Texas Municipal Utilities Association Annual Conference

January 27, 2012

Providing a Voice to Your Silent Sewers

Bill Gross

Ryan Davenport

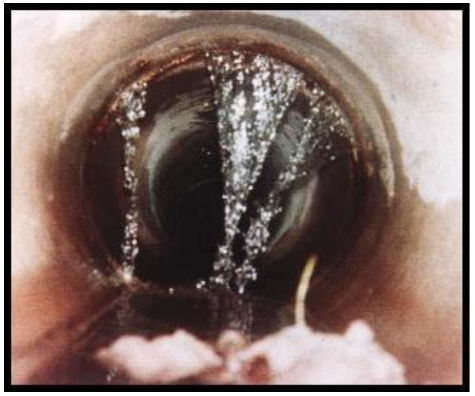
Advanced METERING SOLUTIONS

Points of Discussion

- Historical Trends of WW Systems
- Collection System Design
- Effects of Construction
- Operation and Maintenance
- System Management
- Technologies Past and Present
- Newer Technologies

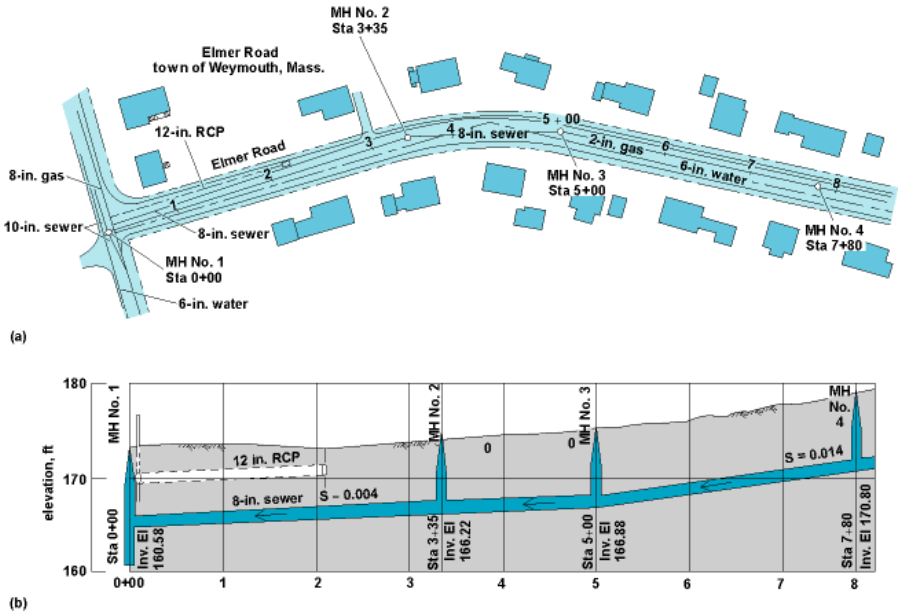
“Out of Sight, Out of Mind”

- Neglected Systems
- WW Treatment Plants
- Inflow and Infiltration
- CC/TV
- F.O.G.
- Slow Progress



Design and Construction

- Excellent Design Criteria
- Poor Inspection
- Poor Workmanship
- Poor Piping
- Material Handling

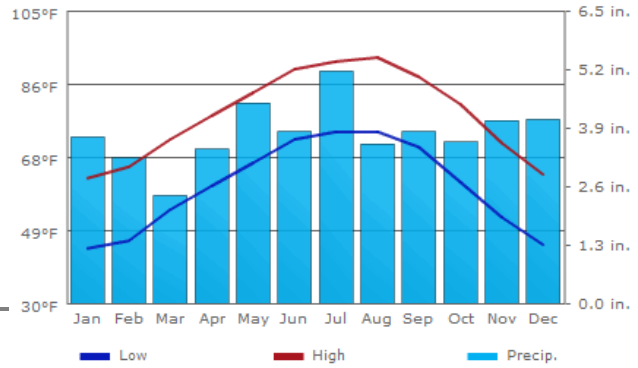


Operation & Maintenance

- Knowledge of Infrastructure
- Visual Inspections
  - Manholes
  - Lift Stations
  - Siphons
- Vandalism

Management

- Treatment of Wastewater
  - Piping and Pumping Capacities
  - Climatic Cycles
  - Seasonal Trends
  - Population Movement/Addition
- Plan Ahead and Oversee O & M

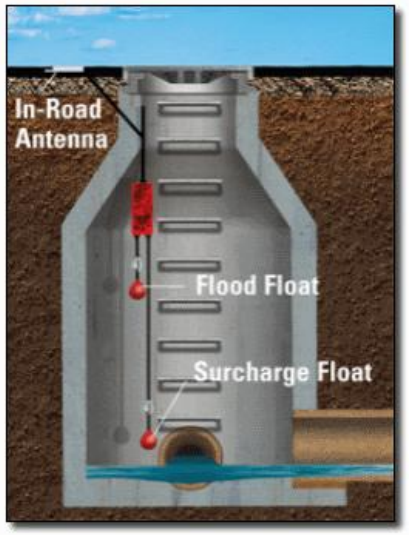


Technologies Past/Present

- CC/TV
- Smoke Testing
- Gravity Sewer Flow Measurement
- SCADA
- Spills Still Occur

Newer Technologies

- Floats
  - Will Alert of High Level in Manhole or Lift Station
  - Possibility of Fouling or Failing
  - No Trending Data
  - Installation Requires “Hot Patch”
- Flow Monitoring
  - Good for Long-Term Trending
    - Capacity Studies
    - I & I Studies



Newer Technologies

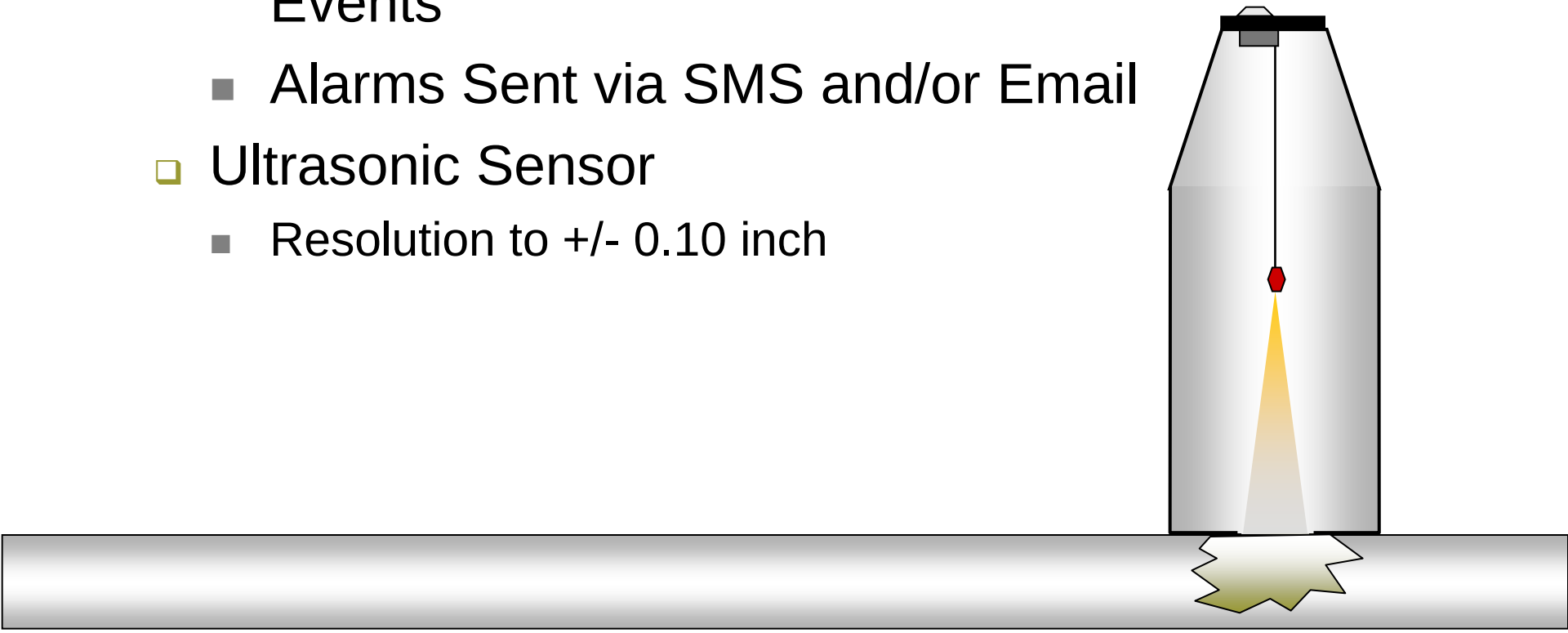
- Flow Monitoring Ctd.
  - Requires Confined Space Entry
  - Requires External Power
  - Difficult Maintenance Access
    - Repairs
    - Calibration
    - Cleaning of Unit
    - CC/TV Access

