

WEST BASIN MUNICIPAL WATER DISTRICT

JULY 13, 2006 – Water Resources
Little, Baker
JULY 24, 2006 – Board Meeting
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Approved by: Rich Nagel

ACTION CALENDAR

PHASE III MICROFILTER ELEMENTS REPLACEMENT
WEST BASIN WATER RECYCLING PLANT

SUMMARY:

The Phase III Expansion of the West Basin Water Recycling Plant (Plant) uses microfiltration pre-treatment followed by thin-film composite reverse osmosis membranes to provide boilerfeed water to Chevron's El Segundo refinery. There are ten microfilter units that have been in service for about five years, since June of 2001. Service conditions for these microfilters are severe because they are fed secondary effluent from Hyperion. They are backwashed and chemically cleaned more often than the microfilters operating on Title 22 effluent at the satellite plants. In spite of the varying water quality from Hyperion, these microfilters have consistently produced water with sufficient quality to feed the reverse osmosis units. The expected life of the microfilter elements is about five years.

The Normalized Trans-membrane Pressure has increased as explained below, resulting in reduced capacity. Normalized Trans-membrane Pressure (NTMP) is a measure of the pressure drop through the microfiltration membranes, normalized for filtrate flow rate and water temperature. It is used as an indication of the fouling experienced by the membrane over time. Higher NTMPs indicate greater fouling, which in turn ultimately result in reduced flows and shorter run times between chemical cleanings. The target NTMP after chemical cleaning is approximately 5 psi. An NTMP at this level after cleaning indicates effective backwash and cleaning procedures. Recently, the NTMP in some units after cleaning has remained at 10 psi or above, indicating that backwash and cleaning procedures have become less effective in removing the foulants from the membrane surface. Another indication of the "health" of the microfilters is the time between cleanings. The cleanings were typically three to six weeks apart initially, depending on water quality from Hyperion. Recent experience has been that cleanings are required every one to three weeks. The inability of the CMF units to now achieve an NTMP of approximately 5 psi and the more frequent chemical cleanings are indications of irreversible membrane fouling.

Although the quality of the water is still adequate to feed to the reverse osmosis units, the microfilters are also showing signs of leakage based on pressure decay tests. The leakage could be caused by broken fibers or other mechanical defects.

Based on increased NTMPs of the microfilters and resulting loss of capacity, increased chemical cleaning frequencies, and possible leakage of the units, staff recommends the elements be replaced.

The microfilters are manufactured by U.S. Filter and replacement sub-modules must be purchased from the manufacturer. Staff has been quoted a price for the replacement microfiltration sub-modules from U.S. Filter of \$750 per sub-module. This is \$115 per sub-module more than the District paid last year, and excludes the cost of o-rings. Although the District does not have a service contract with U.S. Filter, they are charging the District the rate they would charge a preferred customer with a service contract. Total price for the replacement sub-modules for all ten units, including sales tax and shipping, and re-commissioning services is estimated to cost \$787,975.

The Phase III reverse osmosis membranes at the plant are also about five years old and need to be replaced. Staff will be sending out "Request for Bids" to the qualified manufacturers and will report the results to the Board in the near future.

FISCAL IMPACTS:

Fund are available in the Facility Replacement Fund.

ENVIRONMENTAL COMPLIANCE:

Not applicable.

COMMITTEE STATUS:

This item was reviewed by the Water Resources Committee on July 13, 2006 and was recommended for approval at the July 21, 2006 Special Board meeting.

RECOMMENDED MOTION:

Authorize the General Manager to purchase replacement microfiltration sub-modules and appurtenant equipment and re-commissioning services from U.S. Filter for \$787,975 plus 10% contingencies for a total not-to-exceed amount of \$866,773.

LIST OF EXHIBITS:

None.