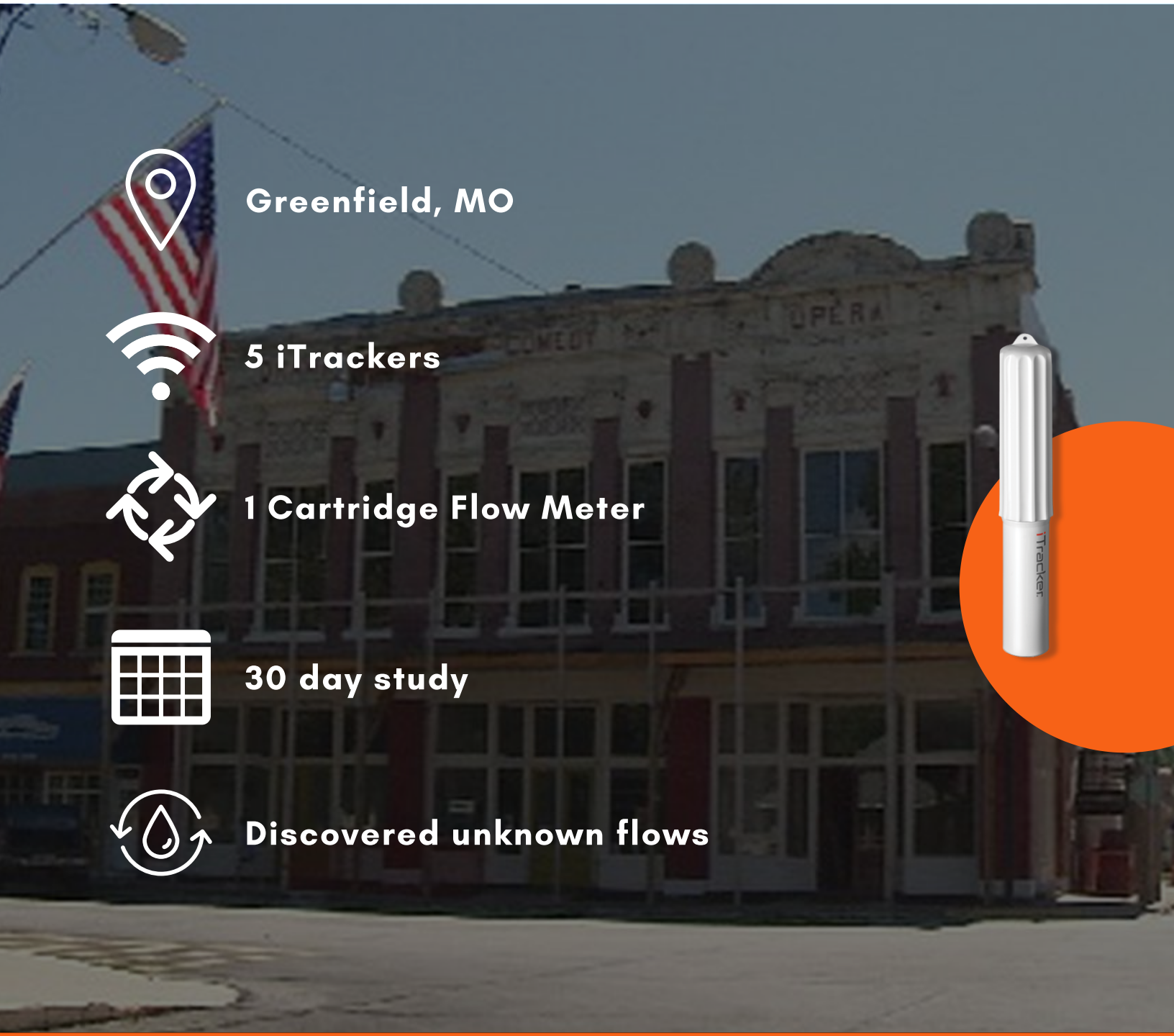
CASE STUDY

02/13



Greenfield, MO

5 iTrackers

1 Cartridge Flow Meter

30 day study

Discovered unknown flows

EASTECH Smart Wastewater

smartwastewater.com

CONTENTS

OBJECTIVE

Background

For a small community, Greenfield was plagued with what appeared to be major I&I problems. The sewer pipes were old, made of clay, and the area is rich with underground lakes.