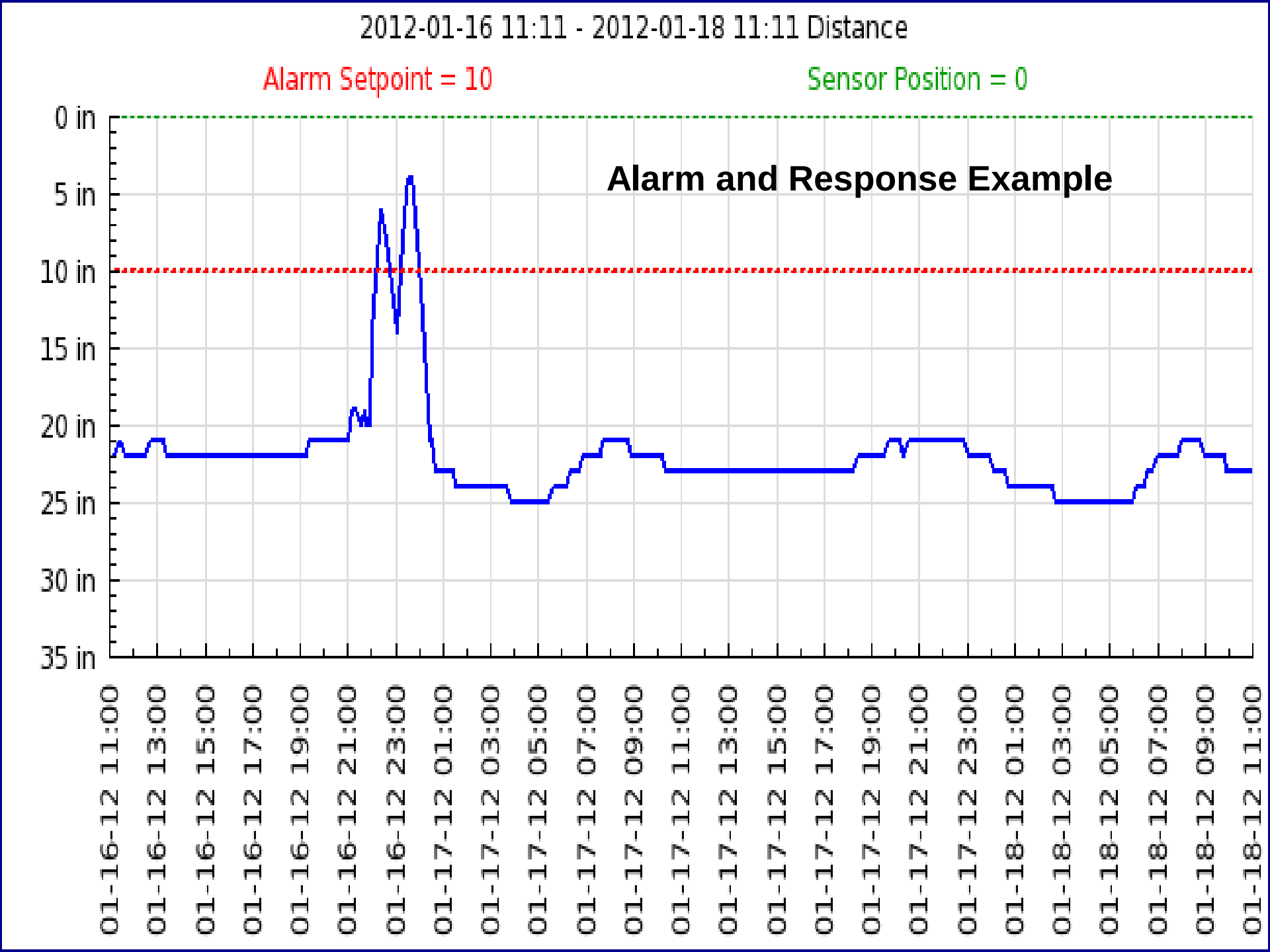
Newer Technologies

- Satellite Based Technology
  - Real-Time Communication via Satellite Network
    - Two-Way Communication
  - Requires No Confined Space Entry
  - Relies Solely on Battery Power
  - Secure Web-Hosted Software Platform
    - Data-Logging
      - Hourly, Daily, Weekly, Monthly, Yearly
    - Maintenance Data
    - Real-Time Level Monitoring

