Summary of Issues | Strategies | Benefits & Costs | Key Uncertainties | Additional Resources

KEY POINT: Wastewater treatment plant (WWTP) fees can vary substantially and can be cost prohibitive.

SUMMARY OF ISSUES

- Key cost elements for this disposal method include (Mickley 2006):
  - Cost of conveyance (pump station and pipeline)
  - Fees for connecting to the sanitary sewer
  - Fees for treatment/disposal of the concentrate at the WWTP.

- While the volume of the concentrate mainly drives conveyance costs, sewer connection and treatment fees can vary substantially. These fees are typically related to the available capacity of the sewer facilities and the effect of the concentrate discharge on the operational costs of the WWTP (which would provide ultimate treatment and disposal of the concentrate). Sewer connection and treatment fees can be quite large and can make this method cost-prohibitive (Mickley 2004).

- The possibility of disposal to sewer is highly site dependent. The feasibility of this method is influenced by the distance between the two facilities, by whether the two facilities are owned by the same entity, and by future capacity increases anticipated.

- Figure 1 illustrates the relative capital costs (neglecting conveyance costs) of the different concentrate management options and reflects economy of scale factors as well as general (relative) level of cost (Mickley 2005). As shown, disposal to sewer (if available) can be the least expensive disposal option. Again, this depends on the magnitude of WWTP fees, which vary substantially and can make this method of disposal infeasible in many locations.
Figure 1. Relative capital cost of different disposal options
Source: Xu et. al. (2009), adapted from Mickley (2005).

STRATEGIES

- Discharge of small volumes of concentrate to sewer systems is more economical and may have only limited permitting requirements.

- Some regions have installed regional interceptors or “brine lines” that covey brine to a wastewater treatment plant prior to ocean discharge. A regional interceptor is used specifically to collect streams (which can include concentrate) from multiple dischargers. An example is the Santa Ana Regional Interceptor (SARI) in Southern California, which consists of over 90 miles (145 km) of pipeline (Jordahl 2006).

- Currently, the RO concentrates from the Menifee and Perris I Desalter plants of Eastern Municipal Water District (EMWD) are disposed via a 22-mile-long (35 km) Temescal
Valley Regional Interceptor line, a nonreclaimable waste pipeline connecting EMWD to the SARI line. The disposal cost of $36,600,000 ($28,800,000 for SARI, treatment & disposal cost; and $7,800,000 to reach four brine lines) accounts for 25.5 percent of the total desal program costs ($143,400,000) (Xu et. al. 2009, Survey results).

When sewer system capacity is reached, concentrate disposal costs can increase significantly. For example, in addition to the Menifee and Perris I Desalter plants mentioned above, a third desal plant (Perris II Desalter), with three more extraction wells, is under design. These three desal plants will ultimately produce concentrates in excess of EMWD’s permitted capacity in the SARI line. The Santa Ana Watershed Project Authority has indicated that there is no available capacity for purchase in the SARI system, and the cost of treatment and disposal is expected to increase exponentially in the future. As a result, EMWD has decided to further investigate recovering drinking water from the primary RO brine stream and converting the entire system to zero-liquid discharge (ZLD) (Xu et. al. 2009).

**BENEFITS & COSTS**

**Benefits**

When available, sewer disposal can be a low-cost, low-technology solution to concentrate management.

**Costs**

Potential adverse impacts on wastewater treatment processes, if any, must be within acceptable limits. Large-volume discharges are therefore typically not practical or suitable.

**KEY UNCERTAINTIES**

The possibility of disposal to sewer is highly site dependent. In addition, where disposal to the sewer is allowed, fees may be required based on volume and/or composition. These fees can vary substantially and can be cost prohibitive.
ADDITIONAL RESOURCES


