



February 2, 2026

Sean Reese
Deputy Director of Public Works
DuPage County Public Works
7900 S. Route 53
Woodridge, IL 60517

**Subject: Proposal for Professional Engineering Services
AVA Water Main Condition Assessment -**

Dear Mr. Reese:

RJN Group, Inc. is pleased to submit this proposal to the DuPage County Public Works (County), offering comprehensive watermain assessment services for the County to understand the condition of these essential pipelines.

RJN, established in 1975, is a professional engineering consulting firm focused on providing innovative engineering solutions and field services. With over 90% of our work focused on underground infrastructure, we are uniquely qualified for this project.

Key Project Goals and Objectives

RJN actively embraces innovative technologies and carefully selects the most suitable technology for each project. We fully understand the County's interest in assessing the condition of watermains. Moreover, we recognize the critical importance of ensuring that the chosen pipes remain operational while minimizing any disruptions along the pipeline routes.

The project's goal is to assess the structural integrity of critical watermains to determine if improvements are needed. Per the County's GIS, the project will assess 6,146 linear feet of metallic watermain with a resolution as precise as 5 to 10-foot segments. The area to be tested is shown in Exhibit D and summarized as follows:

- 4,888 linear feet of 12" metallic water main at the water treatment plant.
- 1,258 linear feet of 10" metallic water main near the intersection of 87th street and IL-83.

This proposal includes three alternatives to the scope of the project. Alternative A assesses only the 1,258 linear feet of 10" metallic water main that crosses under Route 83. Alternative B assesses the 4,888 linear feet of 12" metallic water main within the Woodridge Green Valley Treatment Plant. Alternative C assesses both sections. The advantage to the County for Alternative C is that it is more cost-effective, mainly due to mobilization costs and other factors.

Advanced VibroAcoustic Analysis (AVA) Powered BY dynamic Response Imaging™ (DRI)

AVA powered by DRI™ uses nonlinear vibroacoustic technology to assess pipeline condition using external access points such as hydrants, control valves or temporary potholes (installed via hydro excavation).

A wave generator introduces microscopic vibroacoustic signals into the water column, tuned to specific frequencies based on the pipe type and size, to excite the entire pipeline segment. The pipe vibrates at multiple resonance frequencies, which reflect localized wall stiffness. These frequencies are recorded and localized using a cross-correlation function between two sensors.

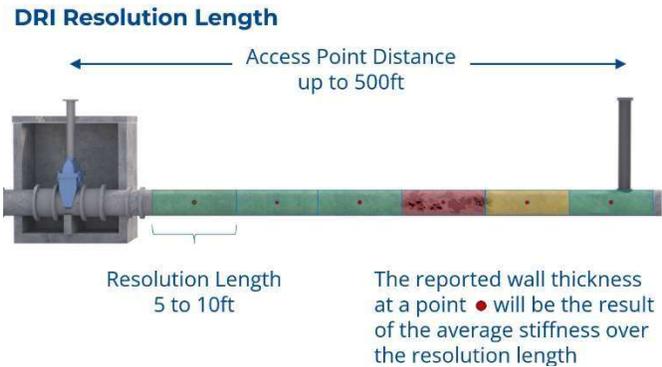


FIGURE 1

Resolution Diagram, based on < 600 ft access points

Post-inspection analysis in the time and frequency domains identifies and locates leaks and pipe wall distress and reports residual wall thickness for cast iron pipes with a resolution as finite as 5 to 10 feet, depending on the spacing of access points. This capability can provide sub-pipe stick level condition assessment and accurate leak locations as a result.

The DRI technology requires three access points per pipe segment, with examples as shown in Figure 2.

