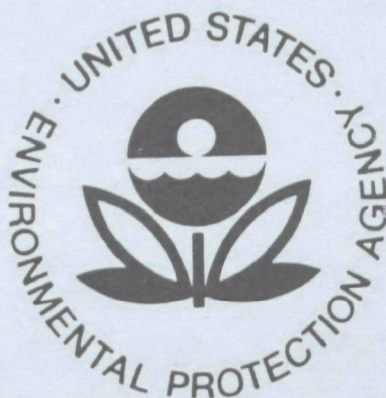


# **INTERNAL CONTROL REVIEW REPORT**

**on the**

## **MUNICIPAL WASTEWATER TREATMENT WORKS CONSTRUCTION GRANTS PROGRAM**



**September, 1984**

**OFFICE OF WATER PROGRAM OPERATIONS**

**and**

**REGIONAL WATER MANAGEMENT DIVISIONS**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

SEP 25 1984

OFFICE OF  
WATER

MEMORANDUM

SUBJECT: Annual Certification of Construction Grants Program Compliance  
With the 1982 Federal Managers' Financial Integrity Act

FROM: *[Signature]* Jack Ravan, Assistant Administrator  
Office of Water (WH-556) *[Signature]*

TO: William Ruckelshaus, Administrator

Last fall I forwarded a preliminary internal control review of the construction grants program. The results and measures from this review were included in your December 1983 report to the President on the status of compliance of the Agency's internal accounting and administrative controls with the applicable requirements. You will recall that you informed the President that material weaknesses, as defined under the OMB guidelines, had been identified in the construction grants program. During the year, I initiated a joint Headquarters and Regional evaluation of our internal controls. The attached report concludes my 1984 assessment of our priority reviews, outlines my plans for 1985, and certifies our compliance with the Federal Managers' Financial Integrity Act.

The 1984 report contains the findings and recommendations of the seven review teams that conducted direct performance reviews and evaluations. The recommendations contained a number of significant opportunities for management improvements, and we have an action plan for 1985 that implements most of the recommendations.

The decentralized nature of the construction grants program requires that we manage this program as effectively as possible to protect the considerable Federal investment. I am, therefore, establishing a continuing process for conducting an annual internal control review to address selected program areas that are perceived as highly vulnerable to fraud, waste, and mismanagement.

During 1984, we evaluated priority area management controls in 27 States. In 1985, we plan to focus particularly on grantee project management controls. We believe that we are most vulnerable at the grantee level and will evaluate their implementation and understanding of controls in the areas of construction management, land acquisition,

financial management and operation and maintenance. We plan to involve the delegated States and, also, to conduct a national review of the integrity of the data base for our biennial Construction Grants Needs Survey for Congress.

I would appreciate your comments on this report and our plans to improve program management.

Attachment

cc: Howard Messner



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

SEP 25 1984

OFFICE OF  
WATER

MEMORANDUM

SUBJECT: Annual Certification of Construction Grants Program Compliance  
With the 1982 Federal Managers' Financial Integrity Act  
*William A. Whittington*  
FROM: William A. Whittington, Acting Director  
Office of Water Program Operations (WH-546)  
  
TO: Jack E. Ravan, Assistant Administrator  
Office of Water (WH-556)

I have completed our annual review of the internal controls for the construction grants program. In the priority review areas that we evaluated, we did not find any evidence of major fraud, waste or mismanagement. However, the review teams offered several significant recommendations to improve pre-award management, design and construction management, and project operation. The Executive Summary of our report contains the review team findings, management decisions, and action plans.

I am very pleased with this initial review; the results are particularly notable in view of the "first time" planning and resource constraints on the teams. I also want to commend the Regional Water Management Divisions for their tremendous participation in this effort.

I believe the ICR review process offers a valuable tool for taking an in-depth look, on a priority basis, at vulnerable areas of program management. This year, we focused our review on State and EPA management. Next year, we will sample grantees and test the integrity and usefulness of our requirements at that level of management.

Recognizing the highly delegated nature of the construction grants program and the large amount of Federal funds invested, we expect to remain highly vulnerable to fraud, waste, and mismanagement. I have been moving to integrate the ICR review process into budget planning and annual work plan development. I am also coordinating the ICR process and schedule with the Office of Water Accountability System (OWAS). While OWAS provides a mechanism for broad Regional management (built on delegated State management) tracking, reporting, and goal setting, the ICR process offers a more targeted opportunity to focus in detail on a few priority areas to identify and resolve management problems.

I am available to brief you on this year's review and to outline our plans for next year. If you have any questions, please contact me, or have your staff contact Steve Allbee (382-5856).

Attachment

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## EXECUTIVE SUMMARY

The Federal Managers' Financial Integrity Act (FMFIA) directs the assessment of internal controls for areas identified as highly vulnerable to waste, loss, unauthorized use or mismanagement of Federal program funds. This executive summary provides a brief overview of our Internal Control Review (ICR) process for EPA's construction grants program, highlights the findings of our first seven priority reviews, establishes our management action plan resulting from these reviews, and outlines our FY 1985 ICR program.

Our approach to complying with FMFIA was to establish the ICR process as part of our basic management system and to conduct integrated Headquarters and Regional reviews. The purpose of our reviews was to determine the efficiency and effectiveness of the EPA program management controls in meeting statutory and program objectives and to identify needed changes in EPA regulations, policies, or guidance. We are using the ICR program to help us maintain the overall administrative and programmatic integrity of the highly delegated construction grants program.

THE CONSTRUCTION GRANTS PROGRAM IS EXTREMELY VULNERABLE  
BECAUSE OF THE LARGE NUMBER OF DOLLARS AND PROJECTS  
AND THE HIGHLY DECENTRALIZED NATURE OF PROJECT MANAGEMENT.

From 1973 through 1983, Congress appropriated approximately \$40 billion for construction grants. We have disbursed approximately \$30 billion since 1973, completing construction on around 3,500 plants. We have an additional 8,000 projects under planning, design or construction. The construction grants program represents about 60% of EPA's FY 1984 budget.

The statutory and regulatory framework for construction grants management encourages full State delegation. EPA and States share in management overview, evaluation, and planning. EPA's overview policy emphasizes achievement of environmental and program results, rather than routine process reviews. Therefore, management controls are principally assessed by measuring the extent of State and grantee implementation of EPA requirements and by evaluating the progress in achieving National environmental program objectives.

In FY 1983 we participated in the Agency-wide preliminary Internal Control Review that listed and assessed management control techniques. This preliminary review effort resulted in a list of 57 issues that we then ranked, prioritized, and summarized to establish our priority issues for full scale review. At the beginning of this FY 1984 ICR effort we reexamined the priority issues and identified seven specific subject areas in which there was significant potential for mismanagement of Federal, State, and local funds. The first four issues were scheduled for reviews of one-year duration, and the final three issues were tentatively scheduled for two-year studies.

Seven Headquarters/Regional Office review teams were established, with 10 representatives from the Office of Water Program Operations (OWPO) and 22 representatives from the Regions. All the Regions participated in one or more reviews. Using EPA and OMB guidelines and GAO standards,

each team developed study-specific questionnaires and chose a sample of projects to review that would help assure the validity and applicability of the findings. Each issue area included 3-4 Regions and 6-8 States. (See reviewers and States in Exhibit I.) Although the number of States in each area under review was limited, the selection was carefully made to represent the States within the reviewers' Regions. A total of 27 States were reviewed. The reviewers sampled project files to see how grantees were implementing established guidance and procedures. OWPO worked closely with the Office of Administration's Internal Control Review Task Force and, as appropriate, with the Grants Administration Division and the Office of the Inspector General (OIG). The reviewers also looked for State-specific guidance, procedures, and management innovations that might be useful to other States and EPA Regions. (See review schedule, Exhibit II.)

THE FY 1984 ICR DID NOT FIND MAJOR PROBLEMS WITH WASTE,  
FRAUD OR MISMANAGEMENT IN THE PRIORITY AREAS WE EXAMINED.

No evidence of major fraud, waste or mismanagement was documented as a result of this year's effort. However, the review teams identified significant opportunities to improve program management, and some teams perceived resource requirements, chiefly for improved delegation oversight. The recommendations are specified in the individual team reports (Chapters II - VIII). Our action plan for implementing accepted ICR recommendations is contained in Exhibit III.

The construction grants program will continue to be a highly vulnerable program due to the extent of program delegation, the highly decentralized management and the amount of public funds involved. Therefore, we have developed a FY 1985 ICR program that involves following up on our FY 1984 ICR recommendations and identifying a selective list of additional priority areas to be reviewed in FY 1985. This year, we evaluated delegated States. Next year, we plan to evaluate grantee communities. (See our FY 1985 ICR program action plan, Exhibit IV.)

PRE-AWARD MANAGEMENT COULD BE IMPROVED.

- I. Priority Lists -- State priority systems usually direct funds to high priority projects, except under pressure of reallotment where "by-passing" may preclude optimum achievement of water quality and public health objectives.

The eight State priority systems that we reviewed appeared to direct grant funds to high priority water quality and public health projects as required by law, regulation and guidance. Direct and indirect water quality and public health factors are present and assigned proportionally high weightings in the priority ranking formula, but the basis for the values supporting the weightings is often not evident. Each State's system contained "by-pass" procedures that allow funding of lower priority projects. Generally, by-passing has followed the established priority; therefore, it does not appear to have a highly negative impact on overall water quality and public health priorities. However, there was also evidence that States have initiated large scale by-pass procedures to avoid the imminent loss of funds to reallotment. Under reallotment pressures by-passing may have been detrimental to achieving the highest priority public health and water quality objectives.



II. Cost-Effectiveness and POTW Facility Sizing -- EPA could do more to prevent high-cost, problem projects and to encourage better, cheaper alternatives.

The team members found that the majority of the projects reviewed appeared to be cost-effective and appropriately sized. However, they also found that most of the States and Regions seemed to misunderstand the term "appropriate technology". The State facility planning review process could allow some potential problem projects to be approved, and State facility design codes (e.g., limitations on the minimum size of sewer lines), among other restrictions, apparently were influential in preventing the use of some less-costly technologies. States and Regions lack mechanisms to identify potential problem projects early and to feed back information on constructed projects experiencing generic design and O&M problems into facility planning for proposed projects. The team advocated a systematic method for early updating of older facility plans.

III. Local Financial Management Capability -- EPA could do more to prepare communities to support the increasing burden of costs to build, operate, maintain and replace a treatment facility.

The team found that specific requirements of the Financial Capability Policy were not yet incorporated into delegation agreements or workplans for most States in the three Regions. Regions have transmitted the policy and HQ guidance to the States, but have not developed a State oversight system nor begun conducting reviews. States and Regions have not developed specific screening procedures for early identification of high cost projects, but were screening informally as part of their other review activities. Most Regions were not distributing the EPA screening computer printout, "Possible High Cost Projects". Problem projects were being resolved on a case-by-case basis.

IV. Value Engineering Analysis (VE) -- EPA could improve the environment for VE to stretch grant funds further.

The team reviewed 17 VE studies and existing statistical data. They found that the capital and O,M,&R savings from the approximately 75 annual VE studies far outweigh the cost of conducting these evaluations. The review team recommended VE reviews on projects costing under \$10 million, although such reviews are not required by the Act. Twenty percent of all VE study cost saving recommendations are actually implemented by the grantees. Life-cycle (O,M&R) cost savings are especially significant to communities since they pay 100 percent of these costs. The team reported that EPA Regional and State personnel assigned responsibility for VE program oversight have had much of their time diverted to other program activities.

PRE-CONSTRUCTION AND CONSTRUCTION ARE STILL  
VULNERABLE TO WASTE, FRAUD, AND MISMANAGEMENT.

V. Design Specifying and Bidding -- EPA can tighten procedures and instruct other levels of management in fraud prevention during these periods.

The team found that the States and Corps of Engineers (COE) are performing timely bidding and procurement process reviews consistent with EPA guidance. State performance was rated "excellent" by recently completed Section 205(g)



delegation reviews. However, level of effort in biddability and constructability (B&C) reviews did not vary in proportion to project size or complexity (i.e., large, complex projects warrant much more reviewer attention than small, standard projects). Also, State checklists for review of bidding documents and the local procurement process are out of date; State follow-up of deficiencies is insufficient. Regional oversight of the minority business enterprise/womens' business enterprise (MBE/WBE) certification process would appear inadequate. The required, written grantee codes of conduct are not addressed in EPA program guidance, and requiring non-collusion certification by grantees would reduce the possibility of bidder collusion. Regional and State program personnel do not have a formal process to identify fraud, collusion and bid rigging and lack the Inspector General's "trained eye". Bidding laws in a significant percentage of the States sampled do not allow self certification by grantees of their procurement systems. The majority of these States do not encourage the process, viewing it as a "blind approval". (In six States only one grantee procurement system was self certified.)

VI. Claims and Change Orders Management -- Project reviewers seem to be adequately protecting EPA from faulty change orders, but EPA could act to protect the grantees from loss. We could do more to prevent claims and speed resolution.

The team found that State and COE reviews of change orders and claims were sufficiently thorough to determine necessity and reasonableness of costs. However, the basis for many determinations on grant allowability was not uniformly documented. EPA has no specific requirement for reviewers to document the basis for these decisions in the project file or to inform the grantee in writing of the reason for denial of funds. HQ has not yet issued national guidance, although it is currently being drafted, to assist grantees and reviewers to deal with contractor claims. Initial documentation submitted by grantees was insufficient for approximately 40-50 percent of change orders reviewed and 60-70 percent of claims reviewed. In all cases, the reviewing agency requested and ultimately received the missing documentation, or the grant cost was not allowed. However, the additional time spent in obtaining complete information could cause future contractor claims. States and Regions timely reviewed all change orders. But, States and COE had difficulty reviewing contractor claims; in some cases, claims review took years to complete. The State and COE reviewers appeared to consider respective liabilities of the parties in their determinations.

COMPLETION AND OPERATION PHASE  
CHALLENGES EPA MANAGERS.

VII. Project Operation and Maintenance (O&M) -- EPA has not developed sufficient new management methods to help public treatment works function as designed.

The team found that EPA and State guidance and procedures are adequate for the development, review, and approval of plans of operation and O&M manuals. State use O&M manuals for technical assistance; however, States are not using plans of operation to manage projects. EPA HQ has not issued final guidance and Regions and States have not established procedures for POTW project performance certifications. (EPA HQ will provide project performance certification guidance in the construction grants guidance manual "CG 1985" to be issued at the beginning of FY 1985.)

# EXHIBIT I

<u>ICR Review</u>	<u>Regions Participating</u>	<u>States Included</u>
I. Priority Systems	III, IV, V, IX	California, Florida, Illinois, Maryland, Minnesota, Nevada, Pennsylvania, Tennessee
II. Cost-Effectiveness/ Facility Sizing	III, IV, VI, VIII	Georgia, Maryland, Montana, North Carolina, Oklahoma, Pennsylvania, Texas, Wyoming
III. Financial Capability	III, IV, VII	
IV. Value Engineering	IV, VI, VII	Iowa, Kentucky, Missouri, North Carolina, Oklahoma, Texas
V. Specifying & Bidding	II, V, X	Minnesota, New Jersey, New York, Ohio, Oregon, Washington
VI. Claims & Change Orders	I, V, IX	California, Massachusetts, Minnesota, Nevada, Ohio, Vermont
VII. Operation & Maintenance	I, II, III, IV	Maine, Maryland, Massachusetts, Mississippi, New York, North Carolina, West Virginia

## EXHIBIT II

## SCHEDULE FOR FY 1984 ICR REVIEW

- ° Conference call with Regional Water Division Directors and Branch Chiefs describing plans for conducting ICR, seven subject areas to be covered, and Regional involvement 3/23
- ° Branch Chiefs' meeting, Indianapolis, with further discussion of ICR plans, schedule, resource needs, HQ/RO roles, review process and issues 4/3-5
- ° HQ team leaders and RO members designated. HQ team leaders from Municipal Construction and Facility Requirements Divisions briefed by Office of Program Management and Evaluation. Team leaders identify internal control documentation for their studies. 3/23-4/10
- ° Regional staff to HQ to plan and develop study procedures and test materials; select States and grantee issues for evaluation 4/10-12
- ° Regions invite States to participate. 4/15-30
- ° HQ/Regional field visits (to Regions and States) to conduct reviews; team member findings circulated within teams 5/1-6/20
- ° Team members meet at HQ; analyze findings; agree on findings and recommendations; present oral reports to HQ managers. 6/28-29
- ° HQ team leaders draft reports; brief HQ Division Directors. 7/2-8/10
- ° Brief OWPO Director & AA, OW on ICR issues related to FY 1986 budget decisions 7/10
- ° Detailed briefing of OWPO Director by ICR team leaders on recommended actions in draft ICR reports 7/17-20
- ° Route draft reports for Regional Division Directors' comments 8/15-30
- ° OWPO managers select priority implementation needs and establish action plan. 9/3-17
- ° Modified/consolidated report draft to OWPO Director 9/21
- ° Transmit report to Ravan 9/24
- ° Transmit report for Administrator 10/31

## EXHIBIT III

OWPO CONSTRUCTION GRANTS PROGRAM ACTION PLAN BASED ON  
FY 1984 INTERNAL CONTROL REVIEW (ICR) RECOMMENDATIONS

## STATE PRIORITY SYSTEMS

RECOMMENDED AND PLANNED FOR FOLLOW-UP ACTION	DATES FOR ACTION		RESPONSIBLE OFFICE AND/OR PERSON
	INITIATION	COMPLETION	
° Evaluate the extent of the discrepancies between the various priority lists and funded projects.	continuing	9/85	FRD/Byron
° Develop guidance for priority system and list management, and a process to routinely advise permits compliance personnel when priority grant projects are "by-passed" for funding.	10/84	2/85	FRD/Byron and OWPO/RO workgroup
° Re-examine Agency role in the review/approval of priority systems and lists and include, through a workgroup to be established early involvement by State and EPA Regional offices in policy and guidance development. Short report to be submitted to Director, OWPO. (Note: In the spirit and intent of the FY '84 ICR, this activity will be audited through independent EPA contractor reports during FY '85.)	10/84	2/85	FRD/Byron and OWPO/RO workgroup
° Require States to provide a "hard copy" of the final, fully accepted list to Regions.**		1/85	Regional Water Management Divisions
° Ensure delegated States input to the GICS system the final "hard copy" list; ensure correlation between the GICS priority list and grant awards.** (**Note: OWPO/FRD has issued Supplemental Guidance to the Regions.)		1/85	Regional Water Management Divisions

RECOMMENDED BUT NOT PLANNED  
FOR FOLLOW-UP ACTION

## REASON

- |  |  |
|--|--|
| ° Establish a work group to determine how to improve the correlation between State priority systems, lists and the Needs Survey. | ° Resources may not be sufficient in FY '85 to implement this.   |
| ° Emphasize in guidance the need for State to provide documentation for priority rankings at the time lists                      | ° The Paperwork Reduction Act requires EPA to reduce the respondents' burden to data requests. Also, RO resources are insufficient for review. |

OWPO CONSTRUCTION GRANTS PROGRAM ACTION PLAN BASED ON  
FY 1984 INTERNAL CONTROL REVIEW (ICR) RECOMMENDATIONS

COST-EFFECTIVENESS AND POTW FACILITY SIZING

RECOMMENDED AND PLANNED FOR FOLLOW-UP ACTION	DATES FOR ACTION		RESPONSIBLE OFFICE AND/OR PERSON
	INITIATION	COMPLETION	
° Hold more seminars at State offices and use case studies to inform State and A-E personnel concerning technology developments and potential benefits of technologies appropriate for small communities.	10/1/84	9/30/85	FRD/Dearth and Regional Water Management Divisions
° Require and provide guidance for facility plans to be reviewed and updated if they are old and in need of updating before grant award of construction funds.	10/1/84	1/31/85	FRD/Dearth and RO Water Mgt. Division
° Involve State personnel responsible for O&M inspections and NPDES permits compliance in the facility plan review process.	1/85	ongoing	FRD/Dearth, RO Water Mgt. Div's, & 205(g) State Managers
° Overview facilities planning more closely and encourage rigorous State enforcement of CFR 35.2030.	10/1/84	ongoing	FRD/Dearth and RO Water Mgt. Div's

RECOMMENDED BUT NOT PLANNED  
FOR FOLLOW-UP ACTION

REASON

- |  |   |
|--|---|
| ° Hold high level discussions with States which restrict use of alternative systems.   | ° Other actions will be identified to assist States in alleviating this problem.  |
| ° Change regulations to require a grant-eligible value engineering analysis of projects in communities of less of less than 10,000 population. | ° Appropriate technology implementation should be negotiated under delegation and State/EPA agreements. Instead, OWPO/FRD will suggest to Regional offices that they encourage these reviews for smaller communities. |

OWPO CONSTRUCTION GRANTS PROGRAM ACTION PLAN BASED ON  
FY 1984 INTERNAL CONTROL REVIEW (ICR) RECOMMENDATIONS

LOCAL FINANCIAL MANAGEMENT CAPABILITY

RECOMMENDED AND PLANNED FOR FOLLOW-UP ACTION	DATES FOR ACTION		RESPONSIBLE OFFICE AND/OR PERSON
	INITIATION	COMPLETION	
° Ensure that States are employing existing policy and guidance and are resolving problem projects in a systematic manner.	ongoing	12/84	RO Water Mgt. Divisions FRD/Dearth
° Establish a strategy to assist States to resolve project problems, when appropriate.	10/84	1/85	RO Water Mgt. Divisions FRD/Dearth
° Incorporate the policy requirements into State delegation agreements and workplans in specific terms.	ongoing	12/84	RO Water Mgt. Divisions & delegated States
° Ensure that the demonstration and certification is completed for all grant applicants.		ongoing	RO Water Mgt. Divisions & delegated States
° Offer seminars to improve the ability of reviewers to analyze and evaluate demonstrations.	10/84	9/85	FRD/Dearth

OWPO CONSTRUCTION GRANTS PROGRAM ACTION PLAN BASED ON  
FY 1984 INTERNAL CONTROL REVIEW (ICR) RECOMMENDATIONS

BLUE ENGINEERING (VE) ANALYSIS

RECOMMENDED AND PLANNED FOR FOLLOW-UP ACTION	DATES FOR ACTION		RESPONSIBLE OFFICE AND/OR PERSON
	INITIATION	COMPLETION	
Increase the amount of information available to Regional and State managers on the utility of VE analysis in identifying and achieving project cost reductions.	10/1/84	4/1/85	MCD/Brodtman
Encourage all States to designate a VE coordinator.		10/15/84	RO Water Mgt. Divisions; MCD/Murphy
Assign a higher priority in Regional and State management to VE analysis.	FY 1985	FY 1985	RO Water Mgt. Divisions & delegated State managers

RECOMMENDED BUT NOT PLANNED  
FOR FOLLOW-UP ACTION

REASON

Consider the cost effectiveness of administratively requiring VE analysis on projects valued between \$1 million and \$10 million.

This would require an initiative for a legislative change which is not a current priority of program management.

Issue guidance to the Regions discouraging award of VE contracts to the same architect-engineering (AE) firm that produced the original design.

Recommendation is not substantiated by analytical findings. Management of the VE process is the key factor in securing adequate VE team design reviews.

Consider adopting a national, annual goal greater than the current 5 percent capital and 1 percent O,M&R savings being achieved from VE analyses to encourage States' and communities' acceptance of a higher percentage of VE recommendations.

Adopting a goal will not raise VE savings; securing management attention is more likely to do this.



OWPO CONSTRUCTION GRANTS PROGRAM ACTION PLAN BASED ON  
FY 1984 INTERNAL CONTROL REVIEW (ICR) RECOMMENDATIONS

DESIGN SPECIFYING AND BIDDING

RECOMMENDED AND PLANNED FOR FOLLOW-UP ACTION	DATES FOR ACTION		RESPONSIBLE OFFICE AND/OR PERSON
	INITIATION	COMPLETION	
° Encourage States, the COE, and grantee communities, where feasible, to establish their own Q/A, oversight, and internal control programs, and disseminate information on New York States' program to EPA & States.		11/1/84	MCD/Hanlon and RO Water Management Div's
° Consult with COE and jointly consider ways to optimize COE participation in plans and specifications review.		11/1/84	OPME/Hardaker & MCD/Brodtman
° Develop and issue national guidance on: (1) use of a non-collusion certification; (2) a written, community code of conduct.	10/1/84	4/1/85	MCD/Murphy
	10/1/84	11/1/84	MCD/Murphy
° Continue to inform RO, State, local managers on procedures to detect/prevent fraud, collusion & bid rigging.	Ongoing		MCD/Hanlon, GAD/Pippen, OIG & Justice Dept.
° Issue regulations or guidance requiring grantees to retain no less than the 12 items recommended by the DOJ in their bidding records for review by State and EPA.	10/1/84	4/1/85	GAD/Pippen (OWPO representative: MCD/Murphy)
<hr/>			
RECOMMENDED BUT NOT PLANNED FOR FOLLOW-UP ACTION	REASON		

- ° Develop and issue national guidance on Minority Business Enterprise/Women's Business Enterprise (MBE/WBE) bidding document inserts.

Under the "fair share" philosophy currently being applied, a national specification would be inappropriate.

The ICR review should be continued another year & expanded to include self certification & debarment, since these activities are potentially vulnerable & sufficient project specific documentation is unavailable for review in FY 1984.

Disagree. These are not highly vulnerable areas within the program.

OWPO CONSTRUCTION GRANTS PROGRAM ACTION PLAN BASED ON  
FY 1984 INTERNAL CONTROL REVIEW (ICR) RECOMMENDATIONS

CLAIMS AND CHANGE ORDERS MANAGEMENT

RECOMMENDED AND PLANNED FOR FOLLOW-UP ACTION	DATES FOR ACTION		RESPONSIBLE OFFICE AND/OR PERSON
	INITIATION	COMPLETION	
° Advise grantees of the information required to be submitted with a request for approval of a change order or settlement of a contractor claim, and direct grantees to submit all the necessary information at one time. (HQ inform RO's that this could be done in the grantee information package, during a Project Management Conference (PMC) or included in a State publication.)	10/1/84	1/1/85	MCD/Murphy; Regions; delegated States
° Expedite issuance of the "Management of Claims" guidance currently being developed.	ongoing		MCD/Brodtman
° Require reviewing agencies to follow the "Change Orders Guidance" ("Documenting the Project File", p. 15).	10/1/84	1/1/85	MCD/Brodtman
° Suggest that reviewing agencies document the basis for each "allowability/unallowability" decision in the project file and include the basis for each decision denying additional funds in the letter to the grantee.	(Immediately)	10/1/84	MCD/Brodtman

OWPO CONSTRUCTION GRANTS PROGRAM ACTION PLAN BASED ON  
FY 1984 INTERNAL CONTROL REVIEW (ICR) RECOMMENDATIONS

PROJECT OPERATION AND MAINTENANCE (O&M)

RECOMMENDED AND PLANNED FOR FOLLOW-UP ACTION	DATES FOR ACTION		RESPONSIBLE OFFICE AND/OR PERSON
	INITIATION	COMPLETION	
° Help States to establish project performance certification procedures.		FY 1985	RO Water Mgt. Divisions
° Designate staff members to coordinate and manage performance certification procedures.		FY 1985	RO Water Mgt. Divisions
<hr/>			
RECOMMENDED BUT NOT PLANNED FOR FOLLOW-UP ACTION	REASON		
° Issue guidance on procedures for project performance certification review and assistance.	"CG-85" will soon be issued and will provide sufficient guidance. No additional guidance is needed.		

