

CASE STUDY

Sewer Sentry Manhole Device: A Case Study in Richwood, LA

The following case study examines the installation of Smart Cover devices on manholes in Richwood, Louisiana, to measure rainwater inflow and recovery times during storms.

www.sewersentry.com

Reduce sewer inflow Impact

See the real-world impact of Sewer Sentry's solutions. Explore our case studies to discover the measurable results and success stories behind our innovative sewer protection systems!



Manhole Device For Cities

The Sewer Sentry device is an innovative and patented inflow reduction technology designed to significantly decrease the infiltration of rainwater into sanitary sewer systems, thereby reducing sewage overflows. It achieves this by replacing traditional manhole rings and covers with specialized units that greatly limit the entry of stormwater.

Installation is straightforward and efficient. A hole is drilled into the existing manhole cover, and the Sewer Sentry is installed using a rubber gasket to ensure a tight seal and minimize any potential leakage.

The product



Main Benefits:

- **Rainwater Inflow Reduction:** A standard sanitary manhole will leak up to 45 gallons per minute of water during a rain event, which is any event that produces 0.5 inches or more precipitation within a 48 hour or greater period. This excess rainwater must also be treated at the treatment center. Sewer Sentry's inflow reduction technology reduces this inflow by up to 98%.
- **Reduce Sewage Treatment Costs:** Cities spend from \$6 per thousand gallons (El Paso) to \$22 per thousand gallons (Seattle) to treat sewage at treatment facilities. Reduced inflow directly reduces the cost of sewage treatment by at least 30%.
- **Reduced Impact From Snowmelt:** Reduced impact from surface runoff produced by melting snow in colder regions.

26+ US Cities

With Sewer Sentry Manhole Installed

Property **flooding** has been reduced to **zero** incidents **per year**, and **odor complaints** have dropped to **zero per month**.

"The majority of SSO events are caused by sewer blockages that can occur at any time. The majority of SSO volume appears to be related to events caused by wet weather and excessive inflow and infiltration"

U.S. Environmental Protection Agency. (2004). Report to Congress on the Impacts and Control of CSOs and SSOs.

Sewer Sentry Manhole Device: A Case Study in Richwood, LA

From April 29, 2024 through July 22, 2024, Smart Cover devices were installed on different manholes in Richwood, Louisiana to measure the amount of rainwater inflow into a manhole during a rain event and the amount of time it took for the associated levels to return to normal. On each manhole measured, the data was collected before and after the Sewer Sentry was installed.

Note: These measurements are based on replacing 106 ring and covers with CAP Sewer Sentry.

| Before/After Installation | Rain Event (2024) | Rain (in.) | Inflow into Manhole (in.) | Return to Normal (hrs) | % Inflow Reduction | % Expense Reduction |
|---------------------------|-------------------|------------|---------------------------|------------------------|--------------------|---------------------|
| Before | April 29th | 2.2 in. | 108 in. | 26 hrs | 52% | 38% |
| After | July 5th | 2.33 in. | 52 in. | 16 hrs | | |
| Before | May 3rd | 0.62 in. | 60 in. | 13 hrs | 70% | 69% |
| After | July 7th | 0.52 in. | 18 in. | 4 hrs | | |
| Before | May 3rd | 0.62 in. | 60 in. | 13 hrs | 47% | 38% |
| After | July 19th | 0.85 in. | 32 in. | 8 hrs | | |
| Before | May 3rd | 0.62 in. | 60 in. | 13 hrs | 100% | 100% |
| After | July 22nd | 0.40 in. | — | — | | |

* A "rain event" is any event that produces 0.5 inches or more precipitation within a 48 hour or greater period.

** OPEX represents operating expenses and can include energy to power treatment plants, cost of treatment itself, and other relevant expenses.

