

- Review of Long-Term Delta Actions and Water Supply Planning Implications

Summary

Recent actions by the Department of Water Resources and U.S. Bureau of Reclamation to curtail pumping by the State Water Project (SWP) and Central Valley Project (CVP) to protect delta smelt underscores the incompatibility of how water is conveyed to meet much of California's needs and protection of Delta fisheries. While the recent shutdown was temporary, the underlying needs to better protect delta smelt and other fisheries is likely to threaten water deliveries with more prolonged supply curtailments resulting in serious economic consequences for the entire State.

In addition to the ongoing effort to resolve near-term issues, two efforts are in progress to develop long-term solutions in the Sacramento-San Joaquin Bay Delta system: the Bay Delta Conservation Plan (BDCP) and the Governor's Long-Term Delta Vision process. The BDCP is a voluntary effort initiated by water users working with state/federal fishery regulatory agencies and other non-governmental organizations to develop a conservation plan that will serve as the basis for long-term federal and state endangered species act permits for the SWP and CVP. The Governor's Delta Vision process is an effort to develop a specific long-term solution for addressing Delta resource conflicts, including conveyance, and a strategic plan for implementation.

Four Delta conveyance alternatives are currently being discussed in these two efforts:

1. Use of Existing Facilities
2. Eco-Crescent/Middle River Corridor Conveyance
3. Dual-Intake Facility (Eco-Crescent + Isolated Conveyance Canal)
4. Fully-Isolated Facility

On August 4, 2007, the Delta Vision Stakeholder Coordination Group submitted a report to the Blue Ribbon Task Force that narrowed their list of recommended alternatives for further analysis to the Eco-Crescent/Middle River Corridor Conveyance and the Dual-Intake Facility¹. In addition to these alternatives, the Blue Ribbon Task Force reviewed a total of 29 alternatives.

Both the BDCP and the Delta Vision process are targeting a preferred alternative recommendation by the end of 2007. While these are independent efforts, there is significant overlap and coordination between these processes.

Metropolitan's Board approved a Delta Action Plan in June 2007 that provides a framework for actions to reduce near-term and longer-term risks in the Delta. This report provides more detailed information on the potential long-term actions, and the water supply planning implications.

Detailed Report

Delta Alternatives Under Consideration

Four alternatives are currently being discussed in the BDCP and the Delta Vision Process. The alternatives are:

1. Use of Existing Facilities – Current water conveyance through the Delta would be unchanged. Key levees would be strengthened to reduce seismic and flood vulnerability. Habitat restoration would occur mainly outside the Delta in the Cache Slough/Yolo Bypass and Suisun Marsh regions. Water project operations/pumping would be constrained to address conflicts with in-Delta native fisheries. Certain levee and habitat improvements in this alternative are common to all alternatives under discussion.
2. Eco-Crescent/Middle River Corridor Conveyance – In this alternative, efforts would be focused on reducing the effects on export pumping and separating and enhancing habitat for the endangered delta smelt and other native fish. Operable barriers would be installed on key east-west channels in the south Delta to create enhanced fishery habitat in the southwestern Delta along the Old River corridor, and establish a separate

¹ No official, agreed upon names have been defined for these alternatives.

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water conveyance corridor with moderate upgrade to levees along the middle portion of the Delta through Middle River. A potential siphon is being analyzed that would convey water under Old River to the SWP/CVP pumps. The improved habitat established along the Old River corridor would benefit San Joaquin salmon fish migration down Old River to the ocean, and provide delta smelt protection.

3. **Dual-Intake Facility** – This alternative would build on Alternative 2 with the addition of a screened intake, isolated conveyance facility from the Sacramento River to the export pumps and moderate upgrades to levees forming the Eco-Crescent/Middle River Corridor. Discussion of sizing of the isolated facility ranges from about 3,000 cfs up to 23,000 cfs. If adequately sized, this proposal would provide flexibility to pump at either the south Delta location or the Sacramento River to avoid fishery impacts and improve supply reliability.
4. **Fully-Isolated Facility** – This alternative would include a larger-capacity isolated facility (15,000 cfs or greater) designed to transport the entire SWP/CVP project demand from the Sacramento River to the export aqueducts in the south Delta. Fishery habitat improvements could be expanded Delta-wide as export conflicts would be reduced under this alternative. Fewer and less intensive levee improvements would be necessary to protect water quality and supply reliability.