# EXHIBIT IV

## FY 1985 INTERNAL CONTROL REVIEW PROGRAM SCHEDULE

PRIORITY ISSUES SCHEDULED FOR REVIEW	OCT.....	JAN.....	APR.....	JULY.....	SEPT
<u>Grantee Management:</u>	:	:	:	:	:
	:	:	:	:	:
° Grantee Construction Management	<u>Plan/Select/Pilot</u>	:	:	:	:
	° Establish detailed plan for review	:	:	:	:
° Financial Management Capability	° Determine statistically valid sample	:	:	:	:
	° Assign responsibility for evaluations	:	:	:	:
° Operation & Maintenance	° Construct pilot test procedures & materials	<u>Conduct Review/Draft Report</u>	:	:	:
° Land Acquisition	° Acquire management approval of methodology	° Based on existing Agency information establish background data file on each sample project	:	:	:
<u>State Management:</u>	° Issue notice to proceed with study plan	° Proceed to supplemental field investigations (with delegated States, when possible)	<u>Peer Review/Modify Draft/Refine Data Base</u>	:	:
		° Analyze results	° Regions/HQ review/comment	:	:
° Needs Survey Data Base		° Draft initial findings & conclusions	° Input to budget	:	:
		° Coordinate with State delegation reviews & operator training diagnostic evaluations	° Input to OWAS mid-year review	:	:
			° Submit findings & recommendations	:	:
				<u>Management Decisions/Report Completion</u>	:
				° Managers' consider recommendations	:
				° Complete FY 1986 action plan	:
				° Select FY 1986 ICR targets	:
				° Complete report for OW to review/send for Administrator	:

## INTRODUCTION

Since enactment of the Federal Managers' Financial Integrity Act (FMFIA) early in 1982, EPA managers of the municipal wastewater treatment construction grants program have taken several steps to bring the program into compliance. This review report is based upon the previous management efforts. It is directed to areas identified under the Act as highly vulnerable, with the greatest priority for attention and potential for assuring that "funds, property, and other assets are safeguarded against waste, loss, unauthorized use, or misappropriation." It provides the findings of the initial internal review of EPA management controls and techniques and State implementation in the selected areas.

## HISTORY OF REVIEW

The first Vulnerability Assessment of the construction grants program was performed in August and September, 1982 by EPA Headquarters (HQ) and Regional (RO) offices. This was performed under OMB's initial Circular No. A-123, "Internal Control Systems", dated October 1981.

The individual self-assessments reviewed the susceptibility of the program to unauthorized use of resources, errors in reports or information, illegal or unethical acts, and adverse or unfavorable opinion. The reports were channeled to the Inspector General (IG), who issued a consolidated report on overall Agency vulnerability in January 1983. The report identified the construction grants program as highly vulnerable and recommended an internal control review (ICR) be conducted during 1983 and 1984. The IG report summary stated:

"The municipal wastewater treatment construction grants program was ranked as having a high degree of vulnerability by the Headquarters program office and eight regional offices. The primary reasons for this ranking are the large number of dollars and projects involved and the fact that 80 percent of project management is to be performed by parties outside the Agency. The regional offices also reported numerous perceived weaknesses involving organizational issues, policies, procedures, personnel, and reporting."

In late FY 1983 the program participated in the Agency-wide preliminary ICR. The Headquarters office and each Region conducted its own review; the Regional Administrators reported individually to the Administrator. However, Assistant Administrator Howard Messner's memorandum of August 25, 1983 designated the Assistant Administrator for Water, Jack Ravan, as the program head with lead responsibility to conduct the review. Office of Water Program Operations (OWPO) managers accordingly compiled an extensive national list of all issues identified in the 1982-1983 vulnerability assessment and all issues

known to program managers and targeted in reports issued by the General Accounting Office (GAO), the Inspector General's Office (OIG), and other special studies issued in the period from 1981. The study was structured on the program objectives, sub-objectives and activities identified in the program budget. Management control techniques were listed and assessed.

This list was reviewed, expanded to 57 issues based on Regional input, and ranked in order of vulnerability and priority by the HQ and Regional managers. Each of the issues were identified by source. Because many of the issues were somewhat redundant or overly narrow, OWPO condensed them into twelve summary issues. These were again ranked and prioritized for study by the OWPO Director, and reported to Assistant Administrator Ravan.

Mr. Ravan, in his letter to the Administrator of November 1983, conveyed the preliminary review and indicated the following summary issues were selected for in-depth IC review during FY 1984:

- ° Improve grantee financial management and control of project planning, design, and construction (change orders, claims, and lags); completions and closeouts (physical completions and closeouts); and procurement, records, and accounting systems.
- ° Improve grantee publicly owned treatment works (POTW) performance, addressing operations and maintenance (O&M) and pretreatment.
- ° Ensure targeting of funds to:
  - (a) water quality priority needs, and
  - (b) most cost effective and appropriate project design.
- ° Improve State management of delegated activities, assuring:
  - (a) an adequate number of State staff, and
  - (b) trained State staff.
- ° Improve EPA oversight of delegated State, Corps and Region activities, including 205(g) grants and Corps interagency agreement (IAG) by:
  - (a) enforcing delegation agreements,
  - (b) reviewing State staff levels and capability, and
  - (c) improving project information.

The Administrator, in his December 27, 1984 letter, assured the President that priority program issues identified would be reviewed during FY 1984 and corrective actions would be implemented, subject to resource availability.

At the beginning of the ICR effort, OWPO managers were confronted with the challenge of planning the review so that it could be performed within available resources. The managers reexamined the five summary issues and identified seven (7) specific subject areas within them which had the greatest vulnerability to fraud, financial loss, or mismanagement and the greatest potential for safeguarding Federal, State, and local government funds.

The seven subject areas selected for review were:

- ° Cost-Effectiveness and POTW Facility Sizing
- ° State Project Priority Systems
- ° Change Orders and Claims Management
- ° Design Specifications and Bidding
- ° Local Grantee Financial Management Capability
- ° Facility Operations and Maintenance
- ° Value Engineering Analysis

The first four subjects were scheduled for reviews of one-year duration because it was hoped all significant questions could be examined and recommendations for actions to address management deficiencies made within the year. The final three subjects were scheduled for two-year studies because the EPA policies and requirements for these were recently issued and implementation was insufficiently advanced for assessment. It is also more important to examine EPA provisions for these subjects at the local/grantee level and more feasible to do this in FY 1985.

#### CONDUCT OF REVIEW

The OWPO Director designated the Office of Program Management and Evaluation (OPME) as the lead office within OWPO for planning and coordinating the full review. This office was assigned responsibility for assisting management involvement, planning review procedures, scheduling the outputs, coordinating the individual team reports, and consolidating and providing for review of this report. EPA and OMB guidelines were used, and the GAO standards were consulted. Throughout the process, the office worked closely with the Office of Administration's Internal Control Review Task Force and, as appropriate with the Grants Administration Division (GAD) and the Office of the Inspector General (OIG) concerning project design specifications and bidding, where related reviews are also underway.

Because of the highly delegated status of the program, Regional office management performance was principally assessed through measuring the extent of State management implementation of EPA requirements in the study areas. A combination of factors influenced this review approach. Grant application review, implementation of Federal requirements and project management during the construction and post-construction stages are very heavily delegated to States (and to the Corps of Engineers). Program personnel have been reduced by forty percent since FY 1980, principally in the Regions. The 1981 Clean Water Act Amendments have introduced a number of significant changes. Regional personnel work with their State counterparts to effect national requirements within individual State programs, and they provide technical assistance to State reviewers. The revised regulation and guidance governing Sec. 205(g) delegation program management very significantly streamlined EPA management of the program. The regulations "encourage full State delegation, and the broadening of EPA and State responsibilities related to overview, evaluation, and planning under delegation." The changes reflect "a broad overview policy, which emphasizes achievement of environmental and program results, rather



than routine management review." The weight of these new factors on program management requires the integrity and effectiveness of the Regional performance to be measured through State management accomplishments and implementation of the national requirements.

Regional managers were briefed April 3 on the rationale for selection of review subjects and procedures, and HQ/RO agreement was reached. Seven HQ/RO review teams were established, with 10 representatives from HQ and 22 representatives from the Regions participating. All the Regions participated in one or more reviews.

OWPO and Regional team members met in Washington, D.C. for a detailed planning and study development in mid-April. (See Exhibit II for a complete schedule of review activities.) HQ staff briefed HQ and Regional team members on the concepts and objectives of the FMFIA, Circular A-123 and the Agency's ICR process. The majority of the time was devoted to individual team sessions to allow the members to organize themselves, discuss issues, list management techniques for review, and develop study-specific questionnaires and a team approach to involving and interviewing the States and selecting test projects. The teams were given a set of generic forms and questionnaires to aid this process.

Because it was necessary to limit the number of States interviewed, each team chose a representative sample that would help assure the validity and applicability of review findings and team recommendations to the national program. Criteria used for choice of States were generally based on relative State size (e.g., the largest and smallest State in each Region) and team members' knowledge of conditions affecting program management in individual States. Six to eight States were chosen for each study, and a total of 27 States participated in the review. (Each ICR team report provides attachments that list team members, State personnel interviewed, and the questionnaires used.)

In inviting States to participate, Regional management emphasized that the purpose of the review was to determine the effectiveness of EPA management approaches in meeting statutory and program objectives to identify needed changes in EPA policies, guidance or regulations. The teams emphasized that the purpose was not to duplicate State performance evaluations under delegation as defined in annual Sec. 205(g) delegation workplans, operating guidance and EPA management systems such as the Administrator's Strategic Planning and Management System (SPMS) or Office of Water Operating Guidance and Accountability System (OWAS/OWOGAS) or to "second guess" program or project management decisions made previously. In order to cover the two summary issues concerning program delegation, State management of delegated activities and EPA oversight of States, the ICR review teams drew upon pertinent Section 205(g) delegation program findings from reviews that had been conducted recently. If the data were not available, the ICR reviewers incorporated the delegation concerns within the scope of their studies, as appropriate. Also, the reviewers on some teams sampled project files to see how grantees were implementing established guidance and procedures in their subject areas. The reviewers also looked for State-specific guidance, procedures, and management innovations that might be useful to other States and EPA Regions.

RO team members with some HQ assistance reviewed delegated State implementation of policies, guidance and procedures and selected grantee project files during May and June. These reviews were coordinated with on-going mid-year reviews scheduled under the Agency Accountability Systems, as appropriate. During this time, to prevent duplication of effort, the OWPO review managers arranged several meetings with Grants Administration Division (GAD) managers of the ICR review of the procurement process and with the OIG and GAD managers involved in on-going reviews on the integrity of the bidding process under EPA grants. Also to help coordination, GAO studies underway in corresponding areas (e.g., VE analysis) were identified and information shared.

The teams met again June 28-29, compared and discussed questionnaire data and findings, and drafted team reports. Teams discussed their reports with HQ program managers at the June 28-29 meeting. Following this meeting, HQ team leaders briefed the Office and Division Directors on conclusions and recommendations, and decisions were made on the supportability of the conclusions and recommendations for the final report. Management decisions were also reached on the Office's priorities and plans for implementation of report recommendations. Following these discussions, the team reports were consolidated and closely reviewed by HQ and RO program managers and the Assistant Administrator for Water prior to transmittal to the Assistant Administrator for Administration.

In addition to the findings and recommendations outlined in the management summary, the teams reported that the review was helpful in achieving a deeper understanding of the study areas and operations of the Regions and delegated States. Although no evidence of major fraud, waste or mismanagement was found, the team members unanimously supported conducting ICR reviews annually because of continuing high program vulnerability due to the extent of program delegation and the levels of public funds involved. They recommended integrating ICR issues and tracking follow-up actions in the OWAS system and the Sec. 205(g) State delegation reviews. OWPO is moving to accomplish this during planning of the FY 1986 OWAS priorities in early FY 1985.

#### FY 1985 REVIEW

Construction grant program managers recognize the continued highly vulnerable nature of the program and EPA responsibilities to assure adequate management controls exist to prevent and detect fraud, waste and mismanagement. They have moved to institutionalize the ICR reviews into the annual management tracking process. An ICR of the integrity of Federal requirements and recommended procedures will be conducted annually.

In FY 1985 the review will be conducted at the local grantee management level. The study will particularly focus on the grantees' implementation of the Federal requirements and the grantees' management support needs.

The review will be organized to focus closely on two areas which are being extended into a second year of study:

- ° Local Financial Management Capability
- ° Grant Facility Operation and Maintenance

And, we are adding two new studies:

- ° Grantee Construction Management
- ° Grantee Land Acquisition for POTW Projects

We plan to include the delegated States in the grantee reviews, when possible. We are proposing only one study directed to the State level:

- ° POTW Grant Funding Needs Survey Data Base

Details of the FY 1985 ICR review plans are provided in Exhibit IV in the Executive Summary.

The other five ICR reviews in this report are being discontinued because they have fulfilled their purpose and have provided program managers sufficient valuable insights and action recommendations for implementation within FY 1985.

## II

### STATE PRIORITY SYSTEMS

#### A. TEAM MEMBERSHIP

The ICR team was composed of four Regional office members and one headquarters member. Generally, the experience level of the team is considerable. For the most part, each member has extensive professional experience, including six or more years of experience in construction grants. More comprehensive information concerning the review team is attached.

#### B. EVENT CYCLE

The purpose of the priority system/list management process is to assure that EPA construction grants are awarded to high priority water quality or public health projects. The objective is to assure that grant awards to these projects are made in conformance with the 1981 Construction Grant Amendments of the Clean Water Act and appropriate regulations and guidance. Effective priority list management is important to the program because it is the initial step in determining the priority of grantees to receive Federal funds through the construction grants program. Furthermore, effective priority list management is necessary to assure the maximum return on the Federal investment and discourage the funding of projects that achieve only minimal pollution abatement.

The review was conducted in the context of the States having program management responsibility and EPA Regions and HQ having oversight responsibilities.

#### C. CONTROL TECHNIQUES

The basis for control is embodied in law, regulation, and guidance, as well as in ongoing management and oversight processes such as priority system and list approval, monitoring and tracking, and performance evaluation. The following published controls and implementation procedures are involved in priority system/list management:

##### Published Controls

- o Section 216 of the 1981 Amendments to the Clean Water Act (P.L. 97-117), published February, 1982 [Priority Determination].
- o Interim Final Construction Grants Regulation, published in the Federal Register, May 12, 1982, (40CFR 35.2015) [State Priority System and Project Priority List].
- o Office of Water Administrator's memo dated July 20, 1982 [Approval of State Priority Systems].
- o OWPO FY 1984 priority list development information memorandum dated March 31, 1983.

- o Final Construction Grants regulation, published in the Federal Register, February 17, 1984, (preamble and 40CFR35.2015) (State system and project priority list).
- o OWPO FY 1985 priority list development guidance dated February 24, 1984.
- o Any supplementary guidance that may have been published by the Regional Administrator to clarify or otherwise assist the States in meeting the requirements of the Clean Water Act.

#### Implementation Procedures

The process begins with the States developing and submitting their proposed project priority systems to the EPA Regional Offices for review and approval. If the States make frequent modifications to their systems, this review and approval process tends to be an annual activity. Generally, systems undergo substantial changes only when the law changes. The requirements of the 1981 Amendments to the Clean Water Act are an example of significant change.

To expedite the priority list development process, EPA generally issues priority list guidance appropriate for a given fiscal year. EPA Regional Offices typically supplement this guidance to account for regional differences. The project priority list is developed by the State consistent with the approved priority system. It is submitted annually to the EPA Regional Office for review and acceptance prior to the beginning of the Federal fiscal year.

Regulation requires the priority list to include a fundable portion, consisting of those projects anticipated to be funded from the current allotment; and a planning portion, consisting of projects anticipated to be funded from future authorized allotments. Projects which are neither in conformance with the priority system criteria nor required to meet the enforceable requirements of the Act must be withdrawn from the list. After acceptance by the EPA Regional Administrator, the list is entered into GICS for ongoing program management. Projects are awarded from the fundable portion of the list, except where appropriate "by-pass" procedures are employed as provided for in the approved priority system. Priority system and list management is funded under Sec. 106 of the Act. EPA monitors priority list management through State work plans, periodic performance evaluation, and through other related performance areas such as a State's progress toward meeting grant award obligation commitments.

Many EPA Headquarters offices rely on priority list information for oversight purposes. Their success or failure to extract information from the Grants Information and Control System (GICS) is an ongoing indication of the States performance, not only in supplying accurate data, but in properly managing their priority lists as well. If Headquarters offices cannot extract accurate information, it is virtually impossible to show national program status at a particular point in time.

#### D. REGION/STATE SELECTION

States selected for review by the Regional workgroup members are as follows:

<u>REGION</u>	<u>STATES SELECTED</u>
III	Maryland, Pennsylvania
IV	Florida, Tennessee
V	Illinois, Minnesota
IX	California, Nevada

The key criterion for selecting the States was, generally, size, with sampling limited to one large and one small State per participating Region. Other contributing factors included travel requirements, the workload of the State at review time, dovetailing this review with other evaluations in a given State, and noteworthy priority system/list circumstances in a particular State. The team's judgment was that the States selected would be representative of the national picture.

#### E. REVIEW PROCEDURES

The reviews were conducted in the four Regional Offices and in the eight selected States during May 1984. The Regions and four of the States (one in each of the four Regions) were reviewed by a team, which consisted of a headquarter's member and one or more members from the respective Regional Office. The four other States were reviewed only by the respective Regional Office team member.

A list of questions focusing on five areas of interest was developed by the team prior to the Region and State visits. These five areas (issues 1 through 5 as shown on the questionnaire [Exhibit I]) cover a complete cycle of priority system/list management: 1) features of the approved priority system, 2) priority list development in accordance with the system, 3) choice of projects for funding in accordance with the accepted priority lists, 4) priority system/list management coordination with other water quality and public health initiatives, and 5) results achieved in terms of projects funded versus actual water quality improvement.

From the beginning, the team decided to present a "generic findings" report. This approach keeps the focus on the evaluation of control techniques and how they are working. The stated purpose of the review was not to evaluate, grade, or rank a given State's performance.

## F. TEAM FINDINGS AND RECOMMENDATIONS

The Federal Managers Financial Integrity Act of 1982 requires each Executive Agency to establish a system of internal accounting and administrative controls. In this context, the team found that:

### State Ranking Formulas

- o The eight State systems reviewed appeared to emphasize water quality and public health as required by law, regulation and guidance and to direct grant funds to high priority water quality and public health projects. Specific factors which evaluate projects for water quality and public health importance were generally found to be prominent in each State's priority system.
- o The States varied in their approach to creating and modifying their priority systems; each State system is different in one way or another. The States' view is strong that the law, from inception, gives the States primary responsibility for project priority systems and lists.
- o A number of the States are not clear on what the universe of projects for priority determination is. This uncertainty suggests that some portion of the universe of projects is not run through the priority ranking process, but is subjectively determined not to have priority list position.
- o Documentation to substantiate values for various factors used in the priority system ranking formula is weak and not readily available. For example, direct and indirect water quality and public health factors are present and assigned proportionally high weightings in the ranking formula, but the basis for the values assigned to these factors is often not evident.
- o System ranking formulas are sometimes so complex that a cursory review cannot readily demonstrate how various factors impact the result. Water quality and public health criteria often are indirect surrogates, causing some doubt as to their influence in the ranking formula.
- o The review revealed some interesting approaches to arriving at the fundable portion of the priority list. This ranged from pre-screening on the basis of readiness-to-proceed to a multi-year fundable portion. It also revealed how some States build in flexibility to handle unexpected public health problems without by-passing a project on the fundable portion of the priority list.
- o All States have procedures to develop lists in accordance their systems. However, individual States caused ICR reviewers some concern in that not all data to support project priority were accurately verified. The control technique is in place, but subsidiary data to substantiate values for the ranking formula calculation were deficient or not available.



### Recommendation

Task group should conduct further, comprehensive analysis of the workings of State priority system ranking formulas to insure the mandatory water quality and public health emphasis and to recommend modifications where formulas are overly complex and not readily understandable.

### Guidance

- o States found Agency guidance during the past few years to be late and weak in "how to" details.
- o The team agrees that, generally, Agency guidance has been too late. To meet some States' needs, priority system guidance would have to be issued approximately a year in advance of the intended implementation date because of the State's legislative process. Large States with well developed programs do not desire extensive Agency guidance. Small States, with less developed programs and limited resources want detailed guidance to help them improve their existing systems.
- o There are indications that both Regional and Headquarters oversight of the priority system/list control process has been too shallow. Review and approval procedures are often very informal and at times are not applied with sufficient rigor.

### Recommendation

Agency should provide priority list guidance to Regions/States no later than the end of February preceding the fiscal year for which it applies. Headquarters should seek additional Region/State input to make guidance clear and more meaningful. Because certain State legislatures must act to effect priority system revisions, EPA must allow for a substantial lead time when issuing priority system revision guidance.

### Oversight

One of the States reviewed uses a multi-year fundable portion approach to priority list management. This is clearly in conflict with the current construction grant regulation, which calls for a fundable portion based on the current year allotment.

### Recommendation

Establish task group to develop procedures for review, approval, and acceptance of State priority systems and lists. Use this as a training vehicle for participants. This would permit cross fertilization and expanded understanding of multiple approaches to system/list management among Regions and States.

### Priority List Management

- o Each State's system contains by-pass procedures that allow funding projects from the I/A, rural and other set-aside allocations. The procedures permit the by-passing of projects where grantee inaction makes funding impractical. Generally, these situations do not negatively impact the overall water quality and public health objectives because by-pass funding follows the established priority. At times, however, States will initiate large scale by-pass procedures to avoid the imminent loss of funds to re-allotment even though high water quality and public health benefits may not be achieved. A project's readiness to proceed may carry excessive weight in priority funding determinations.
- o All reviewed States phase or segment projects to prevent a few projects from taking all the State's allotment. Segmenting allows funding of other, smaller (less costly) projects throughout the State. In States with very large urban areas, segmenting is absolutely essential to stability in the grant program.
- o All reviewed States have public hearings annually to discuss priority system/list matters. The frequency varies from bi-monthly to once a year. In the case of the State with bi-monthly meetings, the agenda includes adjustments to lists, by-passing projects, and other list management aspects for discussion in public forum.

### Recommendations

- o Regional EPA priority list reviewer must require State to provide complete data documentation at the time it is submitted for review and acceptance.
- o Have a task group study further these various approaches to priority system/ list management. It is the review team's perception that there are several effective approaches to successful results in this area. It would be helpful if information concerning these systems could be shared by those States still trying to improve the effectiveness of their systems.

### Information Systems Management

The review confirmed that we continue to have difficulty getting the officially accepted State priority lists into the Grants Information and Control System (GICS) to reflect what the States took to public hearing and what was accepted by the Regional EPA. Often this is attributed to key punch problems, errors, omissions, and other general administrative problems. Whatever the reasons, the problem remains and corrective action is indicated.

### Recommendation

Require State to provide Region with hard copy of officially accepted priority list identical to that which is put into GICS at the beginning of the fiscal year. Regions should follow up to insure correlation between hard copy and what goes into GICS. A hard copy should be provided to Headquarters as well.

### Grants Management

Ongoing monitoring reveals that grant awards vary somewhat from priority lists in a number of States. Some of the differences can be explained in terms of GICS administration; that is, keypunch and coding errors. Additional effort is needed to reduce this variance.

### Recommendation

Have work group study the reasons for grant awards not tracking completely with priority lists and make recommendations for substantially reducing or eliminating the problem.

### Other Findings and Recommendations

Regional EPA should investigate States that have set unusually high reserves for grant increases. This practice may be impacting the funding of additional water quality/public health improvement projects. Practices in States reviewed range from zero allowance for grant increases to tens of millions of dollars annually. Regional EPA should determine what reserve is reasonable for a given State operation and provide appropriate State-specific guidance.

Encourage continued coordination among grants, Needs Survey, permits and enforcement. States with good coordination of actions appear to be placing greater emphasis on the highest priority projects. For example, each program operation should recognize priority overlaps, so that actions can be taken in harmony to achieve results.

If monitoring for results is to be successful, much more effort at coordination among water quality/public health focused initiatives must be fostered, including provision for a much expanded funding base for these activities. (Refer to Section 305(b) State Water Quality Reports and ASIWPCA report "America's Clean Water 1972-1982"). These reports may not be comprehensive enough to gain widespread acceptance as representative of the state of the Nation's waters.

## G. RESPONSE TO REGIONAL COMMENTS

Two Regions pointed out the substantial resources required to fulfill the review team's recommendation concerning the States' providing documentation to substantiate values used in the priority system ranking formula. The intent of the team's recommendation is precisely that of the two Regions. The intent of the recommendation is to increase Regional oversight and to have assurance that the States do, in fact, have subject documentation, should questions arise during the priority list acceptance process. It goes without saying, that oversight must be selective. It is incumbent upon the Regions, of course, to determine the extent of documentation required to achieve confidence in the State numerical rankings.

One Region commented: "Do not agree priority system management has been shallow. Feel State has primary responsibility as indicated in the Act. EPA role has been appropriate." The workgroup's recommendation to tighten oversight of the priority system and list is consistent with its findings that oversight has been shallow in several key areas of priority system and list management. The Region which made the comment was not involved in the ICR review.

One Region made the statement that the Needs Survey, "...needs to be revamped from the top to bottom." The review did not scrutinize the Needs Survey process particularly. It was looked at only to the extent that it be considered as the "universe" from which priority projects should be drawn. This Region's recommendation to revamp the Needs Survey is not considered by the team to be an integral part of this ICR review and should be considered under other auspices.

WORKGROUP MEMBERSHIP

Roy Whatley: Region IV; 31 years of Federal Service, 18 years with EPA and predecessor agencies, 6 years in construction grants; registered Professional Engineer in the State of Georgia. Current position: Grants Management Team Leader for North Carolina and Kentucky.

Charles Orzechoskie: Region V; 20 years of engineering related employment, 14 years of Federal service, 13 1/2 years service with EPA, 13 1/2 years in construction grants; registered Professional Engineer in the State of Illinois. Current position: Chief of Facility Planning Unit.

Richard M. Fetzer: Region III; 9 years with EPA, 9 years in construction grants; B.S. degree in Earth Science, Master of Public Administration. Current position: Water Quality Management Coordinator for Pennsylvania, West Virginia and D.C.