Measured Reduction

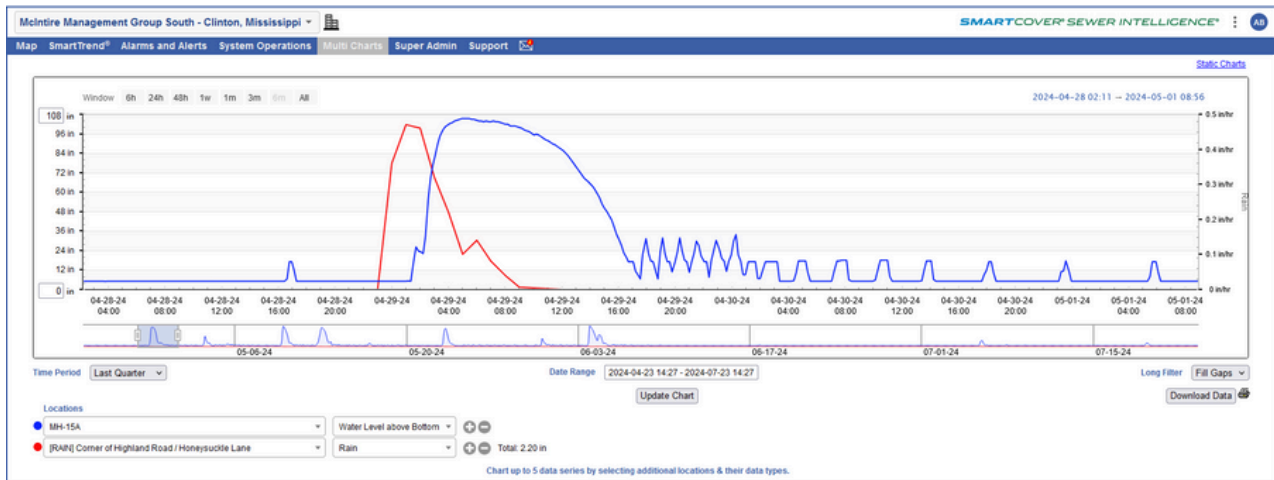
Of the 3 manholes with measurable differences across the rain events, they measured at least a 47% reduction of inflow into the manhole and at least a 38% reduction in OPEX expenses for power and treatment.

The Sewer Sentry device delivers significant improvements in managing rainwater inflow. It reduces manhole water levels by up to 70% and shortens recovery times by 60%, minimizing the risk of system overflows and infrastructure damage. Additionally, the device cuts operational costs by 38% through reduced energy consumption and treatment expenses.

By preventing excess water and gas buildup, it enhances long-term infrastructure protection. These results, effective across both heavy and light rain events, provide a solid foundation for the deeper analysis that follows, highlighting the transformative impact of Sewer Sentry on system performance and cost efficiency.

Individual Tests **Before** Sewer Sentry Installed

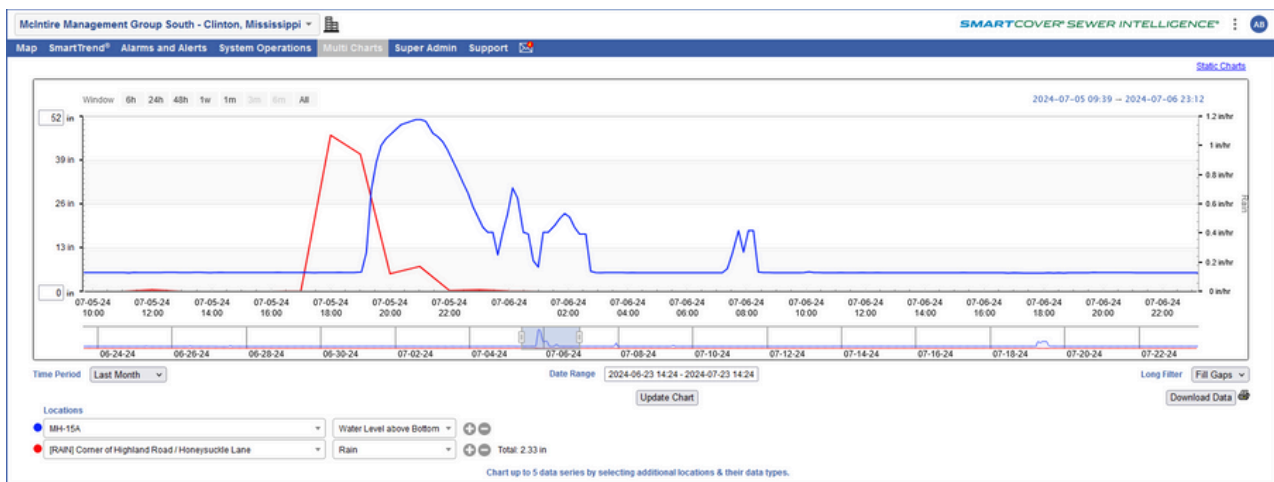
Rain event on **April 29, 2024** — 2.2 Inches of Rain / 108 inches in Manhole / 26 Hours to Return to Normal.