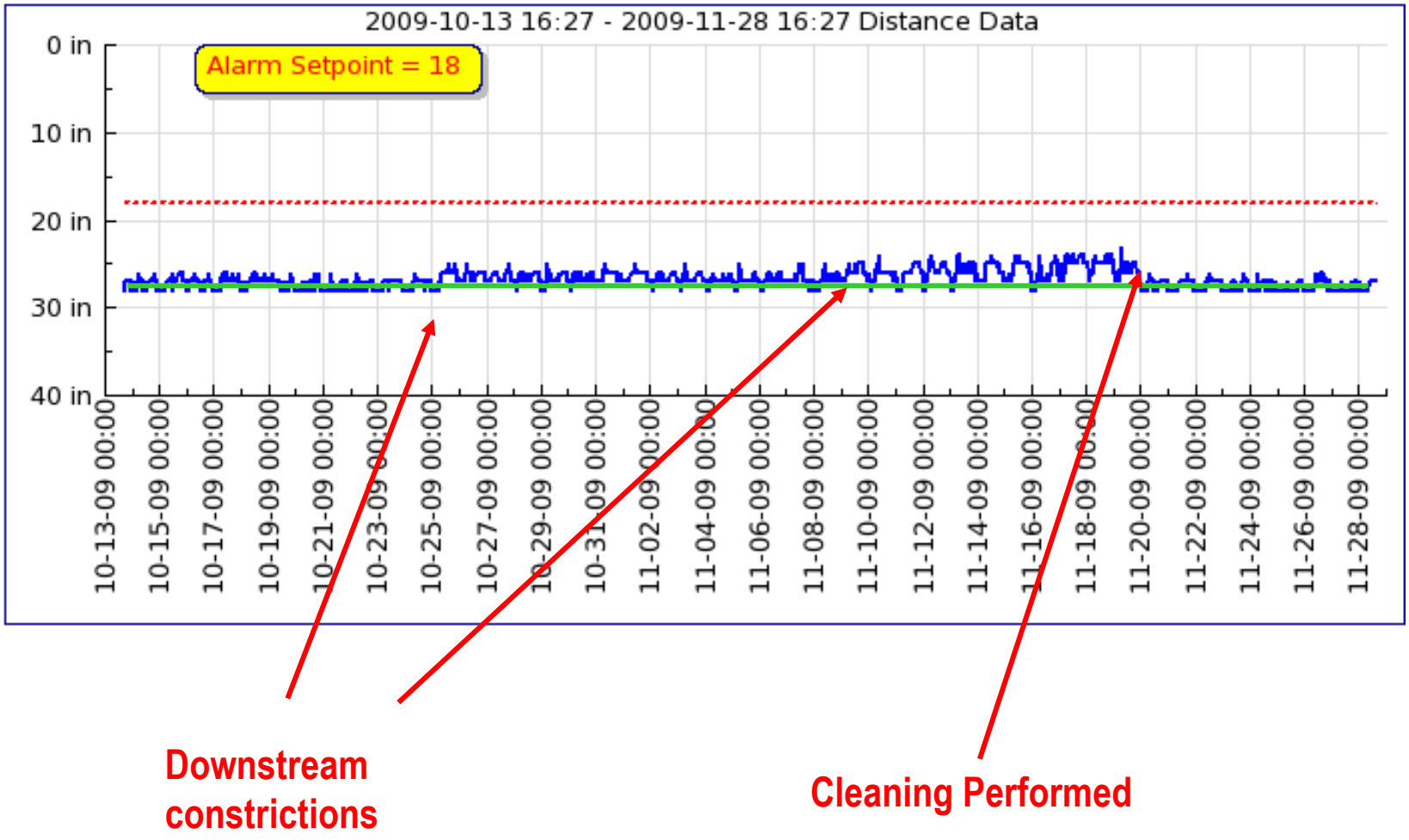
Newer Technologies

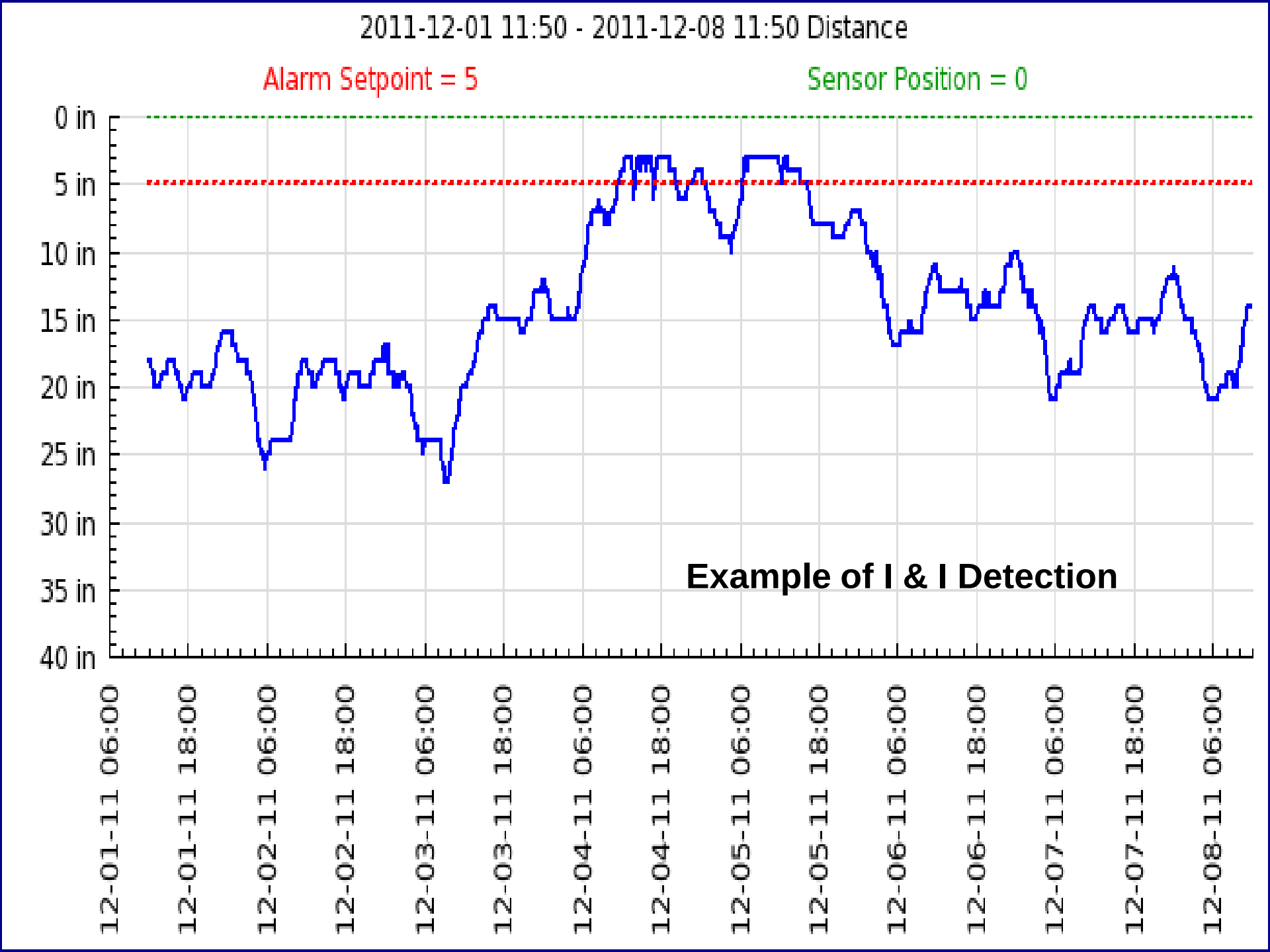
- Secure Web-Hosted Software Platform Ctd.
  - Real-Time Alarms for Surcharge and Intrusion Events
  - Alarms Sent via SMS and/or Email
- Ultrasonic Sensor
  - Resolution to +/- 0.10 inch




2012-01-16 11:11 - 2012-01-18 11:11 Distance
Alarm Setpoint = 10
Sensor Position = 0
Alarm and Response Example
0 in
5 in
10 in
15 in
20 in
25 in
30 in
35 in
01-16-12 11:00
01-16-12 13:00
01-16-12 15:00
01-16-12 17:00
01-16-12 19:00
01-16-12 21:00
01-16-12 23:00
01-17-12 01:00
01-17-12 03:00
01-17-12 05:00
01-17-12 07:00
01-17-12 09:00
01-17-12 11:00
01-17-12 13:00
01-17-12 15:00
01-17-12 17:00
01-17-12 19:00
01-17-12 21:00
01-17-12 23:00
01-18-12 01:00
01-18-12 03:00
01-18-12 05:00
01-18-12 07:00
01-18-12 09:00
01-18-12 11:00

Data-Driven Maintenance




2011-12-01 11:50 - 2011-12-08 11:50 Distance
Alarm Setpoint = 5
Sensor Position = 0
0 in
5 in
10 in
15 in
20 in
25 in
30 in
35 in
40 in
Example of I & I Detection
12-01-11 06:00
12-01-11 18:00
12-02-11 06:00
12-02-11 18:00
12-03-11 06:00
12-03-11 18:00
12-04-11 06:00
12-04-11 18:00
12-05-11 06:00
12-05-11 18:00
12-06-11 06:00
12-06-11 18:00
12-07-11 06:00
12-07-11 18:00
12-08-11 06:00

