

CRITICAL SEWERS™ CHRONICLES



AN ELECTRO SCAN PUBLICATION. ALL RIGHTS AND PRIVILEGES RESERVED. ISSUE No. 2, OCTOBER 2013

ELECTRO SCAN PICKED 'BEST TECHNOLOGY' BY WEF

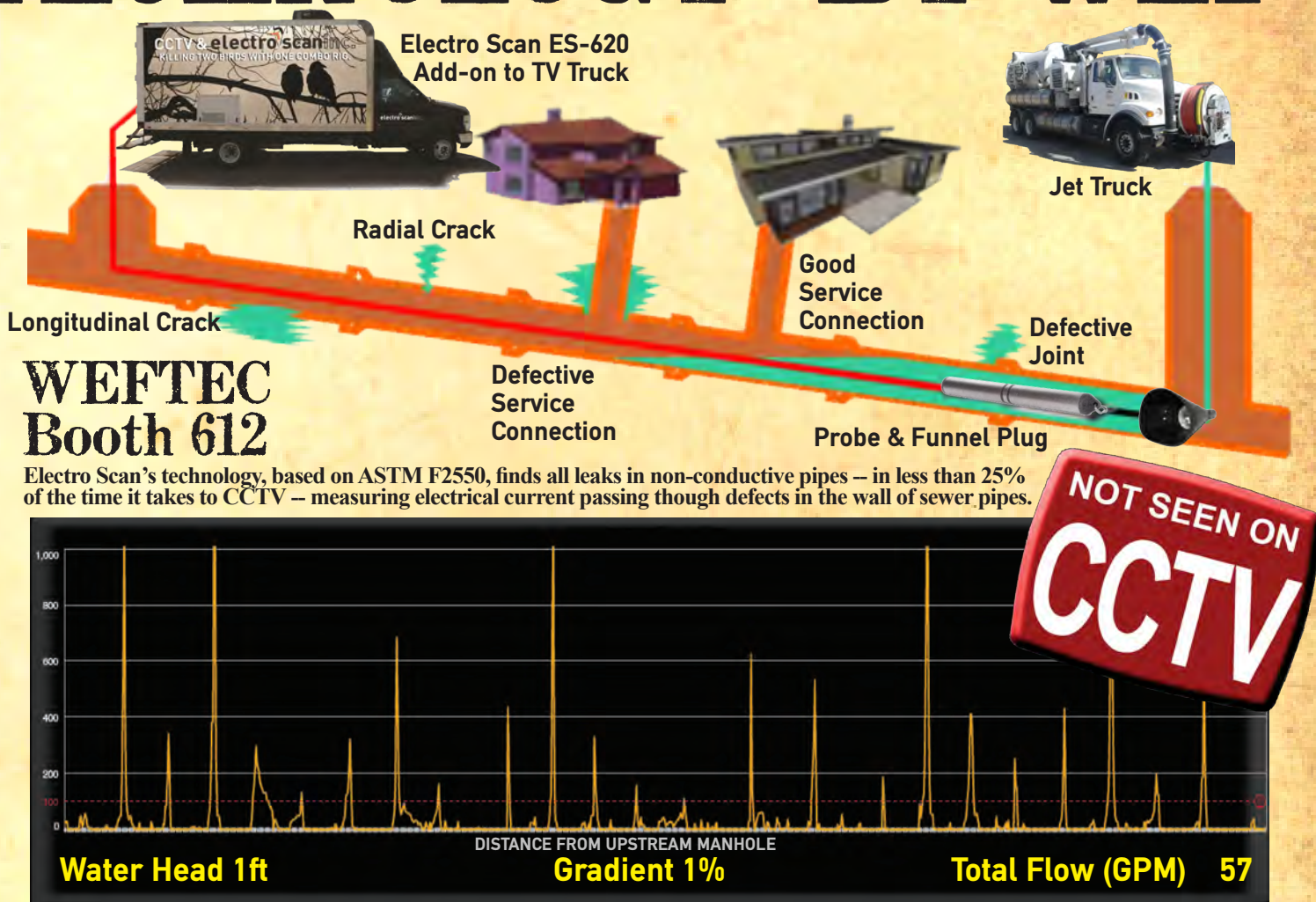
Electro Scan Finds Leaks Not Found By TV Inspection

The Water Environment Federation (WEF) has selected Electro Scan Inc.'s ES-620 for Sewer Mains™ as 'Best Innovative Technology' for 2013.

The prestigious award was presented to Electro Scan for its groundbreaking leak detection technology that finds all defects in sewer pipes that leak. Representing a paradigm shift for the sewer pipeline assessment market, the new technology is also able to certify point repairs & relining projects as 'leak free.' Electro Scan is currently available as an add-on product to existing CCTV trucks, with services available from leading contractors.

In contrast to CCTV cameras that rely on visual identification of defects, Electro Scan's patent-pending technology, developed in accordance with ASTM F2550, automatically locates & measures pipe defects finding all direct pathways from inside a pipe to the surface above.

continued on page 17



WEFTEC Booth 612

Electro Scan's technology, based on ASTM F2550, finds all leaks in non-conductive pipes – in less than 25% of the time it takes to CCTV – measuring electrical current passing through defects in the wall of sewer pipes.

CLAYTON COUNTY ADDS ELECTRO SCAN TO SSES

Bid Includes 50,000 ft of Electro Scan

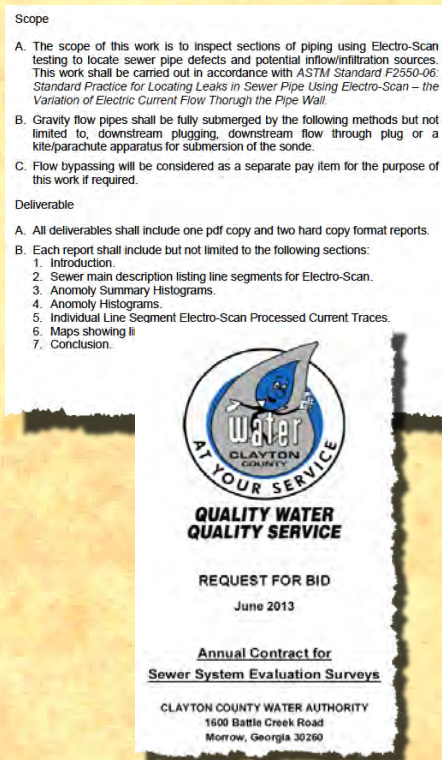
In June 2013 Clayton County Water Authority, Georgia, issued a Request For Bid for an Annual Contract for 'Sewer System Evaluation Surveys' and—for the first time --included Electro Scan as part of its Bid.

Electro Scan represents a next generation sewer assessment tool that measures the variation of electrical current inside sewer pipes to find all cracks, including defective service connections and defects at joints--anywhere there is direct contact or a pathway to ground or dirt.

The Annual Contract is expected to require the successful bidder to scan 50,000 ft of sewer main using Electro Scan technology.

Receiving numerous awards for its innovative technology and designed to comply with ASTM F2550, Electro Scan automatically finds sources of infiltration that are commonly missed by TV inspection and other field tests.

Numerous consulting engineers and contractors have begun working with Electro Scan to get experience with its technology, so call Electro Scan or one of its Dealers for sample specifications & reports that will get you up-to-speed on this game-changing technology.



Electro Scan Able to Certify Point Repairs & Relining Work

So, your sewer utility's chief engineer, consulting engineer, contractor, or superintendent thinks you need to perform a point or spot repair. You've televised the sewer main and know how to 'fix' the pipe; or know someone who can.

After the repair, you run a CCTV camera through the pipe and everything looks good. Sound familiar?

A wet weather event happens and your flow meter exceeds its Peak Flow Threshold by 5-10 times--coming from the same pipe you just fixed! What the heck happened?

After hundreds of projects, Electro Scan is finding an alarming number of point repairs, lining projects, and new pipe installations that either were not successfully repaired, or missed other major defects in the same pipe, not seen by TV inspection.

Since CCTV can't see where leaks occur, like at joints, service connections, and man-hole inverts, the industry has never known if it successfully fixed a repair -- or even picked the right method of rehabilitation.

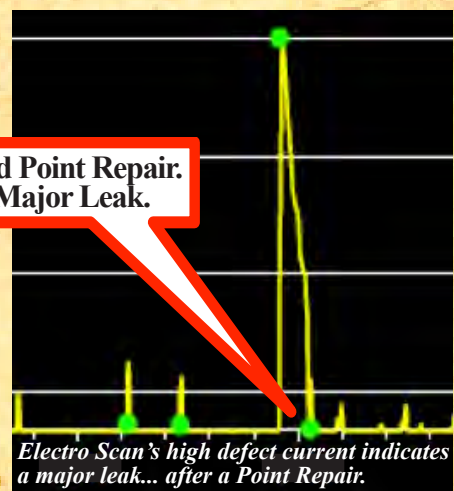
You see, people don't fix what they can't 'see.'

Good Point Repair. But, Should've Relined.

No defect current; so leak was fixed.

Unfortunately, CCTV missed numerous defects that leaked in the rest of the pipe.

Bad Point Repair. Major Leak.

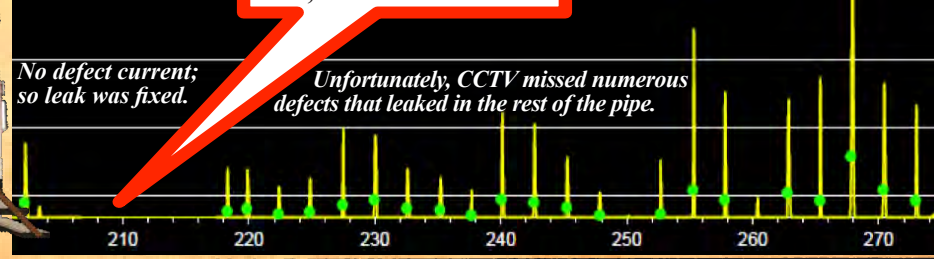


Electro Scan's high defect current indicates a major leak... after a Point Repair.

(Above) Electro Scan finds a major leak precisely where a point repair had been recently completed. (Below) A point repair was fixed, but other major defects remain.

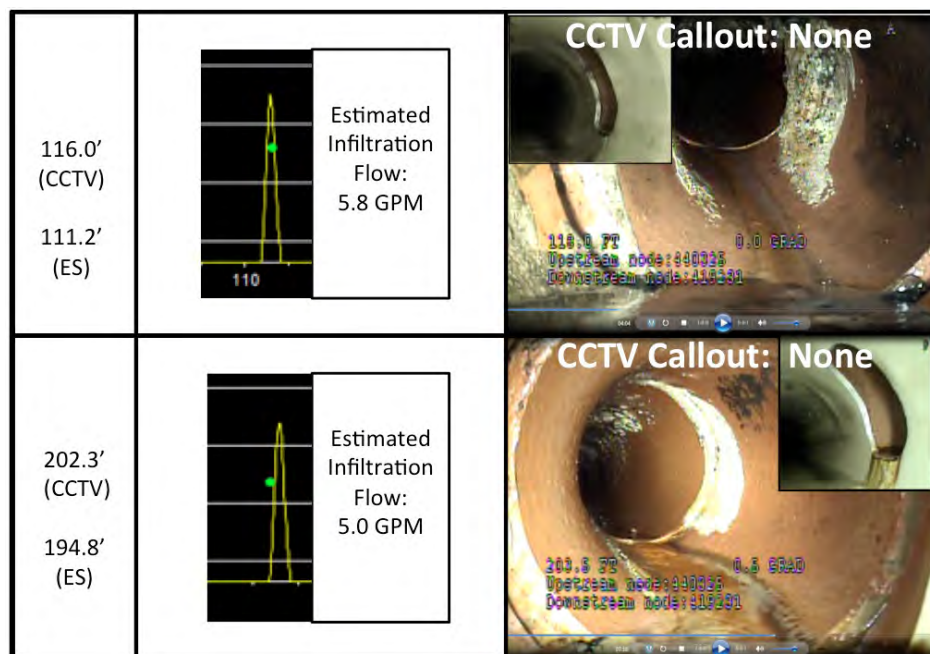
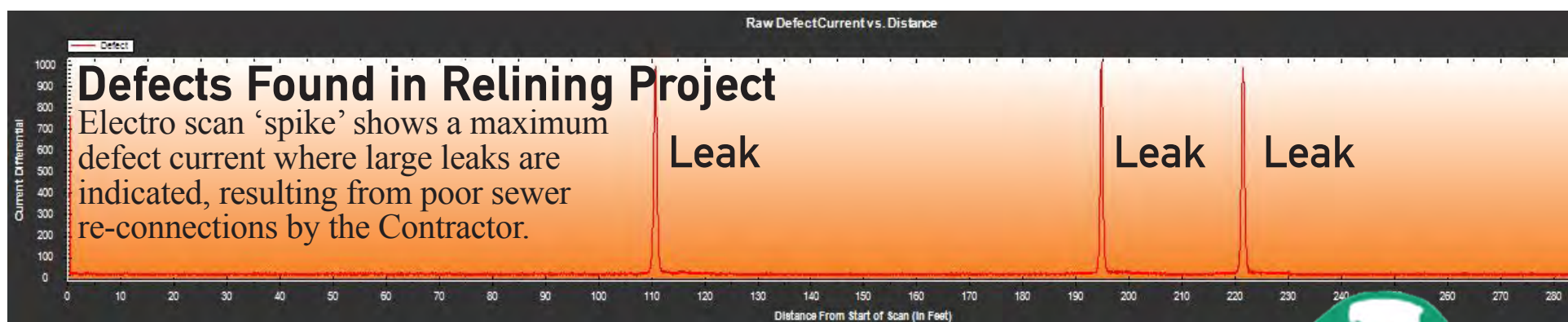
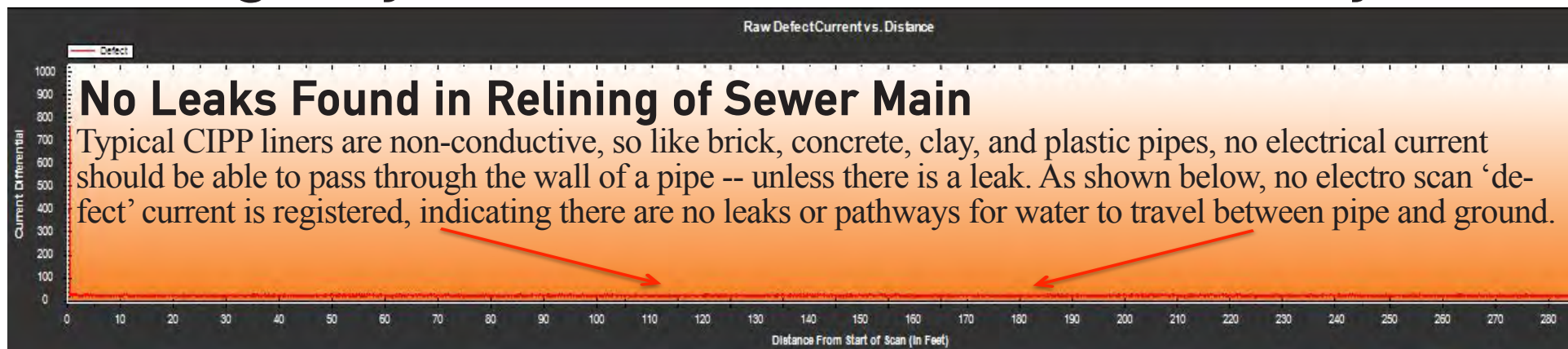
CCTV is good for many things, but not to certify whether a repair is done correctly. Pressure testing may tell you if a pipe fails, but not where or how much a defect will leak. Just add Electro Scan and reference

ASTM F2550 in your next RFP to ensure contractors deliver leak free projects.



Call 916-779-0660, Extension 7001, to Request a Demonstration or Budget Quote!

Leading South Florida Sewer Utility 'Electro Scans' Relining Project and Finds Defects Not Seen By CCTV



Electro Scan readings taken March 2013, compared to CCTV images taken in January 2013.



Diagnostic Resources & Solutions
 2840 Cressington Blvd.
 Kennesaw, GA 30144
 Tel: 678-594-0731
 Web: <http://www.drsmamerica.net/>
 Contact: Danyale Smith Berthelot, President
 Email: danyale@drsmamerica.net
 Territory: Florida, Georgia, Tennessee, and Puerto Rico

British Village 'Electro Scans' Pitch Fiber Pipe

Originally Slated to Compare CCTV & Electro Scan, No Televising Was Possible Due to High Build-Up of Silt

The use of pitch fiber pipe was widespread in the United Kingdom from the 1950s to early 1970s, including use for nearly 50,000 property connections. Today, a number of UK water companies are experiencing growing problems related to this type of pipe.

Considered ideal for laterals and sewer mains due to their lightweight and low cost, pitch fiber pipe was typically produced in 8 foot lengths so they were easy to handle and faster to install.

Made of wood cellulose fiber that was impregnated with refined inert coal tar pitch, pitch fiber pipe was created under vacuum and pressure, representing approximately 25% fiber and 75% pitch, by weight.

Initial research suggested that if pitch fiber

pipes were laid correctly, without any adverse ground conditions, the pipe could be expected to have a life span of up to 40 years; however, high pressure jet nozzles used for periodic cleaning could inadvertently damage the structural integrity of the pipe wall.

Not familiar with this type of pipe, Electro Scan undertook several projects in early 2013 to catalog its defect patterns. Working in cooperation with UK-based Pell Frischmann, Upstream Pipeline Services, and Electro Scan's authorized dealer, Leeds-based Ant Hire Ltd., Electro Scan inspected all pitch fiber sewers in its target survey area. By comparison, no CCTV inspections were possible to due to heavy build-up of silt. **Contact Electro Scan for completed details of this project.**

Pitch Fiber Pipe.



(Above) Chuck Hansen, Electro Scan's CEO, onsite in England overseeing the field team and paying all bar tabs for his people at the local pubs.



Ant Hire Ltd
 The Specialist Hire & Sales Company

Ant Hire Solutions LLP
 Unit 4 Queen Street
 Stourton, Leeds LS10 1SL
 Tel: +44 113 270 7777
<http://www.anthire.co.uk>
 Tel: +52 1 871 1890879
 Contact: Adrian Thompson
 Email: adrian@anthire.com

Going Where No TV Camera Has Gone Before Electro Scan Surveys Sewer Underneath Lake

McKinney, TX ‘Electro Scans’ 600ft Sewer Main Below Lake

The City of McKinney’s Water / Waste-water division within the Department of Public Works is responsible for supplying safe, uninterrupted water and wastewater services to their residents and businesses.

The City of McKinney’s sewer system consists of 620 miles of sewer main and 396 miles of storm main -- double in size from ten years ago. Today, McKinney collects & delivers sewage to the North Texas Municipal Water District for treatment.

Working with Jerry Sonnier, President of CLS Sewer Equipment, Inc.-- Electro Scan’s Dealer in Texas -- the City wanted to scan a 24” diameter clay sewer main, experiencing moderate-to-heavy flows, making it difficult-to-impossible to inspect with conventional CCTV cameras.

Objective: *Determine if Electro Scan can identify any defects in the pipe that could contribute to infiltration.*

Without the need for external water, given the existing flow, an electro scan test was conducted with Electro Scan locating 197 Total Defects, including 112 Small, 34 Medium, and 51 Large defects.



But ASTM F2550 and Electro Scan do not simply recommend looking at the total number of defects in a pipe. Instead, the ASTM & Electro Scan’s technology displays both a Maximum Defect Current (i.e. for Small, Medium, and Large readings) **AND** an estimated Defect Flow based on the Defect Area *for each defect* -- as defined by the electric current sustained over an Area. The longer or wider the reading, the worse the leak.

Electro Scan represents a new data type for assessing sewers, calculating an estimated gallons per minute (gpm)* -- in direct contrast to the PACP-standard of calculating an Overall Pipe Rating (i.e. 1-5) Index (OPRI) from visual observations.

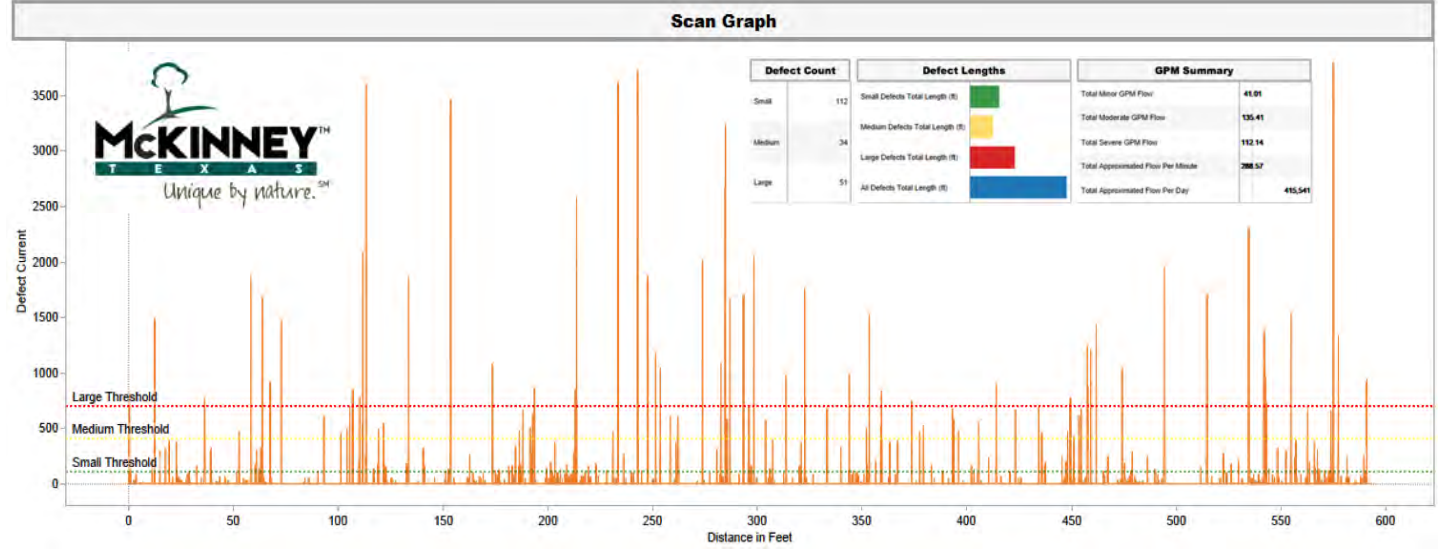
In some cases, sewer mains may be renewed with a single point repair. Unfortunately, this is not one of those cases. Electro Scan shows that defects are consistent throughout the pipe, making it a prime candidate for relining.

Based on the size and quantity of all defects, it was estimated that McKinney’s pipe could infiltrate 290.5 gallons per minute.

Estimated infiltration for the City’s sewer main -- running underneath the lake -- is over 418,000 gallons per day. But, before scheduling this pipe for rehabilitation, it would be recommended to Electro Scan other sewer mains to determine a recommended priority.

*Electro Scan’s gpm calculation represents an *Estimate Only* with a ±40% accuracy and assumes 1 foot of water head above the pipe. Besides gradient and ground water conditions, other factors should always be considered prior to selecting a rehab method as the rate of flow can also be calculated by the orifice formula $Q=VA$ where Q is flow, A is the area, V is the velocity, with $V=\sqrt{2gh}$, where g is the acceleration of gravity (32.2 ft/sec squared) and h=height of water column (head). Since this relationship is not linear, it means if a 12” column of water drains, Q will be higher at the beginning of the episode and vary over the time to drain and be lower approaching Zero at the end.

Of course, if draw-down testing (e.g. exfiltration tests) are used, the time-to-drain a certain volume is measured, realizing that the rate varies over the draw-down time. In this case, the relationship between different draw-down times would be linear, i.e. if it takes ‘twice as long’ the average rate would be 1/2 the original, and if it took ‘half as long’ the average rate would be 2x the original. Happy hunting!



The biggest breakthroughs are the ones that alter decisions.



electro³scaninc.
“Product of the Year”

Water Environment Federation (2013) | NASTT No-Dig (2013) | CleanTech Innovation Challenge (2013)

Call 800-975-6149 or 916-779-0660 to Arrange A Demo Today
That Will Change The Way You Inspect Your Sewers & Laterals,
Certify Your Next Lining Project, and Conduct Your SSES.

WEFTEC Booth 612

www.electroscan.com

Salt Lake City Finds Leaks in 66" Relined HDPE Pipe Using Electro Scan's ES-620 for Sewer Mains™

CCTV 'Misses' Defects On Spiral Wound HDPE Using Rib-Loc Lining

Established in 1876, the Salt Lake City Department of Public Utilities manages 652 miles of sewer main and 336 miles of stormwater covering a service area of 112 square miles.

After learning about the Electro Scan technology, Ryan Broadhead, Wastewater Manager, and Steven Terry, Wastewater Supervisor, invited Electro Scan to visit Salt Lake City and 'look' at a few of their sewer pipes.

First, scanning 2,000 ft, or 9 pipe segments in less than a day, followed by a 900ft scan of a 42" pipe, the City asked Electro Scan to 'look' at a 66" diameter reinforced concrete pipe (RCP), traversing under I-15, that had recently been relined using a spiral wound high density polyethylene (HDPE) rib-loc lining. Truly a special situation.

Electro Scan first heard of Salt Lake City's 'special situation' in October 2012 when CH2M Hill's Mark Wade presented a paper at the Dallas Municipal Forum, sponsored by the Louisiana Technical University's Trenchless Technology Center. Then again in May 2013, while attending the annual NWEA & WEAU Joint Conference in St. George, Utah.

With the 66" diameter sewer pipe running 1/4 to 1/2 full, Marc Lyons, Electro Scan's Western Regional Field Technician, positioned his CCTV/Electro Scan rig near the upstream manhole, connected his ES-620 probe to his truck's CCTV cable reel, and started to scan.

Taking less than 20 minutes, Electro Scan located 35 Total Defects – 21 Small, 3 Medium, and 11 Large defects. Using its cloud-based Critical Sew-

er™ app, Electro Scan immediately quantified all defects, estimating an infiltration rate of 52 gallons per minute (gpm), i.e. 75,000 GPD.

