# ASTERRA

# ASTERRA Satellite Leak Detection Service
East China Region

April 2022

ASTERRA provided satellite SAR imaging of area in East China in December 2021 to identify likely leak locations using their Recover product from the potable water system. A total of 308 points of interest (POI) were identified. Pursuant to the boots-on-the-ground (BOTG) field inspection of these POIs a total of 140 leaks were pinpointed.

One way to categorize leaks is by pipe size. 80% of the leaks found were on small pipe (≤100mm), 15% on medium size pipe (between 100mm and 500mm) and 5% on large pipe (<500mm). Six leaks were found on 600mm pipe and one leak on an 800mm pipe. See Figure 1 for leak pipe size distribution.

Figure 1
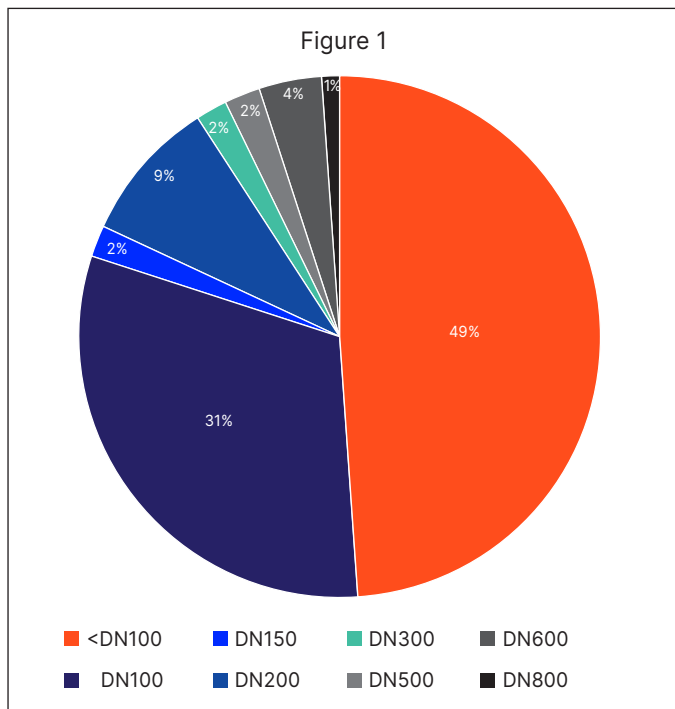
Out of the 140 leaks found, 110, or 78%, were unreported or non-surfacing leaks. This is also very consistent with the Recover average of 60% non-surfacing leaks. These are leaks that would otherwise have not been located and thus contribute greatly to real water loss in a system. In this project, 25% of the leaks were found in valves, connections, meters and pipe joints while 75% of the leaks were found in hydrants, service lines and mains. This is also very consistent with the Recover leak location averages from the worldwide database. Of the 140 leaks pinpointed, 84, or 60% were found on iron pipe, 46, or 33%, on steel or concrete pipe, and 10, or 7%, were found on PVC, plastic or copper pipe. See Figure 2 for detailed breakdown.

Figure 2
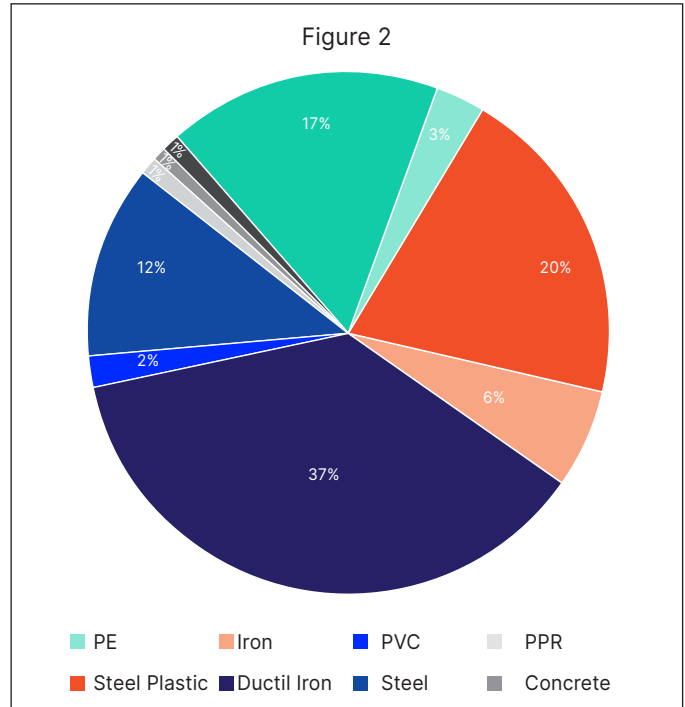
It is not uncommon for more leaks to be acoustically pinpointed on metal pipe than on plastic pipe. Sounds travel less far and has a lower intensity in plastic pipe then in metal pipe, thus it is harder for BOTG staff to correlate leak locations.

To evaluate the performance efficacy of the Recover satellite pre-location technology, the results must be compared to historical leak detection efforts by the customer. Pursuant to the traditional method of leak detection employed by the utility, and point-to-point system investigation, 0.11 leaks were found per person per crew day. This metric was used because various size leak detection crews have been deployed historically and following the Recover POI analysis. By normalizing the results to a crew person all the data can be compared. Using Recover 1.05 leaks per person per crew day were found. This is a 10 times improvement in performance. The results obtained can also be expressed as leaks found per Km inspected. The traditional method yielded 0.0065 leaks per Km, while the Recover assisted protocol yielded 0.06 leaks per Km. This is a 10 times performance improvement.

The performance metrics show that using the ASTERRA Recover pre-location technology increases the leaks found per day and per mile, which increases the value proposition over the traditional method.