



DEPTH ONLY MONITORING UTILIZED BY BALTIMORE COUNTY

Presenters:
Kraig Moodie
Chris Korpman



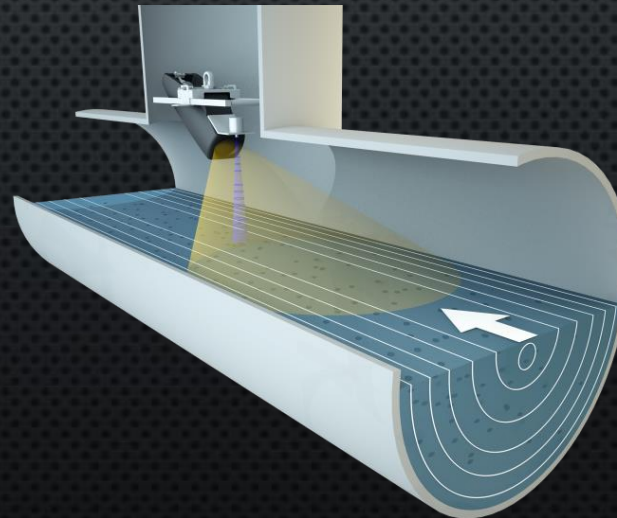
DEPTH ONLY MONITORING TECHNOLOGY

- WHAT TECHNOLOGY IS USED FOR DEPTH ONLY MONITORING?
- IS IT “NEW” TECHNOLOGY?
- HOW IS IT DIFFERENT THAN “CONVENTIONAL FLOW MONITORING”?
- HOW DID BALTIMORE COUNTY USE DEPTH ONLY MONITORING?



CONVENTIONAL FLOW MONITORING

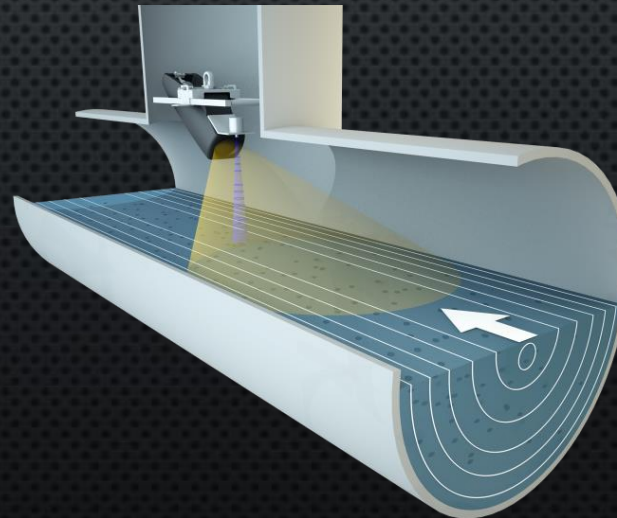
- CONTACT SENSORS
- NON-CONTACT SENSORS
- ULTRASONIC DEPTH
- PRESSURE DEPTH
- RADAR DEPTH
- DIGITAL DOPPLER VELOCITY
- RADAR VELOCITY
- LASER VELOCITY





CONVENTIONAL FLOW MONITORING

- I/I QUANTIFICATION PROJECTS
- CSO REPORTING
- CAPACITY ANALYSIS
- MODEL DEVELOPMENT
- INTERJURISDICTIONAL BILLING
- REGULATORY REQUIREMENT
- WATER QUALITY ANALYSIS
- $Q=A*V$