As part of Electro Scan's 'after action' discussions with Ryan Broadhead, Tom Ward, and members of the City's engineering department, Electro Scan was informed that the pipe, in fact, was located over a former lake—Warms Springs Lake—in an area with as much as 15ft of groundwater -- far in excess of Electro Scan's base 1ft assumed head, indicating that actual flow rates might be substantially higher.

Today, Electro Scan's Critical Sewers™ performs all calculations assuming a 1ft head and 1% gradient, providing a ±40% accuracy for its estimated gpm calculation, when combined with Electro Scan data. Working with Platinum Level customers & engineers, Electro Scan can fine-tune this analysis. "The location and size of the defects [found by Electro Scan] do not change," says Mark Grabowski, VP Electro Scan. "Those defects are definitely in the pipe, at those locations, and the only change would be from engineering variables that will help fine-tune the estimated rate of infiltration."

"While CCTV should (still) be used for visual inspections, it should not be used to certify that repairs are complete. Instead, Electro Scan should be added as a line item to your next RFP to ensure that all repairs are 'leak free'."

"We prove (daily) that while CCTV is good for recording general observations, it shouldn't be relied on to certify repairs or rehabilitation," says Marc Lyons. "Instead, Electro Scan should be added as a line item in your next RFP to ensure that all point repairs and rehabilitation are leak free."



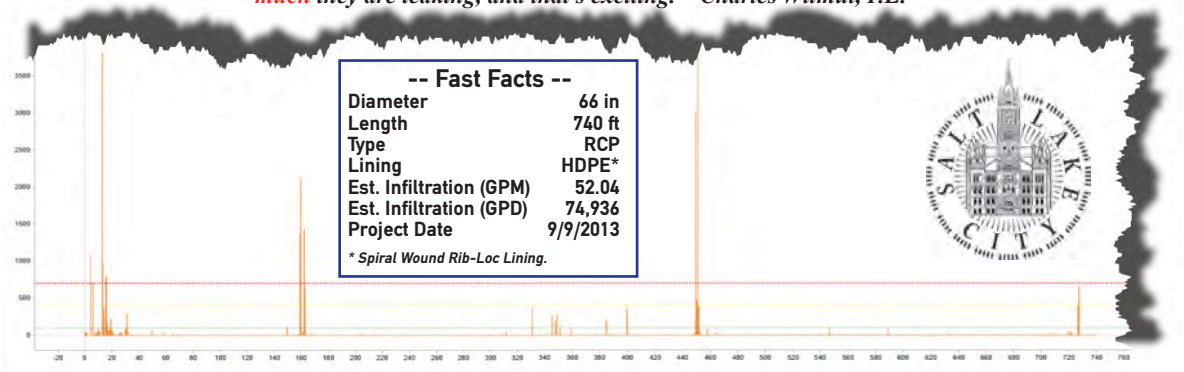
(Right) Side-by-side comparisons of Electro Scan defects and CCTV images. In each case, no CCTV callouts were recorded that corresponded to defects found by Electro Scan.

Electro Scan recorded over 45,000 data points as part of its pipe scan, finding 35 Total Defects representing 52 Gallons of Minute (i.e. 75,000 GPD) of estimated infiltration.

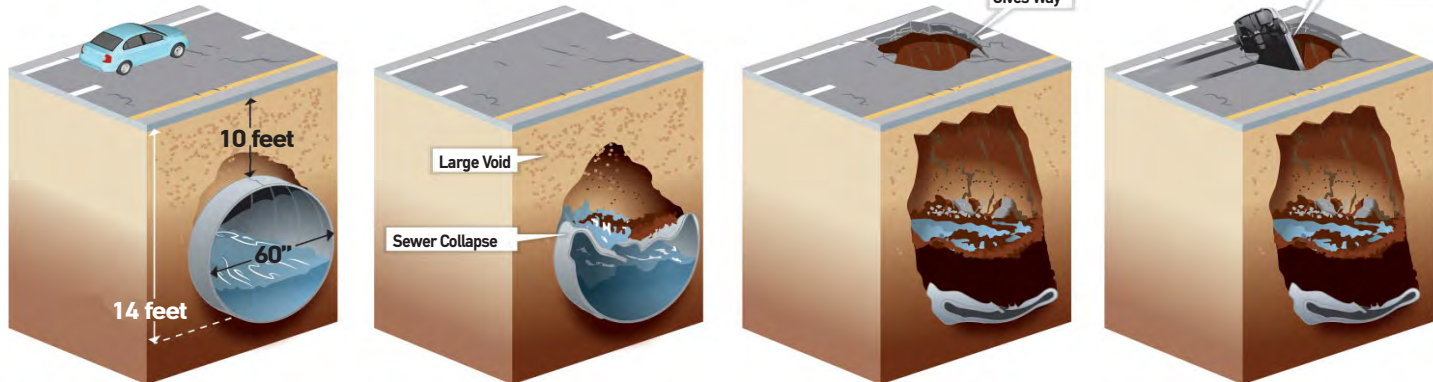
6101 West 9790 South
West Jordan, Utah 84081
Tel: 800-424-8693
Web: www.maricsales.com
Contact: John Housley
Email: maricsales@msn.com

"We may not know exactly what the defects are, but we certainly know where they are and how much they are leaking, and that's exciting." Charles Wilmut, P.E.

Defect Count		Defect Lengths		GPM Summary	
Small	21	Small Defects Total Length (ft)		Total Minor GPM Flow	5.32
Medium	3	Medium Defects Total Length (ft)		Total Moderate GPM Flow	29.53
		Large Defects Total Length (ft)		Total Severe GPM Flow	17.20
Large	11	All Defects Total Length (ft)		Total Approximated Flow Per Minute	52.04
				Total Approximated Flow Per Day	74,936



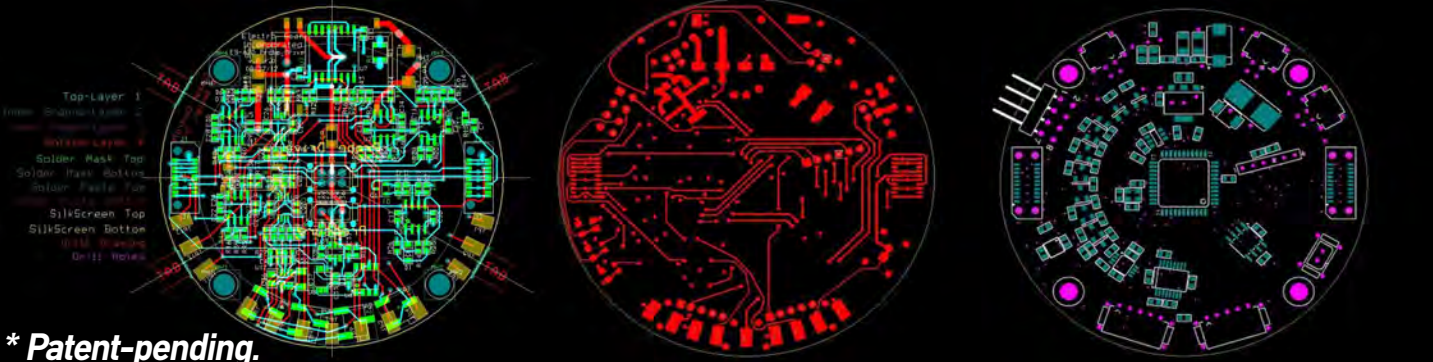
How Do Sewer Sinkholes Happen?



An aging sewer... allows soil to leak through bad joints creating a void... so the pavement gives way... & swallows a car.

A 50-year old sewer has been televised multiple times in the past 20 years, with no visible defects. Defective joints, not seen by CCTV inspection, periodically surcharge and systematically liquifies soil above the sewer pipe, creating a void. City crews have a PM to remove silt, without knowing that a void is being created. Without a base under it, the pavement collapses, opening a hole wide enough and deep enough to swallow a car. An unsuspecting car plunges into the sinkhole as the hole continues to widen.

WEF 'Best Innovative Technology' 2013*



* Patent-pending.

Electro Scan Builds Pipe Testing Center

In addition to cataloging all scan results on its Critical Sewers™ cloud computing app, including pipe diameter, material, depth, soil type, surface cover, pipe length, and more, Electro Scan is building its own pipe testing center to calibrate groundwater infiltration and exfiltration test results. Below, Electro Scan's Eastern Regional Field Tech, Macy Grubbs begins trenching Electro Scan's test bed.



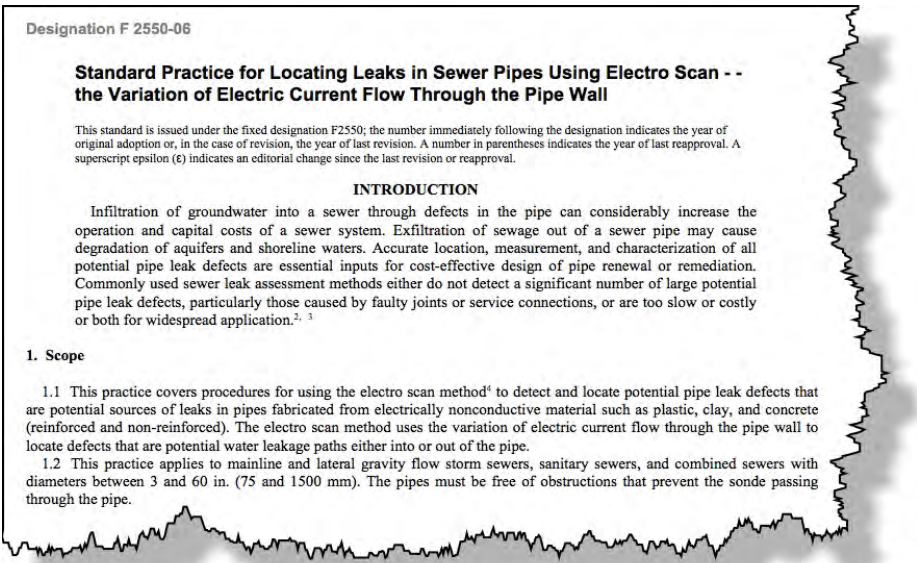
ASTM F2550: Getting the Most From Your SSES & Sewer Lateral Inspection Program

Electro Scan is delighted to see leading sewer utilities modify their specifications for Sanitary Sewer Evaluation Studies to incorporate ASTM F2550-Standard for Locating Leaks in Sewer Pipes Using Electro-Scan--the Variation of Electric Current Flow Through the Pipe Wall.

ASTM F2550, first established in 2006, provides a groundbreaking specification that describes the next generation in sewer assessment.

In April 2013, Chuck Hansen was appointed the new Technical Contact for ASTM F2550, with plans to expand the standard to include additional features and incorporate potable water pipes.

“Our mission is to help engineers and contractors understand key aspects of the [ASTM] standard,” states Chuck Hansen, Technical Contact, ASTM F2550, “and, help transition the industry to more accurately locate & quantify sources of infiltration by measuring the variation of electric



Including key terminology, principles of operation, procedures, description of apparatus, data descriptions, and reporting standards, ASTM F2550 ensures that consulting engineers and contractors provide consistent and meaningful results.

Headquartered in West Conshohocken, PA, about 5 miles northwest of Philadelphia, ASTM, was founded in 1898 as the American Section of the International Association for Testing and Materials -- pre-dating other venerable standards-making societies, including BSI (1901), DIN (1917), ANSI (1918) and AFNOR (1926).

Up until 2001, ASTM International, was known as the American Society for Testing and Materials (ASTM). Today, ASTM is an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services.

Today, ASTM has emerged as the dominant rule-making society among standards developers in the USA and represents the largest developer of standards in the world.

Using a consensus approach to develop its standards, ASTM supports thousands of volunteer technical committees, which draw their members from around the world to collectively develop and maintain more than 12,000 standards.

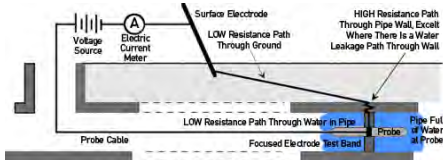
ASTM F2550 is administered by Committee F36 on Technology and Underground Utilities, which is overseen by industry veterans, including Dr. Jey K. Jeyapala, Chairman, and Steve Henning, Vice-Chairman.

ASTM F2550 is specifically part of the F36.20 Inspection and Renewal of Water and Wastewater Infrastructure roster. Other F36 rosters include F36.10 Optical Fiber Systems with Existing Infrastructure and F36.60 Infrastructure Asset Management.

Two initiatives under consideration for becoming full standards, but not yet reaching this distinction, include:

- New Practice for Laser Technologies for Measurement of Pipeline Ovality.
- New Practice for Establishing Sampling Density Units for Computer-Vision-Based Laser Pipe-Profiling Robots.

current in non-conductive (i.e. reinforced and non-reinforced) pipes.

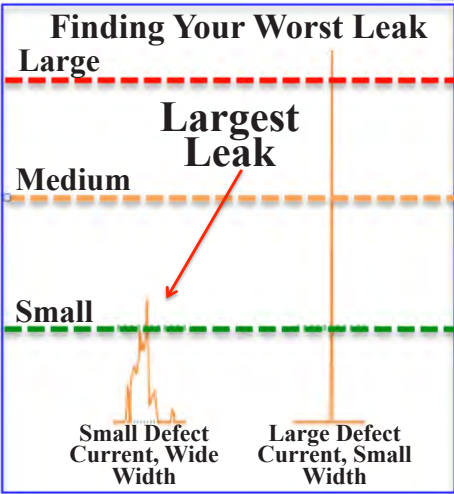


Schematic of an electric circuit as applied to a common sewer main.

Electro Scan represents a new data layer for SSES, Sewer Lateral Inspection Projects (SLIPs), and hydraulic modeling, oftentimes changing the ranking and prioritization of critical sewers. While CCTV and other tests may find *some* sources of infiltration, Electro Scan finds *all* sources of leaks, including location, length, and intensity, often delivering different results from the PACP's OPRI 1-5 rating system.

Over 1 million feet of electro scan has been completed in accordance with ASTM F2550, including several US EPA field tests for both sewer mains and laterals. Today, Electro Scan is being used to assess a variety of pipe materials, diameters, lengths, surface covers, depths, groundwater, and soil types. Representing the first solution able to automatically quantify infiltration, Electro Scan does not require any visual interpretation or subjective analysis, as required for TV, smoke testing, and surface dye flood testing.

Contact Electro Scan for a list of consulting engineers that are certified as adhering to the ASTM F2550 standard.

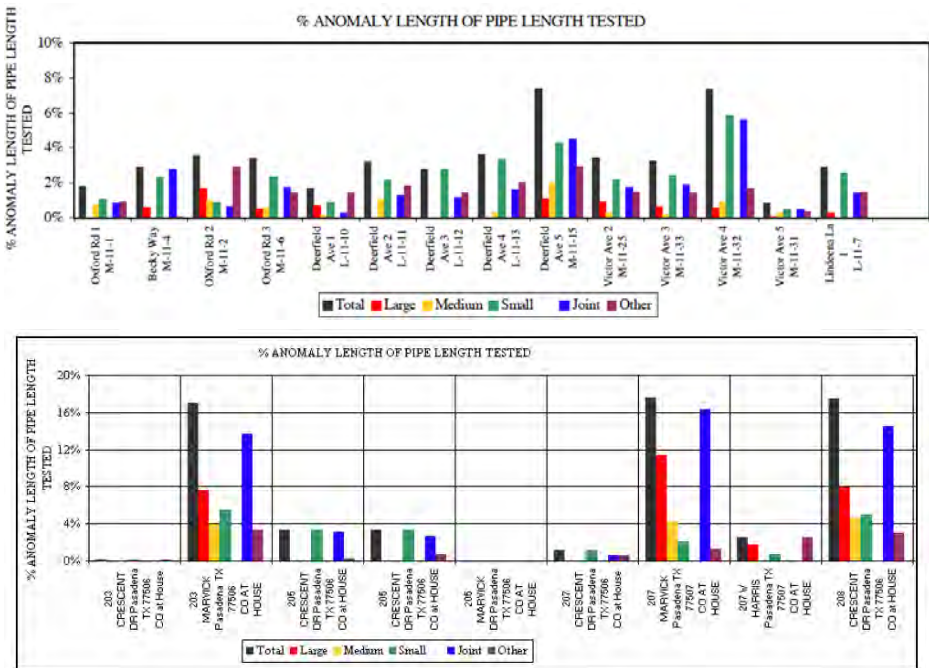


Purchase a Copy Today!
ASTM F2550
Please Visit ASTM's Online Store:
<http://www.astm.org/Standards/F2550.htm>

This article published with written permission of ASTM International.

INFILTRATION SCORECARD			
CCTV & Electro Scan: Working Together to Eliminate Infiltration and Find Leaks		CCTV	Electro Scan
1	Automatically Finds Potential Sources of Infiltration	N	Y
2	Automatically Finds Leaks Inside Joints	N	Y
3	Automatically Finds Leaks at Service Connections	N	Y
4	Automatically Finds Sources of Infiltration at Cracks	N	Y
5	Automatically Finds Leak Locations (within 0.4 in or 1 cm)	N	Y
6	Automatically Measures Size of Leaks (Est. GPM or LPM)	N	Y
7	Automatically Finds Defects That Leak from Bad Couplings	N	Y
8	Automatically Finds Defects That May Still Leak After Repairs	N	Y
9	Automatically Finds Defects That Leak in Re-Lining Projects	N	Y
10	Automatically Finds Defects After Service Re-Connections	N	Y
11	Automatically Finds Leaks, If Silt or Debris on Bottom of Pipe	N	Y
12	Able to Conduct Inspections, If Sewer Pipe Is Full of Water	N	Y
13	Able to Determine Size of Potential Leak, If Roots Are Present	N	Y
14	Automatically Finds Leaks at Joints, If Grease Is Present	N	Y
15	Able to Determine Size of Leaks, If Pipe Has Encrustation	N	Y
16	Requires Active Infiltration to Identify Defect at Source	Y	N
17	Contains Moving Parts That Could Clog from Debris or Silt	Y	N
18	Requires Bypass During Inspection, If Pipe Full	Y	N
19	Requires Special Training and Certification to Identify Defects	Y	N
20	Relies on Visual Observations to Record Defects	Y	N
21	Ave. Speed of Inspection (6-20" Sewer Main)	3ft / min	50ft / min

Sample Data Prepared in Accordance with ASTM F2550, Paragraph 8.5



Don't Let Your Contractor Leave The Next Lining Job, Before Fixing Their Leaks.

Add **Electro Scan** To Your CCTV Rig and Certify Your Lining Projects & Point Repairs as Leak Free*

Automatically Locate & Measure the Peak GPM of Defects, That CCTV Can't See.

NOT SEEN ON CCTV

Flat Line = No Leaks

Contractor's Defective Service Reconnection.

* Measures the variations of electricity passing through defects in pipe walls in accordance with ASTM F2550-06.

"Product Innovation of the Year"

Water Environment Federation (2013) | NASTT No-Dig (2013) | CleanTech Innovation Challenge (2013)

Hampton Roads Sewer Agency Completes 20,000ft of 'Electro Scan' in Less Than a Week

Electro Scan Project Helps Re-Assess Previously Inspected & Rehabilitated Sub-Basins

Problem

Two sub-basins within the James City Service Authority (JCSA) are experiencing a serious and persistent infiltration problem, in spite of being only 20-30 years old, consisting mostly of PVC pipe material, and undergoing a previous round of sewer surveys and rehabilitation.

Located between the James River and an inland lake in Williamsburg, VA, the 10-year, 24-hour Peak Hour Flows for these basins were 5 to 7 times greater than their Peak Flow Thresholds.



Background

Flow monitoring was performed at two lift stations (LS 1-8 and LS 1-9) using field calibrated algorithms and SCADA, indicating that flows increased significantly during wet weather events. Hydraulic modeling using rain and flow monitoring data was collected during 2008 and 2009 and projected a 10-year, 24-hour Peak Hour Flow to be 1,574 gallons per minute (gpm) at LS 1-8 and 959 gpm at LS 1-9.

Discharge from LS 1-9 is pumped to the gravity collection system of LS 1-8, and re-pumped by LS 1-8. The Peak Flow Threshold -- a reasonable assumption for average daily flow and an allowance for I/I as defined in the Regional Consent Order with DEQ -- was 214 gpm for LS 1-8 and 183gpm for LS 1-9, yet the 10-year 24 hour Peak Hour Flows for these basins are 5 to 7 times greater than their Peak Flow Thresholds.

Prior Rehabilitation

In 2005, water mains in LS 1-8 and LS 1-9 basins were replaced. At the same time, the related sanitary sewer system was evaluated using CCTV and visual inspection of manholes to determine if sewer improvements should be made in conjunction with water main upgrades. Within the two basins, 40 sewer mains were replaced (i.e. approximately 4,320 LF of 8" gravity mains), 28 sectional or point repairs were made (i.e. approx., 1,250 LF of 8" gravity mains), 14 manholes were replaced, and 17 manholes were lined with a cement mortar lining.

In 2009 and 2010 both basins were smoke tested and televised with Red Zone SOLO Robotic cameras. Some open channel flow monitoring was performed upstream from LS 1-9, and a wet weather inspection was performed in the LS 1-9 basin to observe flows in manholes, working upstream from the lift station.

Several defective manholes were discovered and subsequently repaired, with other significant defects repaired, too.



LS 1-8 service area consists of approximately 5,300 LF of 8" gravity pipe, 300 LF of 10" gravity pipe, 33 manholes, and 58 laterals. In comparison, LS 1-9 service area consists of approximately 14,650 LF of 8" gravity pipe, 81 manholes, and 326 laterals.

JCSA prepared a preliminary Rehabilitation Plan which assumed fixing those portions of the LS 1-8 and 1-9 systems that pre-dated 1980, including 4,500 LF of gravity pipe, 27 manholes, and 58 laterals in the LS 1-8 basin and 8,230 LF of gravity pipe, 45 manholes, and 102 laterals in the LS 1-9 basin.

In spite of an EPA-mandated TV inspection, smoke testing, open channel monitoring program, and selected rehabilitation, infiltration levels remained high, requiring an ongoing need to identify sources of infiltration.

Electro Scan Project

Upon learning of Electro Scan, JCSA contracted with Prism Contractors & Engineers (Yorktown, VA) to electro scan both sub-basins LS 1-8 and LS 1-9, using the ES-620 for Sewer Mains™ -- WEF's 2013 Innovative Technology Award Winner -- to assess its sewer mains. Additionally, Electro Scan's ES-38 for Sewer Laterals™ would be used to assess selected customer laterals, without disruption to residents or the sanitary sewer system.

Project Results

The project electro scanned 133 main line segments, representing 19,260 feet, identifying 350 defects in both sub-basins contributing an estimated 1.3 MGD of infiltration. By comparison, previous CCTV inspection had indicated 44 Structural Defects (i.e. S1, S2, and S3). With all field work completed in less than a week.

The Electro Scan project team identified the 'Top Twenty Worst Sewer Mains' (See Summary Report, page 7), representing 4,159 feet of sewers from the combined sub-basins, contributing an estimated 652,928 gallons per day of infiltration.

Next Steps

JCSA will begin rehabilitating the worst mains and laterals, with Electro Scan providing post-rehabilitation scanning to ensure all repairs are delivered without leaks.



Electro Scan's Summer Intern, Jamie Johnson, monitors real-time data from the Electro Scan ES-620™.



(Above) Industry veteran and Electro Scan Special Advisor, Charles Wilmut, P.E., talks with JCSA's Director of Engineering, Danny Poe, P.E., on the Electro Scan job site.



Prism Contractors and Engineers, Inc. and Electro Scan Inc., would like to 'thank' JCSA for all their support during the Project, especially Larry Foster, General Manager, Danny Poe, P.E., Chief Wastewater Engineer, James Canning, Civil Engineer, Jared Nuss, GIS Analyst, Thomas Ebert, Underground Utility Superintendent, and George Adams, Operations Administrator.

(Above) Prism Contractors & Engineers, guides water into sewer main to surround Electro Scan's moving funnel plug.

(Right) Award winning photograph taken by Electro Scan's Vice President of Municipal Markets, Mark Grabowski, selected by the International Society for Trenchless Technologies (ISTT) for inclusion in their 2013 Photo Gallery.