A 10,000 linear foot sewer basin suspected of contributing major amounts of I&I had recently been replaced with new PVC piping. Still, the I&I problem remained. In fact, it seemed to be getting worse.

What We Did

Eastech offered to conduct a Sewer Evaluation Study throughout the Talburt Lagoon Basin using their iTracking® technology. (5) iTrackers were strategically placed within Talburt Lagoon manholes TN2100, TN2020, TN2050, TN2070, and TN2090.

Even though Greenfield was confident that the I&I problem at the basin adjoining Talburt Lagoon had been solved by installing new PVC piping, Eastech decided to confirm this belief by placing one of their high-performance Cartridge Flow Meters at the culmination of the remediated basin in manhole TN0080 (top right).

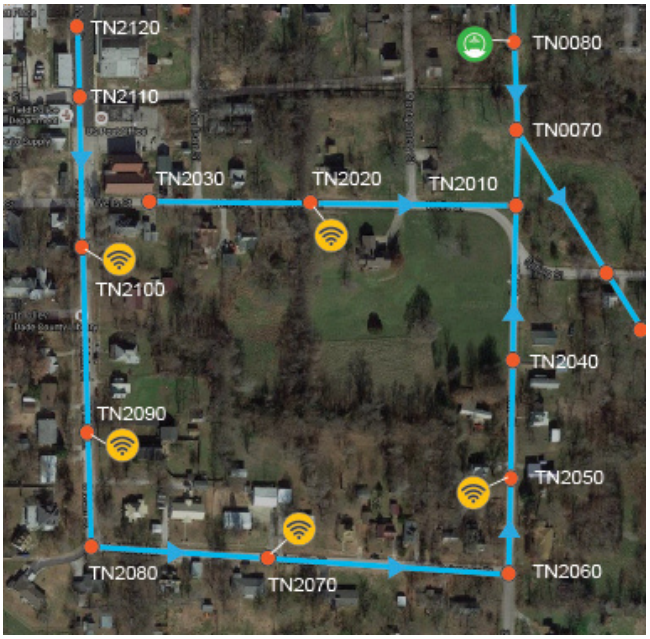


Figure 1: iTracker placement in Talburt Lagoon North Basin, Greenfield, MO

WHAT WE FOUND

The study lasted for 30 days and the results surprised Greenfield. During the study period, two rainfall events occurred, 0.74" and 1.48", providing infiltration markers for the period. During both rain events, sites TN2100 and TN2020 showed no signs of inflow or infiltration.

However, TN2050, TN2070, and TN2090 showed significant increases versus their dry day flows.

Normally, the dry day flows at the Talburt Basin are 6.95 GPM. During the Peak RDII period, flows increased to 57.36 GPM.

