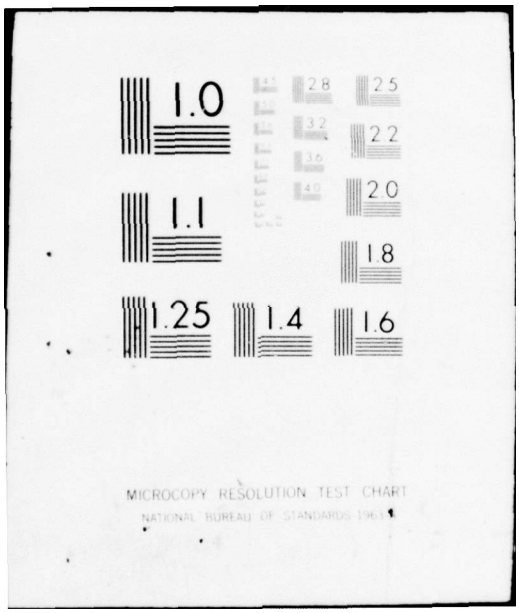
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DREDGED MATERIAL RESEARCH PROGRAM

CONTRACT REPORT D-77-1

DESIGN REQUIREMENTS FOR AN INFORMATION DISSEMINATION AND TECHNOLOGY TRANSFER SYSTEM FOR THE DREDGED MATERIAL RESEARCH PROGRAM

Volume I

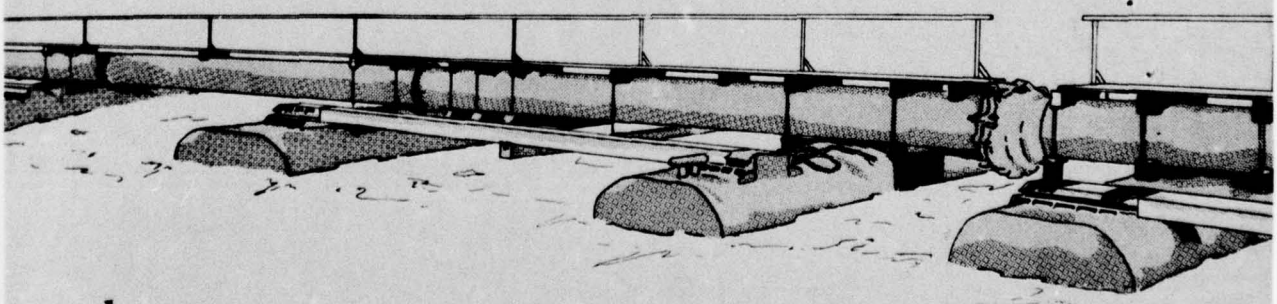
by

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February 1977
Final Report

Approved For Public Release; Distribution Unlimited



Prepared for Environmental Effects Laboratory
U. S. Army Engineer Waterways Experiment Station
P. O. Box 631, Vicksburg, Miss. 39180

Under Contract No. DACW 39-75-C-0022
(DMRP Work Unit No. 9A01)

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DEPARTMENT OF THE ARMY
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P. O. BOX 631
VICKSBURG, MISSISSIPPI 39180

IN REPLY REFER TO: WESYV

28 February 1977

SUBJECT: Transmittal of Contract Report D-77-1

TO: All Report Recipients

1. The contract report transmitted herewith represents the results of a study that was conducted with applicability to the entire Dredged Material Research Program (DMRP) rather than more typically to one of the four DMRP projects or one of the twenty tasks (i.e., basic objectives). Different in one other major aspect from all other DMRP research efforts, the study reported herein concerned itself with the awareness and utilization of research results rather than the pursuit of answers to particular technical questions or the development and testing of concepts. While its attention was inner directed in that the DMRP would be the principal user and/or action group for its findings, the study has produced a wealth of information of anticipated value to a large number of other Corps of Engineers (CE) and other agency elements and of significance beyond just the DMRP. For these reasons, it has been published and distributed to an audience equally as large and diverse as that for any DMRP report on a specific scientific or engineering topic.

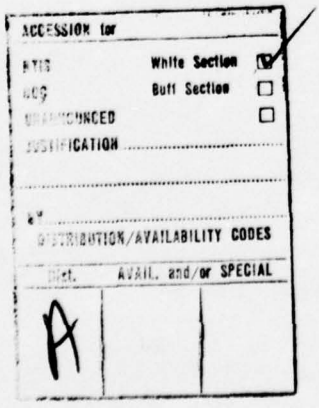
2. Since early in the DMRP, there has been a growing awareness of the exceptional requirements of the program for both intensive and extensive information dissemination and transfer--exceptional both in terms of what has been past practice for programs of this type and what is being demanded under the present atmosphere of awareness of problems in technology transfer. These requirements are of multiple origin and perhaps are attributable primarily to the generic nature, nationwide scope, and extremely diverse multidisciplinary character of the highly funded effort. These and other factors have made the DMRP highly visible--visibility that coincides with a critical need on the part of CE field elements and numerous other agencies and organizations for research results of the precise type being pursued by the DMRP.

3. In an attempt to meet the requirements for the rapid, widespread, and effective dissemination of DMRP research results on the environmental effects of dredged material disposal and alternative disposal methods, traditional information dissemination techniques have been

progressively supplemented with others, including periodic information exchange bulletins, interagency briefings, workshops, annual reports, interagency personnel assignments, and cooperative field projects and demonstrations. However, lacking was a feedback mechanism whereby the audience acceptance and effectiveness of these activities could be assessed so that modifications and/or additions could be made if needed. Moreover, also lacking was a baseline or point of departure for designing a final program-wide system necessary to assure the availability and use of the huge amount of technical knowledge and data contained in well over 100 reports and other documents.

4. The study reported herein, accomplished under contract to Teknekron, Inc., Washington, D. C., was designed to generate both types of needed information. To accomplish this, it was necessary to do far more than simply survey recipients and users of DMRP information already disseminated. It required the design and implementation of a multifaceted survey that identified and characterized both existing and potential users (both CE and non-CE), and that produced insight into the nature of and variations within their activities, attitudes, and concerns. Procedures employed and results obtained in the survey are presented in the first volume of this report and in detailed tabular form in the second volume.

5. Specific conclusions and recommendations presented in the report pertain to three aspects of the overall problem. Those that relate to information dissemination and information transfer (see report for a definition and discussion of these terms) can be and are being evaluated for implementation by the DMRP. In some cases, actions already have been initiated to put recommendations into effect. Those that relate to technology transfer cannot be implemented solely by the DMRP since technology transfer involves actions on the part of the users as well as the supplier. The DMRP intends to implement those actions that will serve to provide or support essential motivation; however, complementary actions elsewhere within the Corps are necessary. Significant information of value in deciding on the precise nature of these complementary actions at various levels is contained within this report.



JOHN L. CANNON
Colonel, Corps of Engineers
Commander and Director

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)
Surveys of both District and non-Corps DMRP audiences were conducted in order to evaluate the effectiveness of current information dissemination by the Program. These surveys also provided the basis for defining the requirements of an integrated DMRP technology transfer system specifically adapted to the needs of the District audience. Awareness of the DMRP among District personnel under recall assist conditions is about 86%, but actual knowledge of the technical structure of the Program is far less common. Only a (Continued)

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20. ABSTRACT (Continued)

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minority of the District personnel is inclined to optional job related reading, so that the DMRP reports are not optimal as information transfer media. Furthermore, the Program is perceived as generically oriented and the applicability of its outputs to specific projects is often not obvious. The study findings clearly indicate the need for a DMRP information transfer system which will: (a) facilitate the correlation of applicable Program-generated information to project requirements and (b) present this information in a systematic and topically organized format.

