Clay Township Regional Waste District

Policy Document to Reduce Inflow and Infiltration (I/I) from the Sanitary Sewage Collection and Treatment Systems

In Accordance with Ordinance 12-08-08

Adopted January 12, 2009

Revised February 2014

Clay Township Regional Waste District

www.ctrwd.org • (317) 844-9200 • Fax (317) 844-9203

February 2014

CTRWD Customers,

The Clay Township Regional Waste District is dedicated to providing the best sanitary services to its customers. The implementation of this Inflow/Infiltration (I/I) reduction program provides for inspection of and certification of compliance for all properties connected to the District's sewer system. The program is a step towards a more efficient sewer system by reducing the amount of clear water that enters our system. This ultimately means less flow to treat at the wastewater treatment plants and therefore lower operating and treatment costs.

The program requires at the time of the sale of a property that the property owner notify the District and schedule an inspection. The inspection will verify that:

- **Downspouts are not connected to the sanitary sewer**
- **The sump pump is not connected to the sanitary sewer**
- **Cleanout caps are in place and watertight**
- **No yard drains are connected to the sanitary sewer**
- **There are no sinkholes or other indications that the sewer lateral is leaking**

If no deficiencies are found, the District will issue a certificate of compliance. If deficiencies are found, the property owner will be notified and must make corrections immediately. The property owner will need to schedule a follow up inspection. If a certificate of compliance is not issued within thirty days of the change in ownership, or thirty days following notice of scheduled inspection, a sewer surcharge of $20 per month will be assessed and added to the sewer bill. Such sewer surcharge shall be in addition to any and all other fines levied under existing ordinances.

With our existing treatment plant nearing capacity, it is desirable to delay expansion as long as possible. Every gallon of clear water that we can eliminate from the collection system means one more gallon of capacity for new residents and businesses.

This policy book was developed to help both property owners as well as experienced plumbers understand this program. This program is new to our service area but is based on similar programs being successfully operated in other sewer utilities. The District welcomes your comments on this program. The policy will be reviewed and revised as needed to reach our goal of reducing I/I.

Sincerely,

Andrew Williams
Utility Director

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INTRODUCTION

The Clay Township Regional Waste District (District) is committed to reducing the amount of clear water that enters the sanitary sewer collection system. The District has developed this Policy Document to describe the programs and policies of the District and to educate the property owners of their role and responsibility in eliminating clear water Inflow and Infiltration (I/I).

INFLOW is rainwater that may enter the sanitary sewer system directly. Evidence of inflow sources exhibit increased sewage flow rates immediately during a storm event and ending quickly after the storm event. General examples of inflow sources are down spouts, street storm systems, and sump pumps that pump directly to the sanitary sewer collection system.

INFILTRATION is rainwater, groundwater, or springs that enter the sanitary sewer collection system after filtering through the ground. Infiltration can also be clear water from mechanical and air conditioning units such as condensation and cooling water. Evidence of groundwater infiltration sources exhibits a gradual increase of sewage flow rates during a storm event and continues several days after a storm event, if it ever stops. Infiltration sources are generally cracks in sewage pipes or manholes, and building foundation drains illegally connected to the sanitary sewer.

Like most municipalities, the District has a combination of clear water I/I problems. Evidence of combined I/I is noticed at the District's wastewater treatment plant (WWTP), where the sewage flow rate increases immediately during a storm event and continues at elevated conditions for several days after the storm event. The immediate flow increase is due to inflow and the continued elevated flow rate is due to infiltration.

Elevated flows in the collection system can exceed the sewer main's capacity to get the sewage to the WWTP. When the sewer pipe capacities are exceeded, sewage may overflow at locations such as manholes, lift stations, and basements. These overflows and bypasses allow untreated sewage to bypass treatment, pollute the environment, and have the potential of human contact.

After a storm event, a large percentage of the flow can be the result of groundwater infiltration. This "clean" sewage must still be transported and treated at the WWTP. Even if the sewer lines have the capacity to transport all of the sewage, including the clean water inflow and infiltration, treating the increased volumes of sewage is an operational problem. Once clear water is mixed with domestic sewage, it must all be treated.

Over the years, the District has had to increase capacity in the collection and treatment systems to accommodate not only growth in the customer base but inflow and infiltration. In 2005 alone, over $4 million was spent on capacity upgrades at the pumping station located at Springmill Road and 106th Street.

It costs the District approximately **$2.04** to treat 1,000 gallons of sewage at the WWTP.

