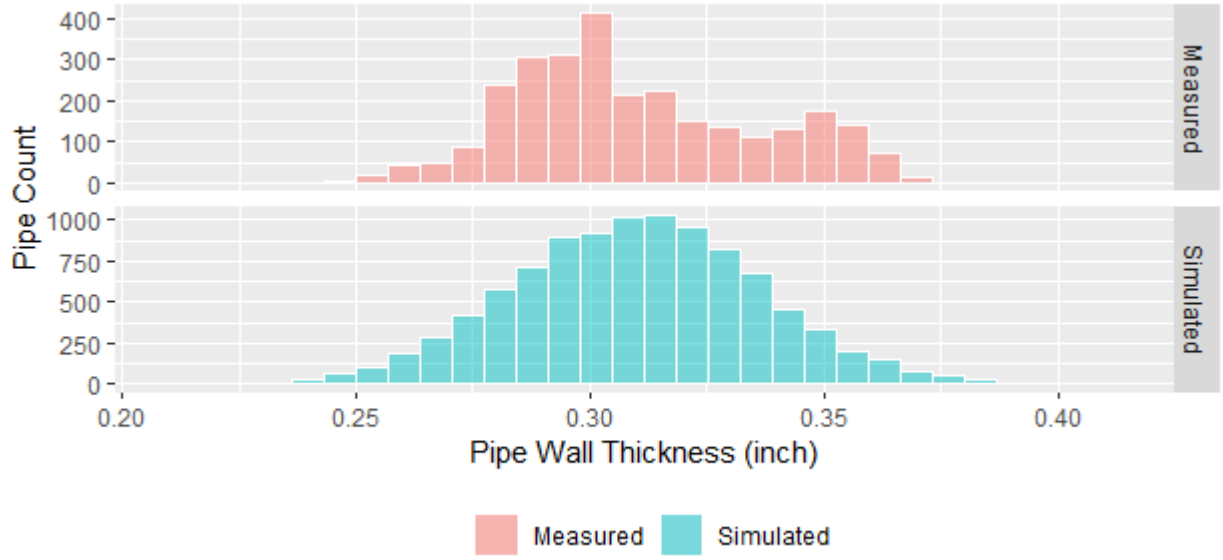


Pipe LS-116, Dig 6, Excavation 2A: Measured Thickness and Simulated Thickness

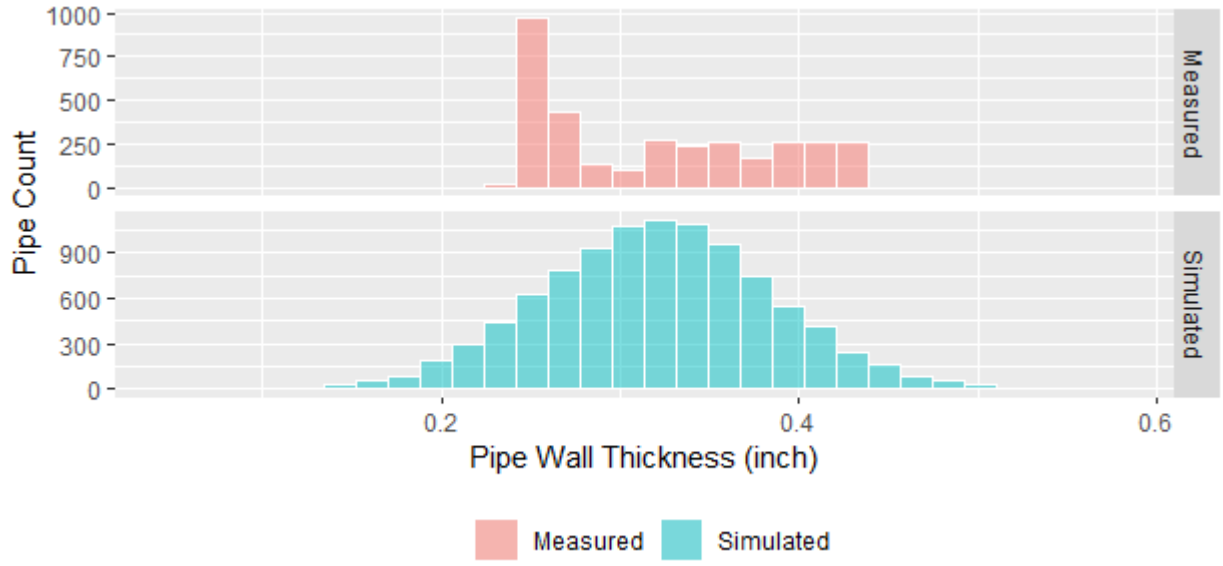


Pipe LS-116, Dig 6, Excavation 2B: Measured Thickness and Simulated Thickness

[redacted]