* Blue line is the water level in the manhole; red line is the rain event data.

Individual Tests **After** Sewer Sentry Installed

Rain event on **July 5, 2024** — 2.33 Inches of Rain / 52 Inches in Manhole / 16 Hours to Return to Normal.



Key Insights:

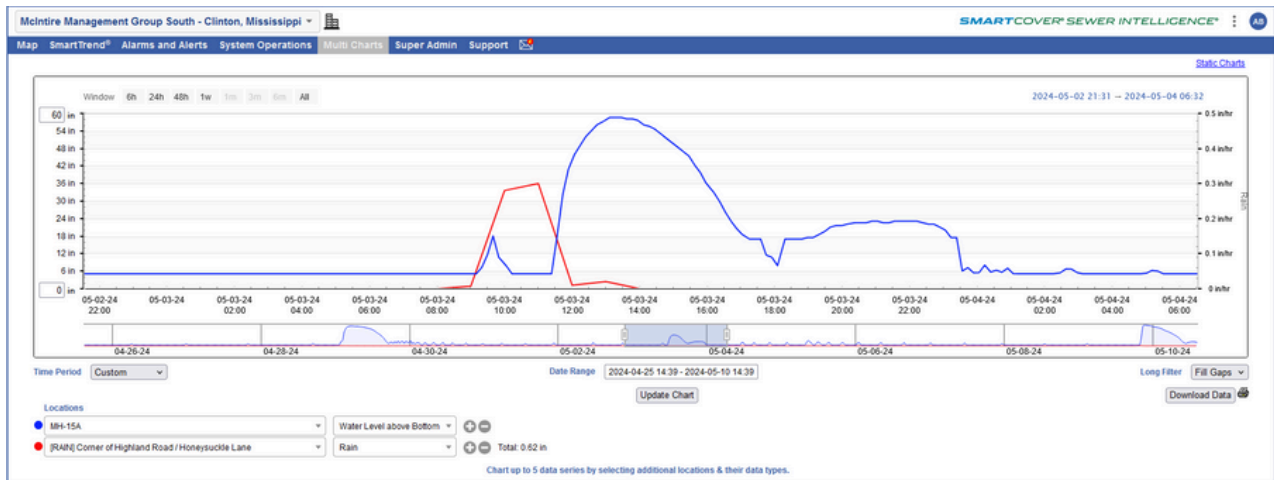
This rain event caused severe inflow, with water levels rising to 108 inches. The system took 26 hours to return to normal, indicating a major strain on the infrastructure. During this period, the sewer system was vulnerable to overflows and required significant energy and resources to pump and treat the excess water. Such prolonged recovery times also increase the risk of SSOs (Sanitary Sewer Overflows), which can lead to health hazards and environmental damage.

After the Sewer Sentry installation, water levels during a comparable rain event dropped by over 50%, down to 52 inches, and recovery time was reduced by 40%. This indicates a significant reduction in rainwater inflow, leading to less strain on the sewer system and faster recovery times. By cutting the water levels in half, the system can operate more efficiently and avoid the risk of overflows, even during intense rain events.

The Sewer Sentry device reduces the volume of rainwater entering the sewer system by over half, protecting the infrastructure from overloading and significantly reducing recovery times, which can save municipalities from expensive overflows and damage to properties.

