



- Board of Directors
Engineering and Operations Committee

6/12/2012 Board Meeting

9-1

Subject

Options to enhance the solids handling capability of the Joseph Jensen Water Treatment Plant

Description

At the February 13, 2012 meeting of the Board's Engineering and Operations Committee, a motion was passed to defer action for 90 days regarding authorization of final design of the planned Solids Dewatering Facility and Lagoons at the Joseph Jensen Water Treatment Plant. The time extension was provided for the Los Angeles Department of Water and Power (LADWP) and Metropolitan to develop additional project alternatives.

At the May 8, 2012 meeting of the Engineering and Operations Committee, staff provided an update on the project alternative jointly being developed by LADWP and Metropolitan. The goal of this alternative is to address the needs of each agency and reduce Metropolitan's initial capital costs to enhance the Jensen plant's solids handling capability. As a result of this effort, a second option is described herein for moving forward with solids handling facilities to support near-term Jensen plant treated water production. The two project options are as follows:

- Option No. 1 consists of a 50-year lease agreement with LADWP which would allow Metropolitan to initially use existing LADWP lagoons and then construct new lagoons on LADWP property, to support Jensen plant residual solids production over the 50-year term of the agreement. This option would defer the construction of mechanical solids dewatering at the Jensen plant, thereby reducing up-front capital expenditures, and would minimize the near-term impact on Metropolitan's treated water surcharge.
- Option No. 2 consists of a staged on-site Solids Dewatering Facility and Lagoons project at the Jensen plant, as originally presented to the Engineering and Operations Committee in February 2012. This project would provide a long-term solution which would enable on-site dewatering of water treatment residual solids, increase washwater recovery, and improve plant operational flexibility and reliability.

Both options are consistent with Metropolitan's long-term plan for solids handling at the Jensen plant, which is to thicken and dewater all residual solids on-site at the plant, based on the full plant capacity of 750 mgd.

Timing and Urgency

The Jensen facility is Metropolitan's only water treatment plant which does not have on-site solids dewatering capability to process thickened residual solids. Currently, the Jensen plant relies on a combination of two processes for solids handling: air-drying of solids in two lagoons leased from LADWP, and discharge to the city of Los Angeles sanitary sewer. Under design conditions, the existing LADWP lagoons can accommodate only 15 percent of the Jensen plant's maximum capacity solids disposal needs, while sewer discharge can only accommodate an additional 25 percent. Thus, unless improvements are undertaken, the long-term, reliable Jensen flowrate may be reduced from 750 million gallons per day (mgd) to 300 mgd.

Given the variability of State Water Project supply deliveries and water quality, enhanced solids handling facilities are needed to meet short-term, high-solids loading and long-term, reliable treatment capacity at the Jensen plant. Since the Jensen plant commenced operation in 1972, nine high-turbidity events have occurred,

which required either temporary storage of solids in lagoons or excessive discharge to the sanitary sewer. At the present time, any increased sewer discharges above the limitations contained in Metropolitan's discharge permit would require discretionary approval by the city of Los Angeles. Sewer disposal is not considered a feasible alternative for accommodating short-term, high-solids loading unless these limitations are changed.

Staff will return to the Board in July 2012 for authorization to implement the recommended option for solids handling for the Jensen plant.

Background

The Jensen plant was placed into service in 1972 with an initial capacity of 400 mgd. The plant was expanded in the early 1990s to its current capacity of 750 mgd. The Jensen plant exclusively treats water from the West Branch of the State Water Project, and delivers it to Metropolitan's Central Pool portion of the distribution system and to service areas in the western portion of the distribution system.

Residual chemicals and settled solids collected from the Jensen plant's sedimentation basins are currently thickened on-site and then air-dried at two nearby LADWP lagoons on the Los Angeles Aqueduct Filtration Plant (LAAFP) site. This cooperative arrangement was initiated in February 2005 and is under negotiation to be extended. Under the existing Metropolitan-LADWP agreement, Metropolitan may use two of LADWP's lagoons while Metropolitan's land for planned on-site Jensen lagoons is leased for recreational purposes. Currently, the LADWP lagoons have sufficient capacity to process only 15 percent of the solids generated at the Jensen plant's maximum flowrate at design conditions. Solids produced at the Jensen plant may also be discharged to the sanitary sewer. However, sewer disposal is expensive and is limited by the discharge permit. For example, in 2005, when all of the Jensen plant's solids were discharged into the sanitary sewer for several weeks in a row, the discharge fees totaled approximately \$70,000 per day. Under maximum plant capacity of 750 mgd, the sewer discharge can only accommodate approximately 25 percent of the solids generated at the plant's maximum flowrate at design conditions. Thus, unless improvements are undertaken, the long-term, reliable Jensen flowrate may be reduced from 750 mgd to 300 mgd.

