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Staff Report Responding to Auditor's Report Dated October 5, 1994 Regarding Review of Certain Ultra-Low-Flush Toilet Agreements

Volume 1 of 2 volumes

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1. INTRODUCTION/BACKGROUND

A. CTSI Corporation

CTSI Corporation (CTSI) was formed in 1991 for the purpose of developing and implementing water conservation programs. CTSI is a women-business enterprise (WBE) and currently subcontracts a portion of its program implementation tasks to minority-business enterprises (MBE).

CTSI staff currently consists of nearly 40 professionals, of whom 83 percent hold college degrees. CTSI is headed by Lois and Jim Craft, whom together have more than 40 years of experience in new business development, sales, marketing, communications, physical distribution management, and association network development. As founder and President of the corporation, Ms. Craft oversees corporate operations, finance, resources, and staff. She is the force behind incorporating societal benefits into program implementation. Jim Craft previously served as Special Assistant for Energy Conservation with the U.S. Air Force and possesses another ten years of experience in international business and six years in agricultural and water conservation. Mr. Craft possesses a Masters of Business Administration from Harvard University.

A synopsis of the qualifications of other CTSI professionals engaged on the Program is included in Appendix A.

In addition to its work with Metropolitan, CTSI has recently undertaken an ultra-low-flush (ULF) toilet distribution program in New York City. The firm is also active in Atlanta, Georgia and Florida.

B. Evolution of the CTSI/Metropolitan Relationship

CTSI's first contract with Metropolitan was for the implementation of the Water-Wise '91 Program in response to the California drought. In that program, CTSI distributed over 800,000 low-flow showerheads and kits to residential customers. At the conclusion of the Water-Wise '91 Program, CTSI and the program were the subject of a comprehensive Metropolitan audit. That audit identified shortcomings in CTSI's inventory control system, which were subsequently corrected in anticipation of future contracts with Metropolitan.

In 1992, CTSI undertook a self-funded demonstration project to demonstrate the viability and feasibility of distributing ULF toilets through inner city community-based organizations (CBO). This successful project, using the Mothers of East Los Angeles (MELA) as the distribution vehicle, caught the attention of many in the water conservation field, including Metropolitan. CTSI's subsequent implementation of the ULF Toilet Replacement Pilot Program with Metropolitan was patterned after the earlier demonstration project.

C. ULF Toilet Program - Contractor Selection and Management

PHASES ONE AND TWO

Definition of the Program

Branch staff consistently considers and explores a variety of approaches for marketing devices to residential customers, among which are a number of ULF toilet rebate projects. Rebate projects, however, reach primarily those individuals who have the financial ability to purchase their new toilet and wait up to six or eight weeks for the $100 rebate from their water agency.

In response to Metropolitan's goal to make ULF toilets available to low- and moderate-income households (where it was predicted that water savings per installed ULF toilet would be higher), other approaches were investigated by staff. In mid-1992, CTSI invested their own resources and undertook a demonstration (pilot) project in the inner-city community. The project was designed to test the feasibility of distributing ULF toilets free of charge to residential customers through local CBOs. The demonstration project (funded solely by CTSI and rebates from the Los Angeles Department of Water and Power) proved to Metropolitan staff that the CBO concept for distributing water conservation devices was viable and more cost-effective than rebate projects.

Solicitation, Evaluation, and Selection of the Contractor

In late 1992, Metropolitan issued Request-for-Proposal (RFP) No. 061 for the *Retrofit of Residences with ULF Toilets*. The RFP called for proposers to:

> "...design and administer a pilot program for the retrofit of single and multi-family residences with ultra-low-flush toilets in the Metropolitan service area. Metropolitan is particularly looking for innovative programs that focus on the low income and minority communities."
>
> "Consultant will design and project manage a pilot program to warehouse, market, and distribute ultra-low-flush toilets, and to dispose of replaced toilets. The ultra-low-flush toilets will be provided by Metropolitan.
>
> "This pilot program will target the replacement of 100,000 toilets." *(RFP Scope of Work)*

CTSI responded to that RFP, was interviewed, evaluated, and ranked against two other proposers. The greatest weight in the ranking and selection process was given to the respondent's ability to effectively market the Program and organize CBOs. This

emphasis was dictated by the belief that the Program success was fully dependent upon marketing to residential customers. CTSI was clearly the superior respondent to the RFP and was awarded Phases One and Two of the ULF Toilet Retrofit Program (Program).

As a part of the contract negotiation process, the following adjustments were made to the scope of work:

- The contracted number of ULF toilet retrofits was established at the following level:

Phase One	25,000
Phase Two	50,000
TOTAL	75,000

- The contract included a performance incentive for achieving cost and volume goals. That incentive was based upon:

  - Achieving a maximum Program design, marketing, warehousing distribution, and management cost of $26.00 per ULF toilet distributed for Phase One and $16.25 in Phase Two.

  - Achieving a minimum verifiable volume of ULF toilet installations (as determined by customer-returned used toilets) of 25,000 in each phase.

- CTSI was required to purchase the first 10,000 ULF toilets for the Program to meet start-up timelines. Because of the difficulties in developing a Metropolitan procurement specification that met all of the member agency requirements and needs, Metropolitan was unable to proceed with competitive bidding for the initial Program ULF toilets. Metropolitan intended to purchase all subsequent Program requirements once the specification was available.

Letter Agreement No. 3826 for Phases One and Two of the Pilot Program was reviewed and approved by Metropolitan Legal Counsel; it was subsequently executed by CTSI and Metropolitan in November 1992. The term of the agreement commenced on October 26, 1992 and concluded on June 30, 1994. A copy of the agreement, together with all subsequent amendments, is included herein as Appendix B-1.

Metropolitan Management and Oversight of the Program

CTSI's small (only 1,334 ULF toilets) demonstration project in 1992 did not provide Metropolitan with reliable information as to the extent of project management that might be required for a larger CBO program such as that planned for the Pilot Program. For the Pilot Program (75,000 ULF toilets), only actual field experience would tell staff the depth of management needed to account for program activities and resources. In

addition, staff was uncertain as to the likely success of the Program. Day-to-day management of the contract was assigned to the existing Branch staff, primarily the Branch Manager.

By February 1993, it became evident to Division management that this complex and growing Program would require specialized oversight on one or more individuals exclusively assigned for this purpose. Because of a freeze on hiring of new staff at that time, management sought a staff consultant to fill the need. That staff consultant would be housed at Metropolitan and be assigned initially to a 75 percent commitment to the Program.