Removing Inflow/Infiltration will…

- Save sewage utility customers money.
- Add capacity to the sanitary sewage collection and treatment systems.
- Help eliminate pollution to the environment.
- Help eliminate human contact with raw sewage.
- Help the DISTRICT comply with State and Federal regulations.

Many utilities across Indiana and the United States have been forced to eliminate I/I problems with drastic measures that are burdensome and expensive for the utilities and customers. To avoid future situations that are expensive to the District's customers, the District is committed to reducing I/I through property inspections and certification of compliance as outlined in this Policy Document.

This policy will be reviewed and revised as needed to reach our goal of reducing I/I. To obtain a current version of this document, contact the District at 10701 North College Avenue, Suite A, Indianapolis, 46280, or visit the website at www.ctrwd.org

PROGRAM PROCEDURES

The goal of this program is to reduce the amount of Inflow and Infiltration as much as possible. The District structured this program in such a way that it will be the least intrusive to private property owners, but will still be effective in the elimination of Inflow and Infiltration.

At the time of the sale of a residential property, it is the responsibility of the property owner to notify the District and schedule the I/I inspection. The fees for inspections are identified in the attached I/I Ordinance 12-08-08. If a deficiency is found, a follow-up inspection is required to verify that corrections were completed. The District requires that the inspection be completed prior to the sale of the property so that any deficiencies can be corrected and the certification issued. Prospective owners may be reluctant to close on a property if the certification has not been issued. If the certification of compliance is not received within thirty (30) days of the change in ownership, a sewer surcharge of $20 per month will be assessed and added to the monthly bill until the certification is received. If the demand for inspections exceeds the District's capability to perform the inspections, private firms trained to perform the inspections will be utilized.

For all residential rentals, commercial, and industrial properties, the inspection for certification of compliance shall occur prior to the sale of the property. The fees for inspections are identified in the attached I/I Ordinance 12-08-08. If a deficiency is found, a follow-up inspection is required to verify that corrections were completed. If the certification of compliance is not received within thirty (30) days of the change in ownership or thirty days (30) days following notice of scheduled inspection, whichever is earlier, a sewer surcharge of $20 per month will be assessed and added to the monthly bill until the certification is received. The District Ordinances specify additional penalties for non-compliance which may also be assessed.

When a property is given a certification with all "N/A" or "Sufficient" designations, the certification shall be kept on file at the CTRWD Office. *(Revised February 2014)*

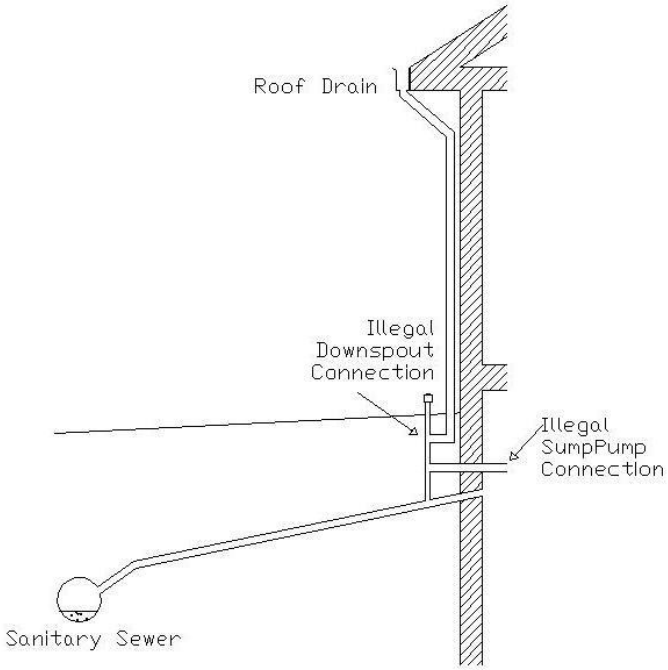
At the District's discretion, any property connected to the sewer system may be inspected to verify compliance with the District's policies and ordinances.

