

- **Board of Directors**
Water Quality and Operations Committee

September 11, 2007 Board Meeting

8-3

Subject

Appropriate \$5.91 million; and authorize (1) chlorination and aqueduct isolation projects; and (2) increase of \$425,000 to the agreement with Environmental Science Associates, for Phase II of the Quagga Mussel Control Program (Approp. 15447)

Description

The discovery of quagga mussels in the Colorado River has prompted a series of response actions from Metropolitan to conduct surveillance and to implement mitigation strategies for the control of mussel populations within Metropolitan's raw water conveyance system. This action authorizes Phase II of the Quagga Mussel Control Program (QMCP), including two Capital Investment Plan (CIP) projects and an amendment to an existing agreement in support of a comprehensive, multi-year approach for quagga mussel management.

Background

Quagga mussels, a species related to zebra mussels, were discovered on January 6, 2007 at Lake Mead by the 100th Meridian Initiative Zebra Mussel Volunteer Monitoring Program (Initiative). In immediate response to the Lake Mead finding, the California Department of Fish and Game (Fish and Game) created a multi-agency task force to address this issue with Metropolitan as one of its members. The initial objective of the task force was to conduct a survey of the Colorado River to ascertain the extent of the quagga colonization. Divers from Fish and Game, the National Park Service, and Metropolitan completed a survey of Lakes Mead, Mohave and Havasu in February 2007. Quagga mussels were detected at low densities in all of these lakes and in the intake of the Central Arizona Project. The quagga mussels were detected at depths between 35 to 40 feet, which may explain why previous monitoring of the Colorado River, which focused on zebra mussels, did not provide earlier warning of the infestation. Unlike zebra mussels, quagga mussels tend to favor deeper depths and darker environments. During this initial surveillance, Metropolitan's divers detected quagga mussels at Whitsett Intake Pumping Plant (Intake) and at Gene Wash Basin, but not at Copper Basin. Divers did not detect quagga mussels at Lake Skinner, Diamond Valley Lake (DVL) or Lake Mathews. Based on the low colonization levels and the age of mussels detected in Metropolitan's system during January and February 2007, U.S. Fish and Wildlife Service biologists believed that the infestation in Metropolitan's system was in its very early stages. In response to the quagga mussel infestation, Metropolitan's Board authorized Phase I of the QMCP in February 2007. The Phase I objectives of the program addressed immediate needs for monitoring, coordination and mitigation, and purchase of equipment for surveillance, monitoring and decontamination of Metropolitan's boats.

A thorough surveillance of the Colorado River Aqueduct (CRA) was conducted during a previously scheduled 21-day maintenance shutdown of the CRA in March 2007. Quagga mussels were found at Intake, Gene Wash Basin, Copper Basin, and siphons within the first 21 miles of the CRA. The mussels were detected in low numbers (2-10 per square meter) and were confined to the concrete walls of the siphons. In response to these findings, detected mussels were removed, major portions of the aqueduct canals were dried out, and 68 of the 144 siphons in the CRA were dewatered and inspected. In addition, shortly after flows were re-established, the CRA was "shock chlorinated" (i.e., adding high concentrations of chlorine over a short period of time) at nine locations between miles 5 and 120. Metropolitan routinely conducts shock chlorination monthly at eight locations for control of algae and Asiatic clams.

During the March inspections, divers did not detect mussels at Lake Mathews, DVL or Lake Skinner. In anticipation of quagga mussel spawning in the Colorado River, shock chlorination was increased to once per week

commencing in early April at the Copper Basin outlet in order to reduce the spread of veligers (mussel larvae) in the CRA.

Inspections of the CRA in June 2007 found that mussels had penetrated further into the CRA, with detections up to 125 miles west of Intake. The inspections revealed mussels at Intake, Iron Mountain and Hinds pumping plants. At Intake, mussels were found at densities of 500 per square meter with progressively lower concentration at Iron Mountain and Hinds. This recent proliferation is attributed to the spring spawning of quagga mussels in Lakes Mead and Mohave. No adult mussels or veligers were detected in Lake Mathews during the inspections conducted in June.