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EXECUTIVE SUMMARY

The effectiveness of information dissemination by the Dredged Material Research Program (DMRP) to both Corps District and non-Corps audiences was evaluated through three surveys as follows:

1. Self-administered questionnaire surveys were conducted at 12 Districts representing coastal, inland and other generic categories of dredging locale. The survey sample, of over 900, included personnel of GS-9 or higher Civil Service rating and military ranks of 1 LT and above. This sample was selected on the basis of those organizational affiliations (division and branch) that suggested involvement in dredging operations. Of the total sample, 336 were found to be dredging-assigned. The survey focused primarily on (a) the characterization of the respondents in terms of classification, their use of informational materials and sources and their job-related attitudes, and (b) respondent perceptions of work climate factors which do or may influence District receptivity to new information and technology.
2. Personal interview surveys were performed at 6 of the above 12 Districts, with the samples drawn from those who had originally participated in the self-administered questionnaire survey. Of 134 interviewees, about 75% were assigned to dredging operations and the balance to environmental inventory and assessment. The interviews dealt principally with dredging related topics and with the participants' assessments of the DMRP Bulletin, reports and program objectives.
3. Telephone interviews with non-Corps recipients of the DMRP Bulletin were conducted nation-wide with 100 individuals, most of whom were officials of environmental agencies at all governmental levels. The topical areas addressed in these interviews related chiefly to the

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respondents' environmental interests, their evaluations of the DMRP Bulletin and their familiarity with the DMRP reports.

The major conclusions of this study are:

1. Information dissemination by the DMRP to Corps Districts is, at present, based largely on the distribution of printed materials, i.e., information exchange bulletins and reports. This method is suitable for those Corps personnel who are inclined toward optional job-related reading. However, these individuals probably constitute no more than 25% of the total DMRP audience.
2. A substantial percentage of the District personnel favors interpersonal modes of learning. This finding is consistent with other survey results and suggests that the supplementation of printed technical materials with verbal tutorial methods, particularly those permitting the free interchange of question and answer, would significantly augment information transfer within the Districts.
3. About 86% of the personal interview survey respondents exhibited awareness of the existence of the DMRP under conditions of assisted recall. In the case of the participants in the self-administered questionnaire (SA) survey, in which recall assist was not employed, the incidence of awareness of the Program was approximately 28%. It was found that SA aware respondents were, on the whole, more inner-directed than the unaware. (Inner-directed individuals tend to be less interpersonally reliant in their work relationships than "other directed" individuals.)
4. Knowledge of the scope and content of the DMRP and its information Bulletin is considerably less frequent than the mere awareness of these.

5. Most dredging-assigned personnel are not comprehensive in their dredging interests. They tend to focus on specific areas of direct concern to them. Their reading of dredging related materials is, accordingly, often quite selective.
6. The inherent work-related attitudes of the District personnel are good and offer the potential for high quality job performance. However, the Districts are not generally perceived as providing climates that encourage either receptivity to new and original ideas from without or the freedom to experiment within. The survey findings show that a high level of innovative capability exists among the District personnel, but this appears to be more frequently exercised in consequence of individual initiative than in the context of organized institutional support.
7. The areas of principal dissatisfaction of the District personnel relate to their perceived scarcity of opportunities for promotion and advancement. Further, they believe that dependability on the job and cooperation with others are regarded by the District divisions as more important factors to be considered in awarding promotions than is contribution to knowledge. These findings do not imply an atmosphere that is conducive either to receptivity to disseminated information or to internal technical innovation.
8. More than one-half of the participants in the personal interview survey regard the topical areas treated in the DMRP reports as relevant to their informational needs. However, although about 41% of these participants had known of at least one report title prior to the survey, somewhat fewer than 22% had actually scanned or read more than one report.

9. The DMRP reports, while obviously required outputs, are not considered in themselves to represent the optimal format for the dissemination and transfer of the Program's research findings and developed methodologies to the District personnel. This assessment is based on several considerations, including:
   a) The DMRP is, on the whole, generically oriented and the relevance of its research results to informational needs associated with specific projects is frequently not obvious to its audience.
   b) Each report deals, of necessity, with a particular investigative study. However, information relevant to a given topical area may appear in several different reports. Augmenting this retrieval problem is the fact that the total number of reports to be published by the DMRP on completion of its Program is expected to exceed 150. These factors are likely to discourage routine and frequent use of these documents, except by highly motivated personnel.
   c) District personnel vary considerably with respect to their knowledge of dredging operations and the extent of their technical training and experience. Some of them are likely to experience difficulty in assimilating and applying report information whose level of presentation is relatively sophisticated.
10. Most dredging-assigned personnel have only a fragmentary knowledge and understanding of dredging operations. This is partly because of their tendency, as mentioned, to focus on areas of special interest and partly because of a relatively high turnover rate among them of 20% per 6-months. There is, accordingly, a need, which many of these personnel have expressed, for a comprehensive and simply written dredging primer which would provide a systematic overview of the subject. A broad

elementary presentation of this type would also serve as a basis for the better understanding of the more specialized DMRP outputs.

11. The DMRP Bulletin is being disseminated to an appropriate non-Corps audience whose environmental interests are primarily water-quality oriented. These recipients place a relatively high value on the publication and secondary dissemination to other readers (by pass along) is considerable. Non-Corps Bulletin recipients exhibit a somewhat greater incidence of familiarity with its topical content than do the District readers. However, many of these recipients are on the Bulletin mailing lists at their own requests, so that their interest in the publication is presumably high. Also, their awareness of the existence of the DMRP reports is, on a percentage basis, more widespread than within the Districts. However, their actual knowledge of the technical areas the reports deal with is often vague and inexact.

A broad system approach to the optimization of information transfer is recommended. This approach addresses the Districts as audiences as well as the DMRP information disseminated to them and, for this reason, transcends the scope of the Program in certain areas appropriate for consideration by the Corps as a whole. The suggested overall approach incorporates three key recommendations as follows:

1) Enhancement of District Self-Motivation

There should be a common center established within the OCE for the receipt and subsequent diffusion of District-developed technology, including innovative applications of DMRP findings. This would assure District personnel that awareness of their more noteworthy technical accomplishments would be disseminated throughout the Corps.

2) Self-Perpetuation of DMRP-Developed Technology
Qualified District teams, to be initially trained by the DMRP staff, should be established within the Districts as disseminative centers for providing required guidance in the application of DMRP technology. The high turnover rate of dredging-assigned personnel, indicated earlier, virtually dictates the requirement for the perpetuation of DMRP information transfer within the Districts to assure the application and further development of Program-generated technology over the long term. Inasmuch as the DMRP will terminate in March 1978, support from its staff cannot be relied on indefinitely.

3) Implementation of DMRP Information Transfer Mechanism
Independently of any measures which may be adopted for the enhancement and stabilization of the information transfer process within the Districts, there is a need for a DMRP information transfer mechanism that will both correlate Program-developed technology with local District project requirements and present DMRP technical material in an organized and readily assimilable form without sacrifice of its pertinent informational content. This recommendation is based on the study conclusions to the effect that the DMRP reports are not optimal technology transfer media and that the applicability of generic Program outputs to project specific needs is often not evident.

In addition to suggested system approaches, major specific recommendations are:

1) The reports should contain summaries of the DMRP technical organization for the orientation of readers who are only partially familiar with the Program, as well as titles of any other reports that are topically related.

2) The DMRP technical structure should be periodically recapitulated in the Bulletin.
3) Bulletin distribution to the Districts should be more effectively targeted by supplying request forms to the personnel.
4) The Bulletin non-Corps mailing list should be periodically corrected and updated.
5) Recent Final Environmental Impact Statements on dredging projects should be scanned for the names of concerned commentators who may now be unaware of the DMRP, but who might be interested in receiving the Bulletin.
6) A comprehensive primer on dredging and dredging-related operations should be prepared for distribution to the Districts. (This is not a responsibility of the DMRP, but is offered as a suggestion to the Corps in toto.)

PREFACE

The study described in this report, entitled "Design Requirements of an Information Dissemination and Technology Transfer System for the Dredged Material Research Program," was conducted by Teknekron, Inc., Washington, D.C., during the period April 1975 to November 1976. It was sponsored by the U. S. Army Engineer Waterways Experiment Station (WES), Environmental Effects Laboratory (EEL), under the Dredged Material Research Program (DMRP). The investigation was performed under Contract No. ~~DACW-39-75-R-005~~ DACW39-75-C-0092

In this study, the survey method was employed to assess the effectiveness of current DMRP information dissemination with particular emphasis on Corps Districts, and to identify the requirements of a technology transfer system which would best serve the needs of the DMRP audience.