In April 1993, John Koeller (Koeller and Company) was retained as the staff consultant to assist Branch staff in tracking the performance of CTSI, monitoring the costs incurred, and dealing with CTSI on a day-to-day basis. Within 30 days of joining Metropolitan, Koeller had reviewed the six prior months of the Program and instructed CTSI to correct ten of its prior invoices. Within 30 days thereafter, Koeller further instructed CTSI to begin systematically reporting distribution and used toilet recycling volumes to Metropolitan for each participating member agency. In the ensuing months, Koeller spent extensive time at CTSI directing (through the Agreement Administrator) changes and improvements to the relationship between CTSI and Metropolitan.

Koeller's oversight responsibilities included:

1) CTSI invoice review;
2) Receive, review, approve and disseminate CTSI distribution statistics to participating member agencies and others;
3) Provide the distribution data necessary to invoice participating member agencies for their cost share;
4) Reconcile distribution reports to CTSI invoices;
5) Track all CTSI costs invoiced to Metropolitan; reconcile actual invoiced costs to Accounts Payable records;
6) Prepare new agreements to permit CTSI to purchase ULF toilets; track all toilet purchases, suppliers and pricing; implement ULF toilet purchase policies and practices;
7) Implement new practices and control procedures at CTSI as distribution volumes and Program complexity increased;
8) Arrange for CTSI to accept customer copayments for ULF toilets; implement control procedures for cash, checks, Visa/Mastercard debits, and money orders received from customers by amending CTSI agreement accordingly;
9) Receive and account for all copayment funds; reconcile to CTSI distribution reports;
10) Implement practices and procedures for the purchase and control of Metropolitan-funded data processing equipment at CBOs; amend CTSI agreement accordingly;
11) Reconcile payments by CTSI to individual CBOs with toilet distributions and

recyclings by those CBOs;

12) Draft Program Phase Three agreements, substantially increasing CTSI reporting and accountability for toilet distributions;
13) Coordinate and resolve various contractual legal and financial issues with Metropolitan Legal Counsel and Controller;
14) Prepare management and Board reports and presentations;
15) Work with Metropolitan Auditor on various Program elements (beginning in January 1994); and
16) Implement a quality assurance program.

Note: Among the more significant elements of Koeller's oversight responded to concerns expressed by management and others over the security of Program assets and the assurance that ULF toilets were actually being installed as intended.

Koeller prepared a Board letter on the measures taken to protect Metropolitan assets. That Board letter is included herein as Appendix C.

In January 1994, and at the request of the Agreement Administrator, Koeller also implemented Phase One of an installation verification process by retaining the services of PEAK International (a minority-business enterprise-MBE), a respected quality assurance consulting firm, to begin a study of installation statistics. Phase One of their investigation, based upon secondary data from consultants employed by the Los Angeles Department of Water and Power (LADWP) and Central/West Basin Municipal Water Districts (C/WBMWD), indicated that approximately 97 percent of all ULF toilets were installed at the destined location. Subsequently, Koeller prepared a scope of work and Metropolitan agreement for PEAK to implement Phase Two of their study. Phase Two requires PEAK to perform 2,000 randomly selected in-residence inspections in Los Angeles, Orange and San Diego Counties and develop a statistically reliable installation verification process. That effort is about 40 percent complete at this time. Their interim report on inspections in Los Angeles County indicates a 98.7 percent installation rate; that report is included herein as Appendix D.

Koeller further identified and initiated actions to correct and resolve certain issues and concerns prior to their documentation by the Auditor in his report on Phases One and Two. For example, by May 1994, eight of the 15 issues subsequently identified by the Auditor and documented in his October 5, 1994 report had been partially or fully addressed by Koeller either through immediate changes in the Program or through changes proposed in the later Phase Three contracts. Those issues were:

- Requirement for a full timekeeping system in Phase Three;
- Addition of CTSI staff and separation of responsibilities for ULF toilet purchase from invoice payment in Phase Three;
- Correction of invoice approval and payment procedures at Metropolitan (as

disclosed by Auditor in June 1994);

- Retention of a quality assurance consultant to develop and implement continuing process for verification of toilet installations (see explanation above);
- Periodic remittance of customer copayment funds to Metropolitan;
- Discontinuation of the distribution of "rebate toilets;"
- Clarification for CTSI of the interpretation of the performance incentive criteria (bulk toilet sales not to be included in the incentive formula); and
- Correction of certain errors made by the Controller in the recording of Program costs.

Toilet Purchases by CTSI

By early 1993, Metropolitan staff had determined that the development of a ULF toilet specification sufficient for the bid process and purchase of toilets for the Program could not be completed in time for its use in Phases One and Two. It was evident that to develop and use a general procurement specification that did not relate to ULF toilet performance would result in some ULF toilets qualifying for purchase that had already been found to be unsatisfactory to residential customers. In view of the heightened concern for customer relations expressed by the participating member agencies, it was important that any ULF toilets found to be unacceptable to customers be excluded from the Program.

In addition, Metropolitan Legal Counsel indicated to staff that contracting with CTSI (rather than using Metropolitan) to purchase and warehouse ULF toilets would remove Metropolitan from the "chain of commerce" and, as such, could distance Metropolitan further from any potential product liability lawsuits.

In view of all of the above, staff determined that the purchase of ULF toilets from the manufacturers then serving the Program could best be accomplished by CTSI, since CTSI could purchase those ULF toilet models most favored by the customers provided that they obtained the best pricing available.

Subsequently, CTSI was authorized to purchase up to 185,000 ULF toilets on behalf of the Program through Letter Agreement No. 4207. These ULF toilets were divided as follows:

Phase One and Two	140,000
Phase Three[1]	45,000
TOTAL	185,000

1 - Toilets authorized for purchase for Phase Three prior to the commencement of Phase Three distribution

Because of procurement leadtimes ranging from four to ten weeks (depending upon manufacturer), ULF toilets purchased during May and June of 1994 (the final months of Phase Two), were destined for distribution on Phase Three beginning in July.

A copy of Letter Agreement No. 4207, including all amendments, is included herein as Appendix B-2.