Jim Shuster: Headquarters; 25 years business management experience, 6 years in construction grants, most recent 1 1/2 years principal focus has been priority system/list management. Current position: Senior Staff Operation Research Analyst with the Priority and Needs Assessment Branch.

The following Region IX personnel were also involved in the Priority System/List Internal Control Review

Albert Brody: Environmental Protection Specialist, Program Support Branch, Water Management Division; 7 1/2 years in EPA construction grants.

Nancy Edmisten: Environmental Engineer, California Branch, Water Management Division; B.S. and M.S. in Microbiology, M.S. in Civil Engineering; 4 years in private consulting firm, 1 year with the Corps of Engineers, 4 months with EPA.

Jeff Willett: Environmental Engineer, Program Support Branch, Water Management Division; B.S. in Civil Engineering; 2 1/2 years with U.S. Forest Service, 6 months with EPA.

Steve Fuller: Environmental Engineer, Arizona, Hawaii and Nevada Branch, Water Management Division; M.S. in Engineering; M.P.A. in Environmental Management; 10 years experience in EPA construction grants.

## STATE STAFF INTERVIEWEES

## PRIORITY SYSTEM/LIST ICR

MARYLAND: Charlotte Holland, Chief, Division of Grants, Programming and Liaison, Maryland Department of Health and Mental Hygiene.

PENNSYLVANIA: John Dougherty, Chief, Planning and Evaluation Section, Division of Municipal Facilities and Grants, Bureau of Water Quality, Pennsylvania Department of Environmental Resources.

Tom Kahler, Chief, Project Evaluation Unit, Bureau of Water Quality, Pennsylvania Department of Environmental Resources.

FLORIDA: Jerry Hertin, Environmental Supervisor, Program Management Section, Bureau of Wastewater Management and Grants, State of Florida.

TENNESSEE: Greg Majure, Chief, Administrative Section, Division of Construction Grants and Loans, State of Tennessee.

ILLINOIS: Ron Drainer, Manager of Grants Administration Section, Illinois Environmental Protection Agency.

Mike Bowers, Staff Specialist, Grants Administration Section, Illinois Environmental Protection Agency.

MINNESOTA: Duane Anderson, Grants Section Program Administrator, Minnesota Pollution Control Agency.

CALIFORNIA: Eric Torgeson, Acting Chief, Management Evaluation Section, State Water Resources Control Board.

Sharie Carlson, Staff Specialist, Management Evaluation Section, State Water Resources Control Board.

NEVADA: Jim Williams, Chief, Construction Grants, Division of Environmental Protection.

PRIORITY SYSTEM/LIST  
ICR ISSUES/QUESTIONS

ISSUE 1

Are water quality/public health (WQ/PH) weighting factors, ranking formulas, by-pass procedures, and public participation mechanisms in State priority systems getting the appropriate high priority WQ/PH projects to the top of the priority list?

Questions: How is priority system established and modified?

Are WQ/PH factors incorporated into a ranking formula in such a manner that their impact is readily identifiable?

How are water and public health factors assigned weights vis-a-vis other factors that are weighted as well?

What are these factors? Which are WQ/PH? How do they fit into the formula?

How dominant overall are they?

What are the reasons for by-passing? What are the procedures?

How do by-pass procedures impact the process?

What is the procedure for phase/segmenting?

How does phase/segmenting impact the process?

What are the procedures for public participation?

How does public participation impact the process?

Has the Agency provided sufficient guidance on how to accomplish the WQ/PH focus? Is the guidance timely?

What is the level/detail of the review process for approval of a revision to a State's priority system?

ISSUE 2

Are the resulting lists being developed in accordance with the approved priority systems?



Questions: How does the list development process incorporate assurance that the resulting lists are a direct reflection of the requirements of the system?

Does the system include procedures that result in the list being developed in a timely manner?

What form does the priority list take?

What is the universe of projects that are to be considered for the list?

### ISSUE 3

Are projects being awarded in accordance with these lists?

Questions: To what extent are projects awarded that do not appear on the priority list or only appear just prior to award?

To what extent are projects awarded that do not appear on the fundable portion of the priority list at the beginning of the fiscal year.

What is the nature of such projects?

What action is taken on by-passed projects to get/keep them moving?

How well does the fundable portion of the project priority list correlate with obligation projections? What are the reasons for differences, if any?

### ISSUE 4

Are water quality areas being identified in coordination with other WQ/PH initiatives?

Questions: What exactly are these other initiatives?

What are the similarities with those of priority system/list management?

What are the benefits of effective coordination?

What systems/mechanisms exist to insure that priority water quality areas are identified?

How does a State's priority system address a situation where a municipality is in noncompliance with the NPDES Permit but the project has insignificant water quality or public health benefits?

ISSUE 5

Are the projects that are being funded actually cleaning up the water?

Questions: What monitoring and tracking mechanisms are in place or are being put in place to demonstrate that projects being funded are actually cleaning up the water?

### III.

#### COST-EFFECTIVENESS AND FACILITY SIZING

##### A. THE REVIEW TEAM

The internal control review team consisted of nine members, five from the Office of Water Program Operations, four from Regions III, IV, VI and VIII. The combined experience of team members is more than 81 years in the construction grants program and almost an equal amount of time in other professional engineering work. Their education and experience well qualified the team to examine and assess the wastewater engineering issues within the scope of the review. (A list of the review team members with their experience is attached.)

##### B. BACKGROUND/EVENT CYCLE

Under Sections 204 and 218 of the Clean Water Act (CWA) the construction grants program is required to ensure that wastewater treatment projects receiving EPA funds are cost-effective and properly sized. The objective of this review is to determine if adequate management management procedures are in place and working effectively to meet this requirement.

The most cost-effective wastewater system is that combination of components which has the most economical overall life cycle costs and meets the goals of the CWA. Selection of the cost-effective alternative also takes into consideration non-monetary factors such as environmental concerns, project implementation, operability and aesthetics. A properly sized wastewater facility is based on sound demographic projections, reasonable flow estimations, staging considerations and good design practices.

The concept of "appropriate technology" refers to a recognition that certain types of wastewater technologies are generally more suited to certain community situations. Low capital cost, low operation and maintenance cost technologies for small communities include onsite and cluster systems, facultative ponds, overland flow land application, trickling filters and alternative sewers. EPA began stressing alternatives to conventional gravity sewers and complicated centralized treatment plants for small communities in 1976 in recognition that some low - cost alternatives were inadequately considered in the cost-effectiveness analysis.

The focus of this review is on projects for communities with populations of 15,000 or less. Addressing small community wastewater facilities needs is a major management concern. The majority of the 3,000 active planning projects are for smaller communities, and the difficulties these communities face in the construction grants program are widely recognized.

Cost-effectiveness and sizing reviews are important in controlling Federal construction grant fund expenditures. These activities, properly conducted, also help to protect the Federal interest in water pollution

control by determining the type and size of wastewater facilities most appropriate for the community's situation, in terms of the water quality or public health problem being addressed and the capability of the community to finance and manage a wastewater system. This is especially crucial to a small community, for which an investment in a wastewater project is often the largest capital undertaking it has experienced. Consequently, should the analysis of cost-effectiveness and facility sizing not be conducted properly, there is a potential not only for a waste of Federal funds but for the imposition of a severe financial hardship on the community. Additionally, an adequate solution to the pollution problem may not be achieved initially and further expenses may be incurred in meeting permit limits or correcting the public health problem.

### C. CONTROL TECHNIQUES

The following are the basic control techniques:

#### 1. Headquarters Control Techniques

##### o Cost-effectiveness/Appropriate Technology

- The Clean Water Act Amendments of 1978 and 1981, Public Law 95-217 and 97-117: Set requirements, policy and incentives for facility planning, cost-effectiveness and innovative/alternative technology.
- Construction Grants Regulation, (September 27, 1978 and February 17, 1984), principally 40 CFR 35.2030 Facilities Planning; Section 35.2032 Innovative and Alternative Technologies and Section 35.2034 Privately Owned Individual Systems (Subpart I Designations): These regulations require consideration of innovative, alternative and, for small communities, appropriate low cost technologies; list the required contents of a facilities plan; and outline requirements for I/A technology and privately owned individual systems.
- National Environmental Policy Act of 1969: Requires Federal agencies to carefully consider all environmental effects of proposed actions and alternatives and make analyses available for public scrutiny.
- Council on Environmental Quality Regulations of November 29, 1969 and EPA regulations, 40 CFR Part 6, Implementation of Procedures of NEPA: Establishes EPA policy and procedures for the identification and analysis of the environmental impacts of EPA-related activities and the preparation and processing of environmental impact statements.

- Program Requirements Memoranda (PRM's) and Policy Memoranda: Several addressed this subject area including a December 20, 1976 memorandum from Russell Train to Regional Administrators entitled "Encouraging Less Costly Wastewater Facilities for Small Communities," and PRM's 77-8, 78-9, 79-3, 79-7, and 79-8.
- Construction Grants 1982 (CG-82 Guidance): Part 1 contains guidance for facilities planning and cost-effectiveness analysis. Section 7.2.1. contains specific guidance on selecting appropriate technologies for small communities.
- Financial and Management Capability Policy: In addition to requiring a demonstration of financial capability, it requires States to develop a procedure for identifying problem projects on the basis of high cost, inappropriate technology or potential financial impact. An ICR is being conducted separately on implementation of this Policy.
- Advance Treatment (AT) Policy: Requires EPA Headquarters review of projects with an incremental cost due to advanced treatment of over \$3 million to determine whether they will result in significant water quality improvements.
- Office of Water Operating Guidance and Accountability System (OWOGAS): Contains the qualitative question for use in the FY 1984 mid-year review of the Regions, "How are the delegated States ensuring the selection of appropriate and cost-effective technologies in small communities?"
- Technology Transfer: OWPO and ORD disseminate technical information to program staff and consulting engineers on less costly treatment methods and general information to small communities on how to identify and rectify potential cost problems with wastewater treatment systems. Distribution is primarily through Regional and State offices and mass mailings to interested organizations.

o Sizing of Facilities

- 1981 Amendments: After October 1, 1984, grants are limited to the amount of treatment capacity to serve needs existing on the date of grant approval, but not in excess of existing needs on October 1, 1990. Any incremental costs for reserve capacity would not be grant eligible.
- Construction Grants Regulations (February 17, 1984): Principally, Section 35.2030 Facilities Planning (flow reduction, relationship between capacity and need, upgrading existing facilities, infiltration/inflow); Section 35.2116 Collection System; Section 35.2110 Infiltration/ Inflow; and Section 35.2123 Reserve Capacity.

- Construction Grants 1982 Guidance: Especially Chapter 5 - Existing and Future Conditions; Chapter 6 - Development and Screening of Alternatives (Parts 6.0, 6.2 and 6.9) and Chapter 7, Part 7.1 - Additional Capacity.
- Infiltration/Inflow Program Guidance: PRM 78-10, and other I/I guidance and technical manuals.

## 2. EPA Regional Control Techniques

Following is a summary of the techniques used in the four Regional offices relative to the issue area reviewed:

- Delegation Agreements: Delineate the responsibilities of EPA and the State for managing the construction grants program. Documents vary widely in organization and format from Region to Region. In most of the Regions reviewed, agreements are fairly standardized for all States and define the functions which are delegated. The procedures for carrying out the functions are either standardized and included in the agreement or are covered in separate documents for each State. In one Region, procedures unique to a State are incorporated in its delegation agreement, resulting in significantly different agreements for each State. Delegation agreements constitute by far the most influential source of control of the States.
- Overview of Delegation: Each delegation agreement specifies how annual review of the State's program will be conducted. Most Regions conduct their reviews with staff other than those assigned to work with the State under delegation. A review of a specified number of approved facility plans, usually ten percent, is normally conducted as part of overview in the delegation agreement.
- Annual Workplans: These documents negotiated between the Region and the States contain both the planned achievements for the fiscal year and the overview methods by which progress will be assessed.
- Environmental Review: A non-delegable review function, this is usually performed by a group in the Regional Office other than the project engineering staff. The Region determines, by reviewing State's environmental information or by making its own environmental assessment, whether a project receives a "Finding of No Significant Impact" or requires an Environmental Impact Statement.
- AT Review: Regional offices are responsible for reviewing advanced treatment projects with an incremental AT cost of less than \$3 million. Four of the eight States reviewed are delegated the AT review function.

- Regional Policies and Guidance: Some Regions, lacking directives from Headquarters, develop their own policies or guidance in response to programmatic issues. Policies are usually transmitted by memorandum to the States. Guidance is transmitted by memo, newsletter or staff meetings.
- Technology Transfer: Some Regions have technical information dissemination programs directed at State staff and consulting engineering which may include training seminars, meetings, brochures and newsletters.

### 3. State Control Techniques

State control techniques are governed largely by the extent of delegation of relevant functions. All States reviewed are delegated facilities plan review; however, in one Region cost-effectiveness analysis is a shared function with the States. Most other functions related to cost-effectiveness/sizing, such as environmental information document preparation and infiltration/inflow analysis are delegated to the States reviewed. Advanced treatment review is delegated in four States.

Control techniques used by the States include:

- Wasteload Allocation: This measure sets permits limits for proposed facilities, which can affect the type of technology selected.
- Design Reviews: In some States, such as Montana and Wyoming, design review can involve an in-depth review of technology selection.
- State Guidance, Codes, Regulation and Policy: Can pertain to planning aspects such as sizing but usually apply to facility design (design criteria and standards). Some States reviewed did not have their own guidance specific to facilities plan review and related reviews but used EPA guidance.
- Pre-planning Conference: Meeting with the potential grantee and engineer to review requirements, guidance and procedures.
- Mid-course Review: Meeting or teleconference with potential grantee and/or engineer to review status of planning; check whether requirements are being met; and comment on preliminary alternative selection.
- Checklists: Lists of requirements for various components of the planning phase of a project.

- Information Dissemination: Newsletters, mailings, etc., to current and potential grantees and their consulting engineers notifying them of program changes, new guidance and publications.

With the exception of the wasteload allocation process, none of these control techniques are specifically required by EPA regulation.

#### D. THE STATE SELECTION AND REVIEW PROCESS

Four Regional offices participated in the review. Two Headquarters representatives and a Regional representative participated in each State review. One day was spent at each Regional Office reviewing management procedures and one day at each State Office reviewing management procedures and a random sample of facilities plans and files. The States were selected by the ICR team primarily on the basis of having been delegated the facility planning review and approval function for a long period of time and having a sufficient number of projects to review. (A list of the Regional and State personnel included in the review is attached.) Eight States, two States in each of the four Regions, were evaluated in detail -- Maryland, Pennsylvania, Georgia, North Carolina, Oklahoma, Texas, Montana and Wyoming.

The management procedures and techniques bearing on cost-effectiveness determination, facility sizing, and technology selection were examined in each Regional office by interviewing key staff and reviewing pertinent documents. The management techniques in the eight States were similarly investigated. Facility plans and project files for a total of 47 projects (five to nine projects in each State) were reviewed to test the application of the various control techniques. (Sample questionnaires used in the reviews are attached.)

#### E. EFFECTIVENESS OF CONTROL TECHNIQUES

Generally, the facilities plans reviewed exhibited proper cost-effectiveness analysis and sizing. In some cases, however, there were significant analytical mistakes which affected the results. Most of the projects were governed by the September 28, 1978 regulations. Program Requirements Memoranda 77-8, 78-9, 79-3, and 79-8, which were in effect at the time most of the facilities plans were approved, emphasized technologies suited for small communities. While the methodology used was mostly accurate, there were instances of improper or inadequate consideration of technologies which may have affected the outcome of some of the analyses. Examples are a lack of consideration of small diameter gravity sewers, onsite systems and cluster systems; improper cost-effectiveness analysis of pressure and vacuum sewers; and unreasonable estimates of costs and useful lives for alternative sewers and onsite systems.



# 1. Effectiveness of Headquarters Control Techniques

- Clean Water Act: Basically it provides a good framework for ensuring cost-effective and properly sized facilities appropriate for small communities. The elimination of grant eligibility for reserve capacity, although not yet in effect, should prove to be a strong deterrent to oversizing of facilities. The eligibility restriction on collectors will have its biggest effect on small communities and may be a strong incentive for use of alternative conveyance systems which remain eligible for grant funding for a small community (as defined in the regulations). Reduction of the Federal share may increase the attractiveness of I/A technologies. However, the allowance system is seen as a disadvantage for most rural communities, where a different and often more difficult set of problems exist. These problems require more sophisticated and more costly planning techniques than are usually necessary for a larger community. In these cases the amount of the allowance may be a smaller percentage of the planning costs incurred. Conversely, the allowance system rewards high capital cost projects by giving a greater amount for design of expensive projects. Also, the elimination of Step 1 and 2 grants reduces the likelihood that communities and States would be willing to go back and redesign a lower cost alternative because it would be at their expense.
- Construction Grant Regulations: Many Regional and State staff interviewed felt that the February 17, 1984 regulations, particularly the absence of the Appendix A - Cost-effectiveness Analysis Guidelines of the Subpart E Regulations, severely gutted the controls over cost-effectiveness and sizing. Only one Region interviewed had a system for reviewing whether appropriate low cost technologies were considered in the facilities plan for small communities as called for in the regulations. The system consists of a simple required checklist. One Region cited a problem with the 85% removal requirement potentially causing a community with dilute wastewater to implement advanced treatment processes to meet secondary standards.
- NEPA Law and Regulations: Because NEPA compliance is not delegable, this function in some Regions provides the only hands-on EPA contact most projects receive. For States delegated the function of preparing the environmental summary information, EPA Regions rely on the information provided by the State for their review. Although the purpose of the environmental assessments is to provide EPA with information for environmental decisions regarding cost-effectiveness and sizing, this may be the only detailed information regarding cost-effectiveness

and sizing that is available to EPA Regional personnel before applications are submitted for funding. As such, it provides some opportunity for EPA Regional office personnel to give a broad appraisal to cost-effectiveness and sizing considerations applicable to specific projects that would not be available under delegation without NEPA.

- CG-82: The guidance document was highly thought of by the Region and States as a control technique because it is a compendium of all regulations and guidance impacting the program and is written in easily-understood terms. GC-82 was not in effect when most of the sample projects were approved. The document is now somewhat out of date, which may limit the document's current effectiveness in the cost-effectiveness and sizing areas. Most States and Regions feel that there is a lack of guidance on implementing the reserve capacity provision of the 1981 Amendments.
- Financial and Management Capability Policy: This was not in effect when most projects reviewed were approved, so no results-oriented test was conducted. States do not appear to be making much progress in developing a screening system for detecting problem projects.

EPA's recently developed screening system for potential problem projects was applied to the sample projects as an adjunct to the review. The indicators with suggested high cost criteria are as follows:

<u>Indicator</u>	<u>Suggested Criteria</u>
Capital Cost of Sewers	\$4000 per household
Capital Cost of Treatment	\$3 per gallon per day of capacity
Total Project Capital Cost	\$6000 per household
Allowance for Future Flow	50% of initial flow
Annual Operations and Maintenance Cost	\$100 per household
Annual Household Cost	1.5% of median household income

The suggested criteria are based on national data and are intended to point to a potential problem and the need for more intensive review. (Each State should select its own criteria to meet local conditions.)

Of the 47 project reviewed, 13 exceeded two or more of the indicators. The criteria for total project capital cost was exceeded in 12 cases. Annual household cost as a percentage of median income was exceeded 5 times but this cost determination could not be made in 14 cases because no income data was given. Of the 9 projects with data on sewer costs, 6 exceeded the capital cost of sewers indicator. The allowance for future flow was more than 50 percent of the initial flow in 11 projects. The O&M cost indicator was exceeded 6 times. Had the sample projects undergone early screening, as outlined above, more intensive review would have been conducted on a significant number of these projects. This review may have included a reevaluation of the need for and size of the project, a reassessment of technologies and an investigation of additional funding or financing methods. The more intensive review would not necessarily indicate a need for a major project change.

- Advanced Treatment (AT) Policy: Small community AT projects usually don't receive a Headquarters' review because of the \$3 million incremental cost criterion. Four of the States reviewed were delegated the AT review function. Nine projects reviewed were AT projects, the costs of which were within reasonable limits. Some States were urging grantees to use certain lower cost technologies, such as oxidation ditches and land treatment, if AT permit limits were called for. These States reported success in a number of cases.
- OWOGAS: It is significant to note that key personnel in several of the States and some Regional staff had never heard of the appropriate technology section of OWOGAS, or in some cases, of OWOGAS itself. It appears that most Regions are getting little input from the States in responding to the mid-year review of the qualitative questions dealing with appropriate technology. Based on this observation, it is possible that OWOGAS is not very effective.
- Technology Transfer: A good program of technology transfer is available and, to the extent it is used, is effective in promoting understanding of low cost appropriate technologies. The concept of small community wastewater planning and technology selection needs to be more comprehensively transferred to the States and consulting engineers.

## 2. Effectiveness of Regional Control Techniques

- Delegation Agreements: In some cases, it was difficult to ascertain the effectiveness of delegation agreements. Annual reviews of the States by the Region should result in conclusions on delegated State performance. In some cases, either the State review was not performed, was performed sporadically, or if a review resulted in meaningful recommendations, no follow-up was conducted. An annual review is one of the few control tools available to EPA, yet it was not employed effectively in all cases.
- Annual Workplans: Comprehensive use of annual workplans was not evident in the Regions.
- Environmental Review: Its effectiveness seems to be governed by the latitude given the environmental review group in setting the scope of the review, the credibility given to the review, and particularly the accuracy and completeness of the environmental assessment provided by the State. Most Regions effectively apply this technique as a broad appraisal of technology selection and sizing. (See also NEPA law and regulations.)
- Regional Policies and Guidance: Some guidance developed by the Regions prior to delegation has made its way into delegation agreements. Region-developed guidance on some aspects of the 1981 Amendments such as reserve capacity has not been tested. In general, most Regional guidance is effective.
- Technology Transfer: The Region that has the most active technology transfer programs claimed beneficial results. This seemed to be borne out by a cursory comparison of technology selection in the various Regions reviewed.

## 3. Effectiveness of State Control Techniques

- Facility Plan Review: Most States and Regions reviewed facilities plans using checklists designed to ensure all statutory and regulatory requirements are met. None used evaluative forms directed at utilizing judgment regarding technology selection, sizing and the overall soundness of a project. Three States relied heavily on individual reviewer judgement rather than specific guidance in the facilities plan review process. All States cited problems in reviewing projects under constantly changing regulatory scenarios. The difficulties of determining the validity of planning assumptions and thoroughly evaluating technology selection were cited by the States. In one State, facility plans are routinely reviewed by O&M inspection and permit compliance staffs. In many States, very little facility planning is currently being

done because of the backlog of approved plans. The absence of a Step 1 grant makes it more difficult to track facility planning.

- Wasteload Allocation: In some cases, stringent permit limits had a detrimental effect on technology selection by necessitating advanced treatment processes or not allowing seasonal discharge.
- Design Reviews: The two States emphasizing in-depth design reviews see them as a positive tool in assuring appropriate technology because they resulted in significant beneficial technology changes in several cases. Because of the new reserve capacity clause, a need for better plans and specifications review was noted.
- State Regulations, Codes, Policies and Guidance: These techniques are used positively in some cases by facilitating small community wastewater planning, e.g. generic facilities plans, review for simplicity of facility operation, strict evaluation of failing septic situations, etc. On the other hand, restrictive codes and policies can have a disastrous effect by limiting technology selection. The most frequent case of this was non-consideration of small diameter gravity sewers, either because of a minimum pipe size criteria or reluctance to use septic tanks in conjunction with a sewer system. Inadequate consideration of onsite systems was also common.
- Pre-planning Conferences and Mid-course Reviews: These techniques are valuable if one of their objectives is to guide the grantee and his engineer toward a valid consideration of technology and sizing issues. They are mostly used to ensure compliance with the law and regulations. These measures are resource intensive and are used by about one-half of the States reviewed.
- Checklists: (See Facilities Plan Review)
- Information Dissemination: Most States do a good job in providing guidance and procedural and technical information to grantees and engineers.

#### F. TEAM FINDINGS AND RECOMMENDATIONS

The ICR team concludes that the majority of small community projects reviewed through the construction grants program in the eight States surveyed, are sound, cost-effective, suitably sized projects with technologies appropriate for the grantee's situation. Extrapolating from the sample, the team believes this also applies nationally. Some problems are recognized, however, and they are summarized, as follows:

### Program Restrictions and Training Needs

- o There appears to be a general misunderstanding of the term "appropriate technology" by the Regions and States. The concept of "appropriate technology" needs to be demonstrated in training sessions for State and EPA project reviewers and consulting engineers, using case studies.
- o Recommendation: We suggest that training sessions be held in the office of each State desiring one.
- o Insufficient or inaccurate consideration is frequently given to alternative technologies that are well suited to small community situations, in particular small diameter gravity sewers and onsite systems. (In the 14 projects involving collector sewers, none considered small diameter gravity sewers; pressure or vacuum sewers were not considered in 5 cases; consideration of onsite systems was lacking in 5 instances; 12 plans did not consider cluster systems.) Reasons for this can be categorized as follows:
  - 1.) State codes which restrict sewers to a minimum size larger than commonly used for alternative sewers;
  - 2.) Reluctance by approving agencies to consider onsite systems as an integral part of a public wastewater system, or
  - 3.) A lack of knowledge of, or a bias against, alternative systems on the part of consulting engineers and project reviewers.
- o Recommendation: EPA hold high level discussions with States which restrict the use of alternative systems to ensure that the States' policies are based on sound engineering judgement. EPA continue its training program on alternative technologies for State and Regional review staff and A/E's as part of a workshop series on appropriate technology.

### Updating Old Facilities Plans

A systematic method for early updating of older facility plans is not universally applied. There were four cases observed where facility plans were approved three or more years prior to construction. Those projects may be affected by changes in cost estimates, changes in the state-of-the-art, planning area changes, etc.

Recommendation: Although manpower intensive, the team recommends that EPA require a review of all small community projects scheduled for Step 2 + 3 or Step 3 funding if the facility plan is over two years old. Resource requirements can be reduced by using a screening procedure based on type of technology proposed, extent of sewerage or cost indicators to

pinpoint those in most need of updating. The team recommends an early financial capability type review. If necessary, projects should be referred for further facilities planning or design work, which is eligible for EPA funding in many cases. (See memorandums from OWPO Director to Regional Water Management Division Directors dated February 23, 1982 and May 17, 1982.)

#### Delegation Performance Reviews and Management Reviews

- o In several States, annual reviews by the Region of facilities planning and related delegated functions had never been performed, or had been performed incompletely; annual workplans are used only to a limited extent by the Regions.
- o Recommendation: In those States where facility planning is active, the Region must devote resources to an annual review of facility planning and related functions by using annual workplans. Accomplishment of this task should be reviewed by Headquarters each year.
- o A general lack of knowledge by some key State and Regional personnel of OWOGAS was apparent.
- o Recommendation: Regional offices should convey in an effective manner to their staff and to the States the operating level priority activities which OWOGAS outlines. OWOGAS activities should be included in State - EPA agreements. Further, OWOGAS should be revised to better address the appropriate technology issue.