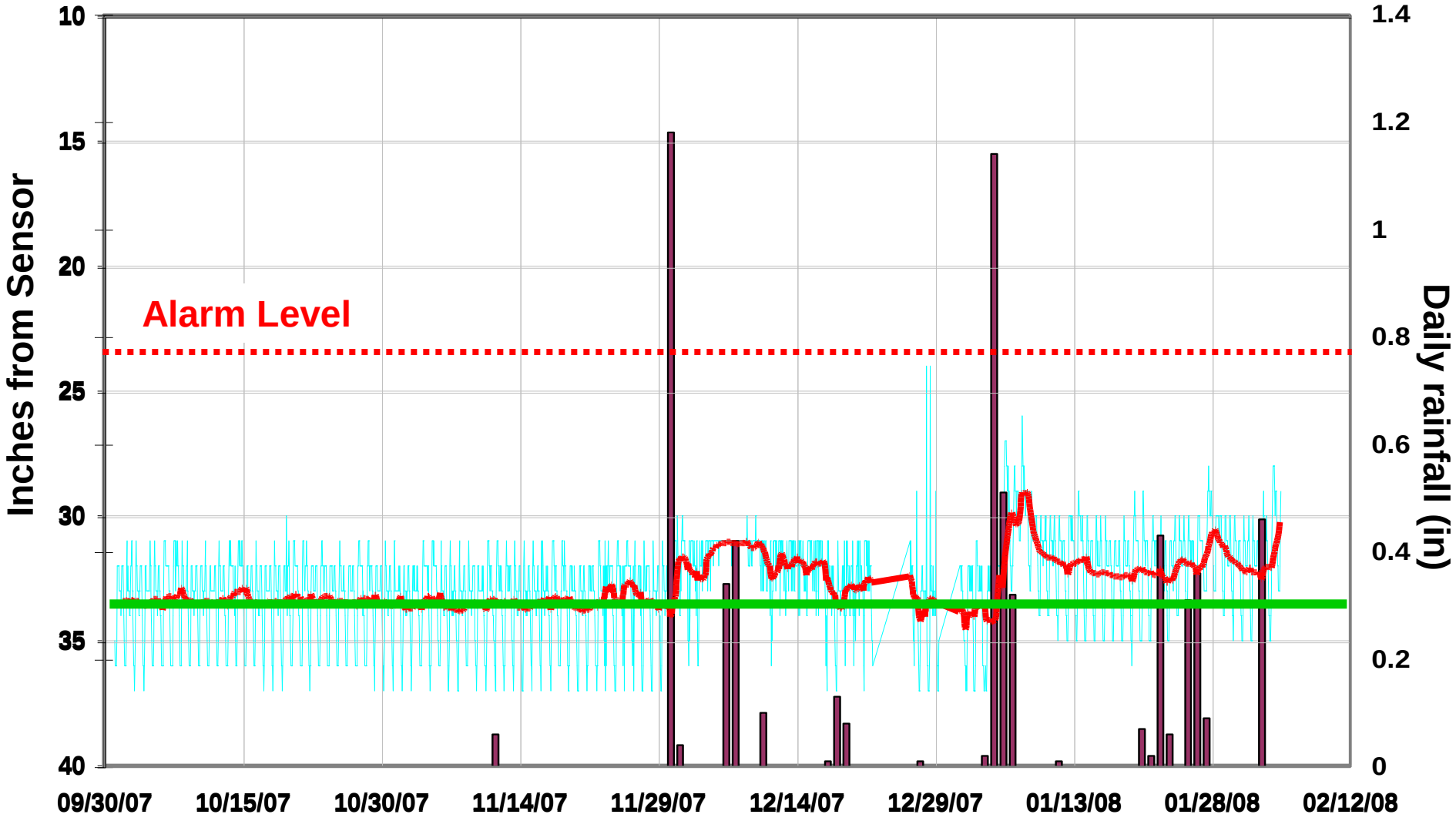
Raw level data

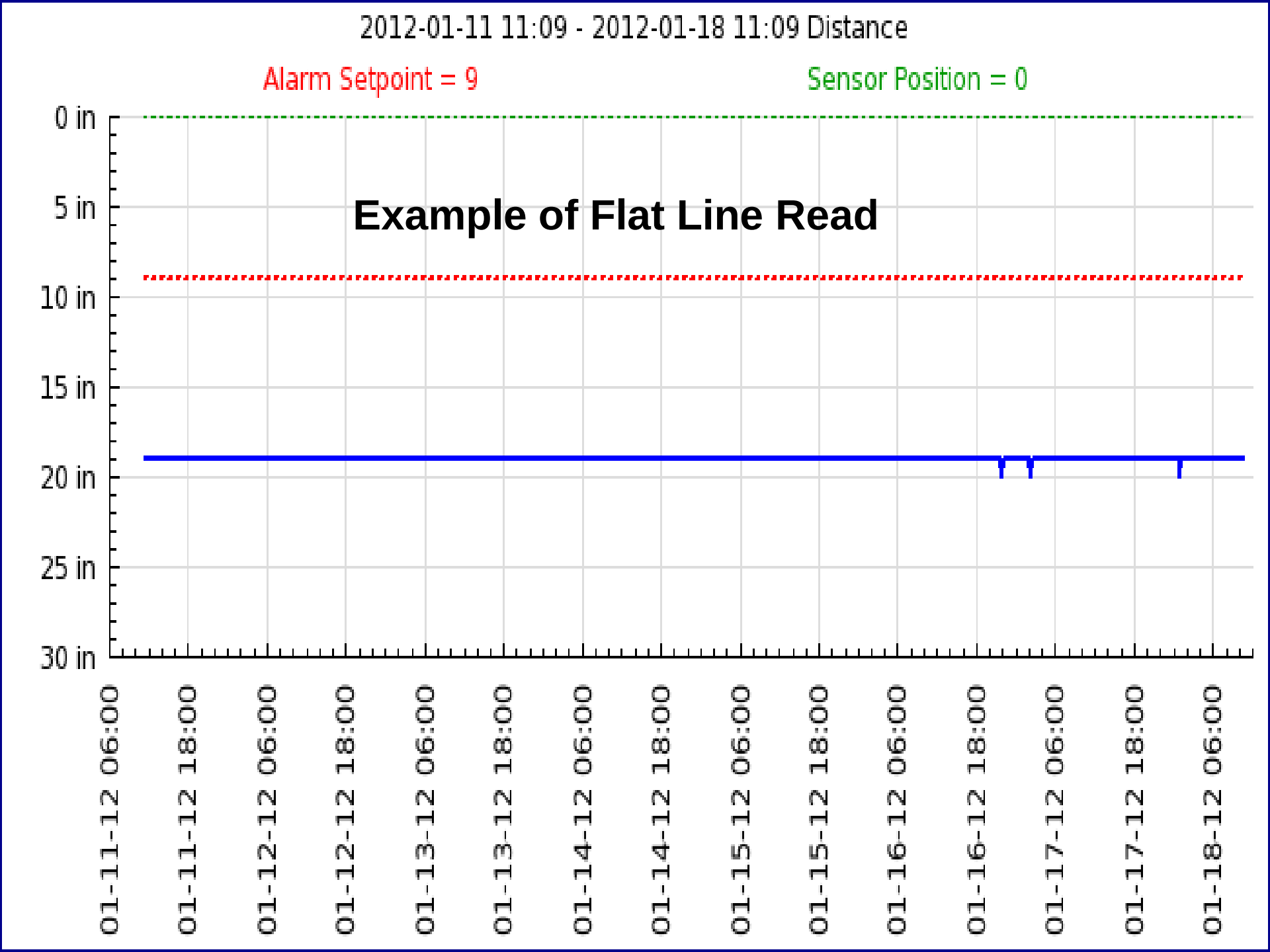
Rolling daily average

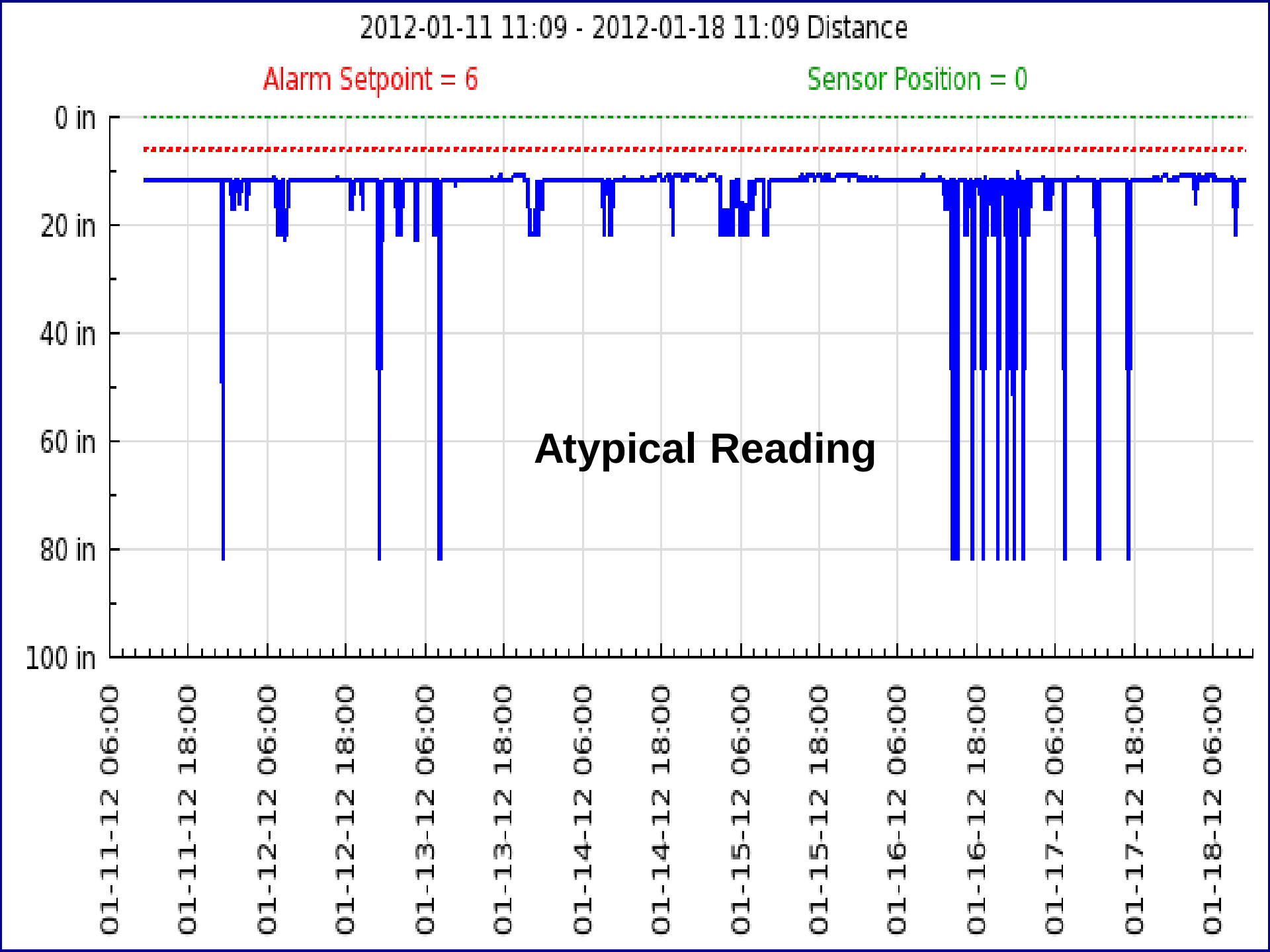
CIMIS Station daily rainfall

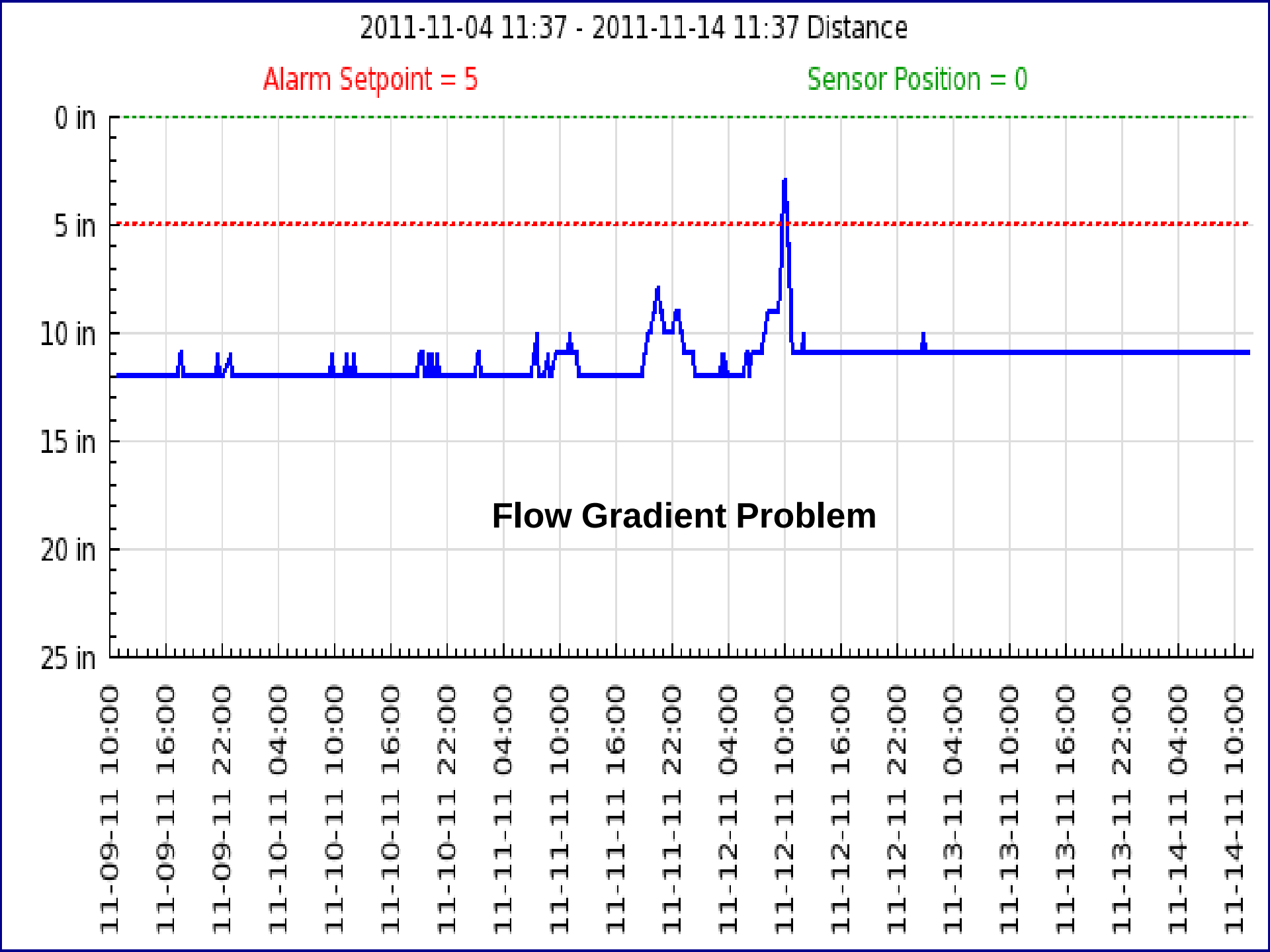
Pre-rain baseline

I and I Measurement

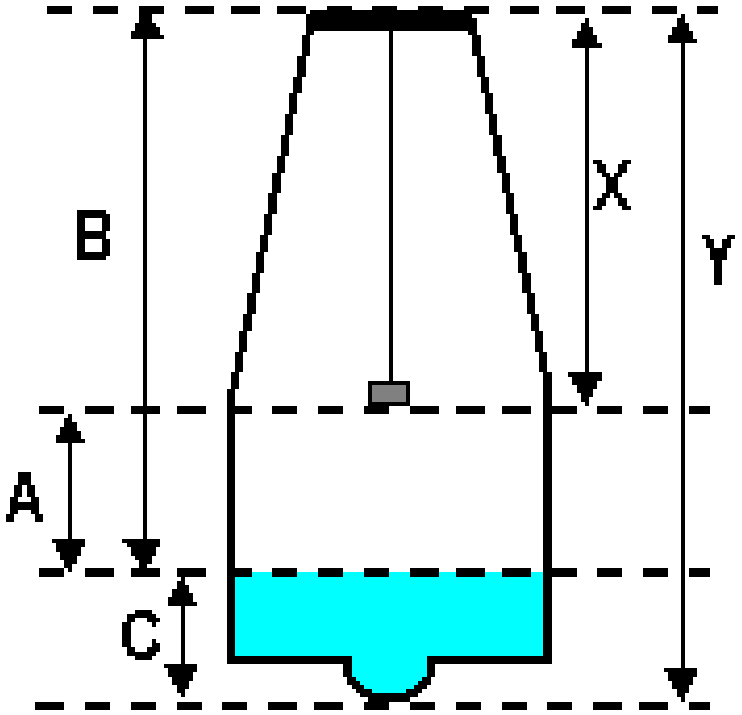



2012-01-11 11:09 - 2012-01-18 11:09 Distance
Alarm Setpoint = 9
Sensor Position = 0
Example of Flat Line Read
0 in
5 in
10 in
15 in
20 in
25 in
30 in
01-11-12 06:00
01-11-12 18:00
01-12-12 06:00
01-12-12 18:00
01-13-12 06:00
01-13-12 18:00
01-14-12 06:00
01-14-12 18:00
01-15-12 06:00
01-15-12 18:00
01-16-12 06:00
01-16-12 18:00
01-17-12 06:00
01-17-12 18:00
01-18-12 06:00


2012-01-11 11:09 - 2012-01-18 11:09 Distance
Alarm Setpoint = 6
Sensor Position = 0
0 in
20 in
40 in
60 in
80 in
100 in
Atypical Reading
01-11-12 06:00
01-11-12 18:00
01-12-12 06:00
