



Discharge of brine into an existing sewage collection system.

1. Potential Environmental Impacts
2. Impact on Wastewater Treatment Plant Operations
3. Effect on Water Reuse
4. Costs for Brine Sewer Discharge

Brine discharge to the nearest wastewater system is only suitable for small volumes into large-capacity WWTPs, due to the potential impact of the brine's high TDS to the WWTP operations. In most countries, brine discharge to a WWTP is regulated by the requirements applicable to industrial discharges of the responsible authority.

### 1. Potential Environmental Impacts

Desalination plant discharge to a sanitary sewer could potentially have environmental impacts similar to those of co-discharge of concentrate and WWTP effluent.

### 2. Impact on Wastewater Treatment Plant Operations

This brine disposal method is limited by the hydraulic capacity of the WW collection system and the capacity of the WWTP processes.

A WWTP biological treatment process is usually constricted by high salinity (TDS > 3000 mg/L). So the WWTP's salinity tolerance must be assessed before discharging the desalination plant brine to the sewer. Accounting for the influent TDS being  $\geq 1000$  mg/L in many facilities located

✔ Advantages (+)	✘ Disadvantages (-)
Low construction and operation costs	Limited to small size flows
Easy implementation	Potential adverse effects to WWTP operations
Low Energy Consumption	/

along the ocean coast, and that the SWRO brine TDS is  $\geq 65,000$  mg/L, the WWTP's capacity has to be 30 to 35 times higher than the daily volume of brine discharge so as to maintain the influent TDS concentration  $<3000$  mg/L.



### 3. Effect on Water Reuse

If there's reuse of the WWTP's effluent, the brine intake is limited by,

- 1) its salinity
- 2) the concentrations of sodium, chlorides, and boron

These constituents could severely impact the reuse of the WWTP effluent especially if it is used for irrigation due to the treatment processes of a typical WWTP not removing a sizeable amount of these contaminants. Although there are crops and plants that have  $>1,000$  mg/L TDS tolerance, most plants cannot tolerate chloride levels  $> 250$  mg/L. Typical WWTP effluent has chloride levels  $\leq 150$  mg/L, while SW brine could have  $> 40,000$  mg/L.

### 4. Costs for Brine Sewer Discharge

Brine sewer discharge is typically the lowest-cost disposal method, especially if there's already a wastewater collection system is available near the desalination plant site, and the WWTP can manage the brine intake.

Conditions and therefore costs are site-specific, and the main costs are for the discharge conveyance (pump station and pipeline) and the fees for connecting to the sewer and for the treatment/disposal (can vary from very low to several orders of magnitude larger than the conveyance costs).

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