Electro Scan Project Summary Report*

'Top Twenty Worst Sewer Mains'



Ranked by Estimated GPM				critical sewers™										CCTV Inspections											
				# of Defects				Estimated Maximum Flow																	
														M1	M2	M3	M4		S1	S2	S3				
#	Manhole ID	DIAMETER	LENGTH	Small	Medium	Large	Total	Minor	Moderate	Severe	Total Est. Peak GPM	Peak Max. Gallons Per Day (GPD)	Roots Fine Joint	Deposits Attached Grease	Tap Break In	Camera Underwater	Total Maintenance Defects	Separated Medium Joint	Surface Spalling	Multiple Cracks	Total Structural Defects	Total Defects	# of CCTV W/ ZERO Defects	# of CCTV W/ ONE Defect	
1	19006_19004	8"	166	1	0	4	5	0.1	0.0	37.67	37.8	54,418	0	0	0	0	0	0	1	0	0	1	1		1
2	19067-004_19067-003	8"	290	1	0	4	5	0.1	0.0	37.37	37.4	53,914	0	0	0	0	0	0	0	0	0	0	0	1	
3	18009_18008	8"	273	1	0	5	6	0.8	3.7	27.27	31.8	45,778	0	0	0	0	0	0	1	0	0	1	1		1
4	18015_18014	8"	222	4	0	3	7	1.0	0.0	28.74	29.7	42,754	0	0	0	0	0	0	0	0	0	0	0	1	
5	19047_19046	8"	362	12	2	3	17	3.0	0.0	26.51	29.5	42,422	0	0	0	0	0	0	4	1	5	5	5		
6	19059_19058	8"	164	1	1	6	8	0.9	11.1	16.33	28.3	40,795	0	0	0	0	0	0	1	0	1	1	1		1
7	19034_19033	8"	220	1	3	3	7	1.1	5.3	17.43	23.8	34,200	0	0	1	2	3	0	0	0	0	0	3		
8	19019_19018	8"	231	5	2	8	15	1.6	21.6	0.00	23.2	33,422	0	9	3	1	13	0	0	0	0	0	13		
9	18011_18005	8"	297	2	1	2	5	0.6	0.0	21.97	22.6	32,530	0	0	0	0	0	0	0	0	0	0	0	1	
10	19018_19013	8"	219	2	0	6	8	0.3	9.8	11.38	21.4	30,830	0	0	0	0	0	0	2	0	0	2	2		
11	19007_19006	8"	193	2	1	2	5	1.2	0.0	19.94	21.1	30,384	0	1	0	0	1	0	0	0	0	0	1		1
12	19055_19019	8"	295	2	0	2	4	0.5	0.0	20.00	20.5	29,520	1	0	0	0	1	0	1	0	1	2	0		
13	19031R_19030AR	8"	108	0	0	2	2	0.0	0.0	19.34	19.3	27,850	0	0	0	0	0	0	0	0	0	0	0	1	
14	19058_19057	8"	200	3	0	4	7	0.4	1.2	15.33	16.9	24,394	0	0	0	0	0	1	0	0	1	1	1		1
15	19025_19022	8"	214	0	0	2	2	0.0	0.0	16.19	16.2	23,314	0	0	0	0	0	0	0	0	0	0	0	1	
16	18016_18015	8"	86	1	0	4	5	0.4	3.6	11.72	15.7	22,637	0	1	0	0	1	0	0	0	0	0	1		1
17	19003_19002	8"	214	2	0	2	4	0.8	0.0	14.61	15.4	22,234	0	0	0	0	0	0	0	0	0	0	0	1	
18	19060_19059	8"	166	0	0	3	3	0.0	5.0	10.0	15.0	21,586	0.0	0	0	0	0	0	0	0	0	0	0	1	
19	18007_18006	8"	160	1	0	2	3	0.1	3.8	10.00	13.9	20,002	0	0	0	0	0	0	0	0	0	0	0	1	
20	19028R_19027A	8"	78	0	0	2	2	0.0	3.9	10.00	13.9	19,944	0	0	0	0	0	0	0	0	0	0	0	1	
TOTAL				4,159	41	10	69	120	13	69	372	453	652,928	1	11	4	3	19	5	6	1	12	31	9	6
* Request a copy of JCSA's +300-page report by calling Electro Scan at 916-779-0660, Extension 7001.								61%					39%	100%	15										

James City Service Authority

CCTV Inspections -- By The Numbers

Number of CCTV Inspections in Survey Area

131

of Pipes Televised - with 'ZERO' or 'ONE' Call-Out

124

of Pipes Televised - with 'ZERO' Structural Defects

110

of Pipes with 5 Structural Defects of More

2

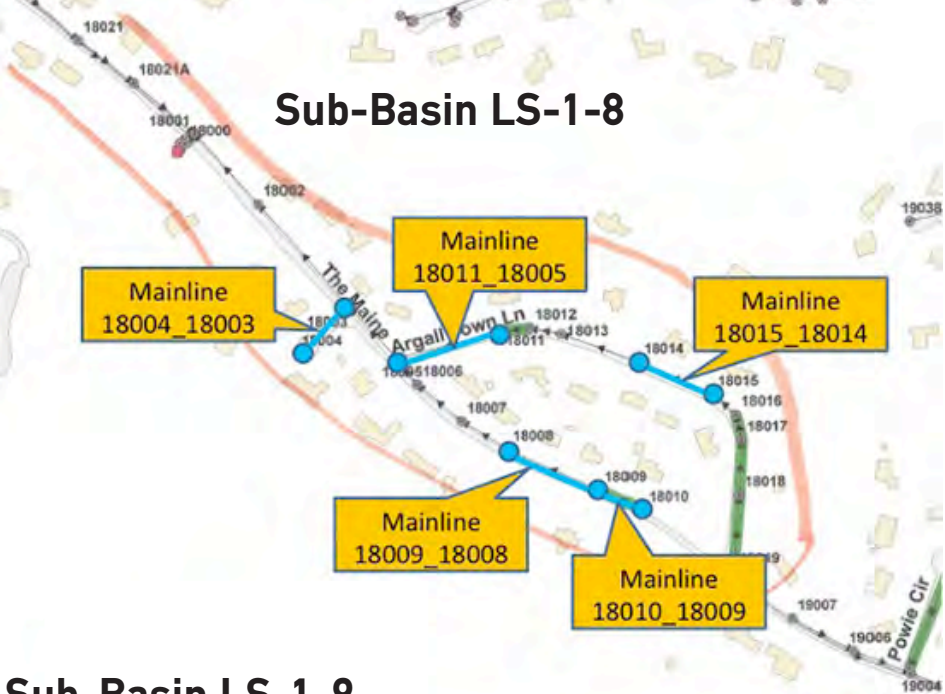
of Pipes with 9 Structural Defects

1

Highlights

- A number of CCTV Inspections recorded pipe segments that were underwater, without noting a specific defect that would contribute to a PACP rating.
- Service Connections (at the Main) were often observed as 'FACTORY TAPS (ACTIVE)' without any associated defect, often missing significant openings to soil found by Electro Scan.
- Oftentimes 'TAP BREAK INS' had no corresponding PACP Defect, therefore no detectable source of infiltration was recorded.
- The majority of CCTV Still Images, did not correspond to defects detected by Electro Scan, requiring a detail re-review of all video.
- Only six (6) types of sewers defects had been identified during CCTV inspection of the 20 Worst Pipes as identified by Electro Scan, including:

	Number
1. M1 - Fine Roots	1
2. M2 - Deposits Attached Grease	11
3. M3 - Tap Break In	4
4. M4 - Camera Underwater	3
5. S1 - Separated Medium Joint	5
6. S2 - Surface Spalling	6
7. S3 - Multiple Cracks	1
- Nine (9) sewer mains or 45% of the 'Twenty Worst Pipe Segments' identified by Electro Scan had ZERO # of defects identified by CCTV.
- Fifteen (15) sewer mains or 75% of the 'Twenty Worst Pipe Segments' identified by Electro Scan had One or Fewer Defects identified by CCTV.



Tri-Cities North Regional Wastewater Authority, OH Upgrades TV Truck to Include Electro Scan ES-620

TCA's Goal For First Year: Electro Scan 100,000 ft.

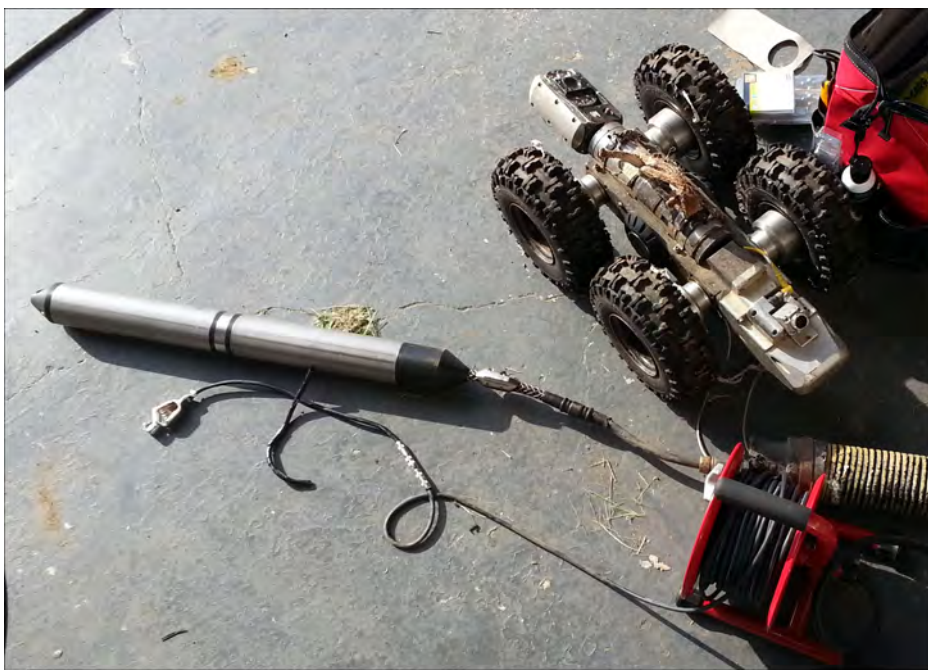
Tri-Cities North Regional Wastewater Authority (TCA) was formed in June 1996 by joint venture agreement between the cities of Huber Heights, Vandalia, and Tipp City and concurrently acquired the north regional wastewater treatment plant and related facilities from the Miami Conservancy District.

The joint venture agreement was made possible by State of Ohio Statute 715.02 that allows municipalities to enter into joint venture agreements for the purposes of providing utility services.

The purchase was arranged through MTech Company (Bedford, OH), Electro Scan's authorized dealer for Ohio and Michigan.

"We strongly believe that Electro Scan fills an immediate need for wastewater utilities to accurately assess their defects and certify that repairs and lining projects have been done correctly," stated Dan Soukup, MTech's Regional Manager. "Combining Electro Scan and CCTV offer a 365-day solution for wet-weather and dry-weather evaluation of any sewer or drainage network."

Final training of TCA's new rig was completed the week of August 26th, when it was stated that **TCA's first year goal is to electro scan 100,000ft of sewer main.** In addition to classroom training on operation and field procedures in using the ES-620 for Sewer Mains™, training also included data management and access to Electro Scan's Critical Sewers™ cloud application.

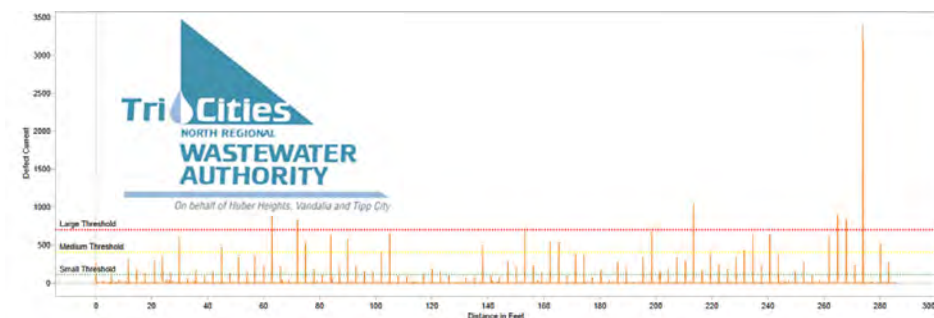


In addition to its wastewater treatment plant, TCA manages a sewer interceptor network and assists its three (3) member cities in inspecting their respective sanitary sewer collection systems. Combined, TCA manages 265 miles of sewer main serving 61,000 people.

Employing a general manager to oversee the day-to-day operations and maintenance of its facilities, TCA currently contracts with Veolia Water North America to work with the cities' engineering, finance and planning staff to advise the joint operating Board of Participants.

"The thing that sold us was the fact we can use Electro Scan any day of the year, under any condition," said David Heckler, TCA General Manager. "We typically have to wait until the ground is dry to conduct smoke testing or when sewer lines are under normal flow conditions before conducting CCTV inspection; but with Electro Scan we can inspect year round and utilize Electro Scan's automatic gpm capability to quickly identify and address our hot spots."

Defect Count		Defect Lengths		GPM Summary	
Small	51	Small Defects Total Length (ft)		Total Minor GPM Flow	19.30
Medium	17	Medium Defects Total Length (ft)		Total Moderate GPM Flow	33.71
Large	8	Large Defects Total Length (ft)		Total Severe GPM Flow	5.37
		All Defects Total Length (ft)		Total Approximated Flow Per Minute	58.38
				Total Approximated Flow Per Day	84,067



(Above & Below) Add-on products to convert CCTV for electro scanning in less than 5 minutes.



7401 First Place, Unit G
Bedford, Ohio 44146
Toll Free: 440-646-0996
Web: www.mtechcompany.com
Contact: Bryan Cohen, Dan Soukup, and Chris Cira
Territory: Michigan and Ohio

Electro Scan Joins Louisiana Tech Univ TTC Advisory Board

Electro Scan is pleased to announce its joining Louisiana Technical University's Trenchless Technology Center (TTC) Advisory Board. Led by Erez Allouche, Ph.D., P.E., TTC serves as a key facilitator in conducting independent testing, educational, and research activities.

Electro Scan's 2013 NASTT/No-Dig selection as 'Product Innovation of the Year' and its ability to certify liners as 'leak free' – finding defects often missed by CCTV inspections – made joining the Advisory Board an easy decision.

"We were impressed with the [TTC] program after participating in a number of Municipal Forums," stated Mark Grabowski. "We also met faculty and graduate students in July 2012 when we flew into Ruston, Louisiana, to present the Electro Scan technology."



Louisiana Tech University
Ruston, Louisiana

"We look forward to becoming an active participant on the Board and to assist in a number of trenchless technology research projects," asserted Chuck Hansen. "Our thanks to Cathy Sly & Teresa Fletcher for all your help."

'Whitney Lofrano Design & Creative Thinking' Takes Home a Silver Award for Electro Scan Ad Campaign

Lots of words describe Electro Scan, including audacious, brash, bold, cutting edge, daring, fearless, gutsy, heroic, honest, impactful, indomitable, irreverent, phat, unafraid, and well-financed. But the word was 'lucky' when Electro Scan found its brilliant marketing strategist, Whitney Lofrano.

"Whit immediately understood us and knew what to do without being told," commented Chuck Hansen, Electro Scan's CEO. "Congratulations on your 2012-13 Addy Award."



WINNER!
CONSUMER OR TRADE PUBLICATION SILVER AWARD
Electro Scan Inc. 2012 Branding Campaign
Electro Scan Inc.
Print Campaign – 4 color
Whitney Lofrano Design & Creative Thinking
Whitney Lofrano, Creative



Southlake, TX 'Electro Scans' New Development; Finds Defects Not Seen By TV Inspection Survey

The Wastewater Division of the City of Southlake's Public Works Department is responsible for the daily operation of the wastewater collection system. Representing 181 miles of sewer main, ranging from 6" to 24" diameter pipes, the City has 3,385 manholes and 14 lift stations supporting 7,726 customers.

Located near DFW airport, the City wanted to have Electro Scan determine whether a recently completed property development was ready to become part of the City.

Electro Scan detected 48 defects that could leak finding moderate flow in the system *without any homes built*. So, are the sewers ready to be transferred from the Builder to the City? Not quite.

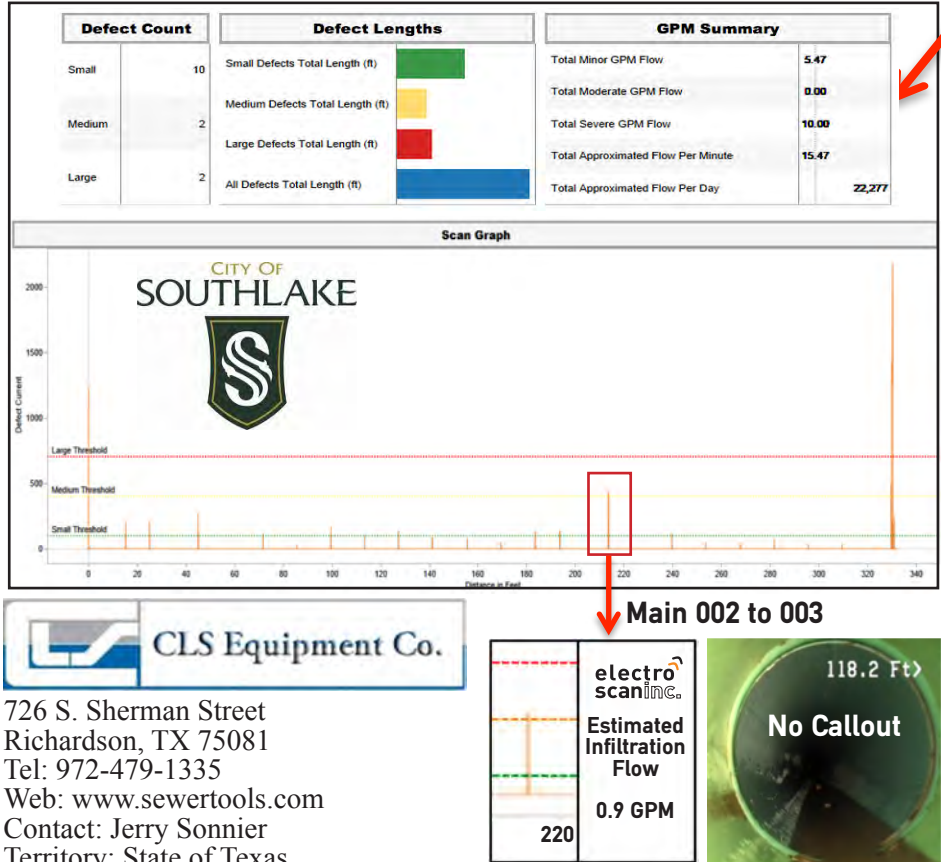
Mainline	Pipe Length	Small Defects	Medium Defects	Large Defects	Total Defects	Gallons Per Day	% of Total Infiltration
001_002	178	3	0	1	4	1,757	4%
002_003	330	10	2	2	14	22,277	54%
004_003	292	2	0	0	2	346	1%
003_005	49	2	0	0	2	1,094	3%
005_006	193	0	0	0	0	-	0%
006_007	129	0	0	1	1	5,717	14%
007_008	300	4	0	1	5	1,757	4%
009_008	425	13	1	1	15	5,846	14%
008_010	379	0	0	0	0	-	0%
010_011	327	1	0	0	1	446	1%
011_012	145	2	0	1	3	778	2%
012_013	56	0	0	1	1	864	2%
TOTAL	2,803	37	3	8	48	40,882	100%

Worst 3 Pipes, Total GPM as a % of Total Subdivision 83%
Worst 3 Pipes, Total Length as a % of Total Subdivision 32%



New development, with no houses, experiencing infiltration, with no defects found on CCTV inspections. City asked Electro Scan to find defects.

GPM	From	To	Date	Defects
17.36	002	003	8/8/2013	2
11.11	002	003	8/8/2013	1
4.08	009	008	8/8/2013	3
3.87	006	007	8/8/2013	1
1.22	001	002	8/8/2013	1
0.07	007	008	8/8/2013	1
0.78	003	005	8/8/2013	1
0.6	013	011	8/8/2013	1
0.54	011	012	8/8/2013	1
0.31	010	011	8/8/2013	1
0.24	004	002	8/8/2013	1



Electro Scan Inc. Named 'Best Cleantech' Company for 2013

Electro Scan Inc. was selected as 'Cleantech Company of the Year' at the 2013 Innovation Challenge held at the Sierra Nevada Brewing Company in Chico, California, June 27, 2013.

The Sierra Nevada Innovation Challenge is the only statewide competition focused primarily on California businesses located outside of San Francisco, Silicon Valley, Los Angeles and San Diego. Each finalist had six (6) minutes to present their company's product features and competitive position; more importantly, *'explain how their product changes the world, an industry, people's lives, or the environment, in a positive, meaningful way.'*

Over 70 industry experts from throughout California were on hand to serve as judges including CEOs, media representatives, angel investors, ven-



ture capitalists, university and government officials and corporate executives. The event marked Chuck Hansen's first financial presentation since selling Hansen Information Technologies to Infor Global in 2007 for a reported \$100 million.

Field Tech, Marc Lyons (pictured below), wasted no time in celebrating Electro Scan's latest award.



Electro Scan Offers A Funnel Cone for Every Sewer Main*

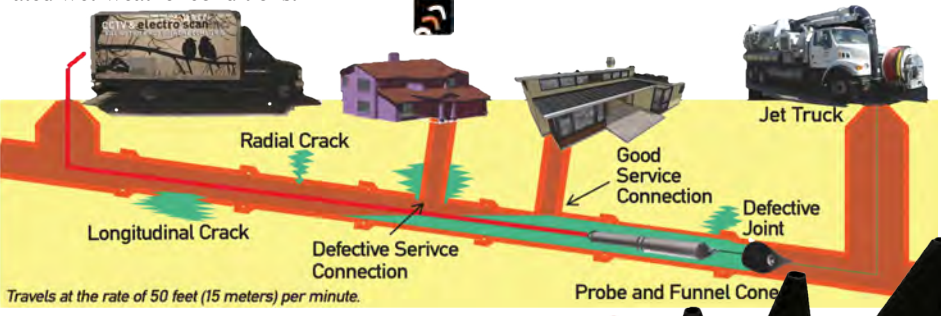
Since Electro Scan requires water to surround its probe -- allowing for a defect current to conduct to the wall of the pipe -- a moving reservoir of water is created through the pipe using a *funnel cone*.

While water (technically) is only needed to surround its middle electrode, a 3-to-6 foot column of water is recommended behind the probe to allow water to partially surcharge up each lateral. Since Electro Scan finds all leaks where water rises, a complete scan of the service connection, including and first 18-24 inches up the lateral, can be accomplished.

With its own pressure sensor designed as part of its probe, real-time data is transmitted to the truck to help evaluate sewers in simulated wet-weather conditions.



Field Tech, Macy Grubbs, attaches a Funnel Cone to Jet Hose and Electro Scan Probe.



Electro Scan Funnel Cones*
Ranging from 6" to 15" Diameter Pipes

* Initial set of funnel cones, up to 12" pipe diameter are provided with the purchase of all ES-620 for Sewer Mains™.



Electro Scan Authorized Dealers

U.S. DEALERS

AZ Wastewater Industries

20 South 48th Ave., Suite 802
Phoenix, AZ 85043
Tel: 602-778-9359
Web: www.azwastewaterindustries.com
Contact: Gary Hall
Email: ghall@azwastewaterindustries.com
AZ, NM, and Clark County, NV

Atlantic Machinery

2628 Garfield Avenue
Silver Springs, MD 20910
Tel: 301-585-0800
Web: www.atlanticmachineryinc.com
Contact: T. Gardner
Email: tgardner@atlanticmachineryinc.com
Maryland, Delaware, Virginia, and District of Columbia

Bahr Sales & Service

1185 South Broad Street
Wallingford, CT 06492
Tel: 203-265-6711
Contact: Bill Bahr
Email: bahrsales@aol.com
CT, RI, MA, NH, VT, ME

CLS Sewer Equipment, Inc.

726 S. Sherman Street
Richardson, TX 75081
Tel: 972-479-1335
Web: www.sewertools.com
Contact: Jerry Sonnier
Email: jerry@sewertools.com
Texas

Diagnostic Resources & Solutions

2840 Cressington Blvd.
Kennesaw, GA 30144
Web: <http://www.drsamerica.net/>
Physical Address:
3620 Kennesaw Industrial Parkway, Suite D
Kennesaw, GA 30144
Tel: 678-594-0731
Contact: Danyale Smith Berthelot
Email: danyale@drsamerica.net
Florida, Georgia, Tennessee, Puerto Rico

EJ Equipment

6949 N. 3000 E. Road
Manteno, IL 60950
Tel: 815-468-0250
Contact: Ed LaSage
Email: edlesage@ejequipment.com
Web: www.ejequipment.com
Illinois and Eastern Missouri

Eye-Tronics

145 Smith Lane
Louisville, KY 40229
Tel: 502-955-5288
Contact: Bobby Chesnut
Email: bpipeeyes@aol.com
Kentucky

Faris Machinery

5770 East 77th Avenue
Commerce City, CO 80022
Tel: 303-289-5743
Web: www.farismachinery.com
Contacts: Giles Poulson
Email: giles.poulson@farismachinery.com
Colorado

Maric Sales

6101 West 9790 South
West Jordan, UT 84081
Tel: 800-424-8693
Web: www.maricsales.com
Contact: John Housley
Email: maricsales@msn.com
ID, UT, MT, WY, Eastern Nevada

Municipal Pipe Tool Co.

515 5th Street
Hudson, IA 50643
Tel: 319-988-4205
Web: www.munipipe.com
Contact: Bryan Robinson
Email: bryanr@munipipe.com
Iowa, Nebraska, and Eastern South Dakota

MTech Company

7401 First Place, Unit G
Bedford, Ohio 44146
Tel: 440-646-0996
Web: www.mtechcompany.com
Contact: Bryan Cohen
Email: bcohen@mtechcompany.com
and
Contact: Dan Soukup
Email: dsoukup@mtechcompany.com
Michigan and Ohio



Plumbers Depot

3921 W. 139th Street
Hawthorne, CA 90250
Tel: 310-355-1700
Web: www.plumbersdepotinc.com
Contact: Jose Martin
Email: jose.martin@plumbersdepotinc.com
Southern California

Southern Municipal Equipment

2931 Mineral Springs Road
Lexington, SC 29073
Tel: 803-358-0221
Web: www.southernmunicipal.com
Contact: Russell Senn
Email: rsenn@southernmunicipal.com
North and South Carolina

WECO Industries

630 Eubanks Ct. Suite K
Vacaville, CA 95688
Local: 707-446-6661
Web: www.wecoind.com
Contact: Tom Johnson
Email: tjwecoind@sbcglobal.net
Northern California and Northwest Nevada



Electro Scan's Macy Grubbs and Mark Grabowski, with EJ Equipment's Erik and Ed LeSage, taking a break to catch a Chicago Cub's game at Wrigley Field.

Electro Scan's 'Way of Doing Business'



INTERNATIONAL DEALERS

AUSTRALIA

UVS Pty Ltd.
21 Huntingdale Drive
Thornton, NSW 2322
PO Box 3022 Thornton
New South Wales 2322
Web: www.uvs.com.au
Tel: +61 (0)2 49643508
Contact: Neil Trenaman
Email: neil.trenaman@uvs.com.au

BRAZIL

Aqua Pura
Tel: +52 1 871 1890879
Contact: Ing. Crisanto Rodríguez P.

NEW ZEALAND

City Care Ltd.
226 Antigua Street
Christchurch, 8011
Website: www.citycare.co.nz

Postal Address:
PO Box 7669, Sydenham
Christchurch 8240
Tel: +64 3 941 7200
Fax: +64 3 941 7202
Contact: Hugh Blake-Manson
Email: Hugh.Blake-Manson@citycare.co.nz

UNITED KINGDOM and REPUBLIC OF IRELAND

Ant Hire Solutions LLP
Unit 4 Queen Street
Stourton, Leeds LS10 1SL
Tel: +44 113 270 7777
<http://www.anthire.co.uk>
Tel: +52 1 871 1890879
Contact: Adrian Thompson
Email: adrian@anthire.com

Interested in Becoming An International Dealer?