Phase One/Two Results

Distributions under Phase Two concluded on June 30, 1994. (The term of the Phase One/Two agreements extended to July 31, 1994, providing a one-month overlap with Phase Three for coordination and close-out purposes.) CTSI's performance under the Phase One/Two agreements was as follows:

	Original Program Projection	*Final Program Results*
• Volume of ULF Toilets Distributed	up to 75,000	150,293
• Cost Per ULF Toilet		
- Toilet & materials	$ 73.50	$ 66.28
- Program management, CBO payments, and recycling charges	55.75	48.01
TOTAL	$129.25	$114.29

A graphic display of distribution statistics and cost for Phases One/Two is included as Appendix E.

PHASE THREE

By December 1993, it became apparent to staff that the implementation contractor selected for Program Phase Three would be subject to contractual agreements much more complex and definitive than those for Phases One and Two. Staff, including Koeller, had already begun to identify areas of the Program and provisions of the agreements that required alteration, amplification, and/or strengthening. In particular, these included:

- Methods, frequency and format of reporting by CTSI, including narrative, statistical and financial reports to Metropolitan;
- Requirement for monthly reconciliation of ULF toilet inventories at CTSI and the CBOs with purchases and distributions;
- Handling and remittance of residential customer copayments received by CTSI, including credit card, cash, and customer finance contract receipts;
- Advance funding of ULF toilet purchases and establishment of a toilet purchase account; establishment of advance payment schedule and criteria;
- Requirement for CTSI to take advantage of all toilet supplier early-payment discounts;
- Reduction in the fee percentage for ULF toilet purchases;

- Purchase/lease, use, and accounting for capital equipment items required at the CBOs, including the property control, ownership, and disposition of such items;
- Establishment of checking and (interest-bearing) money market accounts with financial institutions with the prior approval of Metropolitan; safeguarding and reconciliation of Metropolitan funds held by CTSI;
- Requirement for CTSI employee dishonesty bond indemnifying Metropolitan;
- Appointment of a Program Manager and Agreement Manager by CTSI;
- Implementation of a timekeeping system capable of tracking labor costs for each member agency project;
- Requirement for prompt expense billing;
- Provisions for contractual overlap of Program Phases Two and Three;
- Definition of a CBO and the procedure for obtaining prior approval from Metropolitan for the establishment of new Program CBOs;
- Requirement for MBE participation in the Program;
- Prohibition of ULF toilet sales to an agency, organization or other entity apart from the prior approval of Metropolitan;
- Establishment of Program cost targets and a cost-achievement incentive formula and payment schedule for CTSI; and
- Provisions for Program conclusion and shut-down, including the final accounting for and remittance of Metropolitan resources (funds, ULF toilets, capital equipment, and other resources) and resolution of outstanding ULF toilet purchase orders, if any.

(Note: Some of the above provisions were incorporated into amendments to the Phase One/Two agreements; all were incorporated into the Phase Three agreements.)

Phase Three Letter Agreements Nos. 4643 and 4644 were prepared in draft during the period from February to June 1994 and were reviewed and approved by Legal Counsel and the Controller.

In January 1994, staff began considering the available implementation contractor alternatives for Phase Three:

Alternative 1 - Continue with CTSI for Phase Three
Alternative 2 - Solicit competitive proposals from other qualified firms for a one- or two-year exclusive agreement.
Alternative 3 - Solicit and award multiple contracts with several qualified firms.

In view of the leadtime required to qualify, select, and familiarize a new contractor with the Program, it was essential that early consideration be given to the alternatives and a choice be made. On January 14, 1994, the above alternatives were presented to the Division Director for consideration. On April 25, 1994, the Division Director recommended to the Assistant General Manager that CTSI be selected as the Phase Three implementation contractor. On May 12, 1994, the Assistant General Manager approved

that recommendation. Refer to Appendix I for a complete discussion of the alternatives and the rationale for the selection of CTSI.

During the period from January to May 1994, CTSI's volume and cost performance improved significantly. Member agency participation and demands grew. Continuing attention was given to implementing needed changes and improvements in the contractual relationship between Metropolitan and the implementation contractor.

As stated previously, by May 1994, eight of the 15 issues subsequently identified by the Auditor (in June and July 1994) and discussed in their October 5, 1994 report had been addressed by staff, either through immediate changes in the Program or through changes proposed in the Phase Three contracts. Those issues were:

- Requirement for a full timekeeping system;
- Separation of responsibilities for ULF toilet purchase from invoice payment;
- Correction of invoice approval and payment procedures at Metropolitan;
- Retention of a quality assurance consultant to develop and implement continuing process for verification of toilet installations;
- Periodic remittance of customer copayment funds to Metropolitan;
- Discontinuation of the distribution of "rebate toilets;"
- Clarification for CTSI of the interpretation of the performance incentive criteria (bulk toilet sales and "rebate toilets" not included in the incentive formula); and
- Correction by the Controller of certain errors in the recording of Program costs.

Therefore, based upon: (1) CTSI's outstanding marketing and cost performance through Phases One and Two; (2) confidence that the problems staff identified were being corrected; and (3) that effective contractual oversight was in place, the General Manager recommended in Board Letter 8-4 (dated May 25, 1994) that CTSI be awarded the management of Phase Three as well.

CTSI had exceeded the original contract volume goal by 100 percent (150,293 toilets compared to the original estimate of 75,000), and had reduced program costs to $114.29 per unit from an original budget of $129.25. Further, many of the subsequent concerns identified by the Auditor had been addressed by staff.

A copy of both Phase Three Letter Agreements Nos. 4643 and 4644 with CTSI are included herein as Appendices B-3 and B-4.

PHASE FOUR

At the time of Board approval of CTSI as the Phase Three implementation contractor, it was understood by Metropolitan management that Phase Four would be subject to a formal RFP process in 1995.

Currently, Phase Four is scheduled to commence on October 1, 1995. The process of preparing a Request for Qualifications (RFQ) and an RFP will commence in January 1995. Proposals will be formally solicited from candidate contractors no later that April 1995; selection would occur no later than July 1995.

Consideration is being given to dividing the responsibilities for Phase Four implementation among several contractors and Metropolitan. Among the possibilities currently being explored by staff are:

- Single contractor to purchase and warehouse ULF toilets; another contractor to distribute toilets and manage the Program.
- Metropolitan to purchase and warehouse ULF toilets; contractor(s) to distribute toilets and manage the Program.
- Multiple distribution/management contractors assigned exclusive geographic regions within Metropolitan service area.

Recommendations as to the Phase Four structure of the Program will be made to management by March 1995.