DOWNSPOUTS & CLEANOUTS

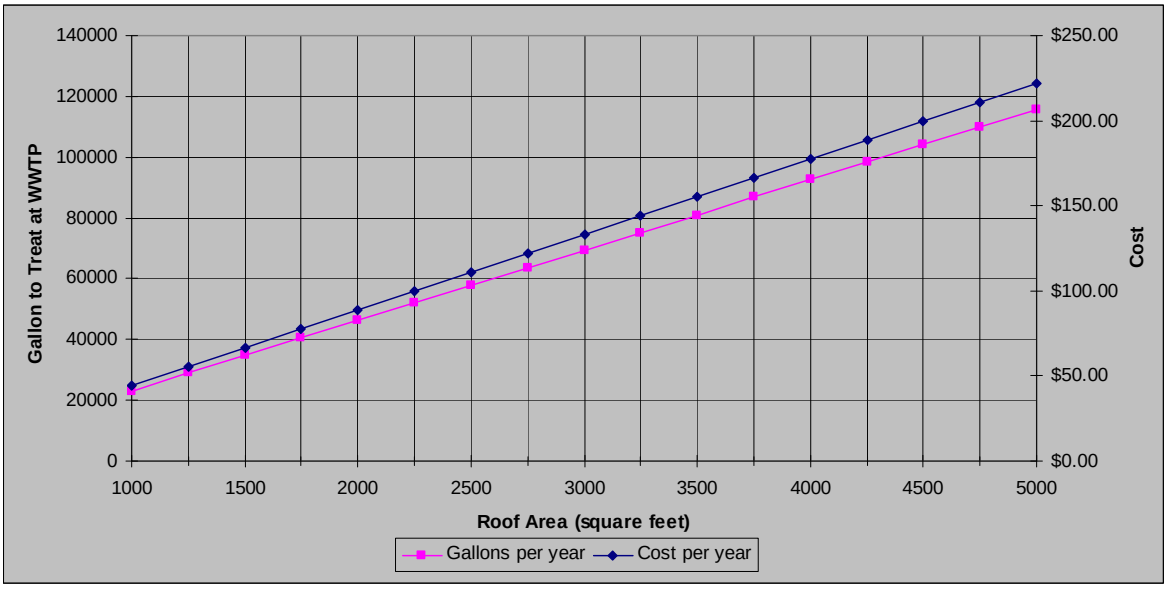
In older communities, a common and inexpensive construction practice was to connect downspouts to the sanitary sewer system. In locations where storm sewers were unavailable, this was an easy way to dispose of rainwater without having to construct a storm sewer. Often, offending downspouts are not physically connected to the sanitary sewer system, but are discharged to a location that is drained by a missing or defective cleanout cap. However, since the sewers in the District are only 20 years old, this has never been allowed and is an illegal practice.

Cleanouts provide access to the sewer lateral so that plugged lines may be serviced without having to dig up the yard or make a mess indoors. Cleanouts are highly recommended and are required for new construction. Unfortunately, the caps that cover the cleanouts are sometimes missing or damaged so that rainwater may directly enter the lateral and the sanitary sewer system.

Broken Cleanout



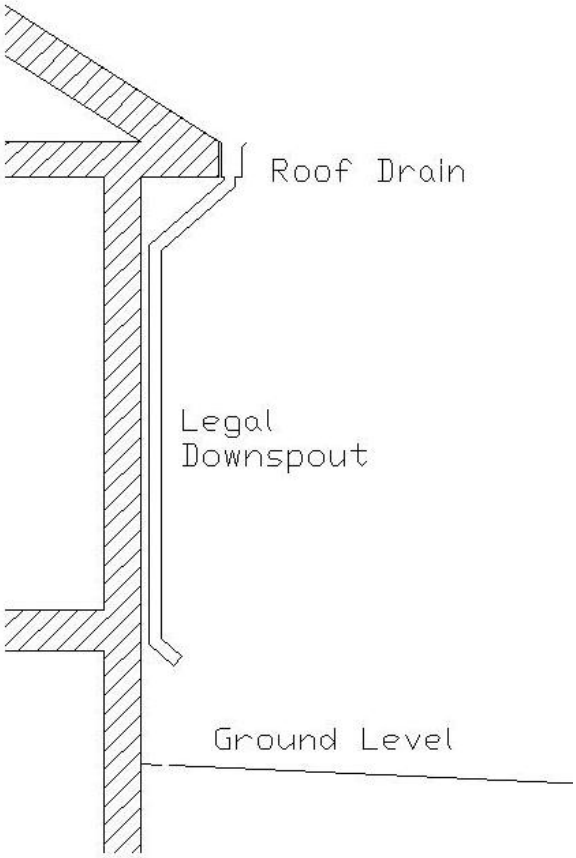
Downspouts illegally connected to the sanitary sewer system can be a huge source of clear water inflow. Roofs do not absorb water like soils and turfs. Therefore, rainwater that falls on a rooftop will leave the rooftop.



Since Clay Township receives an average yearly rainfall of 36-inches, one residential house with 2,000 square feet of rooftop can contribute approximately 45,000 gallons of clear water to the sewage systems each year. This equates to a yearly cost of approximately $92 per house to treat rain water.