In order to assess the extent of infestation within the CRA, a second CRA shutdown was conducted in late July 2007. A complete shutdown was necessary to access pumps and tunnels for inspection. The shutdown was also used as a control strategy to kill established adult mussels in canals and within dewatered pumps and siphons. Inspections during the July shutdown revealed low numbers of mussels at the Lake Mathews inlet and at the Lake Skinner inlet and outlet tower. Continuous chlorination at the outlets of Copper Basin and Lake Skinner was initiated to control the transport of veligers. The chlorination facilities at Copper Basin include a temporary sodium hypochlorite system using leased tractor-trailers to provide on-site storage.

Assembly Bill 1683

Assembly Bill 1683 (AB 1683) was introduced by Assembly Member Wolk for the purpose of increasing the authority of Fish and Game to control dreissenid (Zebra and Quagga) mussels. The bill, if signed by the Governor on or before October 14, 2007, would provide Fish and Game the authority to inspect and quarantine boats and trailers (referred to as fishing and recreational conveyances in AB 1683) and restrict access or order closure of recreational facilities in waters that may contain dreissenid mussels. The bill would exempt water supply systems as long as they have prepared and implemented a prescribed plan to control mussels. The bill would also require that the discovery of mussels be immediately reported to Fish and Game.

Metropolitan's Quagga Mussel Control Program

Metropolitan's QMCP is a comprehensive plan that incorporates enhanced detection, surveillance, and mitigation strategies. The QMCP will be conducted in at least three phases. Phase I addressed immediate quagga mussel detection, surveillance, and mitigation strategies for the first seven months of the mussel infestation. The results of Phase I are being used to prioritize infrastructure upgrades and to develop a control plan for later phases of the QMCP. Phase II consists of a comprehensive, multi-year approach for mussel management, and Phase III will address long-term needs and cost minimization strategies.

Results of Phase I of the QMCP

The objectives of Phase I of the QMCP have been to address immediate quagga mussel detection, surveillance, and mitigation strategies. During Phase I, staff developed a surveillance program for Metropolitan's source water conveyance system through inspections by divers and maintenance personnel for adult mussels, and detection of larvae by water sampling and analysis. As part of this effort, staff hosted a workshop addressing quagga mussel sampling and analysis. Participants at this workshop included the Department of Fish and Game, U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, California Department of Water Resources, Los Angeles Department of Water and Power, and the city of San Diego. In addition, Southern Nevada Water Authority and Portland State University (the laboratory for the Initiative) also attended and discussed their monitoring programs.

During Phase I of the QMCP, staff developed in-house capability to conduct veliger analyses, and conducted a vulnerability assessment of Metropolitan's raw water conveyance system to establish a risk-based prioritization of facilities for preventive infrastructure upgrades and for control measures. The information obtained through the vulnerability assessment was used to prioritize actions for Phase II. Also during Phase I, a comprehensive plan for management of invasive mussels was developed with input from Fish and Game, U.S. Fish and Wildlife Service, scientists from the Center for Lakes and Reservoirs of Portland State University, the Great Lakes Water Institute, and the U.S. Bureau of Reclamation. Finally, a temporary chlorine feed system was installed during Phase I to treat flows at the outlet of Copper Basin on a continuous basis. This temporary sodium hypochlorite-based chlorination system employs leased tractor-trailers to provide on-site chemical storage.

Proposed Capital Facilities for Phase II of the QMCP**Permanent Chlorination Systems at the Outlets of Copper Basin, Lake Mathews and DVL – Conceptual and Preliminary Design (\$1,235,000)****Interim Chlorination Systems at the Outlets of Copper Basin and Lake Mathews – Design and Construction (\$4,288,000)**

The presence and spawning of quagga mussels in the Colorado River from Lake Mead through Lake Havasu poses a threat to Metropolitan due to the potential to continuously seed the CRA with veligers. While the presence of adult quagga mussels in the CRA and the potential for production of veligers within Copper Basin and Gene Wash Basin are of concern, staff believes that measures can be implemented to minimize the adverse impacts of these organisms. To control veliger transport through the CRA, it is essential that continuous chlorination be maintained at the outlet of Copper Basin.