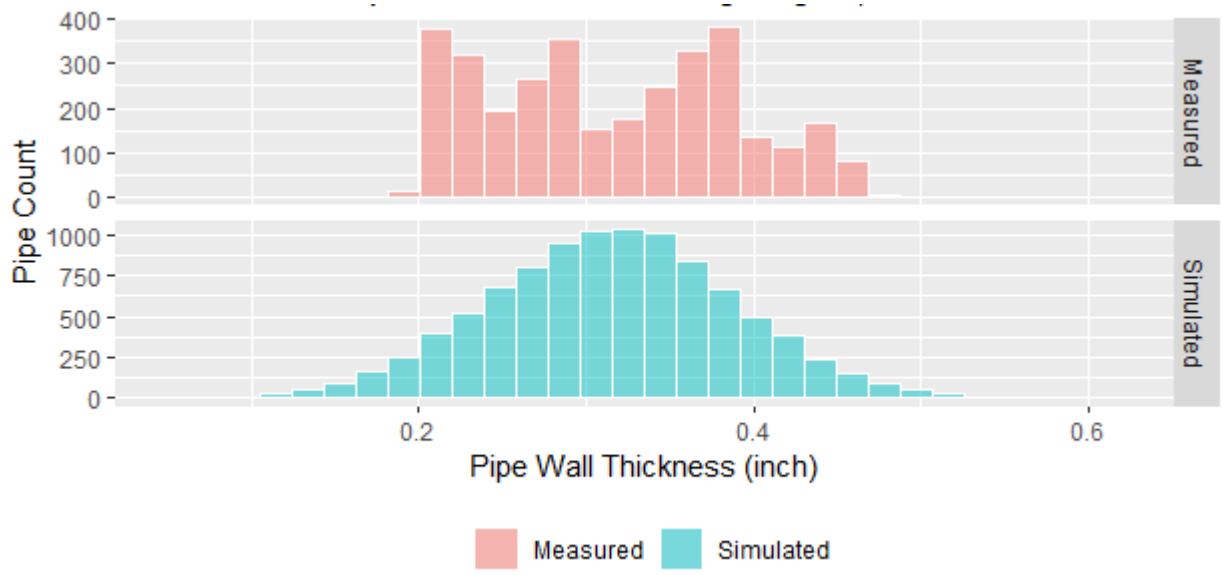


Pipe LS-116, Dig 7, Excavation 3: Measured Thickness and Simulated Thickness



Pipe LS-116, Dig 9, Excavation 4A: Measured Thickness and Simulated Thickness

[redacted]