The invaluable assistance of the many Corps personnel representing WES, Office, Chief of Engineers, and the Districts, whose cooperation made this study possible, is gratefully acknowledged.

Messrs. David M. Speaker and William H. Weisgerber, Teknekron, Inc., directed the investigation and prepared this report. The Contracting Officer's Representative for WES was Dr. Roger T. Saucier, EEL, and the program was performed under the general supervision of Dr. John Harrison, Chief, EEL. The Directors of WES during the contract period were COL G. H. Hilt, CE, and COL J. L. Cannon, CE. Technical Director was Mr. F. R. Brown.

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DESIGN REQUIREMENTS FOR AN INFORMATION DISSEMINATION AND TECHNOLOGY TRANSFER SYSTEM FOR THE DREDGED MATERIAL RESEARCH PROGRAM

PART I: INTRODUCTION

This report describes a study whose principal objective was the characterization of an information and technology transfer system that would best serve the needs of users of the investigative results, conclusions, and recommendations developed by the Dredged Material Program (DMRP) through its constituent project efforts. Other important objectives included (a) an assessment of the degree of diffusion, within Corps Districts, of awareness of the DMRP and an understanding of its goals and purposes (as derived, in part, from currently distributed informational materials) and (b) a determination of how these materials are perceived and evaluated by both Corps District personnel and non-Corps recipients, in terms of their interest, usefulness, and other pertinent considerations. All data and information produced during this study were derived from surveys.

As can be inferred from its character, this investigation related to the DMRP as a whole, rather than to any specific aspects of its technical activities. For this reason, it is probable that the structure of the study and its methodologies and findings will be most meaningful if presented in relation to the DMRP's overall role and objectives, particularly in the case of those readers whose familiarity with these may be limited. Accordingly, the immediately following discussion provides a summary account of the DMRP, in the light of which this study and its findings will then be described.

Background

On even a cursory review of the programmatic responsibilities of the Civil Works Directorate of the U.S. Army Corps of Engineers, it will be evident that these are all concerned with water-related

projects. Categories of Corps civil works activities include basin planning, flood control, shore protection, and, of direct pertinence here, navigation channel and harbor dredging. The magnitude of new work and maintenance dredging operations is, collectively, enormous, with estimates of curently dredged annual volumes exceeding 350,000,000 cubic yards. The problem of disposal of such vast quantities of dredged material, which was often difficult in the past because of technological and/or economic considerations, has, in recent years, become increasingly severe as the result of environmental concerns which have led to the imposition of additional constraints on disposal operations. As the DMRP pointed out in its Second Annual Report, dated January 1975, the criterion of prospective environmental impact may at times outweigh economic factors in influencing the selection of dredged material disposal methods and the location of disposal sites.

Major generic categories of adverse environmental impacts frequently adduced in connection with dredging per se, as well as with dredged material disposal, include such effects as degradation of water quality, damage to biota, and the degradation of local aesthetic values. It was, of course, always obvious that consequences of these kinds can and do occur as the result of dredging and related operations. What seems equally clear, at least in retrospect, was the past lack of a scientifically based methodology permitting (a) the predictive identification and quantification of environmental impacts of these operations and (b) the identification, evaluation, and selection of those alternative disposal approaches that, for different settings and situations, would mitigate their severity. For the most part, site-specific experience has been only marginally contributory to the development of generally applicable predictive mechanisms for impact assessment. An important consequence of the lack of such mechanisms has been that the intensity of public apprehension triggered by proposed dredging and disposal operations frequently exceeded the level justified by actual consequences.

History of the DMRP

Congressional recognition of, and responsiveness to, the considerations summarized above, coupled with a realization that the severity of the problem was more likely to grow with time than to diminish, resulted in the authorization of a comprehensive dredged material study to be conducted by the Corps. This investigation was formulated as a four-phase program as follows:

Phase I Problem Identification and Assessment
Phase II Research Program Development
Phase III Research Program Execution
Phase IV Prototype Tests and Applications of Results

The responsibility for the performance of Phases I and II was assigned by the Office, Chief of Engineers, to the U.S. Army Engineer Waterways Experiment Station (WES) at Vicksburg, Mississippi. This portion of the program, which was conducted by members of the WES in-house staff, resulted in a report issued November 1972, entitled "Disposal of Dredge Spoil: Problem Identification and Assessment and Research Program Development," M.B. Boyd et al. The findings and recommendations presented in this report contributed substantially to the shaping of the Phase III effort which was formally established as the Dredged Material Research Program within WES. The DMRP was initiated March 1973 and is expected to be completed March 1978 at a total cost of about $30,000,000. During the first sixteen months of its history, the DMRP was administered through the Office of Dredged Material Research (ODMR). In July 1974 the ODMR was combined with the Office for Environmental Studies to form a new WES entity, the Environmental Effects Laboratory (EEL), within which the DMRP has since been managed. Neither the conceptual orientation of the DMRP, its management at the project level, nor its objectives were modified by the administrative change.

Technical Structure

In terms of its technical design, the DMRP was originally organized on the basis of seven research areas, each including several research tasks. Each task, in turn, consisted of a number of work units, or specific research studies, conducted either by WES directly or through contracts with other organizations. As the Program evolved, its organizational structure was somewhat simplified, partly through the consolidation of the initial seven research areas into four research projects and partly through a reduction in the number of research tasks (accompanied by a corresponding broadening of task scopes). These modifications, instituted primarily in the interests of administrative efficiency, did not materially affect the technical content of the DMRP. As it is now structured (since August 1, 1975), the four research projects are:

1) Environmental Impacts and Criteria Development
2) Habitat Development
3) Disposal Operations
4) Productive Uses

These research projects can be categorized in several different ways. In general terms, the majority of the tasks falling under the first project are largely addressed to the acquisition of information and data relating both to environmental effects of dredged material disposal and to contained pollutants, as these may vary at different dredging locations. For example, defined task objectives within this project group, as presented by the DMRP, include "develop techniques for determining the spatial and temporal distribution of dredged material discharged into various hydrologic regimes," "determine on a regional basis the direct and indirect effects on aquatic organisms due to dredging and disposal operations," and "develop techniques for determining pollutional properties of various dredged material types on a regional basis."

Task objectives pursued under the other three research projects are essentially different in character in that they are

largely concerned with the investigation or development, as well as with the evaluation, of a wide variety of alternative disposal techniques and methodologies. Conceptually, these three projects may be subcategorized on the basis of what may be termed the "utility values" associated with the types of disposal methods they address.

The research tasks under the Disposal Operations Project relate to a large extent (though not entirely) to the concept of disposal of dredged material in more efficient and environmentally compatible ways, but within the context of disposal for disposal's sake, as opposed to that of useful applications. Specific task objectives within this project are, accordingly, oriented to the development of new or improved methods for the design and operation of dredged material containment areas, for the densification (through dewatering) of dredged material in order to extend the useful life of these areas, and for the treatment of contaminated dredged material in order to mitigate its pollutant properties.

The Habitat Development Project can be viewed as higher in utility value, though this value obviously applies more directly to biota than to man. The concept on which this project is based is evident from its title and is explicitly reflected in its research task objectives, which include "evaluation and testing of environmental, economic, and engineering feasibility of using dredged material as a substrate for aquatic habitat development" and "investigation, evaluation, and testing of methodologies for habitat creation and management of dredged material islands."

The research task objectives addressed under the Productive Uses Project are directed, for the most part, to the development and evaluation of dredged material applications intended to serve socially and/or economically beneficial purposes and may therefore be considered to represent the highest "utility value" of the three disposal projects. Typical of these objectives are "evaluation of the use of dredged material for the development, enhancement, or restoration of land for agricultural and other uses" and "investigation of technical and economic aspects of the manufacture of marketable products."