As an interim measure, a temporary continuous chlorine feed system was installed at Copper Basin during Phase I of the QMCP. This temporary system is recommended to be replaced with a permanent system in two stages. The first stage will consist of immediate upgrades to the automation, chemical storage and feed, and safety features of the facility, and replacement of the leased tractor-trailers with two 15,000-gallon sodium hypochlorite tanks. The second stage will involve conceptual and preliminary design of permanent chlorination facilities at Copper Basin.

While efforts are underway to control the spread of quagga mussels entering the CRA, Metropolitan's reservoirs are also vulnerable to infestation via the State Water Project or from contaminated recreational boats. Final provisions in AB 1683 may require that water purveyors implement actions to limit the spread of quagga mussels. Installing chlorination systems at key Metropolitan reservoirs will be a critical step to minimize the spread to downstream users and to potentially meet requirements of AB 1683. Consequently, staff recommends that permanent chlorination facilities be provided at the outlets of Lake Mathews and DVL.

Lake Skinner is currently Metropolitan's only reservoir with a permanent, fully operational outlet chlorination system. Previously, a chlorination facility at Lake Mathews had included a gaseous chlorine-based feed system. However, this system has not been operated for many years, the equipment is in disrepair, and the operating permits have expired. In addition, the Lake Mathews facilities were not designed for continuous operation and would not meet current fire code regulations for gaseous chlorine systems. DVL does not have outlet chlorination capability.

This action appropriates \$5,523,000 in unbudgeted funds and authorizes: upgrade of the Phase I Copper Basin chlorination facility; construction of interim chlorination facilities at Lake Mathews; and conceptual and preliminary design of permanent chlorination systems at the outlets of Copper Basin, Lake Mathews, and DVL. The use of sodium hypochlorite, chlorine dioxide, calcium hypochlorite, and gaseous chlorine will be considered for these locations as part of the conceptual and preliminary design efforts. Sodium hypochlorite has been selected as the interim chlorination chemical because of its relatively easier handling and dispensing properties, and less stringent permitting requirements.

The requested funds include \$1,235,000 for conceptual and preliminary design of the permanent chlorination systems. For the interim chlorination systems, the amount requested is \$4,288,000, which includes \$3,225,000 for construction; \$460,000 for final design; \$216,000 for project management, permitting, and field investigations; and \$387,000 for remaining budget.

Construction of the upgrades, along with all conceptual and preliminary design work, will be performed by Metropolitan staff. As part of the preliminary design effort, environmental documentation and a construction cost estimate will be prepared. Staff recommends that environmental support be provided by Environmental Science Associates, as discussed below. Staff's preliminary assessment is that an environmental impact report will be required for the chlorination facilities.

Isolation Barriers at Whitsett Intake Pumping Plant and at Selected Locations along the Colorado River Aqueduct – Conceptual Design (\$387,000)

In order to conduct spot-chlorine or molluscicide treatments along the CRA, segments of the aqueduct and pumping plants must be shut down. Hydraulic isolation barriers such as drop-gates, valves, floating bulkheads, or stop-logs may be utilized to isolate segments for treatment, avoiding a complete shutdown of the CRA. For example, isolation gates are currently used to isolate siphons along the aqueduct while partial flows are maintained through a parallel siphon.

A barrier at Intake is needed to isolate the CRA system from the Colorado River. This isolation barrier would provide physical separation from Lake Havasu to allow chlorine or molluscicide treatments at the intake structure. In addition, by installing isolation barriers at strategic locations along the aqueduct and at the pumping plants, Metropolitan would be able to continue limited water deliveries during treatments for quagga mussel control.