NOTE: A complete chronology of Program actions by CTSI and Metropolitan staff from 1991 to date may be found in Appendix J.

2. *METROPOLITAN AUDIT ISSUES (Phases One and Two)*

A. Contract Compliance Issues

(1) Lack of Timesheets for Exempt Employees

Through the term of the Phase One/Two agreement, CTSI submitted 49 invoices for labor, expenses and ULF toilet purchases. Each of these invoices met the requirements of Metropolitan in their content and detail as required by the terms of the underlying agreements. Invoices for labor (which were submitted for payment twice per month) specified individual employees, hours worked, the applicable hourly rate (as defined in the agreement fee schedule), and the extension of the rate and hours to a total billing amount. (A sample CTSI invoice is included herein as Appendix F.) Invoice form and content were consistent with that expected from all Metropolitan consultants and contractors. Staff considered these invoices to fully meet the requirements of the agreements with CTSI. Invoices were thoroughly reviewed by staff and approved or adjusted accordingly.

In early 1994, Koeller saw the increasing necessity for staff to have the capability of segregating Program costs by member agency project. That is, member agencies were requesting services that differed somewhat from the standard menu of services offered for the Program (without extra cost to those agency). As the Program was originally established, staff did not have the ability to track actual costs incurred for each agency project; as such, staff could not accurately compare actual costs against projected costs for those agency projects. By April 1994, staff and management concluded that a more comprehensive timekeeping system was needed for Phase Three. Staff directed CTSI to develop an estimate of the added costs that would be incurred for a full project timekeeping system to track the labor expended on each agency project. The requirement for such a system was incorporated into the Phase Three Letter Agreement No. 4644 negotiated with CTSI in May 1994. That system is in place and has operated successfully since July 1, 1994.

In July 1994, the Auditor informed staff that CTSI's timekeeping records for Phases One and Two were inadequate to fully substantiate the labor invoices previously submitted to Metropolitan. Exempt employees were found not to have individual timesheets backing up their time estimates. Rather, two employees logged their time on their personal computer, one employee kept a personal diary of time spent each day on the Program, and the balance of the exempt employees reported their time to management twice per month when invoices were being prepared.

A listing of CTSI's exempt employees charging labor hours to Program Phases One and Two is included herein as Appendix G. This breakdown has been reviewed and accepted by the Auditor. The information contained within this listing is derived from CTSI labor invoices submitted for payment to Metropolitan. Management has concluded that,

although the timekeeping system was deemed inadequate by the Auditor, based upon staff observation and oversight of CTSI during Phases One/Two, the hours billed to Metropolitan are reasonable, consistent with the requirements of the underlying Letter Agreement No. 3826, and show no evidence of fraud or abuse on the part of CTSI. Further, the aggregate of labor charges billed to Metropolitan were significantly less that the amount forecasted and budgeted for these phases of the Program.

Recommendation by Auditor: None

Action by Staff: In April 1994, CTSI was directed to implement a full timekeeping system capable of tracking labor hours by member agency project for Phase Three. This system exists and has been used by CTSI since August 1, 1994. At staff's request, the Auditor subsequently performed a follow-up examination of the system and found it meets the standards and requirements of Metropolitan.

ULTRA-LOW-FLUSH TOILET PROGRAM

Letter Agreement No. 3826 for Phases One and Two

CTSI Corporation

Exempt Employees

Name	Program Title	Period of Contract Participation (wks)	Hours Billed to Contract	Average Wkly Billings (Hrs.)	Hourly Billing Rate	Gross Billings to Metropolitan	Formal Timesheets?
J. Craft	Principal	88	2,795.5	31.8	$95	$265,572.50	No (1)
L. Craft	Program Mgr.	88	1,891.0	21.5	$75	$141,825.00	No
R. Ruiz	Project Mgr.	30	1,015.0	33.8	$55	$55,825.00	No
S. Ling	Project Mgr.	88	2,928.0	33.3	$55	$161,040.00	No
J. Heltebrake	Project Mgr.	79	2,571.0	32.5	$65	$167,115.00	No
J. Sanchez	Project Mgr.	88	3,180.0	36.1	$55	$174,900.00	No (2)
F. Hamilton	Project Mgr.	88	3,123.0	35.5	$55	$171,765.00	No (2)
B. Boyle	Project Mgr.	71	1,980.0	27.9	$55	$108,900.00	No
J. Chapman	Project Mgr.	11	191.0	17.4	$55	$10,505.00	No
M. DeVan	Project Mgr.	17	192.0	11.3	$55	$10,560.00	No
R. Rodriguez	Whse Supv	6	286.0	47.7	$25	$7,150.00	No
A. Roth	Sr. Consultant	88	961.0	10.9	$75	$72,075.00	No
F. Sanchez	Graphics Mgr.	81	2,894.5	35.7	$45	$130,252.50	No
T. Jackson	Project Mgr.	20	728.0	36.4	$45	$32,760.00	No
D. Lessick	Project Mgr.	4	168.0	42.0	$45	$7,560.00	No
J. Engel	Support	58	1,798.0	31.0	$45	$80,910.00	No
L. King	Project Mgr.	85	2,966.0	34.9	$25/$45	$85,950.00	No
C. Seiler	Project Mgr.	30	930.0	31.0	$55	$51,150.00	No
Total: Exempt Employees			30,598.0	347.7	$57	$1,735,815.00	

Other Employees

Clerical & Support Employees	8,493.5		$27	$225,818	Yes
Sub-Total: Non-Warehouse	39,091.5			$1,961,632.50	
Warehouse Employees	12,676.0		$25	$316,900.00	Yes
Total: All Employees	51,767.5			$2,278,532.50	

Note: Contract time period - October 26, 1992 to June 30, 1994

(1) Hours maintained in personal diary

(2) Hours maintained on personal computer

(2) Management of Community-Based Organizations

The Auditor found that: (1) CTSI did not enter into formal agreements with CBOs engaged to perform ULF toilet warehousing and distribution tasks; and (2) that standard operating procedures did not exist for Program CBOs. The specific indicator cited for this issue was that the Auditor found that one CBO (Keeping the World at Peace-KTWP) collected funds ($4,561) from customers for toilet installation items that were normally to be given to customers at no cost. That CBO claimed that these funds had been forwarded to CTSI, a transaction which could not be verified by the Auditor.