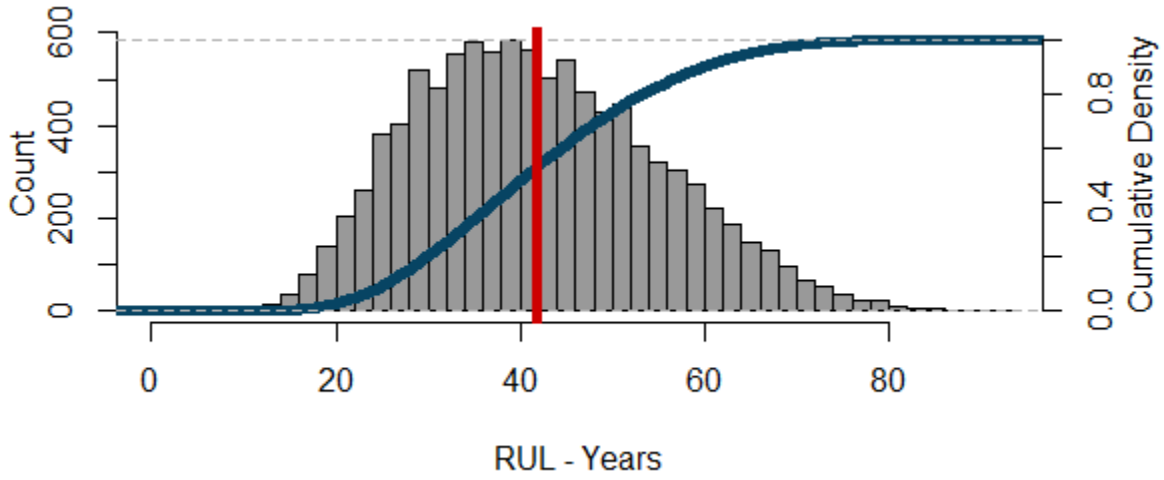


Pipe LS-116, Dig 9, Excavation 4B: Measured Thickness and Simulated Thickness

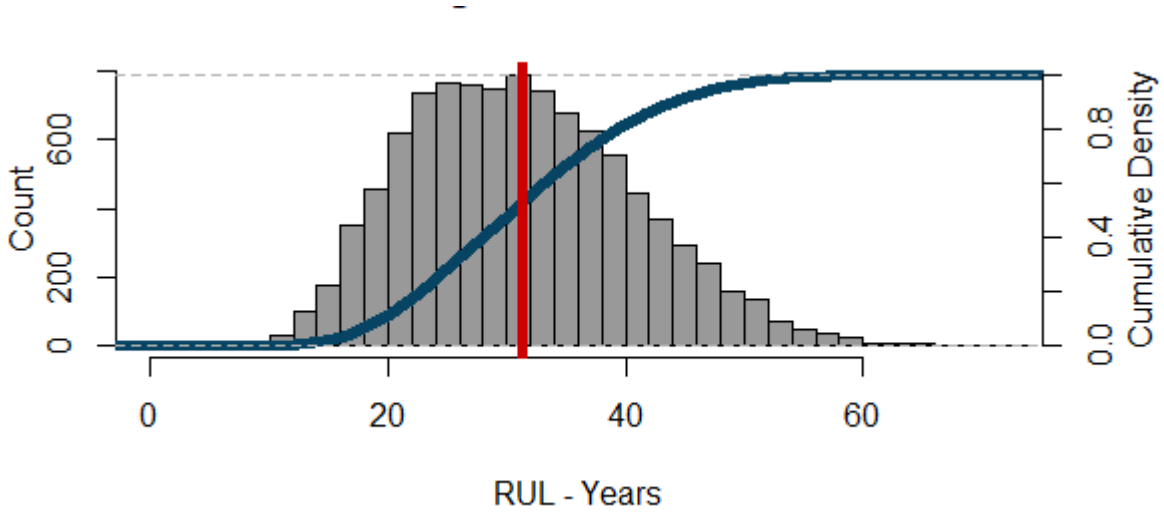
APPENDIX B

Remaining Useful Life Graphs

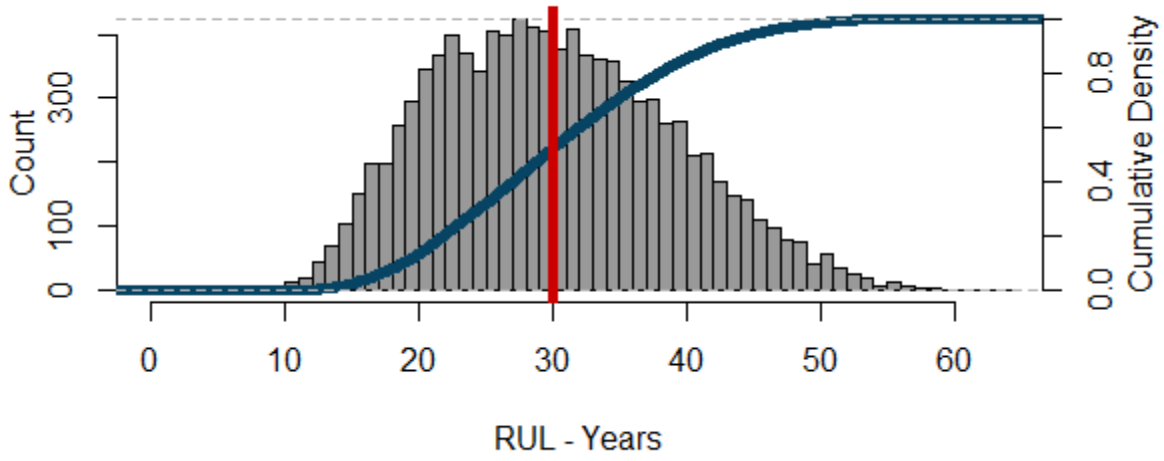
[redacted]



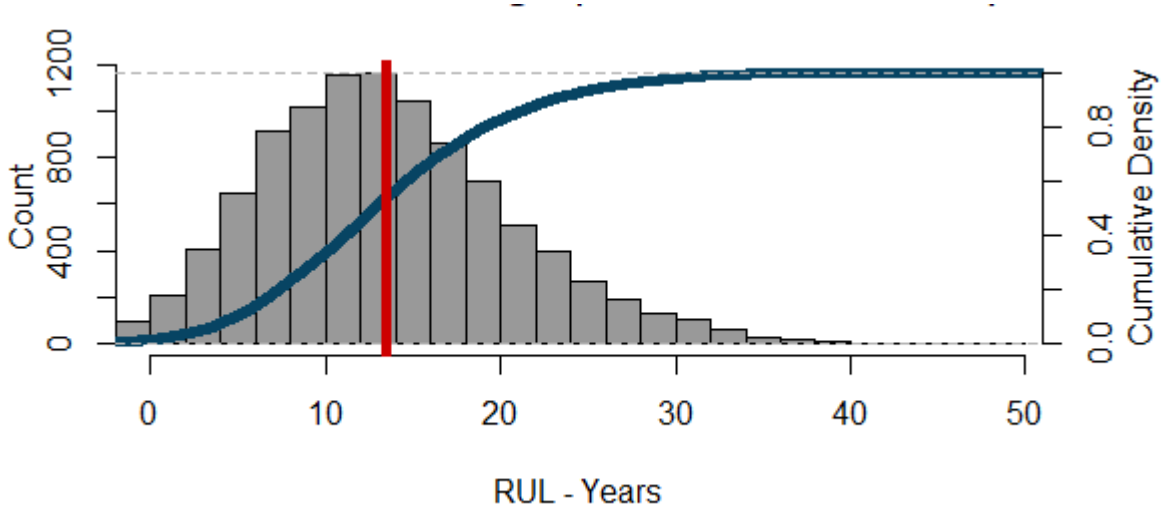
Pipe LS-35, Dig 8, Excavation 10A: Remaining Useful Life



