

WEST BASIN MUNICIPAL WATER DISTRICT**AUGUST 2, 2001 – Water Resources**

McDonald, Little

AUGUST 27, 2001 – Board Meeting

Prepared by: Wyatt Won

Submitted by: Paul E. Shoenberger

Approved by: Darryl G. Miller

INFORMATION CALENDAR

BARRIER REVERSE OSMOSIS TRAIN NO. 2 MEMBRANE REPLACEMENTSUMMARY:

Secondary effluent is pre-treated using lime clarification and tri-media filtration prior to Barrier Reverse Osmosis (RO) Train No. 2. Historically, cellulose acetate (CA) RO membranes have been used with lime clarified water. While CA membranes run at higher pressures than the thin film membranes used in the microfilter fed Barrier Train No. 3, CA has historically been the choice because of their ability to operate better than traditional thin-film membranes in this "fouling" environment. The newest generation thin film membranes, which are less prone to fouling than the original versions, have been considered for use on the lime-clarified water.

The CA RO membranes in Barrier Train No. 2 have been in service for a little over four years. As reported last October and November, the performance of the CA membranes in Train No. 2 has been deteriorating and the membranes need to be replaced. Staff was considering replacing the CA membranes with thin film membranes, but because of the uncertainty of how the thin film membranes would perform on lime-clarified water, a temporary solution was proposed. As an interim measure to temporarily improve Train No. 2 performance, the Board authorized the purchase of thin film composite membranes to replace the CA membranes in the third stage of Train No. 2 (108 of the total 756 elements in the train). Staff was to make a recommendation for the replacement of the remaining CA membranes in Train No. 2 after further study.

The thin film membranes in stage 3 of Train No. 2 have been operating under difficult conditions for about six months. Productivity of the thin film membranes in stage 3, although not as good as on microfiltered water in Train No. 3, has been as good as what could have been expected from CA membranes. An earlier study done at the water recycling plant also indicated that productivity of the thin film membranes was equal to or greater than that of CA membranes on lime-clarified water over a five-month period. Data from a current Desalination Research Innovation Partnership (DRIP) is not yet available.

Although there is still some uncertainty as to the long-term performance of thin film membranes on lime-clarified water, staff believes there are several compelling reasons to replace the CA elements in stages 1 and 2 of Barrier Train No. 2 with thin film membranes. The reasons are described below.

- Product water quality is anticipated to be substantially better with thin film membranes than with CA membranes. Additionally, the product will maintain at high quality during the membranes life, unlike CA which experiences a normal deterioration over time.
- Based on the limited thin film membrane operational data available, the water productivity of thin film membranes is expected to be equal to or better than that of CA membranes on lime-clarified water.

- The cost of thin film membranes is about equal to the cost of CA membranes.

WBMWD Board Memorandum

August 27, 2001 Page 2

- Membrane manufacturers are de-emphasizing CA products, as the market shifts toward use of thin-film membrane. This has resulted in high CA bid prices from some manufacturers and poor quality control from another. A recent large municipal procurement for CA elements has had problems meeting specified performance.

Staff will be issuing a "Request for Bids" to supply thin film RO elements for stages 1 and 2 of Barrier Train No. 2. Staff is planning to ask for Board authorization to purchase thin film membranes in September after the bids are received and evaluated.

FISCAL IMPACTS:

Funds are available in the Facility Replacement Fund.

ENVIRONMENTAL COMPLIANCE:

Not applicable.

COMMITTEE STATUS:

This item was reviewed by the Water Resources Committee on the August 2, 2001 and was recommended for approval. This item was agendaized to the August 27, 2001 Board meeting for action.

RECOMMENDED MOTION:

This item is for information only.

LIST OF EXHIBITS:

None.

I:\direct\wbmwd\01aug003