Contact: Andrew O'Keefe
Email: andrew@electroscan.com



City of Ukiah, Calif. ‘Electro Scans’ Post-Rehab Sewers; Finds Leaks at Joints & Connections

Working with its local dealer, WECO Industries (Vacaville, Calif), Electro Scan was invited to scan a number of 6” diameter VCP sanitary sewers at the City of Ukiah, California.

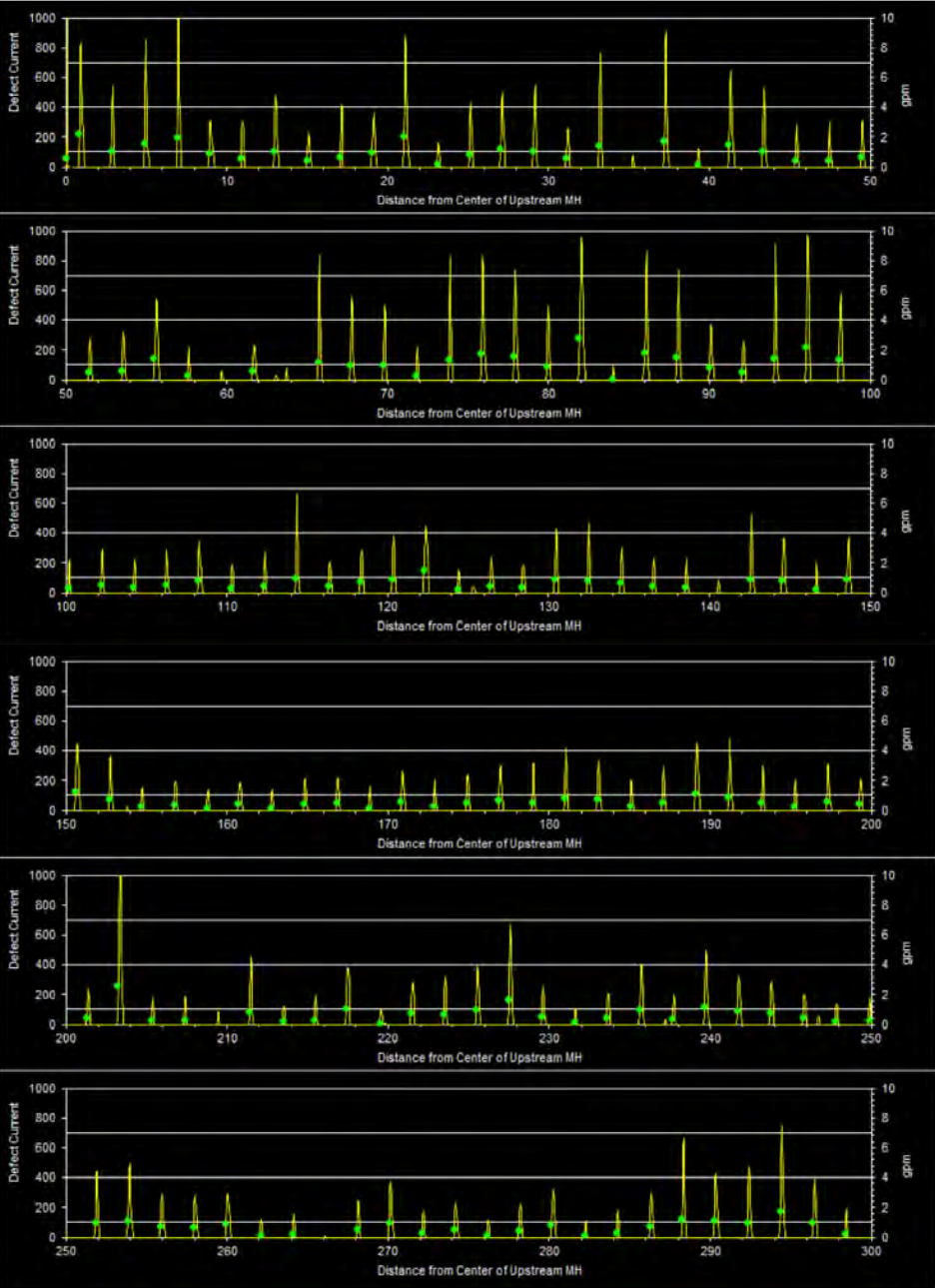
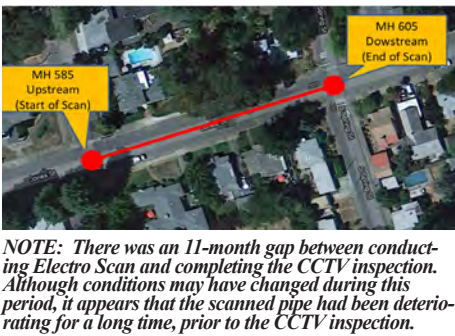
Laid at minor-to-moderate grade with a minimal flow upstream, gradually increasing further downstream, Electro Scan’s Field Techs set-up to scan the City of Ukiah’s sewers.

Objective: Determine if Electro Scan can identify any defects and compare to previous CCTV inspections. As shown in the pipe scan below Electro Scan identified each defect, displaying a potential to infiltrate estimated of 2 gpm or more.

Of the five (5) defects that have the potential to infiltrate 2 or more gpm, none had shown any defects from previous CCTV inspections.

Electro Scan located 148 Total defects, compared with ‘No Defects’ identified by a PACP-certified CCTV operator. A majority of defects identified by Electro Scan were at each joint, showing that its independent TV operator was unable to visually see any visible defects.

Contact Electro Scan or WECO Industries to request a full report of this project.



82.0' (C CTV) 81.9' (ES)	 Estimated Infiltration Flow: 2.76 GPM	 CCTV Callout: None
96.0' (C CTV) 96.1' (ES)	 Estimated Infiltration Flow: 2.16 GPM	 CCTV Callout: None
203.4' (CCTV) 203.2' (ES)	 Estimated Infiltration Flow: 2.56 GPM	 CCTV Callout: None



City of Ukiah, California

Electro Scan Results in Accordance with ASTM F2550

Anomaly Picking Threshold	100.00	Grade Current Levels	Number	Length	% Length of Pipe Tested	% of Total Anomaly Length	Grade Flow Levels	Number	Flow gpm	Flow per 100ft of pipe	% of Total Flow
Grade	Large	>700	18	4.1	1%	17%	>4	0	0.0	0.0	0%
	Medium	700 to 400	34	6.8	2%	29%	4 to 1	37	55.4	18.0	49%
	Small	<400	96	12.3	4%	53%	<1	111	56.7	18.4	51%
Total			148	23.2	8%	100%	<1	148	112.1	36.3	100%



WECO INDUSTRIES

630 Eubanks Ct. Suite K
Vacaville, CA 95688
Local: 707-446-6661
Web: www.wecoinc.com
Contact: Thomas Johnson
Territory: Northern California and Northwest Nevada

Mark's Corner A Message from Electro Scan's VP, Mark Grabowski

Tips for Making The Most of Your Electro Scan ES-620 Demo



Mark Grabowski, VP, Electro Scan, on a recent trip to NYC, checking out sewer access in front of 30 Rockefeller Center in Manhattan.

- People ask me all the time, what is needed to prepare for an Electro Scan demonstration; and I tell them its all about getting the **RIGHT PIPES** with the **RIGHT EQUIPMENT**, and including the **RIGHT PEOPLE**.
- 1. Select The Right Pipes**
- To make your demo the most efficient & effective, find sewer mains 6”-10” in diameter that are 100-400 ft in length, in low-traffic areas. Additionally, try and select the following:
- Pipes with high (unexplained) flows,
 - Pipes that can't be easily televised,
 - Recently relined pipes,
 - Pipes with spot or point repairs,
 - Pipes with known problems.
- We recommend that you stay away from pipes that are difficult to access or previously grouted. Also, make sure you provide your Dealer or Electro Scan with all maps, manhole numbers, prior TV reports, and videos.





- 2. Get The Right Equipment**
- Electro Scan trucks are equipped with flashing directional arrows, strobe lights, and traffic cones, but anything above & beyond will need to be provided by the local sewer utility.
- A jet truck (or combo truck) with operators, is also required, so don't forget to bring a full tank of water & gas with a general cleaning nozzle that will be used to propel your jet hose up the pipe to the upstream manhole.
-

- 3. Schedule The Right People**
- Most times, we perform demos at two locations a day – one in the morning and another in the afternoon, with 2-3 hours allotted for each demonstration.
- Typically, we like to spend at least a half-hour at the beginning of the demo to give a brief explanation of our technology, safety procedures, field operations, and technical standards. This is often done at the office, corporation yard, or shop, but can also be done in the field.
- Because our data is so unique and leapfrogs over traditional TV data, it is recommended that your chief engineer or consulting engineer be present at our briefing.
- And, don't forget to have fun. This is cool stuff, and we want to make sure you feel comfortable with using this great new tool to solve your problems.

Mark Grabowski	U.S. and Canada	mark@electroscan.com	262-510-5107
Macy Grubbs	U.S., East of the Mississippi	macy@electroscan.com	270-498-5310
Marc Lyons	U.S., West of the Mississippi	marc.lyons@electroscan.com	480-274-6900
Andrew O'Keefe	International	andrew@electroscan.com	503-939-0403

ES-620 & 2060 for Sewer Mains™

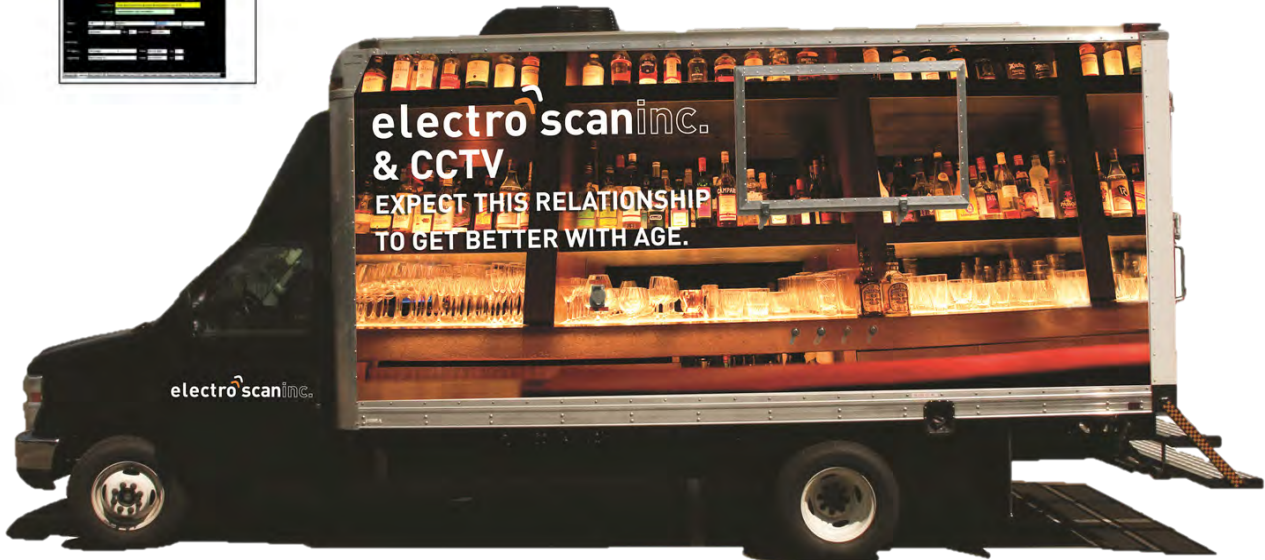
Field Guide

JOB SITE PREPARATION							EQUIPMENT SET-UP		
1. Job Planning	2. Traffic Control	3.CCTV to Electro Scan	4. Grounding Reel	5. Mainline Console	6. Upstream Prep	7. Downstream Prep	8. Retrieve Jet Hose	9. Attach Funnel Plug	10. Jet Truck Operation
									
a. Map Book	a. Deploy Safety Cones	a. Shut Down CCTV System	a. Set-Up	a. Co. Registration	a. Position Truck to MH	a. Remove Manhole Lid	a. Remove Jet Nozzle	a. Lubricate Funnel Plug	a. Begin Retracting Hose
									
b. Map Sheet Review		b. Switch CCTV to Electro Scan	b. Grounding Stake	b. Operator	b. Remove Manhole Lid	b. Jet Hose to Upstream MH	b. Attach Funnel Plug	b. Stop Funnel 6" into Pipe	
									
c. ES-620 Field Guide		c. Connect Probe to Cable		c. System Options			c. Attach to Probe	c. Turn on Water	
									
		b. Turn on Electro Scan Controller		d. Operator Logon			d. Sample Funnel Plug	d. Fill until over MH Bench	
									
				e. Sewer Agency					
									

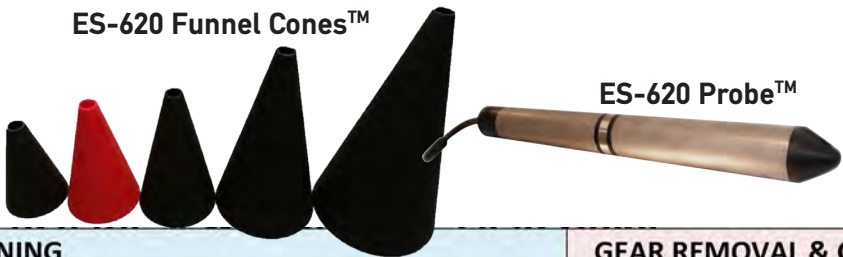
ES-620 Grounding Rod™



ES-620 Grounding Cable™











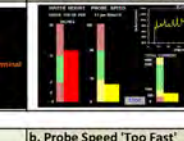


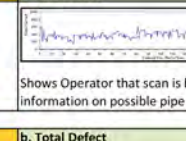







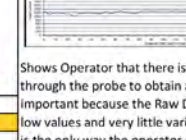



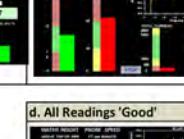
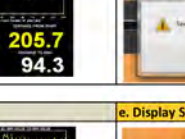
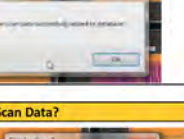
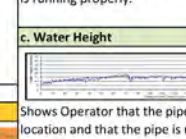



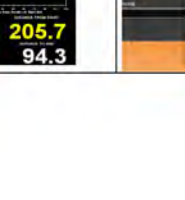

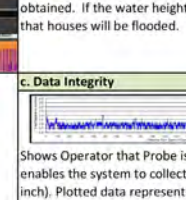


ES-620 Funnel Cones™



ES-620 Probe™

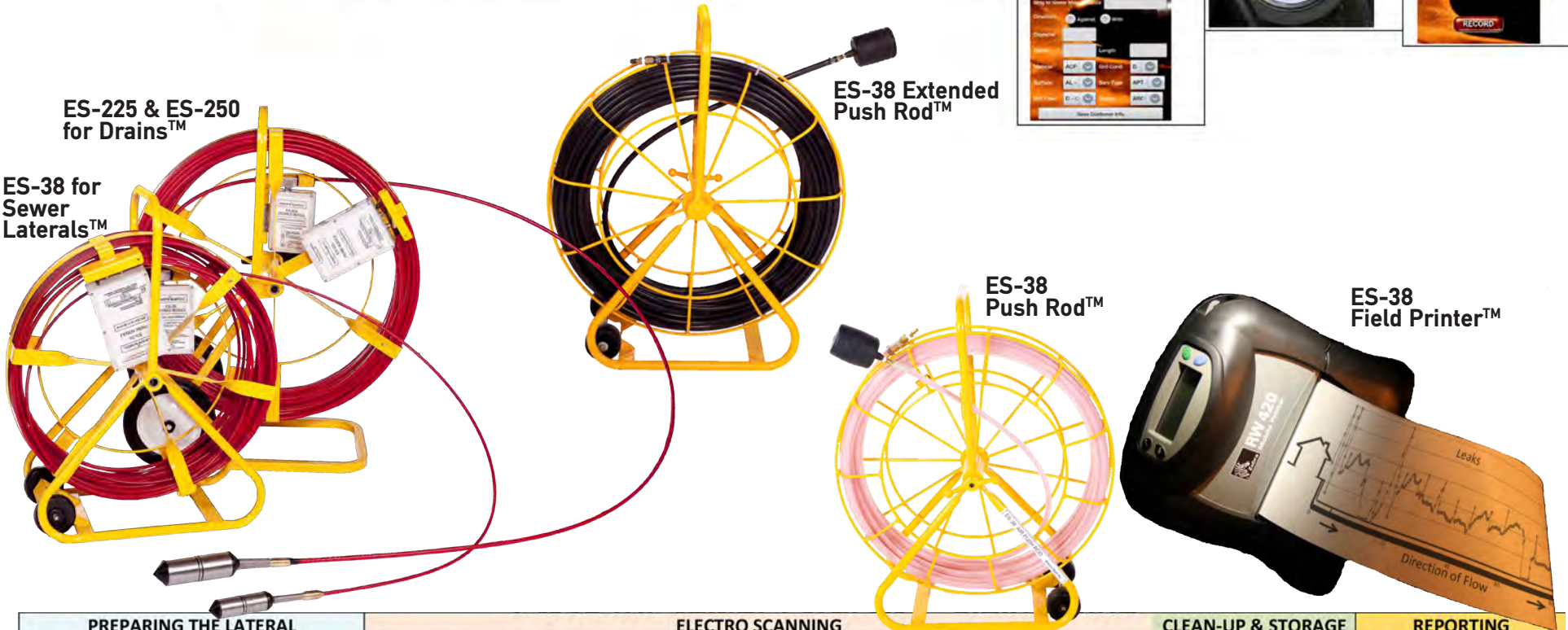


ELECTRO SCANNING					GEAR REMOVAL & CLEAN-UP		REPORTING
11. Position Probe	12. Final Checks	13. Key Indicators	14. "Live" Scanning	15. Completed Scan	16. Gear Removal	17. Clean-Up	18. Cloud Reporting
							
a. Layout Probe	a. Connection Check	a. Water 'Too High' & Probe 'Too Slow'	a. Scan (In Process)	a. Raw Defect	a. Stop Retraction When Funnel in Downstream MH	a. Clean-Up Equipment	a. www.CriticalSewers.com
							
b. Insert Probe	b. Connection Check	b. Probe Speed 'Too Fast'	c. Save Scan	b. Total Defect	b. Carefully Pull Probe Into Downstream Manhole		b. Data Display: Subject To Licensing
							
c. Single Pulley	c. Scan Setup	c. Total Current 'Too Low'	d. Successfully Added to Database	c. Water Height	c. Unhook Funnel Plug from Rope		b. GPM for Advanced Data Management Only
							
d. Side Wedge Pulley	1. Total Current	d. All Readings 'Good'	e. Display Scan Data?	c. Data Integrity	d. Pull Probe & Rope Back Through Pipe		
	2. Defect Current						
	3. Battery Volts						
	4. Probe Volts						

ES-38, 150, and 250 for Sewer Pipes™

Field Guide

BEFORE LEAVING THE OFFICE					EQUIPMENT TESTING		
1. Smartphone Pairing	2. Application Set Up	3. Battery Check	4. GPS Check	5. Printer Check	6. Customer Data	7. Air Push Rod Test	8. ES-38 Calibration
a. Bluetooth Pairing	a. Hardware Settings	a. Probe Module	a. Locational Accuracy	a. Battery Power	a. Set Customer Info	a. Pressure Test	a. Green (or black) wire to Reel
b. Enter MAC IDs	b. Distance Module	a. Positional Accuracy	b. Paper Stock	b. Address Info	b. Bike Pump	a. Red Wire to Yellow Socket	c. Touch Center w/ Alligator Clip
				c. Pipe Info	c. 10 PSI	d. Yellow Indicator > 50%	



PREPARING THE LATERAL		ELECTRO SCANNING				CLEAN-UP & STORAGE	REPORTING
9. Plug the Lateral	10. Filling the Lateral	11. Deploy Probe	12. Recording a Scan	13. Upload to Cloud	14. Print and Storage	15. Clean-Up	16. Cloud Reporting
a. Walk Off Estimated Length	a. Diffuser (If Needed)	a. Insert Probe	a. PRESS Record	a. Save and Send to Cloud	a. PRINT Button	a. Storage	a. www.CriticalSewers.com
b. Lubricate Plug	b. Add Salt (If Needed)	a. All the Way to Plug	b. PULL Probe Back	b. Electro Scan Servers	b. Zebra Printer	b. Storage	b. Data Display; Subject To Licensing
d. Insert Plug	c. Update Smartphone		d. View Readings	c. Filtered Scans	c. Record a Map Sketch		b. GPM for Advanced Data Management Only
e. Extend to End of Pipe	d. Alternative #1 Use of Water Truck		e. CAUTION				
d. Inflate to 25 psi	d. Alternative #2 Use of Jet Truck						

Case Study - City of Wauwatosa, Wisconsin WERF Sewer Lateral Electro Scan Field Verification Pilot -- Eagle Street Revisited

Lack of Compliance With ASTM F2550, And Disregard For Manufacturer's Recommendations, Requires Major Report 'Do Over'

Mistakes happen. Especially when dealing with a new technology that is changing how sewers are assessed and prioritized for repairs, rehabilitation, and renewal.

Despite repeated advice and recommendations to comply with ASTM F2550, a recently published Water Environment Research Foundation (WERF) report entitled Sewer Lateral Electro Scan Field Verification Pilot, incorrectly limited its analysis to assessing only Small, Medium, and Large defects (i.e. height of defect current), without consideration of size (i.e. width) of the defect, automatically determined by the electro scan process.

Subsequent discussions and review of the published WERF Report offers a valuable lesson for consulting engineers, subject matter experts, and WERF staff -- *if a report intends to cite an ASTM standard, make sure the data complies with the standard.*

ASTM F2550-06 states that “the focused electrode current data may be processed to grade the variations of the focused electrode current values into those that represent small, medium, and large pipe defects according to the maximum amplitude of focused electrode current.” But, the standard goes on to state that “the processed focused electrode current data may be presented as a distance versus current plot showing the location, grading, and classification of the focused electrode current variations.” A recommended table and chart displaying Electro Scan data is provided as part of ASTM F2550, with corrected analysis for Eagle Street provided as part of this article.

The Standard also states that “the apparatus manufacturer should be consulted regarding the relationship between focused electrode current and pipe defect size.”

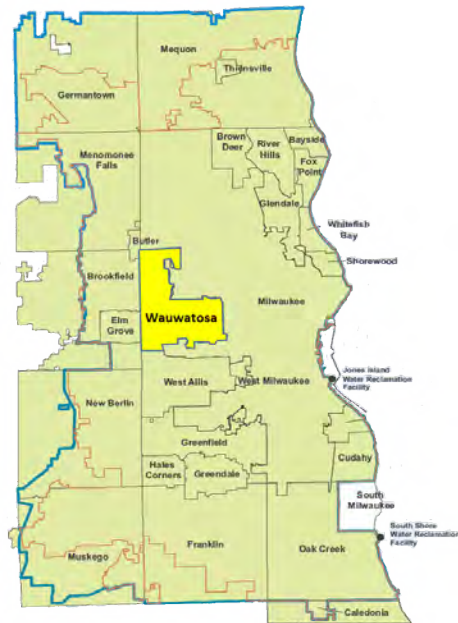
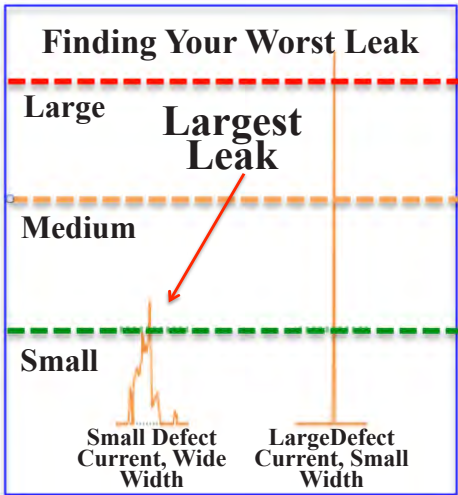
ES-38 for
Sewer
Laterals™



Unfortunately, the published WERF Report based its findings on the number of small (S), medium (M), and large (L) defects. While small, medium, and large defects indicate a Maximum Defect Current, the WERF Report failed to consider the percent of pipe affected by the defect, i.e. distance an electric current is sustained over the area of the pipe for each defect.

Readers may draw their own conclusions from reviewing the highlighted columns in the Table (Right) to compare results of the Number of Defects, ASTM F2550, and Electro Scan Recommended GPM.

‘Large Current Readings’ over ‘Large Areas’ often result in the largest GPM or Defect Flow; however, as illustrated below, ‘Large Current Readings’ (i.e. used in the WERF Report) over a ‘Small Area’ often result in Small or Medium GPMs, therefore missing ‘Small Current Readings’ over ‘Large Areas’ that may indicate larger GPM flows.



Can You See Why No One Would Exclusively Rely on 'Total # of Electro Scan Defects' or 'Total # of Large Electro Scan Defects' To Compare With Standard Leakage Tests?