HOW CAN THEY BE FIXED?

Fortunately, offending downspouts and cleanouts are one of the easiest and least expensive Inflow sources to eliminate. This is usually accomplished by capping the opening to the sanitary sewer system.



The opening to the sewer system can be capped with an inexpensive manufactured PVC fitting available for this purpose. These fittings allow access to the lateral for inspection or maintenance purposes. When not needed for inspection or maintenance purposes, the cleanout cap shall be closed in a watertight position. Typically the cap uses a screw method to achieve this watertight connection.

Often, there may be a PVC cleanout that was installed properly but removed or damaged at some time. The cleanout

caps should be inspected to see that there are no cracks or defects that could allow surface water to enter into the lateral.

If the opening to the sewer system is not needed as a future access to the building lateral, the connection should be capped using a gasketed PVC cap. Moveable and biodegradable materials such as wood and bricks are not an acceptable alternative for the cleanout cap.

When a missing or damaged cleanout cap is replaced on an open connection to the lateral, ponding may occur if the cleanout had been illegally used to drain the area. Re-grading of the ground may be required to direct water away from the cleanout location.

There are laws that address drainage disputes between private properties. To prevent lawsuits and avoid liability when redirecting drainage from the cleanout location, the property owner should redirect drainage to an existing natural drainage location or defined storm sewer system. If a property owner needs assistance in locating an available storm sewer system, he should contact the City Engineer's office, or the County Surveyor's office if in an unincorporated area.

HOW CAN DOWNSPOUTS AND CLEANOUTS BE INSPECTED?

The District requires that visual inspections or closed circuit television (CCTV) cameras be used to locate offending downspouts and cleanouts. The District's personnel have the right to enter private yards to verify that there are no illegal storm water connections to the sanitary sewer system. If needed, the District may use a variety of methods to locate offending downspouts and cleanouts. The most common methods are smoke testing and dye testing.

CERTIFICATION

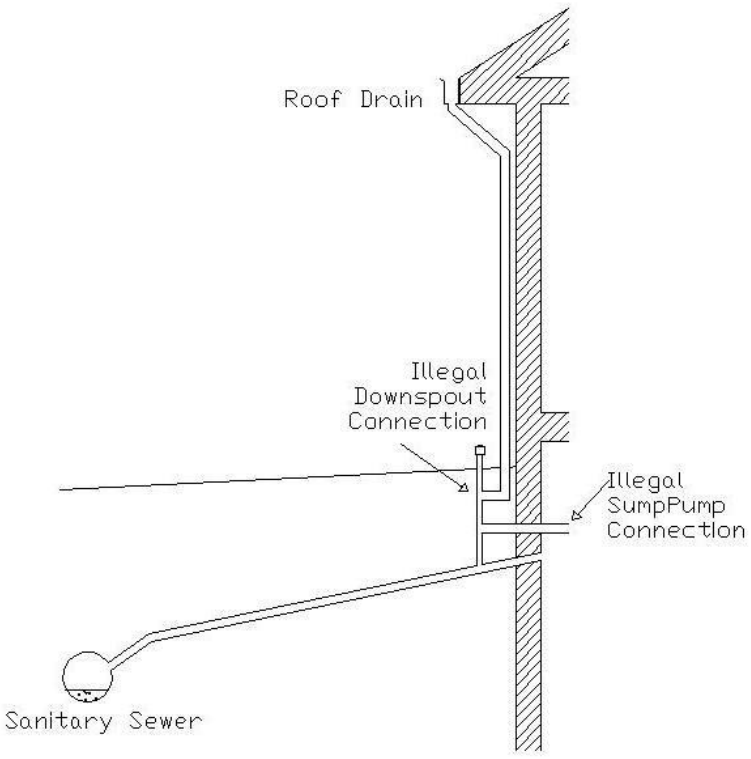
Down spouts and cleanouts are two items required to be certified at the time of the sale of a house as "N/A" or "Sufficient" to prevent a surcharge on the property owner's sewer bill.

A certification of "N/A" indicates that there are no down spouts or cleanouts on the property.

"Sufficient" indicates that there are down spouts and/or cleanouts on the property and that there is no potential for clear water discharges to the sanitary sewer system.

SUMP PUMPS & GRINDER PUMPS

Many homes have drainage sump pumps located in crawl spaces and basement areas. If it were not for sump pumps, many locations would experience water damage to furnaces, water heaters, electrical panels, etc., and some locations would develop health concerns such as mold, fungus, and mildew.