The categorization of the disposal-oriented research projects on the basis of "utility value" provides a perspective on the DMRP's technical structure, which highlights the relatively large share of program effort addressed to the investigation and development of beneficial or productive uses of dredged material. It is not, however, intended to imply that any specific disposal approaches are consistently favored regardless of circumstances, because no single disposal alternative, or even a related group of alternatives, will be practicable under all dredging conditions and in all dredging locales. Rather, it is a prime objective of the DMRP to develop a sufficiently wide range of realistic and feasible disposal options, together with adequate methodologies and expository guidelines for their implementation, to permit the selection, for detailed consideration, of those alternatives identified as most appropriate and practicable within the contexts and associated constraints of particular dredging situations. This objective is clearly expressed in the previously cited WES report (on Phases I and II) as follows: "(the) central theme of research is to give the District Engineer the widest possible choice of technically satisfactory, environmentally compatible and economically feasible, disposal procedures. . . not just ideas but working systems."

Phase IV (Prototype Tests and Application of Results) of the dredged material study is, as planned when the study was originally formulated, being conducted concurrently with the more exploratory research tasks of the DMRP, as sufficient investigative work is completed within specific technical areas to provide experiential and conceptual frameworks for the design of the field tests. This phase is, as the WES report states, ". . .concerned with field trials of new or improved spoil (i.e., dredged material) disposal techniques to determine their effectiveness in eliminating specific spoil disposal problems." A characteristic example of on-going Phase IV projects is the long-term field testing of marshes created by dredged material deposition in order to evaluate their developmental patterns and stability, as well as their functional effectiveness as wildlife habitats.

DMRP Orientation

As is suggested by the foregoing summary description of the DMRP, the basic orientation of the program tends to be generic rather than case specific. That is, its constituent research studies address, for the most part, (a) the development of general principles through which the environmental effects of dredging and disposal operations may be predictively estimated for various types of project settings and circumstances and through which adverse environmental impacts may be controlled or mitigated and (b) the formulation, as already mentioned, of a broad array of disposal alternatives.

Although some demonstration projects are being conducted cooperatively with Corps Districts and although DMRP staff personnel provide assistance to District personnel with respect to planning and other aspects of specific dredging projects, the DMRP does not consider that its primary mission, in the programmatic sense, is or should be that of local problem solving as opposed to more general and pervasive goals. This view is consistent with its Congressional mandate [Section 123(i) of the River and Harbor Act of 1970 (Public Law 91-611)] which authorizes ". . .a comprehensive program of research, study and experimentation relating to dredged spoil." (emphasis ours) At the same time, it can easily be understood that the DMRP position, though arguably justifiable on legislative grounds and on the basis of maximization of long-term program benefits, may engender some sense of impatience within Districts faced with prospective dredged material disposal problems of clear severity but uncertain resolution.

DMRP Information Dissemination Modes

During its history, the DMRP has consistently maintained and implemented a policy of open dissemination of information relating to the program in terms of its objectives, organization and organizational changes, project activities, research findings, work unit

budgets, and staffing. This information is addressed to various groups and individuals whose activities or interests relate directly or indirectly to dredging and associated activities, including both technial operations and their environmental implications. The principal segments of this audience, other than individuals, are:

- Corp elements
- Other Federal agencies
- State, regional, and local agencies
- The dredging industry
- Environmental organizations
- The scientific community

The DMRP employs various modes of information dissemination that can be conveniently grouped into two categories: interpersonal and distribution of printed materials.

1. Interpersonal. Information dissemination activities falling within this group include, but are not limited to, participation in conferences and meetings, interagency briefings, and direct contacts with Corps District personnel.
2. Distribution of printed materials. The major informational documents published by the DMRP for external distribution are annual reports, information exchange bulletins, and work unit reports.
   a. DMRP annual reports, of which three have been issued to date, present summaries of program accomplishments for the period reported, the status of the program at work unit level, and other pertinent information, such as the DMRP technical structure and staff organization, a listing of published reports, and an identification of both outside contractors and WES elements whose efforts contributed to the program. The annual reports also contain sufficient introductory background information to provide readers unfamiliar with the DMRP with an

overview of the program.

b. DMRP information exchange bulletins are issued at approximately monthly intervals and distributed to an audience, both within and outside of the Corps, which now numbers about 2,000. The main purposes of these bulletins are to provide up-to-date information on current DMRP activities, to acquaint the reader with new work units being initiated and to describe any changes which may have occurred in the technical or organizational structure of the program. The bulletins also contain timely information on dredging-related activities other than those directly pertinent to the DMRP, such as announcements of national and international conferences and of books and other publications of interest to the readership.

c. Work unit reports describe studies conducted under the DMRP project elements. The investigative work performed in the attainment of each work unit objective is detailed in a separate technical report prepared by the project research staff. Typically, these reports describe the methodologies employed and present the study findings and the conclusions derived from them. Work unit reports on projects conducted by contractors are identified as "contract reports." Reports generated by WES elements are called "technical reports." The general report formats, for both categories, are essentially similar. Publication runs of individual DMRP reports are typically in the range of 500-750, with unlimited additional copies made available from the National Technical Information Service (U.S. Department of Commerce) after exhaustion of the initial supply. As is true of the bulletins, work

unit reports are routinely distributed to both Corps and non-Corps recipients. As of June 1976, over 20 separate reports were issued. As more work units are completed, this number will grow and it is expected that the total to be generated by the DMRP will be nearly 150.

d. In addition to annual reports, information exchange bulletins, and work unit reports, the DMRP also distributes "miscellaneous papers." These papers comprise various informational issuances that do not fall into a rigidly definable category. Some, for example, are techical discussions of specific topics pertinent to the program that had been delivered at meetings or conferences. Others contain textual material and reproductions of slides presented at DMRP inter-agency briefings. Miscellaneous papers of the second category are typically broad and comprehensive in their scope, rather than technically intensive.

The phases of this study which were directed to the evaluation of the effectiveness of current DMRP information dissemination mechanisms focused, in this context, on the program's information exchange bulletins and work unit reports. This emphasis was based on the fact that these issuances are the most important and most widely distributed documents through which DMRP information is transmitted to both Corps and non-Corps audiences. In general terms, the information exchange bulletins may be thought of as telling their recipients what the program is doing and how it is doing it; the reports detail the results of the individual DMRP research studies.

Conceptual Basis of the Study

The major premise underlying the DMRP effort is, obviously, that the program products (i.e., the technical information and methodol-

ogies it generates) will, through their application in the field, substantively and favorably influence the design, implementation, and consequences of dredging operations in ways previously identified in this discussion. This premise, if viewed as an objective, is the rationale for the DMRP's existence. It is expected, however, that in addition to their direct support of the central program goal, DMRP outputs will also generate secondary benefits. For example, technical findings resulting from water-quality related studies or from the investigation of the stability of wildlife habitats created from dredged material should prove useful to Federal, State, and other agencies whose concerns relate to such areas. Also, much DMRP-generated information and data are of direct interest to academic and other scientific communities, even though this interest may not extend to practical dredging operations as such. Although the Corps Districts are the DMRP's primary audience, the program's information dissemination efforts are also responsive to the needs and interests of other agencies and organizations.

Definition of Terms

The terms "information dissemination," "information transfer", and "technology transfer" are in common use, but often employed in somewhat different senses by different individuals. Since these terms will appear frequently throughout this report, it is desirable, at this point, to specify the exact meanings that will be consistently associated with them in the context of the following discussions. (Also, the word "information" itself alludes principally to printed or published materials, unless otherwise indicated, because this study, as already stated, dealt with DMRP bulletins and reports as the program's primary disseminative mechanisms).