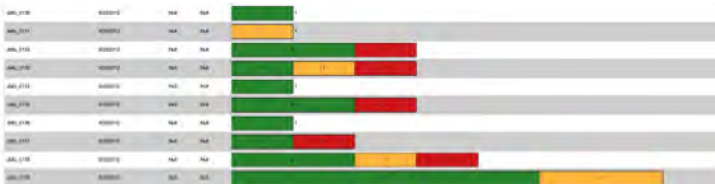
Rank	SCAN ID	Number of Defects				ASTM F2550 % Anomaly Length of Pipe Tested						Electro Scan's Recommended GPM			
		Small	Medium	Large *	Total *	Small	Medium	Large	Joint	Other	Total **	Minor GPM Flow	Moderate GPM Flow	Severe GPM Flow	Total GPM **
1	dafu_0025	9	2	14	25	0.22	0.40	11.07	4.67	7.02	11.69	2.49	24.47	15.4	42.3
2	dafu_0031	30	7	4	41	5.90	1.93	1.22	3.80	5.25	9.05	10.48	14.52	0.0	25.0
3	dafu_0009	5	9	6	20	1.77	2.75	1.48	1.83	4.17	6.00	6.2	16.46	0.0	22.7
4	dafu_0023	17	4	5	26	2.15	1.66	1.91	3.37	2.35	5.72	5.51	13.31	0.0	18.8
5	dafu_0022	14	6	3	23	1.16	1.56	2.02	1.08	3.66	4.74	4.92	9.96	0.0	14.9
6	dafu_0028	23	0	1	24	3.55	0.00	1.61	1.65	3.51	5.16	5.81	2.02	6.2	14.1
7	dafu_0015	22	4	0	26	5.42	1.07	0.00	2.84	3.65	6.49	8.53	5.27	0.0	13.8
8	dafu_0008	12	6	1	19	0.20	2.81	2.94	1.41	4.54	5.95	6.58	6.49	0.0	13.1
9	dafu_0018	26	5	0	31	0.77	0.13	0.00	0.90	0.00	0.90	8.4	2.12	0.0	10.5
10	dafu_0029	14	9	0	23	1.26	1.62	0.00	2.88	0.00	2.88	10.52	0	0.0	10.5
11	dafu_0006	22	4	2	28	0.47	1.55	1.91	2.79	1.14	3.93	6.67	3.66	0.0	10.3
12	dafu_0012	19	5	1	25	0.36	0.85	1.43	2.45	0.19	2.64	6.29	2.61	0.0	8.9
13	dafu_0011	16	2	1	19	0.49	0.59	0.56	0.74	0.90	1.64	4.12	2.85	0.0	7.0
14	dafu_0020	18	5	0	23	1.48	0.89	0.00	2.11	0.26	2.37	6.85	0	0.0	6.9
15	dafu_0027	21	2	0	23	1.78	0.38	0.00	1.56	0.60	2.16	5.52	1.13	0.0	6.7
16	dafu_0016	13	1	0	14	0.83	0.19	0.00	0.90	0.12	1.02	4.13	0	0.0	4.1
17	dafu_0017	19	2	0	21	0.72	0.24	0.00	0.87	0.09	0.96	3.99	0	0.0	4.0
18	dafu_0030	14	0	1	15	1.37	0.00	0.21	0.30	1.28	1.58	3.97	0	0.0	4.0
19	dafu_0026	9	0	1	10	1.61	0.00	0.00	1.27	0.34	1.61	2.27	1.02	0.0	3.3
TOTAL		323	73	40	436										240.7

* WERF reporting metric, used to correlate with Exfiltration Tests.
** Not included in WERF Report

Understanding The Power of Electro Scan

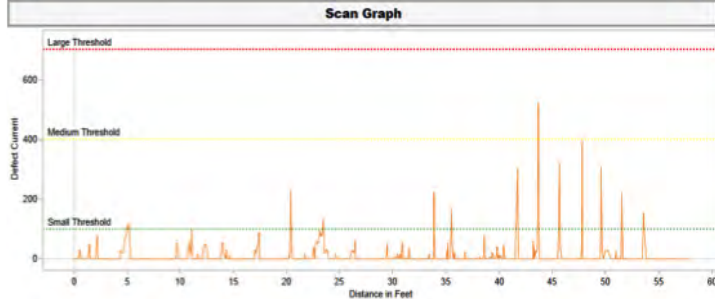
While readers should never rely exclusively on Total Defect Counts, as shown above, the % of defective pipe, as required by ASTM F2550 may not always match up with GPM estimates as the standard does not take into account the severity of the defect.

For example, a small longitudinal crack may not leak much, but will cause a higher % of the pipe length to be graded as 'defective.' At the City of Wauwatosa, in particular, a majority of infiltration occurred at offset joints, most registering a defect length of less than 1/4 of an inch, but leaking huge amounts. This resulted in a low % of defective pipe, but high flow.



Defect Count		Defect Lengths		GPM Summary	
Small	13	Small Defects Total Length (ft)	0.000	Total Minor GPM Flow	4.13
		Medium Defects Total Length (ft)	0.000	Total Moderate GPM Flow	0.00
Medium	1	Large Defects Total Length (ft)	0.000	Total Severe GPM Flow	0.00
		All Defects Total Length (ft)	0.000	Total Approximated Flow Per Minute	4.13
				Total Approximated Flow Per Day	5,947

Defect by Location in Pipe					
Analysis Defect Grade	Defect Start (ft)	Defect End (ft)	Defect Length (ft)	GPM Flow	GPM Defect Area (ft)
Small	-0.509	-0.420	0.089	0.210	0.001
Small	5.016	5.056	0.030	0.190	0.001
Small	5.220	5.289	0.069	0.190	0.001
Small	20.413	20.496	0.085	0.280	0.001
Small	23.474	23.507	0.033	0.130	0.000



Source: Electro Scan Inc. Critical Sewers™ September 2012

SCAN	ELECTRO SCAN ID	ELECTRO SCAN & EXFILTRATION DATE	DISTANCE -- BLDG TO SEWER MAIN	PIPE DIAMETER	PIPE DEPTH	PIPE LENGTH	PIPE MATERIAL	GROUND CONDITION	Detail Exfiltration Test Results				Drop (Feet)	4 inches, 1ft, 1.5ft, 2ft, 3ft Drop in 1 second (6" Stand Pipe)	Time (Seconds)	Gallons Per Minute (Equiv. Drop Divided By Time)	Gallons Per Day (GPM x 1,440 min/day)	Gallons Per Minute [Surface Dye Flood Test, aka Soaker Test]	Number of Defects				% Anomaly Length of Pipe Length Tested						Estimated Flow			
									Small	Medium	Large	Total							Small	Medium	Large	Joint	Other	Total	Minor GPM Flow	Moderate GPM Flow	Severe GPM Flow	Total GPM				
1	dafu_0006	6/26/08	59	6	108	58.8	VCP	D - Dry	Exfiltration - 3ft drop in 8.9 sec.	3	264.384	8.9	29.7	42,777		22	4	2	28	0.47	1.55	1.91	2.79	1.14	3.93	6.67	3.86	0.0	10.3			
2	dafu_0008	6/28/08	60	6	108	52.37	VCP	D - Dry	Exfiltration - 4 inch in 7.05 sec.	0.333	29.3466	7.05	4.2	5,994		12	6	1	19	0.20	2.81	2.94	1.41	4.54	5.95	6.58	6.49	0.0	13.1			
3	dafu_0009	6/28/08	58	6	108	52.35	VCP	D - Dry	Exfiltration - 4 inch drop in 3.59 sec.	0.333	29.3466	3.59	8.2	11,771		5	9	6	20	1.77	2.75	1.48	1.83	4.17	6.00	6.2	16.46	0.0	22.7			
4	dafu_0011	7/4/08	59	6	114	55	VCP	D - Dry	Exfiltration - 2ft drop in 9.56 sec.	2	176.256	9.56	18.4	26,549		16	2	1	19	0.49	0.59	0.56	0.74	0.90	1.64	4.12	2.85	0.0	7.0			
5	dafu_0012	7/12/08	60	6	127	47.67	VCP	D - Dry	Exfiltration - 1ft drop 2.01 sec.	1	88.128	2.01	43.8	63,136		19	5	1	25	0.36	0.85	1.43	2.45	0.19	2.64	6.29	2.61	0.0	8.9			
6	dafu_0015	7/12/08	62	6	108	0	VCP	D - Dry	Exfiltration - 1ft drop in 2.61 sec.	1	88.128	2.61	33.8	48,622		22	4	0	26	5.42	1.07	0.00	2.84	3.65	6.49	8.53	5.27	0.0	13.8			
7	dafu_0016	7/12/08	55	6	107	47.96	VCP	D - Dry	Exfiltration - 2ft drop in 2.6 sec.	2	176.256	2.6	67.8	97,619	20	13	1	0	14	0.83	0.19	0.00	0.90	0.12	1.02	4.13	0	0.0	4.1			
8	dafu_0017	7/12/08	64	6	100	48.71	VCP	D - Dry	Exfiltration - 1ft at 1.68 sec.	1	88.128	1.68	52.5	75,538		19	2	0	21	0.72	0.24	0.00	0.87	0.09	0.96	3.99	0	0.0	4.0			
9	dafu_0018	7/12/08	59	6	109	48.91	VCP	D - Dry	Exfiltration - 1ft drop in 1.7 sec.	1	88.128	1.7	51.8	74,650		26	5	0	31	0.77	0.13	0.00	0.90	0.00	0.90	4.32	0	0.0	4.3			
10	dafu_0020	7/15/08	55	6	90	44.48	VCP	D - Dry	Exfiltration - 1ft drop in 4.9 sec.	1	88.128	4.9	18.0	25,899	40	18	5	0	23	1.48	0.89	0.00	2.11	0.26	2.37	6.85	0	0.0	6.9			
11	dafu_0022	7/15/08	56	6	100	46.5	VCP	D - Dry	Exfiltration - 1ft drop in 7.7 sec.	1	88.128	7.7	11.4	16,481	10	14	6	3	23	1.16	1.56	2.02	1.08	3.66	4.74	4.92	9.96	0.0	14.9			
12	dafu_0023	7/15/08	56	6	112	51.3	VCP	D - Dry	Exfiltration - 1ft drop in 4.4 sec.	1	88.128	4.4	20.0	28,842		17	4	5	26	2.15	1.66	1.91	3.37	2.35	5.72	5.51	13.31	0.0	18.8			
13	dafu_0025	7/15/08	60	6	107	50.6	VCP	D - Dry	Exfiltration - 1ft drop in 74.2 sec.	1	88.128	74.2	1.2	1,710		9	2	14	25	0.22	0.40	11.07	4.67	7.02	11.69	2.49	24.47	15.4	42.3			
14	dafu_0026	7/18/08	63	6	121	39	VCP	W - Wet	Exfiltration - 1.5ft drop in 17.2 sec.	1.5	132.192	17.2	7.7	11,067	10	9	0	1	10	1.61	0.00	0.00	1.27	0.34	1.61	2.27	1.02	0.0	3.3			
15	dafu_0027	7/18/08	57	6	110	53	VCP	W - Wet	Exfiltration - 2ft drop in 4.1 sec.	2	176.256	4.1	43.0	61,905	15	21	2	0	23	1.78	0.38	0.00	1.56	0.60	2.16	5.52	1.13	0.0	6.7			
16	dafu_0028	7/18/08	56	6	107	47.7	VCP	W - Wet	Exfiltration - 1ft drop in 12.3 sec.	1	88.128	12.3	7.2	10,317		23	0	1	24	3.55	0.00	1.61	1.65	3.51	5.16	5.81	2.02	6.24	14.1			
17	dafu_0029	7/18/08	64	6	109	51.2	VCP	W - Wet	Exfiltration - 1ft drop in 5.6 sec.	1	88.128	5.6	15.7	22,661		14	9	0	23	1.26	1.62	0.00	2.88	0.00	2.88	10.52	0	0.0	10.5			
18	dafu_0030	7/18/08	61	6	103	52.2	VCP	W - Wet	Exfiltration - 1ft drop in 22.3 sec.	1	88.128	22.3	4.0	5,691		14	0	1	15	1.37	0.00	0.21	0.30	1.28	1.58	3.97	0	0.0	4.0			
19	dafu_0031	7/24/08	57	6	108	51	VCP	D - Dry	Exfiltration - 2ft drop in 4.5 sec.	2	176.256	4.5	39.2	56,402	5	30	7	4	41	5.90	1.93	1.22	3.80	5.25	9.05	10.48	14.52	0.0	25.0			
										Total GPM				477.5			323	73	40	436					Total GPM				234.5			

Only 19 of 45 laterals on Eagle Street had CCTV, Electro Scan, and Exfiltration Test Results (i.e. 7 Exfiltration Test were deemed unusable as plugs got loose during field testing and 3 were never taken). Only 6 laterals with previous Infiltration (i.e. soaker) Tests, were included in the 19 tests.

In computing GPM, Electro Scan's proprietary models assumes 1ft of head and 1% pipe gradient. As a result, Electro Scan's computations tend to understate GPM in higher groundwater conditions.

WERF Project First to Compare Electro Scan & CCTV For '27 Laterals' on Eagle Street

As communicated by the WERF Team:

Principal Investigator
March 25, 2013

SCAN	ELECTRO SCAN ID	ELECTRO SCAN DATE	CCTV DATE	DISTANCE -- BLDG TO SEWER MAIN	PIPE DIAMETER	PIPE DEPTH	PIPE LENGTH (MM to FT)	PIPE MATERIAL	GROUND CONDITION	RAW SCAN DATA POINTS	FILTERED DATA POINTS	PIPE LENGTH (MM)	Number of Defects ⁽¹⁾				Estimated Flow				Structural Codes	Service Defects	Constructional Features	Misc. Features	Collapsed or Collapse Imminent	Total Defects	OPRI	# of Laterals With 3 or Less Defects
													Small	Medium	Large	Total	Minor GPM Flow	Moderate GPM Flow	Severe GPM Flow	Total GPM								
1	dafu_0001	6/26/12	6/12/12	19	6	108	19	VCP	D - Dry	1952	710	5791	3	3	4	10	2.2	12.1	0.0	14.3	0	0	0	1	0	1	4.00	1
2	dafu_0002	6/26/12	6/12/12	61	6	108	61	VCP	D - Dry	1777	817	18593	6	5	0	11	4.9	2.1	0.0	7.0	1	1	0	0	0	2	1.50	1
3	dafu_0003	6/26/12	6/12/12	58	6	108	58	VCP	D - Dry	2117	758	17678	8	0	0	8	0.6	0.0	0.0	0.6	1	0	1	1	0	3	2.67	1
4	dafu_0006	6/27/12	6/12/12	59	6	108	59	VCP	D - Dry	3240	1445	17983	22	4	2	28	6.7	3.7	0.0	10.3	4	3	1	0	0	8	1.63	
5	dafu_0007	6/27/12	6/12/12	55	6	108	55	VCP	D - Dry	1467	625	16764	8	5	0	13	2.3	4.7	0.0	7.0	1	0	0	1	0	2	2.50	1
6	dafu_0008	6/29/12	6/12/12	60	6	108	60	VCP	D - Dry	2592	1257	18288	12	6	1	19	6.6	6.5	0.0	13.1	1	5	3	0	0	9	2.22	
7	dafu_0009	6/29/12	6/11/12	58	6	108	58	VCP	D - Dry	2466	1273	17678	5	9	6	20	6.2	16.5	0.0	22.7	2	1	1	0	0	4	1.33	
8	dafu_0010	7/5/12	6/12/12	60	6	113	60	VCP	D - Dry	3021	1344	18288	13	4	5	22	7.4	3.6	7.0	18.0	3	5	1	1	0	10	2.00	
9	dafu_0011	7/5/12	6/12/12	59	6	114	59	VCP	D - Dry	2613	1403	17983	16	2	1	19	4.1	2.9	0.0	7.0	6	0	1	0	0	7	1.29	
10	dafu_0012	7/13/12	6/12/12	60	6	127	60	VCP	D - Dry	3140	1264	18288	19	5	1	25	6.3	2.6	0.0	8.9	0	3	0	0	0	3	2.00	1
11	dafu_0013	7/13/12	6/11/12	62	6	108	62	VCP	D - Dry	3742	1648	18898	22	4	0	26	8.5	5.3	0.0	13.8	1	1	1	0	0	-3	2.00	1
12	dafu_0016	7/13/12	6/11/12	55	6	107	55	VCP	D - Dry	2787	1451	16764	13	1	0	14	4.1	0.0	0.0	4.1	0	1	0	1	0	2	3.00	1
13	dafu_0017	7/13/12	6/11/12	64	6	100	64	VCP	D - Dry	2856	1259	19507	19	2	0	21	4.0	0.0	0.0	4.0	0	0	0	0	0	0	0.00	1
14	dafu_0018	7/13/12	6/11/12	59	6	109	59	VCP	D - Dry	3367	1419	17983	21	2	0	23	4.3	0.0	0.0	4.3	5	0	1	0	0	6	1.33	
15	dafu_0019	7/16/12	6/11/12	55	6	92	55	VCP	D - Dry	2673	1139	16764	26	5	0	31	8.4	2.1	0.0	10.5	7	1	0	0	0	8	1.13	
16	dafu_0020	7/16/12	6/11/12	55	6	90	55	VCP	D - Dry	3016	1158	16764	18	5	0	23	6.9	0.0	0.0	6.9	3	3	0	0	0	6	1.50	
17	dafu_0021	7/16/12	6/12/12	56	6	116	56	VCP	D - Dry	2550	1164																	

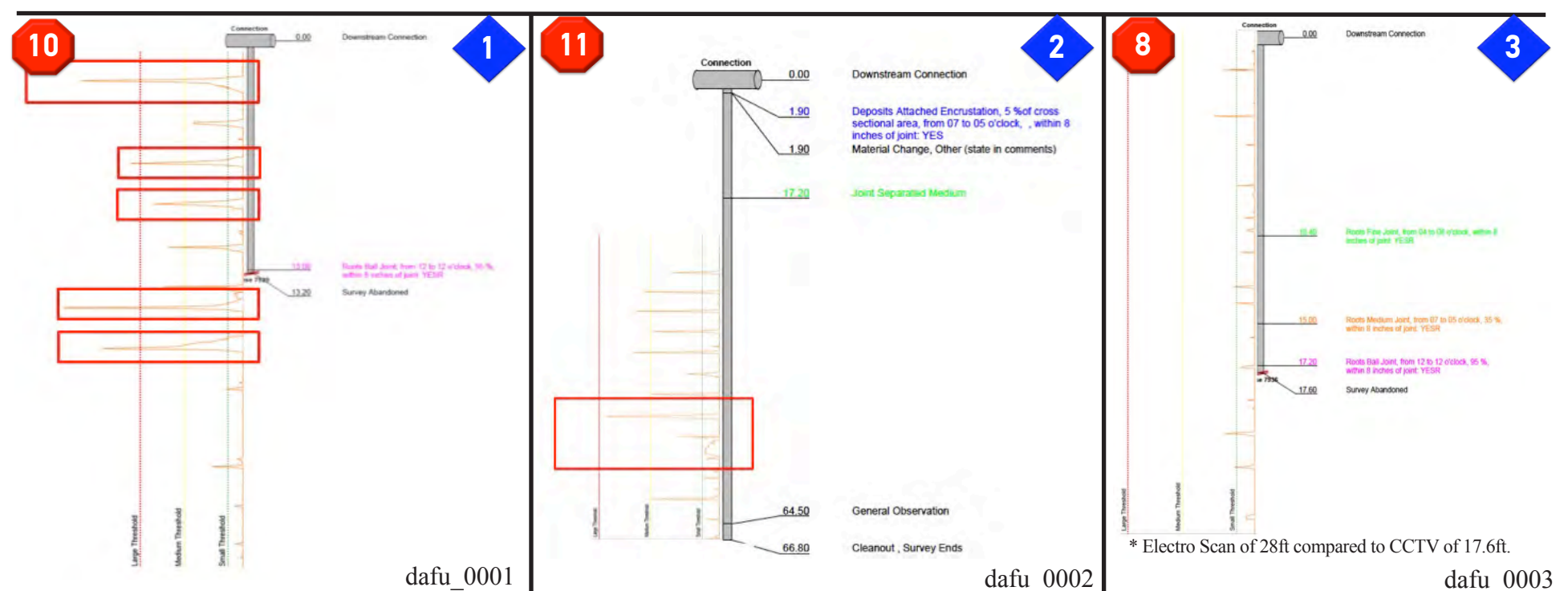
Based on side-by-side comparisons of LACP-certified CCTV results and Electro Scan results for Eagle Street, it appears that CCTV consistently, (1) missed major sources of infiltration, (2) repeatedly used the same LACP codes for different-sized defects or leaks.

Finally, a major deficiency of the WERF Report was the lack of re-review of CCTV footage that corresponded to defects identified by Electro Scan. This would have determined whether CCTV operators either (a) failed to record visual defects, or (b) were simply unable to 'see' defects by visual inspection techniques, warranting further study.

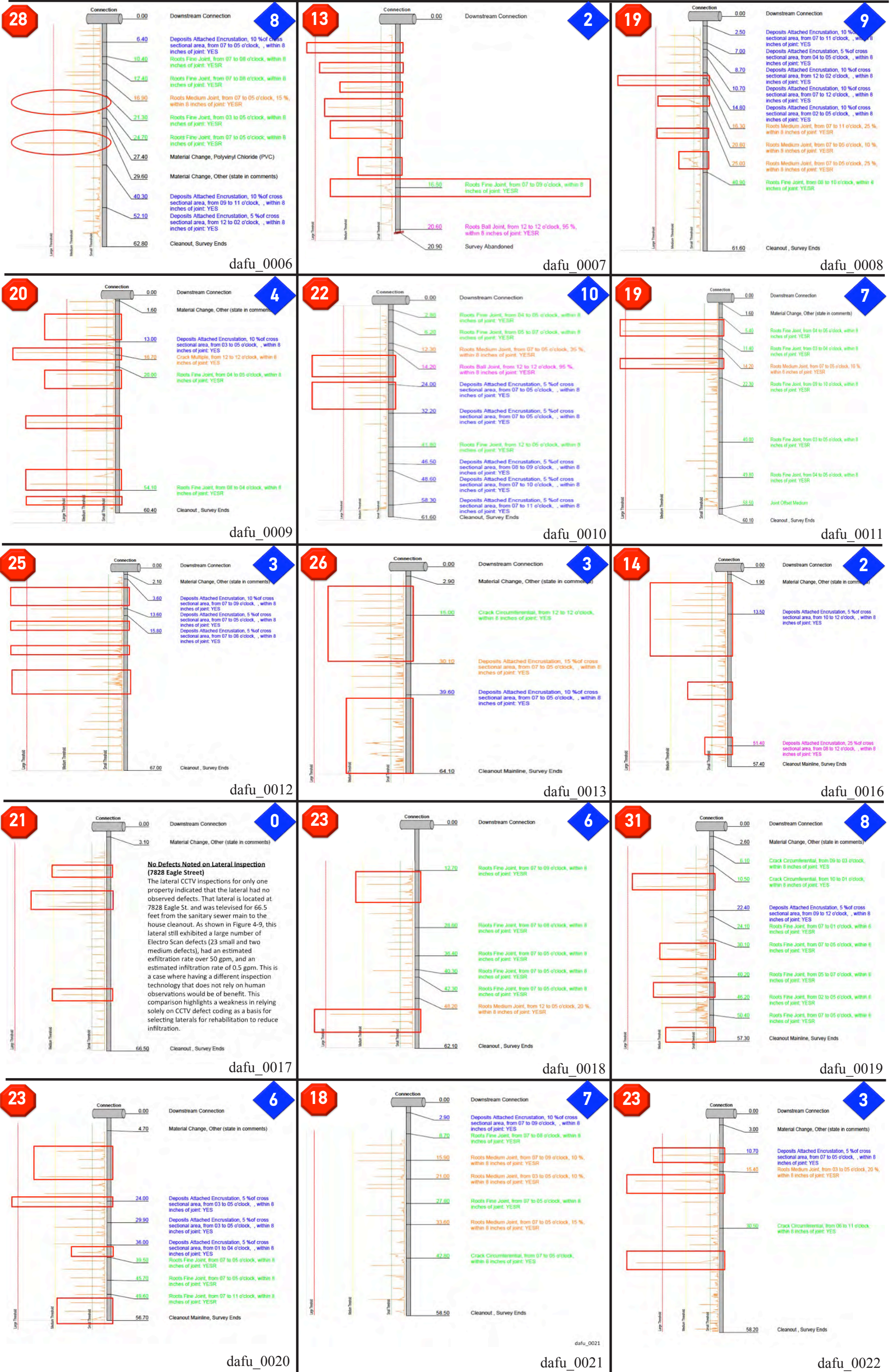
SCAN	ELECTRO SCAN ID	ELECTRO SCAN DATE	CCTV DATE	DISTANCE -- BLDG TO SEWER MAIN	PIPE DIAMETER	PIPE DEPTH	PIPE LENGTH (MM to FT)	PIPE MATERIAL	GROUND CONDITION	RAW SCAN DATA POINTS	FILTERED DATA POINTS	PIPE LENGTH (MM)	Number of Defects ⁽¹⁾				Estimated Flow				Structural Codes	Service Defects	Constructional Features	Misc. Features	Collapsed or Collapse Imminent	Total Defects	OPRI	# of Laterals With 3 or Less Defects
													Small	Medium	Large	Total	Minor GPM Flow	Moderate GPM Flow	Severe GPM Flow	Total GPM								
1	dafu_0001	6/26/12	6/12/12	19	6	108	19	VCP	D - Dry	1952	710	5791	3	3	4	10	2.2	12.1	0.0	14.3	0	0	0	1	0	1	4.00	1
2	dafu_0002	6/26/12	6/12/12	61	6	108	61	VCP	D - Dry	1777	817	18593	6	5	0	11	4.9	2.1	0.0	7.0	1	1	0	0	0	2	1.50	1
3	dafu_0003	6/26/12	6/12/12	58	6	108	58	VCP	D - Dry	2117	758	17678	8	0	0	8	0.6	0.0	0.0	0.6	1	0	1	1	0	3	2.67	1
4	dafu_0006	6/27/12	6/12/12	59	6	108	59	VCP	D - Dry	3240	1445	17983	22	4	2	28	6.7	3.7	0.0	10.3	4	3	1	0	0	8	1.63	
5	dafu_0007	6/27/12	6/12/12	55	6	108	55	VCP	D - Dry	1467	625	16764	8	5	0	13	2.3	4.7	0.0	7.0	1	0	0	1	0	2	2.50	1
6	dafu_0008	6/29/12	6/12/12	60	6	108	60	VCP	D - Dry	2592	1257	18288	12	6	1	19	6.6	6.5	0.0	13.1	1	5	3	0	0	9	2.22	
7	dafu_0009	6/29/12	6/11/12	58	6	108	58	VCP	D - Dry	2466	1273	17678	5	9	6	20	6.2	16.5	0.0	22.7	2	1	1	0	0	4	1.33	
8	dafu_0010	7/5/12	6/12/12	60	6	113	60	VCP	D - Dry	3021	1344	18288	13	4	5	22	7.4	3.6	7.0	18.0	3	5	1	1	0	10	2.00	
9	dafu_0011	7/5/12	6/12/12	59	6	114	59	VCP	D - Dry	2613	1403	17983	16	2	1	19	4.1	2.9	0.0	7.0	6	0	1	0	0	7	1.29	
10	dafu_0012	7/13/12	6/12/12	60	6	127	60	VCP	D - Dry	3140	1264	18288	19	5	1	25	6.3	2.6	0.0	8.9	0	3	0	0	0	3	2.00	1
11	dafu_0013	7/13/12	6/11/12	62	6	108	62	VCP	D - Dry	3742	1648	18898	22	4	0	26	8.5	5.3	0.0	13.8	1	1	1	0	0	-3	2.00	1
12	dafu_0016	7/13/12	6/11/12	55	6	107	55	VCP	D - Dry	2787	1451	16764	13	1	0	14	4.1	0.0	0.0	4.1	0	1	0	1	0	2	3.00	1
13	dafu_0017	7/13/12	6/11/12	64	6	100	64	VCP	D - Dry	2856	1259	19507	19	2	0	21	4.0	0.0	0.0	4.0	0	0	0	0	0	0	0.00	1
14	dafu_0018	7/13/12	6/11/12	59	6	109	59	VCP	D - Dry	3367	1419	17983	21	2	0	23	4.3	0.0	0.0	4.3	5	0	1	0	0	6	1.33	
15	dafu_0019	7/16/12	6/11/12	55	6	92	55	VCP	D - Dry	2673	1139	16764	26	5	0	31	8.4	2.1	0.0	10.5	7	1	0	0	0	8	1.13	
16	dafu_0020	7/16/12	6/11/12	55	6	90	55	VCP	D - Dry	3016	1158	16764	18	5	0	23	6.9	0.0	0.0	6.9	3	3	0	0	0	6	1.50	
17	dafu_0021	7/16/12	6/12/12	56	6	116	56	VCP	D - Dry	2550	1164	17069	18	0	0	18	4.0	0.0	0.0	4.0	3	1	3	0	0	7	2.00	
18	dafu_0022	7/16/12	6/11/12	56	6	100	56	VCP	D - Dry	2936	1317	17069	14	6	3	23	4.9	10.0	0.0	14.9	1	1	1	0	0	3	2.00	1
19	dafu_0023	7/16/12	6/11/12	56	6	112	56	VCP	D - Dry	3342	1379	17069	17	4	5	26	5.5	13.3	0.0	18.8	0	0	6	0	0	6	3.00	
20	dafu_0024	7/16/12	6/11/12	55	6	104	55	VCP	D - Dry	2698	1223	16764	11	5	5	21	4.8	9.8	0.0	14.6	0	5	3	1	0	9	2.56	
21	dafu_0025	7/16/12	6/12/12	60	6	107	60	VCP	D - Dry	2986	1248	18288	9	2	14	25	2.5	24.5	15.4	42.3	0	8	3	1	0	12	2.42	
22	dafu_0026	7/19/12	6/12/12	63	6	121	63	VCP	W - Wet	2354	990	19202	9	0	1	10	2.3	1.0	0.0	3.3	2	8	3	0	0	13	2.08	
23	dafu_0027	7/19/12	6/12/12	57	6	110	57	VCP	W - Wet	3253	1320	17374	21	2	0	23	5.5	1.1	0.0	6.7	0	3	0	1	1	5	3.00	
24	dafu_0028	7/19/12	6/12/12	56	6	107	56	VCP	W - Wet	2286	1143	17069	23	0	1	24	5.8	2.0	6.2	14.1	2	0	1	0	0	3	1.67	1
25	dafu_0029	7/19/12	6/12/12	64	6	109	64	VCP	W - Wet	2699	1239	19507	14	9	0	23	10.5	0.0	0.0	10.5	3	1	0	0	0	4	1.25	
26	dafu_0030	7/19/12	6/12/12	61	6	103	61	VCP	W - Wet	2625	1275	18593	14	0	1	15	4.0	0.0	0.0	4.0	0	10	3	1	1	15	2.53	
27	dafu_0031	7/25/12	6/11/12	57	6	108	57	VCP	D - Dry	2760	1336	17374	30	7	4	41	10.5	14.5	0.0	25.0	2	0	4	1	0	7	2.57	
						1,540				73,315	32,604	469,392	411	97	54					310.5	48	61	37	10	2	154	1.90	10