Individual Tests **Before** Sewer Sentry Installed

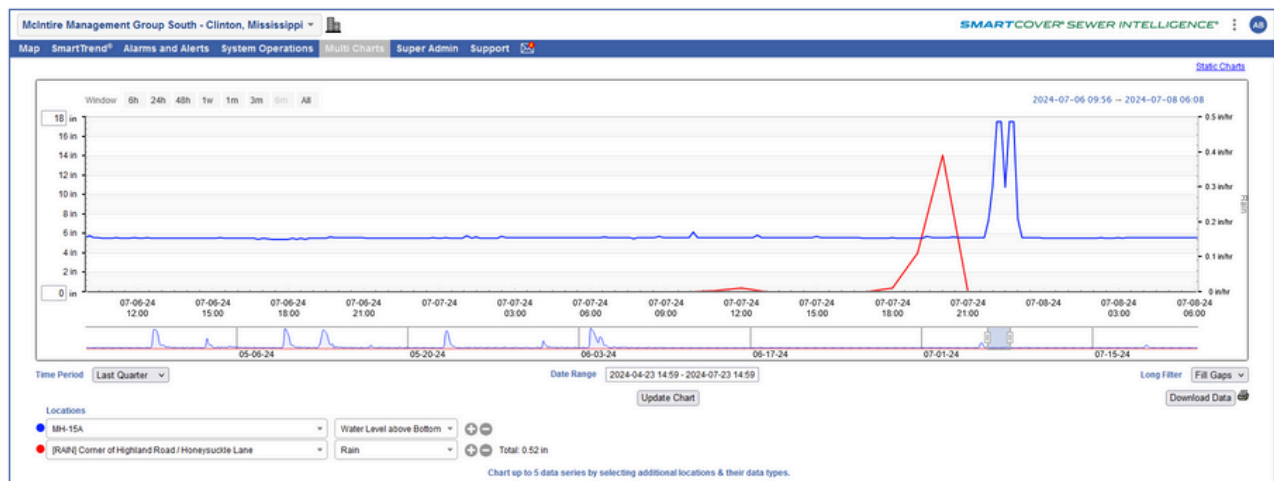
Rain event on **May 3, 2024** — 0.62 Inches of Rain / 60 Inches in Manhole / 13 Hours to Return to Normal.



* Blue line is the water level in the manhole; red line is the rain event data.

Individual Tests **After** Sewer Sentry Installed

Rain event on **July 7, 2024** — 0.52 Inches of Rain / 18 Inches in Manhole / 4 Hours to Return to Normal.



Key Insights:

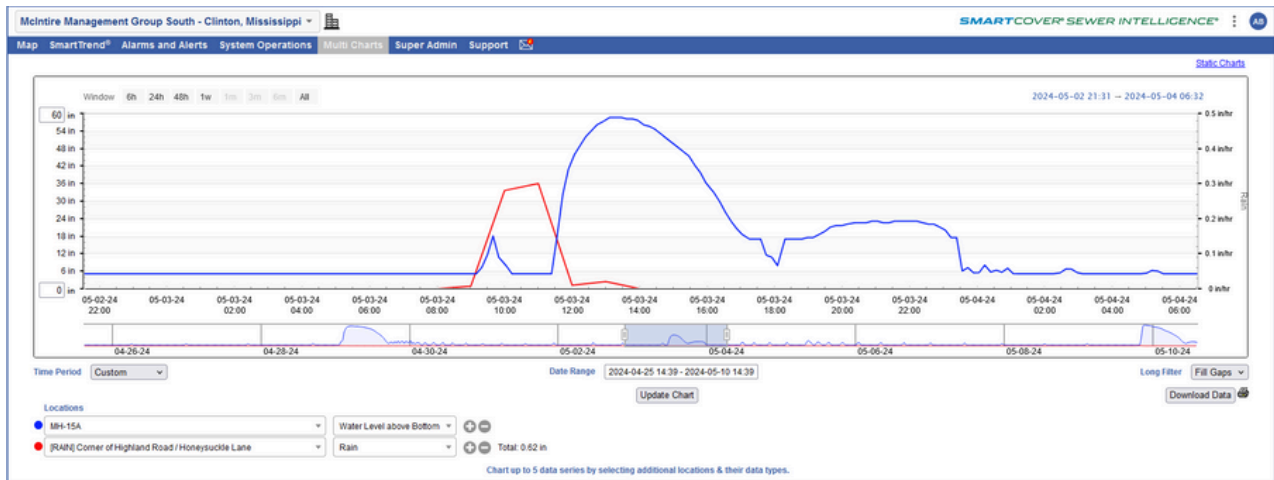
Even with just 0.62 inches of rain, the manhole filled up to 60 inches, and the system required 13 hours to return to normal. This shows that even small rain events cause significant inflow into the sewer system. While recovery time is shorter compared to larger rain events, the system still struggles to cope with the rainwater, which adds unnecessary operational load and costs.