The transfer of information, as a process, inherently suggests the concept of a sender/receiver relationship. It is important to recognize, however, that the sending function in itself, i.e., information transmission or dissemination, while implying such a

relationship, does not necessarily ensure either its existence or future occurrence. Therefore, by "information dissemination" is meant only the transmission or distribution of information by a "sender" to points where intended "receivers" are believed or known to be present or accessible. Although the purpose of information dissemination is, of course, information transfer, the only reliably predictable result of the process, provided that it has been effectively conducted, is the availability of the information at desired locations. Information transfer, in the strict sense meant here, occurs only when a receiver has read and understood whatever has been disseminated by the sender. Thus, information dissemination is necessary to, but does not in itself guarantee, the transfer of the information to its intended audience. Recipient responsiveness (i.e., acquisition and understanding of the information) is also essential to the process.

Technology transfer is considered here as a special case of information transfer, which itself is a more general concept. "Technology transfer" means the acquisition of knowledge, or training, or other required capability by A (who may be an individual or a group) from a source B, which will then enable A to successfully employ a previously unfamiliar procedure, method, or technique. (It is immaterial whether B is the innovator of the transferred methodology or occupies an intermediate tutorial position between the innovator and A. It is also immaterial whether the transferred methodology is, in itself, new or already well established. The key point is that it is new, in the sense of being unfamiliar, to the recipient). In general, technology transfer is that category of information transfer that is directed to the subsequent application of the transferred information by the receiver. Instruction books and manuals of the how-to-do-it type are examples of technology transfer instruments.

DMRP Information Dissemination Activities

The information dissemination activities of the DMRP are obviously conducted for the purpose of achieving both information and tech-

nology transfer, primarily to individuals in Corps Districts. This point, although self-evident, is made explicit in order to highlight the consideration that the program, in its role of an information sender only, cannot directly control (although it may influence) the appropriate receiver responsiveness that is necessary for the completion of the transfer process. It was, of course, recognized at the inception of this study that positive receiver responsiveness was critical to the success of the DMRP's information and technology transfer efforts. It was also appreciated that this responsiveness, in turn, reflects a variety of factors requiring separate examination and evaluation. Because of the direct relationship of the DMRP effort to the Corps dredging operations, the factors that influence receiver responsiveness within Districts were selected for more intensive study than those which may operate in relation to non-Corps audiences. Some of these factors, as well as others which pertain primarily to information dissemination, are discussed in the following paragraphs.

1. Effectiveness of information dissemination. Information dissemination effectiveness as a factor is dependent upon various subfactors. The nature of such subfactors is reflected by questions of the following kinds:

   a. Are the direct recipients of DMRP issuances actually those who have a need to know, or an interest in, the program's informational outputs? In other words, do the DMRP mailings target the appropriate individuals within the District? This subfactor is essentially within the sender's (DMRP's) control in the sense that procedures exist through which the appropriate audience can be identified. The DMRP does not, however, have any direct control over derivative dissemination, although it may indirectly influence it to some extent through the character of its issuances.

b. To what extent does derivative dissemination occur among District personnel? (For example, an individual in a Corps District receives a copy of the DMRP information exchange bulletin directly because his name or title is on the program's mailing list. In the language of information dissemination and transfer science, such an individual is called a "primary recipient." If he passes the document on to an associate or co-worker, the latter becomes a "secondary recipient." The transmission of the bulletin from the primary to the secondary recipient is derivative dissemination, as opposed to the initial dissemination by the DMRP. Note that derivative information dissemination may also occur through verbal communication).

2. District perceptions of the DMRP. Perceptions of and attitudes toward the DMRP are important because of their role in influencing receiver responsiveness to information disseminated by the program. These perceptions attitudes may be based on a variety of considerations as follows:

   a. The DMRP was not created because of market demand (i.e., as a response to District request), but, as explained earlier, because of Congressional decision-making. In consequence, the attitudes of District personnel toward the existence of the DMRP may be far from uniform. Some may view it as an imposition and others as supportive and contributory.

   b. The essentially generic orientation of the DMRP may be viewed by some as lessening its overall direct applicability to specific District dredging problems.

   c. District personnel perceptions of the DMRP technical structure may vary considerably. Some may

view certain program task objectives as quite important and others as relatively unimportant. Some may regard the program as completely comprehensive, while others may consider that additional topical areas should be included within it.

3. Information form and content. Important determinants of receiver responsiveness to disseminated information are (a) its apparent relatedness to his needs and/or interests and (b) its ease of its assimilability (according to his evaluation). The relative intensity of (a) may, of course, affect the importance of (b). (For example, one will read difficult or obscurely written textual material if a knowledge of its content is essential to one's work. Such material is, however, far less likely to be read by choice).

   The nature of the content of DMRP technical information is determined by the topical areas of the defined work units. The pattern of presentation of this information in the research reports is structured, for the most part, according to a format prescribed by a WES guideline manual.* This format is appropriate for a single report, considered as an isolated document, which deals with a specific topical area. There is, however, no *a priori* basis for assuming that this particular *form* of presentation of disseminated DMRP information which will, ultimately, comprise a large number of reports, many of

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*Note: All contract reports prepared for any WES element, including the DMRP, are to comply with formal requirements identified in a manual entitled "Guide for Preparation of Waterways Experiment Station Contract Reports," dated August 1974.

them interrelated, mutually supplementary and/or overlapping to some degree, is necessarily optimal in terms of District recipient needs or convenience.

4. Individual perceptions of self-relatedness to dredging operations. Individuals in Corps Districts who have dredging assignments and/or responsibilities may vary with respect to their perceived comprehensiveness of personal relatedness to dredging and dredged material disposal operations. In some cases, individuals' roles will focus largely on specific aspects of dredging activities. In others, the range of involvement may be broad. Those individuals with more specialized and correspondingly sharply defined roles are more likely to relate to dredging operations in terms of the particular aspects of these operations with which they are directly concerned than are those whose involvement is more comprehensive. These differences of self-relatedness to dredging activities can substantially affect receiver responsiveness to disseminated information. Individuals with more specialized involvement may tend to respond to DMRP outputs on a selective basis in the sense that they may carefully review material that directly pertains to their own work areas, but may be relatively indifferent to information they do not consider applicable to them. Regional factors also may affect receiver responsiveness. Personnel attached to inland Corps Districts are obviously likely to be more interested in DMRP information bearing on riverine dredging operations than in information specifically addressed to coastal situations.
5. District receptivity to innovation. Aside from those factors influencing receiver responsiveness that pertain directly to the DMRP (such as the way in which its technical structure is assessed and the perceived

degree of relatedness of its outputs to recipient needs and interests), the overall climate of Corps Districts in terms of the prevailing levels of acceptance of, or resistance to, proposed new or different methodologies is a consideration of major importance. It is clear that the ease or difficulty with which technology is transferred will, independently of the mode and form of the transfer mechanism, be determined to a significant extent by the receptivity of the audience. At one extreme, receptivity may be virtually nonexistent because of the dominance of attitudes such as "the old way is the best way." At the other, innovative approaches may be welcomed for their own sakes, independently almost, of critical assessment of their substantive values. It is not, of course, implied here that either of these extremes represents the information receptivity level actually prevailing at any Corps District. They are mentioned only to suggest the possibility that receptivity climates may vary over a considerable range among the organizational elements of a common institution. This possibility was afforded substantial weight in this study because of the fact that the Districts tend to be operationally autonomous and, to some degree, distinct individual entities. It was, therefore, hypothesized that receptivity would not be uniform among Districts and the survey objectives accordingly included the elicitation of personnel perceptions of factors considered likely to reflect the local receptivity climates.

Teknekron Surveys

The data presented in this report were developed through three surveys. The first of these was conducted at 12 Corps Districts,

using self-administered questionnaires. The second survey, which used the direct personal interview method, was performed at 6 Corps Districts selected from the intial 12. The third survey consisted of unstructured telephone conversations with various non-Corps recipients of the DMRP bulletin. These individuals were, in most instances, officials of other agencies with identifiable environmental interests.

The following section of the report, Part II, describes the survey methodologies employed. It also defines the criteria used for the selection of the sampled populations and for the construction of the sample sets. Part III discusses the findings from the self-administered questionnaire survey, the personal interview survey, and the discussions with non-Corps DMRP information users in that order. Part IV of the report is a compilation of conclusions reached on the basis of the study and its findings. Part V presents recommendations for consideration by the DMRP staff.