Preliminary Evaluation of Alternatives

Each of the alternatives discussed herein are currently being modeled and analyzed to identify the water quality, water supply, and environmental benefits and costs. In some cases, only qualitative information is available to date. The following is a summary of the current analyses.

Alternative 1 – Use of Existing Facilities

- **Performance and Implications** – This alternative maximizes use of existing facilities and attempts to manage fish/pumping conflicts through enhanced real-time project operation and limited in-Delta habitat improvements. Water supply and ecosystem performance for this alternative would be poor relative to other alternatives. Based on ranges of proposals for near-term operations of the existing system, up to 50 percent of the currently available SWP supply could be reduced under this alternative. Ecosystem restoration options would be limited to the periphery of the Delta to avoid adverse impacts of pumping. Near and long-term vulnerability from seismic risk and sea-level rise would remain.
- **Supporters** – In-Delta interests generally prefer the existing water infrastructure, modified through fortified levees to reduce the vulnerability to flooding and earthquake outages and enhance protection of subsided in-Delta islands. Environmental interests on the Stakeholder Coordination Group generally did not support this alternative since it did little for resolving the conflict between fisheries and water supply conveyance.



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Alternative 2- Eco-Crescent/Middle River Corridor Conveyance

- **Performance and Implications** – This alternative offers improved ecosystem and water supply functions over current Delta configurations by providing some separation of conveyance and ecosystem functions of the Delta. Creation of an area within the Delta that is favorable to delta smelt and other native fisheries and one in which salinity and turbidity could possibly be varied allowing for habitat experiments that mimic historic natural/estuarine conditions. Additionally, by building a siphon under Old River, the export projects can reduce take of San Joaquin River water, which under current conditions only reaches the western Delta under wet conditions, and would provide a more favorable environment for San Joaquin River salmon populations. Ecosystem restoration options expand under this alternative to include the San Joaquin/Old River corridor and areas westward within the Delta. Further analysis will need to be conducted to address potential concerns regarding San Joaquin and Mokelumne River salmon migration.
- Export water quality would be modestly improved over operation of the existing system. Export supplies would be constrained due to Middle River channel capacity. In-Delta water quality for farming interests in the southwestern Delta is currently being analyzed. Any negative water quality impacts could be alleviated by provided water supply connections to the Middle River corridor. Contra Costa Water District's intake on Old River near Highway 4 would not be impacted. CCWD's Old River intake location is in the process, pending environmental documentation approval, of being moved to Middle River. Seismic vulnerability of this alternative is reduced from the current configuration, with the operable channel barriers providing hydraulic protection and allowing for strategic levee improvements.
- **Supporters** – Water and business community interests active in the Delta Vision process are supporting this alternative as a first step in a more comprehensive and overall linked Delta solution. Within the Delta Vision Stakeholder Coordination Group process, environmental and in-Delta support is growing. Most of the investments here would not be abandoned with some type of isolated facility.



Alternative 3 – Dual-Intake Facility

- **Performance and Implications** – Building on Alternative 2, this alternative would provide significant improved water supply security and reliability, quality, and ecosystem benefits over Alternative 2 alone. Additional habitat restoration in the central and southern Delta could be accommodated under this alternative that cannot be implemented under the existing conveyance system. The flexible intake location would allow for reducing conflicts with migrating salmon and other in-Delta fish species while maintaining reliable water supplies for the Bay Area, Central Valley, Central Coast, and Southern California. Opportunistic flood flows on both the Sacramento and San Joaquin Rivers could be captured under a dual-intake approach. Risks due to threats from seismic-induced flooding and sea level rise would be reduced. Water quality would be improved. The size of the conveyance canal should be designed to optimize water supply and

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habitat/fisheries benefits. This includes taking advantage of higher flood flows on the Sacramento River to maximize opportunities for adaptively managing export operations to meet multiple objectives.