Post-installation, the water level decreased by 70%, with only 18 inches of water entering the manhole. The recovery time improved dramatically to just 4 hours. This demonstrates how Sewer Sentry is effective even in smaller rain events, reducing the inflow and speeding up the recovery time. It ensures the sewer system remains operational with minimal impact, even during moderate rainfall, drastically lowering the risk of system failures.

The device cuts the water level by 70%, drastically reducing the load on the sewer system during even minor rain events, which translates to lower operational costs and reduced risk of overflows.

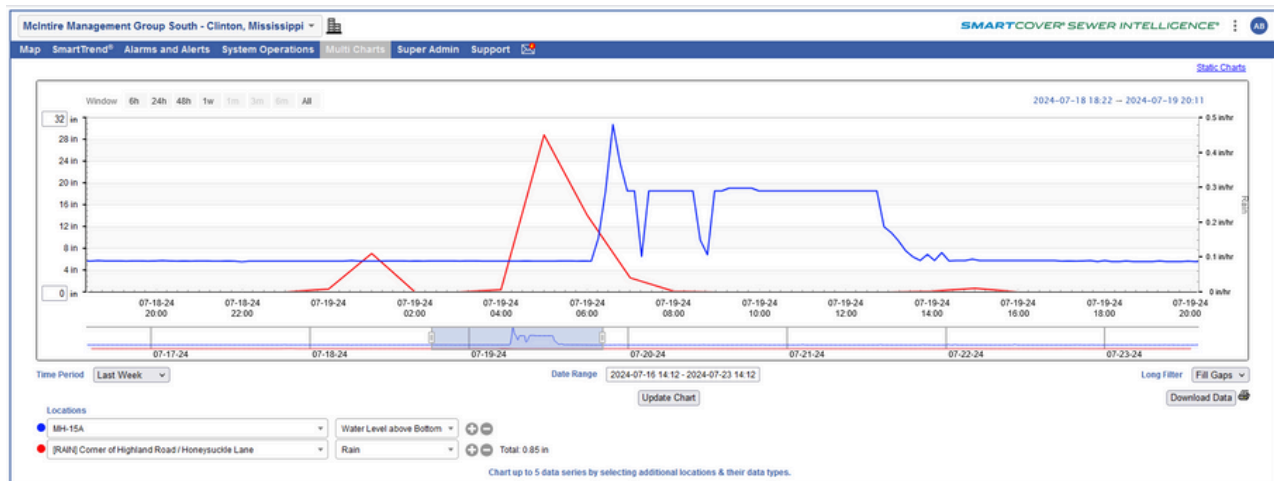
Individual Tests **Before** Sewer Sentry Installed

Rain event on **May 3, 2024** — 0.62 Inches of Rain / 60 Inches in Manhole / 13 Hours to Return to Normal.



Individual Tests **After** Sewer Sentry Installed

Rain event on **July 19, 2024** — 0.85 Inches of Rain / 32 Inches in Manhole / 8 Hours to Return to Normal.



Key Insights:

