



City of Yakima
Wastewater Division
Annual Infiltration and Inflow Report
2023

2023 Annual Inflow and Infiltration Evaluation

Reduction of Inflow and Infiltration (I&I) is a major priority for the City of Yakima Wastewater Division. I&I ties up capacity of the sanitary sewer system and increases treatment costs. In 2023, the City continued its effort to reduce I&I to the wastewater collection system.

Municipal Wastewater Facilities must demonstrate that wastewater collection systems are not and will not contribute to excessive infiltration or inflow. EPA's *Infiltration/Inflow: I/I Analysis and Project Certification* brochure (Ecology Publication No. 97-03) is being used to determine if there is excessive I&I to the City's wastewater system. The submittal of this report by January 31, 2024 to the Department of Ecology satisfies the requirement of Section S4. D. of the City of Yakima's National Pollution Discharge Elimination System (NPDES) permit WA-002402-03, Infiltration and Inflow Evaluation.

The total Yakima Regional Wastewater Treatment Plant (YRWWTP) flow consists of a combination of residential, commercial, industrial flows, and infiltration & inflow. The City of Yakima receives flow from the City of Union Gap metered at the Union Gap Public Works Yard, from the Terrace Heights Sewer District and the City of Moxee metered collectively as direct discharge from the Terrace Heights Lift Station, from a City of Yakima Industrial Waste collection system metered at the YRWWTP Industrial Waste Pump Station (IWPS), and from YRWWTP facility return flows (pump seal water, cooling water, plant sanitary sewers, sludge thickening/dewatering aqueous fractions, industrial waste from the IWPS treated in the upflow anaerobic sludge blanket digester) metered directly at the Yard Pump Station. All of the contributing flows described above are measured collectively at the YRWWTP headworks channel Parshall flume.

The dry weather flow, wet weather flow, and the attached tables (completed Ecology template) identify Infiltration & Inflow for the City of Yakima domestic sewer collection system. It utilizes City of Yakima population estimates from the State of Washington Office of Financial Management at (<http://www.ofm.wa.gov/pop/april1/default.asp>) and flows contributed by City of Yakima residential, commercial, and most City of Yakima industrial customers. Extra-jurisdictional (Union Gap, Terrace Heights, Moxee) flows and populations are excluded based upon the fact that the City of Yakima collection system plays a negligible role in the conveyance of these flows. The flows of four industrial waste customers (Del Monte, Jewel Apple, Seneca Fruit, and Noel Canning) each of whose discharge is conveyed by the City of Yakima Industrial Waste collection system, are also excluded as these discharges are not included in the flow conveyed by the City of Yakima domestic sewer collection system. Rainfall totals are from the Weather Underground website for the station located at the Yakima Air Terminal (latitude: 46°34'5.88" N, Longitude: -120°32'34.8" W).

EPA's guidance uses a national average to determine excessive dry weather flow (DWF) or excessive wet weather flow (WWF). Values above 120 gallons per capita per day (gpcd) and 275 gpcd are considered excessive DWF and WWF, respectively. For 2023, the average flow for the period from August 11 to August 24 (high groundwater and zero precipitation conditions), inclusive, was used to determine the **City of Yakima collection system DWF of 79.7 gpcd**. For 2023, the **WWF of 75.5 gpcd** was determined from one of the higher daily flows, which occurred on April 10, during a rain event totaling 1.10 inches. The City of Yakima 2023 DWF and WWF are each below the EPA's respective excessive flow thresholds.

The flow data indicates that the flows are not significantly affected by high rain events. However, leakage from irrigation pipes and canals, during the irrigation season, significantly raises the shallow ground water table that runs under the City of Yakima and along the Yakima River. A noticeable flow increase is observed in April when the irrigation season begins. When the irrigation is shut down in the fall, the City's Wastewater Treatment Plant flows are reduced.

The Water/Irrigation Division has spent a great amount of time and effort addressing this issue over the past several years. We are seeing the benefit from their work. The City of Yakima will continue to pressurize and rehabilitate a major portion of its irrigation system to reduce leaking of irrigation water into the water table.