PART II: SURVEY METHODOLOGY

Three surveys were performed during this study as follows:

1. A survey of Corps personnel at 12 Districts using self-administered questionnaires. This survey was largely addressed to job-related information needs, patterns of information use, work attitudes, and perceptions of the work climates.
2. A survey of Corps personnel at 6 Districts (of the above 12) using the direct personal interview method. This survey dealt principally with dredging related topics, including the respondents' perceptions of new trends in dredging operations and of the DMRP and its informational products.
3. A survey of non-Corps DMRP information users. This survey, which was based on telephone conversations with recipients of the DMRP information exchange Bulletin, was concerned principally with the respondents' broad areas of environmental interest and their evaluations of the Bulletin as an informational source.

Corps District Surveys

The initial step in the design of the Corps District personnel surveys was the selection of the Districts to be sampled. Aside from the obvious criterion of substantial involvement in dredging operations, it was considered desirable that the selected Districts, in terms of the situational characters of their dredging projects, would represent a variety of types of locales (e.g., inland, coastal, and Great Lakes). On the basis of data presented in the Arthur D. Little, Inc. "National Dredging Study" (1975), an analysis was made of projected District dredging operations (for the period 1974-1983) as reflected by aggregate dollar volume forecasts. These forecasts are shown in Table 1. Through

Table 1

An Analysis of Projected Dredging Dollar Volume
by Corps District

	Dredging Dollar Volume			
Inland Districts	Forecast -1974-83	Percent	Cumulative Percent	No. of Employees
1. Vicksburg	$160,965,000	29.2	29.2	1834
2. Philadelphia	150,912,000	27.4	56.6	705
3. Memphis	55,217,000	10.0	66.6	1272
4. St. Louis	42,791,000	7.8	74.4	866
5. St. Paul	38,047,000	7.0	81.4	538
6. Louisville	29,145,000	5.3	86.7	775
7. Kansas City	19,804,000	3.6	90.3	711
8. Huntington	16,914,000	3.0	93.3	758
9. Little Rock	10,855,000	2.0	95.3	797
10. Nashville	10,665,000	1.9	97.2	706
11. Rock Island	5,550,000	1.0	98.2	455
12. Pittsburgh	5,576,000	1.0	99.2	656
13. Tulsa	4,000,000	.7	99.9	991
14. Omaha	162,000	.03	100.0	1308
15. Fort Worth	none	none	none	993
16. Alburquerque	none	none	none	173
17. Walla Walla	none	none	none	579
Total -	$550,595,000	100.0%		
Coastal Districts				
1. New Orleans	$676,292,000	26.7	26.7	1329
2. Galveston	381,176,000	15.1	41.8	425
3. Jacksonville	236,768,000	9.4	51.2	633
4. Mobile	219,999,000	8.7	59.9	1283
5. New York	174,412,000	6.9	66.8	452
6. Wilmington	139,821,000	5.5	72.3	339
7. Norfolk	120,321,000	4.8	77.1	336
8. New England	107,810,000	4.3	81.4	469
9. Portland	89,750,000	3.5	84.9	1081
10. Charleston	72,360,000	2.8	87.7	100
11. San Francisco	70,218,000	2.8	90.5	359
12. Baltimore	67,180,000	2.6	93.1	726
13. Los Angeles	52,834,000	2.1	95.2	426
14. Seattle	50,539,000	2.0	97.2	570
15. Sacramento	39,183,000	1.5	98.7	651
16. Savannah	33,385,000	1.3	100.0	674
Total -	$2,532,048,000	100.0%		
Great Lakes Districts				
1. Chicago	$80,668,000	39.9	39.9	483
2. Buffalo	75,429,000	37.4	77.3	345
3. Detroit	45,901,000	22.7	100.0	564
Total -	$201,998,000	100.0%		

consultation with the DMRP Project Officer, the following 12 Districts were selected for the self-administered questionnaire survey:

- Inland Districts*
  - Vicksburg, Miss.
  - Philadelphia, Pa.
  - Memphis, Tenn.
  - St. Louis, Mo.
- Coastal Districts*
  - New Orleans, La.
  - Galveston, Texas
  - Jacksonville, Fla.
  - New York, N. Y.
  - Wilmington, N. C.
  - Portland, Ore.
  - San Francisco, Ca.
- Great Lakes District*
  - Chicago, Ill.

It was established early in the study that the Corps District surveys were to focus primarily on those personnel who could be directly involved in decisionmaking with respect to dredging and related operations and on those whose informational inputs could affect decisionmaking processes. The personnel sampled were those, accordingly, of Civil Service rating GS-9 and higher and, of military rank, 1 LT and higher. The process by which the District samples were drawn was as follows:

- Based on the organization charts of the 12 Districts, a list was prepared of all divisions, branches, and sections within these Districts.

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*Note: The Inland/Coastal/Great Lakes classification reflects the regions where most dredging is performed, rather than the geographic locations of the Districts per se.

- This list was reviewed with DMRP and OCE staff members for their identifications of those organizational elements with which personnel with direct dredging assignments were likely to be associated. The sample drawn later from these personnel was designated "Strata A."
- A subsequent selection was made of other organizational elements whose members were considered to be possibly involved, at least peripherally, or interested in dredging operations. The sample drawn later from these personnel was designated "Strata B."
- Through OCE coordination (OCE interest in the surveys is based on their potential for suggesting approaches to job climate enhancement), personnel lists (GS-9 and higher, 1 LT and higher) showing organizational affiliations were received from the 12 Districts.
- Self-administered questionnaires were addressed to 75%* of the Strata A personnel and to 50%* of the Strata B personnel, chosen at random, at each District. The actual numbers of questionnaires distributed to the Districts were determined by these sampling rates together with the District populations falling into the A and B categories.

The surveys were coordinated, at each District, by a previously designated liaison official. To ensure the privacy of the respondents, each questionnaire was accompanied by a stamped envelope that was preaddressed to Teknekron, Inc. The respondents were instructed to seal the questionnaires in the envelopes immediately after completing them. A reproduction of the questionnaire used in the survey is shown in Appendix A (pages A-2 through A-9).

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*Note: These sampling rates are considerably higher than those employed in most survey studies. A sampling rate of 10% is usually regarded as a desirable target.

Table 2 shows the responses received, by District. In several instances the returned questionnaires were not usable for the survey, either because they were not filled out or for some other reason. Therefore, in the cases of some Districts, the numbers of questionnaires which were computer processed were lower than the numbers received.

The personal interview survey was performed at 6 Corps Districts selected from the 12 previously identified and, like the self-administered questionnaire survey, was conducted under OCE auspices. The candidate interviewees, all of whom had participated in the former survey, were selected according to the following criteria:

- Work assignments in dredging operations and/or in environmental inventory and assessment.
- If assigned to dredging, individual must have been engaged in this assignment for at least six months.
- If assigned to environmental inventory and assessment, individual must allocate at least 20% of working time to this area.
- In either case the individual must also have working contacts with one or more of the following non-Corps organizations or groups:
  Environmental Protection Agency
  National Oceanic and Atmospheric Administration
  U.S. Fish and Wildlife Service (Department of the Interior)
  State or regional conservation or water resources agency
  State or regional environmental protection or pollution control agency
  State or regional planning commissions
  Attorneys or legal profession
  Private conservation/environmentalist organizations

These criteria were designed to generate a survey sample whose members would all have an actual or potential need to know in relation to the DMRP. The individuals meeting the above criteria were identified by computer search of the self-administered questionnaire

Table 2

District Responses to Self-Administered Questionnaire Survey

District*	No. of Questionnaires Distributed	Questionnaires Returned No.	Questionnaires Returned %	Computer Processed
1	109	91	83.5	85
2	141	127	90.1	126
3	112	97	86.6	97
4	122	108	88.5	107
5	98	55	56.1	46
6	82	79	96.3	79
7	59	47	79.7	47
8	126	83	65.9	83
9	74	72	97.3	71
10	44	43	97.8	42
11	85	71	83.5	71
12	88	84	95.5	84
TOTALS:	1,140	957	83.9%	938

*Note: From this point on Districts will not be identified by name since specific identification is irrelevant to the purposes of this report.

responses elicited from the 6 selected Districts. The questionnaire employed for the interviews is shown in Appendix A (pages A-10 through A-22), It had originally been intended to complete 150 personal interviews. However, due to a variety of reasons such as transfer, illness, etc., 16 selected individuals were not available, so that 134 interviews* were performed with the following distribution by District:

District	Interviews Performed
2	27
4	27
5	17**
7	13
9	23
11	27
	134

Non-Corps DMRP Information User Survey

The survey of non-Corps DMRP information users was conducted through telephone discussions with individuals selected from the DMRP information exchange bulletin mailing list. The respondents to the telephone interviews fell into four main groups that were identified in the DMRP circulation list as follows:

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* More than three-fourths of the 134 interviewees had dredging assignments.