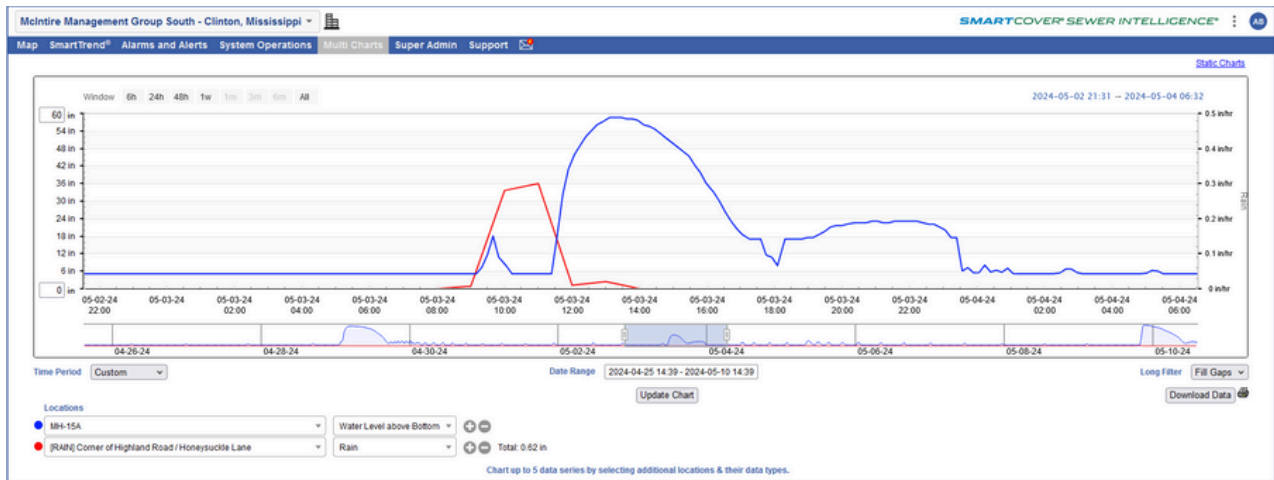
As previously analyzed, the system without Sewer Sentry allows significant water inflow even during relatively mild rainfall, leading to prolonged recovery periods and additional costs for pumping and treatment.

With more rainfall (0.85 inches), the system post-installation only saw the water level rise to 32 inches—nearly half the previous level despite the increased rainfall. The recovery time was shortened to 8 hours, highlighting the system's improved efficiency in handling rainwater. This demonstrates that even in more severe rain events, the Sewer Sentry effectively limits water inflow and reduces recovery times, offering significant protection against overflows and lowering the operational stress on the system.

The Sewer Sentry continues to perform exceptionally well even in heavier rain events, cutting water levels in half and improving recovery time by 40%, ensuring better control over rainwater inflow and reducing the risk of costly system overloads.

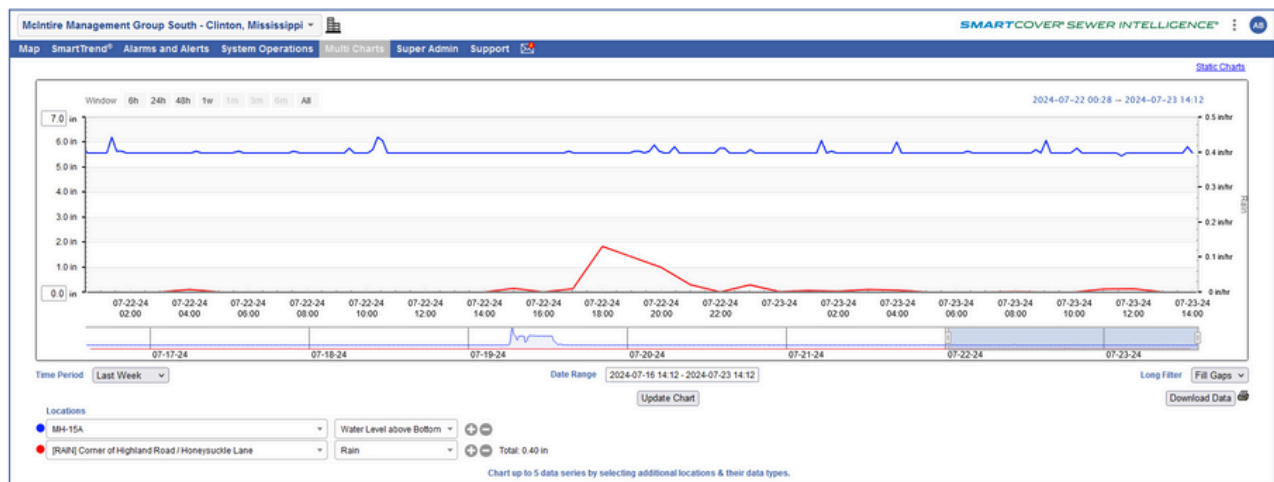
Individual Tests **Before** Sewer Sentry Installed

Rain event on **May 3, 2024** — 0.62 Inches of Rain / 60 Inches in Manhole / 13 Hours to Return to Normal.



Individual Tests **After** Sewer Sentry Installed

Rain event on **July 22, 2024** — 0.40 Inches of Rain / No Noticeable Level Change.



