

**MWD**

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

October 5, 1993

(Special Committee on Water Quality and  
Environmental Compliance--Action)

To: Board of Directors (Finance and Insurance Committee--Action)  
(Engineering and Operations Committee--Action)

From: General Manager

Subject: Appropriation No. 670 for \$952,000 for the Procurement of a  
Replacement Mass Spectrometer

Report

The mass spectrometry instrumentation of the Water Quality Laboratory must be replaced to continue meeting Metropolitan's Strategic Plan objectives for water quality and to enable Metropolitan to play a key role in development of Stage 2 of the Disinfectants/Disinfection By-Product (D/DBP) Rule. The present mass spectrometer (MS), purchased in 1977, enabled Metropolitan to substantially influence the first stage of the D/DBP Rule, including avoiding granular activated carbon (GAC) as best available technology for organics contaminant control.

The research-grade MS that needs to be replaced, a Finnigan 4021, has an expected useful life of ten years. After 16 years of continual usage, it is essentially obsolete, in that it is no longer supported by the manufacturer, requires frequent repairs which must be made with scavenged rebuilt parts, and has limited capability. An appropriate analogy would be a personal computer purchased in 1977; today a system that had been purchased in 1977 would be considered obsolete.

Recently, the Federal D/DBP Negotiated Rulemaking ("Reg Neg") Committee has indicated a need for continued extensive research on DBPs. Monitoring and research data will be used for the D/DBP Information Collection Rule (ICR), beginning in 1994, and the Stage 2 D/DBP "Reg Neg" beginning in 1998 with far reaching effects. We need the new instrument to gather data necessary for Stage 2 regulatory decisions. Furthermore, the American Water Works Association Research Foundation is committing four million dollars per year for D/DBP research. The new MS will allow us to aggressively compete for these funds.

Past benefits of mass spectrometry-related projects are shown in Attachment 1. In addition to benefits realized in the Stage 1 D/DBP "Reg Neg", the present MS has played a significant role in establishing an effective Taste-and-Odor Control Program resulting in improved customer satisfaction. Also, during contamination threats and spills, rapid turnaround analyses have allowed fast return of service for effected bodies of water, thus maintaining public confidence in the water supply and water quality.

A cost benefit analysis of purchasing a new GC/MS compared with contracting with a university or commercial laboratory, indicated that it is more cost effective for Metropolitan to perform GC/MS research in-house. For example, the cost for developing methods for haloacetic acids, a group of compounds to be regulated in the Stage 1 D/DBP Rule, would have been 26 percent and 59 percent more expensive to develop through a university or a special consulting laboratory (Attachment 2). Based on the projected work for the ICR and Stage 2 D/DBP Rule, the payback time for the GC/MS is less than 6 years. This length of "payback" is likely to decrease because of grant money Metropolitan will seek from money made available for the D/DBP Rule.

It is proposed that Appropriation No. 670 be funded to purchase a replacement, up-to-date research grade MS. A table showing how the money would be spent is attached (Attachment 3). This capital project was included in the Fiscal Year 1993-94 budget.

#### Board Committee Assignments

This letter was referred for action to:

The Engineering and Operations Committee because of its authority with regard to plans, specifications, and bids pursuant to Administrative Code 2431 (a);

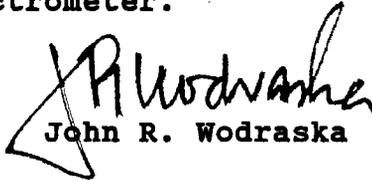
The Finance and Insurance Committee because of its authority over requests for authorization of appropriations pursuant to Administrative Code 2441 (d); and

The Special Committee on Water Quality and Environmental Compliance for consideration of water quality issues pursuant to Administrative Code 2551 (a) and (b).

Recommendation

ENGINEERING AND OPERATIONS, FINANCE AND INSURANCE, AND  
SPECIAL COMMITTEE ON WATER QUALITY AND ENVIRONMENTAL  
COMPLIANCE FOR ACTION

It is recommended that the Board authorize the appropriation of \$952,000 from the Pay-As-You-Go-Fund to finance the purchase, installation, and personnel training for a replacement mass spectrometer.