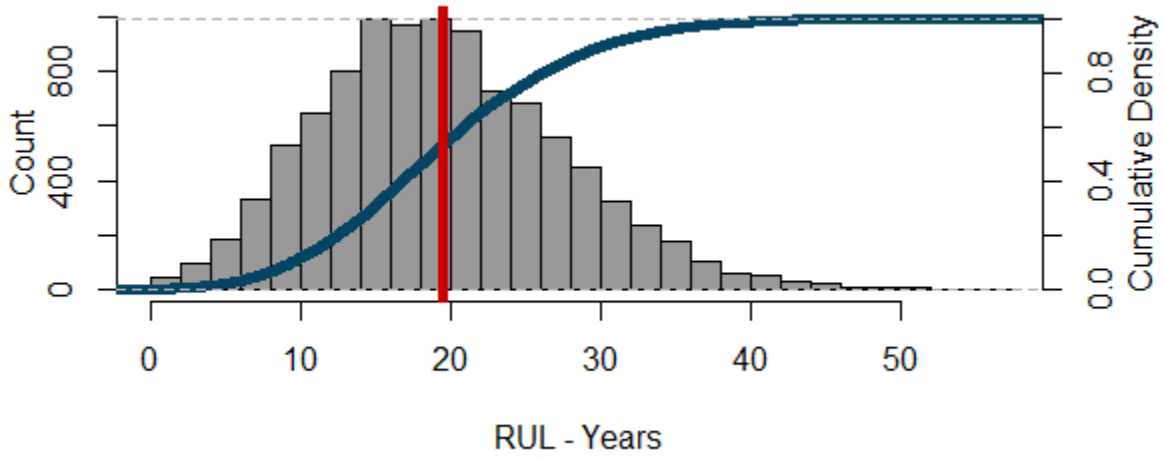
Pipe LS-35, Dig 8, Excavation 10B: Remaining Useful Life



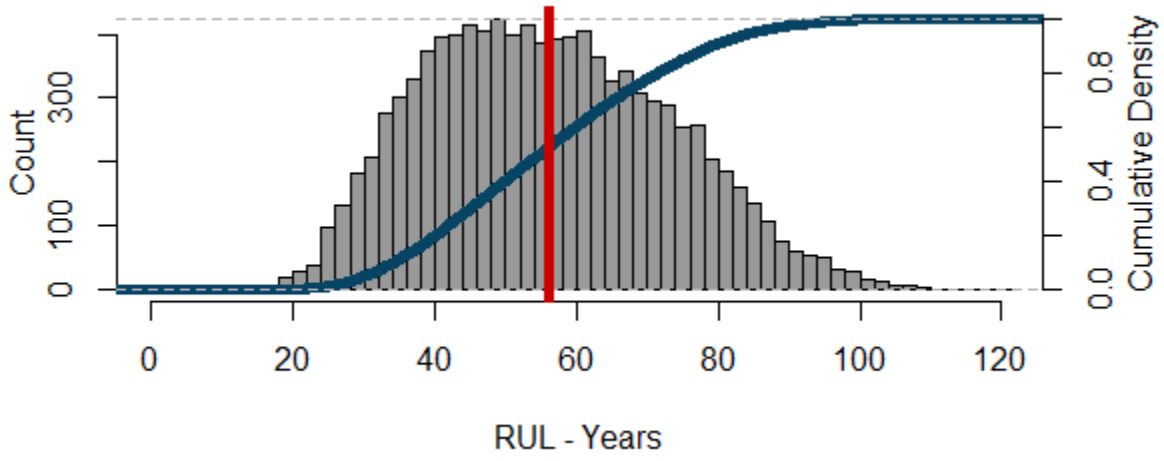
Pipe LS-72, Dig 3, Excavation 12A: Remaining Useful Life



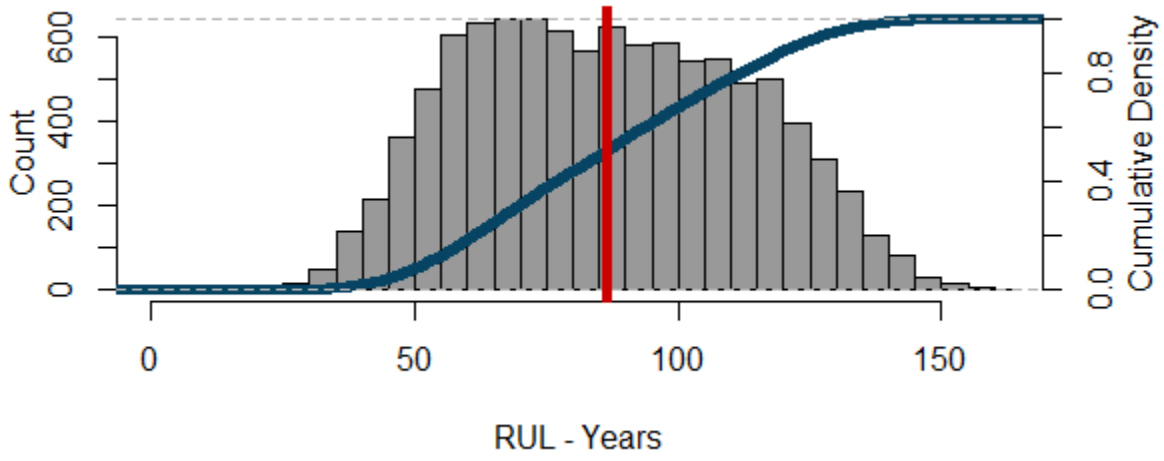
Pipe LS-72, Dig 3, Excavation 12B: Remaining Useful Life