Key Insights:

Prior to installation, even small rain events led to significant inflow, with water levels rising to 60 inches, indicating a system under strain even during light rainfall.

In this event with light rainfall, there was no noticeable rise in water levels in the manhole after installation of Sewer Sentry. This indicates that the device completely prevented rainwater inflow, ensuring the system remained unaffected by the rain. The absence of any required recovery time demonstrates that the Sewer Sentry can fully protect the sewer system from inflow during lighter rain events, preventing unnecessary operational load.

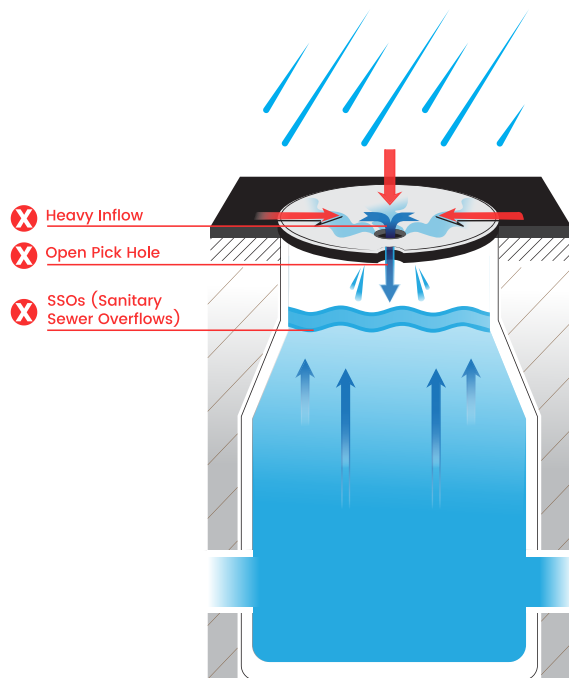
The Sewer Sentry offers 100% protection during light rainfall, preventing any rainwater from entering the sewer system and eliminating the need for recovery. This ensures no added operational costs or risks to the system during minor rain events.

The Sanitary Sewer Overflow Solution: How it Works?

The Sewer Sentry device stops storm water from going through hole in the manhole cover simply by creating a new point of entry a "raised hole" that is 5/8" higher than the surface of the manhole. At the same time, it reduces sewer gas problems, by allowing enough oxygen to reach the sewer.

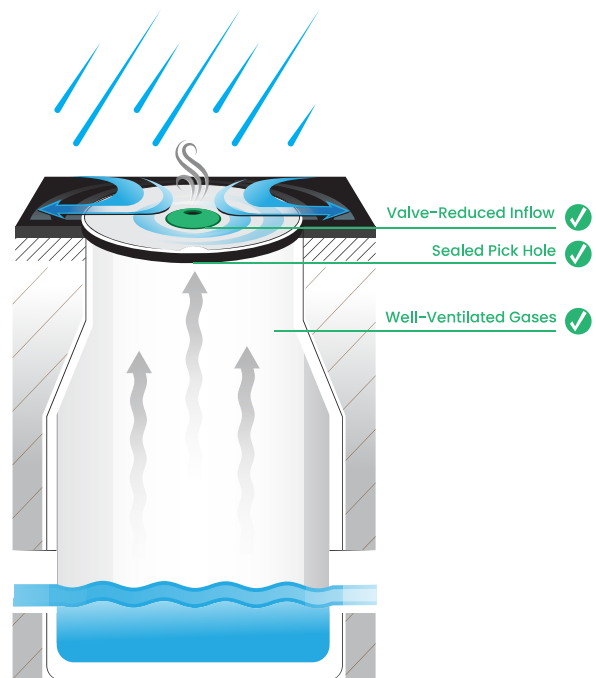
Standard Manhole

With a standard manhole, heavy rain inflow leads to more water in the storm drain and sewer that needs to be processed thus overwhelming the pumps.



Sewer Sentry Manhole

With the Sewer Sentry manhole, the rain water is correctly diverted to the storm drain, allowing the system to breathe properly and not overwhelming the pumps.



Typically, these are directly exposed to rainwater, allowing water to freely enter the sewer system. This can result in heavy inflow that the sewer system is not designed to handle, thereby increasing the risk of overflows and flooding. The basic structure of traditional manholes lacks mechanisms to regulate water entry or vent sewer gases effectively, which can exacerbate maintenance issues and environmental hazards.