01-12-12 18:00
01-13-12 06:00
01-13-12 18:00
01-14-12 06:00
01-14-12 18:00
01-15-12 06:00
01-15-12 18:00
01-16-12 06:00
01-16-12 18:00
01-17-12 06:00
01-17-12 18:00
01-18-12 06:00


2011-11-04 11:37 - 2011-11-14 11:37 Distance
Alarm Setpoint = 5
Sensor Position = 0
0 in
5 in
10 in
15 in
20 in
25 in
Flow Gradient Problem
11-09-11 10:00
11-09-11 16:00
11-09-11 22:00
11-10-11 04:00
11-10-11 10:00
11-10-11 16:00
11-10-11 22:00
11-11-11 04:00
11-11-11 10:00
11-11-11 16:00
11-11-11 22:00
11-12-11 04:00
11-12-11 10:00
11-12-11 16:00
11-12-11 22:00
11-13-11 04:00
11-13-11 10:00
11-13-11 16:00
11-13-11 22:00
11-14-11 04:00
11-14-11 10:00

Alarm Level (in.) 6	Normal High Level (in.)
X: Sensor Length (in.) 96	Y: Depth of Manhole (in.) 108



Level Display Options

- A: Distance from Sensor to Water Level
- B: Distance from Surface to Water Level
- C: Level of water above Bottom of Invert