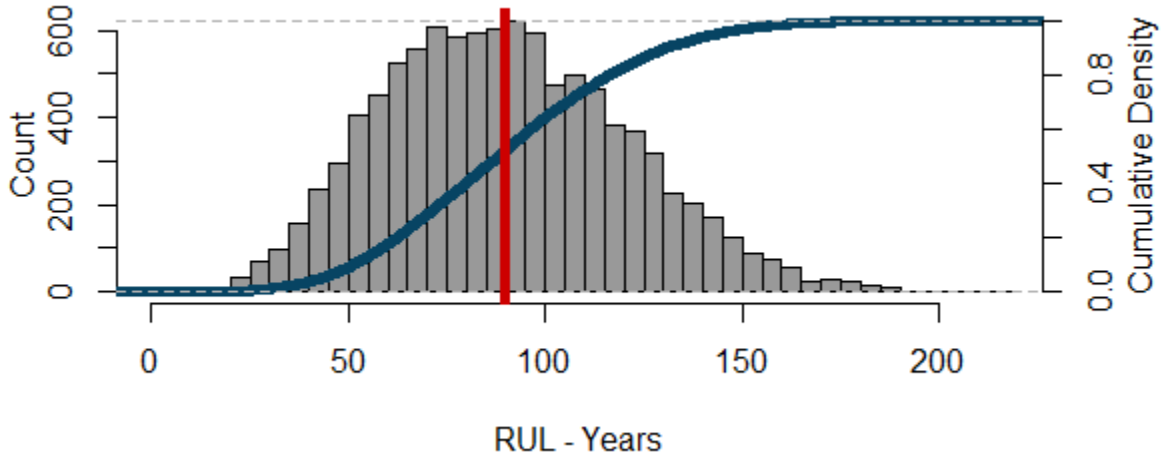
Pipe LS-79, Dig 1, Excavation 5A: Remaining Useful Life



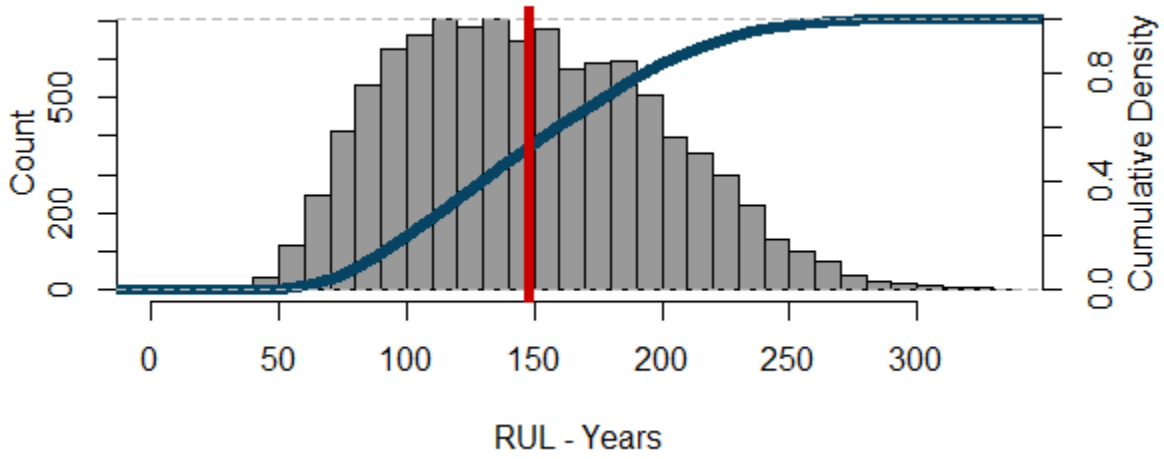
Pipe LS-79, Dig 1, Excavation 5B: Remaining Useful Life



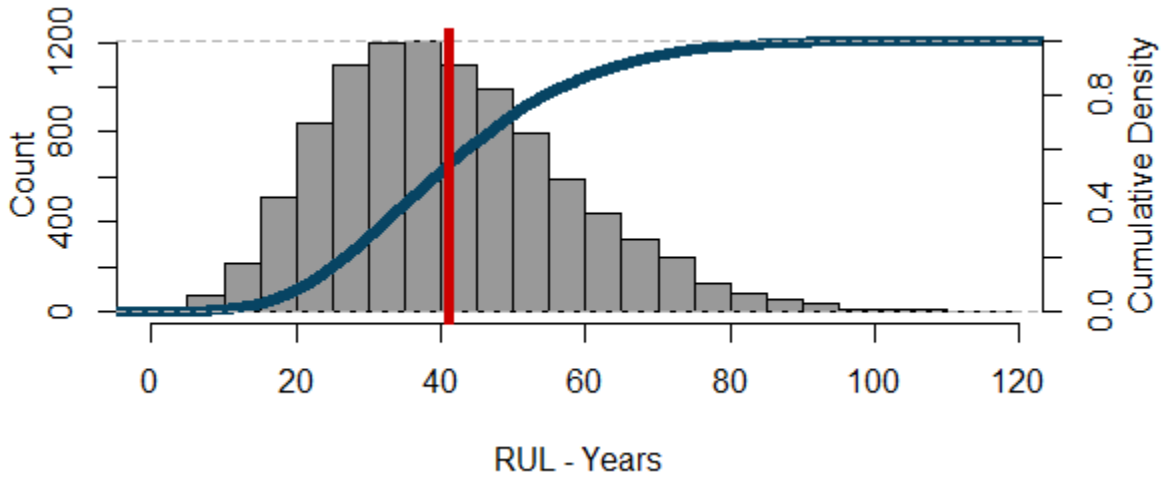
Pipe LS-79, Dig 2, Excavation 6: Remaining Useful Life