** Due to a keypunch error during the processing of the personal interview survey data, the tables presented in this report that show District distributions of the responses elicited during the survey indicate the number of respondents from District 5 as 16 rather than 17. Since this had no significant impact on the overall findings of the study, a computer rerun of the analysis was not considered to be justified.

Group	Number of Completed Interviews
Other agencies	68
Individuals	11
Conservation organizations	8
U.S. Environmental Protection Agency (EPA)	13
	100

The group classified as "Other Agencies" includes Federal, State and local agencies which, for the most part, have defined environmental interests. "Conservation Organizations" are environmentally oriented private citizen groups.

As indicated above, the telephone discussions with the respondents in this survey dealt mainly with their environmental interests and their assessments of the DMRP information exchange bulletin. Other topical areas addressed included their familiarity, if any, with DMRP work unit reports and their view as to which categories of dredging-induced environmental impact should receive high research priority. A listing of these topical areas is presented in Appendix A (pages A-23 and A-24).

The performance of this survey was made somewhat difficult by the unavailability of many of the potential interviewees. A summary field report is presented in Table 3.

TABLE 3

Non-Corps User Telephone Survey

	Total Sample		Mailing List Categories							
			Other Agency		Individual		Conservationist		EPA	
	#	%	#	%	#	%	#	%	#	%
Total Sample	204	= 100%	118	= 100	41	= 100	22	= 100	23	= 100
Telephone listed: Yes	171	83.9	104	88.1	28	68.3	18	81.8	21	91.3
No	33	16.1	14	11.8	13	31.7	4	18.2	2	8.7
Potentially Available	171		104		28		18		21	
Yes:	149	= 100 %	90	= 100%	26	= 100%	15	= 100%	18	= 100%
Completed	100	67.1	68	75.6	11	42.3	8	53.3	13	72.2
Not available during interview	11	7.4	7	7.7	1	3.8	2	13.3	1	5.6
Unable to contact after 4 attempts	31	20.8	10	11.1	13	50.0	4	26.7	4	22.2
Refusal	7	4.7	5	5.5	1	3.8	1	6.7	-	-
No:	22	= 100%	14	= 100%	2	= 100%	3	= 100%	3	= 100%
Not at that address:*	12	54.4	8	57.1	1	50.0		-	3	100%
Tel. # not in service	1	4.5		-	1	50.0		-		-
Library only	3	13.6	3	21.4		-		-		-
No surname	6	27.2	3	21.4		-	3	100		

* 3 no longer employed, 1 retired, 1 transferred, 1 deceased, 6 not at that telephone number.

PART III: SURVEY RESULTS

This part of the report discusses the results of the three surveys previously identified and is organized into three corresponding sections. The results of the Corps surveys (self-administered questionnaire and personal interviews) are not comingled because of differences in the sample populations and in the methodologies used. Differences in methodology are of considerable importance because of their bearing on the interpretation of the responses of the survey participants. For example, respondent awareness or lack of awareness of the existence of the DMRP appears as a fairly ubiquitous consideration in the analysis of the findings. Awareness in the context of the self-administered questionnaire survey is based on certain criteria (identified later) that did not involve any recall assist mechanism; however, in the personal interview survey the respondents were asked directly if they knew of the DMRP (recall assist). It is clear that the significance of "awareness" is different in the two cases. This point is discussed more fully later on.

The questionnaires employed for both Corps District surveys are reproduced in Appendix A which also includes a listing of topical areas addressed during the telephone interviews with non-Corps recipients of the DMRP bulletin. Appendix A will be found at the end of this volume.

In order to facilitate cross-referencing of the discussion in Part III with the survey response data, the latter are presented, in tabular form, in the second volume of this report. These data are distributed among three appendixes (B, C, and D) as follows:

Appendix B contains

1) Self-administered questionnaire survey data for the portion of the survey sample identified as assigned to dredging operations
2) Personal interview survey data which are displayed, in most instances, by totals and in some by District distribution.

3) Data resulting from the telephone interviews with non-Corps recipients of the DMRP bulletin.

Appendix C contains the self-administered questionnaire survey data for the complete sample.

Appendix D contains the data generated by the personal interview survey by District distribution, which are not included in Appendix B.

The tables are headed by identifications of the survey questions or the topical areas to which they relate.

A. Self-Administered Questionnaire Survey of Corps Personnel at Twelve Districts

Introduction

The results discussed in this section do not include all details of the information generated in the self-administered questionnaire survey. They focus, rather, on those findings considered of major pertinence to the study. These findings apply, for most part, to those respondents who had identified themselves as assigned to dredging operations. This segment of the sampled District populations was considered to be the prime audience for DMRP-generated information.

Key objectives of the self-administered questionnaire survey were:

- To identify and characterize the DMRP target audience in the 12 selected Districts.
- To estimate the effectiveness of current DMRP information dissemination efforts by assessing audience awareness of the Program.
- To determine the job-related informational needs of the District personnel and their patterns of information use.

- To determine the respondents' perceptions of the District work climates.
- To determine the extent of the respondents' working contacts with other agencies and organizations and their general assessment of these.
- To develop an appropriate personnel sample for the subsequent direct interview survey.

The self-administered questionnaire used in this survey is reproduced on pages A-2 through A-9 of Appendix A at the end of this volume. The survey data which relate to the dredging-assigned respondents are shown, in tabular form, on pages B-2 through B-74 of Appendix B (Volume II). It will be noted that the sequence of data presentation corresponds with that of the data discussions in this section, but not completely with the sequence of the questions which elicited the data. The latter was based largely on considerations pertaining to the interview situation, while the sequence of the discussions is organized by topical area. As stated earlier, tabular summaries of the total survey sample responses (i.e., those from both dredging-assigned and not dredging-assigned respondents) are presented in Appendix C (Volume II). The sequence of these tables is consistent with the original sequence of the questions.

Respondent Characterization

Awareness/Unawareness of DMRP

In the context of the self-administered questionnaire survey, the respondent was considered to be aware of the DMRP if he (a) identified WES in relation to dredging and/or related investigation studies in answering Question 9(a)*; if he identified the DMRP information exchange

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* This reference and all other references to questions cited in Part III (A) relate to the self-administered questionnaire (Appendix A).

bulletin in answering Question 11(a); or both. Table B-1 presents the response distribution by District for the total survey sample of 938 individuals. All of the percentages shown relate to the District sample number. For example, in the case of District 12, 21 of 84 respondents (25%) identified WES in connection with dredging research. Seven respondents identified the DMRP bulletin in answering Question 9(a) (8.3%). Twenty-three respondents were considered to be DMRP aware. (The total is not 28, however, because of overlap. Five of the 21 who cited WES in relation to dredging studies also listed the Bulletin.) The final column shows the distribution of Bulletins to the Districts by percentages of District respondents. For District 12, therefore, the absolute distribution is 84 x 0.143 = 12 copies. Table B-1 suggests that, in the case of most Districts, awareness of dredging-related studies at WES occurs with greater frequency than awareness of the Bulletin, at least at the conscious level. Note that the Bulletin was not spontaneously mentioned by any respondents in District 5 or in District 9. Also, the frequency of Bulletin mention by District does not appear to correlate with its availability.