The Sewer Sentry system enhances stormwater management through several innovative features: a "raised hole" that is 5/8" above the manhole surface to strategically reduce water entry and minimize overflow risks; a valve mechanism that controls inflow during severe weather, directing excess water to storm drains and preventing system overload; sealed pick holes that replace traditional open ones to curb unnecessary water ingress, thereby boosting efficiency; a design that ensures effective ventilation of sewer gases to maintain a healthy sewer environment and avert gas buildup; and notable durability and compliance, as evidenced by DOTD approval and rigorous testing that confirms its resilience to compression and structural integrity without any signs of cracking or deformation, making it well-suited for modern urban challenges.

Specifications of the Sewer Sentry Manhole Device: Durable & Versatile Design

All Sewer Sentry manhole cover gaskets are fitted with a 1" wide, 1/8" rubber seal that helps create minimal leakage between the sewer hole cover and bearing surface. The Sewer Sentry sewer solution system is installed through a hole that is drilled in the manhole cover using a rubber gasket to minimize leakage. It protrudes approximately 5/8" above the surface of the manhole cover, allowing some sheet flow over the cover but not high enough to damage bicycles, vehicles, etc.

The Sewer Sentry Manhole Vent Device was independently tested for compression strength with a minimum 6000 lbs. with no cracking or deformation. Sewer Sentry is offered in stainless steel, and DuPont™ Zytel® ST801-NC010A, a nylon 66 resin that is highly impact-resistant, chemical, UV, and heat/cold resistant.

The sewer sentry is installed with a rubber gasket constructed of commercial-grade EPDM (Ethylene Propylene Diene Monomer) blended rubber in 60 durometer (a measure of hardness).

EPDM provides superior properties for outdoor and high-temperature applications, with a minimum of 1000 PSI tensile strength, accommodating temperatures from -20 to 230 degrees F, provides resistance to ozone and many oxidizing chemicals and acids, and is highly resistant to sunlight

Available in both cast iron and composite manhole covers, the Sewer Sentry is designed to fit manhole lids in sizes of 24 inches, 26 inches, and 32 inches, with height options of 4 inches and 7 inches; the riser is available in Nylon 66 and stainless steel, providing durable and versatile solutions for various installation needs.



Standards-Approved Inflow Reduction: The High-Quality Sewer Sentry Manhole Device

- **Prevent Rainwater From Going Into The Manholes:** The Sewer Sentry System is an innovative, patented inflow reduction technology solution that dramatically reduces inflow during rainstorms and lowers a sewer system exposure to corrosive gasses.
- **Allows Harmful Sewer Gases to Vent:** The Sewer Sentry Riser is 5/8" high, so water goes around the vent hole. If the water rises higher, a ball check valve prevents the rainwater from entering the manhole. This eliminates extra electricity and water treatment costs at the pump stations, prevents storm water backups into homes and businesses, and allows harmful odors to escape.
- **DOTD Approved:** The Sewer Sentry Manhole Device is Department of Transportation and Development Approved, ensuring reliability and safety for municipal systems. It has been compression tested to ASTM D4280-12 standards, successfully withstanding 6000 lbs of pressure in three directions without cracking or deformation, demonstrating its durability for public infrastructure use.

Two-minute explanation of rainwater inflow using red dye:



One-minute demonstration of the Sewer Sentry in action:





Sewer Sentry is a company that specializes in developing innovative sewer protection solutions to safeguard properties from the risks of sewage backups and flooding. Dedicated to promoting community well-being and addressing climate change, they utilize advanced technology to reduce combined sewer and sanitary sewer overflows (CSOs and SSOs). Their mission is to equip homeowners, businesses, and municipalities with the tools needed to build and maintain safe, healthy communities that foster long-term growth and sustainability.

Guided by core values of integrity, quality, and responsibility, Sewer Sentry ensures that every product meets the highest standards of quality and durability while acting as responsible stewards of resources and the environment. Their focus on excellence drives them to deliver efficient and reliable innovations that protect properties and enhance community well-being. By prioritizing customer satisfaction and continually improving their processes, they contribute to long-term safety, sustainability, and peace of mind for all their clients.

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