This action appropriates \$387,000 in unbudgeted funds and authorizes conceptual design of isolation barriers at Intake and at strategic locations along the CRA. Conceptual design of isolation barriers will include field investigations and surveys along the CRA, geotechnical assessments of barrier alternatives, identification of equipment needs to install and remove isolation barriers, and development of budgetary cost estimates. All work will be performed by Metropolitan staff.

Amendment to Agreement for Preparation of Environmental Documentation

Environmental Science Associates (ESA) is recommended to provide environmental permitting services and to prepare environmental documentation for the QMCP. ESA was selected through a competitive process (Request for Proposals No. 763), and a professional services agreement in the amount of \$245,000 was initially executed under the General Manager's authority per Metropolitan's Administrative Code. Due to the specialized nature of the work, no Small Business Enterprise participation was established for this agreement.

This action authorizes an increase of \$425,000 to the existing agreement with ESA, for a new not-to-exceed total of \$670,000, to prepare environmental documentation for permanent chlorination facilities at the outlets of Copper Basin, Lake Mathews, and DVL.

Proposed New Operations and Maintenance Activities for Phase II of the QMCP

Review of Mobile Chlorination Equipment

Continuous chlorination of the water entering the CRA from Copper Basin is essential to control the spread of veligers. However, chlorine residuals dissipate within a few miles downstream of Copper Basin. Chlorination at other strategic locations along the CRA, such as siphons, tunnels and other infrastructure not amenable to desiccation, will be necessary to control mussel proliferation from previously attached adult populations. Thus, a comprehensive mussel control plan must include the capability for short-term chlorine application using mobile chlorination equipment.

Exposure to chlorine has been shown to be effective for the control of adult mussels when consistently applied for 14 to 21 days. This ability to chlorinate a targeted facility for short durations (two to three weeks) using mobile chlorination equipment will enhance Metropolitan's ability to control mussel growth. Over the next several months, staff plans to evaluate mobile chlorination equipment and will select the most appropriate equipment for this specific application. Use of sodium hypochlorite and calcium hypochlorite will be considered as part of this effort.

No additional funds are requested at this time. Staff will return to the Board at a later date to request an increase of the 2007/08 operating equipment budget to purchase the appropriate mobile chlorination equipment.

Enhanced Water Craft Inspections

The most likely source of quagga mussels in the Colorado River system was trailered watercraft coming from infested waters in the Eastern U.S. As noted previously, AB 1683 will provide Fish and Game increased authority to control the invasive species. Until the legislation and subsequent regulations are finalized, staff recommends that Metropolitan proactively improve its interim watercraft inspection program at DVL and at Lake Skinner. The

recommended boat inspection program would consist of: (1) A training course recognized by the National Association of State Boating Law Administrators (NASBLA) and by many state and federal fish and wildlife agencies, which is specifically designed to educate recreational facility and marina staff on how to inspect and decontaminate boats; and (2) Requesting the operators at DVL (Urban Parks Concessionaires) and at Lake Skinner (county of Riverside) to upgrade the quagga mussel watercraft inspections to NASBLA standards. Once Fish and Game develops regulations in response to AB 1683, staff will return to the Board with further recommendations, if necessary, to comply with the new regulations and to protect Metropolitan's reservoirs from the spread of quagga mussels.

No additional funds are requested at this time. The training and upgraded inspections are budgeted under fiscal year 2007/08 operations and maintenance (O&M) funds.

Development of Integrated Pest Management Strategies and Evaluation of Alternative Control Strategies