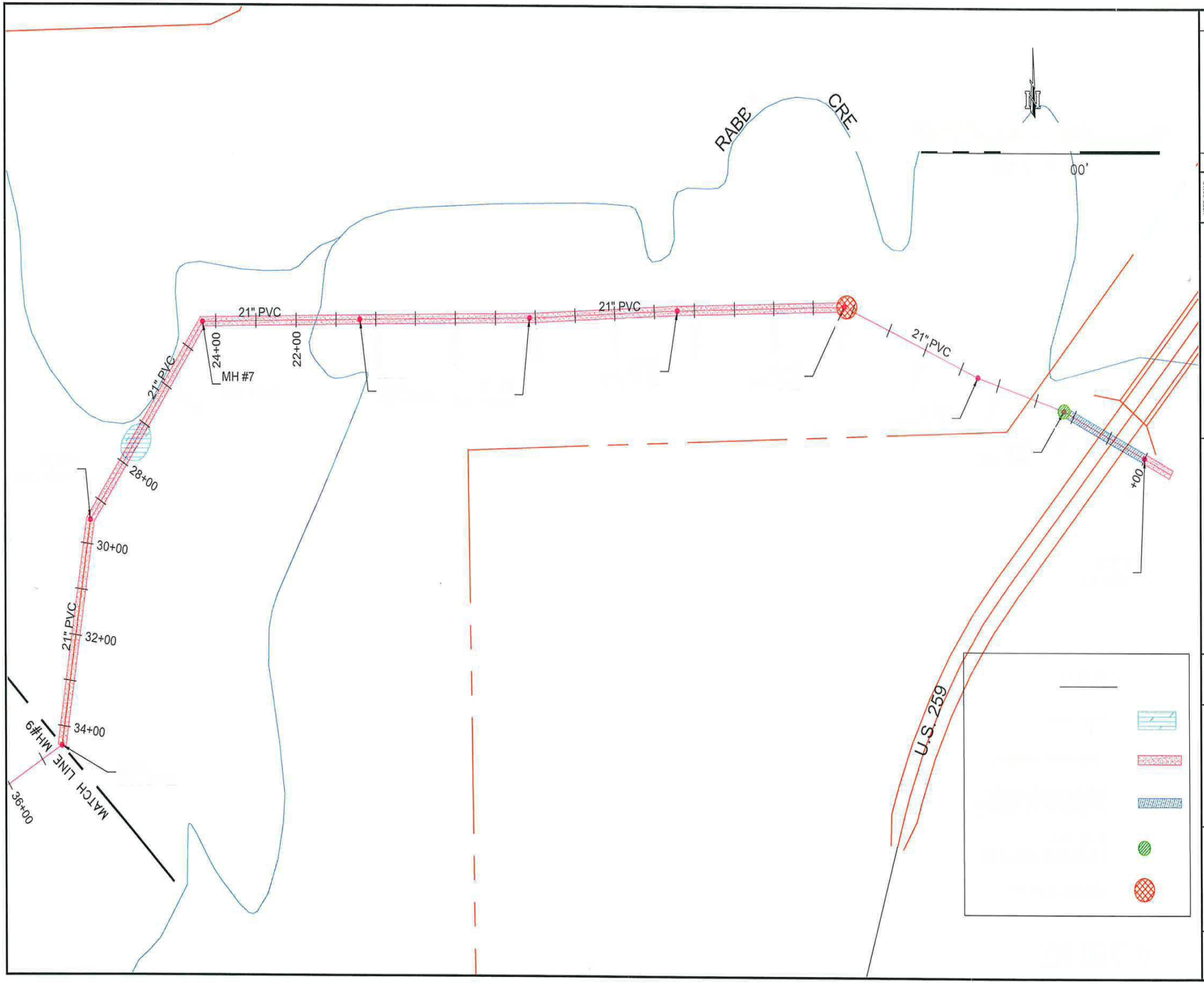
Measured Values

- X: Length of Sensor from Grade
- Y: Depth of Manhole from Grade to Bottom of Invert
- Default distance display is A. Distance from Sensor to Water Level.

Thank You

Questions?

Advanced METERING SOLUTIONS



VERT. SCALE -
HORIZ. SCALE 1:200
PLOT SCALE 1:1
DRAWING NAME PROP. REPAIRS
MARK
REVISION
DATE
SHEET NAME
PROJECT NAME

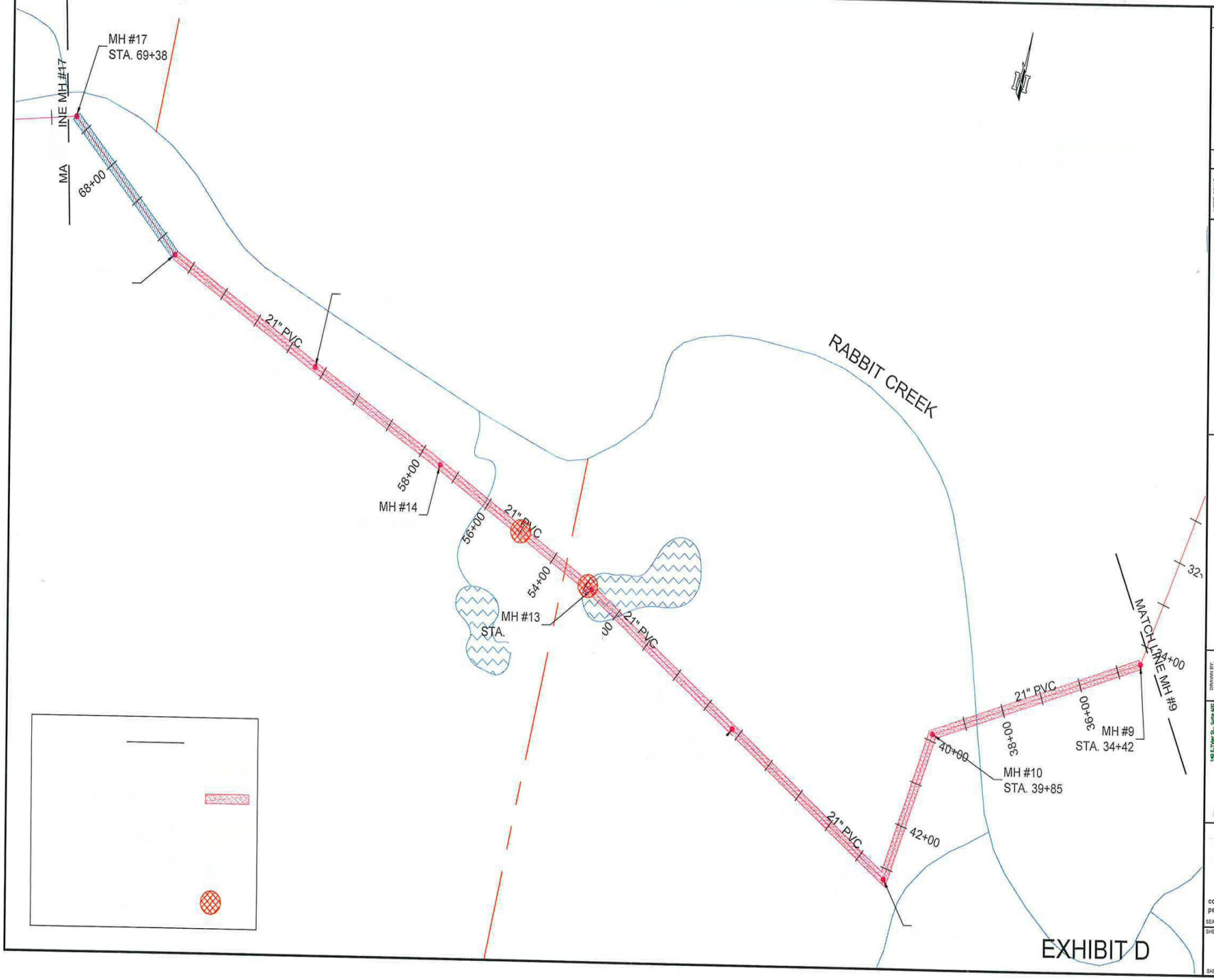
DRAWN BY: JAH
DESIGNED BY: MAB
LATEST REVISION: 2/9/2010
KSA JOB NO. K1-135

KSA ENGINEERS

not construction, bidding, or permit purposes.