Sump pumps are different than grinder pumps. Grinder pumps or Ejector pumps are intended for the discharge of domestic sewage from low spots to higher sewage pipes. Grinder pumps chop or shred solids so that the sewage may pump through small diameter pipes. Unfortunately, some grinder pumps also pump clear water I/I to the sanitary sewer system.

The District <u>does not</u> intend to eliminate the use of sump pumps or grinder pumps. The intention is to prevent the sump pump discharge from entering the sanitary sewer system. In the past, many builders and homeowners found the sanitary sewer a convenient location to discharge the sump pump clear water.

Many sump pumps can easily discharge 20 gallons per minute. During wet conditions, those same sump pumps may operate almost continuously and could potentially discharge 28,800 gallons per day of clear water I/I into the sanitary sewer system. This equates to a daily cost of $58.75 per household to treat the groundwater.

During moderately-damp conditions when sump pumps do not run continuously, it still does not take very many sump pumps to overload the capacity of the sanitary sewer mains.

HOW CAN SUMP PUMPS BE FIXED?

New valves, pipes, fittings, etc., may need to be installed to redirect the sump pump discharge to a location where it will not enter into the sanitary sewer system. These permissible locations may be a natural drainage location or defined storm sewer system.

If the sump pump discharge is redirected, then all of the new valves, pipes, fittings, etc., need to be installed so that reversal of the discharge back to the sanitary sewer is difficult.

Often it is difficult to tell if a sump pump discharges to the sanitary or to the storm sewer systems. In those cases, liquid dye should be mixed with water, and the sump pump should be operated. All of the adjacent storm and sanitary sewers should be inspected to discover where the dyed water appears. No dye from sump pumps should be found in the sanitary sewer system.

HOW CAN GRINDER PUMPS BE FIXED?

Fixing the offending Grinder Pumps is often more difficult than fixing sump pumps.

The first question the property owner needs to answer is, “Does the grinder pump need to accept flows from the clear water sources?” Bringing a grinder pump into compliance may be as easy as permanently plugging or redirecting an outside floor drain. If all clear water sources can be eliminated from draining to the grinder pump, the grinder pump can continue to discharge domestic waste into the sanitary sewer system.

If clear water cannot be easily eliminated from the grinder pump, the only option may be that a new sump pump is needed for the clear water sources.

It may be necessary to dye test the grinder pump to see where it discharges. Pumping domestic waste to a storm sewer system is illegal and must be redirected to the sanitary sewer immediately.

CAUTIONS

When working with pumping systems (both sump and grinder), a qualified professional should examine the pumping characteristics of the pump. As a discharge pipe increases in length, decreases in diameter, or increases in vertical lift, the pump will not pump as quickly and may not operate at all. This problem may result in flooding. Only a qualified professional familiar with the pump characteristics should make the decision about altering the pump discharge location.

Check valves are required on all grinder pumps. Check valves prevent water from draining backwards to the pump through the discharge line.

Also remember that pumps are electrical machines that may require the involvement of a qualified electrician.

INSPECTIONS

The only accurate way to inspect sump pump and grinder pump conformance is by using liquid dye. Smoke testing is ineffective because of check valves or other pipes that have water traps.

DO NOT ATTEMPT TO REMOVE MANHOLE LIDS OR ENTER A SEWER MANHOLE

Manholes are confined spaces and may contain deadly gasses. Contact the District when access to a sanitary manhole is required.