DEPTH ONLY MONITORING

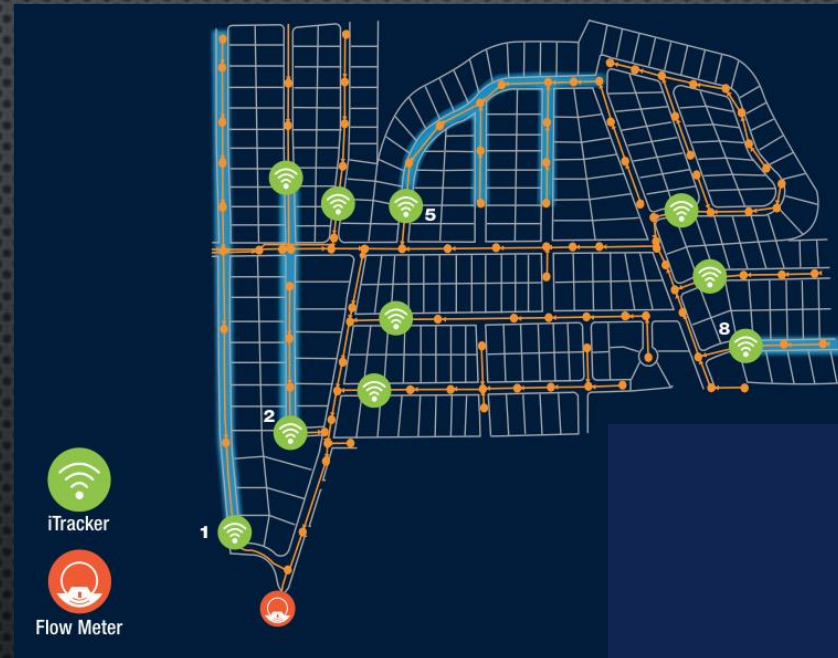
- ULTRASONIC/RADAR DEPTH
 - EASY TO INSTALL
 - SENSOR DEAD BAND
 - SIGNAL GOES TRANSMITS IN A CONE
 - DISTANCE LIMITATION
 - ACCOUNT FOR MANHOLE CONSTRUCTION
- PRESSURE DEPTH
 - GREATER RANGE
 - NO DEAD BAND
 - CONFINED SPACE ENTRY





DEPTH ONLY MONITORING

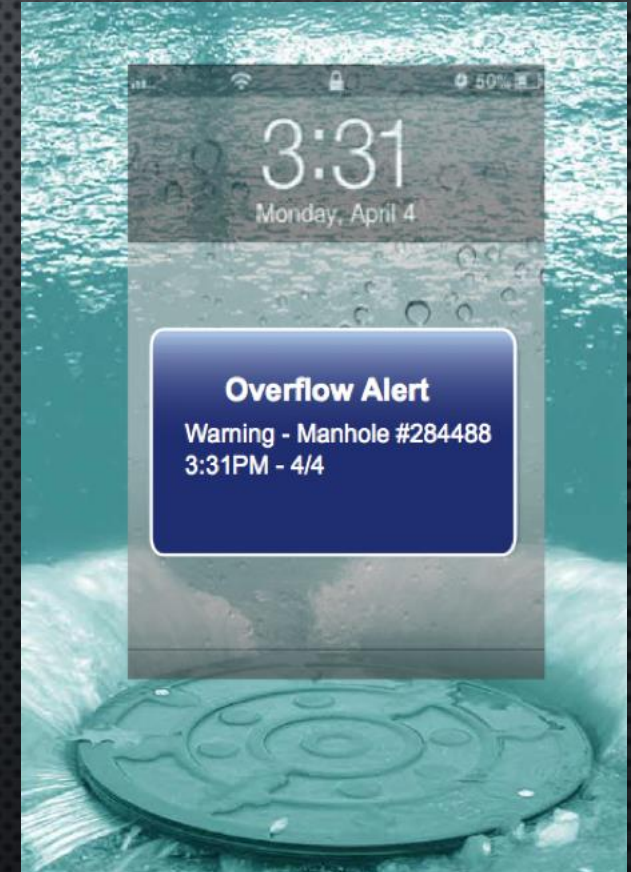
- APPLICATIONS
- PACKAGING
- COMMUNICATIONS
- PRICING
- UNIT DISTRIBUTION
- ANALYTICS





DEPTH ONLY MONITORING TECHNOLOGY

- WHAT IS THE PURPOSE FOR THE DATA?
 - ENGINEERING?
 - O&M?
 - NOTIFICATION?
 - BUDGET?
 - FUTURE DATA REQUIREMENTS?





