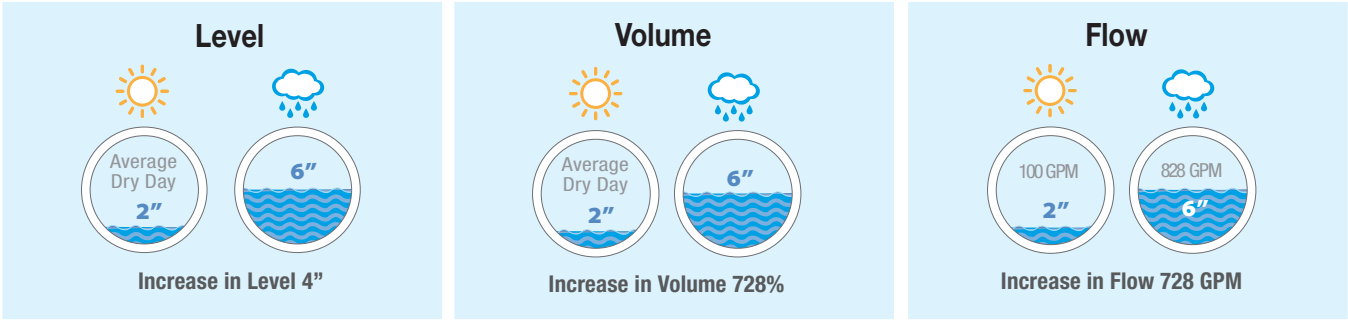
iTracking®
How the Magic Happens

EASTECH

The Magic is in the Math

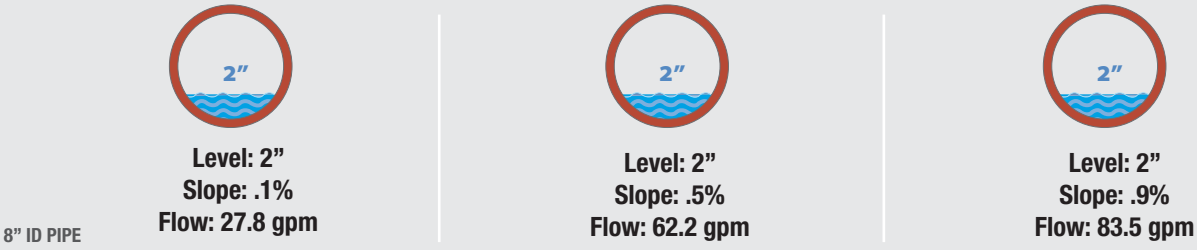
For level sensing technology to become a viable solution for pinpointing I&I, an advanced set of algorithms needed to be developed that took into consideration the effects of variables such as slope in order to establish a definitive relationship between wastewater levels, volume and flow.



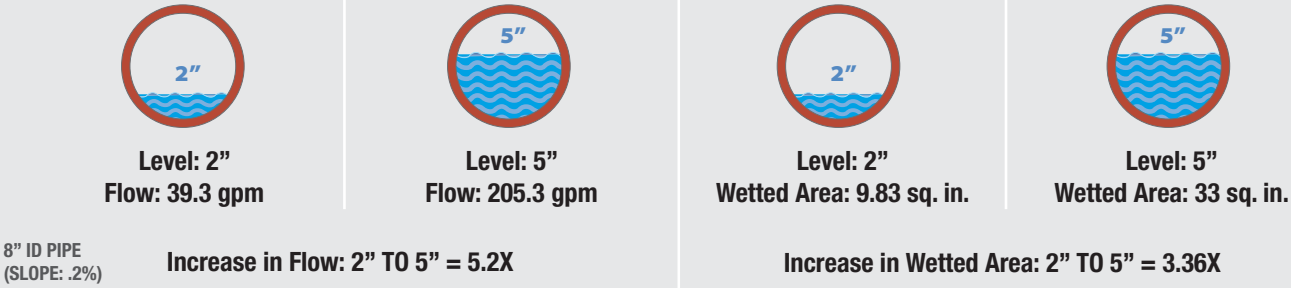
This is where iTracking® delivers huge benefits. By having the ability to simply convert level readings recorded by iTracker® sensors to actual changes in volume and then ultimately to flow in gallons per minute, a safe, quick and cost-effective solution is now available to every community, regardless of size, for pinpointing I&I down to a pair of adjacent manholes.