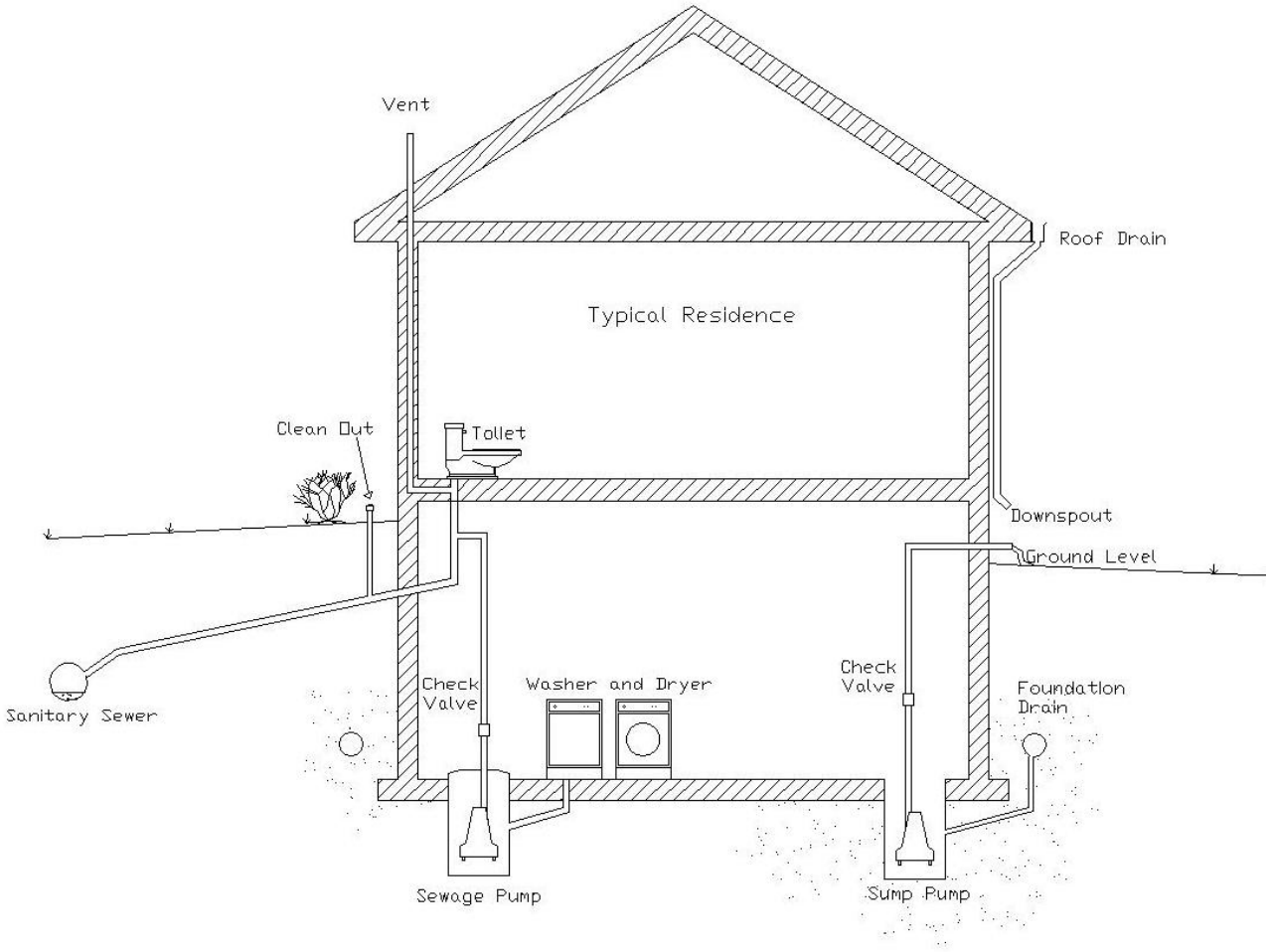
CERTIFICATIONS

Sump Pumps and Grinder Pumps may be certified as "N/A" on the Certification Form if there are no sump pumps or grinder pumps present.

They may be certified as "Sufficient" if the pumps exist and do not contribute clear water to the sanitary sewer system, and do not discharge domestic sewage other than to the sanitary sewer system. Also, all "dirty" water from clothes washers, dish sinks, etc., must be discharged to a sanitary sewer.

DISTRICT ORDINANCES

The discharge of clean water to the sanitary sewer collection system is a violation of the District's IDEM permit. If it is discovered that modifications have been made to allow clean water connections to the sanitary sewer after a certification is issued, District Ordinances specify procedures for fines and penalties to be assessed and collected from the homeowner.



LATERALS

Laterals are generally 6-inch diameter PVC sewer pipes that transport the domestic sewage from the building to the sewer main. Per District policies and ordinances, the property owner is responsible for the lateral to the point of connection to the sewer main. Cleanouts are typically located 3 feet from the house and every 100 feet after that until connection to the sewer main.

In most circumstances, these laterals were installed in an acceptable manner with state of the art materials. Over time however, the lateral pipe may crack, disintegrate, or separate at joints and allow groundwater to infiltrate into the sanitary sewer system. If the lateral is in an area with a high ground water table, the lateral may contribute a significant amount of I/I.

Defective laterals may also be a significant concern for the property owner. When water can infiltrate into the sanitary sewer system, soil particles can also migrate into the pipe and leave a subsurface void. These voids can cause sidewalks and patios to collapse. These voids also create sink holes that are a hazard. Some property owners believe they have a “perpetual sinkhole” where they continually add dirt, when in fact they have a defective lateral.

