

MEMORANDUM

To:

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Copies:

File

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From:

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City Project No:

5643

Date:

June 3, 2016

Arcadis Project No.:

05673009.0000

Subject:

Phasing of Improvements for Zebra Mussel Management

INTRODUCTION

It is our understanding that budget constraints limit the amount of funding allocated for zebra mussel management improvements to \$4,000,000 during CIP year 2017. Phasing of improvements as described below would allow design, construction and installation of key improvements to be accomplished as part of the 2017 CIP, with completion of the remaining improvements recommended in the Control, Operation and Maintenance Manual (Manual) for Zebra Mussels timed based upon the results of on-site monitoring.

PHASING OF IMPROVEMENTS:

Observations reported by Dr. Robert McMahon suggest that the population of zebra mussels in Lake Ray Roberts has “crashed”, as it did in both Lake Texoma and Lake Belton, and that it is uncertain as to whether a resurgence (and timing of it) will rival what occurred before the recent cleaning project was completed. Therefore, we recommend a phased approach to implementing the permanent facilities recommended in the Manual, based upon the results of monitoring by outside agencies and the City. Enhanced in-house monitoring is recommended moving forward, and a cost estimate for field and laboratory zebra mussel monitoring is provided at the end of this memorandum for consideration. Arcadis, in conjunction with Dr. McMahon, is currently conducting a similar training program for City of Dallas staff.

We recommend design and installation of the sodium permanganate system at the Lake Lewisville Water Treatment Plant (LLWTP) under the current (2017) CIP cycle as it can be used to replace the existing, labor-intensive, potassium permanganate system for pipeline maintenance and pre-oxidation, and also be used to manage zebra mussels, as necessary. The design should include provisions (e.g., building space, piping connections, vendor coordination, etc.) for the future installation of the copper ion system during the

following CIP cycle or when zebra mussel indicators are observed. Note that the copper ion chemical storage and feed systems are available as turnkey skids which could be connected to the pumps and piping installed as part of the 2017 CIP design and construction effort.

While at the Ray Roberts Water Treatment Plant (RRWTP), access improvements have been made that will ease physical removal efforts in the future, we recommend that proposed improvements to the raw water line be included as part of the 2017 CIP to allow easier access along with addition of a new water line for future cleaning events. In addition, we recommend that the temporary sodium permanganate system recently installed be utilized while design of permanent chemical feed systems takes place during the 2017 CIP cycle. Installation of permanent chemical feed facilities should be slated for inclusion in the 2018 CIP, contingent upon the degree of infestation observed in the coming year.

COST BREAKDOWN:

2017 CIP

LLWTP

Permanent Sodium Permanganate Feed System with Provisions for Future Copper Ion Skid:

Capital ¹	\$2,060,000
Design and Construction Admin	\$ 440,000

RRWTP

Permanent Sodium Permanganate and Copper Ion Feed Systems Design	\$ 200,000
Raw water line improvements and new water line for ease of cleaning	
Capital	\$ 750,000
Design and Construction Admin	\$ 150,000

Staff Training on Monitoring Techniques led by Arcadis

Interactive Field and Laboratory Training on Veliger and Adult Mussel Identification ²	\$ 20,000
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Total **\$3,620,000**

¹ The capital cost could be further reduced by approximately \$730,000 if the mid-level intake was constructed under another contract.

² Costs of Monitoring Equipment Including Microscope Not Included

2018 CIP

LLWTP

Copper Ion Skid Installation

Capital	\$ 300,000
Engineering Support	\$ 50,000

MEMORANDUM

RRWTP

Permanent Sodium Permanganate and Copper Ion Feed Systems

Capital	\$1,430,000
Construction Admin	\$ 130,000
Total	\$1,910,000