Ongoing City efforts to identify and reduce I&I:

- Repair work by Water/Irrigation, Wastewater, and Stormwater crews.
- Tracking the water usage of our Hydro-cleaning.
- Smoke-testing and dye-testing connections to the YRWWTP with no previous account history and billing information.

Specific year 2023 I&I reduction efforts:

- 2023 Budget approval of \$1,500,000 dedicated to ongoing sewer pipe and manhole rehabilitation and replacement, including new manholes to optimize sewer pipe maintenance for further I&I reduction.
- City Wastewater Collections staff installed 40 cured-in-place pipes (CIPPs) liner kits totaling 18,118 linear feet.
- 33 Manholes were repaired or replaced during 2023.

Much credit must be given to the efforts of City staff in Wastewater, Stormwater and Water/Irrigation for their continued success in reducing the amount of infiltration entering into the City's wastewater system. Doing so helps to preserve capacity for future growth and reduces treatment costs for the rate payers.

Report submitted by:



Mike Price
Wastewater Division Manager
January 25, 2024

City of Yakima Wastewater Treatment Plant, Permit No. WA0024023

January 1, 2023 to December 31, 2023

I&I Base Year: 2011

Base Year I/I (MGD): 3.16

Max month design flow (MGD):	21.5
Peak daily design flow (MGD):	40
Design Population Equivalent:	179,000

Population Served			
2020	2021	2022	2023
95,490	97,810	98,200	98,650

New Sewer Lines Added (feet)			
2020	2021	2022	2023
14,731	11,069	10,631	3,779

Total Sewer System Length (mi)			
2020	2021	2022	2023
361.1	363.2	362.0	362.7

Average Annual Monthly Flows (MGD)				
Month	2020	2021	2022	2023
January	6.13	6.10	6.13	6.14
February	6.12	6.04	6.21	5.88
March	5.98	5.97	6.22	5.76
April	6.39	6.33	6.66	6.34
May	6.58	6.59	6.94	6.65
June	6.98	6.95	7.20	6.96
July	7.36	7.66	7.37	7.24
August	8.16	8.68	8.22	7.89
September	8.61	9.05	8.34	7.96
October	8.10	8.06	7.55	7.41
November	6.98	6.91	6.56	6.89
December	6.31	6.53	6.18	6.47

Total Monthly Rainfall (inches)				
Month	2020	2021	2022	2023
January	1.10	2.08	2.30	1.38
February	0.11	1.64	0.08	1.49
March	0.33	0.07	0.11	1.93
April	0.07	0.04	1.28	1.62
May	0.87	0.05	1.07	0.11
June	0.24	0.28	1.38	0.06
July	0.00	0.00	0.29	0.33
August	0.01	0.03	0.00	0.55
September	0.06	0.47	0.13	0.47
October	0.20	1.16	0.30	0.43
November	1.15	2.44	1.08	0.53
December	0.58	0.61	3.88	2.06

Annual Average	6.97	7.07	6.96	6.80
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TOTAL	4.72	8.87	11.90	10.96
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Infiltration and Inflow Summary					
Year	2019	2020	2021	2022	2023
High Flow	9.28	8.61	9.05	8.34	7.96
Low Flow	6.26	5.98	5.97	6.13	5.76
Average	7.54	6.97	7.07	6.96	6.80
I&I, MGD	3.02	2.62	3.08	2.21	2.20
Change from 2011	-4.4%	-17.0%	-2.6%	-30.1%	-30.3%
Percent of Design	14.0%	12.2%	14.3%	10.3%	10.2%

Gallons of Non-I&I Contributions to City of Yakima Flows

Month	Nob Hill Water System Flushing	City of Yakima Wastewater Collection System Hydro-Flushing
January	5,000	61,550
February	7,000	26,000
March	16,800	87,500
April		56,400
May		97,600
June	7,500	75,000
July		72,500
August		65,400
September		47,600
October	16,800	50,350
November		67,751
December	132,000	35,300
Total	185,100	742,951