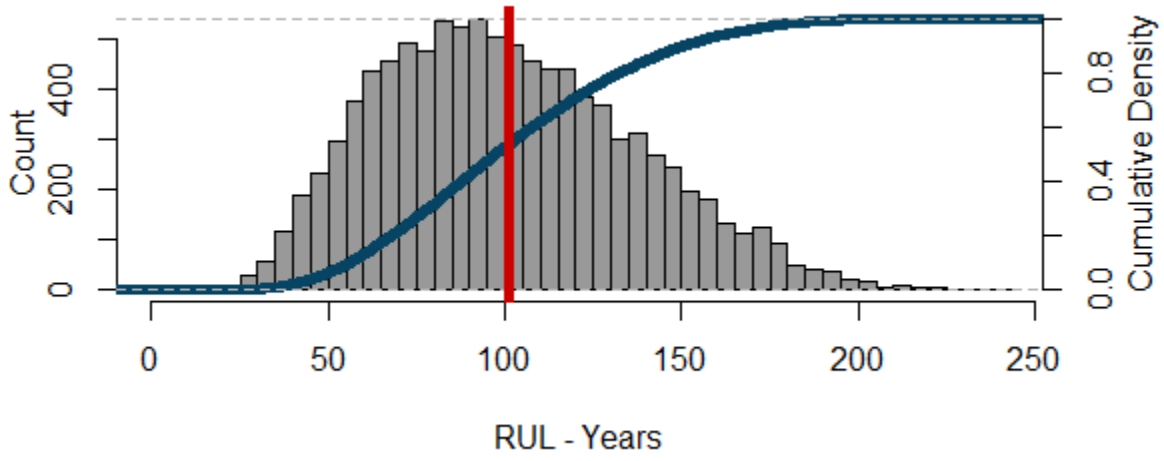
Pipe LS-79, Dig 4, Excavation 7A: Remaining Useful Life



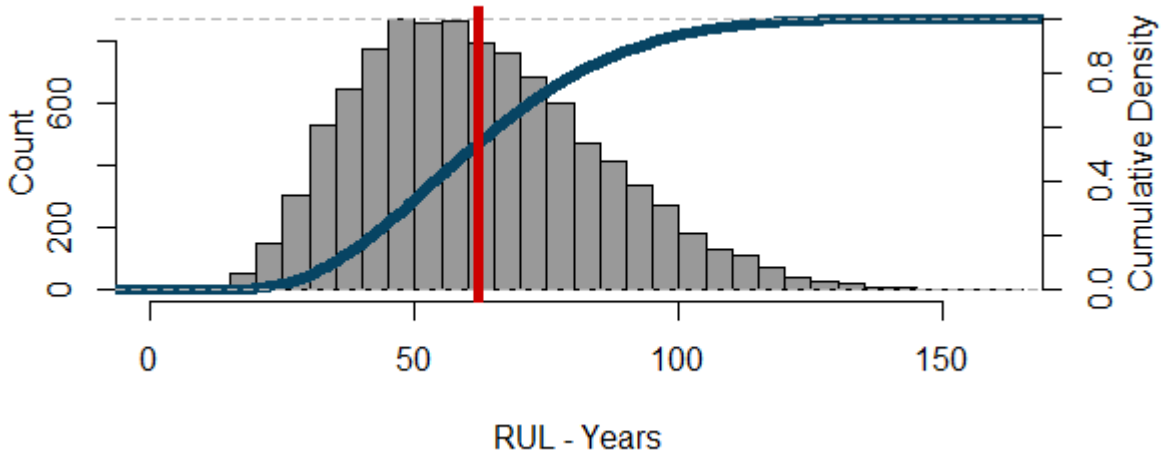
Pipe LS-79, Dig 4, Excavation 7B: Remaining Useful Life



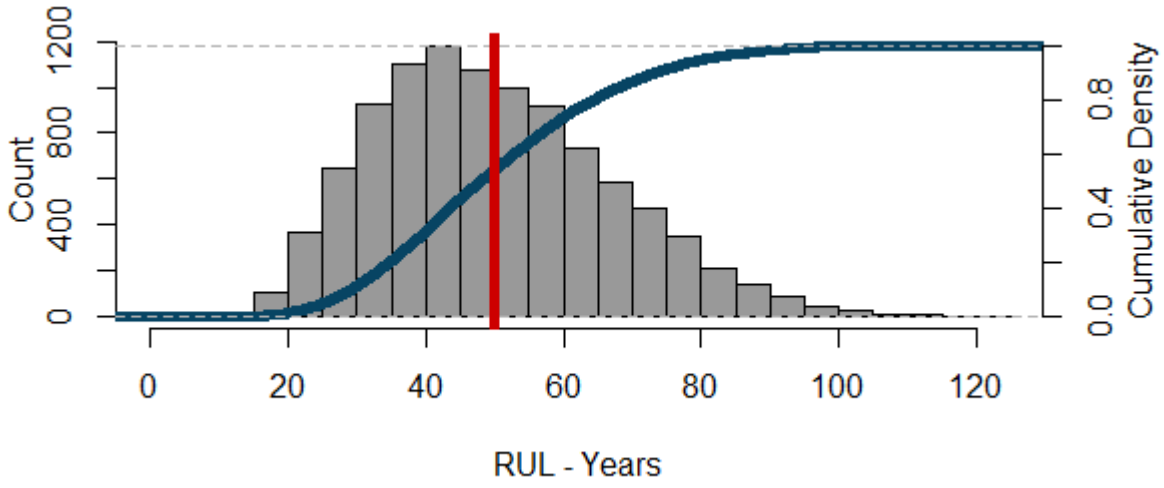
Pipe LS-116, Dig 5, Excavation 1: Remaining Useful Life