Integrated Pest Management (IPM) is a strategy developed by the U.S. Department of Agriculture to provide a science-based decision-making process that identifies and reduces risks from pests and pest management-related strategies. While IPM was originally conceived to control food/crop-associated pests (e.g., insects), Fish and Game, U.S. Fish and Wildlife Service, and Metropolitan are collaboratively developing a similar approach that can be used to address quagga mussel infestation. Specifically, staff plans to evaluate tactical IPM control measures aimed at: (1) Changing environmental conditions in the CRA or in Metropolitan's reservoirs that will promote a suboptimal or antagonistic environment for quagga mussel attachment, growth or proliferation; (2) Identifying physical or mechanical processes to deter attachment or remove quagga mussels from surfaces; (3) Promoting the use of biological controls such as predators, parasites or diseases targeted to suppress or kill larvae or adult quagga; and (4) Applying oxidative chemical controls (i.e., chlorine) or non-oxidative controls (i.e., molluscicides). Limnological and flow pattern studies will be conducted to assess the feasibility of modifying environmental conditions such as oxygen demand, temperature, and pH to control mussels in Metropolitan's reservoirs. In addition, studies of surface treatments which may deter attachment, and of molluscicide use, will be conducted under laboratory and field conditions. The results of these studies will be used to design infrastructure improvements for long-term management of quagga mussels.

Although IPM provides a framework for activities over several years, immediate actions will need to be prioritized in response to the progress of the infestation over time, and resources will need to be focused on the locations most affected. In addition, IPM strategies will need to be adapted to address the various components of Metropolitan's conveyance system. Based on an initial vulnerability assessment, Metropolitan's system can be divided into five separate environments for mussel colonization: (1) Whitsett Intake pumping plant; (2) Pumps and adjoining pipes at the other pumping plants; (3) Open canals; (4) Siphons and tunnels; and (5) Reservoirs. Each of these components provides a different environment for colonization by quagga mussels; thus, specific control tactics will be developed and applied accordingly.

No additional funds are requested at this time. The studies in support of the IPM approach will be conducted over the next two fiscal years using budgeted O&M funds.

Collaborations with Federal, State, Local and Member Agencies

Quagga mussels have rapidly spread in the Southwestern U.S. and have been detected in Arizona, Nevada, Utah and California. A regional effort is needed to control the quagga population in the Colorado River, its tributaries, and the water intakes and conveyance systems of multiple Colorado River water users. In order to facilitate this regional coordination, Metropolitan staff is working with the U.S. Fish and Wildlife Service (the agency with jurisdiction over the river) to establish a Colorado River Quagga Mussel Coalition in conjunction with other stakeholders including Arizona Department of Water Resources, Southern Nevada Water Authority, and Coachella Valley Water District, to address the quagga infestation. The coalition will also collaborate with Fish and Game representatives from the affected states to review feasible mussel control strategies in the Colorado River and to propose short- and long-term approaches. Staff has also worked with the California Department of Water Resources to establish a monitoring and response program for quagga mussels in the State Water Project system. As part of the regional effort to control quagga mussels, staff will hold a technical workshop for

Metropolitan's member agencies on September 13, 2007 to provide technical assistance and guidance for monitoring, response and control strategies for quagga mussels.

Summary

This action appropriates \$5.91 million for chlorination facilities at Copper Basin, Lake Mathews and DVL, and for isolation barriers along the CRA, and authorizes an increase of \$425,000 to the existing agreement with ESA for permanent chlorination facilities at the outlets of Copper Basin, Lake Mathews, and DVL.

These projects have been evaluated and recommended by Metropolitan's CIP Evaluation Team. Funds for this work were not included in the fiscal year 2007/08 capital budget because the budget was adopted prior to the detection of quagga mussels during the CRA shutdown in July 2007. Upon approval of this action, the fiscal year 2007/08 capital expenditure plan will be adjusted to reflect the Phase II QMCP activities. See [Attachment 1](#) for the Financial Statement, and [Attachment 2](#) for the Location Map.

Policy

Policy Principle on Source Water Quality Protection, M.I. 42820, February 10, 1998

Policy Principle on Watershed Management, M.I. 43964, April 11, 2000

Policy Principle on Water Quality, M.I. 46191, April 12, 2005

Metropolitan Water District Administrative Code Section 5108: Appropriations

California Environmental Quality Act (CEQA)

CEQA determinations for Option #1:

Interim Chlorination Systems at the Outlets of Copper Basin and Lake Mathews - Design and Construction

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed project involves the funding and minor alterations of existing private or public facilities, along with the construction of minor appurtenant structures, with minor modifications in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees. These activities would result in negligible expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed action qualifies under Class 1, Class 3, and Class 4 Categorical Exemptions (Sections 15301, 15303, and 15304 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under three Categorical Exemptions (Class 1, Section 15301; Class 3, Section 15303; and Class 4, Section 15304 of the State CEQA Guidelines).