In September 2008, Metropolitan's Board authorized preliminary design phase activities for an on-site Jensen Solids Dewatering Facility and Lagoons project. A combination of on-site mechanical dewatering and air-drying lagoons was selected to improve plant operational flexibility and reliability. A combination of these two processes is required for an on-site project because a lagoon-only option would require excessive amounts of land, while a mechanical-dewatering-only option could not process the very high volumes of solids produced during storm events, which can double the solids generated under normal design conditions. Based on an assessment of future process space needs and geotechnical conditions at the Jensen plant, staff recommended at the February 2012 board committee meeting that the on-site lagoons and the mechanical dewatering facility be located at the southern portion of the plant. The proposed location for the on-site lagoons is currently leased to the Los Angeles Department of Recreation and Parks (LADRP), which subleases the property to the Granada Hills Youth Recreation Center, Inc. (GHYRC). GHYRC operates and maintains several soccer and baseball fields for youth sports on this subleased property.

Two options for proceeding with upgrades to the Jensen solids handling facilities are presented as follows:

Option No. 1 would authorize negotiations for a 50-year lease with LADWP, under the terms specified below, which would allow Metropolitan to use lagoons on LADWP property. Option No. 1 would also authorize preliminary design of a new solids transfer system, which would convey Jensen plant residual solids to the LADWP lagoons, and preparation of environmental documentation to support the preliminary design and proposed 50-year lease. This option would meet Metropolitan's near-term solids handling needs while keeping the local youth sports operation at the current location. Under this option, Metropolitan would enter into a 45-year lease for continued use of the ballfields at the Jensen plant site, contingent upon the LADWP solids lagoon-lease remaining in effect.

Option No. 2 would authorize final design of the staged Solids Dewatering Facility and Lagoons project at the Jensen plant, as originally discussed by the Engineering and Operations Committee in February 2012. This

option would provide a long-term solution for solids handling at the Jensen plant, but would require significant initial capital investment.

Option No. 1 – Jensen Solids Transfer System – Preliminary Design Phase

This option was developed via collaborative discussions between LADWP and Metropolitan staff. It would address the needs of both agencies, reduce Metropolitan's initial capital expenditures, and minimally impact Metropolitan's treated water surcharge at this time. The cornerstone of this option will be a 50-year lease agreement between LADWP and Metropolitan, which would support an alternative plan for solids handling for the Jensen plant. With this option, Metropolitan would rely on lagoons at the LAAFP site for air-drying a portion of the Jensen plant's residual solids.

During the 50-year term of the lease agreement, LADWP will allow Metropolitan to use four lagoons at the LAAFP site. Four existing lagoons will be rehabilitated by LADWP for Metropolitan's initial use. During the first 10 years of the agreement, Metropolitan will construct two new lagoons on the LAAFP site and return two of the original lagoons to LADWP for its own use.

The four lagoons are expected to have sufficient capacity to process approximately 50 percent of the solids generated during 500-mgd plant operation at design conditions. During the past few years, the Jensen plant has been processing all Jensen solids using only two LADWP lagoons due to favorable source-water quality and low water demand in its service area. If this trend continues, four LADWP lagoons could support the expected near-term water demand of 500 mgd. Under the proposed agreement, LADWP will pay for any discharge of Jensen plant solids to the city of Los Angeles sanitary sewer. LADWP will continue to pay for the sanitary sewer discharges for the period prior to completion of the two new lagoons at the LAAFP site and on-site mechanical dewatering facility at the Jensen plant.

Before the mechanical dewatering facility is operational, if the treated water demand increases significantly or water quality degrades substantially over a short period of time, the capacity of the four solids lagoons (and sewer discharge) may be insufficient to meet Metropolitan's needs. In this case, Metropolitan may temporarily contract with a belt-press vendor to dewater the solids while commencing to design and construct the mechanical solids dewatering facility.

Terms to be incorporated into the proposed agreement include:

- LADWP will provide a no-cost lease for Metropolitan to use four solids lagoons on LADWP property for a term of 50 years.
- LADWP will refurbish four existing solids lagoons for Metropolitan's initial use, and allow Metropolitan to construct two new lagoons in the future (to replace two of the initial lagoons), including conducting a hazardous waste and groundwater site characterization analysis to determine the baseline conditions of the four existing lagoons and two new lagoons.
- LADWP will construct and operate groundwater management facilities to minimize the impact of groundwater infiltration on the four existing lagoons and two new lagoons used by Metropolitan.
- LADWP will reimburse Metropolitan for all sanitary sewer disposal costs until Metropolitan constructs two new lagoons at the LAAFP site and a permanent mechanical dewatering facility at the Jensen plant.
- LADWP will indemnify, defend, and release/hold harmless Metropolitan from any liability due to occurrence/presence of hazardous waste, to the extent permitted by law.
- Metropolitan will provide a no-cost lease for use of ballfields at the Jensen plant for a term of 45 years, contingent upon the LADWP solids lagoon lease remaining in effect.
- Metropolitan may construct two new lagoons on LADWP property at its cost, and will relinquish use of two existing LADWP lagoons within 10 years.
- Metropolitan will construct a new solids transfer system from the Jensen plant to the LADWP lagoons.
- Metropolitan will prepare environmental documents related to the 50-year lease and the solids transfer system.
- If after completing its feasibility study and preliminary design, Metropolitan determines that it is feasible and cost-effective to construct the new lagoons on LADWP property, Metropolitan will prepare

environmental documents for the two new lagoons. Metropolitan and LADWP will equally share in the cost for preparation of the CEQA documentation and for mitigation for the new lagoons. Construction of the new lagoons will not proceed until further technical and CEQA analyses are completed, and all applicable project approvals are obtained.