Metropolitan's agreements with CTSI do not require CTSI to establish formal written agreements with the CBOs they enlist to distribute ULF toilets. During the course of Phase Two, Metropolitan staff consulted on several occasions with CTSI management concerning their verbal understandings with CBOs and the desirability of formalized written agreements. CTSI indicated to staff that they had been advised by others that the approach they had chosen was in the best interests of the firm. Staff did not believe, at that time, without a requirement in the agreement with CTSI to formalize their agreements with CBOs, that staff could impose this requirement on their implementation contractor. Furthermore, Metropolitan Legal Counsel indicated to staff that there was little or no risk to Metropolitan on this issue, since payments to the CBO were to be based solely upon ULF toilets installed (as determined by used toilets returned by the customer). Any funds advanced by CTSI to a CBO over and above their "earnings" for toilets installed was done at the risk of CTSI. Any excess funds paid to and held by the CBO would not be reimbursed by Metropolitan.

Because of subsequent circumstances and the encouragement of Metropolitan Legal Counsel, however, CTSI has since developed pro-forma agreements for execution between CBOs and CTSI. Those agreements are in the review stage at Metropolitan.

Although CTSI did develop a standard CBO training manual and had in it place at the time of the audit, they have since been directed to develop, improve and standardize the operating procedures for all CBOs, particularly those relating to the fiscal integrity of the Program.

Regarding the funds collected by KTWP for items sold by that CBO, the Auditor reviewed receipt records at KTWP but could not verify that those funds had been transferred to CTSI as claimed. CTSI has no record of such a funds transaction. KTWP has since been dropped from the Program amidst a controversy over non-performance of its obligations to CTSI.

Recommendation by Auditor: CTSI develop: (1) standard operating procedures for CBOs; and (2) written agreements with all CBOs.

Action by Staff: Improved standard operating procedures are being developed by CTSI. Standard written CBO agreements have been prepared by CTSI's legal counsel and submitted to Metropolitan for review and comment. The installation items sold by one CBO are no longer provided as part of the Program. CTSI has remitted to Metropolitan $7,131 in claimed transmittals from CBOs, although CTSI indicates that they have not received these funds from the CBOs in question. See also Item 2.C.(2) regarding the accounting for funds collected from CBOs.

(3) Documentation of used toilet returns

The Auditor found that in the case of the multi-family toilet replacement project for the Municipal Water District of Orange County, used toilet returns were not documented properly on standard forms. These returns were recorded apart from the standard forms. The Auditor did not find a discrepancy in the used toilet statistics, however.

CTSI developed and uses standard forms for recording the return of used toilets from customers (those used toilets later being recycled). That standard form has been in use since July 1994 on Phase Three. CTSI has been directed to comply with its own procedures and use and complete those forms in all cases.

Recommendation by Auditor: Develop a standard form to properly account for used toilet returns on multi-family projects.

Action by Staff: CTSI directed to develop standard forms for used toilets and rigorously enforce the usage of those forms in all cases. Those forms have been used since July 1994. Metropolitan staff will monitor the use of the forms and compliance with used toilet return procedures.

(4) Purchases of ULF Toilets

The Auditor was unable to find satisfactory documentation of CTSI's responsibilities for obtaining ULF toilet bids, performing bid analysis, and vendor evaluations.

Requirements of CTSI

CTSI was originally authorized to purchase ULF toilets after Metropolitan determined that significant advantages existed over a Program wherein Metropolitan would handle all procurement and warehousing. Those advantages were:

- A lack of a suitable toilet performance specification limited Metropolitan's ability to seek competitive bids and accept the bid of the lowest responsible bidder, a requirement of the California Administrative Code.

- Removing Metropolitan from the "chain of commerce" could distance Metropolitan further from any product liability claims.

- CTSI was able to be more responsive to participating member agency requests for specific customer-accepted toilet models, since no requirement for competitive bids was imposed on CTSI.

CTSI was and is required to evaluate manufacturers and suppliers, evaluate ULF toilets, and analyze bids. In addition, Metropolitan imposed additional requirements upon CTSI during Phases One/Two as follows:

(a) Take advantage of all early-payment supplier discounts (normally two percent for payment within ten days);

(b) Secure lines of credit with distributors and manufacturers (normally $200,000 to $400,000 each);

(c) Purchase only those ULF toilets found to provide satisfactory performance, as evidenced by customer surveys and new toilet returns;

(d) Supply only selected ULF toilet brands to agencies requesting same;

(e) Coordinate returns of new ULF toilets found to be defective and negotiate solutions to correctable design and manufacturing problems (particularly with certain manufacturers);

(f) Evaluate consumer acceptance of all brands and models used in the Program and structure purchase decisions accordingly;

(g) Evaluate new ULF toilet brands and models not currently marketed extensively on the West coast; and

(h) Coordinate and schedule bulk shipments from multiple manufacturers to CTSI consistent with Program volume demands.

Program Volume Demand for ULF Toilets

During Program Phase Two, Program demand for ULF toilets increased dramatically, straining the capacity of the procurement system to perform and the ability of the manufacturers to supply product. Although the Phase One/Two agreement projected Phase Two purchases averaging about 4,100 toilets per month, actual monthly distribution volumes (and the demand for toilets) for Phase Two were as follows:

Month	Number of ULF toilets
July 1993	6,363
August 1993	5,198
September 1993	9,956
October 1993	10,100
November 1993	12,897
December 1993	9,437
January 1994	9,011
February 1994	13,428
March 1994	14,340
April 1994	12,970
May 1994	14,338
June 1994	11,832
TOTAL	129,870

By the first half of 1994, Metropolitan (through CTSI) was reported to be the largest single purchaser of ULF toilets in the United States. The extremely high demands of the Program coincided, however, with a period of production capacity shortfalls at the manufacturers.

ULF Toilet Supply Shortages

In the latter half of 1993, it became apparent to CTSI and to Metropolitan staff that procurement difficulties were about to be encountered. CTSI had been alerted by various manufacturers that they were about to restrict or close down entirely their toilet production lines in order to convert their capacity to the exclusive production of 1.6-gallon ULF toilets. California and Federal mandates for the sale only of 1.6-gallon toilets took effect in January 1992 and January 1994, respectively. The manufacturers, however, were late to respond to these mandates and most waited until the "eleventh hour" to make the conversions. New manufacturers, such as Toto Industries (Atlanta),

Inc. were already producing only the 1.6-gallon ULF toilets and no conversion was involved. Others, however, indicated to CTSI that their shipments to CTSI would be severely reduced.