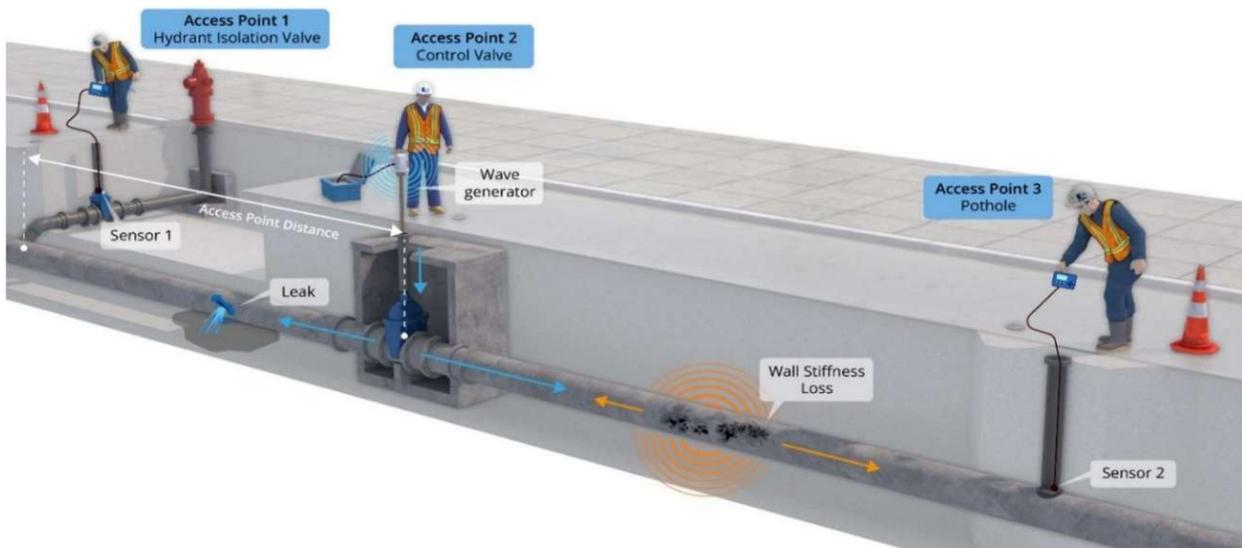


FIGURE 2

Sample AVA Field Setup

Access points can be spaced up to 600 feet apart, depending on site conditions, while still providing pipe wall distress measurements with a resolution of 5 to 10 feet. While access points further apart can be acceptable due to accessibility, distress resolution will not be as refined.

A three-person field team operates lightweight, mobile field kits. Two members set up data acquisition units, while the third sets up the wave generator at predetermined access points. The pipeline is excited with specific vibroacoustic test signals, and data is recorded via sensors connected to the acquisition units. After uploading the data, the team moves to the next section to repeat the process until the entire pipeline is covered. The inspection uses five main tools:

1. Data acquisition unit (data recorder)
2. External acoustic sensor (data sensing)
3. Wave Generator (excite the pipeline)
4. Tablet/laptop (user interface)
5. Personal protective and safety equipment