#### Project Tracking and Feedback

A general observation can be made that there is not an adequate feedback process at either the Region or State level by which a project is tracked from inception through the operational phase and whereby significant changes, problems, or other valuable information is catalogued and analyzed with other input to determine if changes in the planning process are necessary, e.g., a particular technology is unsuited to a small community situation.

Recommendation: At the least, the facilities plan and design should be reviewed by Staff staff level responsible for O&M inspections and permit compliance, i.e., those knowledgeable about operating facilities. This activity may be resource intensive.

#### Resource Needs

There is insufficient contact by Regional people with State staff and with projects (i.e., site visits, trouble-shooting) and inadequate staff resources in speciality areas such as I/A technology, small flows and financial capability.

Recommendation: More resources in terms of staff-power (especially senior technical personnel) and travel funds should be allocated to the Regional program.

#### State Facilities Plan Reviews

The State facilities plan review process allows some potential problem projects to be approved.

#### Recommendations:

(1) Rigorously enforce the provisions of 40 CFR 35.2030 with project reviews based on a sound knowledge of wastewater technologies and engineering economics.

(2) Change regulations to require a value engineering analysis for projects in communities of less than 10,000 population, the cost of which is to be made grant eligible under a separate allowance.

#### Findings and Recommendations for Future Internal Control Review

Several shortcomings of this internal control review of cost-effectiveness/facility sizing were noted:

- 1.) The scope of the issue area is too large for the resources and time allotted.
- 2.) Because of the wide variation in techniques, attitudes and geography among the Regions and States it is difficult to generalize many of the findings of the review as being indicative of the construction grant program on a national scale.
- 3.) It is difficult to assess the effectiveness of some current control measures because few projects have been approved under them.
- 4.) The volatile nature of any "bad" project makes this subject area sensitive to individual Region-specific, State-specific or even grantee-specific control measures.
- 5.) The scope of the control measures is limited, for the most part, to the facilities planning stage. There are additional control measures applied in later stages of a project, such as value engineering and financial capability analysis, which may have a bearing on the cost-effectiveness and size of the constructed facilities.

Recommendations: Because the scope of the activity reviewed is so large, only an overview evaluation was made. The review team recommends that an internal control review of specific subjects in this activity area be conducted next year. Recommended subjects for review are facility sizing and design criteria and an assessment of the impact of



the 1981 amendments, especially the allowance system and reserve capacity limitations on the quality of facility planning in States where a significant amount of facility planning is still being conducted. The review team also recommends that different Regions be reviewed next year.

#### G. RESPONSE TO REGIONAL COMMENTS

One Region disagreed with requiring a grant-eligible value engineering analysis prior to design for projects in communities of less than 10,000 population since EPA pays the States, under Sec. 205(g), to review facilities plans. We, accordingly, changed the recommendation to delete the words "prior to design". Two other Regions commented regarding the need for a regulation change and funding mechanism for the recommendation of VE analyses, the grant eligibility of updating older facility plans, and an incorrectly worded reference to the degree of Region/State knowledge of the "appropriate technology" provisions in the OWOGAS system. These comments have been addressed through appropriate revisions to the report.

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The Review Team

The internal control review team consisted of eight members:

Connie Bosma - Headquarters

Education: B.C. Civil Engineering, M.S. Civil Engineering  
Professional Experience: P.E. (Virginia), 7 years experience with a water and sewer utility and with a consulting firm, 4 years of service in the construction grants program. Presently is Chief, Construction Planning and Review Section

Keith Dearth - Headquarters

Education: B.S., Civil Engineering, Master of Civil Engineering (MCE)  
Professional Experience: P.E. (South Carolina, Oklahoma, Nevada), 19 years experience in architecture/engineering, construction and public works facility engineering, 9 years of service with EPA in the areas of facilities planning, financial analysis and small flows technology. Presently is Chief of the Assistance and Review Branch.

John E. Flowers - Headquarters

Education: B.S. Civil Engineering, M.S. Environmental Engineering  
Professional Experience: P.E. (Virginia), 10 years as project manager of wastewater projects for water and sewer utility; 4 years as environmental engineer in construction grants program involved mainly with small community wastewater issues.

Bob Freeman - Region IV, Atlanta

Education: B.S. Chemical Engineering, M.S. Civil/Sanitary Engineering  
Professional Experience: P.E. (Georgia, Mississippi), 11 years in the construction grants program involved with facilities planning, plans and specifications approval, and construction activities in the Florida, Georgia, and Mississippi Sections Presently in Office of Applied Technology which provides technical support to the grants division and State agencies.

Ancil A. Jones - Region VI, Dallas

Education: B.S. Civil Engineering, M.S. Environmental Engineering  
Professional Experience: P.E. (Oklahoma, Louisiana, and Texas), 17 years experience in Federal water pollution control programs covering all water related activities. Currently Regional Staff Engineer in the Construction Grants Branch.

Dave McAdams - Region III, Philadelphia

Education: B.S. Civil Engineering, M.S. Environmental Engineering  
Professional Experience: P.E. (Pennsylvania), 7 years experience in the construction grants program reviewing facilities plans and preparing environmental documents as Staff Engineer.

Lee Pasarew - Headquarters

Education: B.S. Civil Engineering, M. of Eng. (Civil), M.S. Planning  
Professional Experience: Eleven years of wastewater planning experience with a county government and a consulting firm, 4 years of EPA service as an Environmental Engineer in financial capability analysis, facilities planning, and small systems technology.

Marie Perez - Headquarters

Education: B.S. Civil Engineering  
Professional Experience: P.E. (Virginia), 4 years design and construction experience with consulting firms, 8 years as Environmental Engineer on a wide variety of water-related activities with EPA.

Stanley M. Smith - Region VIII, Denver

Education: B.S. Civil Engineering, M.S. Sanitary Engineering  
Professional Experience: P.E. (Kansas), 14 years as District Engineer and Chief of Water Pollution Control Program for State health department, 19 years in Federal water pollution control programs with experience in most water-related activities, currently an Environmental Engineer in Water Division.

## Agencies and Individuals Involved

<u>Region Office</u>	<u>ICR Team Representatives</u>	<u>State Office Visited</u>	<u>Principal State Contact</u>
Region III (Philadelphia)	Connie Bosma John Flowers Dave McAdams	Maryland Department of Health and Mental Hygiene, Office of Environmental Programs	John Milnor, Chief Division of Grants Project Management
		Pennsylvania Department of Environmental Resources Bureau of Water Quality Management Division of Municipal Facilities and Grants	John Dougherty, Chief Planning and Evaluation Section
Region IV (Atlanta)	Connie Bosma Bob Freeman Lee Pasarew	Georgia Department of Natural Resources, Environmental Protection Division	Gadenzio Paquibitan, Jr., P.E., Program Manager, Municipal Grants Program
		North Carolina Department of Natural Resources and Community Development Division of Environmental Management	Alan Wahab, Supervisor Local Planning Management Unit
Region VI (Dallas)	John Flowers Ancil Jones Marie Perez	Oklahoma Department of Health Environmental Health Services Wastewater Construction Grants Services	H.J. Threng, Director Construction Grants Engineering Division
		Texas Department of Water Resources Construction Grants and Water Quality Planning Division	Don Nelson, Chief Project Engineering Section
Region VIII (Denver)	Keith Dearth Marie Perez Stan Smith	Montana Water Quality Bureau Environmental Services Division	Joe Steiner, Chief Construction Grants Section
		Wyoming Department of Environmental Quality, Water Quality Division	Mike Hackett, Engineering Control Supervisor

Questionnaire  
Regional/State Management

Control Objective: Projects for Small Communities Have Low Cost,  
Easily Operated and Maintained Technologies

Region: \_\_\_\_\_

1. What control techniques are in use by Region and each State? (Use attached Tables)
  - A. Delegation Agreements
  - B. State EPA Agreements
  - C. Annual Workplans
  - D. Overview Procedures
    - 1.) Description of Procedures
    - 2.) Summary of Results in each State
  - E. Other (e.g., States' procedures for reviewing documentation of need for the project, cost estimates and AT projects; procedures for assuring existing facilities are used to the optimum degree.)
2. Region's and State's opinion of effectiveness of each control technique used by States, Regions and Headquarters.
3. What additional control techniques are being planned by Regions and States?
4. How and when does the State convey its procedures, requirements and guidance to the grantee?
5. What additional control techniques does the Region and State recommend?
6. What problems/obstacles do the Region and States have in achieving the control objective?
7. What positive/innovative actions are being taken to achieve the control objective?

Questionnaire  
Regional/State Management

Control Objective: Wastewater Facilities are Properly Sized

Region: \_\_\_\_\_

1. What control techniques are in use by Region and each State? (Use attached Tables.)
  - A. Delegation Agreements
  - B. State EPA Agreements
  - C. Annual Workplans
  - D. Overview Procedures
    - 1.) Description of Procedures
    - 2.) Summary of Results in each State
  - E. Other (e.g., States' procedures for reviewing population and flow projections, reviewing consistency of treatment capacities with loadings and flows, and implementing the reserve capacity provision in the 1981 amendments.)
2. Region's and State's opinion of effectiveness of each control technique used by States, Regions and Headquarters.
3. What additional control techniques are being planned by Regions and States?
4. How and when does the State convey its procedures, requirements and guidance to the grantee?
5. What additional control techniques does the Region and State recommend?
6. What problems/obstacles do the Region and States have in achieving the control objective?
7. What positive/innovative actions are being taken to achieve the control objective?

Questionnaire  
Cost-Effectiveness/Sizing  
Random Sample

Region: \_\_\_\_\_  
 State: \_\_\_\_\_  
 Project: \_\_\_\_\_  
 Grant Number: \_\_\_\_\_  
 Size of Community: \_\_\_\_\_

Date of Delegation for Facility  
 Plan Approval \_\_\_\_\_  
 Date Facility Plan was  
 Approved \_\_\_\_\_  
 Status of Project: \_\_\_\_\_

Part I C/E Analysis

Existing Facility (Description and Size):

Problem/Need:

What alternatives were evaluated in terms of cost?

What consideration was given to the following alternatives (include reasons for rejecting any alternative);

- Use of all or part of existing facilities, upgrade O&M:
- Onsite or cluster systems:
- Alternative sewers:
- Trickling filters:
- Lagoons:
- Oxidation ditches:
- Land treatment:
- Alternative methods of sludge disposal/utilization:
- Other innovative/alternative technology:

What alternative was selected?

Why was this alternative selected?

Has the alternative changed since the facility plan was approved? If so, has the FNSI been amended and costs reevaluated?

What level of O&M effort is needed? Was the community's O&M capability considered?

Cost of proposed facility:	Total capital	\$	_____
	Total eligible cost	\$	_____
	Grant amount	\$	_____
	Local share	\$	_____
	O,M&R	\$	_____ /yr.
	Household cost	\$	_____ /yr.
	Year of estimate		_____
	or ENR index		_____

What consideration was given to financial capability?

What other control techniques were applied to this project?

If operating, is the facility meeting its permit limits?

Part II Sizing

Current Population:

Sewered  
Unsewered

Design Population:

Sewered  
Unsewered

Initial number of households to be served:

Design Population According to BEA Projections

If design population is different than BEA projections, why?

Projected Annual Growth Rate

Historic Annual Growth Rate Over Last Ten Years

What was the basis for selecting the design population?

Residential flow: Existing  
Design

Basis for determination:

Commercial/institutional flow: Existing  
Design

Basis for determination:

Industrial flow: Existing  
Design

Basis for determination:



## LOCAL FINANCIAL CAPABILITY

## A. STUDY TEAM

The ICR review team was composed of three Regional office members and three Headquarters members. Individually and collectively, the team members were well qualified and brought considerable experience to the study. Their professional experience is in the fields of environmental and sanitary engineering, financial planning, and construction grants and other public works programs. (See attached information concerning the review team.)

## B. INTRODUCTION/BACKGROUND

Objective. The objective of the review was: 1.) To determine if adequate management procedures are in place to ensure that grant applicants have demonstrated the necessary financial capability to construct, operate and maintain the treatment works and 2.) to evaluate the effectiveness of these management procedures.

Importance. The success of construction grants projects depends to a large extent on whether the projects are financially sound. Ensuring that grant applicants have the necessary financial capability will facilitate cleaning up the nation's waters and meeting the goals of the Clean Water Act.

Consequences. If the objectives are not met, communities may build wastewater treatment systems that they cannot afford. This may result in abandonment or substandard operation of wastewater facilities, non-compliance with the Clean Water Act, a waste of Federal, State and local funds, and an adverse impact on water quality.

## C. PRESCRIBED CONTROL TECHNIQUES

The major management control techniques are summarized below. [More detailed descriptions are presented in Attachment A.]?

- o Program Requirements Memorandum (PRM) 76-3 "Presentation of Local Government Costs of Wastewater Treatment Works in Facility Plans" (8/16/76): Required that cost, financing method and typical user cost information be included in all facility plans.
- o Administrator memo to Regional Administrators "Encouraging Less Costly Wastewater Facilities for Small Communities" (12/30/76): Recognized and discussed high cost projects and low cost alternatives and requested special consideration for high cost projects. It also established a way to identify high cost projects.

- o PRM 79-8 "Small Wastewater Systems," (5/9/79): Further clarified definition of small alternative systems, refined guidelines for what constituted a high cost project and elaborated on what actions to take for expensive projects.
- o CG-82" Guidance: States that six questions should be answered in order to demonstrate financial capability and redefines method for identifying high cost projects. It also presents several suggested indicators for identifying potential problems.
- o Clean Water Act: Requires grantee to certify that it has financial capability before receiving grant assistance.
- o Construction Grants (CG) Regulations (40 CFR 35 Subpart I) (2/17/84): Elaborates on CWA requirement with respect to financial capability demonstration, certification, and intermunicipal service agreements (ISA). Previous regulations also required that communities demonstrate their financial capability before receiving grant assistance.
- o Financial and Management Capability Policy (2/17/84): Presents specific questions for demonstrating financial capability, requires certification, intermunicipal service agreements, and outlines EPA, State and grantee roles and responsibilities. Also requires States to develop a screening system to identify possible high cost projects for more detailed review of financial impacts and cost-effectiveness.
- o Delegation Agreements: Describe EPA and State responsibilities for managing the construction grants program including implementation of the Policy.
- o Office of Water Operating Guidance and Accountability System (OWOGAS FY 1984): Establishes Agency priority objectives (e.g., implementing the Financial Capability Policy) and provides a framework for evaluating Regional performance in meeting these objectives.

#### D. DATA SOURCE SELECTION AND REVIEW PROCEDURES

Regions III, IV, and VII were selected as the participating Regions based on their willingness to participate. This is a two-year study because the Financial Capability Policy was recently issued (2/17/84), and an adequate random sample of financial capability demonstrations was not available for review in the first year.

In the first year of the study management procedures at each participating Region were reviewed by one person from EPA Headquarters during a one day visit. A questionnaire (See Attachment) was developed for this purpose by a study team composed of Regional and Headquarters representatives. As part of the Regional reviews information was gathered on all 17 States within the three participating Regions. No States, however, were actually visited.

In FY '85 this ICR will be completed by updating information on the questionnaire pertaining to Regional and State management procedures and reviewing a random sample of demonstrations at the offices of participating States. Two States from each participating Region will be selected to participate in the second, in-depth part of this study, based on their interest in participating and the availability of a representative sample of approved financial capability demonstrations.

#### E. TEAM FINDINGS

These findings are based on interviews and review of documents at Regional Offices. They have not been confirmed by State visits, and thus will be further verified in the second year of study.

#### Delegation Agreements/Workplans

The EPA/State delegation agreements had not served as an effective control technique because only three months had passed since publication of the Policy and most delegation agreements had not been updated. All three Regions indicated that their State/EPA delegation agreements would be updated by FY 1985.

Of the 17 States in the three Regions studied only one State had included all of the requirements of the February 17, 1984 Financial Capability Policy in its delegation agreement. Thirteen had general requirements regarding analysis and demonstration of financial capability without specific reference to the Policy. The remaining three States either were not delegated or had no financial capability requirement in their agreements. The major element missing from the delegation agreements in all but the one State was the requirement for the State to develop a screening system to identify those projects in need of further review.

Two of the States had specific language in some detail in their FY '84 workplan regarding activities they would take to fulfill their responsibilities under the Policy. One Region, prior to February 1984, required State workplans to reflect implementation of the Policy when it was finally published. Eight States had general language which basically mirrored the delegation agreement, while four States had no financial capability elements in the workplans. The workplans, which typically reflected the general requirement in the delegation agreement, could not yet function as a control technique. The one workplan that did include financial capability required the grantee to demonstrate capability, but there were few specific provisions on how this was to be reviewed by the State and what train of events should be triggered if a project were deemed to be high cost.

#### Regional Overview

None of the Regions had in place specific procedures or checklists for reviewing the State's financial capability activities. Two of the Regions plan to overview a 10% sample of their State's financial capability reviews but had not yet developed a plan to do this within the requirements of the delegation agreements. The third Region has a proposed procedure (still unsigned) which lists the responsibilities of the Region, grantees and States and which includes an implementation section that deals with reasons for disapproving a grant based on financial capability.

The precise method for overviewing State financial capability activities had not been established in two of the Regions, in large part, because the Regions have not developed a clear understanding of how they expect the State to actually implement the Policy. Potentially a strong and effective control technique, Regional overview is not yet being used by the Regions.

#### Early Identification of High Cost Projects (Screening)

The requirement for States to develop a formal screening system to identify those projects in need of further review of their financial capability demonstration had not been met by most of the States. The States do not yet have a specific screening system which is designed to look at all projects in a systematic way. Only one Region distributed the "Indicators of Possible High Cost Projects" computer list and only one State was reported to be using it. These computer lists use the Needs Survey and the U.S. Census to screen all projects nationally to identify those with potential problems. These lists were sent to the Regions in 1982 and 1983. The other States tend to use single indicators such as user cost, user cost as a percentage of median income, total project cost or type of technology to identify potential high cost projects. The Policy requires that a combination of indicators be used. Most States were relying on their project officers to notice high cost projects during the normal course of their facility planning and Step 3 review process.

Preparation of screening systems is reported to be underway in some States. Despite this activity, screening for high cost projects has not yet been developed to a point where it constitutes an effective control technique.

#### Transmittal of Policy and Guidance

Clear communication to the States and grantees of the requirements of the Policy is an essential prerequisite to the development and implementation of effective control techniques. All three Regions transmitted the Policy to the States by mail, together with the related guidance materials produced by Headquarters. Two of the Regions followed up the transmittal with discussions at subsequent scheduled meetings, audits and telephone calls. One Region felt no follow up was necessary. One Region distributed no computer reports and only a small number of Guidebooks. In general, however, most of the Headquarters materials were distributed to the States. Only one Region had produced or distributed any additional guidance material.

The States communicate with grant applicants with varying effectiveness. Some of the States met directly with the grantee/engineer and presented the Policy requirement as part of a pre-application conference or other general discussions. A few States included (or intend to include) the Policy and associated guidance in the grant application kit. One State had not notified its grantees about the Policy although the Policy was effective February 17, 1984. In the case of four other States, the Region did not know if the Policy was being communicated to the grantees.

### Problem Project Resolution

Most of the existing and yet to be implemented control techniques will be ineffective if the States (and Regions) are not prepared to deal with those projects identified as high cost. One of the Regions was unaware of any procedures its States used to resolve problem projects. Many of the States in the two remaining Regions dealt with problem projects on an informal one-on-one basis, usually by talking to the engineer and community officials. In three States efforts were made to ensure that the users were aware of the projected high costs as a method of resolving the problem. One Region felt that if a project is high cost and the community is informed but still wants to proceed, the grant must be awarded, even though the Region has doubts about the community's financial capability. One State indicated that its projects already use the most appropriate technology, and thus they try to resolve high cost problem projects through increased funding and obtaining local acceptance.

None of the States appeared to have a set routine for resolving problem projects. Issues such as who should be notified about a problem project, what type of actions would be set in motion and what resources would be available to work on the problem were not yet addressed at the State level.

### Implementation of Demonstration and Certification Requirement

Two of the specific requirements of the Policy are that all grant applicants must demonstrate their financial capability by submitting 1.) the answers to five questions and 2.) a signed certification of their financial capability. The preliminary findings indicated that the Regions were not aware of whether grant applicants in their States were answering the questions or submitting the certification. Part 2 of the study will focus more closely on this issue.

### Obstacles to Effective Management Controls

Although the Policy requires the demonstration of financial capability prior to award of the grant, any serious problems detected at this stage are very difficult to correct. Once facility planning and design are completed and the project is on the fundable portion of the priority list any intervention which substantially delays and/or revises the project will likely run into considerable opposition from the community and possibly the State.

The reasons that States and communities are reluctant to revise the facility plans and completed designs for high cost projects include:

- o Concern that replanning or redesign will delay a project long enough to cause it to be bypassed on the priority list. This could lead to a delay in construction, a reduction in the Federal contribution (as eligibilities and grant amounts are reduced) or no funding at all.

- o Concern that grant money not spent due to delayed projects will be subjected to reallocation.
- o Concern over the additional cost of redesign or replanning.

The screening element requirement was included in the policy to address this problem by encouraging States to look at their projects as early as possible. The construction grant regulations also require financial capability to be considered in the facility plan. However, most communities have completed their facility plans, and many have completed design and are just awaiting their turn for a Step 3 grant. As a consequence, although screening will be effective in identifying problem projects, remedies will be hard to implement for many projects.

#### Regional and State Capability to Evaluate Financial Capability

For many State and Regional staffs involved in the review and approval of grant applications, the broad area of financial capability is perceived to be beyond the scope of their education and experience. Many have voiced concern about their ability to judge, based on a grant applicant's demonstration, whether a community can or cannot afford to build and operate a wastewater treatment plant. As a result they are hesitant to implement the Policy aggressively.

There are two issues involved here. First, there is the real issue of training, experience and understanding in the field of municipal finance and related areas. This is mainly a staffing skills problem and can be dealt with quite effectively through training, guidance, use of outside resources (e.g., consultants) and acquisition of staff with the appropriate expertise. Recommendations regarding this are included below.

The second issue is the perception on the part of Regional and State staff as to the purpose of the Policy. Many consider the Policy as just one additional gate the grant applicant must pass through on the way to an award and think that it is up to the financial capability demonstration reviewer to either open or close the gate, depending on whether or not the community has the financial capability. This view of the Policy places the reviewer in confrontation with the applicant. Many with this perspective feel that they will be forced to make unpopular financial capability judgments regarding award of a grant without benefit of experience or written criteria against which to measure the project.

One Region has asked for official criteria or an indicator to strengthen their position when they recommend against a grant award.

HQ response to this request has been:

- o The previous HQ indicator was misused as a "go/no go" decision tool with no allowance for local conditions.
- o A nationally developed number may not be relevant at the community level, and these types of indicators are best set at the State or local level to reflect local conditions.

- o The area is too complex to be reduced to one or two single snapshot indicators. Financial capability must be judged on a wide variety of factors and their trends.
- o The primary reason that the Agency issued the Policy is not to turn down projects. Instead, it is to identify, as early as possible, projects with financial capability problems so the problems can be resolved and to ensure that local officials know the real cost and financial impacts of their projects. Thus, an award will be made for a project that the community can afford to operate in compliance and that does not waste federal funds.

A related issue raised by one of the three Regions was whether the States (or Regions when appropriate) can really determine if a community has sufficient financial capability or if the State can only verify the community's certification of financial capability (i.e., answered the Policy questions). The Region felt that States could never be in a position to accurately determine what a grant applicant could or could not afford. That was solely the community's responsibility according to this reasoning, and States can only insure that the questions are answered and certification submitted. Forcing a grant applicant to fully understand the financial impacts of the project is clearly an essential ingredient in promoting sound projects, but it is ultimately not a substitute for the requirement of Section 204(b)(1)(B) of the 1981 Amendments, which essentially says that no grant should be approved unless the Administrator has first determined if the applicant has the financial capability.

#### Effectiveness of Control Techniques

At present the effectiveness of specific, formal control techniques cannot be evaluated because in most cases the appropriate management procedures had not been put in place. This was in large part due to the reluctance of the Regions and States to develop a comprehensive financial capability management system until the Policy was published. In most of the States the specific requirements of the February 17, 1984 Financial Capability Policy were not yet reflected in the delegation agreements, workplans, and review procedures. Thus, the current regulations, CG-82 guidance, and the Policy itself, including the demonstration/certification requirements, have not served to implement the financial capability provision of the Clean Water Act. It must be noted, however, that financial capability activity has occurred in the Regions (and to a lesser degree in the States) based on informal procedures. It is extremely difficult to evaluate management techniques and their effectiveness if no specific documentation is kept.

#### F. TEAM RECOMMENDATIONS

- o Regions and delegated States should revise all existing delegation agreements and FY '85 workplans to include the specific requirements of the February 17, 1984 Financial Capability Policy. This should include revisions to the facility plan review and the Step 3 and Step 2+3 grant approval functions.

- o The Regions should establish specific procedures to overview the States in meeting the requirements of the policy including:
  - development of a screening system
  - review of financial capability demonstrations
  - resolution of problem projects
- o The Regions, working with the States, should also develop a procedure to assist States, when requested, in the resolution of problem projects.
- o The Regions and delegated States should ensure that the demonstration and certification is completed for all grant applicants.
- o Headquarters should proceed with the proposed plan for Part 2 of this ICR study by updating the Regional and State management procedures questionnaire and by reviewing a sample of financial capability demonstrations from the participating States. The ICR study team should investigate, in Part 2 of the financial capability study, if these recommendations are being followed.
- o Headquarters should develop and offer training programs to improve the ability of State and Regional staff to review and evaluate financial capability demonstrations and to assist grantees when appropriate. Additional State Financial Capability training sessions aimed at grant applicants should also be conducted.



## RESPONSE TO REGIONAL COMMENTS

Only one Region provided significant comments as follows:

- o "There appears to be an inconsistency between a statement in the ICR report that is critical of the States for dealing with problem projects on an informal basis (instead of developing a set routine for handling problem projects) and a statement that the value of a nationally developed indicator may not be relevant at the community level (and would be best set at the State level).
- o "There is a critical statement in the ICR report about those who voiced concern over their level of financial capability expertise but then it is stated that the subject is too complex to be reduced to using only one or two financial indicators. Region IV suggests that effort be made to provide more detail on how the financial capability demonstrations must be reviewed (certification vs. affirmative determination of financial capability)."

ICR Team Response: Recommending that States develop a procedure to resolve problem projects does not conflict with recommending that States develop their own indicators to identify potential problem projects. Both recommendations reflect the States responsibility for complying with the policy in two different areas: Identifying problem projects and resolving problem projects.

The ICR report acknowledges that the financial capability area can be somewhat complex and that additional training is desirable. Regardless of its complexity, Regions and States are expected to develop the necessary expertise to adequately review a financial capability demonstration to determine if the applicant has the necessary capability to successfully complete the project (not just to make sure that the applicant has supplied answers to the questions and signed the certification). To assist Regions and States in this effort, EPA Headquarters will be conducting five training seminars in FY '85.