Permanent Chlorination Systems at the Outlets of Copper Basin, Lake Mathews and DVL - Conceptual and Preliminary Design; Isolation Barriers at Whitsett Intake Pumping Plant and at Strategic Locations along the CRA - Conceptual Design

The proposed actions are categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities involve the funding, studying, carrying out preliminary design, and preparing and processing environmental documentation for the proposed actions. These activities consist of basic data collection and resource evaluation activities that do not result in a serious or major disturbance to an environmental resource. This may be strictly for information gathering purposes, or as part of a study leading to an action, which a public agency has not yet approved, adopted, or funded. In addition, the activities may involve a check for performance of an operation, or quality, health, or safety of a project. Accordingly, the proposed action qualifies for both Class 6 and Class 9 Categorical Exemptions (Sections 15306 and 15309 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed actions qualify under two Categorical Exemptions (Class 6, Section 15306; and Class 9, Section 15309 of the State CEQA Guidelines).

Amendment to Agreement for Preparation of Environmental Documentation

The proposed action is not defined as a project under CEQA because it involves continuing administrative activities (Section 15378(b)(2) of the State CEQA Guidelines). In addition, the proposed action is not subject to CEQA because it involves other government fiscal activities, which do not involve any commitment to any specific project which may result in a potentially significant physical impact on the environment (Section 15378(b)(4) of the State CEQA Guidelines).

The CEQA determination is: Determine that the proposed action is not subject to the provisions of CEQA pursuant to Sections 15378(b)(2) and 15378(b)(4) of the State CEQA Guidelines.

CEQA determinations for Option #2:

Interim Chlorination Systems at the Outlets of Copper Basin and Lake Mathews - Design and Construction

The CEQA determination is: The same as Option #1

Isolation Barriers at Whitsett Intake Pumping Plant and at Strategic Locations along the CRA - Conceptual Design

The CEQA determination is: The same as Option #1

Permanent Chlorination Systems at the Outlets of Copper Basin, Lake Mathews and DVL - Conceptual and Preliminary Design; Amendment to Agreement for Preparation of Environmental Documentation

The CEQA determination is: None required

CEQA determinations for Option #3:

Isolation Barriers at Whitsett Intake Pumping Plant and at Strategic Locations along the CRA - Conceptual Design

The CEQA determination is: The same as Option #1

Interim Chlorination Systems at the Outlets of Copper Basin and Lake Mathews – Design and Construction; Permanent Chlorination Systems at the Outlets of Copper Basin, Lake Mathews and DVL - Conceptual and Preliminary Design; Amendment to Agreement for Preparation of Environmental Documentation

The CEQA determination is: None required

CEQA determination for Option #4:

None required

Board Options

Option #1

Adopt the CEQA determinations and

- a. Appropriate \$5.91 million;
- b. Authorize design and construction of interim chlorination facilities at Copper Basin and Lake Mathews;
- c. Authorize conceptual and preliminary design of permanent chlorination facilities at Copper Basin, Lake Mathews and DVL;
- d. Authorize conceptual design of isolation barriers at Intake pumping plant and at strategic locations along the CRA; and
- e. Authorize increase of \$425,000 to the existing agreement with Environmental Science Associates, for a new not-to-exceed total of \$670,000.

Fiscal Impact: \$5.91 million of unbudgeted funds under Approp. 15447

Business Analysis: This option will increase quagga mussel control efforts to protect critical infrastructure including the Colorado River Aqueduct, Lake Mathews, Lake Skinner, and DVL.