As a consequence of these warnings and the desire to induce other non-participating manufacturers to sell ULF toilets to the Program, six suppliers (one based in southern California and five in the eastern United States) were visited by a team of CTSI and Metropolitan personnel.

(Note: A discussion of this trip and a report on the results are contained in Section 3.A and Appendix H of this report. In spite of Metropolitan's attempt to induce manufacturers to sell ULF toilets to CTSI, however, three manufacturers have either refused to accept orders for toilets from CTSI or have taken orders and refused to ship product. As of this date, those suppliers are Kohler, Sterling, and American Standard.)

Follow-up note: Supply shortages abated in the Summer of 1994 as manufacturers brought their new and converted production capacity on line. Although no firm indication exists that such shortages may reoccur, some predict that a significant escalation in new U.S. housing starts could again create shortages in the industry. However, there is no significant competition for ULF toilets from similar toilet retrofit programs elsewhere in the United States.

ULF Toilet Procurement Practices During Supply Shortages

During the course of Phases One and Two, Metropolitan staff and CTSI were in daily contact on issues related to ULF toilet model selection, pricing, deliveries, and other terms of purchase. From late-1993 through early-1994, the ability of ULF toilet suppliers to ship product to CTSI was the single most important factor dictating from which suppliers purchases were to be made. In that period, in addition to performing the above procurement and evaluation tasks, CTSI was required to seek out truckload quantities (approximately 500 toilets per truckload) of ULF toilets from distributors throughout the United States (rather than only in Southern California). In some cases, CTSI paid a slight premium for these toilets. In other cases, CTSI took partial truckloads just to obtain sufficient product to support Program demands. In all cases, the daily communications between Metropolitan staff and CTSI staff enabled CTSI to make all of the usual and unusual purchase commitments with Metropolitan's full knowledge and approval.

Pricing of ULF Toilets

As noted above, a number of factors influenced the pricing of ULF toilets to CTSI. In all cases, however, Metropolitan staff was in daily communication with CTSI on the issue of pricing and terms in order to counsel and direct CTSI where necessary and monitor any anomalies. Critical Program decisions made by CTSI regarding suppliers,

pricing, and purchase choices were made in consultation with Metropolitan staff. The lowest price from responsible suppliers was always chosen when all other terms were equal (discounts, lines of credit, shipment dates). High-cost product was always replaced with a lower-cost product of equivalent quality if the demands of the Program could be met and the integrity of Metropolitan's relationship with member agencies and their customers would not be compromised. For example, when the price of Kohler Company toilets was increased in the Spring of 1994 by as much as 35 percent, all future orders for their product were suspended and Kohler has refused to honor their commitment to CTSI to ship 18 truckloads of toilets ordered at the original price.

Through the Phase One/Two Program, CTSI has successfully held the average price for toilets relatively constant at $66.28 per unit, including sales tax and shipping. They have achieved this figure in spite of periodic supplier pricing increases by changing the mix of toilets in the Program and purchasing more of the lower cost models. *(It should be noted that many of the lowest cost models are the best performing toilets with the highest customer satisfaction.)* In nearly all cases, CTSI also achieved a two percent early-payment discount from suppliers, saving Metropolitan approximately $200,000 in costs during these phases.

Toilets from the following manufacturers were purchased during Phases One/Two:

Manufacturer	Quantity Purchased	Price Paid-6/94[1]
Kohler	50,836	$62.33
Sterling[2]	5,425	$53.41
Mansfield[3]	25,906	$53.12-$59.78
Eljer	33,962	$51.95
Universal Rundle	6,196	$61.25
Toto	34,894	$58.21
Briggs	960	$58.21
TOTAL	158,179[4]	

1-Base cost after 2% discount taken; excludes sales tax
2-Subsidiary of Kohler Company
3-Includes Norris and Kilgore toilets
4-Some toilets were purchased in Phase Two for Phase Three distribution

Conclusion

In the context of a highly competitive market, but one with very severe supply shortages for a period of about six to eight months, Metropolitan benefitted from ULF toilet purchase costs which essentially remained constant throughout the 20-month period of Phases One and Two.

Based upon the ULF toilet purchase invoices staff processed and approved over the term of Phases One and Two, together with staff's direct contact with manufacturers, staff is convinced that CTSI obtained the best pricing, best terms, and most expeditious deliveries for high-quality ULF toilets.

Recommendation by Auditor: CTSI properly maintain bid analyses and other pertinent information.

Action by Staff: CTSI directed to complete and submit such written documentation on a regular basis in accordance with the terms of their Phase Three Agreement. Staff to document conversations and decisions regarding toilet purchases.

(5) Control Over Returned ULF Toilets

The Auditor found insufficient supporting documents to reconcile returned broken and defective ULF toilets to the vendor and credits received from the vendor for those toilets.

Since January 1994, CTSI has maintained a complete list of customer-returned broken and defective ULF toilets for the purpose of determining credits due from manufacturers and evaluating manufacturer quality. CTSI has corresponding files of credits granted (usually at 100 percent of cost) by manufacturers. Metropolitan staff receives copies of all credit invoices from suppliers. These two sets of information could not be reconciled by the Auditor, such that he could determine that all credits due had been received. Reconciliation can be achieved with the creation of a log book as recommended by the Auditor. At Metropolitan's direction, CTSI is in the process of instituting a formal log book for this purpose.

Recommendation by Auditor: CTSI to maintain a log of broken and defective ULF toilets returned to vendors for refund or credit; CTSI to obtain credit slips from vendors when such toilets are received by the vendor.

Action by Staff: CTSI directed to implement log book as recommended; such a log book is being created. CTSI directed to furnish copies of log book and credit slips to Metropolitan.

(6) Segregate Duties of ULF Toilet Purchase and Payment

Auditor found that the responsibility for ULF toilet purchases and invoice payment rest with the same individual, which represents a potential control weakness.

The Program at CTSI unexpectedly grew from a Pilot Program in Phase One into a mature distribution program in Phase Two. During this time, CTSI staff grew from 11 persons at the inception of Phase One to 28 persons at the conclusion of Phase Two. By early 1994, CTSI management and Metropolitan staff recognized during the period of severe ULF toilet shortages (late 1993 through early 1994) that the dual responsibilities for purchase and payment were beyond the capability of one individual. Staff further recognized that the overall value of the monthly purchases and the total amount of Metropolitan assets (warehoused ULF toilets) involved in the Program dictated that new control and accountability mechanisms were necessary.