## Attachment

Keith Dearth - Chief, Assistance and Review Branch, EPA HQ. Eight and one-half years of service with EPA in the areas of facility planning, financial analysis, and small flows technology. Eight years previous experience in the financial field and 19 years in architecture, engineering, construction and public works (facility engineering).

Connie Bosma - Supervisory Environmental Engineer, Chief, Construction Planning and Review Section, EPA HQ. Four years of service with EPA and seven years combined experience with a water and sewer utility and a consulting firm.

Lee Pasarew - Environmental Engineer, EPA HQ. Four years of EPA service in the areas of financial capability analysis, facility planning, and small system technology. Previous experience with a county government and a consulting firm.

Tom Maher - Region III - Public Utilities Specialist with eight years in user charge analysis and municipal finance. Four years as project officer in Federal disaster activities. Private sector experience includes construction, economic and financial feasibility consulting and port management.

John Hagan - Region IV, Supervisory Sanitary Engineer, Chief, South Area Grants Management Section, 24 years service in the environmental field.

Wes Bartley - Region VII, Environmental Engineer, Missouri-Kansas Section. Ten years EPA experience, eight years in construction grants. Regional contact for user charge and financial capability.

## ATTACHMENT

Prescribed Control Techniques

(PRM) 76-3 - 8/16/76 - "Presentation of Local Government Costs of Wastewater Treatment Works in Facility Plans"

PRM required all facility plans after 1/2/77 to include the following cost information:

1. Estimated total capital cost showing breakdown between eligible and ineligible costs and Federal, State and local shares.
2. Expected method of local financing and estimated annual debt service.
3. Estimated annual operation and maintenance costs and allocation of costs between industrial and other users.
4. Estimated monthly charge to typical customer, including connection charges.

Administrator Memo to Regional Administrators 12/30/76 - "Encouraging Less Costly Wastewater Facilities for Small Communities"

- o Recognized problem of high costs in small communities.
- o Outlined factors inhibiting use of low cost approaches. Discussed efforts to encourage greater use of appropriate technology.
- o Requested special consideration of facility plans where cost estimates indicated that:
  - Debt retirement exceeds 1% of median family income.
  - Debt retirement plus user charge exceeds 2% of median family income.

PRM 79-8 - 5/9/79 - "Small Wastewater Systems"

- o Clarified definition of small alternative wastewater systems.
- o Included revised guidelines for determination of financial impact of project. Costs were deemed excessive if average annual household cost as a percentage of median household income (MHI) was:
  - 1.5% when MHI under \$6,000
  - 2.0% when MHI between \$6,000 - \$10,000
  - 2.5% when MHI over \$10,000
- o Projects determined expensive were to receive further review including determination of:
  - the comprehensiveness, accuracy and reasonableness of cost estimates and cost-effective analysis
  - the soundness of local share financing
  - whether the grant applicant has investigated supplemental funding
  - reevaluation of alternatives, including rescoping the project

- o Provided for improved coordination with Farmers Home Administration including FmHA evaluation of community financial capability and proposed financing.

#### CG-82

- o States that six questions should be answered in order to demonstrate financial capability.
- o redefines high cost project as:
  - 1.0% when MHI is under \$10,000
  - 1.5% when MHI is between \$10,000 and \$17,000
  - 1.75% when MHI exceeds \$17,000
- o List fifteen suggested indicators for identifying possible problem projects.

#### Clean Water Act

204(b)(1)(B): requires grantee to certify that it has adequate legal, institutional, managerial and financial capability to construct, operate and maintain treatment works.

#### Construction Grants (CG) Regulation - final (February 17, 1984)

Requires applicants to:

- o demonstrate legal, institutional, managerial, and financial capability to build, operate and maintain wastewater treatment works.
- o answer five questions in order to demonstrate financial capability.
- o provide written certification that they have analyzed the costs and financial impact of the facilities and have the necessary capability.
- o execute intermunicipal service agreement if more than one jurisdiction will use the facilities.
- o demonstrate that the selected alternative is implementable from a financial viewpoint in the facility plan.
- o develop a user charge system that produces enough revenues for proper operation and maintenance. It must also include a financial management system that accounts for revenues and expenditures.

#### Financial and Management Capability Policy - 2/17/84

- o Requires applicants for Step 3 or 2 + 3 construction grants to demonstrate their financial and management capability by:
  - providing answers to five questions:
    1. What is proposed in the facilities plan?
    2. What roles and responsibilities will local governments have?
    3. How much will the facilities cost at today's prices?

4. How will construction, operation and maintenance of the facilities be financed?
  5. What are the annual costs per household?
- certifying their financial capability
  - executing an intermunicipal service agreement indicating allocation of costs and responsibilities if two or more entities are served by the project
- o Outlines EPA and State roles and responsibilities for implementing the policy. Major delegated State role is to develop a screening procedure to identify communities which may need greater attention because of high project cost or potential financial impact. Requires EPA Regional Offices to overview State guidance and procedures and conduct a random sample of financial capability demonstrations.
  - o Includes example financial capability worksheets and suggested grantee financial capability certification letter.

Delegation Agreements - Delegation Agreements are signed written agreements between EPA regional offices and delegated States. The agreements usually cover broad responsibilities and are usually supplemented by subagreements that cover specific functional areas. The subagreements usually outline EPA and State responsibilities for carrying out the function including the method for EPA overview of the State.

Office of Water Operating Guidance and Accountability System (OWOGAS) - FY '84 - OWOGAS is a document that outlines priority Agency objectives and provides a framework for evaluating Regional performance in meeting these objectives. One of the areas evaluated under OWOGAS is financial capability, specifically:

- o compliance with Financial Capability Policy
- o Regional efforts to ensure projects are operating on a self-sustaining basis.
- o Regional overview of State certifications

Questionnaire  
Financial Capability

Region: \_\_\_\_\_

Source of\*  
Information

1. What is contained in each State's delegation agreement and annual workplan regarding compliance with the Financial Capability Policy?
2. Describe each State's procedures and criteria for early identification of projects which are potentially high cost. Are there specific criteria used? What actions will be taken for those projects identified?
3. What procedures do the States use to review financial capability demonstrations? Is there a written checklist? Who reviews the demonstrations? Who routinely is sent a copy of the demonstration and the State review?
4. How do the States inform their grantees of the statutory, regulatory and policy requirements regarding the Financial Capability Policy?
5. What are each State's procedures for resolving problem projects?
6. What are the Region procedures for resolving problem projects?
7. How does the Region overview (or plan to overview) the States financial capability activities?
8. If overview has been conducted, summarize the results.
9. What additional management procedures (or control techniques) does the Region use to ensure the financial capability of grantees?
10. How does the Region inform the States of the regulatory, statutory and policy requirements regarding the Financial Capability Policy?
11. Does the Region feel the States management procedures (control techniques) and guidance used to implement the Financial Capability Policy are adequate?

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\*Please note the source of all information used to answer these questions. Include name and title of persons interviewed or the date, title and page number of documents used.

12. Does the Region feel that the Headquarters management procedures and guidance are adequate?
13. What actions will the Region take (or plan to take) if it determined that a State(s) is deficient in implementing the policy?
14. What circumstances or procedures or other control techniques (see suggested list below) inhibit grantees, States and/or the Region from implementing the policy? (Management Attitude; organizational structure; personnel delegation and communication of authority and responsibility; policies and procedures; budget and reporting; OWOAS; AMAS, organizational check and balances, ADP considerations, others.)

### Financial Capability ICR Evaluation Criteria

An effective management system in order to ensure that grant applicants have the necessary financial capability to build and operate the treatment work should include, at a minimum, the following control techniques.

1. Incorporation into State delegation agreements and annual workplans of all Federal legislation, regulations and policies regarding financial capability.
2. Written guidance to grant applicants for answering the policy's five questions. This should include the Financial Capability Guidebook or approved alternative.
3. Specific written procedures for screening projects. Screening system should have a combination of indicators.
4. Written list of actions to take for a project identified by the screening as a potential high cost project including:
  - notification of grantee and Regions
  - procedures for further review
  - mechanism for tracking project as it goes through grants process
  - methods used to address potential problems
5. Specific written procedures for reviewing demonstrations including:
  - written checklist
  - identification of members of State staff who will conduct reviews
  - training of reviewers
  - quality control of reviews (i.e., review of reviews)
  - procedures for recording reviews
  - designation of one specific person at each State with financial capability responsibilities
6. Specific written procedures for resolving problem projects identified as a result of the intensive reviews following screening or demonstration review including.
  - notification of grantee, A/E and Region
  - methods used to resolve problem
  - coordination with Region
  - mechanisms for providing assistance to grant applicant to resolve problem
  - designation of a specific person with responsibility for project
  - policy on dealing with priority list issues associated with redesign.
7. Specific written and mutually agreed upon procedures for Regional overview of State activities including.
  - Screening all financial capability reviews during period (e.g. one year) prior to delegation



- overview of function (e.g., 10%) of all State financial capability actions after delegations
- placement of financial elements in the mid-year 205(g) and CME reviews.

8. Written specific procedures by Regions to resolve problem projects including.

- coordination with States
- regional review of State and grantee financial capability demonstrations and review
- criteria for using independent inquiry
- procedures for providing assistance to State/grantee to resolve problem
- designation of a specific person with responsibility for financial capability

## VALUE ENGINEERING ANALYSIS

### A. TEAM MEMBERSHIP

The ICR-VE team was composed of four engineers employed in EPA's construction grants program -- one in the Office of Water Program Operations (OWPO) and three in Regions IV, VI and VIII. All four team members were registered professional engineers with individual professional experience ranging from 10 to 20 years in the program and with VE. These members were: Brian Chesson, P.E. (RO IV); Ancil Jones, P.E. (RO VI); Hubert Duckett, P.E. (RO VII); and Walter DeReiux, P.E. (Washington, D.C.).

During 1984 Regional ICR-VE team members visited 6 States, which had been delegated responsibility for reviewing VE studies and implementing VE related project requirements. The team examined 17 complete VE studies as follows:

<u>Region</u>	<u>State</u>	<u>VE Studies</u>
IV	North Carolina	2
	Kentucky	1
VI	Texas	5
	Oklahoma	4
VII	Iowa	2
	Missouri	3

### B. STUDY OBJECTIVE

The objective is to determine if the VE requirement results in achieving the maximum feasible cost savings (capital and operation, maintenance and replacement (O,M&R)) in all wastewater treatment projects with building costs greater than \$10 million (or lesser cost projects when required or requested), while maintaining facility function and performance.

The Regional ICR team members focused on Regional and State VE management practices in assuring compliance with statutory and regulatory VE requirements. Regional team members visited delegated State agencies to analyze and evaluate States' management practices.

### C. CONTROL TECHNIQUES

Clean Water Act Section 218(c), as amended by Public Law 97-117 on December 29, 1981, describes the statutory requirement for VE. The term "value engineering" review is defined in the law as a specialized cost control technique which uses a systematic and creative approach to identify and to focus on unnecessarily high cost in a project in order to

arrive at a cost savings without sacrificing the reliability or efficiency of the project. The law requires VE on all treatment works (i.e. treatment plants, pumping stations and sewers, etc.) with a total estimated project value in excess of \$10 million. Prior to the 1981 Amendments, sewer projects (i.e. collectors and interceptors) were not required to be VE reviewed, although other projects (i.e. pumping stations, treatment plants, etc.) were required to be VE reviewed.

The construction grants regulation (40 CFR 35.2114) further clarifies the law by stating that if the project has not received Step 2 grant assistance and the total estimated cost of building the treatment works is more than \$10 million the applicant shall conduct value engineering. The regulations also state that VE recommendations shall be implemented to the maximum extent feasible.

Guidance to the grantees contained in Construction Grant 1982 ("CG-82") on VE was updated based on VE program experience, and updated guidance is contained in "CG-85". Currently, this grantee guidance describes the VE concept, VE team composition and qualifications, VE study scope of work and VE proposal cost/scheduling.

#### D. REVIEW PROCEDURES

Team members identified highly productive VE studies and less productive VE studies and described the management of these VE studies.

Major issues that the team addressed in their delegated State visits were:

- ° Are VE studies being conducted on all wastewater treatment projects with estimated building costs greater than \$10 million?
- ° Are VE studies encouraged and promoted for projects with estimated building costs less than \$10 million?
- ° Based on ICR interviews, are the procedures followed by Regional Offices and States appropriate to determine that VE studies are thorough?
- ° Are VE studies, and State reviews and approvals scheduled and performed to meet the project schedules?
- ° Are VE studies properly identifying and separating capital cost savings and O,M&R cost savings and then combining them to show total life cycle cost savings?
- ° Are VE study recommendations being adopted to the maximum feasible extent?
- ° Is it cost-effective to lower the VE ceiling of \$10 million to \$5 million or lower?

- ° Should all types of projects (including sewers) have a VE study when project costs are below \$10 million?
- ° When VE studies are conducted by "in-house" personnel (i.e., VE study performed by other personnel in the same design firm) do they result in similar savings compared to VE studies conducted by "out-house" personnel?

#### E. TEAM FINDINGS AND OBSERVATIONS

##### General

Some of the overall observations of the team based on their review of 17 projects and existing statistical data were:

- ° Historically, VE studies on projects with estimated building costs in excess of \$10 million resulted in 5.4% capital cost savings nationally.
- ° Historically, every \$1 invested in VE studies results in a \$15 capital cost savings (i.e. 15:1 rate-of-return).
- ° The percentage of capital and O&M cost-savings from VE studies on projects in excess of \$10 million would be similar for VE studies on projects of less than \$10 million based on actual VE review data from projects of less than \$10 million.
- ° State and Regional personnel that have responsibility for VE program oversight have their time diverted to other activities assigned by State and Regional program managers.
- ° The potential cost savings (capital and O,M&R) for projects below \$10 million may benefit small communities that have a financial capability problem.
- ° Lowering the normal EPA grant share from the current 75 percent to 55 percent and eliminating funding of reserved capacity (effective October 1, 1984) will result in placing a larger portion of the total project costs on local communities, especially where States do not pay the incremental cost increase. Therefore, the significance of VE savings to communities greatly increases after October 1, 1984.
- ° Life-cycle O,M&R cost saving resulting from VE studies are especially significant to communities in light of the fact that communities pay 100 percent of the O,M&R costs.

- ° Savings accrued through VE studies allow more projects to be funded on each State Priority List. This would be especially true if the project ceiling for the VE requirement were lowered below \$10 million since there are currently more projects of less than \$10 million than over that amount.
- ° The percentage of VE savings to original project cost of treatment plants and pumping stations is duplicated by similar VE savings achieved from redesigning sewer projects of equal costs.
- ° VE studies performed by "out-house" personnel (i.e., VE Team members from firms other than the project design firm) result in greater cost savings than studies performed by "in-house" personnel (i.e., VE Team members from same design firm).
- ° The average rate-of return of assigning a full-time professional to oversee VE studies in a delegated State is 90:1. In other words, a \$40,000 annual salary invested in VE reviewing would result in at least \$3,600,000 savings from all projects with VE reviews in the State.
- ° Only 20 percent of all VE study cost saving recommendations are actually being implemented. Proper VE program oversight at Regional and State levels could increase the savings ratio by 50 percent (i.e., increase by 30 percent the recommended cost savings). Because of the small percentage of VE study recommendations that have been implemented, the Team felt that the corresponding national statistics of 5 percent capital cost savings and 1 percent O,M&R cost savings should be considered only minimum national goals. VE saving targets should be set at least 50 percent above those values. The VE Team generally agreed that, through more positive Regional and State program management, the actual VE study cost savings could be increased 50 percent nationally. This could raise the national VE study capital cost savings from 5 percent to 7.5 percent and increase O, M&R life-cycle cost savings from 1 percent to 1.5 percent. In other words, with a national construction grant program outlay of \$2.4 billion this improved VE program management would result in an additional \$58 millions in capital savings.

### Specific

Some specific observations of the team were:

- ° The ICR-VE Team found in the Regions and States included in the study that VE studies were being conducted on all wastewater treatment projects with estimated building costs of greater than \$10 million, as required by statute. However, Team members stated that required VE studies were not being effectively managed and voluntary VE studies were not being encourage or promoted by the Region and States. This is caused by the use of Regional and State VE personnel who do not have sufficient time to promote or encourage VE activity.
- ° Procedures followed by Regional Offices and States to determine if VE studies are thorough appear to be adequate. However, the attention Regional and State personnel devote to VE to effectively implement the procedures need to be increased.
- ° All Team members observed that VE studies, reviews and approvals were scheduled and expedited, when necessary, to meet the individual project schedules.
- ° A resounding "no" was recorded from Team members to the questions of whether VE study recommendations were being adopted to the maximum feasible extent and whether adequate justification for rejecting VE study recommendations was provided in project files.

### F. TEAM RECOMMENDATIONS

A consensus of opinion was reached among the VE team members in arriving at the following recommendations to address the specific and general observations:

#### Regional and State Management Training

Headquarters should instruct and provide information to Regional and State constuction grants managers on the effectiveness and benefits derived from a more vigorous VE program management and oversight.

VE Primary Responsibility

EPA Regional and State managers should assign VE duties to program personnel as their primary responsibility.

Lower VE Floor to \$1,000,000

Based on historical data, the project floor of \$10 million can be lowered to \$500,000 before the cost of a VE study will equal the capital cost savings. Therefore, VE is recommended as a cost-effective measure for all projects of \$1 million, or more.

VE Allowance

This recommendation is made because most of the project cost savings (capital cost savings) resulting from VE are accrued to the State and Federal Government, not the local community. These VE savings are in turn used to fund more projects. (See allowance percentages for project designing provided in Appendix B of the February 17, 1984 Construction Grant Regulations (40 CFR Part 35) and preamble discussion.) Team members recommended an additional project allowance to offset the cost of VE studies. Currently, the community only pays 25 percent of the eligible project costs (after October 1, 1984, this share rises to 45 percent) and usually the State pays a portion (currently averages 10-15 percent) of the local share of eligible project costs. Note that O,M&R costs are fully paid by the community, and O,M&R cost savings resulting from VE are a 100 percent, dollar-for-dollar savings to the community. However, since a national average of only 1 percent of the project's life-cycle O,M&R costs are saved due to VE as opposed to 5 percent of capital cost savings, .... local managers have less incentive to schedule VE studies or adopt most of the VE study recommendations. Developing a precise VE allowance is very difficult since it probably is based on a sliding scale, and the team felt it was beyond the scope of this review.

National 5 Percent Capital and 1 Percent O,M&R Savings

Historically, VE has resulted in 5 percent capital and 1 percent life-cycle, O,M&R cost savings. The team recommends that Headquarters should consider adopting a national goal greater than the current 5 percent capital and 1 percent O,M&R cost savings being achieved from VE analyses. This would provide further incentive to Regional and State reviewers to encourage communities to accept a higher percentage of VE study recommendations.

### Assist State VE Coordinators and Assistants

If a State has been delegated VE responsibility, management should designate a State VE coordinator with an assistant. Both coordinator and assistant should possess proper VE training. Both should have VE assigned as their primary responsibility. Any changes in assigned VE personnel would obligate the State to notify the Regional Office of the State VE substitute and his or her qualifications. Regions and States should modify State delegation agreements to reflect this recommendation.

### Regional VE Budget

Headquarters and Regional budget managers should include a budget element specifically dedicated to VE program activities to allow adequate oversight of delegated States and to manage VE in non-delegated States. This would elevate the importance of the activity in management deliberations on program budget requests.

### GICS-VE Data Elements

Need to initiate Grant Information Control System (GICS) data elements to track each project's conformance with VE program national goals. Suggest GICS data elements indicating targeted and actual dates for VE study reviews (at 25 percent and 75 percent design levels) and a GICS data element indicating recommended and actual capital and O,M&R life-cycle cost savings. Also, it is recommended that the data element indicating recommended and actual cost savings have a time element that lets State officials know when funds are made available and the amount of funds that are made available through VE savings so that these savings can be used to fund additional projects in that State. Also, these data elements are necessary to alert Regional and State managers as to the acceptance of recommendations and actual cost savings before the design is complete.

The team recommends that grantee management practices used on the VE studies discussed in this report be reviewed during FY 1985. This grantee level review is especially important to determine the grantee's documented justification for accepting and rejecting VE study recommendations.



## G. RESPONSE TO REGIONAL COMMENTS

One Region disagreed with the recommendation of adopting a national annual goal of greater than 5 percent capital cost and 1 percent O,M&R cost savings for VE analyses. The team cannot accept this comment. The intent of this recommendation is to provide further incentive to Regional and State VE personnel to encourage communities to accept a higher percentage of VE study recommendations. The Region did not propose an alternative incentive; an incentive should be provided; and the recommended incentive is appropriate.

Another Region stated three concerns with team recommendations. It disagreed with the recommendation to increase the number of projects subject to the VE analysis requirement by reducing the project cost floor for required VE analyses from \$10 million to \$1 million. The Region suggested a \$5 million project cost floor. The team cannot agree in view of statistical data developed by the VE team members which show that VE analyses are cost-effective below the \$1 million level.

The Region also disagreed with the recommendation that one employee be assigned per State as a full-time VE coordinator. The Regional rationale was that States with small populations have very few VE projects. The VE team cannot agree because lowering the floor for required VE analyses to projects costing \$1 million would increase the number of projects to be VE analyzed, thereby significantly increasing each State's VE review workload.

The Region further disagreed with the recommendation that proposed a new GICS-VE data element. It reasoned that less populated States have fewer VE projects. The team's underlying purpose was to alert Regional and State managers to the low level of VE study recommendations being accepted, and to encourage the provision of sufficient State VE personnel to address this problem. The proposed data element and reporting requirement will help to do this.

## Value Engineering

### Objective:

- o To achieve the maximum feasible cost savings (capital and O,M&R) in all wastewater treatment projects with building costs greater than \$10 million (or lesser cost projects when required or requested) while maintaining facility function, performance, and reliability.

### Scope:

- o Analyze completed VE studies in two selected States in each of three selected Regions. Focus on one highly productive study and one lesser productive study in each of these States and describe the management of these studies by the Region, States, grantees, and designers.

### Issues:

- o Are VE studies being conducted on all wastewater treatment projects with estimated building costs greater than \$10 million?
- o Are VE studies being encouraged and promoted for other wastewater treatment projects with estimated building costs less than \$10 million?
- o Are procedures followed by Regional Offices and States appropriate to determine that VE studies are thorough?
- o Are VE studies, reviews and approvals scheduled and expedited to meet the project schedules?
- o Are VE studies properly identifying and separating capital costs savings and O,M&R costs savings and then combining them to show total life cycle costs savings?
- o Are VE study recommendations being adopted to the maximum feasible extent?

### Approach:

- o Select and evaluate those VE studies that (1) achieved capital cost savings of more than 5 percent and O,M&R cost savings of more than 1 percent and (2) achieved less than 5 percent and 1 percent capital and O,M&R savings respectively.

- o Determine if results of VE studies were acceptable, comprehensive, feasible and if life-cycle costs savings were significant.
- o Identify and evaluate the management practices used by the Regions, States, grantees, and designers on these VE studies.
- o Determine whether the national average of 5 percent capital and 1 percent O,M&R cost savings are an accurate index to identify "highly" productive and "lesser" productive VE studies.
- o Identify those management practices used by the Regions, States, grantees, and designers that achieve maximum feasible cost savings.
- o Evaluate the effectiveness of delegation arrangements between Regional Offices and States.
- o Evaluate effectiveness of coordination between States, grantees and designers.
- o Determine, based on the above analyses, if additional effort and resources are needed in the following areas, a) Regional or State level management tracking procedures, b) technical guidance, c) task force effort, d) Regional, State, grantee and designer training seminars, e) changes to regulations, or f) changes in VE scope, etc.



1. Are VE studies being conducted on all wastewater treatment projects with building costs greater than \$10 million?

Yes \_\_\_\_\_ No \_\_\_\_\_

- a. What procedures have been adopted to ensure that all projects requiring VE studies have been identified?

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- b. What controls are used to ensure that identified VE studies are conducted?

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2. Are VE studies being encouraged and promoted for those wastewater treatment projects with estimated building costs less than \$10 million.

Yes \_\_\_\_\_ No \_\_\_\_\_

- a. What activities are used to encourage and/or promote VE studies?

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3. Are procedures established by Regional Offices and States to determine if the VE studies are thorough.

Yes \_\_\_\_\_ No \_\_\_\_\_

- a. What are these procedures?

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b. Do these procedures cover:	Yes	No
Proposal . . . . .	_____	_____
Qualifications of the VE Team . . . . .	_____	_____
Pre-workshop Meetings . . . . .	_____	_____
Workshops . . . . .	_____	_____
Oral presentations . . . . .	_____	_____
Preliminary reports . . . . .	_____	_____
Final reports . . . . .	_____	_____
Implementation . . . . .	_____	_____

4. Are VE studies, reviews and approvals scheduled and expedited to be compatible with the project schedules?

Yes \_\_\_\_\_ No \_\_\_\_\_

- a. What actions are taken to make sure the VE activities (i.e., studies, reviews and approvals) are appropriate for the project requirements?

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- b. What procedures are used to ensure that these activities meet the VE study schedule?

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5. Are VE studies identifying maximum capital and O, M&R costs savings and are they properly evaluating those life cycle costs?

Yes \_\_\_\_\_ No \_\_\_\_\_

- a. What procedures are used to ensure that capital and O, M&R cost savings are separately identified and combined into total life cycle cost savings?

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6. Are VE study recommendations being adopted to the maximum feasible extent?

Yes \_\_\_\_\_ No \_\_\_\_\_

- a. What documentation is available to show that acceptances of the recommendations were appropriate?

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- b. Has complete information been submitted to support rejection of any recommendation?

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- c. Has every effort been made to adopt a cost effective portion of a recommendation even though other portions of the recommendation have been rejected?

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affirmative steps are to be carried out. The six (6) affirmative steps are to be included in the bidding documents (Section 16.9).

### 11.3

**DESIGN REVIEW** A review of your bidding documents including the construction drawings and specifications is performed prior to the award of Step 3 grant assistance or before initiating procurement action for building on Step 2+3 projects. A review of the construction drawings and specifications is made by your reviewing agency. Your design should be consistent with your approved facilities plan, thus avoiding any delay in approval. Also, a biddability and constructability review is conducted by the Corps of Engineers or delegated State to ascertain that the proposed construction drawings and specifications provide adequate information so that a contractor can bid and construct the facility without additional details or directions. The review by the reviewing agency is for administrative purposes only and is a reasonable determination that the effluent limitations or water quality standards described in the facilities plan will be achieved, that the results of the infiltration/inflow analysis have been considered, that the recommendations of the value engineering review have been included. The design review does not relieve you or your A/E of responsibility for the project design. Structural, electrical and mechanical details of design will typically not be reviewed in detail. Obvious irregularities will be noted and reported to you. Compliance with the design and administrative considerations discussed in this section will be confirmed by your reviewing agency.