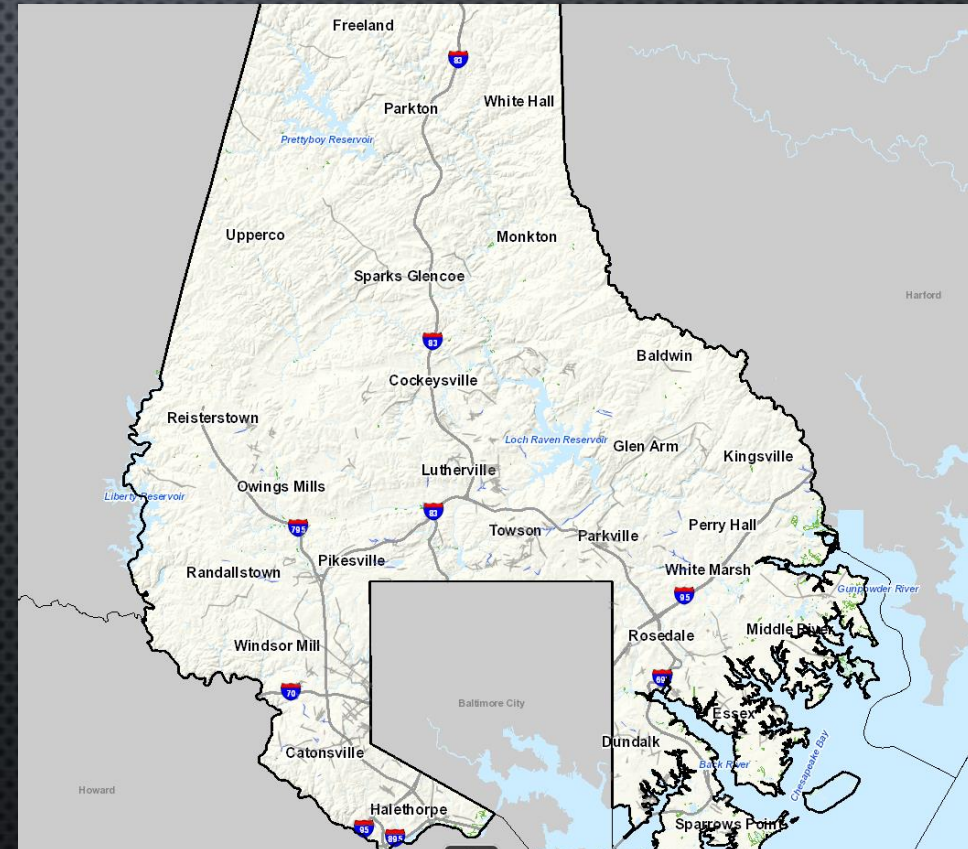
DEPTH ONLY MONITORING TECHNOLOGY

- WHAT TECHNOLOGY IS USED FOR DEPTH ONLY MONITORING?
- IS IT “NEW” TECHNOLOGY?
- HOW IS IT DIFFERENT THAN “CONVENTIONAL FLOW MONITORING”?
- HOW DID BALTIMORE COUNTY USE DEPTH ONLY MONITORING?



BALTIMORE COUNTY'S SEWER COLLECTION SYSTEM

- GRAVITY SEWER SYSTEM
- 8" GRAVITY SYSTEM
 - 50,030 ASSETS
 - 1,686 MILES
- GREATER THAN 8"
 - 9,172 ASSETS
 - 395 MILES