(1) Number of Defects, by Small, Medium, Large, and Total Defects, listed for reference only, as S, M, and L indicating height of defect current, and not width of defect. As stated in ASTM 2550, length of defect (anomaly) is an integral reporting component and represented by Estimated Flow by Electro Scan Inc.

Side-By-Side Comparisons of Electro Scan & CCTV Inspections



Side-By-Side Comparisons of Electro Scan & CCTV Inspection *(continued)*



Water Environment Federation Names Electro Scan 'Best Innovative Technology'

continued from page 1

"We are delighted to be recognized by our colleagues and peers," stated Mark Grabowski, Vice President of Electro Scan. "Not since the introduction of TV cameras to televise sewers, has a technology so quickly and radically changed the way we locate defects and certify repairs. Electro Scan changes everything from deciding which pipes to fix, to determining final acceptance of point repairs and lining projects."

"Electro Scan adds a new dimension to sewer condition assessments," stated Charles Wilmut, P.E., former Senior Vice President, Burgess & Niple, and an early adopter of Electro Scan. "While CCTV provides an operator with an overall visual account of a pipe, it is unable to locate and measure defects that cannot be seen. It's not just the fact that Electro Scan finds more defects than CCTV, but that Electro Scan can locate and measure the estimated magnitude of each defect -- something never before available."

"Congratulations on being selected for this significant honor," stated Jeff Eger, WEF's Executive Director. The award recognized Electro Scan's contribution to improving water quality and was honored at a number of events at WEFTEC, held in Chicago, IL, October 5-9, 2013.

Electro Scan uses its patent-pending technology to generate an intense, focused array, of low-voltage/high-frequency electrical current to examine the walls of pipes for defects.

If a pipe is in good condition, no current will be able to "leak" or escape out of the pipe and into the ground, unless there is a crack. All bad joints, defective service connections, and breaks in a pipe, are found by

Electro Scan, not typically seen or recorded by visual inspection, laser profiling, sonar, or ground penetrating radar.

Advantages of the Electro Scan technology include its ability to rapidly scan pipes that are either full or partially full of water and provide automated leak detection information, including location to the nearest 0.4 inches (1 cm) and estimated gpm. While CCTV cameras are rarely, if ever, used during periods of wet weather, Electro Scan, combined with CCTV, provides a year-round solution.

Earlier this year, Electro Scan won the Joseph L. Abbott, Jr. Product Innovation Award presented by the North American Society of Trenchless Technologies (NASTT) and the Sierra Nevada Innovation Challenge for Best CleanTech Company in California.



Jeff Eger, WEF's Executive Director

Founded in 1928, the Water Environment Federation (WEF) is a not-for-profit association with more than 36,000 members worldwide providing technical education and training for water quality professionals who clean water and return it safely to the environment.

2013 Product Innovation of the Year*

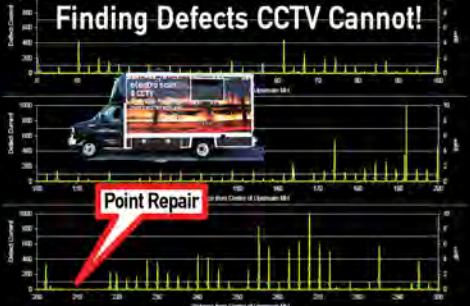


NOT SEEN ON CCTV

If You Use CCTV to Find Infiltration, You Might Be Fixing The Wrong Pipe.

electro scan inc.

1745 Markelton Road
Sacramento, CA 95825-4026 USA
Tel: 916 779 0660
Fax 916 779 0661
Email: sales@electroscan.com
Website: www.electroscan.com

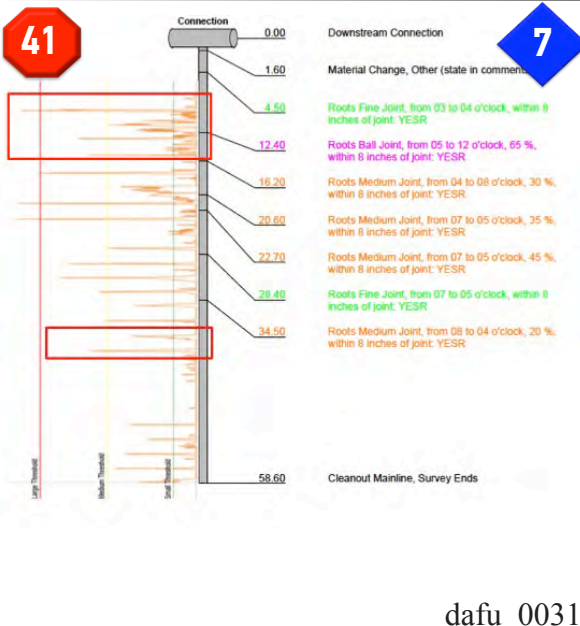
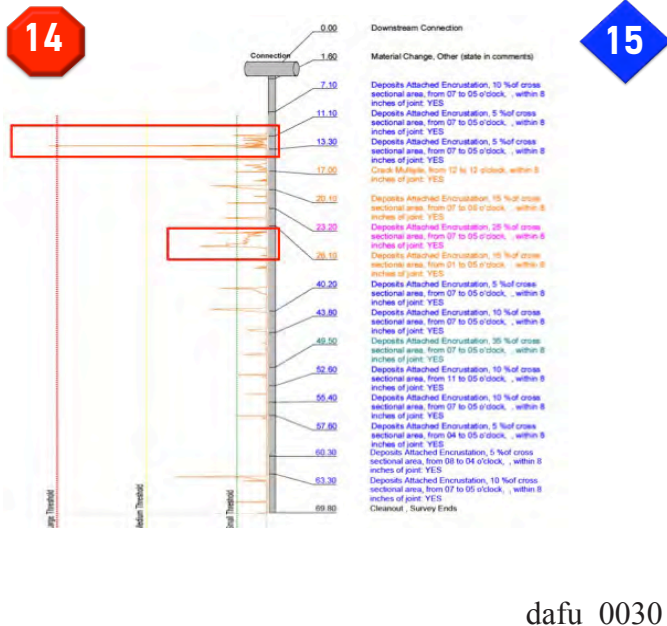
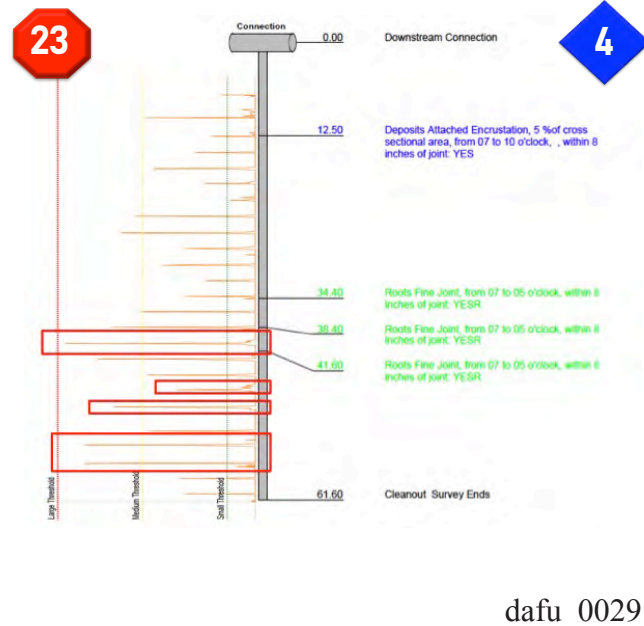
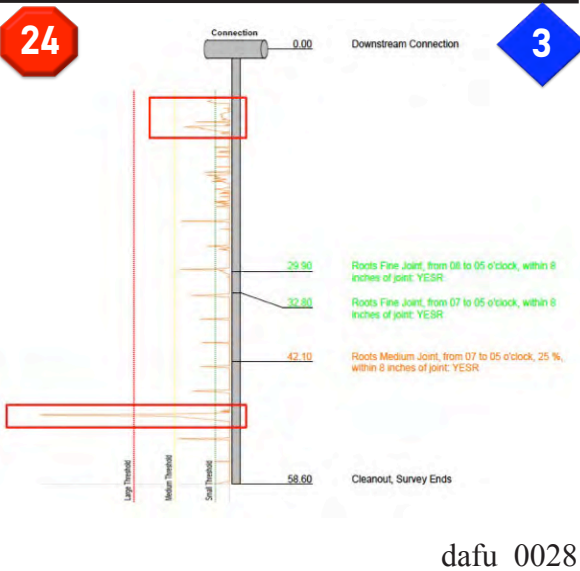
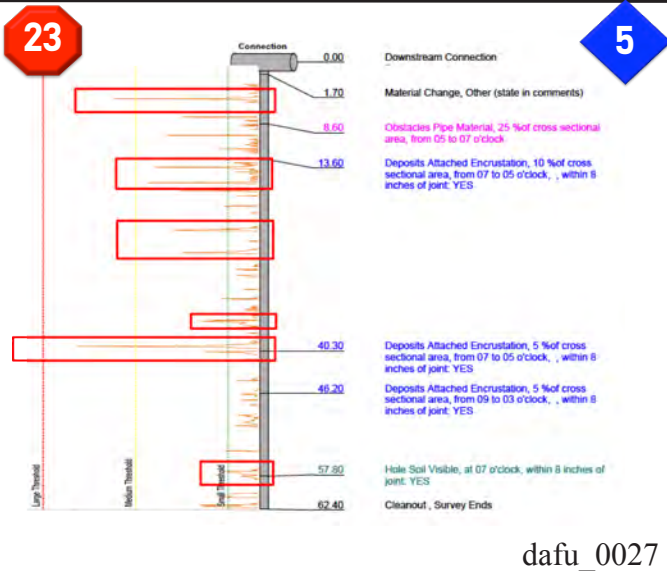
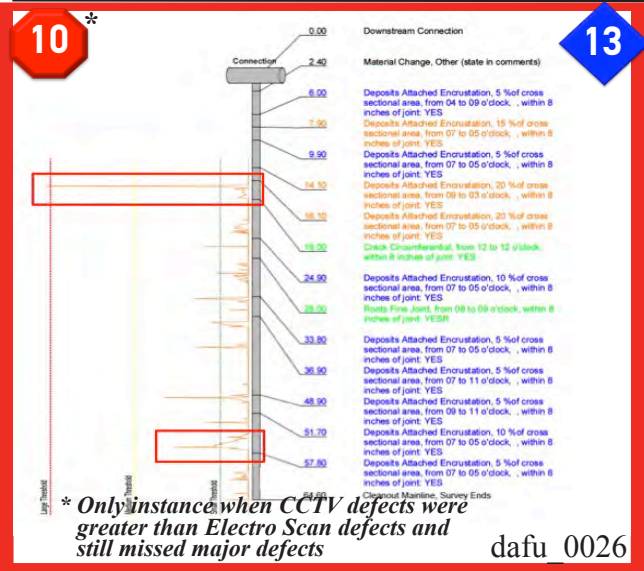
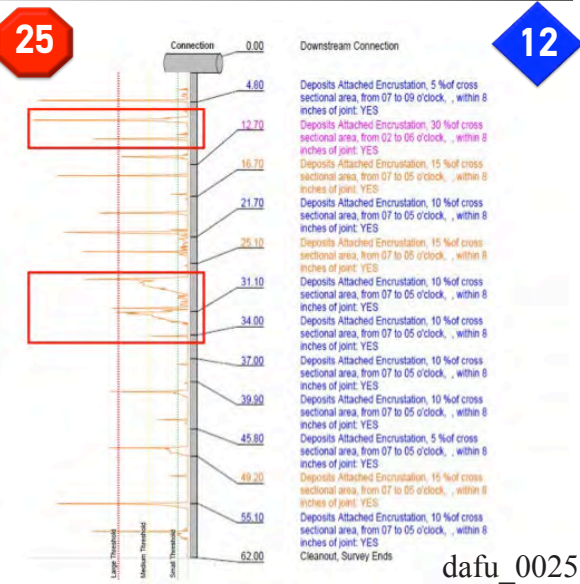
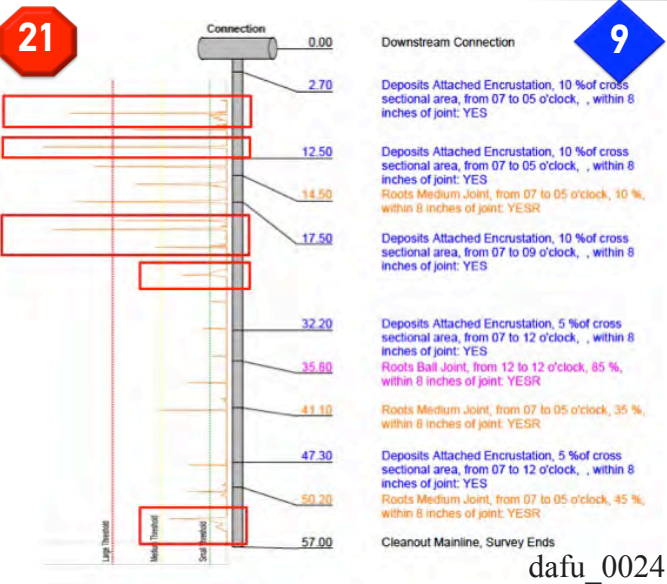
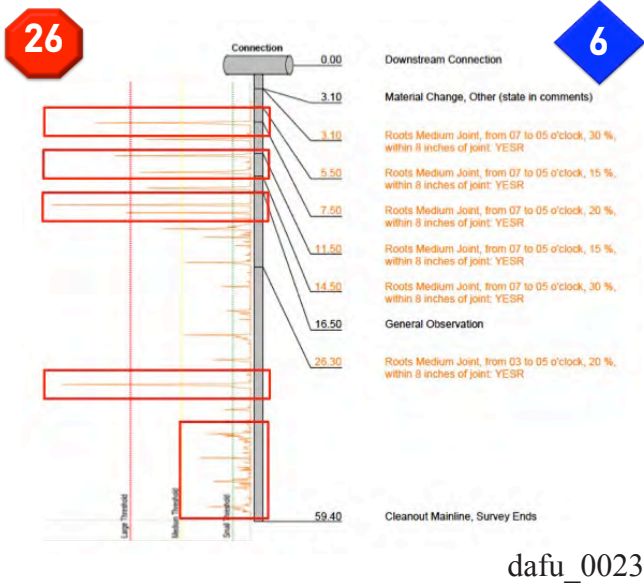


(Above) Sewer agency used CCTV to locate a defect that was determined to require a Point Repair at 210 feet. A Point Repair was completed and the Contrador used CCTV to certify the repair. Then, the pipe was Electro Scanned.

Good News: The Point Repair was successful -- no electrical readings!
Bad News: The Sewer Pipe had numerous other defects not seen by CCTV.

INFILTRATION SCORECARD

How Do They Compare?		CCTV	Electro Scan
1	Automatically Finds Potential Sources of Infiltration	N	Y
2	Automatically Finds Leaks Inside Joints	N	Y
3	Automatically Finds Leaks at Service Connections	N	Y
4	Automatically Finds Sources of Infiltration at Cracks	N	Y
5	Automatically Finds Leak Locations (within 0.4 in or 1 cm)	N	Y
6	Automatically Measures Size of Leaks (Est. GPM or LPM)	N	Y
7	Automatically Finds Defects That Leak from Bad Couplings	N	Y
8	Automatically Finds Defects That May Still Leak After Repairs	N	Y
9	Automatically Finds Defects That Leak in Re-Lining Projects	N	Y
10	Automatically Finds Defects After Service Re-Connections	N	Y
11	Automatically Finds Leaks, If Silt or Debris on Bottom of Pipe	N	Y
12	Able to Conduct Inspections, If Sewer Pipe Is Full of Water	N	Y
13	Able to Determine Size of Potential Leak, If Roots Are Present	N	Y
14	Automatically Finds Leaks at Joints, If Grease Is Present	N	Y
15	Able to Determine Size of Leaks, If Pipe Has Encrustation	N	Y
16	Requires Active Infiltration to Identify Defect at Source	Y	N
17	Contains Moving Parts That Could Clog from Debris or Silt	Y	N
18	Requires Bypass During Inspection, If Pipe Full	Y	N
19	Requires Special Training and Certification to Identify Defects	Y	N
20	Relies on Visual Observations to Record Defects	Y	N
21	Ave. Speed of Inspection (6-20" Sewer Main)	3ft / min	50ft / min



Electro Scan Evaluates Pipes at Japan's Leading Testing Center

Inaugural Tests of Electro Scan A Success in Japan

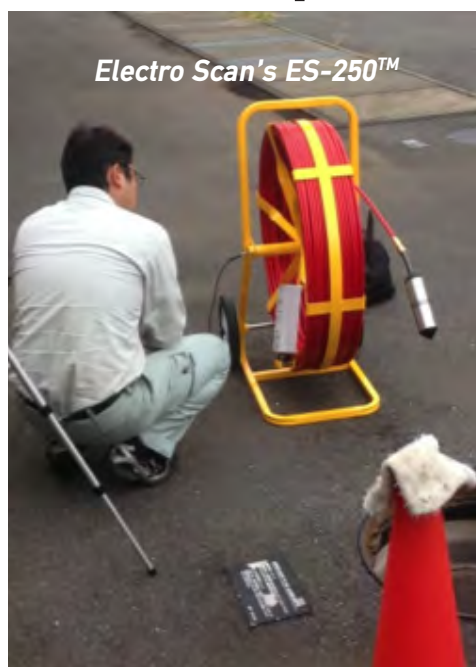
The Japan Sewer Collection System Maintenance Association (JASCOMA) is a leading organization in Japan dedicated to the advancement of sewer operations, maintenance, sewer rehabilitation techniques, and business practices.

As provided in its Charter, JASCOMA is dedicated to conducting surveys on innovative management techniques, informing the general public on important findings, conducting ongoing certification of sewer pipe line management engineers, holding periodic workshops to train professional engineers with respect to sewer pipe line management, and raising awareness of technical improvements in pipeline management.

In March 2013, Chuck Hansen met with the Executive Directors of JASCOMA, including Mr. Yasuhiro Shinoda and Mr. Kenji Sakai at their headquarters in Tokyo to discuss the introduction of Electro Scan in Japan. Assisting Chuck Hansen was Kyoko Kondo, representative from the International Society of Trenchless Technologies (ISTT) and Yumiko Aso, Japanese Interpreter.

As a result, an invitation was extended for Electro Scan to return to Japan, and work with a member company, Kantool Co., Ltd., to undertake testing of selected pipes at the JASCOMA Pipe Conduit Testing Center in Asaka, Japan.

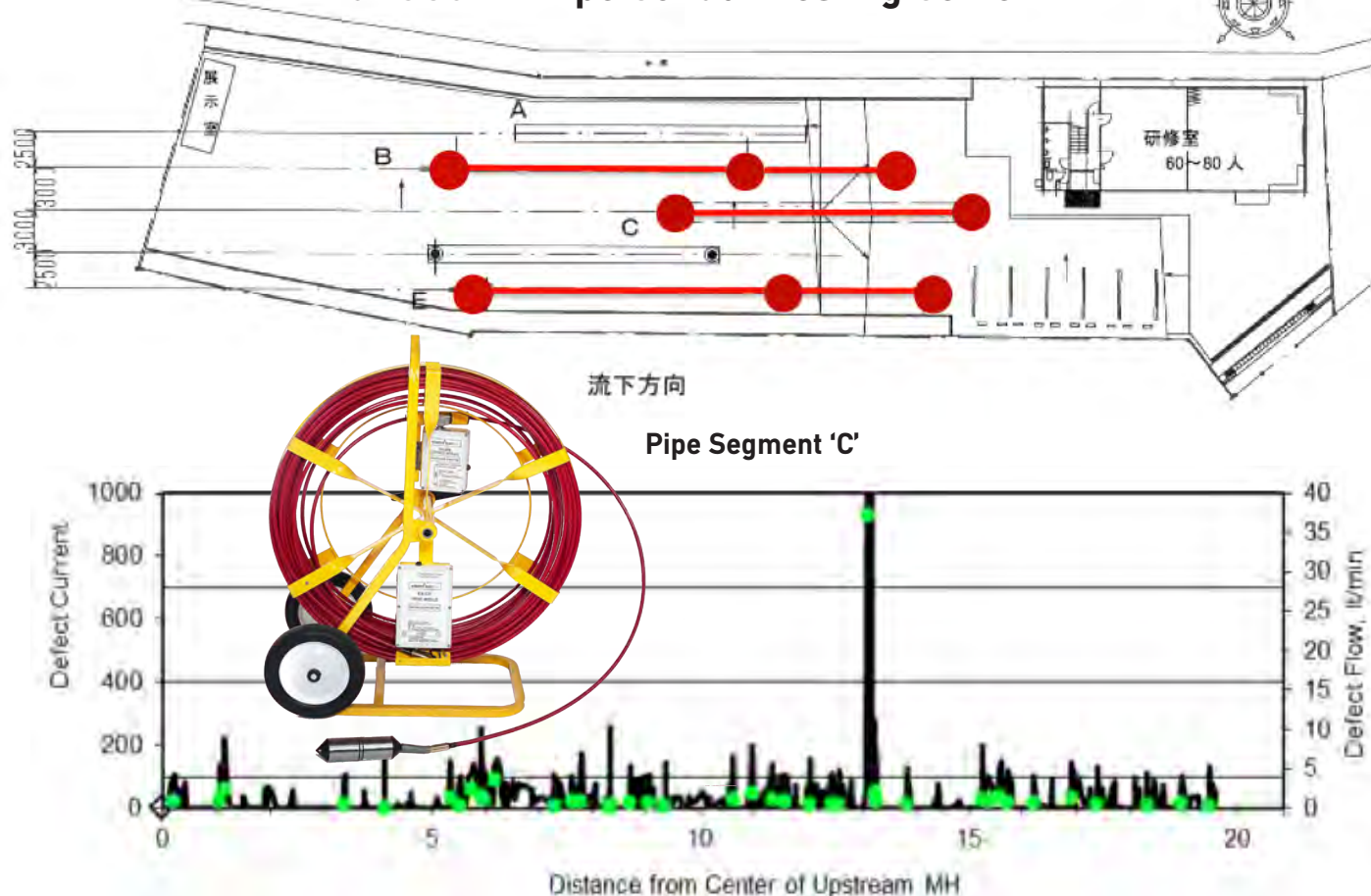
Arriving in Japan in July, Andrew O'Keefe, working with Mikio Goto, Sales Manager, Kantool Co., Ltd. visited JASCOMA's Pipe Conduit Testing Center, and electro scanned all pipes, including A, B, C, D, and E pipe segments, with results for Pipe C shown (Right). Electro Scan successfully located all defects in JASCOMA pipes, providing estimated leakage rates in Gallons and Liters per minute.