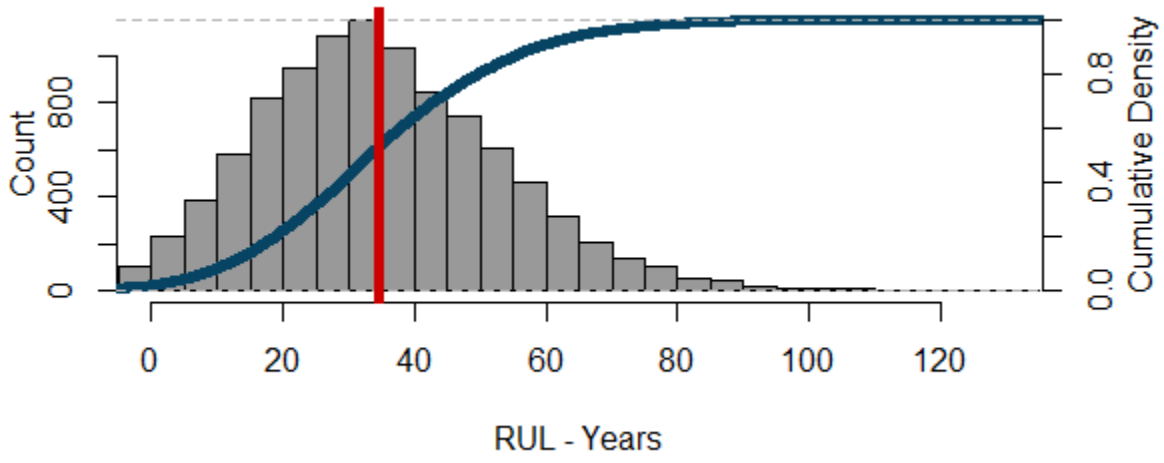
Pipe LS-116, Dig 6, Excavation 2A: Remaining Useful Life



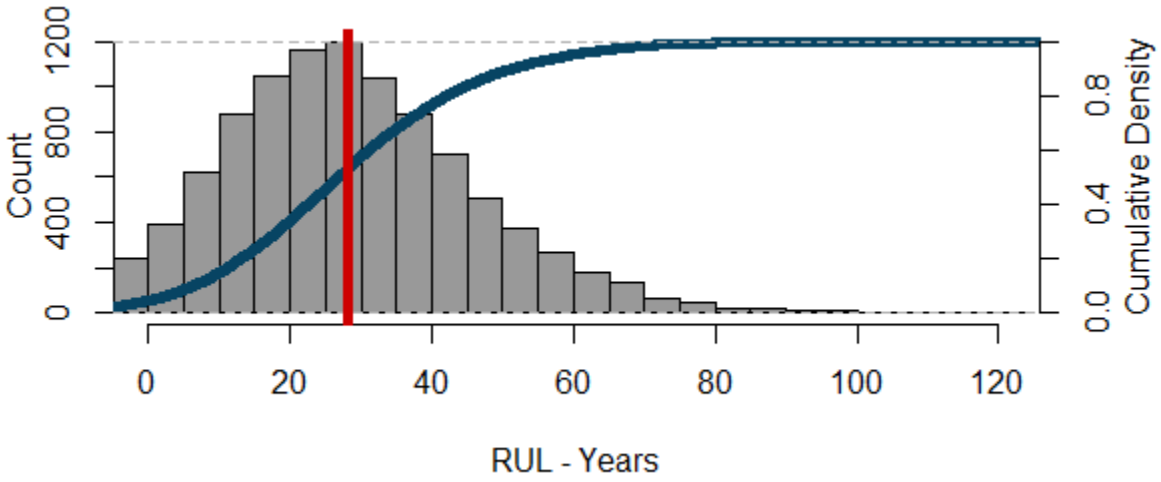
Pipe LS-116, Dig 6, Excavation 2B: Remaining Useful Life



Pipe LS-116, Dig 7, Excavation 3: Remaining Useful Life



Pipe LS-116, Dig 9, Excavation 4A: Remaining Useful Life



Pipe LS-116, Dig 9, Excavation 4B: Remaining Useful Life

IN WITNESS WHEREOF, the Parties hereto, by their duly authorized representatives, have executed this Agreement effective the 20th day of January, 2021.