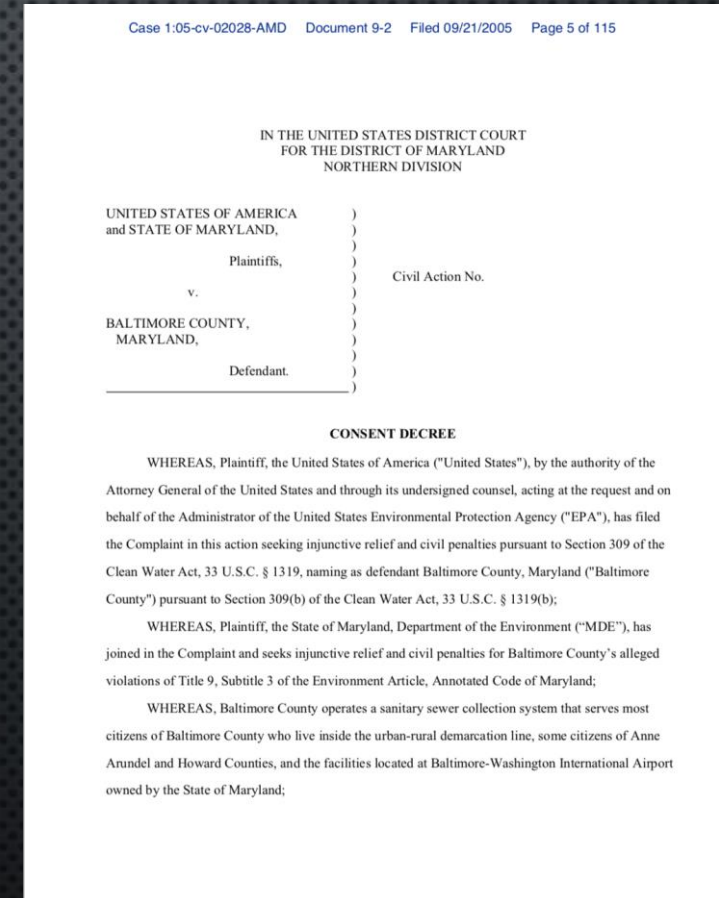


THE SYSTEM IS CURRENTLY MAINTAINED AND INSPECTED BY BOTH ON-CALL CONTRACTORS AND THE BUREAU OF UTILITIES



BALTIMORE COUNTY CONSENT DECREE

- INSTITUTED IN 2005
- PURPOSE
 - THE EXPRESS PURPOSE OF THE PARTIES ENTERING INTO THIS CONSENT DECREE IS FOR BALTIMORE COUNTY TO TAKE ALL MEASURES NECESSARY TO COMPLY WITH THE CLEAN WATER ACT AND THE REGULATIONS PROMULGATED THEREUNDER, AND THE MARYLAND WATER POLLUTION CONTROL LAWS AND THE REGULATIONS PROMULGATED UNDER SUCH LAWS, WITH THE GOAL OF **ELIMINATING SANITARY SEWER OVERFLOWS.**





PROBLEM AREA





PROBLEM AREA

- BALTIMORE STREET
 - 8, 10 AND 15 INCH SEGMENTS
 - ROOTS
 - GREASE
 - LOW ELEVATION
 - HIGH INFLOW & INFILTRATION
 - WET WEATHER BASEMENT BACKUPS





DEPTH ONLY MONITORING

- PORTABLE AND EASY TO INSTALL
 - UNITS ARE SMALL IN SIZE AND MOUNTED ON SPREADER BAR OR COMPOSITE MANHOLE LID
 - NO CONFINED SPACE ENTRY FOR INSTALLATION
 - 2 MAN CREW CAN INSTALL AND SET UP IN 30 MINUTES
- REAL TIME DATA
 - SAMPLE RATES FROM 1 PER SECOND TO 1 PER 8 HOURS
 - UNITS CAN BE PROGRAMMED TO UPLOAD DATA AT PRE-DETERMINED INTERVALS
 - SEND HIGH LEVEL ALARMS
 - RECORD AND UPLOAD DURING ALARMED SURCHARGE EVENTS SIMULTANEOUSLY
- ACCURATE TO 1/10TH OF AN INCH