## CHAPTER 12

### CONCURRENT ACTIVITIES DURING DESIGN

#### 12.0

**CONCURRENT ACTIVITIES** During project design, it will be necessary to undertake other activities which are either directly or indirectly related to the project design or are a part of the grant application process. While some of these activities could be undertaken after design, it is recommended that they be performed concurrently with design in order to save time, reduce costs and continue moving the project toward grant award.

#### 12.1

**VALUE ENGINEERING** Value Engineering (VE) is an intensive review utilizing a specialized cost control technique which identifies unnecessary high costs in a project. VE obtains the best project at the least cost<sub>x</sub> without sacrificing quality or reliability<sub>x</sub> by using:

- o Multidisciplinary team of design professionals guided by a VE coordinator to:
- o Evaluate cost and function relationships;
- o Concentrate on high cost areas;
- o Generate creative alternatives;
- o Provide recommendations to you and the project designer.



A VE review is required for a construction project with a total estimated building cost in excess of \$10 million. VE is also recommended for projects costing less than \$10 million because they also contain the potential for substantial savings. VE serves as a mechanism to enhance the design of wastewater treatment facilities by providing the project designer with an opportunity to utilize the knowledge and experience of other individuals to optimize the project design.

#### 12.1.1

**VE TEAM AND QUALIFICATIONS** The VE team coordinator is an important VE participant who should have demonstrated technical and managerial capability. The team coordinator acts as a liaison between the VE team, the project's design team and you. The team coordinator should be a qualified individual with VE experience on wastewater construction projects.

Other VE team members should be experienced professionals with VE training, if possible, and previous VE experience on wastewater construction projects. The specific team makeup and size should be appropriate for the nature, size, and complexity of the project.

Because it is essential that the VE review be independent and objective, it should not be conducted by the design firm. You should consider using a separate subagreement with the VE review firm to perform the VE review instead of a subcontract under the original architect/engineer (A/E) subagreement.

#### 12.1.2

**SCOPE OF WORK** The VE study should consider all

components and systems of the project. Depending on the size and complexity of the project, the VE effort may vary from one team and one review session to multiple teams and multiple reviews. For example, a large project should involve at least two separate reviews: one review at approximately the 20-30 percent design stage to evaluate the plant layout, structural design, hydraulic capacity, etc.; and a second review at approximately the 65-75 percent design stage when electrical and mechanical systems are being designed.

The VE study will generally result in two reports. The first VE report should include such items as:

- o Scope of the VE study;

- o Basic VE methodology employed, including the results of each phase, such as:

- Information Phase - collection of all facts, background and data that are pertinent to the design, including an energy and a cost model;
- Speculative/Creative Phase - creation of an extensive list of alternative ways to perform the essential functions found during information gathering, concentrating on areas with highest potential savings;
- Evaluation/Analytical Phase - evaluation of the feasibility of alternatives generated during the creative phase;
- Development/Recommendation Phase - a more complete evaluation of the most

feasible alternatives and identification of VE recommendations;

- o Summary of VE recommendations;
- o Estimated cost savings for each VE recommendation.

The VE report is presented both orally and in writing to you and the project designer. Since the purpose of VE is to obtain the best project at the least cost without sacrificing quality or reliability, it is important that the VE recommendations are evaluated from a noncritical and constructive position.

The final VE report should include items such as:

- o Accepted VE recommendations;
- o Cost and schedule for implementing the accepted recommendations;
- o Rejected recommendations and reasons for the rejection;
- o Net savings (both capital and O&M) over the planning period for the accepted VE recommendations.

In reviewing the final report you and your reviewing agency should ensure that there is sufficient justification for each rejected VE recommendation.

### 12.1.3

#### PROPOSAL COST AND TIMING

Since VE is a process that involves senior professionals, the selection of experienced and well qualified VE team members and team coordinator is essential for best results. Likewise, it is vital that you and your design A/E, when soliciting or

advertising for VE proposals, clearly specify the scope of the VE study, including the number of studies required and other essential factors to assure that all proposals will be submitted on the same basis. Proposals should clearly identify the number of studies and teams; the names and experience backgrounds for the team coordinator and study team members, plus a description of the VE study procedures, with a schedule for completing the study.

Experience shows that two VE studies will generally achieve optimum VE benefits. If the second study cannot be accomplished, one study should be scheduled around the 20-30 percent design stage for best results. A prestudy meeting with you, your design A/E, VE team coordinator and reviewing agency will help refine the scope, schedules and procedures and improve working relationships to maximize study benefits. If managed properly, VE will not delay the project.

### 12.2

#### USER CHARGE SYSTEM

The user charge represents the amount of money you will charge each customer each year in order to pay for the operation, maintenance, and replacement (OM&R) of the wastewater collection and treatment system. A sound user charge system is an essential step in ensuring your ability to pay for OM&R. Generally, the charges are based on the amount of water (measured by water meters) used by homeowners and small commercial establishments. Industries and large commercial users, in general, also pay by water use but, in addition, a surcharge may be added because the strength of their waste or the rate of discharge causes

SPECIFYING AND BIDDING

## A. TEAM MEMBERSHIP

The ICR team which conducted this review consisted of one environmental engineer from each of three Regions (II, V, and X) and a construction program manager from Headquarters. Individuals of the group were selected for:

- o Their construction grants program experience with EPA;
- o Their knowledge of construction and construction practices; and
- o Their qualifications to provide expert testimony.

A list of team members and professional summary is shown on Attachment 1.

## B. CONTROL OBJECTIVES

The objectives of EPA requirements and procedures are to:

- o Ensure quality bidding documents by assuring that:
  - Plans, specifications, and estimates are reviewed and approved according to Section 203(a) of the Act;
  - Specifications for bids do not restrict competition in accordance with Section 204(a)(6) of the Act; and
  - Bidding documents comply with Parts 30, 33, and 35 of the Code of Federal Regulations and EPA policies.
- o Ensure quality procurement by assuring that procurement procedures are reviewed and comply with minimum Federal and EPA standards as contained in 40 CFR Parts 30, 33, and 35 and EPA policies.

## C. CONTROL TECHNIQUES

For each objective, the team identified the control techniques that program management had developed to efficiently and effectively accomplish the objective and protect the projects and grant funds from waste, loss, unauthorized use or mis-appropriation.

In the "specifying" event cycle, where the control objective is to ensure quality bidding documents, the following control techniques are prescribed and used:

- o Bidding document reviews by States and Corps of Engineers (COE).
- o Biddability and constructability (B and C) reviews by COE and States.
- o Review by Headquarters and Regions of States and COE activities.

In the "bidding" event cycle, where the control objective is to ensure quality procurement, the following control techniques are prescribed and used:

- o Self-certification reviews by grantees.
- o "Approval to award" reviews by the States and COE.
- o Oversight reviews by the States, COE and Regions on procurement activities of grantees.
- o Oversight functions by Headquarters and Regions relating to activities of the States and the COE.

These control techniques were tested for effectiveness and efficiency. Review findings provide a high degree of assurance that the internal control objectives are being achieved.

#### D. REVIEW PROCEDURES

The team selected two States from each Region involved (e.g., one large State and one smaller State), which had been delegated partial to full project review and management responsibilities. The degree of delegation was an important criterion for State selection.

A listing of the States selected, with comments on the relative size of each State and the degree of delegation, is shown in Attachment 2. Attachment 3 lists the agencies and individuals involved.

#### Project Selection Criteria

In each State, projects were selected using the following criteria:

- o Projects where grantees have recently awarded construction contracts (within six months, if possible).
- o Projects under construction for both large and small contract amounts (e.g., more than \$10 million and less than \$5 million, if possible).
- o Projects where the grantee is self-certified, if possible.

The work group developed a detailed questionnaire for each control objective to be used as a basis for interviewing each State. The questionnaires were annotated for each question to show the responsible entities, such as EPA Headquarters, EPA Region, COE, State or grantee/engineer. The questionnaires for specifying and bidding are included in Attachments 4 and 5.

## ICR Procedures

The ICR was conducted in each Region in essentially the same manner:

- o Regions sent introductory letters to invite State participation.
- o Questionnaires were discussed with each State prior to the EPA visit.
- o Regions conducted interviews at the State offices.
- o Regions analyzed results of interviews.
- o Regions prepared highlights of findings.

## E. TEAM FINDINGS AND RECOMMENDATIONS

### Major Conclusions

The ICR for specifying and bidding was conducted in three Regions (II, V and X) and six States (New York, New Jersey, Minnesota, Ohio, Oregon and Washington). Results clearly show that EPA is now achieving quality performance in this area. Although variability exists, the States and COE are essentially doing a very good job. Only a few instances of minor deficiencies were found. However, the ICR team has identified areas in which the potential for fraud and misuse of Federal funds exist. In an effort to reduce this potential, the team developed recommendations for the five program activities and management concerns.

### Biddability and Constructability Reviews

The effectiveness of B and C reviews conducted by the COE received a very mixed reaction from the States interviewed. The reaction varied from "very beneficial" to "of little benefit." In all cases, it was very difficult to measure the dollar savings from such reviews.

Where the B and C reviews were found to be beneficial, credit was given to the quality of COE personnel assigned to perform the review. Where the reviews were less beneficial, repetitious and less significant comments prevailed. Some States felt that the electrical and mechanical portion of the B and C review was very beneficial to improving design integrity, since their own review was not adequate in this area.

In summarizing the reaction from the States interviewed, two States were convinced that the B and C reviews were very beneficial, two States believed the reviews were moderately beneficial and the other two States had determined that the reviews were not beneficial.

In view of States' response, the team found:

- o The value of B and C reviews varies from being "very beneficial" to being "of little benefit".
- o Performance of B and C reviews varies from "conducted on all projects" to "conducted on selected projects."
- o The B and C level of effort did not vary as a function of the project size and complexity (i.e., large, complex projects warrant much more reviewer attention than small, standard projects). B and C reviewers' time could potentially be more effectively used.
- o Feedback to the COE by the State regarding the implementation of their B and C comments was generally lacking.

Recommendations:

- o Headquarters and COE should jointly consider ways to optionize COE participation in plans and specifications reviews activities.
- o If a B and C review is conducted, it should include a "plan-in-hand" site inspection.
- o Headquarters should compile and develop and Regions should distribute lists of reoccurring deficiencies in B and C reviews to all States and grantees.

Bidding Documents and Procurement Process

Generally, delegation agreements provide for the use of checklists in reviewing plans and specifications and the procurement process. These checklists are effectively employed in the review process. As an example, the checklists include a reexamination to assure that the non-restrictive specification requirements have not been violated (In the limited sample of the ICR, no such violations were found.) The checklists further ensure that EPA and State requirements are met and that the potential for fraud, waste and mismanagement is minimized. However, checklists need to be improved and guidance needs to be expanded or revised so that bidding documents and procurement will address the following concerns.

1. Checklists

- o Checklists serve to document the file and to provide a record of review.
- o Checklists should be expanded to ensure that they include current important items. Not all checklists in use have been updated to reflect current regulations. This deficiency has been recognized in some States and the updating of checklists is in progress.
- o Follow-up by the States of checklist deficiencies should be improved.

## 2. Minority and Women's Business Enterprise (MBE/WBE)

- o The MBE/WBE certification process needs improved oversight and visibility.
- o A suggested MBE/WBE bidding document insert distributed by one Region needs to be rescinded because:
  - It does not clearly define what a bidder must do to be responsive; and
  - It is an ambiguous specification which violates the fundamental principles of competitive bidding.
- o Unacceptable MBE/WBE inserts will promote bid protests and increased construction costs.

(Note that soon after this review, the defective insert was withdrawn by the Region.)

## 3. Non-Collusion Certification

- o Non-collusion certificates are only required by some States.
- o OIG has developed a recommended form of certification.
- o Use of a non-collusion certificate would reduce the potential for collusion.

## 4. Code of Conduct

- o EPA regulations, 40 CFR 33.270, require grantees to maintain a code of conduct which governs their performance in the award and administration of subagreements.
- o The code of conduct requirement is not addressed in EPA guidance and is not uniformly followed.

### Recommendations:

- o Checklists used by States and COE need to be revised and updated.
- o Headquarters should develop and issue national guidance to uniformly address:
  - MBE/WBE inserts for bidding documents; and
  - Use of non-collusion certification.
- o The code of conduct regulatory requirement should be included as an item reviewed in all CMEs.

### Prevention of Fraud, Collusion and Bid Rigging

If suspicion of fraud, collusion or bid rigging arises, the EPA, State or grantee course of action is clearly defined. However, the process for identifying the suspect is not well established.

- o Neither the Regions nor the States interviewed have a process in place to identify fraud, collusion and bid rigging. However, they are submitting the required information to the OIG.
- o The responsibility of identifying suspects rests with the grantee, State, EPA, and the OIG.
- o Unlike the OIG, Regions, States and grantees do not have a "trained eye" for detection.
- o The level of responsibility for all parties involved needs to be more fully defined. Some States are expressing a reluctance to assume the OIG role.

### Recommendations:

- o OIG and the Department of Justice must assist EPA, the State and the grantee to develop a consciousness and awareness of incidents of fraud, collusion and bid rigging.
- o The development of the process applying to grantees, States and EPA to detect suspects of fraud, collusion and bid rigging must be expeditiously continued.
- o Clear lines of responsibility must be identified by Headquarters. For example, grantees should be required to maintain in their files at least the 12 items of bidding records recommended by the Department of Justice and shown in Attachment 6.

### Delegation Reviews and Internal Control

Delegation agreements, of themselves, do not assure that the bidding documents and procurement process are free from omissions or features that may increase the potential for fraud and misuse of Federal funds. State management and implementation of EPA program requirements under delegation and the Regional review of State performance, together with assistance from the COE, mutually activate the agreements and other program provisions that are designed to prevent fraud and misuse of Federal funds.



- o Those States and COE Districts which are responsible for the review and approval of bidding documents and procurement have a procedure in place to assure timely reviews and awards.
- o States and the COE are implementing delegation agreements, including the completion of necessary checklists and taking appropriate action.
- o All Regions have not recently performed overviews in this area because the States have established good performance records in the past.
- o Where Regions have recently performed overviews, they continue to find good State performance.
- o New York State has established its own internal control program. When this program identifies deficiencies, training sessions are held and standard procedures are developed by the State.

Recommendations:

- o Headquarters and Regions should encourage States to establish internal control programs.

Grantee Self-Certification of Procurement System

The May 12, 1982 regulations include provisions which allow the grantees to self-certify that their procurement systems meet Federal requirements.

- o Some State bidding laws do not allow self-certification by grantees.
- o Many States do not encourage self-certification because they view the process as a blind approval without a State or EPA concurrent review of the procurement action.
- o Only one project was found to have been approved under the self-certification process. It is too early to evaluate the impact of the process on that project.

Recommendations:

- o An ICR evaluation of the self-certification process should be performed after more projects are being conducted under a self-certification procedure.
- o For those projects where a grantee has established a self-certification program, more thorough B and C reviews and design reviews should be performed.

### Resource Needs

No additional resources are required to implement the recommendations of the ICR on specifying and bidding. All recommendations can be completed by the existing personnel assigned to perform the management and oversight of those cycles.

### ICR Review Process; Team Recommendations

As a result of having completed this ICR effort, the team has several recommendations to improve and assist the institutionalization of the ICR process and aid the application of ICR recommended actions.

- o Headquarters should develop a mechanism to analyze the impact of new regulations on highly vulnerable program areas identified through the ICR process and distribute advice on appropriate procedures to the Regions and States concurrently with the new regulations.
- o Headquarters should develop a system for incorporating the ICR process and recommendations into OWOGAS and the State oversight reviews.
  - Concentrating on areas where deficiencies have been found; and
  - Including control techniques in the oversight guidance.
- o Subsequent ICRs should involve the States to a greater extent, provide for COE participation, and expand to the grantee level. This can be implemented partially by modifying the CME process to incorporate ICR concerns. A substantial saving of travel funds would be realized. In addition, EPA should encourage States and grantees to establish their own internal control and oversight programs, where feasible.
- o The specifying and bidding ICR should be extended into FY 1985 to include self-certification and debarment. These two areas are recognized as potentially vulnerable areas, but sufficient project specific documentation is not yet available for a complete ICR evaluation.

MEMBERS AND PROFESSIONAL SUMMARIES OF ICR TEAM

David P. Welch

Position: Area Program Manager - Municipal Construction Division  
EPA - Headquarters - Washington, DC

Professional Experience:

7 years - Construction Grants Program, EPA, Headquarters  
7 years - Municipal Enforcement Program, EPA Region V  
23 years - Wastewater Treatment Design, Consulting Engineers, Chicago, IL

Registered Professional Engineer - Illinois and Tennessee

Education:

BS - Civil Engineer, Yale University, Connecticut, 1947

Stewart Alexander

Position: Section Chief - Caribbean Construction Grants  
EPA - Region II - New York, New York

Professional Experience:

4 years - Chief, New Jersey Const. Grants Section, EPA  
5 years - Project Engineer, Caribbean Const. Grants Section, EPA

Registered Professional Engineer - New York

Education:

MS - Environmental Engineering, New York Polytechnic Inst., 1979  
BCE - Environmental Engineering, City College of New York, 1972

Neil M. Denbo

Position: Environmental Protection Specialist - Water Division  
EPA - Region V - Chicago, Illinois

Professional Experience:

12 years - Construction Grants Program, EPA  
16 years - Other professional Federal service

Registered Professional Engineer - North Carolina

Education:

BS - Civil Engineering, University of Illinois, 1951

Norman Sievertson

Position: Environmental Engineer - Construction Grants  
EPA - Region X - Seattle, WA

Professional Experience:

16 years - Construction Grants Program, EPA  
7 years - Design and Const. Management, Dept. of Interior  
4 years - Structural Design Engineer, Corps of Engineers

Registered Professional Engineer - Oregon

Education:

BS - Civil Engineering, Oregon State, 1959

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States Selected for ICR

<u>Region</u>	<u>States</u>	<u>Comments</u>
II	New York	Very large State, delegated
	New Jersey	Medium size State, fully delegated
V	Ohio	Large State, partially delegated
	Minnesota	Smaller State, fully delegated
X	Oregon	Medium size State, COE performs Step 3
	Washington	Large State, fully delegated

## Agencies and Individuals Involved

<u>Region</u>	<u>ICR Team Representatives</u>	<u>State Office Visited</u>	<u>Principal State Contract</u>
Region II New York	Stewart Alexander	New York State Dept. of Environmental Conservation	Robert Hampston, Director Div. of Construction Management Larry Rutland, Chief Quality Assurance
		New Jersey State Dept. of Environmental Protection	George Goldy, Chief Bureau of Construction Management
Region V Chicago	Neil Denbo	Ohio EPA	Spain James, Project Eng.
		Minnesota Pollution Control Agency	Gordon Wegart, Chief Technical Review Section
Region X Seattle	Norman Sievertson David Welch	Washington State Dept. of Ecology	Chris Hanes, Chief Facilities Planning and Design Section
			Cathy Le Prowse COE-EPA Section
		Oregon State Dept. of Environmental	James Van Domelon, Chief Plan & Specification Review Section
			Bill Renfro COE-EPA Section

VI-13

INTERNAL CONTROL REVIEW

## Questionnaire for Specifying

Control Objective: ENSURE QUALITY BIDDING DOCUMENT

## Responsible Entities:

H = EPA Headquarters  
 R = EPA Region  
 C = Corps of Engineers (COE)  
 S = State  
 G = Grantee/Engineer

<u>Entity</u>	<u>Questions</u>
H,R,S,C,G	Are reviews and oversights timely?
H,R,S	Do delegation agreements adequately address administrative and managing responsibilities?
R,S,C,G	Is there a formalized bidding document (i.e., plan and specification) review criteria or checklist?
H,R,S,C	What policies and guidance have been developed to assist in bidding document developments?
R,S,C	Is a checklist used in the review of bidding documents?
R,S,C	If so, does the checklist reflect EPA requirements, policies, and guidances including recent changes to Part 30, 33, and 35 of 40 CFR?
R,S,C	Is the design consistent with the Facility Plan that has been updated with the environmental assessment review?
S	Does the State use a checklist or criteria to review the design for conformance to State construction standards?
R,S,C,G	Does the B and C review ensure that tenets to non restrictive specifications have not been violated?
R,S,C	Is there a checklist to assist in performing quality B and C reviews?
R,S,C,G	What type of internal managing and controlling system is used in performing and implementing B and C reviews?
R,S,C,G	Have any B and C reviews resulted in significant cost savings or changes to the bidding documents?
R,S,C,G	Have changes and addendums to previously reviewed contract documents been adequately reviewed?
R,S,C,G	Have construction work and delivery scheduling reviews been adequately addressed?
R,S,C,G	Does the eligibility review ensure a thorough eligibility/ ineligibility evaluation? (i.e., Section 35.2123 reserve capacity, Sec 35.2120, Section 35.2125, Sec 35.2127, Part 35-Appendix A, Sec 33.275)

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INTERNAL CONTROL REVIEW

## Questionnaire for Bidding

Control Objective: ENSURE QUALITY PROCUREMENT

Responsible Entities:

H = EPA Headquarters  
 R = EPA Region  
 C = Corps of Engineers (COE)  
 S = State  
 G = Grantee/Engineer

<u>Entity</u>	<u>Questions</u>
H,R,C,S	Are reviews and oversights timely?
H,R,C,S	What policies, guidance, and standards are used?
H,R,C,S	Are the State delegation agreements and the COE IAG agreements consistent with EPA procurement standards?
H,R,C,S	Do delegation agreements adequately address administrative and managing responsibilities.
H,R,C,S	Are the agreements being adequately monitored and implemented in this respect?
C,S,G	Is the contract award criteria reviewed to determine if it is in accordance with the bidding documents? (i.e., Sec 33.235, Sec 33.285, Sec 33.240, Sec 33.250, Sec 33.420, Sec 33.430)
R,C,S,G	Is there a process in place for addressing possible instances of fraud, collusion, bid rigging, etc? (i.e., Sec 33.220, Sec 35,2105)
S,G	Is the procurement record keeping and contract administration being adequately reviewed for its documentation, especially when the grantee is self certified? (i.e., small purchase, non competitive, competitive)



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INTERNAL CONTROL REVIEW

LISTING OF DOCUMENTS REQUIRED FOR SUCCESSFUL PROSECUTIONS  
OF POSSIBLE SHERMAN ACT VIOLATIONS

1. Affidavits or Certification of non collusive bidding signed by each bidder;
2. Engineer's pre-bid estimate(s) of construction costs;
3. Specifications for contract bid;
4. Proposals (originals preferred) of successful and unsuccessful bidders;
5. Contracts (originals preferred) awarded successful contractors;
6. Certified bid tabulation;
7. Notice to Proceed Letter;
8. Grant award document and amendments;
9. Grantee's Outlay Requests for Reimbursement;
10. Contractor's pay estimates;
11. Grantee or consulting engineer's list of all firms who purchased bid packages; and
12. Grantee or consulting engineer's list of persons (firms) attending bid openings.

## VII.

### CLAIMS AND CHANGE ORDERS MANAGEMENT

#### A. TEAM MEMBERSHIP

The ICR team was composed of one Headquarters staff member and three Regional members, who brought ten additional Regional personnel into the study. The team members have engineering experience and are well qualified to study claims and change orders management. (See attached list of team members.)

#### B. INTRODUCTION

The purpose of this review is to determine the effectiveness of the various control techniques (regulations, guidance, policy, etc.) that are used in the construction grants program to review, process and approve change orders and claims. The ultimate objective of these control techniques is to assure that the work covered by the change orders and claims is necessary and that the cost of the work is reasonable.

Management of claims and change orders in the construction grants programs involves EPA, the State or CoE, and the grantee. Each entity has a different role and different responsibilities, e.g:

- o EPA Headquarters provides regulations, policy and guidance.
- o EPA Regions oversee the States/CoE's implementation of regulations, policy and guidance.
- o The States/CoE review and approve change orders and determines the cost allowable for grant participation.
- o The grantee negotiates and approves the claims and change orders that are necessary for the successful completion of the project at the lowest possible overall cost.

#### C. BACKGROUND

A change order is a written order by the grantee to the construction contractor authorizing an addition, deletion, or revision in the work and/or time of completion. The change order process generally originates as a request for a change to the existing contract documents either by the grantee or the construction contractor, or from the resolution of a claim. A change order is necessary to increase or decrease the contract cost or work, interrupt or terminate the contract, revise the completion date, alter the design, or in general to implement any deviation from the original contract terms and conditions.

A contractor claim is a request by the construction contractor for funds to cover additional costs and/or time that has been rejected by the grantee, typically because some action or inaction by the grantee or a misrepresentation in the contract documents is alleged to have caused an involuntary change in the cost or time of performing the contract. It differs from the other methods of initiating the change order process, since the circumstances already exist and the construction contractor has announced the intention of pursuing an increase in the contract price or time.

Change orders and contractor claims require special attention since the work required is not subject to competitive bidding. Consequently, each step in the review process becomes critical to ensure that the additional work is necessary, reasonably priced and allowable for grant participation.

The successful completion of the change order process depends upon the successful execution of the responsibilities of each of the participants: grantee, engineer, construction contractor, and the reviewing agency. The grantee is responsible for financing and managing the project to completion. Because of this, the grantee is responsible for determining whether a proposed change is necessary and whether the cost of the change is reasonable without regard to grant assistance. The engineer is the technical advisor to the grantee. The construction contractor is responsible for preparing and submitting the proposal for change and supporting documentation to the grantee. Using the proposal, the grantee negotiates the conditions of change with the construction contractor. The grantee then prepares and presents the change order plus supporting documentation to the reviewing agency. The reviewing agency checks the documentation for completeness and adequacy and the allowability of costs, so that grant participation for the change can be evaluated.

#### D. CONTROL TECHNIQUES

##### Headquarters:

Regulations--Former Part 30 (effective for grants awarded before September 30, 1983)

30.705	Allowable Costs
30.710	Federal Cost Principles
30.725	Cost and Price Analysis
30.900	Project Changes and Grant Modifications

--Revised Part 30 (effective for grants awarded after September 30, 1983)

30.410	How does EPA determine allowable costs?
30.700	What changes to my assistance agreement require a formal amendment?
30.705	What changes can I make to my assistance agreement without a formal amendment?