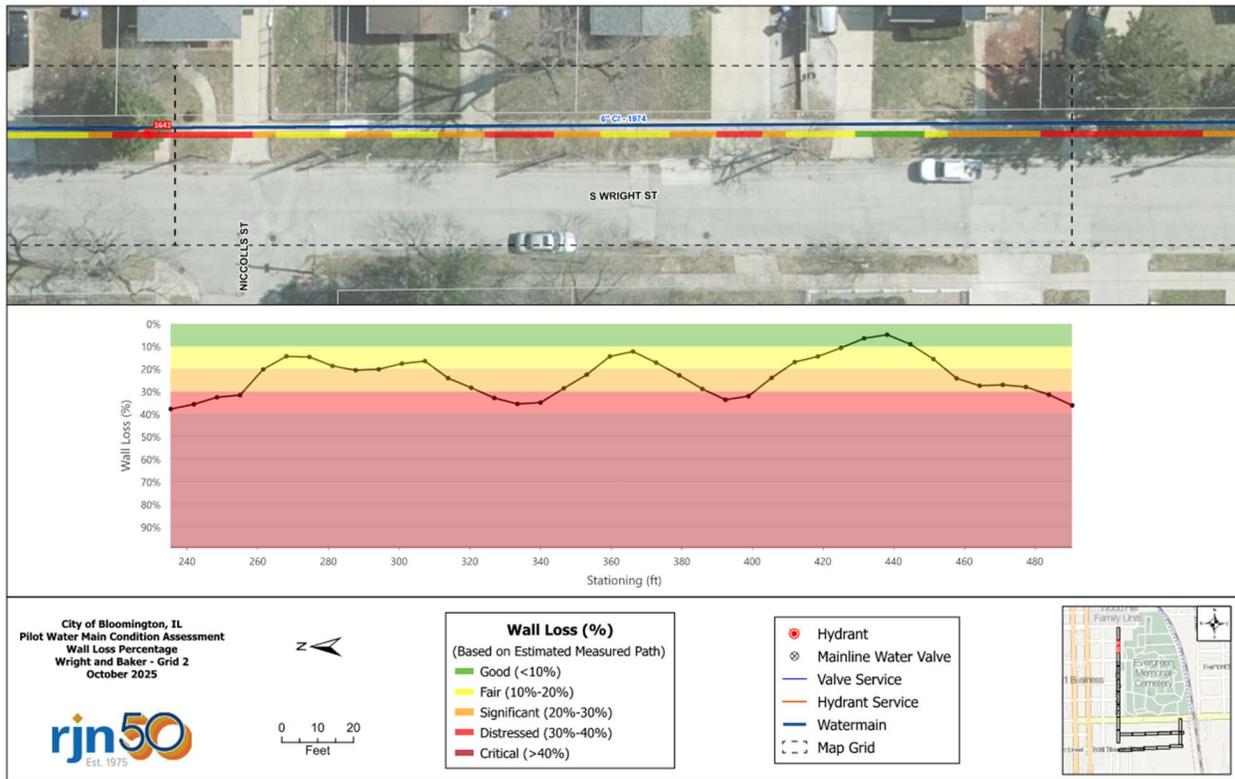
Figure 3
Example Field Equipment

The basic inspection deliverable includes a condition assessment report with residual wall thickness, identified leaks, location of both leaks and pipe wall distress along the inspected watermain, and structural integrity grading of 1-5 based on percent wall loss with supporting excel tables and a color-coded GIS shapefile. An example of the excel table can be seen in Figure 4 and a sample wall thickness profile with ~6-foot resolution length with a color-coded GIS plan can be seen in Figure 5.

FIGURE 4
Sample Excel and Profile Deliverables

Street	Valve	Stationing / Distance	Year Installed	Material	Diameter (in)	Nominal Thickness (in)	Apparent Structural Thickness (in)	Wall Loss (in)	Wall Loss (%)
Wright		366.2	1974	CI	6	0.38	0.333	0.047	12.41%
Wright		372.7	1974	CI	6	0.38	0.314	0.066	17.36%
Wright		379.3	1974	CI	6	0.38	0.293	0.087	22.95%
Wright		385.8	1974	CI	6	0.38	0.270	0.110	28.97%
Wright		392.3	1974	CI	6	0.38	0.252	0.128	33.77%
Wright		398.9	1974	CI	6	0.38	0.258	0.122	32.16%
Wright		405.4	1974	CI	6	0.38	0.288	0.092	24.08%
Wright		411.9	1974	CI	6	0.38	0.315	0.065	17.07%
Wright		418.5	1974	CI	6	0.38	0.325	0.055	14.60%
Wright		425.0	1974	CI	6	0.38	0.339	0.041	10.82%
Wright		431.6	1974	CI	6	0.38	0.355	0.025	6.59%
Wright		438.1	1974	CI	6	0.38	0.361	0.019	4.95%
Wright		444.6	1974	CI	6	0.38	0.345	0.035	9.17%
Wright		451.2	1974	CI	6	0.38	0.320	0.060	15.80%
Wright		457.7	1974	CI	6	0.38	0.288	0.092	24.27%
Wright		464.3	1974	CI	6	0.38	0.275	0.105	27.57%
Wright		470.8	1974	CI	6	0.38	0.277	0.103	27.19%
Wright		477.3	1974	CI	6	0.38	0.273	0.107	28.11%
Wright		483.9	1974	CI	6	0.38	0.260	0.120	31.53%

FIGURE 5
Sample color-coded GIS based on structural integrity grading



PROJECT APPROACH

RJN will begin by collaborating closely with the County to identify and finalize the specific water segments that will undergo AVA powered by DRI™. This initial phase will involve detailed discussions to ensure that the most critical and representative segments are selected. Once the segments are confirmed, RJN will plan the setups and logistics, leveraging the County’s GIS data to optimize the inspection process.

Following the planning phase, RJN will finalize the comprehensive plan in consultation with the County, ensuring all logistical and operational details are addressed. RJN will then schedule a dedicated week for the testing phase. During this week, County crews will work in tandem with RJN crews to deploy and operate the pipeline assessment tools. This collaborative effort will ensure that the inspection is conducted efficiently and effectively, with minimal disruption to the community.