SEAL:

SHEET NO. 1 | 6
SHEET OF

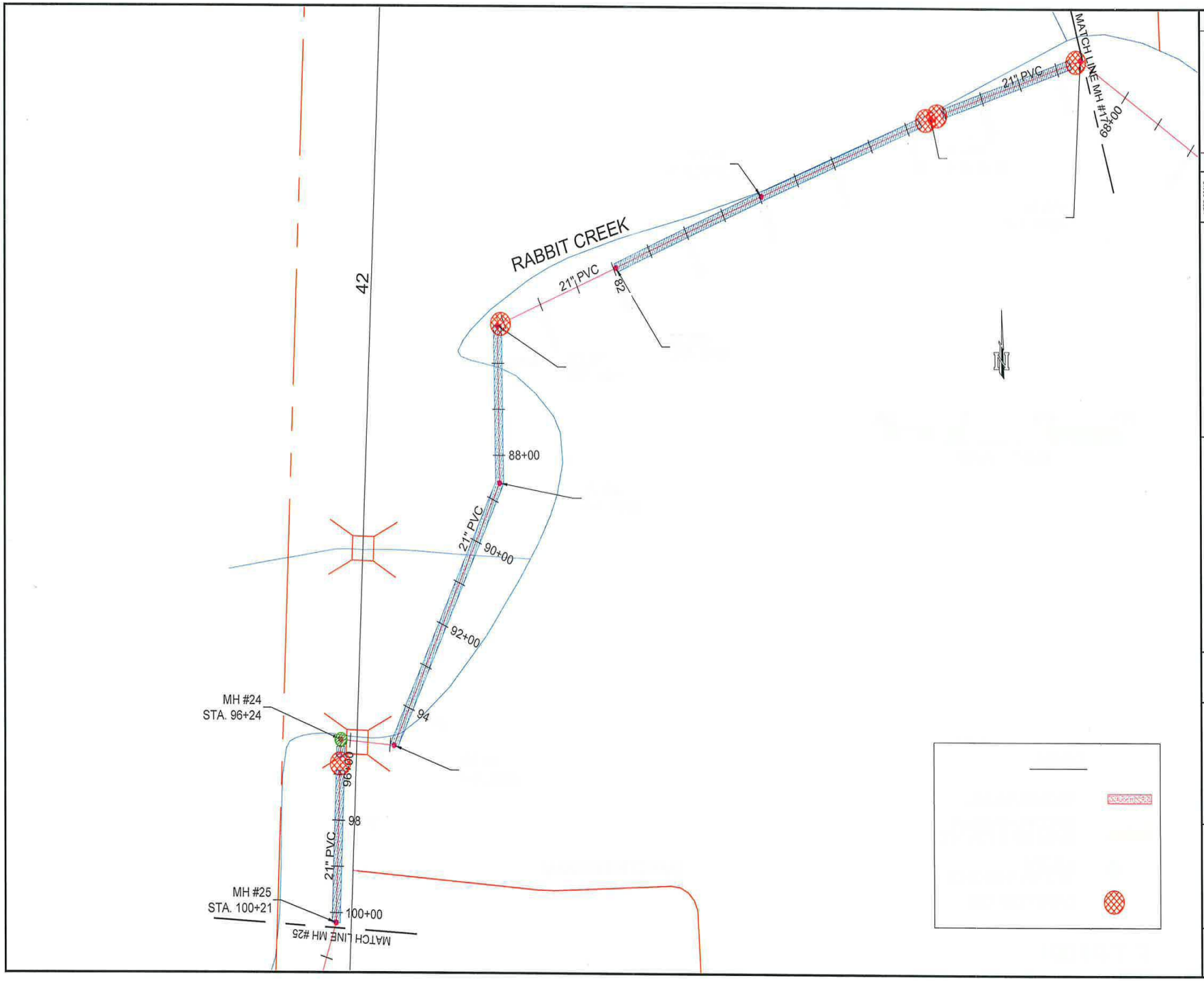


RECOMM
IMPROVE
MH 9 TO

not
construction, bidding, or
permit purposes.

SEAL:

SHEET NO.
2 | 6
SHEET OF



VERT. SCALE
HORIZ. SCALE 1:200
PLOT SCALE 1:1
DRAWING NAME ROP_REPAIRS.MXW

REVISION | DATE

SHEET NAME

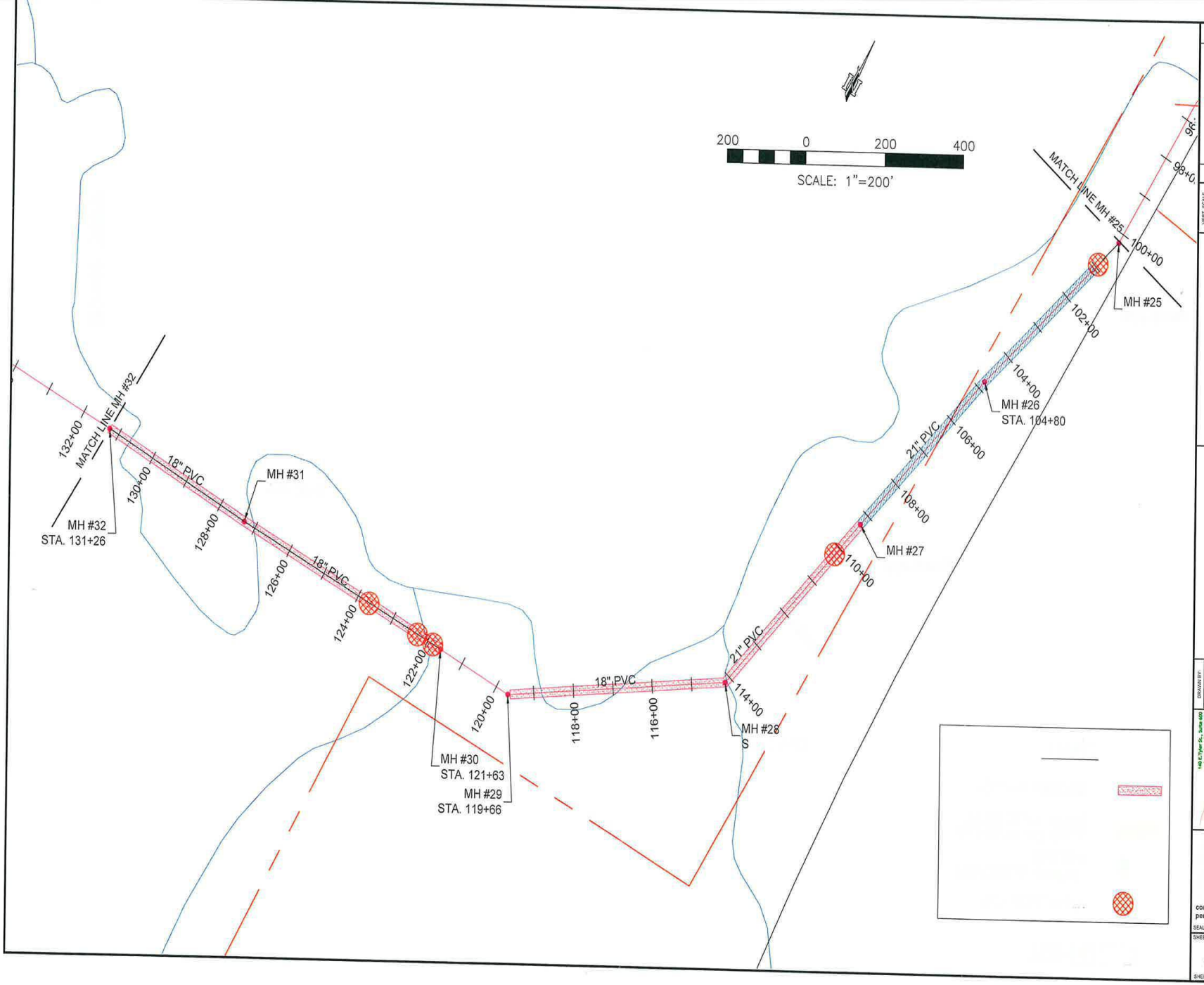
PROJECT NAME

DRAWN BY: JAM
DESIGNED BY: MAB
LATEST REVISION: 2/8/2010
KSA JOB NO.: KI-135

140 E Tyler St., Suite 405
Longview, Texas 75601
T: 903.234.3700
F: 903.234.3779
www.ksaeng.com
KSA ENGINEERS

not construction, bidding, or permit purposes.