With the encouragement and direction of staff, CTSI added staff in the ULF toilet purchase and payment area in Phase Three. In Program Phase Three, responsibilities are divided as recommended.

Recommendation by Auditor: CTSI to divide responsibilities between the Controller and a Purchasing Agent. Metropolitan staff to periodically monitor ULF toilet purchases for reasonableness of prices, terms and quantities.

Action by Staff: At Metropolitan suggestion, CTSI divided responsibilities as recommended. On Program Phase Three, Metropolitan staff continues to monitor all toilet purchase prices, terms, and quantities as they did on Phases One and Two.

(7) Incomplete Inventory Transaction Forms

The Auditor found that some ULF toilet transaction and shipper forms used to document the delivery of ULF toilets to CBOs were incomplete. It is the Agreement Administrator's understanding that, based on the Auditor's report, no discrepancies in the inventory or missing toilets resulted as a consequence of the incomplete forms. See also comments under item (8) below.

Metropolitan staff has directed CTSI to vigorously enforce the inventory control system and related policies and procedures as presented to Metropolitan at the commencement of Phase One. CTSI has informed its warehousing and trucking personnel that incomplete transaction forms are unacceptable and assured Metropolitan that lapses in their adherence to existing policies will not reoccur.

Recommendation by Auditor: CTSI to support all inventory transactions with properly completed forms.

Action by Staff: CTSI instructed accordingly.

(8) Controls Over ULF Toilets in Inventory

Auditor found that the controls over ULF toilet distribution and usage were adequate, and that inventory transactions are properly recorded in the inventory control system on a timely basis. No evidence of missing or mislocated inventory was reported in the Auditor's report.

Recommendation by Auditor: None required.

Action by Staff: None required.

B. Agreement Administration Issues

(1) Invoice Review Procedures

The Auditor found that the invoice approval slips were not properly completed by the Metropolitan Agreement Administrator.

Some approval slips were signed in pencil and others failed to include agreement numbers and/or work order numbers. Immediately upon learning of this finding in June 1994, staff instituted improved procedures on all agreements administered by the Conservation Branch.

Recommendation by Auditor: Properly complete approval slips.

Action by Staff: Fully implemented.

(2) Verification of Retrofitted Toilets

The Auditor found that the Conservation Branch had implemented a ULF toilet installation verification program through a quality assurance consultant, PEAK International. The Auditor also performed his own verification by attempting to contact 22 households that had received new ULF toilets through the Program. The Auditor found that all of those individuals contacted (19) confirmed that they had received a ULF toilet at no cost.

Metropolitan, through Koeller, engaged the services of PEAK International in January 1994 for Phase One of their quality assurance investigation of the Program. PEAK was engaged directly by Metropolitan for Phase Two of their assignment in June 1994. A description of the scope of PEAK's assignment and the results to date is included in Section I.C. herein. Their interim report on is included herein as Appendix D.

Recommendation by Auditor: Metropolitan to continue to perform periodic audits to verify ULF toilet installations and water savings.

Action by Staff: Continue the assignment to PEAK International to (1) conduct in-residence inspections of ULF toilet installations and (2) develop a statistically reliable installation verification process for continuing use on the Program. All future water conservation programs, including toilet rebate programs, will be subject to random inspections in accordance with the process now being designed.

C. Contract Cost Issues

(1) Billing of General & Administrative Expenses

The Auditor found that certain labor hours expended by CTSI for the preparation of monthly inventory management reports and invoices for Metropolitan were billed directly to the contract. Such costs should be classified as a General and Administrative (G&A) expense to be included within the normal hourly billing rates.

Letter Agreement No. 3826 with CTSI for Phases One and Two requires CTSI to maintain an inventory management system for toilets and other materials purchased by them for distribution in the Program. The purchase of these items was not included in the original design of the Program or the RFP distributed to the potential proposers. Rather, procurement tasks were to be performed by Metropolitan. The later authorization and assignment to CTSI of this responsibility resulted from Metropolitan's inability to implement all of the necessary prerequisites to competitive bidding, the goal of Metropolitan Legal Counsel to remove Metropolitan from the "chain of commerce," and the need to provide more flexibility in toilet purchase decisions.

CTSI undertook the procurement responsibility and assured Metropolitan that it had an inventory management system that met Metropolitan's standards. To demonstrate that capability and enable Metropolitan staff to reconcile purchases and distributions to inventory levels, CTSI provided staff with a detailed monthly report on inventories at its warehouse and the CBOs. These monthly reports were not required under the terms of the agreements with CTSI.

Although the costs (estimated at less than $15,000) for preparing the approximately 18 monthly inventory reports over the contract term could, under other circumstances, be classified as an overhead or G&A expense, staff believes that Metropolitan's earlier concern over the adequacy of CTSI's inventory management system (from the Water-Wise '91 Program audit) justified CTSI's frequent and detailed reporting. Therefore, staff has proposed to consult with CTSI on this matter in order to reach a mutually acceptable settlement of the situation.

In addition, staff has requested the assistance of the Auditor in defining specific tasks and job categories within the CTSI structure that should be classified as either overhead or G&A. The Auditor has consented to work with staff in developing these definitions.

Recommendation by Auditor: Metropolitan to seek reimbursement for G&A expenses billed to Metropolitan (up to $25,630).

Action by Staff: Consult with the Auditor on developing clear definitions of overhead and G&A expenses incurred by CTSI. Consult and negotiate with CTSI on the amounts billed to Metropolitan for preparation of inventory reports; seek reimbursement for that portion of the $25,630 determined to have been billed for CTSI invoice preparation.

(2) Accounting for Funds Collected From CBOs

Funds collected by CBOs from customers for broken toilets (at $15 per toilet) are the property of Metropolitan and are used to offset toilet purchase costs. These funds are to be deposited by CTSI into the Metropolitan-approved Copayment Account managed by CTSI.

The Auditor reported that funds collected by CBOs for this purpose were not fully accounted for by CTSI. According to the records of three CBOs, $7,131 was collected by those organizations from their customers. CTSI, on the other hand, reports that they only received a total of $510 from CBOs, leaving an unaccounted-for balance of $6,621. It is staff's interpretation that the balance in question was never transmitted to CTSI.