  
John R. Wodraska

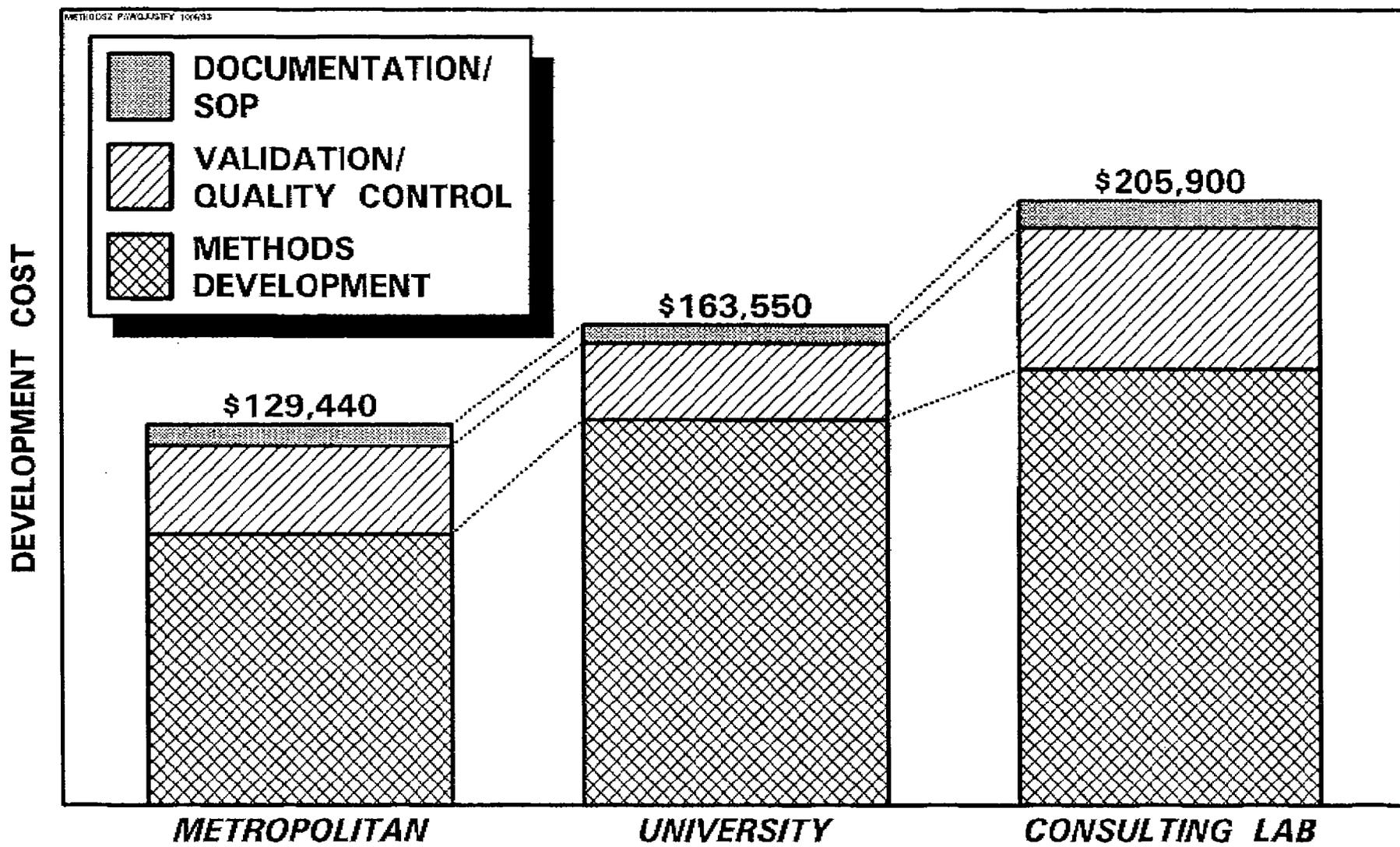
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Attachments

Attachment 1

Benefits of Past Mass Spectrometer Projects

<u>Item</u>	<u>Benefit</u>
Stage 1 D/DBP Rule	<ul style="list-style-type: none"><li>o Avoid spending \$2-4 billion for granular activated carbon.</li><li>o Input to Stage 1 "reg neg" process with reduction in future DBP maximum contaminant levels from &gt;25 to 7, saving at least \$7 million in future monitoring.</li></ul>
Taste and Odor	
MIB and Geosmin	<ul style="list-style-type: none"><li>o Establish effective taste and odor (T&amp;O) control program (saved \$1 million by doing analyses in-house over the last 10 years).</li><li>o Improve customer satisfaction by recommending timely operational changes to correct for T&amp;O episodes.</li></ul>
Ozone/PEROXONE Byproducts	
Cyanogen Chloride and Cyanogen Bromide	<ul style="list-style-type: none"><li>o Identify ozone byproducts and mitigate with treatment studies to ensure feasibility of ozone/PEROXONE process.</li><li>o Show advantage of ozone vs. GAC/membranes.</li></ul>
Emergency Response	
Broadscreen Analyses	<ul style="list-style-type: none"><li>o Provide rapid turnaround time allowing fast return of service for contamination threats and spills (value of concern for public health/safety/confidence as expressed by media undetermined).</li></ul>



**COMPARISONS OF METHODS DEVELOPMENT COSTS FOR HALOACETIC ACIDS**

ATTACHMENT 2

Attachment 3

Mass Spectrometer Replacement  
Capital Project No. 5-0323

Budget in 93/94 Dollars

<u>Personnel</u>	<u>Task</u>	<u>Work Hours Estimate</u>	<u>Cost Estimate</u>
<u>Labor</u>			
Water Quality	Instrument Evaluation, Spec. Writing, Selection	340	\$10,540
	Installation and Training	140	4,340
Environmental	Review, Environ Statement	10	310
Engineering	Review	160	4,960
Operations	Electrical & Room Modification	150	3,300
<u>Total Direct Labor</u>			\$23,450
Labor Additives	(45 percent of Direct Labor)		\$10,553
Equipment	Mass Spectrometer		\$775,000
Admin. Overhead	(80 percent of Direct Labor)		\$18,760
<u>Project Subtotal</u>			\$827,763
Contingency	(15 percent of Project Subtotal)		\$124,164
<u>Total Project Estimate</u>			\$951,927