SEAL



RECOMM
IMPROVE
MH 25 TO

VERT. SCALE	
HORIZ. SCALE	1:200
PLOT SCALE	1:1
DRAWING NAME	PROP_REPAIRS
MARK	
REVISION	
DATE	

DRAWN BY:	JAM
DESIGNED BY:	MAB
LATEST REVISION:	2/5/2010
KSA JOB NO.	KL-135

KSA ENGINEERS

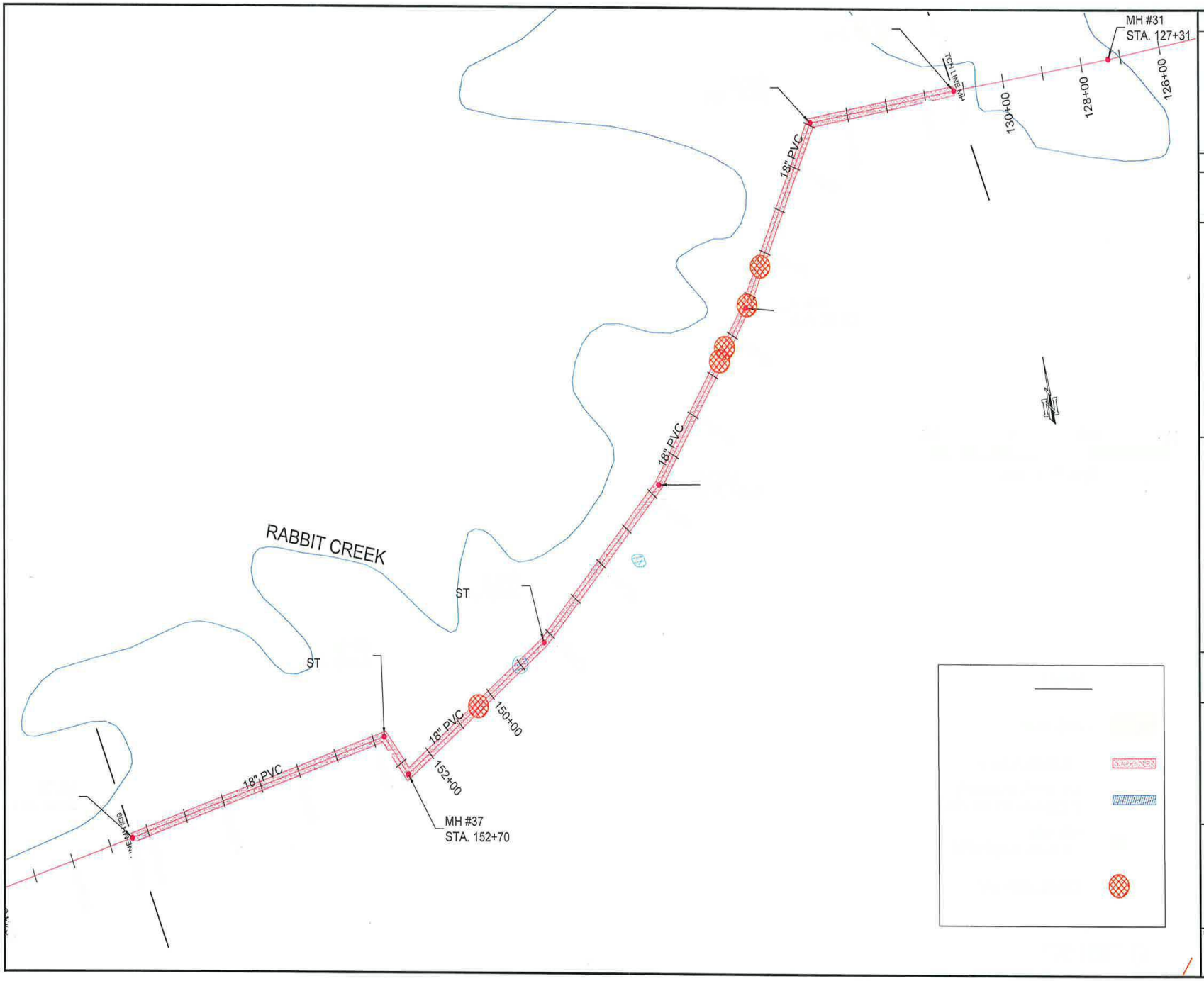
not construction, bidding, or permit purposes.

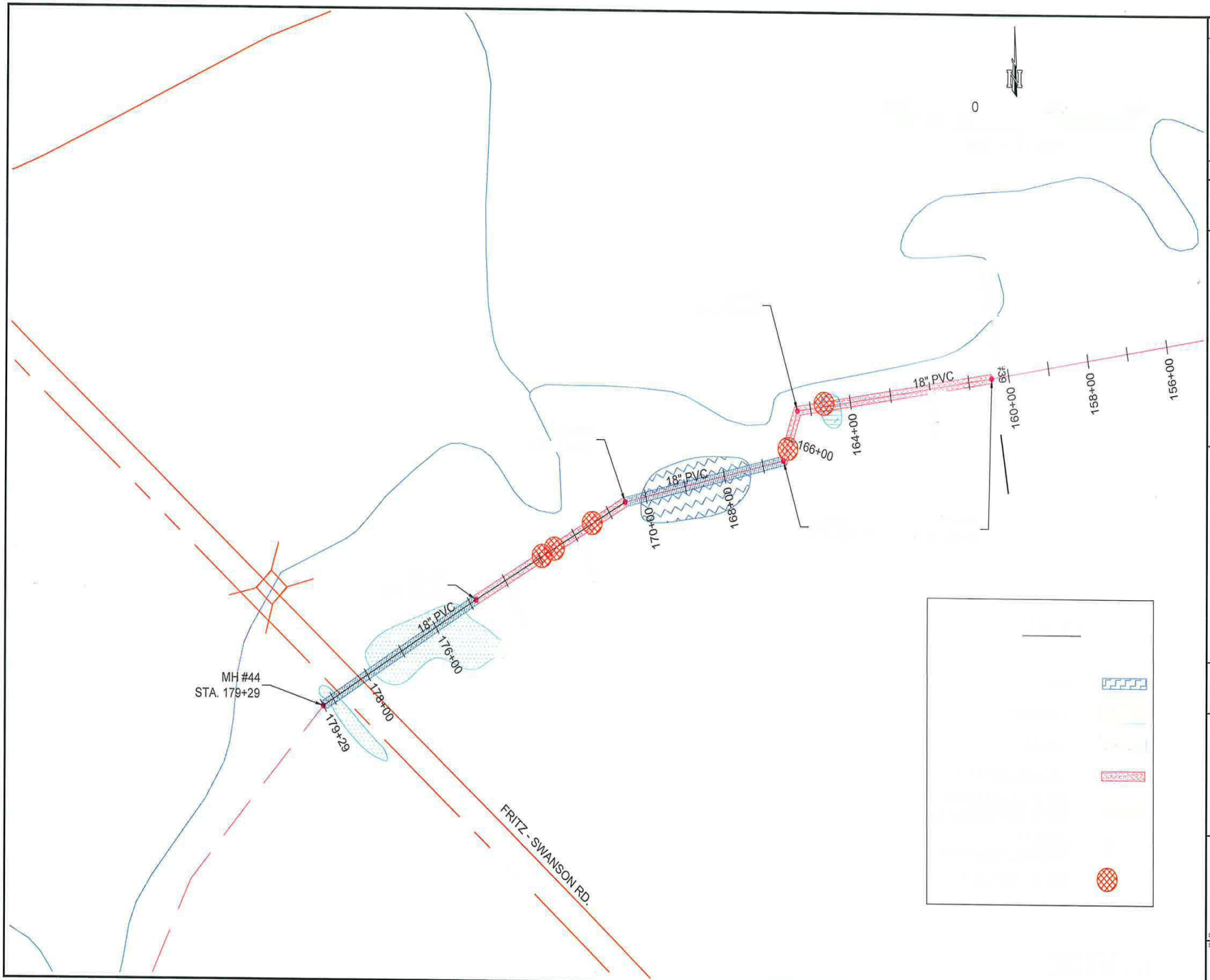
SEAL

SHEET NO.

4 | 6

SHEET OF


MH #31
STA. 127+31
126+00
128+00
130+00
TCH LINE AP
18" PVC
18" PVC
RABBIT CREEK
ST
ST
150+00
18" PVC
152+00
18" PVC
MH #37
STA. 152+70
SUBDIVISION
HORIZ. SCALE
1:200
DRAWN BY:
DESIGNED BY:
LATEST REVISION:
2/9/2010
KSA JOB NO:
SHEET NO.



RECOMMENDED IMPROVEMENTS
MH 39 TO MH 44

VERT. SCALE -
HORIZ. SCALE 1:200
PLOT SCALE 1:1
DRAWING NAME PROP. REPAIRS
MARK
REVISION
DATE

SHEET NAME

PROJECT NAME

DRAWN BY: JAM
DESIGNED BY: MAB
LATEST REVISION: 2/9/2010
KSA JOB NO.: KA-1305

KSA ENGINEERS
149 E. Tyler St., Suite 400
Longview, Texas 75601
T. 903-236-7700
F. 903-236-7707
www.ksaeng.com

not construction, bidding, or permit purposes.

SEAL

SHEET NO.
6 | 6
SHEET OF