Prior to the development of iTracking®, attempts to pinpoint I&I with "conventional" level sensors were mostly unsuccessful due to the following reasons.

1. Sewer basins are comprised of hundreds of manhole segments each having a different slope.



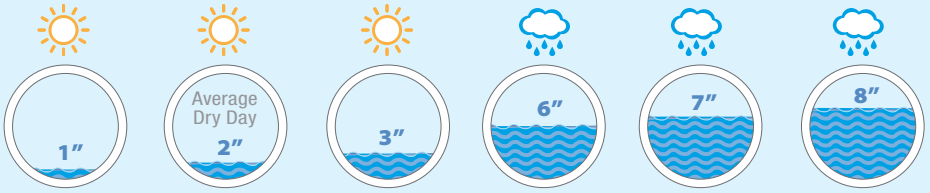
2. A direct relationship does not exist between wastewater flows and wetted pipe area at similar depths.



iTracking® Explained

1. LEVEL: iTracker® sensors continually measure and record wastewater levels during dry and wet weather in order to determine the **average dry day level** which for this example is 2".

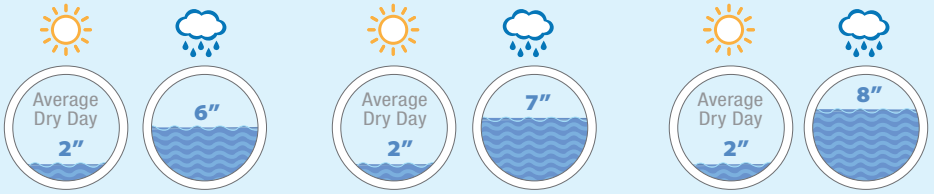
Level



iTracker® performance sensors measure and record wastewater levels during both dry and wet weather.

2. VOLUME: The average dry day level (2") takes into account both the discharge contributed by the population and groundwater ingress. Proprietary algorithms then calculate the **percentage change in volume** between the known average dry day level (2") and all other levels within the collection pipe.

Volume



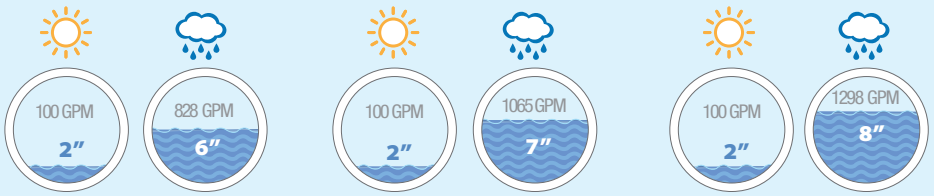
Smart algorithms calculate percentage changes in wastewater volume between the average dry day norm and wet weather events.

3. FLOW: The average dry day flow for the area being studied is **population modeled** by one of (2) methods:

- **a.** By counting the number of residences and allocating 182 gallons per day of wastewater discharge to each household.*
- **b.** By retrieving the actual water bills for the area.

In the following example, the **average dry day flow** using the population model has been calculated to be 100gpm/day. The iTracker sensor in Step 1 has already determined that the **average dry day level** is 2". Knowing that at 2" the flow is 100gpm, proprietary "volumetric change" algorithms described in Step 2 automatically determine the **flow in gpm at every other level** within the collection pipe.

Flow



iTracking® analytical software converts percentage changes in wastewater volume to flow in gallons per minute.

Above example represents 12" ID pipe.
*The EPA, USGS and AWWA have all confirmed that the average daily water usage per household is 182 gallons per day.

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