Upon completion of the fieldwork, the RJN team will undertake a thorough post-processing of the gathered data. This will involve advanced analysis techniques to interpret the acoustic signals and other data collected during the inspection. RJN will then compile a detailed report that outlines the findings and provides actionable recommendations. This report will include comprehensive GIS

exhibits that visually represent the condition of the assessed pipelines, offering clear insights into their structural integrity and remaining useful life.

Assuring Quality and Safety

Quality Assurance

RJN is committed to providing quality deliverables. The completion of these inspections is critical in providing actionable results for the County. RJN's internal Quality Control tools as well as our corporate training and Quality Assurance processes in place will ensure that the program will provide value for the DuPage County Public Works.

Safety

As an employee-owned firm, RJN's commitment to the safety of our employees, County staff, and the public is paramount. RJN demonstrates that commitment to safety in our internally developed and audited safety program where our goal is to have all field staff, engineers, and project managers "RJN Safety Certified." Every project follows RJN's health and safety guidelines when completing any fieldwork.

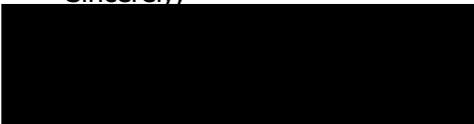
Price and Schedule Summary

This project will be invoiced on a unit price and lump sum, percent complete basis for a total not-to-exceed fee as outlined in Exhibit B. The recommended option of Alternate C is for a total not-to-exceed fee of \$72,468. RJN will complete the study within six months of an Agreement. Complete Scope of Services, Pricing, and Schedules are provided in the following exhibits:

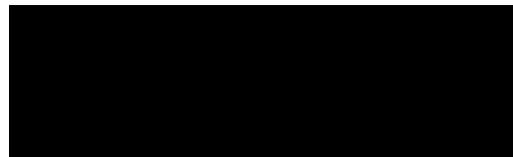
- Exhibit A – Scope of Services
- Exhibit B – Pricing
- Exhibit C – Schedule
- Exhibit D – Maps

We are looking forward to the opportunity to work with the County on this important project. It is our pleasure to submit this proposal to you. Please feel free to contact Tom at 224-587-7366 if you would like to discuss this proposal or have any questions.

Sincerely,



Francisco Sobral, PE
Client Manager
217.714.1209



Tom Romza, PE
Regional Manager
224.587.7366

EXHIBIT A

SCOPE OF SERVICES

RJN is proposing the following scope of services to conduct condition assessments of selected watermains in the DuPage County Public Works service area:

1. Preparatory Work & Data Review

- a. Conduct a kickoff meeting with the County to discuss the project scope, objectives, and roles, and establish lines of communication for the duration of the work.
- b. Discuss watermain histories, operations, and maintenance.
- c. Gather and review all available data from the County regarding the watermains, including
 - i. GIS maps and databases,
 - ii. Design and/or record drawings,
 - iii. Maintenance, modification/rehabilitation, and repair records,
 - iv. Past inspection data, operational data, and any other related data.
- d. Discuss project approach, schedule of work, and set expectations for the project.
- e. Share follow-up questions with the County for discussion.
- f. Visit the project area to preliminary investigate the access points.
- g. Prepare a confirmation list for the County to check fire hydrants, valves, and vaults to meet project objectives. Confirm pothole locations, as necessary.
- h. Ensure selected sites are acceptable and provide suitable testing locations concerning safety and equipment performance, adjust segment plans accordingly based on access availability and site conditions.

2. AVA powered by DRI™ Inspections

- a. Provide all necessary AVA inspection equipment and a trained three-person crew to complete field work.
- b. Use external vibroacoustic sensors and data acquisition units at predefined access points (e.g., hydrants, valves, or temporary potholes) along each pipeline segment to enable AVA testing.
- c. Introduce Vibroacoustic signals into the water column using a centrally positioned wave generator between the sensors to excite the pipeline and capture its dynamic response.
- d. Measure the distance between access points to ensure appropriate resolution and segment coverage.
- e. Perform on-site and remote QA/QC of field data before demobilization to confirm data integrity.