Of the $7,131, $4,561 was collected by KTWP, a CBO recently removed from the Program for failing to fulfill its obligations to CTSI. Of the balance of $2,570, the portion attributed to MELA ($1,490) has subsequently been found to be at MELA in their bank account, not having been transmitted to CTSI as originally indicated. These funds will be transmitted to CTSI.

In response to the audit, CTSI has tendered a "good faith" check to Metropolitan in the amount of $7,131 on December 15, 1994. At this time, the $4,561 in question from KTWP is not recoverable, since that CBO has been dropped from the Program.

Staff has concluded that the discrepancies in the accounting records of the organizations involved is the result of a failure by CTSI to fully implement standardized operating and fiscal procedures at the CBOs (refer to the earlier discussion in Section 2.A.(2) regarding the management of CBOs).

Recommendation by Auditor: CTSI to remit all funds collected by the three CBOs ($7,131) to Metropolitan. CTSI to maintain a current and accurate accounting for such collections in the future.

Action by Staff: CTSI has remitted the funds in question. Staff to direct CTSI to include fiscal policies and procedures within the standard operating procedures being developed in connection with the earlier recommendation.

(3) Outstanding Amount Due Metropolitan

The Auditor found that CTSI had not yet remitted to Metropolitan $120,045 in copayment funds received from customers.

Staff developed the policies and procedures associated with the collection, deposit and remittance of Program copayment funds. CTSI, having collected in the aggregate nearly $1 million in rebate and copayment funds since the inception of Phase One, has remitted those funds to Metropolitan on request at all times. The Auditor visited CTSI in July 1994, at which time the copayment balance was as indicated. As previously, CTSI has again remitted all funds collected to Metropolitan as follows:

Total funds collected from customers	$120,045.00
Less: Credit card charges	-1,669.58
Net amount remitted to Metropolitan	$118,375.42

Recommendation by Auditor: CTSI to remit account balance.

Action by Staff: Complete as noted above.

(4) Additional Project Costs

The Auditor found that CTSI had, during Phase One, distributed ULF toilets and collected rebates from LADWP and C/WBMWD. Those rebate amounts ($100 per ULF toilet) were insufficient to cover the actual cost of the Program.

When distributions under Letter Agreement No. 3826 commenced on October 26, 1992, the only mechanisms in place at that time were those that had been developed in connection with CTSI's earlier (self-funded) demonstration project. (That project was partially funded by rebates from LADWP.) Therefore, the Metropolitan Agreement Administrator authorized CTSI to commence the Program immediately with those mechanisms, with the understanding that, gradually over a period of time, the Program would transition into a CBO program like that which exists today. During that transition period (Phase One and the first few months of Phase Two), 7,274 "rebate toilets" were distributed by CTSI. Approximately 16 months ago, CTSI stopped distributing "rebate toilets" and collecting checks from participating member agencies. "Rebate toilets" are no longer a part of the Program; there is no intent to resume distribution of "rebate toilets."

Recommendation by Auditor: Metropolitan and CTSI to execute formal agreements with participating member agencies from which rebates would be received.

Action by Staff: No further participation by CTSI in rebate projects is intended. Recommendation no longer applicable.

(5) Volume Incentive Payments

The Auditor found that CTSI had submitted three invoices for the earned performance incentive in accordance with Letter Agreement No. 3826. Those invoices were for 75 percent of the earned incentive as prescribed in the Agreement. The total of those invoices was for payment for more ULF toilets than had actually been distributed and installed on the Program.

Staff and management carefully reviewed all invoices for incentive payment prior to any approval to pay. While Metropolitan did receive the invoices cited by the Auditor, the Agreement Administrator rejected the third invoice and returned it to CTSI for correction for a variety of reasons. No payment was ever authorized on the last invoice, pending the determination of the actual number of ULF toilets installed.

In December 1994, it was determined by staff that the earned incentive was to be based upon 148,771 installed toilets. As previously determined and agreed-to in discussions with CTSI, no bulk sale toilets nor "rebate toilets" were included in the incentive calculation.

Recommendation by Auditor: Defer final incentive payment until distributed toilets have been installed. Exclude bulk sales and "rebate toilets" from the incentive calculation.

Action by Staff: Final incentive payment amount has been determined and authorized based upon actual toilet installations, excluding bulk sales and "rebate toilets." No further action is required.

D. Contract Accounting Issues

Errors in Recording of Costs

The Auditor found three incorrect internal postings of Program costs in the records of the Controller. The Auditor also indicated that the Metropolitan Agreement Administrator had previously noted the errors.

Staff was aware of the errors and notified the Controller of the need to correct them. All three errors have been corrected by the Controller.

Recommendation by Auditor: Controller to correct errors.

Action by Staff: Action taken to correct errors. No further action required.

3. *OTHER ISSUES*

Trip to ULF Toilet Suppliers

As indicated earlier, severe supply shortages were experienced in late 1993 and early 1994 as manufacturers converted their production lines to ULF toilets exclusively. Manufacturers closed or reduced the capacity of their production lines. As a result, distributors were unable to secure enough ULF toilets to meet Program demand. In a five-day period in October 1993, Metropolitan staff visited five suppliers east of the Mississippi in order to:

- Secure pricing and delivery commitments on behalf of the Program;
- Encourage two non-participating suppliers to sell ULF toilets to CTSI for the Program;
- Develop a direct relationship between Metropolitan and the manufacturers in anticipation of Metropolitan performing the procurement function at some future date; and
- Determine the research capabilities and progress of the manufacturers toward a solution of toilet functional problems resulting from the use by consumers of certain toxic toilet bowl cleaners.

As a consequence of the trip, Metropolitan was unable to change the position of two manufacturers that refused to sell to the Program (Sterling and American Standard). Contrary to statements at that time made by representatives of the Kohler Company to the Metropolitan/CTSI team that price increases would be held to between three and five percent, Kohler ultimately increased its price by 35 percent and was dropped from the Program. Two manufacturers (Mansfield and Toto) continued to deliver all of the toilets to the Program that they were able.

The Metropolitan/CTSI team discussed with all manufacturers the increasing problems occurring as a result of consumer use of the product "2000 Flushes" in their toilet tanks. Where this chemical is present in high concentrations, new toilet flapper valves are disintegrating and toilets are leaking within months of installation. All manufacturers were aware of the severity of this national problem and were performing polymer and other research potentially leading toward a solution. Metropolitan's Conservation Branch staff is currently working to aid and stimulate manufacturers toward this solution.

A full trip report is included herein as Appendix H.

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