--Part 33 (effective for grants awarded after May 12, 1982 - Revised March 28, 1983)

- 33.210 Recipient Responsibility
- 33.275 Federal Cost Principles
- 33.290 Cost and Price Considerations
- 33.1030 Model Subagreement clauses, specifically clauses:
  - 3. Changes
  - 4. Differing Site Conditions
  - 5. Suspension of Work

--Part 35 - Subpart E (effective for grants awarded before May 12, 1982)

- 35.935-11 Project Changes
- 35.936-5 Grantee Responsibility
- 35.938-5 Negotiation of Contract Amendments (Change Orders)
- 35.940 Allowable Project Costs

Appendix C-2: Required Provisions - Construction Contracts, (March 1, 1976 to May 12, 1982) Specifically, Sections:

- 2. Changes
- 3. Differing Site Conditions
- 4. Suspension of Work
- 5. Termination of Default Damages for Delay Time Extensions

--Part 35 - Subpart I (effective for grants awarded after May 12, 1982 - Revised February 17, 1984)

Project Changes 35.2204

Appendix A - Determination of Allowable Costs

--Federal Procurement Regulations

- 41 CFR 1-15.2: Contracts with Commercial Organizations
- 41 CFR 1-15.4: Construction and Architect-Engineer Contracts

Guidance--Handbook of Procedures

- Chapter VI, Section I, Subsection 1, Change Orders
- Chapter VII, Section B, Allowable and Unallowable Costs
- Chapter VII, Section E, Increases and Decreases

- Construction Grants 1982
  - Section 14.1 Grant Increases/Decreases
  - Section 14.3.1 Change Orders
  - Section 15.0 Allowable and Unallowable Costs

- Management of Change Orders: A Guide for Grantees

Policy--ARB Resolution Board Decisions, especially,  
ARB 8: Allowability of Unsupported Grantee Claims

- Operating Procedures for "Monitoring Construction Activities" -at Projects Funded under the Environmental Protection Agency's Construction Grants Program

Regions:

Delegation agreements

Interagency agreement with Corps of Engineers

Construction Management Evaluations (CME)

Training--Seminar for CoE and States on Claims Resolutions (Region I)  
(February 1984)

Contractor Claims Policy (Region IX) - (April 1983; revised May 1984)

States:

State guidance and procedures

Preaward conferences

Program Management Conferences (PMC)

Grantee:

Local procurement procedures

Preconstruction conferences

(Additional Control Techniques Under Development)

Regulation--5% cap on change orders (published in the Federal Register  
for comment on February 17, 1984)-(April 1985)

Guidance--Management of Claims: A Guide for Grantees (October 1984)

- Revised/updated Handbook of Procedures (October 1984)

- Construction Grants 1985 (September 1984)

Training--Claims Seminars to Assist Grantees in Claims Prevention and Resolution (All Regions)-(FY 1985)

#### E. REGION/STATE SELECTION; STUDY SCOPE

The ICR study was divided into two major phases. The first phase consisted of an evaluation of the procedures used to review claims and change orders in Region I (Boston), Region V (Chicago), Region IX (San Francisco), focusing on the State within each Region with the largest allotment and the State within each Region with the smallest allotment. The Regions were chosen to provide for the widest geographical distribution possible. The States were chosen so that States with large programs could be compared with States with small programs to determine if there are any discernable differences. The States included in the review were Massachusetts, Vermont, Ohio, Minnesota, California and Nevada. (A list of State personnel interviewed is attached.)

The second phase of the ICR study consisted of an in-depth review of 60 change orders (varying in cost from \$250 to \$500,000) and 12 claims (varying in cost from \$226,000 to \$860,000).

The principal objectives of the study were to determine the answers to the following questions:

- Are claims and change orders properly documented by the grantee?
- Are claims and change orders processed in a timely manner by the State/CoE?
- Are the reviews of claims and change orders by the States/CoE thorough enough to determine liability, necessity, allowability and reasonableness of cost?
- Are change orders involving contractor claims reviewed carefully by the State/CoE to ensure that only meritorious claims are approved for payment?
- Is EPA providing the necessary assistance to enable grantees to successfully negotiate change orders and to defend themselves against non-meritorious claims?

Since the purpose of the ICR study was to sample and test the end product, which in this case is a reviewed and approved change order or claim, the scope of the study was restricted to the operating level responsible for performing this function, i.e., the State or CoE. Accordingly, the study did not include an in-depth review and evaluation of the Regional Office oversight in this area. However, it can reasonably be assumed that the State/CoE performance in reviewing and approving change orders and claims is an indication of the effectiveness of the Regional Offices' oversight role in this area.

### GAD Internal Control Review

The Grants Administration Division (GAD), Office of Administration, is conducting an Internal Control Review on Financial Assistance. The GAD study focused on a number of "Control Objectives", but only the following objective specifically addressed the construction grants program: "All Step 3 construction grant applications received are reviewed and analyzed to ensure they meet statutory/regulatory requirements."

The specific control techniques applicable to the construction grants program that GAD focused on were the administrative requirements for review and certification of Step 3 grant applications, and assuring that all required items were included in the grant application.

Note, this ICR study is completely independent of the GAD ICR study and does not in any way conflict or overlap with the GAD study.

### E. REVIEW PROCEDURES/STUDY APPROACH

The followings procedures describe the step by step approach that was used to perform the internal control review of claims and change orders:

- Identify all Agency-wide requirements, (regulations, guidelines, policy, operating procedures, etc.) concerning the review and approval of claims and change orders.
- Identify any additional Regional requirements for the three Regions participating in the review.
- Identify the review and approval procedures mandated by the delegation agreements for the six States.
- Identify any additional State requirements for the six States.
- Develop a questionnaire (See Attachment) to evaluate the State/CoE management of the claims and change orders review and approval process.
- Conduct a review in each of the six States in sufficient depth to determine if all of the required procedures are being followed. (The questionnaire served as the principal basis for this review.)
- Evaluate the management approach and operating procedures in each of the six selected States with an emphasis on determining whether there are adequate mechanisms in place for applying the required control techniques.
- Randomly select 10 change orders that were recently reviewed and approved (generally during the last six months) in each of the six States.

- Select the most recent claims that were settled and a change order submitted in each of the six States.
- Develop a questionnaire (See attachment.) to analyze and evaluate the results of the State/CoE review of the individual change orders and claims that were selected for inclusion in the study. A questionnaire was completed for each of the change orders and claims included in the ICR study.
- Perform an in-depth review and analyses of all the selected claims and change orders, using the questionnaire as the foundation for the review, and compare the results of the review against the stated objectives.
- Describe the nature, extent and cause of any identified problems.
- Using the results of the above analysis, evaluate the procedures used to review and approve claims and change orders in the six States.
- Determine the need for any additional investigation, analysis, or review.
- Evaluate the effectiveness of the regulations, guidelines, and operating procedures governing the review and approval of change orders.
- Evaluate the adequacy of existing personnel resources at the State/CoE level.
- Determine the need for additional controls and procedures.
- If necessary, develop recommendations concerning needed improvements, or changes in management procedures:
  - o additional regulations, technical guidance, operating procedures, or policy issuances.
  - o training programs or seminars (EPA, State or consultant).
  - o additional resources.
- Document the results of the internal control review.



## G. REGIONAL OFFICE ROLE

The following section describes the Regional Office role, responsibilities and functions in the change orders and claims review process for the six States included in the ICR study.

Region I - Massachusetts & Vermont

The Regional Office role in this area varies, to some degree, to fit the particular State. Also, the RO may get involved in the review of detailed change order determinations pursuant to the appropriate procedures outlined in the delegation agreement.

In Massachusetts change orders/claims associated with Federally funded projects are reviewed and certified by the Massachusetts Division of Water Pollution Control in accordance with the existing delegation agreement. In Massachusetts, the Regional Office proceeds, as follows:

- o Arbitrarily selected change orders are routinely overviewed after the fact on a periodic basis, but at least once a year. The objective, here, is not to alter a determination made by the Division but rather to provide general recommendations, concerning the State's review process.
- o For certain change orders over \$100,000 the State may request EPA's concurrence prior to issuing preliminary approval to the grantee.
- o For claims of controversial nature or of significant cost, the Regional Office may offer advice to the State at its request.

In Vermont, the State sends a copy of the certified letter to the Regional Office of each change order (c.o.) it approves. The original is sent to the applicant. A log book is kept by the Regional Office to keep track of them.

At least once or twice a year, five to ten percent of the c.o.'s certified by the Vermont in the prior quarter are randomly selected by the Regional Office for oversight. The Regional Office then sends a letter to the State requesting copies of the c.o.'s and all back-up information. Depending on the volume of back-up information, a trip to the State Office may be necessary to conduct the review.

An overview comment memorandum on each c.o. is written and sent to Vermont for their information. At the following quarterly meeting at the State Office, these comments are discussed. The intent of the overview, because it is conducted after the State has approved the c.o., is to point out both the strong and weak points of the State review for future reference.

In the area of claims, the State of Vermont has requested assistance from the Regional Office in regard to the eligibility of legal costs since Vermont has not approved similar such requests in the past.

The grants administration function in the Administrative Services Division does not have any overview or direct responsibility in the change order/claims process.

Region V - Minnesota & Ohio

Region V has similar responsibilities in both Ohio and Minnesota, that is, to overview and provide guidance and technical assistance to the State in its management of the construction grants program. Specifically, Region V has negotiated delegation agreements with both States which among other things contain detailed responsibilities for the review of change orders and claims. These delegation agreements were based upon current national guidance and regulations. Since the negotiation, Region V has also conducted evaluations of the State's activities and has provided training or advice where it appears necessary. The States have full authority to approve change orders and exercise it without the Region's prior review. Generally, the only time Region V is involved in the full review of a change order (to make a funding decision) is when a grantee requests a review of a State's decision under the "Disputes" provisions of the regulations.

The Water Division controls the State delegation agreement activity and performs all of the evaluations of the State pursuant to the agreement. The grants management function in the Planning and Management Division does not have any overview or overriding responsibility in this area.

Region IX - Nevada & California

The Regional functions in these States (both delegated) follow:

- Update delegation agreements periodically to insure conformance with current regulations and policies.
- Provide guidance and advice to States/CoE whenever requested.
- Perform delegation monitoring reviews on a periodic basis to verify if Federal regulations, rules and policies are being accurately and effectively executed.
- Analyze personnel needs of States/CoE on a continual basis to insure proper resources for the review and approval of claims/change orders.
- Review and make determinations on grantee appeals of State/CoE allowability determinations.
- Provide specific case-by-case advice and guidance on contractor claims to States, CoE and grantees.

Nevada reviews and determines allowability of claims/change orders. In California claims duties will be transferred from the State to the CoE on October 1, 1984; change order review is currently a CoE responsibility.

All of these activities are performed by the Water Management Division. Because of delegation, Grants Administration has no role in this area.

## H. SPECIFIC FINDINGS OF ICR TEAM

### Region I

The ICR study in Massachusetts took place during the first two weeks of June. Conferences on generic topics covering change orders and claims were held with the Chief Engineer and a Supervisory Engineer of the Massachusetts Division of Water Pollution Control (DWPC). In addition, there were discussions at staff level relating to specific reviews of the selected change orders.

Ten change orders were selected at random from a log maintained by the State which shows submittal date and approval date as well as the requested amount. The costs associated with the selected change orders varied between \$2,000 to \$92,000 approximately.

In our discussions with State personnel, it was revealed that grantees do not always submit complete packages with the change order. It was evident from the project files that State reviewers had to request additional documentation to enable them to make a determination as to reasonableness and allowability.

For the ten selected change orders it was found that all documentation supporting a State determination was in the project file once data had been obtained; that applicable Federal guidance and regulations were used in determining allowability/non-allowability; that with one exception, checklists required by the delegation agreement had been completed and signed by the appropriate program manager; that the State approval letter did not always indicate the basis for an allowable/unallowable determination (although it was included in the change order summary); that the grantee or its agent did not always follow established Federal and State guidelines; and that the review process took less than 30 days once all documentation had been received.

The ICR study also included three claims which had received an allowability determination by the State within the past year. In our discussions with the staff of the DWPC it was revealed that the claims documentation is not always complete and that in certain instances it could not be ascertained if any meaningful negotiations had taken place between contractor and grantee. The State felt that a general weakness in the claims area was the lack of a uniform national policy on the part of EPA relative to the allowability of defense costs. This may account for the backlog of unresolved claims in Massachusetts. The State also felt that the interpretation of "defective specification" was very difficult to implement especially as it relates to impact or delay costs.

Massachusetts had developed and distributed to all architect-engineers (A/E's) two construction grants policy memorandums pertaining to the processing and review of change orders and a policy concerning the need and the frequency for taking soil borings. The latter should help in minimizing change orders and claims due to differing site conditions.

It was concluded from the ICR study that more engineers might be needed in Massachusetts in the change order/claims area to reduce the backlog and speed up the review process.

The ICR visit to the State of Vermont took place on June 13 and 14, 1984, following the regional mid-year evaluation which had taken place in March. The State had prepared a list of change orders approved within the past six months prior to the meeting. Ten change orders were selected at random from this list. The costs of the selected change orders varied approximately between \$1500 to \$8000. Generally, the State's review and approval process took considerable less than 30 days. In our discussion with the State managers, we were informed that State personnel visit each project under construction on a regular basis and thus State is thoroughly aware of all potential problems connected with a particular project.

For all change orders reviewed, the project folder contained an approval letter, a summary of the change orders showing allowable/unallowable costs, a delegation agreement checklist, as well as the back-up documentation submitted by the grantee. If some documentation had not been inserted in the folder, the responsible State personnel were able to give an explanation for the change order approval.

Four claims which had been resolved by negotiation and which had been approved between December 1982 and April 1984 were also included in the ICR study. Again, the State personnel were thoroughly familiar with the details of each claim.

The overall impression is that Vermont is doing an excellent job in the review of change orders and claims. It has in place an internal process which addresses documentation submittal, reasonableness of costs and timeliness of review.

Vermont has a project management conference (PMC) with each grantee prior to construction. At these conferences change order procedures are discussed with local officials. Finally, the State mandates that all EPA funded projects include in the specifications the latest portion of the March 28, 1983 procurement regulations. A package of documents has been assembled and is made available to all grantees.

The procedures used by the State to distribute the March 1983, Change Order Guidance were effective. Since receiving the Change Order Guidance the State has not changed its review process because the internal guidance is considered adequate. Grantees are provided with change order management assistance by means of the above mentioned documents and by frequent meetings with the grantee, the engineer, the contractor and other affected parties. State evaluations of grantee change order procedures have shown that the time spent with the grantee at conferences and through updated documentation improves the change order package submitted.

A determination of liability, necessity and reasonableness of cost of the change order poses no difficulty as Vermont's reviews are thorough and usually completely documented. Usually the change order summary accompanying the State approval letter provides the reason for unallowable costs. It is suggested that this information be included in the approval letter. As a rule, only about six change orders are in-house under review. There is no backlog of unresolved claims.

Review of the ten change orders and four claims showed them to be thoroughly reviewed, well documented and meritorious. Vermont had demonstrated that it has technical and managerial ability to review change orders and claims using available control techniques.

### Region V

As a part of the Region's annual work plan development, the evaluation of change orders and claims was included as a FY'84 work plan item. This anticipated the evaluation of each State office and each CoE district office within the fiscal year. Therefore, this ICR review expands on a plan that was already developed. The evaluation for Ohio had already been initiated at the time of the ICR and, therefore, provided a headstart in performing the ICR. The Minnesota evaluation was not anticipated until mid-July and in this case the ICR data-gathering preceded the evaluation. In both cases the evaluation and the ICR were intended to complement each other rather than duplicate or conflict.

A visit to the Minnesota Pollution Control Agency (MPCA) at its Roseville, Minnesota office, was made on May 17 and 18, 1984 by two EPA Region V staff. Twelve different change orders were reviewed from six different grants. The change order requests varied from as much as \$213,000 down to \$1,700. During the visit, various State personnel were interviewed and files were searched. In general, the State was very carefully scrutinizing the need for the change order and the reasonableness of the change order amounts. From the logs that were kept, only a fraction of the requested amounts are actually being approved for funding by MPCA (i.e., \$226,000 allowed out of \$446,000 requested).

The CoE is not officially involved in the change order approval process in Minnesota, but does perform interim inspections on all active projects and generally has some knowledge of change order actions on a project.

In Ohio, the State agency receives the change order from the grantee and reviews the purpose to determine if it is a fundable category (i.e.; it may be for an add-on item which the State does not want to fund). Then it is sent to the CoE office where a complete review is accomplished. The Region's planned evaluation took place in March, at the State office in Columbus and the CoE offices in Huntington and Cleveland, at which time certain change orders were reviewed. However, many of these change orders

were approved more than six months ago, and accordingly could not be used in the ICR study. We, therefore, requested that the CoE, which has the responsibility for final change order approval, send complete change order packages to the Regional Office for review. We asked that they include not only the documents submitted by the grantee, but also that all review materials and project file notations be included. Ten change orders were received in late May and early June. The executed change orders totaled approximately \$366,000 of which the CoE found approximately \$164,000 to be allowable.

In reviewing the change orders, we found that virtually all had adequate cost justification. However, in several instances it was found that the CoE had to request additional cost/pricing information. In most cases, the required information was supplied by the grantee. Very few change orders submitted by the grantee contained independent cost estimates, but they were supplied for the most part upon request. The CoE had carefully scrutinized the necessity for the work and in many cases found portions unallowable due to "rework" or "vicarious liability". They had extended themselves to test the reasonableness of the cost and often used Dodge or Means reports to develop independent cost estimates.

Documentation in the file is most often found as notes written on the change order submitted. There may also be a memorandum identifying the justification for the change order approval. Change order approval letters to the grantees are generally documented with the reason for any unallowable costs, but in some cases could be improved by the citation of either law, regulations or Agency policy.

In both States, no change orders resulting from the resolution of claims were reviewed. In Minnesota, the only such change order approved was two years old and not considered representative of current policies. A number of change orders resulting from the resolution of a claim are currently under review in Minnesota, but final decisions have not yet been made. In Ohio a similar situation exists. Many claims are still at the grantee level and will constitute a review workload in the future, but there were no recent claims related change order approvals to evaluate.

### Region IX

As part of the Region IX Delegation Monitoring Program, the two areas of Change Orders and claims are regularly reviewed to assure that the States and CoE offices are complying with appropriate EPA requirements. Region IX looked upon the ICR as an opportunity to augment regular delegation reviews with an in-depth look into these two critical areas.

Two team members from the Water Management Division visited the State of Nevada, Division of Environmental Protection, on June 5 and 6, 1984, and the State of California, State Water Resources Control Board, on June 7 and 8, 1984. The purpose of these visits was to gather data regarding the State review and evaluation of change orders and claims.

As noted elsewhere in this report, it was agreed that an in-depth review of ten change orders from each State that had recently been reviewed, and four (or as many as were available, if less) claims that had recently been reviewed would be made. For the change order selection, projects were chosen at random from lists of total active projects, prior to the visit. For California, projects were chosen to get a representative cross section of the State, and in so doing, we also got a sample of reviews performed by different reviewers. The last completed change order was then chosen from each of the ten selected projects for the in-depth review. The same procedure was used for Nevada change order selection, however, from a much smaller universe of active projects. For claims selection, in California the four most recently reviewed claim settlements in which an allowability determination had been made, and no further appeals taken, were chosen. In Nevada, only one claims settlement was before the State for review, and since the draft allowability determination had been written (thus, the review process was complete), it was selected for the in-depth review. Costs of change orders ranged from \$250 to \$499,000, and claims from \$266,000 to \$860,000.

In general, the States and CoE are doing a good job of reviewing change orders and claims. In many cases, the project officers themselves acted as reviewers and were intimately familiar with the project and could make enlightened judgments as to the necessity and reasonableness of each change. In California, 80 percent of the packages were complete upon submission, but in Nevada, only 50 percent were complete, and additional information had to be requested. This took time and resources to accomplish and could be the cause of claim costs, if the change required prior approval, and the contractor was delayed during the time the reviewing agency was attempting to get complete documentation from the grantee.

From the decisions made and the notes in the file, it could be seen that the reviewers were thorough and complete in evaluating the change orders and claims. Where documentation was lacking, discussions with the reviewers supplied the needed answers.

Even though there is a substantial number of unreviewed change orders in California it does not appear to impact the program, since the average time for review in that State is less than one month. (Same as Nevada.)

The complete packages contained extensive cost analysis and cost breakdowns. The reviewers usually requested a time breakdown and critical path analysis for change orders involving time extensions, and considered grantee mismanagement and engineer error when making allowability determinations.

In the area of claims costs, both States are using the Regional Policy on Contractor Claims of April 1983, which deals with prevention and resolution techniques, but limits allowability guidance to post - May 12, 1982 grants. Both States want and need guidance for earlier claims and claim costs, as this is becoming a major issue on some large projects. Recommendations covering this issue may be found in the appropriate section of this report.

## I. ICR FINDINGS AND RECOMMENDATIONS

In general, the overall management of claims and change orders by the States, CoE and EPA was satisfactory. However, the results of the Internal Control Review uncovered a number of areas where changes, or improvements are needed. The most pressing need is to educate grantees on what information to submit with a request for approval of a change order or settlement of a contractor claim.

Note, the control techniques applicable to the change orders and claims which were reviewed as part of the ICR generally followed the old Part 35 procurement regulations which contained more detailed requirements than the new Part 33 procurement regulations. The ICR team does not know what effect full implementation of the new Part 33 regulations will have on the change order and claim management process. Accordingly, the results of the Internal Control Review should not be used to evaluate the effectiveness of the control techniques mandated by the Part 33 procurement regulations.

The detailed findings and recommendations of the ICR team follow:

### Documentation of Claims and Change Orders by Grantees

The initial documentation submitted by the grantee was insufficient for approximately 40-50% of the change orders reviewed. The information most frequently missing were independent cost estimates, and to a lesser extent, proof of negotiation. In all of these situations the reviewing agency (State or CoE) requested and received the information needed to review and act upon the change order.

The initial documentation submitted by the grantee was insufficient for 60-70% of the claims reviewed. The data most frequently missing were cost and time information; an independent analysis for determining liability; the rationale for the settlement price; and documentation of the negotiation proceedings. In all cases, the reviewing agencies requested the additional information. In cases where the information was not submitted, the costs were considered to be unallowable.

The ICR team concluded that the grantees are not always supplying adequate supporting documentation for claims and change orders. However, the ICR also concluded that the States/CoE are doing a good job of determining and requesting the information that is lacking.

### Recommendation:

The grantees should be advised of what constitutes a complete change order or claim package and at the same time directed to submit all of the necessary information at one time. This advise and direction can be given during a Program Management Conference, included in a State newsletter or bulletin, or accomplished by any other appropriate method.



Note, the information required for a complete change order package is contained in the "Management of Construction Change Order -- A Guide for Grantees", pages 12 and 13. The information required for a complete claims package will be included in the "Management of Claims: A Guide for Grantees" which is currently under development.

#### Timeliness of Review by State/CoE

All change orders were reviewed in a timely manner, generally 30 days after receipt of all required documentation. Claims took considerably longer, in some cases years.

Based on the samples studied, the ICR team concluded that States/CoE are managing change orders in a timely manner and preventing backlogs from occurring. However, the ICR team also concluded that the States/CoE are having difficulty in reviewing claims in a timely manner. This is due to the complexity of the claims and the lack of any National guidance or policy in this area.

#### Recommendation:

Finalize and issue the "Claims Management Guidance" document as soon as possible.

#### Adequacy of Reviews/Approvals of Change Orders and Claims by the State/CoE

Based on an evaluation of the State/CoE procedures for reviewing change orders and claims; interviews with State staff; and the results of the analysis of 60 change orders and 12 claims, the ICR team concluded that the State/CoE reviews were thorough enough to determine necessity and reasonableness of cost. However, the basis for many of the allowability/unallowability determinations was not uniformly documented in the files. The ICR team thought that the basis for the allowability/unallowability determination needs to be included in every project file for future use in audits and grantee appeals.

The ICR team also concluded that reviewers to considered the issue of respective liabilities of the parties in their determinations and some State/CoE offices had procedures for documenting same. In one specific instance, as a result of the State agency's review of liability, the costs were declared unallowable and the grantee's engineer accepted total responsibility for the incurred costs.

#### Recommendation:

Reviewing agencies should be required to follow the guidance "Management of Construction Change Orders", p. 15, "Documenting the Project File for Change Orders" and, in addition, to add to the project file the basis for each allowability decision, and to the letter to the grantee the basis (law, regulation and/or policy) supporting the decision to deny additional funds.

Adequacy of EPA Control Techniques

Change Orders -- Generally the EPA control techniques concerning the management of change orders were adequate and were being followed. However, there is no EPA requirement that the basis for the allowability/unallowability decision be included in the file and communicated to the grantee. The ICR team concluded that since the information is needed at the time of final audit and in the resolution of grantee appeals, the basis for allowability/unallowability decisions must be included in the official project file. Furthermore, this documentation will improve the thoroughness and precision of the review.

Claims -- There is no National guidance to assist grantees and reviewers in dealing with contractor claims. This has caused confusion and delays on the part of the grantees in preventing and resolving contractor claims. Additionally, the lack of guidance has hindered the reviewing agency in assisting grantees and in making allowability determinations on settlement and associated claims cost.

Recommendations:

Require reviewing agencies to document the basis for the allowability/unallowability determinations and communicate the basis of unallowability to the grantee in writing. Also, issue claims management guidance.

## J. RESPONSE TO REGIONAL COMMENTS

One of the Regional comments suggested that the overview concept used by Region I in Vermont be considered as model for use in other States. The ICR team carefully considered this suggestion, but since the overview process used in Vermont is only applicable to States that have recently been delegated the authority to review and approve change orders, this concept would not be appropriate for use as a general model. Accordingly, the ICR team did not incorporate this suggestion into the report.