- **Supporters** – Water and business community groups participating in the Delta Vision and BDCP processes currently see this alternative as very promising from an environmental, supply reliability, and water quality standpoint. In-Delta interests are largely opposed to the isolated facility component. Some environmental organizations have supported that this alternative move forward for further analysis including governance, operational parameters, and financing options.



Alternative 4 – Fully-Isolated Facility

- **Performance and Implications** – A fully isolated system reduces conflicts between water conveyance operations and fishery habitat, with delta smelt, splittail, and long-fin smelt. However, additional analysis would be needed to ensure a single intake on the Sacramento River would not impact migrating salmon. Habitat restoration opportunities would expand to the entire Delta under this alternative. This alternative would also provide the best export water quality. A single-intake would likely require a larger conveyance canal (as opposed to a Dual-Intake System) to maintain historic water supply reliability. In-Delta water quality would likely be managed at levels equivalent to pre-project levels.
- **Supporters** – Several fishery biologists believe this alternative is superior from a fisheries perspective. Some water interests believe it provides the lowest fishery conflict, most seismically secure supply, addresses sea-level rise implications, and optimizes export water quality. It is opposed by In-Delta interests and a number of environmental organizations.



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Cost Comparison

Cost estimates are at a reconnaissance or pre-feasibility level of detail. The Eco-Crescent/Middle River Corridor concept that includes some levee improvements and operable tidal gates is expected to range from \$0.1 to 0.4 billion. A fully isolated system that includes new intake screens, 13 siphons, and a 42-mile open water canal is estimated at \$3.3 to 3.8 billion. A Dual-Intake Facility that includes both the Eco-Crescent and an Isolated Conveyance Canal on the eastern-side of the Delta is estimated at \$3.8 to \$4.4 billion. A western alignment of an isolated conveyance canal ranges from \$6.4 to 7.5 billion. These estimates do not include ecosystem restoration/mitigation actions or other investments that might be a part of a long-term negotiated package of actions.

Water Quality Management

In-delta and export water quality will likely be an issue relative to decisions on any alternative. Implementation of any of the alternatives, beyond existing facilities, will likely require State Water Resources Control Board approvals. Positive actions are being taken to improve San Joaquin River quality. Preliminary water quality modeling of the Eco-Crescent/Middle River Corridor shows reductions in bromide from about 200 ug/l to 175 ug/l (~5 percent reduction), and salinity from about 235 mg/l to 220 mg/l (5 percent reduction). Preliminary water quality modeling of the Dual-Intake Facility shows reductions in bromide from about 200 ug/l to 145 ug/l (56 percent to 90 percent reduction), and salinity from about 235 mg/l to 70 mg/l (32 percent to 57 percent reduction) assuming a 10,000 cfs isolated Sacramento River intake.

Water Supply Reliability

Metropolitan's Board current policy direction is to ensure reliable water supplies consistent with existing export levels identified in DWR's 2005 SWP Reliability Report. Future demands on Metropolitan would be met through conservation local resource improvements and other water management actions. Based on the reconnaissance level feasibility analysis, the dual-intake facility and fully isolated facility would provide the most reliable water supply for the SWP.

Environmental Enhancement

A series of potential near-term environmental actions in the Delta are currently being discussed and assembled by water agency and environmental groups to assist in stabilizing the key fishery declines in the Delta ecosystem. This collaborate process could also lead to focused development of additional longer-term ecosystem restoration improvements. Candidate areas for habitat restoration projects include: the Yolo Bypass; Suisun Marsh; Dutch Slough; Cache Slough; McCormack Williamson Tract; and others.

In addition to ecosystem and endangered species benefits, well-designed interim habitat restoration projects could provide levee stability and land settlement prevention benefits. By helping to address the pelagic organism decline, they could also indirectly provide water supply reliability benefits.

Land Use

Additionally, restoration projects could sequester carbon and help mitigate climate change impacts.