DEPTH ONLY MONITORS





DEPTH ONLY MONITORS





PROBLEM AREA

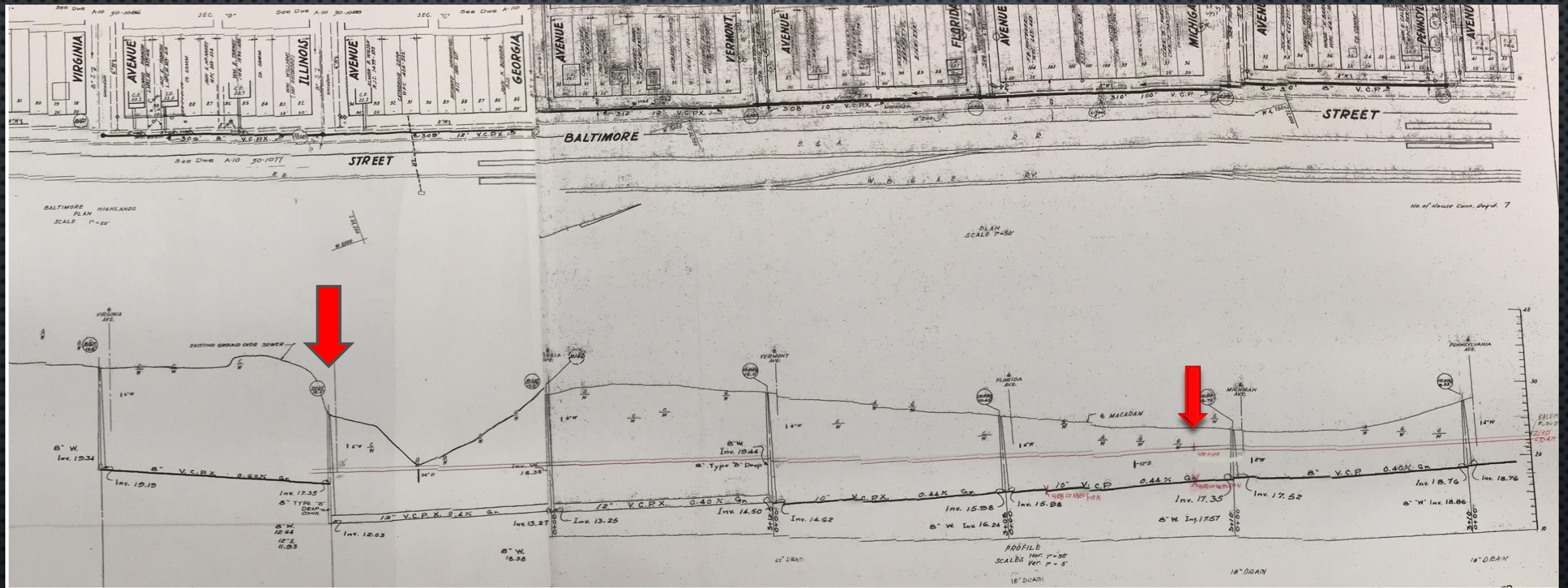
- BALTIMORE STREET
 - 8, 10, 12 AND 15 INCH SEGMENTS
 - ROOTS
 - GREASE
 - LOW ELEVATION
 - HIGH INFLOW & INFILTRATION
 - WET WEATHER BASEMENT BACKUPS
- METERING LOCATIONS