## INTERNAL CONTROL REVIEW STUDY TEAM

Headquarters

Larry McGee	-	Southern Area Program Manager Municipal Construction Division Office of Water Program Operations	10 yrs EPA
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Region I

Anthony DePalma	-	Chief, Southern New England Section Municipal Facilities Branch	14 yrs EPA
Oscar Arpin	-	Environmental Engineer SNE Section, MFB	6 yrs EPA
Ralph J. Caruso	-	Chief, Northern New England Section Municipal Facilities Branch	13 yrs EPA

Region V

John Kelley	-	Chief, Municipal Engineering Section	17 yrs CoE, EPA
Richard Zdanowicz	-	Chief, MES Unit I	12 yrs EPA
James Campbell	-	Environmental Engineer, Unit I	11 yrs EPA
Valdis Aistars	-	Environmental Engineer, Unit I	4 yrs EPA
Dennis Dalga	-	Environmental Engineer, Unit I	5 yrs EPA
Carl Norman	-	Environmental Engineer, Unit II	4 yrs EPA
Tom Griffin	-	Environmental Engineer, Unit II	11 yrs EPA

Region IX

Robert Gervais	-	Special Assistant/Contractor Claims	10 yrs EPA
Kenneth Barker	-	Environmental Engineer	10 mths EPA
Roger Yates	-	Water Resources Engineer	7 mths EPA

INDIVIDUALS INTERVIEWED  
REGION I

Massachusetts: Department of Environmental Quality Engineering  
Division Of Water Pollution Control

- Mr. Paul A. Taurasi, Chief Engineer
- Mr. Robert Cunningham, Asst. Chief Engineer
- Mr. Joseph Cassano, Program Manager  
Construction Grants Program
- Mr. H. M. Chikkalingaiah, formerly Principal  
Sanitary Engineer  
Construction Grants Program

Vermont: Agency of Environmental Conservation  
Division of Environmental Engineering - Montpelier

- Mr. William Brierly, Director  
Public Facilities
- Mr. Edward Leonard, Chief of Engineering
- Mr. Allyn Lewis, Supervisor,  
Construction Section

INDIVIDUALS INTERVIEWED  
REGION V

While doing the ICR visits, numerous State and CoE staff were interviewed. The following is a list of the principal individuals and their titles:

Minnesota: Minnesota Pollution Control Agency

- Gordon Wegwert - Chief, Tech Review Section
- John Hensel - Chief, Minor Municipal/Industrial Unit
- Gene Soderbeck - Chief, Metro/Land Treatment

Ohio: Ohio Environmental Protection Agency

- Sanat Barua - Chief, East Engineering Section
- George Elmaraghy - Chief, West Engineering Section

Army Corps of Engineers:

- Rick Rothbauer - Grants Management Coordinator  
EPA Branch, Construction Division
- Joel Rogers - Construction Management Coordinator  
EPA Branch, Construction Division
- Wes King - Chief, EPA Branch, Construcion Division
- Carl Carter - Construction Representative, EPA Branch,  
Construction Division

INDIVIDUALS INTERVIEWED  
REGION IX

Nevada: Department of Health and Natural Resources  
Division of Environmental Protection

- James Williams, Chief, Construction Grants Section
- David Collings, Project Officer
- John Nelson, Project Officer
- John Worlund, Project Officer

California: State Water Resources Control Board  
Division of Water Quality

- James Putman, Assistant Division Chief/Chief, Construction  
and Grants Administration Branch
- Donald Hodge, Chief, Construction Section
- Jack Holt, Claims Coordinator

Army Corps of Engineers:

South Pacific Division:

- Tony Mei, Environmental Engineer, EPA Coordinator

Sacramento District:

- Lawrence Attaway, Unit Chief, Construction Coordinator

EVALUATION QUESTIONNAIRE  
INTERNAL CONTROL REVIEW  
Claims/Change Orders

CONTROL OBJECTIVE:

To insure effective management of claims and change orders at the Federal, State and local level.

EVALUATION QUESTIONS:

1. How have the current control techniques been communicated:
  - a. Headquarters to Regions?
  - b. Regions to States/CoE?
  - c. State/CoE to Grantees?
2. How are the current control techniques being applied by the Region:
  - a. Do the delegation agreements include all of the Agency requirements concerning the review and approval of change orders and claims?
  - b. Have the latest revisions (e.g. February 17, 1984 regulations) been incorporated into the State/CoE agreements?
3. How are the current control techniques being applied by the State:
  - a. Does the State's operating procedures include all of the requirements contained in the delegation agreements?
  - b. Does the State's operating procedures include the latest EPA requirements (e.g. the February 17, 1984 regulations)?
4. Were the procedures used by the State/CoE to distribute the March 3, 1983 change order guidance effective?
5. Has the State/CoE changed its review process since receiving the Change Order Guidance?
6. Are the review agencies providing grantees with change order management assistance?
7. Have any evaluations of grantee change order procedures been performed?
  - a. If so, give details.
8. Are experienced engineers reviewing the change orders?
9. Does the State utilized the CoE field knowledge in its review?

10. Will the review process identify change orders that are due to mismanagement or due to vicarious liability of grantee agents?
  - a. When such change orders are identified, are the costs of the change orders automatically considered unallowable for grant participation?
11. Are reviews thorough enough to determine liability, necessity, and reasonableness of cost?
12. Does the State/CoE change order approval letter clearly identify any unallowable costs along with the basis (law, regulation and/or policy) to support the decision?
13. What is the normal response time, particularly for change orders in excess of \$100,000?
14. Does a backlog of unreviewed change orders exist?
15. Does a backlog of unresolved claims exists?

COMMENTS:



## INTERNAL CONTROL REVIEW - CHANGE ORDER

Project Name _____	Grant No. _____
Contract No. _____	Change Order No. _____
Contract Amount \$ _____	Change Order Amount _____
	Total \$ _____
	Allowable \$ _____

Approval Dates: Contractor \_\_\_\_\_  
 Grantee \_\_\_\_\_  
 State/CoE \_\_\_\_\_

1. Was a complete change order package received from the grantee (i.e. cost/price information, justification, independent cost estimate, etc.)?
2. Was there documentation in the file that substantiated reasonableness of cost, allowability/eligibility, necessity and liability?
3. What basis/procedures did the State/CoE use to determine reasonableness of cost?
4. If the approved costs of the change order were due to delays, were changes to the schedule suitably documented by the grantee and considered by the reviewer?
5. What test were used to determine allowability relative to possible grantee or contractor mismanagement?
  - a. Was this adequate?
6. Were review decisions adequately documented in the file?
7. Was the agreed upon check list/review procedures outlined in the delegation agreement followed?
  - a. If not, explain.
8. Were change order review guidelines followed.
9. Did it appear, in this instance, that the grantee followed the procedures outlined in "Management of Construction Change Orders - A Guide for Grantees?"
10. Does the State/CoE change order approval letter clearly identify any unallowable costs along with the basis (law, regulation and/or policy) to support-the decision?
11. Did the State use CoE field knowledge?

## INTERNAL CONTROL REVIEW - CLAIMS

Project Name _____	Grant No. _____
Contract No. _____	Settlement Amt. \$ _____
Contract Amount \$ _____	Change Order Amount _____
Original Claim Amt. _____	Total \$ _____
	Allowable \$ _____

Approval Dates: Contractor \_\_\_\_\_  
Grantee \_\_\_\_\_  
State/CoE \_\_\_\_\_

1. Was a complete change order package received from the grantee (i.e. cost/price information, justification, independent cost estimate, etc.)?
2. Was there documentation in the file that substantiated reasonableness of cost and allowability/eligibility?
3. What basis/procedures did the State/CoE use to determine reasonableness of cost?
  - a. Was this adequate?
4. Were the causes of the claim adequately documented?
5. If the approved costs of the change order were due to delays, were changes to the schedule suitably documented by the grantee and considered by the reviewer?
6. What tests were used to determine allowability relative to possible grantee or contractor mismanagement?
  - a. Was this adequate?
7. How was the claim settled?
  - a. Why was it settled that way?
8. Was similar criteria utilized in settling a claim covering both eligible and ineligible work?
9. Was the claim settled contingent upon Federal participation?
10. Were review decisions adequately documented in the file?
11. Was the agreed upon check list/review procedures outlined in the delegation agreement followed?
  - a. If not, explain.

12. Were change orders/claims review guidelines followed?
13. Did it appear, in this instance, that the grantee followed State/CoE guidance, if any, in this area?
14. Does the State/CoE change order approval letter clearly identify any unallowable costs along with the basis (law, regulation and/or policy) to support the decision?
15. Did the State use CoE field knowledge?

OPERATION AND MAINTENANCE

## A. TEAM MEMBERSHIP

The ICR review team was composed of five engineers with individual professional experience in the construction grants program which ranged from two to twelve years and additional professional experience in the field. All were well qualified to review municipal treatment facilities operation and maintenance (O&M). (See attached list of team members with qualifications.)

## B. BACKGROUND/INTRODUCTION

Under the 1981 Amendments to the 1972 Clean Water Act (CWA, or the Act) all publicly owned treatment works (POTWs) are required to meet a statutory deadline of July 1, 1988, for compliance with the water quality objectives of the Act. To accomplish this objective, EPA has established a National Municipal Policy which requires the development of individual compliance strategies for all noncomplying POTWs.

Previous studies of POTWs by the General Accounting Office have identified the more prevalent causes of noncompliance as: (1) design deficiencies, (2) equipment deficiencies, (3) industrial waste overloads, (4) operation and maintenance deficiencies, and (5) infiltration/inflow overloads.

To improve the operation and maintenance (O&M) of POTWs, correct O&M deficiencies and assist POTWs achieve compliance with their NPDES permits, the EPA has undertaken the following actions:

- (1) Develop computerized diagnostic programs to assist States and communities identify operational process, management, and financial problems which are causing poor performance and noncompliance.
- (2) Supported construction of State training facilities for POTW O&M personnel through Section 109(b) grants.
- (3) Improved operation and maintenance training for POTW operators through pilot programs financed by EPA under Section 104(g)(1).
- (4) Required the development of plans of operation under Section 204(a)(4) of the Act for all construction grants facilities.
- (5) Required the development of Operation and Maintenance manuals for all construction grants facilities.
- (6) Required performance certification of all construction grants facilities under Section 204(d) of the 1981 Amendments.

In addition to the above actions, the Administrator has expressed a desire to improve operation, maintenance, and long term compliance of POTWs. In order to explore options for achieving these goals, a task force comprised of representatives from the construction grants, enforcement, and training programs and a Regional Office was established under the leadership of a special assistant to the Administrator. The task force should be publishing their recommendations in the near future.

### C. CONTROL TECHNIQUES

This review focuses on the effectiveness of the requirements established to assure that operation and maintenance deficiencies do not cause NPDES permit noncompliance for the POTWs funded under the 1981 Amendments of the Act. All noncomplying POTWs constructed prior to the 1981 Amendments must develop a Composite Correction Plan under the Agency's National Municipal Policy Program.

Due to resource limitations, the team targeted its review on the following EPA O&M-related management control techniques as required by the 1981 Amendments:

- (1) The Plan of Operations under Section 204(a)(4), which identifies the specific actions and completion schedule required to assure that grant funded POTWs and associated personnel are properly prepared for start-up and operation of the newly constructed facility in a cost-effective, efficient and reliable manner.
- (2) The Operation and Maintenance manuals developed under Section 204(a)(4), which provide long-term guidance for the efficient operation and maintenance of grant funded POTWs. They identify proper staffing, personnel training, maintenance, and operation for each facility.
- (3) The one year performance certification under Section 204(d) of the 1981 Amendments, which improves the performance of grant funded POTWs by placing greater emphasis on the grantee's accountability and responsibility for proper operation, maintenance, management and training during the planning, design, construction and initial operations period. This provision requires the municipality, after one year of operation, to either affirmatively certify that the grant funded facility is meeting its design specification and permit requirements or commit to corrective actions to assure the facility will meet the requirements.

### D. REGION/STATE SELECTION

The first phase of the Internal Control Review was conducted in EPA Regions I, II, III, and IV since these Regional Offices volunteered resources. The States of New York, West Virginia, Maryland, Maine, Massachusetts, Mississippi and North Carolina were selected for the review based on the following criteria:

- o They had been delegated program review responsibilities and were in various stages of O&M program management development.

- o They had reviewed specific ranges of project types and sizes.
- o State staff had varying levels of O&M technical expertise.

#### E. REVIEW PROCEDURES

The review was divided into two phases to facilitate examination of the data at the State and grantee levels. The first phase, conducted during FY 1984, evaluated States' review procedures for assuring quality plans of operation, effective O&M manuals and effective implementation of the performance procedures. The review also included an evaluation of the need for additional investigations and technical guidance or assistance to assure proper operation and maintenance of grant funded wastewater treatment facilities.

The Regional ICR team members examined State management systems for accomplishing the operation and maintenance requirements, plus the plan of operations and O&M manuals. For projects funded under the 1981 Amendments, the review procedures included discussions with State officials responsible for implementing the operation and maintenance requirements, in accordance with a uniform questionnaire developed by the review team. The reviews of the States were conducted during May and June of 1984. In addition to their interviews of State officials, the Regional team members reviewed a total of 23 projects during their 1-2 day visits.

The reviewers addressed the following issues related to each of the three EPA management control requirements:

- o Are plans of operation adequately addressing the development of actions necessary to assure efficient and reliable project start-ups and successful operations?
- o Are plans of operation providing information which results in efficient operations, maintenance, replacement and qualified personnel?
- o Are the operation and maintenance (O&M) manuals providing effective information and guidance for proper operations and maintenance of the facilities?
- o Is the performance certification requirement improving facility performance?
- o Do the performance certifications accurately reflect the capabilities of the facilities?

An examination of EPA's Regional O&M review procedures was not undertaken since the participating Regional Offices had delegated their O&M review functions to the States. These Regional Offices do not have any resources specifically dedicated to project level O&M reviews.

The second phase of this review, planned for FY 1985, will examine grantee utilization of (1) the plan of operation to achieve adequate O&M budgets and personnel staffing, (2) the O&M manuals to operate and maintain the facility and (3) the performance period to assess the facility's capabilities of achieving design criteria and effluent limitations. It will involve detailed discussion with specific grantees to assess if the operation and maintenance requirements are achieving their intended objectives.

The following criteria will be used to select grantees for the review:

- o Grantee project received a construction grant under the 1981 Amendments.
- o The performance certification has been completed, or the facility is completed and operating and has the potential of completing its performance certification in FY 1985.

#### F. TEAM FINDINGS AND RECOMMENDATIONS

The ICR study of State operation and maintenance management and review procedures resulted in the following findings and recommendations:

##### Plan of Operations

- o Plans of operation were prepared, submitted and approved in conformance with EPA regulations and the EPA/State delegation agreement under Section 205(g) of the Act.
- o States review procedures incorporate checklists which contain EPA guidance/delegation agreement criteria.
- o States believe that plans of operation are necessary even though they do not utilize them as a management tool.
- o EPA and State guidance and procedures are adequate for the development, review and approval of plans of operation.

Note, the impact of the lack of State monitoring of the plan of operation will be evaluated in FY 85.

##### Operation and Maintenance Manuals

- o Operation and Maintenance Manuals were prepared, submitted and approved in conformance with regulations and State delegation agreements.
- o State review procedures incorporate checklists which contain EPA guidance/delegation agreement criteria.
- o All States believe that the Operation and Maintenance Manual is an essential element for successful start-up and operation of a wastewater treatment plant.

- o States expressed varied viewpoints on the levels of detail and sophistication required for Operation and Maintenance Manuals, particularly for smaller facilities.
- o Generally, States insure that the grantees have Operation and Maintenance Manuals at the wastewater treatment plant. States refer to O&M Manuals when providing technical assistance for a facility.
- o EPA and State guidance and procedures regarding the development, review and approval of Operation and Maintenance Manuals are adequate.

Note, grantee perception of effectiveness and usefulness of O&M manuals will be evaluated in FY 85.

#### Performance Certification

- o All States view the performance certification activities and startup services as important requirements for proper plant operation.
- o Generally, EPA and the States have not established procedures for implementing performance certification activities.
- o A few projects requiring performance certification contained some general grant conditions and/or A/E agreements that include certification activities.
- o During 1985, very few treatment plants which received grants under the 1981 Amendments will have completed construction and the one year performance certifications in Regions I, II, III and IV.

Note, because of the limited number of treatment plants that will have completed certification in Regions I, II, III and IV during FY 1985, a complete assessment of the effectiveness of this requirement may not be possible in FY 1985 in these Regions.

#### Recommendations:

- o EPA and State guidance and procedures for performance certification should be established as soon as possible.
- o The contract documents for all facilities which received grants made under the 1981 CWA Amendments should be reviewed to determine if they contain adequate provisions to accomplish performance certifications.
- o Regions and States should provide O&M program managers to direct and assure the proper implementation of the performance certification procedures.



## G. REGIONAL COMMENTS

Several Regions commented on the draft report, and their comments have been addressed. One Region questioned the limited scope of the review. The commenter's questions implied that the ICR review should have been broader to accomplish the study objectives. However, the suggested approach was not feasible in this fiscal year due to resource limitations. It could possibly be included in future studies.

Operation and Maintenance  
Team Members

Dan Coughlin, Region I, FTS 223-5684

Background: 10 years in Construction Grants Program; 5 years in Operation and Maintenance and Permit Programs.

Patrick Harvey, Region II, FTS 264-1833

Background: 2 years in Construction Grants Program, 5 years in Compliance Program.

Tom Henry, Region III, FTS 597-9911

Background: 8 years in Construction Grants Program, 3 years O&M Coordinator.

Art Gurley, Region IV, FTS 257-2211

Background: 10 years in Operation and Maintenance Division, 2 years in Municipal Compliance Program.

Haig Farmer, Headquarters, FTS 382-5820

Background: 12 years in Construction Grants Program.

## Projects Reviewed in New York

1. Onondaga County
2. Oneida
3. Defieret

## Persons Contacted in New York

1. Robert Hampton, Deputy Director Construction
2. Robert Berry
3. Thomas Long

## Projects Reviewed in Mississippi

- |                            |          |
|----------------------------|----------|
| 1. Sherman                 | C-280523 |
| 2. Mississippi Bldg. Comm. | C-280424 |
| 3. Canton                  | C-280372 |

## Persons Contacted in Mississippi

1. Mark Smith, Chief, Municipal Facilities Section
2. Louis Montgomery, Project Engineer (MFS)
3. Geff Pittman, Project Engineer, Project Engineer (MFS)

## Projects Reviewed in North Carolina

- |                  |          |
|------------------|----------|
| 1. Winston-Salem | C-370399 |
| 2. Fayetteville  | C-370434 |
| 3. Greenville    | C-370487 |

## Persons Contacted in North Carolina

1. John Blowe, Supervisor, Grants Management Unit
2. Bobby DeWeese, Supervisor, Facility Performance Unit
3. Irish MacPherson, Chemical Analyst

## Projects Reviewed in Massachusetts

1. Milford
2. Hudson
3. Falmouth

## Persons Contacted in Massachusetts

1. Brian Jeans, Assistant, Chief Engineer

## Projects Reviewed in Maine

1. Aroostock - Prestite Treatment District
2. Limerick Sewerage District

## Persons Contacted in Maine

1. Dennis Pevington

## Projects Reviewed in Maryland

- |                   |             |
|-------------------|-------------|
| 1. Indian Head    | C-240459-03 |
| 2. Elkton         | C-240364-03 |
| 3. Fort Frederick | C-240794-01 |
| 4. Anne Arundel   | C-240469-03 |
| 5. Carroll County | C-240437-02 |

## Persons contacted in Maryland

- |                   |   |            |
|-------------------|---|------------|
| 1. Dr. Ta-Shon Yu | - | design     |
| 2. B. Jeng        |   | design     |
| 3. J. Parker      |   | design     |
| 4. J. Rein        |   | compliance |
| 5. D. Howard      |   | compliance |
| 6. E. Quance      |   | grants     |
| 7. G. Keller      |   | grants     |
| 8. J. Leaseburge  |   | grants     |
| 9. R. Schmidt     |   | grants     |
| 10. C. Johnson    |   | grants     |

## Projects Reviewed in West Virginia

- |                  |             |
|------------------|-------------|
| 1. Malden PSD    | C-540336-03 |
| 2. Morgantown    | C-540259-03 |
| 3. Kanawha Falls | C-54        |
| 4. Elizabeth     | C-540351    |
| 5. Fairmont      | C-540222-03 |

## Persons Contacted in West Virginia

- |                |
|----------------|
| 1. W. Means    |
| 2. T. Goodwin  |
| 3. E. Burdette |
| 4. M. Pyles    |
| 5. C. Hiddeman |
| 6. P. Sangani  |

Operation & Maintenance  
Questionnaire Log

State: \_\_\_\_\_ Grantee: \_\_\_\_\_

Questionnaire completed by: \_\_\_\_\_

Region/Office/Branch: \_\_\_\_\_

Phone: (FIS) \_\_\_\_\_

Date(s) Interview conducted: \_\_\_\_\_

Person(s) Contacted at State:

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Phone: (FIS) \_\_\_\_\_

Person(s) Contacted at Grantee:

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Phone: (FIS) \_\_\_\_\_

Description of Project:

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PLAN OF OPERATION  
(State)

1. Was a draft plan of operation submitted prior to a construction grant approval? If not, when:
2. Was it reviewed and accepted by the State management agency when approved relative to grant award?
3. Does the State have written criteria/procedures for the review? (Document)
4. Does the review criteria/procedure summarily address the following:
  - budget
  - financial information system
  - study of financing
  - emergency operation program
  - administrative function/certification/reports
  - startup service/laboratory functions
  - O&M Manual
  - estimated schedule
5. Does the State monitored grantee implementation of draft plan of operation? Describe State's actions.
6. Was the final plan of operation submitted at 50 percent payment level? If not, when?
7. Was it reviewed and accepted by the State management Agency? Describe deficiencies.
8. Was it approved prior to startup? When approved relative to startup? Does the State have written criteria/procedures for review? (Document)
9. Are the following items addressed in the final plan of operation?

Budget

- Provisions for annual budget sufficient to provide for efficient O&M, and replacement (during project's useful life) including administration, supplies, utility charges and ancillary equipment; and
- Provision for salaries to attract, train and upgrade qualified personnel.

Financial Management System

- Contains and accounts for daily revenues and expenditures for project O&M including replacement of parts during useful life.
- Includes O&M costs and expenditures incurred during the project's useful life for materials, labor, utilities and other items which are necessary for managing and maintaining the project to achieve the capacity and performance for which it was planned, designed and built.

Staffing & Training

- Contains a staffing plan which identifies staffing patterns, salary schedules, staff structure and organization and operator certification requirements.
- Provides for hiring the chief operator before building is 50 percent complete.
- Discussion of potential hiring problems that may be encountered and actions to solve the problem.
- Contains a continuous training plan and schedule at least 30 days prior to start-up.

Emergency Operations Program

- Effects of emergencies on operation.
- Vulnerability analysis of system.
- Protection measures.
- Emergency response program.
- Periodic revision of program as necessary.

Administrative Function

- Implementation of programs to perform appropriate monitoring and analyses for process control, compliance with the NPDES permit, and State requirements for submission of appropriate operational reports.
- Implementing of a maintenance management system.
- Procedures for startup and continued engineering services during one year performance period.
- Schedule for O&M Manual preparations, review, update.

Startup Services

- Schedule for startup services.
  - Competent operational assistance for adjustment of the treatment process and related equipment functions to optimize performance, safety and reliability under actual operating conditions.
  - Training and instructions to provide adequate sampling, testing and quality assurance needed for process control and regulatory monitoring reporting, including necessity for laboratory certification by the regulatory agency.
  - Services needed to implement the maintenance management system outlined in the O&M Manual.
  - Services to provide the training needed to implement a record management system as outlined in the O&M Manual.
0. Does the State monitored grantees implementation of the final plan of operation?
  1. What is State view of plan of operation requirements and usefulness to grantee and State; suggestions for change or improvement.



OPERATION AND MAINTENANCE MANUAL  
(State)

1. Was O&M Manual submitted before the date specified in the plan of operation?
2. Was the O&M Manual reviewed and found acceptable by the State Management Agency? (If deficient, please specify actions)
3. Did O&M Manual approval occur before startup? (If not, specify)
4. Does the State have written criteria/procedures for this review? (Document)
5. Are the following areas addressed in the O&M Manual?
  - Information on process design assumptions such as flow, peak flows, pump capacities, etc.
  - Unit process information that includes control measures and monitoring procedures.
  - Startup procedures for each operational unit and item of equipment.
  - Maintenance management system including schedules and procedures for routine adjustments preventive and corrective maintenance. Procedures as well as a spare parts inventory.
  - Laboratory test procedures, schedules and equipment necessary for control of the treatment works and the specific reports to be sent to local, State and Federal regulatory agencies.
  - Safety procedures for operating equipment with particular emphasis on potentially hazardous areas such as wet and dry wells, chlorination facility and anaerobic digestors.
  - Organizational structure, job descriptions and duties, administrative procedures for purchase order preparation approvals and budget preparation, etc.
  - "Troubleshooting:, analyzing and solving problems which frequently occur in treatment works which are related either to unit processes or the operation of specific items of equipment.
  - An operating plan for emergencies which may occur and the procedures to be followed until normal operation can be resumed.

6. What are the State's views or opinion on O&M Manuals, its usefulness for grantee and State. (Include suggestions for changes and/or improvements.)
7. What actions are undertaken by the State to encourage continued use of O&M's Manual by the grantee? Explain.
8. Does the State monitor grantee utilization of the O&M Manual? (Specify)

Project Performance Certification  
(State)

1. Did the grantee provide an engineering services scope of work for the performance period provided to the State for review?  
Submittal date relative to initiation of the performance period.
2. Was it reviewed and accepted by the State Management Agency?  
Approval date relative to initiation of performance period.
3. Does the State have written criteria/procedures for this review?  
(Document)
4. Were the following items addressed in the review:
  - Direction of operation for the project.
  - Training of operating personnel.
  - Preparation of curricula and training materials for operating personnel.
  - Grantee notification of whether project is meeting its performance standard.
  - O&M Manual update to accommodate actual operating experience.
5. Does the State monitored grantee implementation of the project performance certification activities? Describe.
6. What State follow-up actions have been taken? Describe.
7. Does the State have procedures for evaluating grantee project performance certifications? If yes, explain.
8. What is State's view of project performance certification program?
9. What are the State's suggestions/modifications for the performance certification program?

Plan of Operation  
(Grantee)

1. How much input did the grantee have in the preparation of the plan of operation? (Include documentation from files)
2. Were the dates in the plan of operation met? If not, explain.
3. How beneficial was the plan of operation?
4. Was the chief operator hired by the 50 percent level? If not, explain why not?
5. Was the budget developed in the plan of operation realistic for proper facilities operations? If not, explain.
6. Was a fund established for equipment replacement? Do you consider it adequate?
7. Is the salary structure adequate to attract qualified personnel? Explain.
8. Is the financial management system now in place in conformance with the plan of operation? Explain any differences.
9. Is the financial management system working? Explain.
10. Is the staffing and training in conformance with the plan of operation? If not, explain.
11. Is your emergency operation program in conformance with the plan of operation? If not, explain.
12. Were the procedures established in the plan of operation adequate to accomplish the following tasks?
  - Laboratory/monitoring functions.
  - Submission of proper reports.
  - Operational startup.
  - Continued operation during one-year certification period.
  - Implement a maintenance management system.
13. Was staff training, including laboratory training during startup, described in the plan of operation implemented and successful? Explain.
14. How effective was the plan of operation? Explain. (Indicate any necessary changes in the system)

O&M Manual  
(Grantee)

1. Is the O&M Manual readily available to the operator? Explain.
2. Is the O&M Manual utilized and by whom? Describe.
3. Was the O&M Manual revised during startup and certification period to reflect actual operating conditions?
4. Is the O&M Manual understood by plant staff? Explain
5. Is the maintenance management system developed in the Manual followed by plant staff? If not, explain.
6. Have the emergency operating procedures developed in the manual been reviewed by plant staff. Are they utilized? If not, explain.
7. Are the safety procedures provided by the manual followed? If not, explain.
8. Are the laboratory procedures as provided by the manual followed? If not, explain.
9. In general, has the O&M Manual proved useful? What changes are recommended?

Project Performance Certification  
(Grantee)

1. Were there any delays in initiating the performance certification period? If so, explain.
2. Were the following engineering services provided during the performance certification period:
  - Direction of operation for the facility.
  - Personnel training.
  - Curricula and training materials.
  - Revision of the O&M Manual.
  - Grantee notification of the facility's performance.
3. Did actions initiated during the performance period enhance the project's performance? Explain.
4. What changes would you recommend to improve operations and maintenance during the performance certification period? Describe.