- LADWP will secure pre-construction site permits for the two future lagoons, and Metropolitan will secure construction-related permits.
- If Metropolitan determines that construction of the new lagoons is not feasible or cost-effective, Metropolitan may terminate the lagoon and ballfield leases, and Metropolitan will have five years to transition off the use of LADWP's lagoons and to construct its own lagoons on Metropolitan property.

For Option No. 1, the initial scope of work includes preliminary design by Metropolitan of a solids transfer system to convey residual solids from the Jensen plant to the LADWP lagoons; staff activities to further develop the LADWP-Metropolitan agreement; and preparation of environmental documentation to support the 50-year lease. Preliminary design phase activities will include field investigations, engineering design, development of a project cost estimate, and all other activities in advance of final design. The field investigations will include substructures investigations and utility potholing. The environmental documentation will include technical studies and preparation of supplemental documentation to the Draft Environmental Impact Report (DEIR) previously developed for Option No. 2.

The up-front construction cost for this option is anticipated to range from \$2 million to \$3 million for the solids transfer system alone. The cost to construct the two future lagoons is anticipated to range from \$7 million to \$8 million. In the future, a new solids dewatering facility will be constructed at the Jensen plant to support the plant's full 750-mgd capacity.

Option No. 2 - Jensen Solids Dewatering Facility and Lagoons, Stage 1 – Final Design Phase

Metropolitan's long-term plan for solids handling at the Jensen plant is to thicken and dewater all residual solids on-site. This plan would be executed in two stages. During Stage 1, Metropolitan will add an on-site solids dewatering facility and lagoons to provide cost-effective, reliable solids handling of up to 500 mgd of the Jensen plant's water treatment capacity. These facilities will support reliable long-term plant water production. In the future, additional belt presses and ancillary equipment will be added during Stage 2 to process the remaining 250 mgd of plant capacity.

Preliminary design of the Jensen solids handling facilities has been completed. The scope of the planned Stage 1 includes the addition of a new mechanical dewatering facility, lagoons, decant and filtrate pumping stations, and support facilities; modifications to the existing dry polymer building and solids thickening system; and electrical ductbank replacement. The lagoons and mechanical dewatering facility will be sized to process sufficient residual solids to support the Jensen plant's near-term water demand of 500 mgd. If the required level of solids production exceeds this capacity, the city of Los Angeles sewer permit may need to be revised to increase discharge capacity to the sewer, pending expansion of the mechanical dewatering facility to its ultimate capacity. Revision of Metropolitan's sewer discharge permit is subject to discretionary approval of the city of Los Angeles.

The lagoons will be sized to process approximately 30 percent of the residual solids produced at the Jensen plant's maximum flowrate, while the solids dewatering facility will be sized to process the remaining amount. The capacity of the lagoons has been determined based on the available on-site space. The lagoons will be used as the primary means to dewater solids because of their lower operation and maintenance cost. In addition, the lagoons will be used to process peak solids production resulting from extreme water quality events, such as occurred in the winter of 2004/05, when highly turbid water entered the Jensen plant and required greatly increased application of coagulants and polymers to treat the water.

Final design phase activities will include detailed field investigations, engineering design, preparation of drawings and specifications, preparation of environmental-related documents, acquisition of permits, development of a construction cost estimate, receipt of competitive bids, and all other activities in advance of award of a construction contract. The detailed field investigations will include detailed geotechnical investigations, hazardous material testing, and utility potholing. Due to its size and unique location, the Jensen lagoon system is expected to be classified as a dam and thereby fall under the jurisdiction of the California Division of Safety of

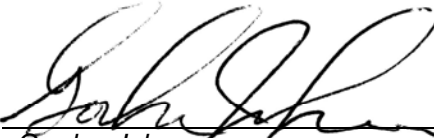

Dams (DSOD). The DSOD-related activities will include permitting, inundation mapping, conducting hazard analyses, and value engineering. The environmental documentation will include technical studies and a revision of the Draft EIR.

The Draft EIR was prepared during preliminary design of the Jensen Solids Dewatering Facility and Lagoons project, and was circulated for public comment. Subsequently, a new project alternative was identified which includes a different on-site location for the solids dewatering facility. This new alternative will require additional environmental studies.

The up-front construction cost for this option is anticipated to range from \$28.5 million to \$34.5 million. In the future, the on-site dewatering facility will be expanded to support the plant's full 750-mgd capacity.

Project Milestone

July 2012 – Final recommendation to Metropolitan's Board to proceed with solids handling facilities for the Jensen plant.

	6/5/2012
_____ Gordon Johnson Manager/Chief Engineer, Engineering Services	Date
	6/5/2012
_____ Jeffrey Kightlinger General Manager	Date