BALTIMORE STREET

- ELEVATIONS





PROBLEMS

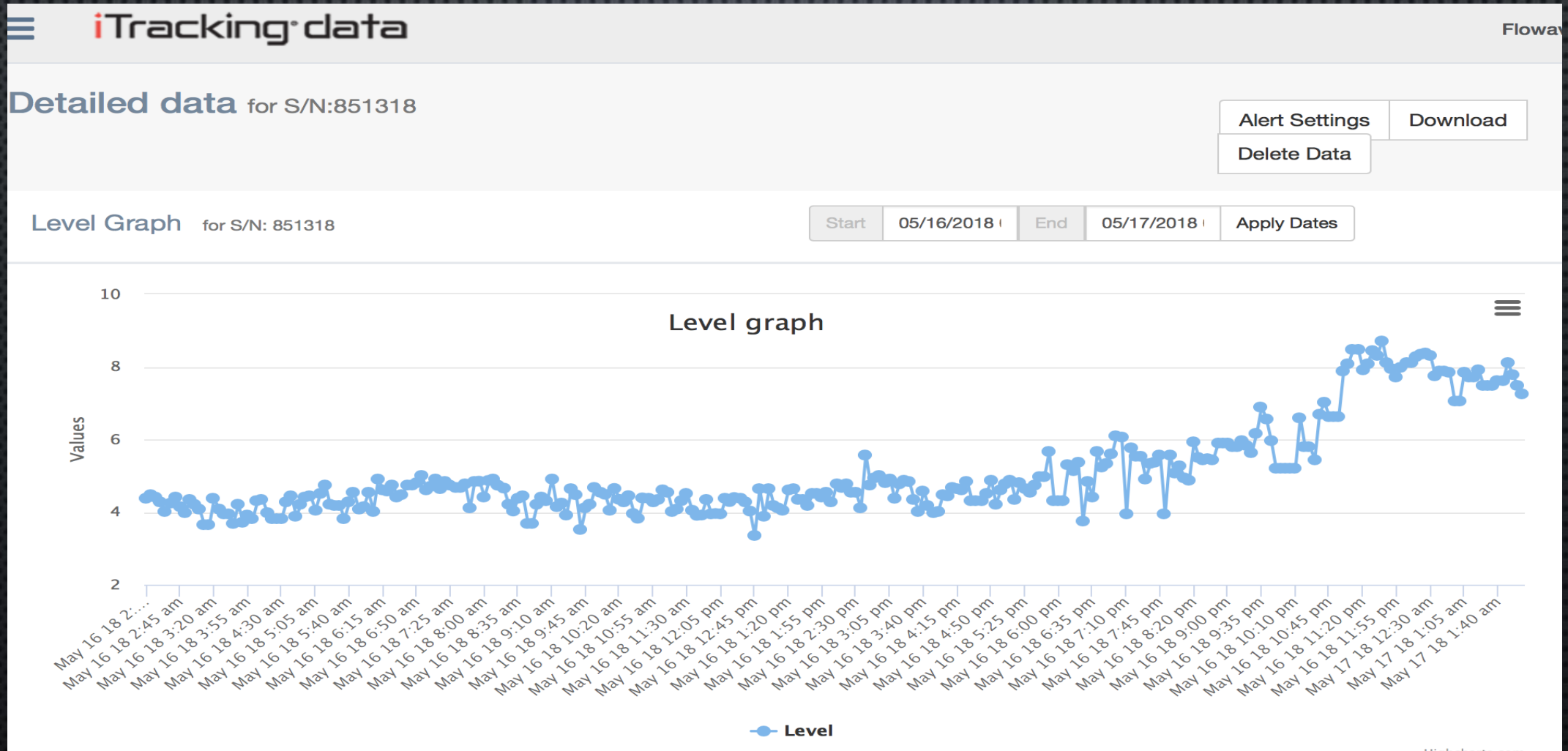
- BASEMENT BACKUPS
 - MICHIGAN AVE
- OBSERVED SURGING
 - ILLINOIS AVE
- ROOTS AND GREASE
 - IN RIGHT OF WAY





DATA

- WATER LEVELS DURING 5/16-17/2018 RAIN EVENT





BALTIMORE STREET LESSONS LEARNED

- PROACTIVE O & M HELPS PREVENT FUTURE BASEMENT BACKUPS
- CAPACITY DOES NOT APPEAR TO BE AN ISSUE
- FLOW LEVEL MONITORING CAN HELP DETERMINE CLEANING INTERVAL
- WILL CONTINUE TO MONITOR SEGMENTS TO LOOK FOR DATA OUTLIERS AND SURGING
- APPROPRIATE APPLICATION OF TECHNOLOGY WORKS – CONVENTIONAL AND DEPTH ONLY
- RELIABLE CELLULAR COMMUNICATION IS CRITICAL



OTHER PROBLEM AREAS

- I & I COMPARISONS
- SLOPE AND RESTRICTION ANALYSIS
- LEVEL VS. ODOR AND HYDROGEN SULFIDE ANALYSIS
- COMMERCIAL DISCHARGE MONITORING.
- LEVEL ALARMS IN PROBLEM AREAS

QUESTIONS?



Chris Korpman
32233324562
ckorp@yourplace.com



Kraig Moodie
(717)580-0123
kmoodie@flowwav.com