(Above) Set-up of Electro Scan's ES-250™ for trials at JASCOMA's Pipe Conduit Training Center in Asaka, Japan.



JASCOMA Pipe Conduit Testing Center



Electro Scan Showcased At Kanalisations Forum in Zurich

It was bound to happen. Chuck Hansen did not make one trip to Switzerland in 30 years, but made three visits in the first six months of 2013 -- receiving his first speeding ticket during his last trip, when he was caught by CCTV cameras driving 51kph in a 50kph zone!

These days, there are lots of reasons for Electro Scan to be in Switzerland, including its new partnership with CD Lab AG -- developers of WinCan software located in Munster; interest in ongoing research being conducted at Zurich-based eawag -- especially in the application of fiber optics in sewers; and growing interest in Electro Scan from leading cities and cantons throughout Switzerland.

Thanks for everyone that attended Chuck Hansen's presentation at Kanalisations Forum in Zurich.



KANALISATIONS FORUM electroscaninc. **V S A**
ZÜRICH, 22/23. MAI 2013

**Wenn Ihr Stadtentwässerungsbetrieb TV-Kanalinspektion verwendet, werden Sie wahrscheinlich die falschen Kanalisationsrohre ersetzen:
Fallstudien aus den USA, England und Neuseeland**

Elektroscan und Kanalfernsehen
Sparen Sie darauf, dass diese Zusammenarbeit mit der Zeit immer besser wird.

**Mittwoch, 22. Mai 2013, 12:30 Uhr
WTC WORLD TRADE CENTER, ZÜRICH**



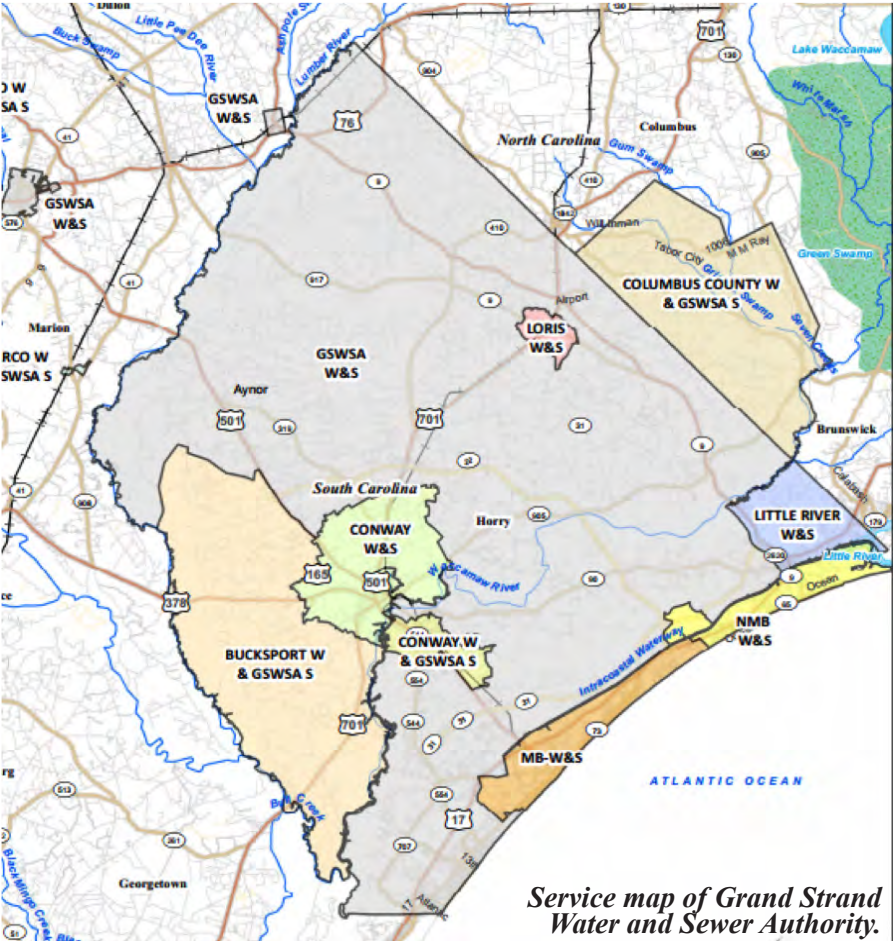
(Above) Chuck Hansen and Bert Bossler, Research Director, IKT - Institute for Underground Infrastructure.



(Above) Marc Lyons and Monika Kern, Dipl. Konferenzdolmetscherin und Dipl. Übersetzerin



Largest Sewer Authority in South Carolina Takes Electro Scan on a ‘Grand’ Tour



Service map of Grand Strand Water and Sewer Authority.

Anomaly Picking Threshold	100.00	Grade Current Levels	Number	Length	% Length of Pipe Tested	% of Total Anomaly Length	Grade Flow Levels	Number	Flow gpm	Flow per 100ft of pipe	% of Total Flow
Grade		Large	>700	6	1.1	0%	15%	>4	0	0.0	0%
		Medium	700 to 400	16	2.6	1%	34%	4 to 1	11	16.4	42%
		Small	<400	59	3.9	1%	51%	<1	70	22.4	58%
Total			81	7.6	2%	100%	<1	81	38.8	11.3	100%

Anomaly Picking Threshold	100.00	Grade Current Levels	Number	Length	% Length of Pipe Tested	% of Total Anomaly Length	Grade Flow Levels	Number	Flow gpm	Flow per 100ft of pipe	% of Total Flow
Grade		Large	>700	0	0.0	0%	>4	0	0.0	0.0	0%
		Medium	700 to 400	3	1.0	0%	4 to 1	3	5.7	1.1	96%
		Small	<400	1	0.1	0%	<1	1	0.2	0.0	4%
Total			4	0.4	0%	100%	<1	4	5.9	0.4	100%

Anomaly Picking Threshold	100.00	Grade Current Levels	Number	Length	% Length of Pipe Tested	% of Total Anomaly Length	Grade Flow Levels	Number	Flow gpm	Flow per 100ft of pipe	% of Total Flow
Grade		Large	>700	0	0.0	0%	>4	0	0.0	0.0	0%
		Medium	700 to 400	1	0.0	0%	4 to 1	0	0.0	0.0	0%
		Small	<400	0	0.0	0%	<1	1	0.2	0.1	100%
Total			1	0.0	0%	100%	<1	1	0.2	0.1	100%

Anomaly Picking Threshold	100.00	Grade Current Levels	Number	Length	% Length of Pipe Tested	% of Total Anomaly Length	Grade Flow Levels	Number	Flow gpm	Flow per 100ft of pipe	% of Total Flow
Grade		Large	>700	3	2.1	1%	>4	1	12.0	6.5	52%
		Medium	700 to 400	0	0.0	0%	4 to 1	3	7.5	4.0	32%
		Small	<400	20	1.6	1%	<1	19	3.6	1.9	15%
Total			23	3.7	2%	100%	<1	23	23.1	12.4	100%

City of Springfield, Illinois, ‘Electro Scans’ Sewers

The City of Springfield’s Department of Public Works provides for the systematic planning, construction, maintenance and operation of the wastewater infrastructure.

As part of the City’s Public Works Department, the Sewer Division operates and maintains a collection system consisting of approximately 140 miles of combined sewers and 355 miles of sanitary sewers. Flows from the collection system are transported to the wastewater treatment facilities operated and maintained by the Springfield Metro Sanitary District.

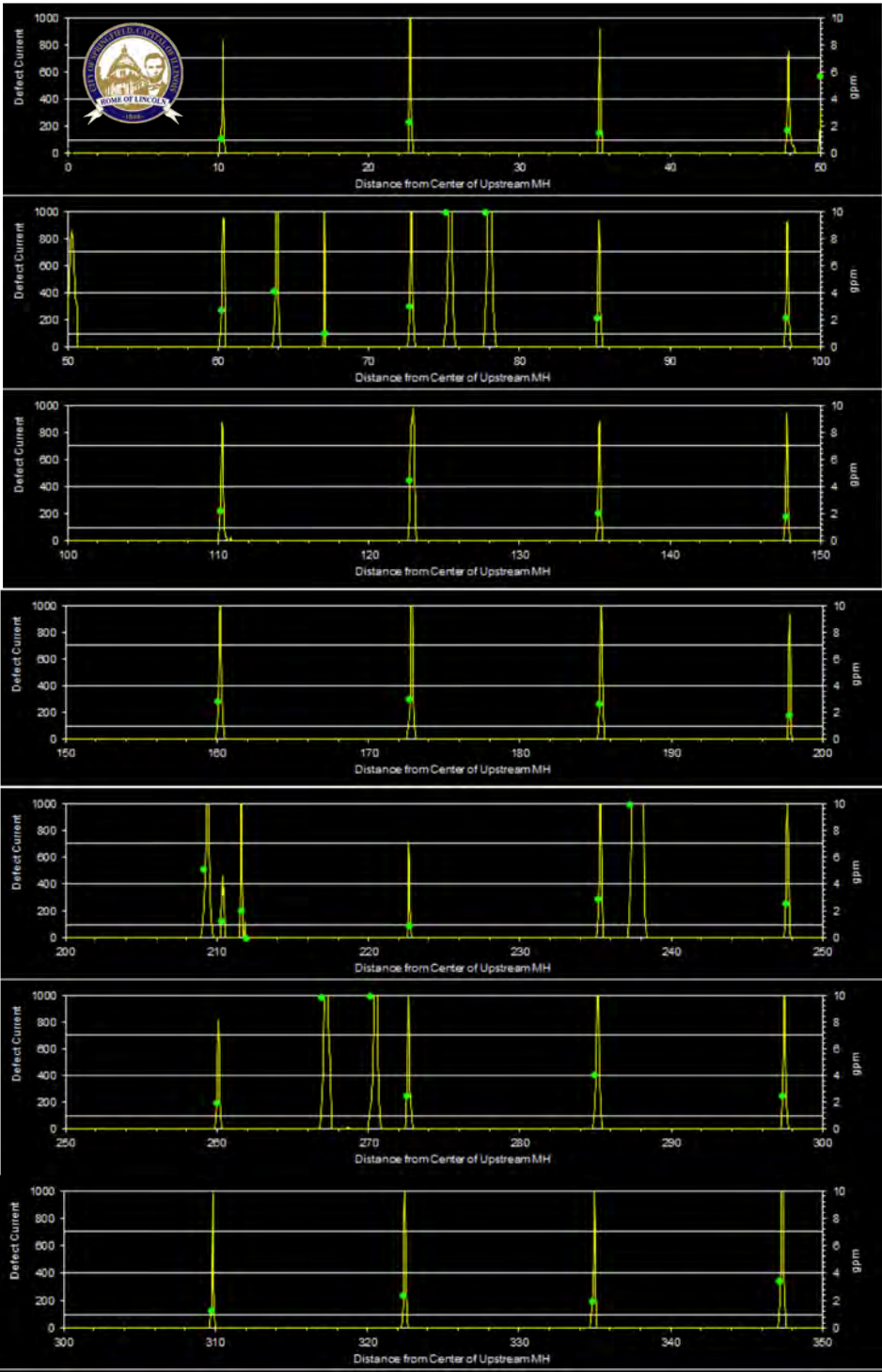
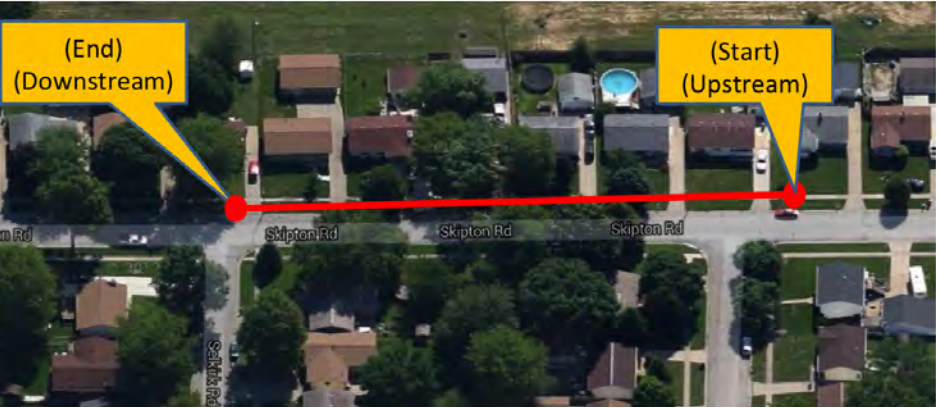
The Department’s vision is to be a leader in the delivery of reliable, efficient, safe, and environmentally friendly services for the benefit of all citizens and asked Electro Scan to test a 10” RCP sewer main, laid at minor grade with a light flow, having nine (9) service connections and 6ft average depth of pipe.

During its initial study, Electro Scan located a total of 40 defects, including 1 Small, 1 Medium, and 38 Large defects. Based on the size and width of defects, it was estimated that the pipe could be the source of 170 gpm of infiltration, ±40% accuracy, assuming one ft of water head above the pipe.



6949 N. 3000 E. Road
Manteno, IL 60950
Tel: 800-522-2808, 815-468-0250
Contact: Ed LeSage
Email: edlesage@ejequipment.com
Web: www.ejequipment.com
Territory: Illinois and Eastern Missouri

Anomaly Picking Threshold	100.00	Grade Current Levels	Number	Length	% Length of Pipe Tested	% of Total Anomaly Length	Grade Flow Levels	Number	Flow gpm	Flow per 100ft of pipe	% of Total Flow
Grade		Large	>700	38	14.5	4%	>4	10	106.6	28.6	63%
		Medium	700 to 400	1	0.3	0%	4 to 1	28	62.8	16.9	37%
		Small	<400	1	0.0	0%	<1	2	1.0	0.3	1%
Total			40	14.8	4%	100%	<1	40	170.4	45.8	100%



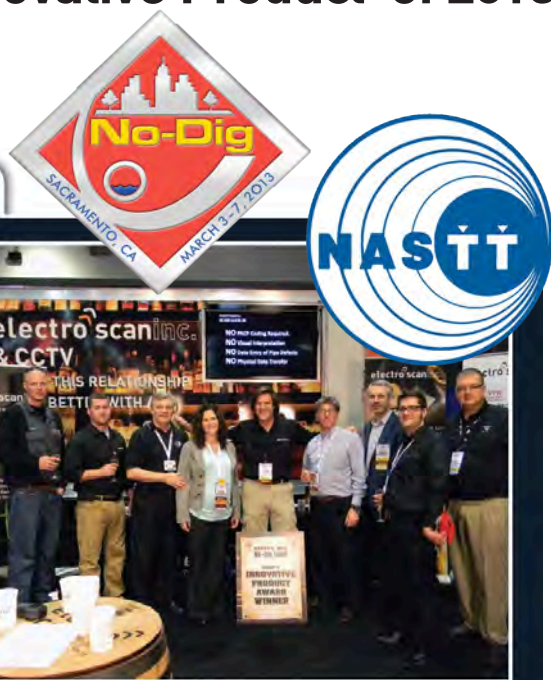
electro scan inc.
ES-620 for Sewer Mains™

electro scan inc. & CCTV
EXPECT THIS RELATIONSHIP TO GET BETTER WITH AGE.

Electro Scan’s ES-620 for Sewer Mains™ is designed for pipe diameters from 6” to 20” (150-450mm). Marketed under the ES-300 brand name in the European and Asia Pacific Rim counties, pricing includes turnkey installation services to modify your existing CCTV truck to allow crews to electro scan.

North American Society for Trenchless Technologies Names Electro Scan's ES-620 'Best Innovative Product' of 2013

Award Presented at No-Dig Conference



INNOVATIVE PRODUCT AWARDS

NASTT annually recognizes two companies with state-of-the-art products in either new installation or rehabilitation for their achievements in advancing the trenchless industry — called the Joseph L. Abbott Jr. Innovative Product Awards. This year, Electro Scan Inc. and HammerHead Trenchless Equipment were the recipients of this honor.

The award is given in memory of the late Joseph L. Abbott Jr., who was an active member of the society since its inception in 1990. Electro Scan Inc. and HammerHead were formally recognized at the Gala Dinner.

Electro Scan Inc. received the Rehabilitation Award for its Electro Scan ES-620 for Sewer Mains technology. Using patent pending technology that measures the variation of electrical current inside pipes, electro scanning is now available to independently test and certify newly relined

and rehabilitated sewer mains and laterals as leak free. While CCTV inspection is often conducted when a pipe is dry, Electro Scan assesses a pipe's performance under wet conditions. Electro Scan is designed to more accurately find defects in newly relined pipes.



U.S. Patent and Trademark Office Approves Electro Scan's Trademark

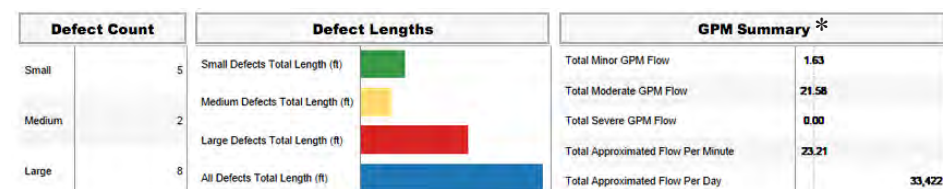


Attention! Attention! Electro Scan is now the official trademark holder for the phrase 'Critical Sewers.' As part of the Company's legal suite of intellectual property assets, the phrase Critical Sewers™ is now owned exclusively by Electro Scan Inc.

Parties wishing to use the term 'critical sewers' must obtain written permission from Electro Scan Inc. or face prosecution for trademark infringement.

All Electro Scan registered cloud users will be automatically eligible to use the term, which resulted from close work with the U.S. Patent and Trademark Office.

Electro Scan is pleased to use the term as part of its hosted website -- www.criticalsewers.com. Today, Critical Sewers™ represents the *first-of-its-kind* web portal dedicated to a new generation of solution, not requiring any desktop software installation.



* Gallon Per Minute (GPM) reserved for Premium Subscription Users of CriticalSewers.com.


Word of Electro Scan's Breakthrough Technology Spreads Around the Globe

Selected Presentations in 2013

- | | |
|-------|---|
| 01-31 | Underground Technologies Conference, Houston, TX |
| 02-25 | US EPA, Special Water Enforcement Briefing
Washington, DC |
| 02-27 | Pumper & Cleaner Show, Indianapolis, Indiana |
| 03-05 | NASTT/No-Dig Conference, Sacramento, California |
| 03-20 | N. Ireland Water Briefing Belfast, Northern Ireland |
| 04-18 | New York Municipal Forum, Queens, New York |
| 04-18 | California Water Environment Association
Palm Springs, California |
| 05-01 | NWEA and WEAU Joint Conference
St. George, Utah |
| 05-22 | VSA, Kanalisations Forum, Zurich, Switzerland |
| 06-05 | Iowa Water Environment Association
Dubuque, Iowa |
| 06-15 | INGENIUM, Dunedin, New Zealand |
| 06-24 | American Society of Civil Engineers, Pipeline
Fort Worth, Texas |
| 06-27 | Sierra Nevada Innovation Challenge, Chico, CA |
| 08-01 | Sewerage Works Exposition, Tokyo, Japan |
| 09-26 | Colorado Municipal Forum, Westminster, Colorado |
| 09-26 | Tri-State Conference, Henderson, Nevada |
| 10-05 | WEFTEC, Chicago, Illinois |
| 10-31 | World Congress on Engineering Asset Management
Honk Kong, People's Republic of China |
| 11-14 | Northwest Municipal Forum, Portland, Oregon |
| 11-27 | JSTT Technical Conference, Tokyo, Japan |

Who 'Likes' Sewers?

Rank	# Facebook 'Likes'	Company or Organization
1	72,680	U.S. Environmental Protection Agency
2	9,557	CH2M Hill
3	6,476	Roto-Rooter
4	5,716	Mr. Rooter LLC
5	4,446	American Water Works Association
6	3,175	Electro Scan Inc.*
7	2,800	Envirosight
8	2,500	RapidView iBAK North America
9	2,106	Pumper & Cleaner Environmental Expo International
10	1,965	Water Environment Federation (WEF)
11	1,894	MWH Global
12	1,820	Black & Veatch
13	1,404	Carollo Engineers, Inc.
14	586	Arcadis US
15	431	Cleaner Magazine
16	382	Municipal Sewer & Water Magazine
17	200	Woolpert
18	199	Sewer Equipment of America
19	175	Greeley and Hansen
20	168	RedZone Robotics
21	147	Brown and Caldwell
22	137	IT Pipes
23	137	Rooter-Man
24	68	Pure Technologies Ltd.
25	56	WinCan Software
26	41	PipeLogix
27	35	MTech Company -- Electro Scan Dealer
28	32	Innovyze
29	27	Rescue Rooter
30	13	Aries Industries, Inc.



Source: Facebook, Septmeber 18, 2013

Want to know how & where Electro Scan spends it's time during the week? Weekends, too? 'Like' us on Facebook and get up-to-date instant updates on where we are, what we're doing, and who we're doing it with. At least, that's what friends & family want to find out. Join us today and start enjoying our stories from the road.

* <https://www.facebook.com/pages/Electro-Scan-Inc/214255938644317?fref=ts>

Electro Scan Inc. and CD Lab AG, Maker of Market Leading WinCan Pipe Inspection Software, Sign Global Alliance Deal



New Module to Allow Electro Scan & CCTV To Be Compared, Side-By-Side

California-based Electro Scan Inc., and Swiss-based CD Lab AG, the world's leading provider of sewer pipe assessment software, with its leading flagship product, WinCan, announced a global partnership to offer an integrated solution.

The cooperative agreement, executed by Chuck Hansen, Chairman & CEO of Electro Scan Inc. and Martin Hien, General Manager of CD Lab AG, includes development of a custom Electro Scan - WinCan Module, to be added to the suite of WinCan products, able to import, store, and display Electro Scan's patent-pending data downloaded from its Critical Sewers™ Cloud app.

"We are excited to work with such a universally-accepted product, like WinCan," states Electro Scan's Chuck Hansen. "I've been watching WinCan, with amazement, for many years and am delighted to see their product evolve into such a feature-rich solution to manage wastewater assets."

"We are delighted to be expanding our product library to include Electro Scan," states CD Lab's Martin Hien. "Chuck and his team have done a great job adding a new level of data to our industry. Combined with CCTV and Laser Profiling data, our customers will have an unprecedented decision tool at their fingertips to manage their aging infrastructure."

"The addition of Electro Scan further solidifies WinCan's leadership as a key decision support system to help manage wastewater assets," comments Mike Russin, Business Manager of Pipeline Analytics, Inc., exclusive dealer in the U.S.

Product features and capabilities are expected to be similar to other popular WinCan modules, such as its WinCan Laser module. The new Electro Scan-WinCan Module is expected for release in early 2014.

Dealers to Offer WinCan
International Electro Scan Dealers

will be able to offer WinCan products, including the new Electro Scan Module, as part of its ES-620 and ES-38 installations.

Electro Scan's U.S. Dealers will also be able to offer WinCan Vx products, including the new Electro Scan Module on sales of all ES-620s and ES-38s, under a special agreement with Pipeline Analytics, the exclusive distributor of WinCan products in North America and South America (See Related Article Below).

How It Works?
"Electro Scan data will still be uploaded from the field to a customer's Critical Sewers™ cloud account," stated Scott Hansen, Chief Technical Officer for Electro Scan. "What has been added is a special feature that allows users to download selected scans from Critical Sewers™ to the new Electro Scan-WinCan Module."

"In May 2013 I had a chance to visit CD Lab [Murten, Switzerland] and get a first-hand look at some of the current & future innovations they are working on, and was quite impressed," said Chuck Hansen. "I've overseen the development of a few versions of storing and processing closed-circuit television inspection reports, and really like where CD Lab is going."

The new Electro Scan-WinCan Module, will be available in early 2014.

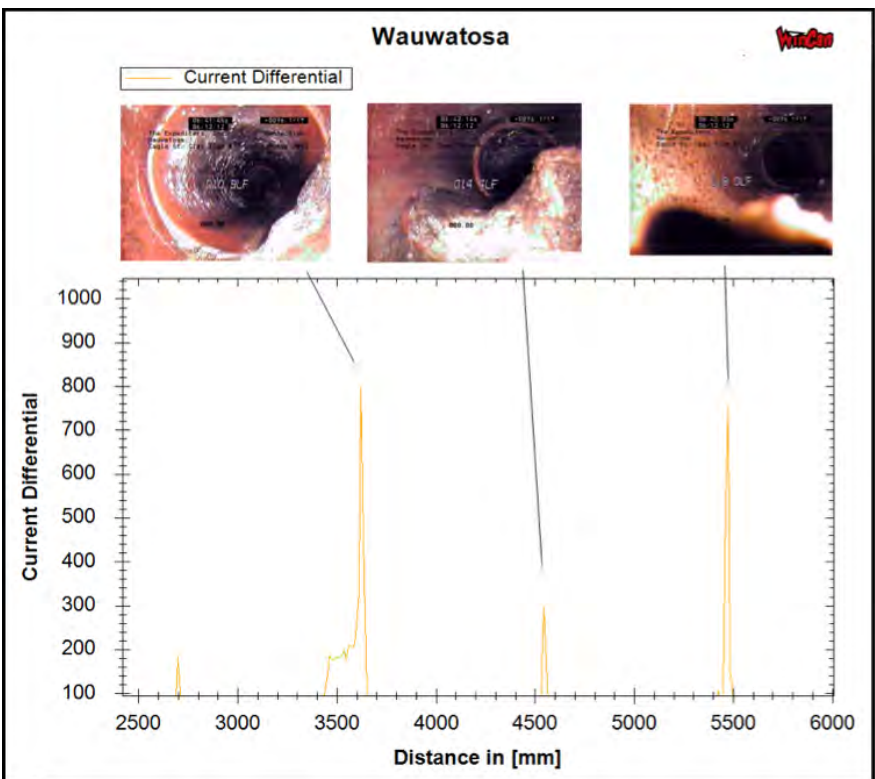
About CD Lab, AG
CD Lab AG, headquartered in Murten, Switzerland, designs, develops, and markets the world's leading pipeline inspection software, WinCan.