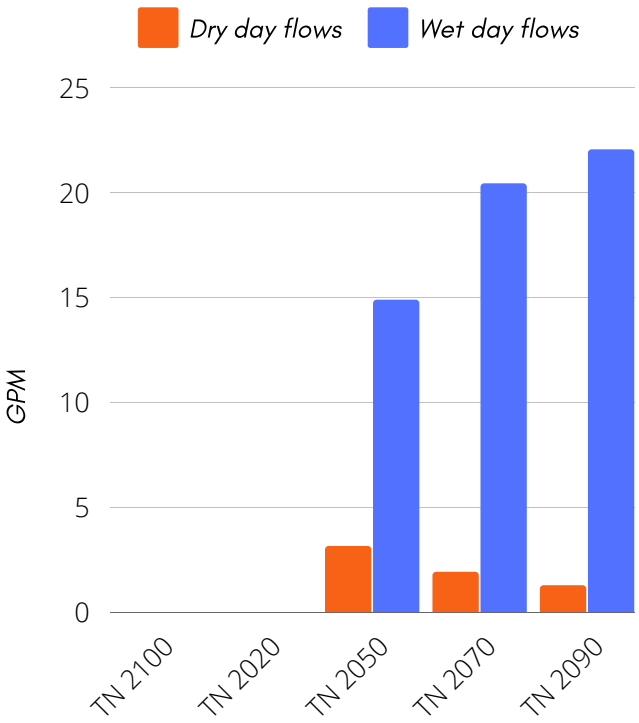


Figure 2: Dry and Wet day flows for TN2100, TN2020, TN2050, TN2070, and TN2090

TN 0080

The surprise came from the Eastech Cartridge Meter installed at the base of the newly renovated 10,000 linear foot basin culminating at manhole TN0080. This basin normally produced average dry day flows of 18 GPM. It was discovered that a consistent influx of groundwater infiltration of 55 to 60 GPM was present during dry day periods.

During one rain event, the peak flow rose dramatically to 180 GPM, a tenfold increase from the average dry day flow of 18 GPM.

During the largest rain event, the flow increased even more dramatically, reaching a peak of 383 GPM.

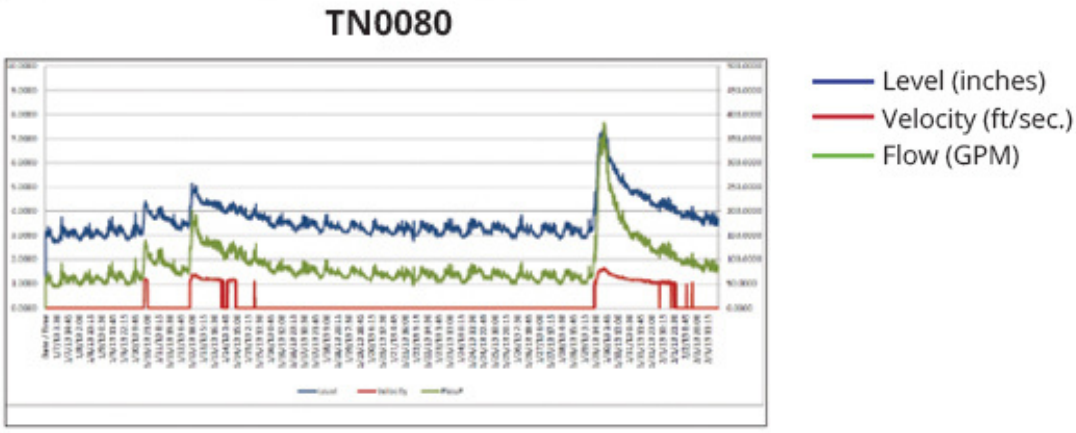


Figure 3: Flow chart of TN0080

RESULTS

The municipality immediately initiated camera surveillance equipment (CCTV) only to discover that every joint within the newly installed PVC collection system was leaking profusely allowing both ground and storm water to enter on a continual basis.

800%

increase in wet day flows within 3 out of 5 measured manholes

10X

During a rain event, the peak flow of TN0080 rose dramatically from 18 GPM to 180 GPM.

GLOSSARY

Base Flow - Wastewater directly discharged by the population upstream of the iTracker® I&I Micro Detection Monitor

GWI - Abbreviation for 'Groundwater infiltration.' Water entering the collection network from saturated soil.

I&I - Inflow and infiltration

Infiltration - Surface water that enters the wastewater collection system after seeping through the soil.

Inflow - Water running directly into the sewer through open manholes, downspouts, and other openings or gaps not covered by soil

Peak - Level/Flow Values based upon maximum one-hour averages.

Population - Refers to the number of residences contributing to the sewer shed upstream of the monitored site. iTracking® technology utilizes the population to estimate the average amount of flow expected on a typical dry day to establish dry day Base Flows.

RDII - Abbreviation for "Rain-Derived Inflow and Infiltration." RDII is rainwater that enters the collection system.

Peak Delta Q - Increase in wastewater volume from the typical dry day average volume to the peak volume during a rain event expressed as a multiplying factor relating to volume. (EXAMPLE: Normal Dry Day Average Volume designated as 1. If Peak Volume shows an increase of 5x over Normal Dry Day Volume, **PEAK DELTA Q** is 5.)