Even if the defective lateral is not creating visible voids, the defects are often a way for tree roots to enter and clog the pipe. Tree roots thrive in the nutrient rich sewage and are often the cause of sewage backups into buildings or houses.

HOW CAN LATERALS BE FIXED?

Typically, the most economical way to fix a defective lateral is to dig up and replace the old lateral. The new lateral should be constructed with new PVC pipe meeting the District’s specifications. The pipe must have stone bedding and backfill per the District’s specifications to protect the new pipe. Lining techniques for existing laterals can also be used to fix a defective lateral. The District inspects all lateral construction and repairs to verify proper installation and to document the location of the laterals.

CAUTIONS

Before digging up the old lateral, the Indiana underground utility location service must be contacted at telephone #811. If this service is not utilized, the person digging is automatically responsible for any damages to the sanitary sewer, gas, electric, telephone, cable, and other underground utilities.

In addition, most of the sewer mains are located within the public right-of-way (ROW). Cities and counties require permits to dig or perform construction within the ROW.

INSPECTIONS

The most obvious way to identify a defective lateral is by looking for the effects of a defective lateral. When walking the area over the lateral, look for voids, sunken sidewalks, or other settlement problems. Sewage backups caused by roots are an indication that there are significant defects within the sewer lateral.

It is also possible to locate some lateral defects by smoke testing. This is best done during dry ground conditions. By blowing smoke into the sewer system with high capacity blowers, smoke can go through the cracks and up through the ground. This procedure should only be conducted with the supervision of the District.

CERTIFICATIONS

Laterals may be certified as “Sufficient” if all evidence indicates that the lateral pipe is in good shape and not a contributor of I/I.

CTRWD SERVICES

As a service to the property owners, CTRWD will to do the following:

- **Administer the Board of Trustees I/I Reduction Policy** to help achieve the goal of reducing I/I from private sources.

- **Provide access to construction plans and sewer connection permits**. The District does have records for most of the sewers and and laterals installed. This information is kept in a format that will be available to the inspectors and customers.

- **Advisory Assistance.** The District is available for assistance to help explain the Policy. However, due to the large number of properties that are affected, the District cannot commit unlimited hours to advisory assistance.

- **Manhole Inspection.** If there is a need to look in the sanitary sewer system, please notify the District. The sewer system can have gasses that may be deadly. Our experienced personnel will remove manhole lids and assist in looking for dyed water.

- **CCTV Inspection.** If there is a valid concern about the condition of the sewer main, the sewer main will be televised at the District's discretion. If any problems such as roots or collapsed pipes are discovered, the District will properly address the situation.

- **Educate Realtors, Lenders, Plumbers, and Home Inspectors.** The District will make efforts to contact the relevant professions and inform them of this policy. A large part of this service is to conduct I/I Inspector seminars.

ACCEPTING EXISTING SEWER SYSTEMS

Design and Construction of new sanitary sewer systems shall conform to the District's Standard Specifications and Construction Details. Those standards were established and developed to protect the integrity of the sewer system and eliminate I/I sources.

There are private systems that contribute sewage flows to the District's public sewer system. It has been the policy of the Board of Trustees to periodically inspect those private systems and check for I/I. If excessive I/I is found, the District reserves the right to do any or all of the following:

- Require that the property owner(s) fix the problem location(s)
- Restrict the ability of the property owner(s) to obtain building permits.
- Pursue any fines and other legal remedies available due to the property owner's non-compliance.
- Fix the problem area(s) and file a lien against the property(s) to recoup the expenses.
- Fix the problem area(s) and charge the affected property(s) a surcharge on the sewer utility bills to recoup the expenses.
- File a lawsuit against the property owner(s) to fix the problem.
- Combination of any of the above.

On occasion, the District will be asked to accept the dedication of existing sewer mains. Because the systems are in use, it is not practical to air test or vacuum test the system. The Board of Trustees' decision to accept the dedication of an existing sewer system will consider some or all of the following actions:

- CCTV inspection of the entire system and identification of any visible defects
- Flow monitoring to identify clear water
- Smoke testing
- Dye testing
- Visual observation
- Lift station evaluation
- Manhole(s) inspection
- Other actions as deemed necessary by the Utility Director and District Engineer.

DEFINITIONS

Cleanout and Cleanout Caps: locations that provide access to the sewer lateral. These locations shall have water tight, manufactured cleanout caps that may be removed for inspection and maintenance purposes, but at all other times shall remain capped.