Option #2

Adopt the CEQA determinations and

- a. Appropriate \$4,675,000;
- b. Authorize design and construction of interim chlorination facilities at Copper Basin and Lake Mathews;
- c. Authorize conceptual design of isolation barriers at Intake pumping plant and at strategic locations along the CRA;
- d. Do not authorize conceptual and preliminary design of permanent chlorination facilities at Copper Basin, Lake Mathews and DVL; and
- e. Do not authorize amendment of the agreement with Environmental Science Associates.

Fiscal Impact: \$4,675,000 of unbudgeted funds under Approp. 15447

Business Analysis: This option would construct interim chlorination facilities to protect critical infrastructure including the CRA, Lake Mathews, Lake Skinner, and DVL. These interim facilities would require continued purchase of sodium hypochlorite, which may incur higher O&M costs versus permanent chlorine facilities.

Option #3

Adopt the CEQA determinations and

- a. Appropriate \$387,000;
- b. Authorize conceptual design of isolation barriers at Intake pumping plant and at strategic locations along the CRA;
- c. Do not authorize design and construction of interim chlorination facilities at Copper Basin and Lake Mathews;
- d. Do not authorize conceptual and preliminary design of permanent chlorination facilities at Copper Basin, Lake Mathews and DVL; and
- e. Do not authorize amendment of the agreement with Environmental Science Associates.

Fiscal Impact: \$387,000 of unbudgeted funds under Approp. 15447. O&M costs associated with removal of mussels at the pumping plants and along the CRA would progressively increase over the next several years. In addition, future cost increases may be significant due to damaged infrastructure.

Business Analysis: Under this option, only O&M activities would be conducted to control quagga mussels until more is known about long-term effectiveness of control strategies. This option could result in significantly higher future costs if the increased infestation of quagga mussels increases throughout the CRA system.

Option #4

Do not authorize Phase II of the Quagga Mussel Control Program.

Fiscal Impact: O&M costs associated with removal of mussels at the pumping plants and along the CRA would progressively increase over the next several years. In addition, future cost increases may be significant due to damaged infrastructure.

Business Analysis: This option would forego an opportunity to address quagga mussel infestation and could result in significant cost increases and impaired water delivery.

Staff Recommendation

Option #1


Eddie A. Rigdon
Manager, Water System Operations

8/28/2007
Date


Jeffrey Kightlinger
General Manager

8/28/2007
Date

Attachment 1 – Financial Statement

Attachment 2 – Location Map

BLA #5580

Financial Statement for Quagga Mussel Control Program

A breakdown of Board Action No. 1 for Appropriation No. 15447 is as follows:

| | Board Action No. 1 (Sept. 2007) |
|---|--|
| Labor | |
| Studies and Investigations | \$ 473,900 |
| Preliminary Design | 274,500 |
| Final Design | 460,000 |
| Owner Costs (Program management, permitting, envir. documentation) | 339,400 |
| Metropolitan Force Construction | 1,645,600 |
| Materials and Supplies | 1,589,600 |
| Incidental Expenses | 17,000 |
| Professional/Technical Services | - |
| Environmental Science Assoc. | 425,000 |
| Geotechnical consultant | 110,000 |
| Value engineering consultant | 50,000 |
| Equipment Use | - |
| Contracts | - |
| Remaining Budget | 525,000 |
| Total | \$ 5,910,000 |

Funding Request

| | | | |
|-----------------------------------|---|----------------------------------|-----------------------------------|
| Program Name: | Quagga Mussel Control Program | | |
| Source of Funds: | Revenue Bonds, Replacement and Refurbishment or General Funds | | |
| Appropriation No.: | 15447 | Board Action No.: | 1 |
| Requested Amount: | \$ 5,910,000 | Capital Program No.: | 15447-S |
| Total Appropriated Amount: | \$ 5,910,000 | Capital Program Page No.: | N/A |
| Total Program Estimate: | \$ To Be Developed | Program Goal: | S-Supply and Delivery Reliability |