3. Data Analysis, Report and Recommendations

- a. Determine if any leaks were found on the tested segments and inform the County of the location within 2 weeks.

- b. Post-process the inspection data to assess localized pipe wall stiffness and identify structural anomalies using both time and frequency domain analyses. Correlate wall stiffness to wall loss averaged over the available resolution length.
 - c. Provide the County with preliminary results and identify if any of the tested segments are recommended for repair or replacement prior to the planned intersection reconstruction.
 - d. Include a summary of the work completed and results of the AVA inspections delivered in a draft report including:
 - i. A GIS map of the water main system, including findings from the AVA inspections.
 - ii. Engineering recommendations for further inspections, rehabilitation/repair, and/or maintenance based on the inspection data.
 - iii. Budgetary pricing and recommended timing (urgency) for implementation of recommendations.
 - e. Meet with County Staff to discuss findings and recommendations, revise draft accordingly.
 - f. Submit a digital and two hard copies (if desired) of the final report.
 - g. Provide digital copies of all inspection data, analysis results, and photographs from inspections, including GIS databases and shapefiles
 - h. Upload final report and supporting documents to Clarity®.
- 4. Project Management**
- a. Provide project management services including invoicing, scope, schedule, fee tracking, and closeout services.
 - b. Provide updates to County staff throughout the duration of the project (summary of completed work, upcoming activities, and any schedule or budget considerations).
 - c. Coordinate and attend meetings with County staff as necessary to discuss the progress of the project, address technical questions, and ensure alignment with client expectations and project objectives.

Items Requested from the County

1. Updated GIS geodatabases, shape files, or CAD atlases for the water distribution system for the study area. Any design and/or record drawings, break history, maintenance, and repair records, past inspection data, and any other related data.
2. Access to distribution system for inspection. Assistance locating or opening seized/buried appurtenances as required.
3. Cleaning of valve boxes and vaults, as necessary, to gain access to the pipe and appurtenances.
4. Actuating of valves, as necessary
5. Install or provide temporary access to the pipeline (potholes), where necessary.
6. Assistance with traffic control in high traffic areas, as necessary. Any permitting involved with traffic control is not included in this proposal. Any required communication with Permitting Agencies is expected to be completed by the County.
7. Provide communication with residents within the vicinity of our work.



EXHIBIT B

PRICING

Pricing for the each Alternative for the 2026 AVA Water Main Condition Assessment project is as follows:

Pricing Terms for Invoicing: Unit Price/Lump Sum, Percent Complete

Cost Schedule –

Alternative A: 1,258 ft Under Rt. 83

Task	Unit Price	Units	Fee
Preparatory Work & Reconnaissance	Lump Sum	-	\$3,600
AVA Inspection and Analysis (1,258 ft)	15.50	ft	\$19,499
Reporting and Exhibits	Lump Sum	-	\$6,000
Project Management	Lump Sum	-	\$3,100
Alternative A TOTAL			\$32,199

Alternative B: 4,888 ft within Woodridge Green Valley Treatment Plant

Task	Unit Price	Units	Fee
Preparatory Work & Reconnaissance	Lump Sum	-	\$6,100
AVA Inspection and Analysis (4,888 ft)	8.25	ft	\$40,326
Reporting and Exhibits	Lump Sum	-	\$8,800
Project Management	Lump Sum	-	\$5,300
Alternative B TOTAL			\$60,526

Alternative C: Both Alternative A and B

Task	Unit Price	Units	Fee
Preparatory Work & Reconnaissance	Lump Sum	-	\$7,300
AVA Inspection and Analysis (6,146 ft)	8.00	ft	\$49,168
Reporting and Exhibits	Lump Sum	-	\$10,000
Project Management	Lump Sum	-	\$6,000
Alternative C TOTAL			\$72,468

Proposal Option

This Proposal can be amended to include additional work upon joint approval by the County and RJN.



EXHIBIT C

PROPOSED SCHEDULE

RJN is prepared to start work immediately upon an Agreement.

Task	Timeline
Preparatory Work, Data Review & Field Reconnaissance	To be completed within 2 months of a NTP
AVA Field Inspections	To be completed within 1 month of recon
Draft Report and Deliverables	Within 2 months of completion of Field Inspections
Final Report and Deliverables	Within 1 month of receiving comments