PURE TECHNOLOGIES US, INC., a Florida foreign profit corporation

By: _____
Print Name: John J. Galleher Jr.
Title: Vice President
Regional
Attest: _____
Print Name: William J. Crowell
Address: 1213 Stetson St.
Orlando, FL 32804

TOHOPEKALIGA WATER AUTHORITY

By: _____
Print Name: Hector Lizasuain
Title: Board of Supervisors Chairman

Attest: _____
Print Name: William Land
Title: Board of Supervisors Secretary
Address: 951 Martin Luther King Blvd.
Kissimmee, Florida 34741

STATE OF California
COUNTY OF San Diego

The foregoing instrument was acknowledged before me by means of [X] physical presence or [ ] online notarization, this 14 day of January, 2021, by

LUIS ALFONSO DIAZ
Commission No. 2305021
NOTARY PUBLIC - CALIFORNIA
SAN DIEGO COUNTY
Commission Expires September 13, 2023

EXHIBIT "C"

Contractor Certification Regarding Scrutinized Companies (Agreements of $1,000,000.00 or more)

CONTRACTOR Name: Pure Technologies U.S. Inc.

CONTRACTOR FEIN: 86-0853190

CONTRACTOR's Authorized Representative Name: John J. Galleher Jr.

Title: Vice President

Address: 9940 Summers Ridge Rd

City: San Diego State: Ca Zip: 92121

Phone Number: 760-644-1535

Email Address: John.Galleher@xyleminc.com

Section 287.135, Florida Statutes, prohibits local governments from contracting with companies, for goods or services of One Million and 00/100 Dollars ($1,000,000.00) or more that are on Scrutinized Companies Lists enumerated in Section 287.135, Florida Statutes.

As the person authorized to sign on behalf of the CONTRACTOR, I hereby certify that the company identified above in the section entitled "CONTRACTOR Name" is not listed on the Scrutinized Companies Lists. I understand that pursuant to section 287.135, Florida Statutes, the submission of a false certification may subject the CONTRACTOR to termination of the Agreement, civil penalties, attorney's fees, and/or costs.

CERTIFIED BY: _____ Date: 1/20/2021
Authorized Signature

Print Name: John J. Galleher Jr.

Print Title: Vice President

RFP-21-002
SECOND AMENDMENT TO AGREEMENT
FOR
FORCE MAIN CONDITION ASSESSMENT SERVICES

THIS SECOND AMENDMENT (the "**SECOND Amendment**") is made and entered into between **TOHOPEKALIGA WATER AUTHORITY**, an independent special district established and created pursuant to Chapter 189, Florida Statutes, by special act of the Florida Legislature, with a principal address of 951 Martin Luther King Boulevard, Kissimmee, Florida 34741 ("**TOHO**") and **PURE TECHNOLOGIES U.S., INC**, a Foreign For Profit Corporation authorized to conduct business in the State of Florida, with a principal address of 8920 State Route 108, Suite D, Columbia, Maryland 21045 ("**CONTRACTOR**"). TOHO and CONTRACTOR may be individually referred to as a "**Party**" or collectively as the "**Parties**".

A. **Extension of Term.** The agreement numbered RFP-21-002 (the **"Agreement"**) and dated January 21, 2024, as amended, which expires on January 20, 2025, is hereby renewed for a period on one additional one-year term, pursuant to Section 1 of the Agreement. The term of this renewal shall begin on January 20, 2025, and expire on January 21, 2026 (the "Renewal Term").

B. **Change in Compensation.** The Agreement, as previously amended, is hereby amended to increase CONTRACTOR's compensation from $2,278,236.00, to an amount not to exceed $2,778,236.00 for the term of the Agreement.

C. **Florida Vendor Eligibility Requirements.** The Parties hereby agree to incorporate the Florida Vendor Eligibility Requirements attached hereto as **Attachment A**.

D. **Full Force and Effect; Conflicts.** This Second Amendment shall be effective upon execution by both Parties. Except as otherwise stated herein, the terms and conditions of the Agreement, as may be previously amended, shall remain in full force and effect during the Renewal Term. In the event of a conflict between this Second Amendment and the Agreement or prior amendments, this Second Amendment shall prevail. The Agreement, as amended, represents the full and complete understanding and agreement between the Parties.

SIGNATURES ON FOLLOWING PAGE

By their duly authorized representatives, the Parties have executed this Second Amendment.

PURE TECHNOLOGIES U.S., INC.

By: _____
Print Name: Ryan McKeon
Title: Vice Pesident

Attest: _____
Print Name: William J. Craven P.E.
Title: Manager of Business Development, East Region

TOHOPEKALIGA WATER AUTHORITY

By: _____
Print Name: ~~Todd Swingle~~ Henry Thacker
Title: ~~CEO/Executive Director~~ Board Chairman

Attest: _____
Print Name: ~~Alison T. Smith~~ Tom White
Title: ~~Executive Assistant~~ Board Secretary.

STATE OF Maryland
COUNTY OF Howard

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☑ online notarization, this 2nd day of December, 2024, by Ryan McKeon, as Vice Pesident of Pure Technologies U.S., Inc.., a Foreign Profit Corporation on behalf of the company/corporation. They ☑ are personally known to me or ☐ have produced _____ as identification.

TRACY LEANE MILLER NOTARY PUBLIC Comm. Exp. Dec 6, 2027 Prince George's County STATE OF MARYLAND

_____
Signature of Notary Public
Tracy Leane Miller
Name of Notary Typed, Printed or Stamped
My Commission Expires: December 6, 2027