Founded in 1990, the company specializes in the inspection and administration of wastewater infrastructure having more than 6,400 licensed installations, translated into 46 different languages, supporting 50 different CCTV inspection standards, and sold through over 80 resellers worldwide.



(Above) Chuck Hansen, Electro Scan, and Martin Hien, CD Lab AG, in Murten, Switzerland.

(Below) The new Electro Scan-WinCan Module, available with in early 2014, able to link automated still images to Electro Scan defects.



Pipeline Analytics' U.S. WinCan Users Able to Add New Integrated Electro Scan-WinCan Module in Early 2014



Electro Scan is delighted to be teaming with Pipeline Analytics to provide sales and support for WinCan, and more specifically, the New Electro Scan-WinCan Module.

With over 100 customer projects and one million feet of scanning as part of its Critical Sewers™ cloud app, Pipeline Analytics, together with Electro Scan, will be offering new & demo customers the ability to see their Electro Scan and CCTV data, side-by-side in WinCan.

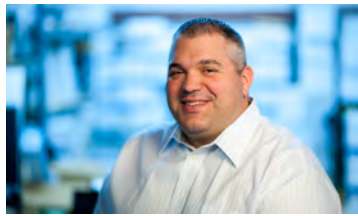
"One of reasons we felt so comfortable with WinCan, was hearing customer & competitors, alike, talk about Mike Russin," said Chuck Hansen, Electro Scan's Chairman & CEO. "How can you not like the guy? Besides we almost have nearly 100 shared contacts on LinkedIn!"

Earning his BS in Environmental Science from Erie, PA-based Gannon University, and a former NASSCO Board Member, Mike has been a positive influence in the wastewater industry for over ten years.

"I like showing customers how to make inspection data help them in their daily decisions," says Mike Russin, Business

Manager, Pipeline Analytics. "The better job I can help linking 'boots on the ground' in the field with 'decision makers in the office' the better sewer utilities can serve their constituents."

"I can't wait to start working with Mike, and the growing team at PA," says Chuck. "I've been around lots of folks selling and supporting products in the wastewater collection business, and don't think there is anyone better than Mike, in knowing what it takes to be successful."



Contact:
Mike Russin, Business Mgr.
Pipeline Analytics, Inc.
200 Cedar Ridge Drive, Suite 207
Pittsburgh, PA 15205
Toll Free: 877-626-8386
Fax: 412-489-6471
wincan@pipelineanalytics.com
www.pipelineanalytics.com

[Home](#) [WinCan Software](#) [Support for WinCan](#) [Training on WinCan](#) [Contact](#) [Partners](#)

WinCan Value Bundles

Choosing the industry leader has never been more affordable. Save up to 60% on the pipe inspection software more users trust than any other.

[Learn More](#)

infinity support

gis/gps integration

side-scan ready

fully digital

advanced reporting

pacp certified

WinCan continually evolves to implement new functionality and harness new hardware capability. A WinCan Infinity subscription from Pipeline Analytics entitles you to every version upgrade and maintenance update, plus unlimited support and special pricing on new modules—all for a low annual percentage of your purchase price.

News

Electro Scan Inc. and CD Lab AG Announce Global Partnership. The agreement includes development of a custom Electro Scan module, to be added to the suite of WinCan products, able to import, store and display Electro Scan data downloaded from its Critical Sewers Cloud app. Product features and capabilities are expected to be similar to other popular WinCan modules. The new Electro Scan Module is slated for release the first quarter of 2014. [Read more ...](#)

Downloads

[WinCan v6 Brochure](#)

Electro Scan Exhibits & Speaks at SWE in Tokyo

Andrew O'Keefe, fresh off a 10-hour flight from the U.S. and his recent wedding, landed in Tokyo to begin Electro Scan's first series of demonstrations in Japan and to participate in the country's largest sewer conference, the annual Sewage Works Exhibition (SWE).

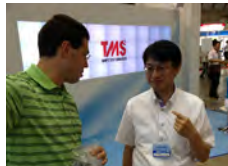
With the help and support of Mikio Goto, Sales Manager Kantool Co., Ltd., Electro Scan had shipped a number of its products, prior to Andrew's arrival in Japan.

Today, Japan is experiencing a record number of sewer collapses, recording over 5,300 in 2012. In response, Japan's Ministry of Land, Infrastructure, and Transport has undertaken a series of demonstration projects to showcase innovative sewer technologies, known as B-DASH.

By accelerating research and development and commercialization of new technologies, Japan's Ministry of Land, Infrastructure and Transport aims to implement leading solutions to improve the allocation of capital projects, streamline operations, and better utilize resources.

Prior to Electro Scan's arrival in Japan, Kantool had introduced key concepts of the new technology at KanShinKyo, Japan's Association of Consultants for Pipeline Diagnostics. Including nearly 80 member companies, full-day seminars were held in the cities of Okayama (May 17) and Sapporo (June 21).

"A special 'thanks' to Goto-san and to our invaluable interpreter, Yumiko-san, for all their help," stated Andrew O'Keefe, Electro Scan's Sales Manager. "We would not have 'hit-the-ground-running' without them."

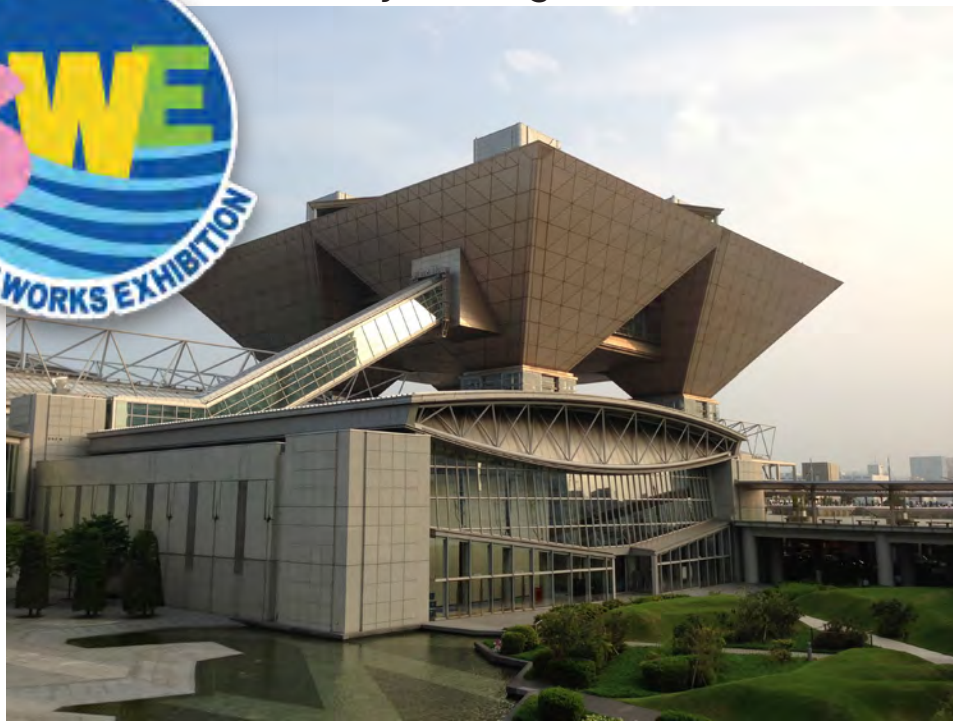


(Above) Andrew O'Keefe and Mikio Goto, Sales Manager, Kantool Co., Ltd.

(Right) Andrew and Yumiko Aso.



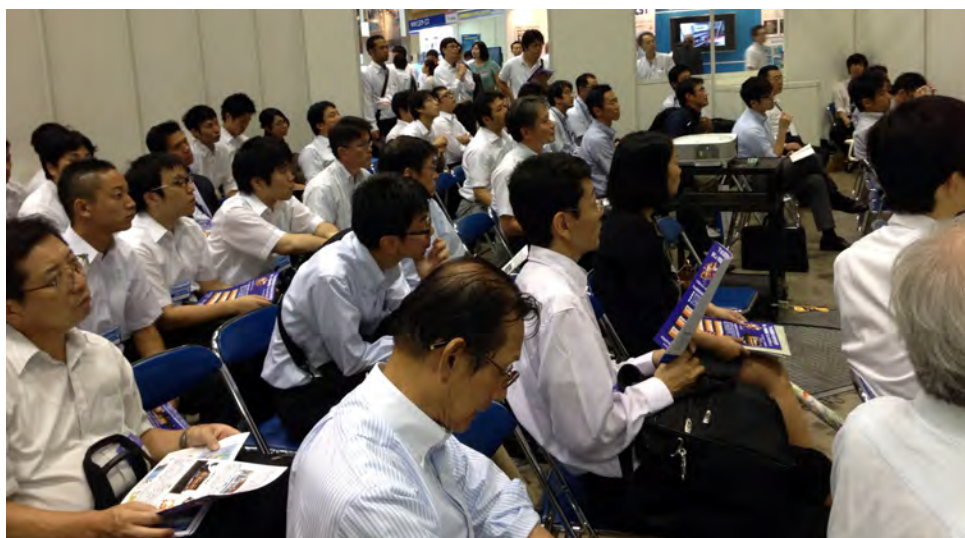
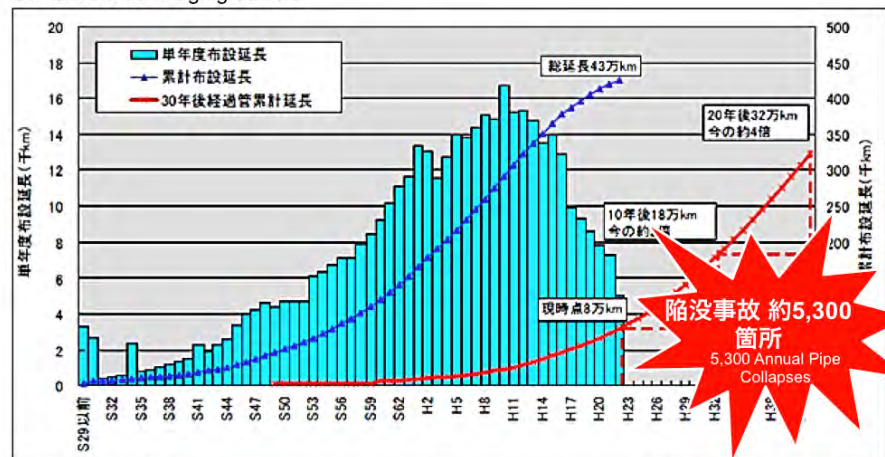
31 July - 2 August 2013



(Above) Big Sight in Tokyo, Japan, site of the 2013 Sewage Works Exhibition.

下水道管路の老朽管の現状

Current status of aging sewers



(Above) Overflow attendance at a bi-lingual (English-Japanese) presentation given by Chuck Hansen, Electro Scan, CEO, and Japanese Interpreter, Yumiko Aso.

(Below) Electro Scan's booth near Tokyo Metropolitan Sewer's booth, occupying a central location for interested sewer professionals, courtesy Kantool Co. Ltd.

下水道調査の次世代を担う 新しい調査機器『エレクトロスキャン』

テレビカメラ車のカメラケーブルに接続できます
(150mm~1.5m)

小口径用 (76mm~250mm)

Electro Scan
テレビカメラ装置後付

下水道管路管理の次世代を担う新技術『エレクトロスキャン』

- 新設管および更生後の管の「漏水ゼロ」を証明
- テレビカメラ調査では発見できない漏水を自動検知
- 下水管継手部の状態を評価
- 浸入水を自動計算 (リットル/分)

WinCan

継ぎ手不良

部分補修不良

更生不良

漏水箇所

エレクトロスキャンで漏水箇所がわかります

小間番号 3-15

electro scan inc.

株式会社 カンツール

www.electroscan.com

www.kantool.co.jp



Envirosight Paves Way For Electro Scan Integration

Electro Scan To Offer Integrated Solution With Envirosight's RAX 300 Cable Reel

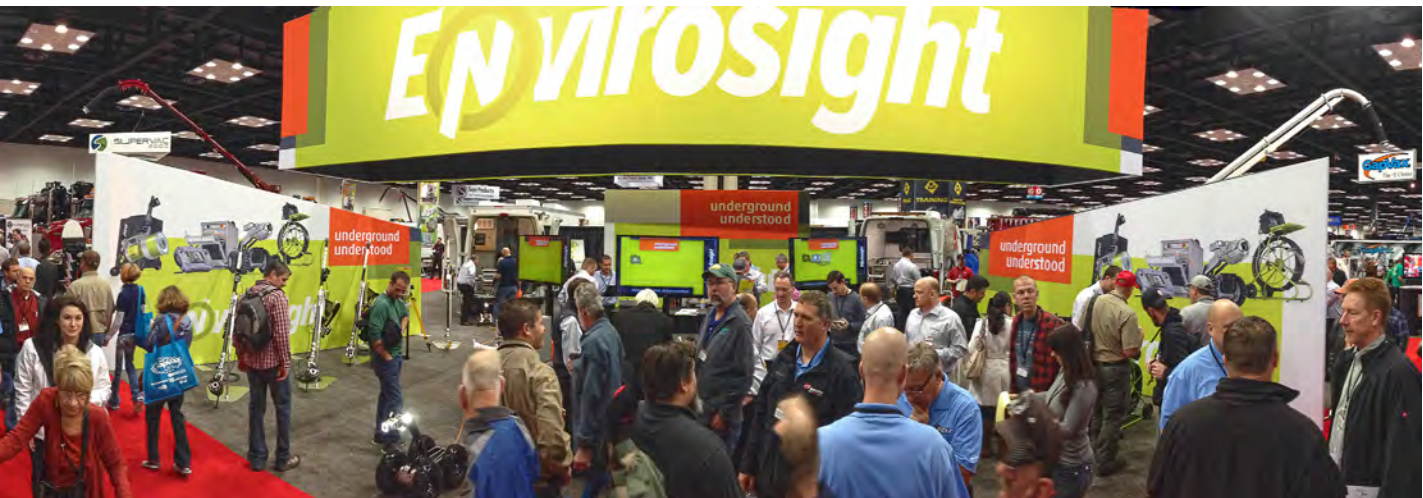
Randolph, New Jersey-based Envirosight has teamed with Electro Scan Inc. to offer an integrated solution for its RAX 300 Cable Reel.

Supplied by iPEK®, based in Sulzberg, Germany, a division of publicly-traded IDEX Corporation (NYSE: IEX) and manufactured exclusively for Envirosight for distribution in North America and South America, the RAX 300 Cable Reel represents an advanced automated cable reel system that powers the company's flagship pipe inspection crawlers, ROVVER X and SuperVision products. And, now Electro Scan.



"Electro Scan and Envirosight's line of crawler cameras represents a complete solution that covers both dry weather [CCTV] and simulated wet-weather [Electro Scan] conditions," states Chuck Hansen, Chairman & CEO of Electro Scan. "The Envirosight product line here in the U.S. and iPEK brand worldwide, represents a leading CCTV solution, and we are proud to utilize their products."

"Envirosight is delighted to offer our RAX 300 Cable Reel to drive Electro Scan," stated Richard Lindner, President of Envirosight. "We pride



(Above) Envirosight at a national exhibition.

ourselves on offering an open, in-field, plug & play platform, to support a complete line of pipe assessment tools, from crawler cameras to laser profilers, and we're delighted to work with an innovative technology, like Electro Scan."

About Envirosight
Envirosight specializes in underground infrastructure, pipeline and confined space inspection. Founded in 2001,



Richard Lindner, President, Envirosight.

Envirosight is a diversified, full service supplier of manhole cameras, zoom survey cameras, robotic crawlers, push

cameras, inspection vehicles, and integrated software technologies.

Envirosight's tools answer a variety of challenging applications, including the inspection of sewer, water and stormwater lines, as well as manholes, wet wells, vessels and electrical conduit.

Envirosight-Electro Scan product pricing and availability will be announced at WEFTEC in Chicago, IL, October 7, 2013.

Electro Scan's engineering team appreciates working with Florian Pfefferle, iPEK's German engineers, and Richard Lindner's Envirosight team at their Randolph, New Jersey headquarters.

Envirosight's RAX 300 Cable Reel



Electro Scan ES-620 Probe



(Above) Vehicle-mounted Envirosight RAX 300 Cable Reel & Electro Scan ES-620 Probe.

Pennsylvania Sewer Authorities 'Electro Scan' Sewers

Lehigh County, PA	Lower Salford Township, PA	Upper Montgomery Joint Authority, PA

JAMES CITY SERVICE AUTHORITY FINDS DEFECTS NOT FOUND BY CCTV

Innovative Technology Used For 20,000ft Sewer Re-Assessment Evaluation Project

James City Service Authority, Williamsburg, Virginia, is a leader in Hampton Roads. Managing 423 miles of sewer main and serving 21,500 sewer connections, JCSA is one of thirteen localities operating under the area-wide Hampton Roads USEPA Consent Decree and Virginia Department of Environmental Quality Order to develop a plan to study the regional sewer system and identify improvements that can be made to reduce the frequency and severity of sanitary sewer overflows.

While regional localities have undergone system-wide condition assessment programs to help develop a Regional Wet Weather Management Plan, recent initiatives, such as the USEPA's Blueprint for Integrating Technology Innovation into the National Water Program, have encouraged leading agencies, like JCSA, to assess new technologies to improve decision making and accelerate corrective actions.

As a result, JCSA commissioned a 20,000 ft re-assessment of two previously investigated sub-basins, using Electro Scan -- WEF's 'Best Innovative Technology' for 2013.

Read About This Project
Page 6

The biggest breakthroughs are the ones that alter decisions.



electro scan inc.
"Product of the Year"

Water Environment Federation (2013) | NASTT No-Dig (2013) | CleanTech Innovation Challenge (2013)

Electro Scan Begins R&D for Water Leak Detection; Expected to Leapfrog Acoustical 'Listening' Products

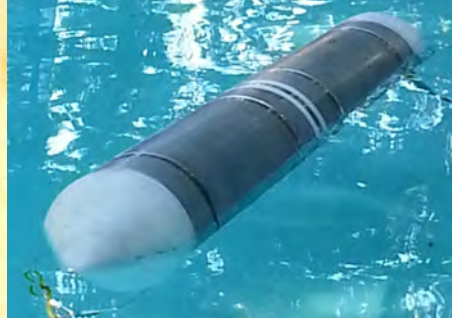
With urging from private equity, venture capital, strategic partners, and major water utilities, Electro Scan has begun research & development to utilize its patent-pending leak detection technology to serve the potable water industry.

Finding an accurate, cost-effective method to locate and measure water leaks in transmission and distribution systems is a key objective for water utilities. With current acoustical solutions able to pinpoint possible leaks to the closest 10 feet, compared to Electro Scan's success in locating leaks to the closest 0.4 inches or 1 cm, water industry leaders are clamoring for Electro Scan to adapt its award winning technology for locating water losses.

Beginning with large diameter raw water pipes and open channels, Electro Scan is expected to be in the field with working prototypes in 2014, with commercial products available in 2015. Early adopters are encouraged to contact Electro Scan to begin budgeting for pilot projects in 2014.

"The market for water loss leak detection is quite large," states Chuck Hansen, CEO of Electro Scan. "But legacy technologies don't appear to deliver the accuracy or dependability demanded by leading water utilities."

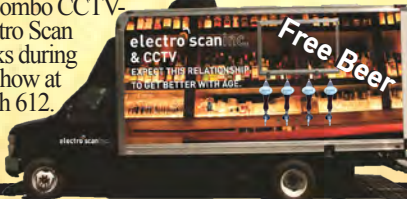
Currently, Electro Scan Inc. designs, manufactures, markets, and sells its patent-pending leak detection instrumentation for sewers & stormwater pipes, sold as an add-on product to



TV trucks, cable reels, and manual push reels, able to scan pipe diameters ranging from 6" (76mm) to 96" (2400mm).

"Given over 25,000 sewer TV trucks worldwide and an average sale price from \$125,000 to \$150,000 to add Electro Scan products, our international dealers have a lot of growth ahead of them in the sewer business," says Chuck Hansen. "Add a new line of products that are performance-tuned for a much larger drinking water business and you have a very exciting road ahead for our company and partners."

Electro Scan Inc. is the Platinum Sponsor for WEFTEC 2013 serving 'Free Beer' from two of its Combo CCTV-Electro Scan trucks during the show at booth 612.



WORLDWIDE DEMAND GROWS FOR PATENT-PENDING ELECTRO SCAN

Keynote presentations at international conferences, numerous technology awards, and an increasing number of authorized dealers, have contributed to the worldwide growth and demand for Electro Scan products.

Now shipping its patent-pending products to Australia, New Zealand, Japan, Ireland, United Kingdom, and now Europe, Electro Scan is thrilled with the international acceptance and adoption of its next generation products by leading sewer utilities.

"Our growth has even surprised me," commented Chuck Hansen, Chairman & CEO of Electro Scan.

Some may remember Chuck Hansen from his previous company, Hansen Information Technologies which he sold to Infor Global in 2007 for a reported \$100 million.

"I think a key to our success has been the team of experts in pipeline assessment and our com-

bined backgrounds in the wastewater business," states Chuck Hansen, CEO, Electro Scan. "Few people have over 30-years in the TV business and I think there is a lot of pent-up demand for products that rely less on subjective or qualitative guesswork, and more on automated solutions that deliver quantitative decision support information, like Electro Scan."

"Last year, we were in Devon, England, to scan a few sewers in Topsham, a village of about 5,000 people, that had its original charter in the Year 1300," recalls Chuck Hansen. "After our demonstration, Julian Briton, Rehabilitation Manager, Wessex Water, mentioned that 'it was too bad' our push probe -- the ES-38 designed for 3" to 8" or 76mm to 200mm pipe diameters -- couldn't handle England's most common sewer pipe, i.e. 225mm diameter pipe."

"International water utilities are often investor-owned companies, listed on public stock exchanges or owned by a diversified group of private equity or pension funds," says Chuck Hansen. "As a result, international water com-

panies tend to be quite sophisticated and rigorous in their CAPEX decision making. I knew AMP 6 was coming up in the UK and that a number of other water & sewer authorities looked to the British for innovation -- where do you think Insituform began? -- so I committed on the spot to have something back in England in less than 90 days, introducing our ES-225 & ES-250, for non-U.S. customers."

Electro Scan is pleased to announce plans to build & operate its first European demo truck, available in 2014.

"I told my wife, Deborah, that I never thought my first Mercedes would be a sewer truck," says Chuck Hansen. "When she asked if we could take the kids in it when we are in Europe, I told her that I didn't think so."

Electro Scan's new European Demo Truck will integrate its award winning products to leading CCTV cable reel manufacturers and be available for use by its European dealers for customer demonstrations and trade shows. Unlike its U.S. counterparts, the Electro Scan's European Demo Truck must be mindful of weight restrictions, and will, therefore, be limited to a single kegerator, instead of the usual double kegerator arrangement.

"I guess we will just have to buy twice as much beer," says Chuck Hansen.



SELECTED ELECTRO SCAN DEMOS IN 2013

- American Fork City, UT
- Broward County, FL
- City of Bridgeport, CT
- City of Berkeley, CA
- City of Castro Valley, CA
- City of Clearwater, FL
- City of Culver City, CA
- City of Dixon, CA
- City of Dothan, AL
- City of Dubuque, IA
- City of El Segundo, CA
- City of El Toro, CA
- City of Hampton Roads, VA
- City of Hawthorne, CA
- City of Healdsburg, CA
- City of Hickory Hills, IL
- City of Hillsborough, CA
- City of McKinney, TX
- City of Meriden, CT
- City of Northumberland, PA
- City of O'Fallon, MO
- City of Oakland, CA
- City of Orem, UT
- City of Pompano Beach, FL
- City of Provo, UT
- City of Richmond, CA
- City of Seven Hills, OH
- City of Springfield, IL
- City of Solon, OH
- City of Southlake, TX
- City of Springfield, IL
- City of St. Charles, IL
- City of St. Petersburg, FL
- City of Toledo, OH
- City of Tuscaloosa, AL
- City of Twin City, OH
- City of Ukiah, CA
- City of Virginia Beach, VA
- City of Waterford, CT
- City of Willits, CA
- Columbus Water Authority, GA
- Cottonwood Improvement District, UT
- Dallas Water Utilities, TX
- Frederick County, MD
- Fulton County, GA
- Grand Strand Sewer and Water Authority, SC
- Gwinnett County, GA
- Jacksonville Electric Authority FL
- James City Sewer Authority, VA
- Jefferson County, AL
- Lehigh County, PA
- Lower Salford Township, PA
- Macon Water Authority, GA
- Miami-Dade Water & Sewer, FL
- Michigan City, IN
- Mt. View Sanitary District, CA
- Oro Loma Sanitary District, CA
- Pima County, AZ
- Pinellas County, FL
- Salt Lake City Public Utilities, UT
- Sonoma Valley County Sanitation District, CA
- South Valley Sewer District, UT
- Sussex County, DE
- Tri-Cities North Regional Wastewater Authority, OH
- Upper Montgomery Joint Authority, PA
- Washington Suburban Sanitation Commission, MD

INTERNATIONAL DEMONSTRATIONS

- Christchurch, NZ
- Asaka, Japan
- Belfast, Northern Ireland
- Severn Trent, UK
- South West Water, UK
- Wessex Water, UK
- United Utilities, UK

PRRST STD
U.S. POSTAGE
PAID
SACRAMENTO, CA
PERMIT NO. 1761

Change Service Requested

electro scan inc.

1745 Markston Road
Sacramento, CA 95825-4026

Call 916-779-0660, Ext. 7001, to Arrange a Demonstration or Get a Budget Quote!