Collection system: a system of sewer pipes designed to collect sewage from many properties and transported to the WWTP. The pipes are typically 8-inch diameter and larger and are owned and operated by the District.

Commercial: a place of business, government, institute, industry or other property that does not conform to the "residential" definition in this Policy.

Domestic Sewage: wastewater generated by households, businesses, or industries before it is mixed with I/I. Also known as raw sewage.

Down spouts: a method that allows water from a building rooftop to discharge to the ground, storm sewer, or sanitary sewer. Sanitary sewer connections from down spouts shall be eliminated. Also commonly known as down spouts, house gutters, and roof leaders.

Dye testing: Liquid dye or tablets are added to water, flushed, drained and/or pumped to verify where the water is normally flushed, drained and/or pumped (make sure to alert the local fire department).

Foundation Drain: A pipe or series of pipes that collects groundwater from the foundation or footing of structures.

Grinder Pumps: a pump within a structure intended to pump domestic sewage from a low point to a high point. These shall be discharged to the sanitary sewer and not to a storm sewer system.

House Gutters: see "Down spouts" definition

Inflow and Infiltration: see "Introduction" section of this policy.

I/I: an abbreviation for Inflow and Infiltration.

Lateral: a pipe that connects a building sewer system to a sanitary sewer main. The lateral is owned and maintained by the property owner. Also known as a service line.

Lift Station: a large manhole in the sanitary sewer collection system with large pumps installed to pump the sanitary sewer to another location closer to the WWTP.

Manholes: 4' diameter structures within the collection system where sewer pipes typically change directions. Manholes have manhole castings, or "lids" that may provide an overflow point when the sewage system surcharges.

Poly vinyl chloride (PVC): a rigid plastic-type material used to make modern plumbing pipes and fittings. PVC is preferable over older materials because of watertight joint connections and long-lasting dependable characteristics.

Rental: a property that is not owner occupied.

Residential: a user of the treatment works whose premises or building is used primarily as a residence for one or more persons, including all dwelling units and non-single family residential dwelling units.

Right-of-way (ROW): this land is typically the street, sidewalk, and parkway used by the general public.

Roof Drains: see "Down spouts" definition

Roof Leaders: see "Down spouts" definition

Sanitary Sewer: a general term to refer to the sewer system intended to transport domestic sewage from individual properties to the WWTP. The sanitary sewer may include laterals, sewer mains, manholes, lift stations, and the WWTP.

Service Line: see "Lateral" definition

Sewer Mains: sanitary sewer pipes that transport sewage from multiple homes to the treatment plant.

Smoke testing: a method to test if different locations, structures, and/or pipes are physically connected. Notify the Fire Department.

Storm Sewer: a system intended to convey clear water to a natural drainage way. These systems may include street curb and gutters, storm pipes, sump pump discharge lines, ditches, swales, and creeks. The storm sewers shall not be connected to a sanitary sewer system.

Sump Pump: a pump within a structure intended to pump clear water from a low point to a high point. These shall not be discharged to the sanitary sewer.

Sewage: a general term for domestic or commercial sewage, or combination of sewage and I/I.

Wastewater Treatment Plant WWTP: also known as sewage plant, or wastewater treatment facility (WWTF).

USEFUL TELEPHONE NUMBERS

If there are any questions concerning this policy, please do not hesitate to call any of the following persons:

CTRWD-District Engineer ..... (317) 844-9200

The District has lateral records that are often useful in locating existing laterals. You may also obtain copies of the I/I Reduction Policy books and lists of current private I/I Inspectors.

CTRWD - Field Operations Supervisor ..... (317) 873-0564

Responsible for the supervision of the District's Collections Staff. Please contact the supervisor for assistance with manhole access.

Other Useful Numbers

Boone County Area Plan Commission..... (765) 482-3821
Boone County Health Department..... (765) 483-4458
Boone County Highway Department ..... (765) 482-4550
Carmel Street Department..... (317) 733-2001
Hamilton County Drainage Board ..... (317) 776-8495
Hamilton County Health Department ..... (317) 776-8500
Hamilton County Highway Department..... (317) 773-7770
Indianapolis Water Company..... (317) 631-1431
Town Of Zionsville..... (317) 873-5410

Acknowledgements

The District would like to thank, acknowledge, and credit the City of Greencastle for contributing substantial material to this document.

This document was assembled under contract with Burgess & Niple (B&N) located at 257 N. Illinois Street, Suite 920, Indianapolis, IN 46204. Telephone (317) 237-2760.