Distribution of Job Assignments

Table B-2 shows the distribution by District of respondents who identified themselves as assigned to dredging maintenance, new work, or both (Q.1(a)). This distribution is shown by percentages of the total District samples. The fourth column lists the percentages of dredging-assigned personnel who are also aware of the DMRP. For example, of the 97 respondents at District 3, 20.6%, or 20, had dredging assignments. Of these 20, 15%, or 3, were also DMRP aware. The inter-District range of relative awareness of the program, among dredging-assigned personnel, is considerable. The ratio of the range extremes (53.8% for District 10 and 15% for District 3) is nearly 3.6.

An analysis was also made of awareness distribution by strata (see Part II for definition) for the entire survey sample. The results showed that, while 21.2% of all Strata A respondents were aware of the

DMRP, only 6.7% of Strata B were so aware. (It will be recalled that the Strata A group was considered a priori the more likely of the two to be involved in dredging operations.)

The responses to all four parts of Question 1 (by dredging-assigned personnel) are summarized in Table B-3. Note that, although the total number of respondents was 336, the totals shown for various assignments are usually somewhat less than this amount. This is because in these instances the respondents failed to check either the "yes" or "no" block corresponding to the assignment categories, leaving their answers indeterminate. The number of such indeterminate answers was subtracted from 336. The table is to be interpreted on the basis of the following example. With respect to basin planning as an assignment, of all 334 respondents who answered substantively, 25.1% had basin planning assignments (in addition to dredging assignments). Of those respondents (334) with dredging assignments who were also aware of the DMRP, 12.6% had basin planning assignments as well. 30.1% of the DMRP unaware group were also assigned to basin planning.

In reviewing the data shown for dredging assignments (both maintenance and new work), it will be noted that the aware group shows a greater trend toward involvement in these activities, in terms of percent of allocated time, than does the unaware group. Also, note that while the relative incidence of awareness exceeds that of unawareness in the cases of those assigned to dredging operations for six months or more, the reverse is true of those whose assignments had been less than six months. The data also suggest that interest in dredging is somewhat more prevalent in the aware, than in the unaware group. (Note that the total percentage assignment to both maintenance dredging and new work is 156.8%. The excess over 100% reflects the fact that many personnel had both maintenance and new work project assignments.)

Table B-4, in summarizing project assignment distributions for the entire survey sample of 938, provides a perspective on the distributions shown in Table B-3. Table B-4 shows the total numbers of personnel by project area assignment, the percentages who were DMRP aware,

and the percentages who also had dredging assignments. It is probably not surprising that awareness of the DMRP was highest (other than among the dredging-involved personnel) in the environmental inventory group (27.2%), even though less than 50% of the members of this group also had dredging assignments. Awareness was also high among those involved in waterway clearing (21.5%). Nearly 75% of these, however, also had dredging assignments.

Organizational Distribution

The next two tables (B-5 and B-6) relate to Question 2, in which the respondents were asked their organizational affiliations within the Districts. Table B-5 summarizes the respondent distribution by division. Of 335 dredging-assigned individuals responding to this question, 187 were distributed among the District Engineering Divisions and 60 among Operations Divisions. Of those in the Engineering Divisions, 22% were aware of the DMRP; of those in Operations Divisions, 42% were aware.

Table B-6 shows the distribution of respondents by branch. Because of slight organizational differences among Districts, certain branch designations may be used by some and not by others. The same may also apply to some extent to divisional designations. For example, in certain Districts planning may be considered as an independent function to the degree that these Districts include a Planning Division in their organizational structure, as identified in Table B-5. Usually, however, planning is incorporated within the Engineering Division. For this reason, planning also appears in Table B-6 as a branch. In general, however, District organizations at the branch level are sufficiently alike so that small deviations do not materially affect the validity of the data shown in Table B-6. Analysis of the Table B-6 data shows that DMRP awareness is relatively high among those respondents associated with Environmental Resources Branches (63%), Naval, Shoreline, and Estuarine Planning Branches (57%), Navigation Branches (44%), and Area Offices

(26%). Among those assigned to Design Branches, the distribution of awareness is about 17.5%. The corresponding distribution for Foundations and Materials Branches is 15%.

Respondent Distribution by Job Title and by Area of Expertise

Table B-7 summarizes the distribution of the respondents by their formal job titles as provided in response to Question 3. These titles correspond, in large part, to standard Civil Service designations. It is evident that the incidence of DMRP awareness is relatively high among most Civil Engineer categories as well as among those whose titles suggest environmentally related job assignments. (For example, 4 of 7 individuals with the title Fishery/Biologist were DMRP aware (57%)). Analyzing the same data from another viewpoint, although only 2.1% of the respondents identified themselves with this job title, 4.3% of all the aware respondents fell into this group.

In Question 4 the respondents were asked to identify their areas of expertise or specialization. Although it was expected that most of the responses to this question would relate, at least broadly, to the individuals' formal job titles, it was believed that identifications of key disciplinary areas would possibly contribute further to respondent characterization. The responses are summarized in Table B-8. Note that some of the respondents (1.5%) identified dredging as their specific area of expertise. (This function is not explicitly identified within the category of formal job titles shown in Table B-7.) The pattern of distribution of awareness in relation to the expertise areas is roughly similar to the awareness distribution by equivalent job title.

Respondent Distribution by Length of Service in the Corps

The lengths of service in the Corps of the respondents was addressed in Question 19. The responses are presented in Table B-9.

Analysis of the data shows that 45% of all respondents who were aware of the DMRP had been members of the Corps for no more than 10 years. On the other hand, the incidence of unawareness among those whose length of service did not exceed 10 years was only 31.4%. This pattern is reversed, however, for those respondents who had been associated with the Corps for 21 or more years. Of the aware group, 22.6% fell into this class, while of the unaware respondents the corresponding percentage was 31.

Educational Profile of the Respondents

Question 20 was designed to establish the educational profile of the respondents and the dates of highest degrees attained. Table B-10 presents a summary of the educational status of the respondents. Of the total number responding to Question 20, 79.8% held Bachelor's or higher degrees. However, of the aware group, 90.4% were degreed, while only 75.4% of the unaware group held degrees. Table B-11 shows the distribution by year of the respondents' attainment of their highest degrees. Those who received their highest degrees within the last 20 years include 81.8% of the aware group, while the equivalent percentage for the unaware respondents is 62.1%. This pattern is reversed for the period 1931-1956. While only 18% of the aware respondents attained their highest degrees during this period, the equivalent percentage for the unaware was 38.

Respondent Distribution by Age Group and Civil Service Rating

A summary of age distribution was developed from the responses to Question 21. This summary, presented in Table B-12, shows that the respondent group born subsequent to 1934 includes 54.4% of the DMRP aware individuals and 40% of the unaware.

In the second part of Question 3 the respondents were asked to identify their Civil Service ratings. A summary of response distri-

bution by GS rating (from GS-9 through GS-15) is presented in Table B-13. There appears to be a real association between rating and awareness in the sense that awareness is more prevalent among individuals with higher ratings. For example, the GS-9 group includes 13.7% of all the respondents with dredging-related assignments. This group, however, contains only 6.6% of those respondents who are aware of the DMRP. Of the aware respondents, 64.9% fell within the GS-12 through GS-15 range.

Job-Related Activities

Tables B-14 and B-15 characterize the respondents in terms of their job-related activities. In the first part of Question 6 (Q.6(a)), the survey participants were presented with a list of activities and asked to identify all of those which they usually performed in connection with their jobs. The responses are summarized in Table B-14. The activity coordinating was identified by the highest percentage (91.6%) of the DMRP-aware respondents, followed by reviewing (87.4%). The next few, in descending order of equivalent percentages, were: planning (81.1%), recommending (80.0%), analyzing (77.9%), and supervising (70.5%). Reviewing was most frequently identified by the unaware group (84.2%), followed by coordinating (82.2%), engineering (74.3%), planning (67.6%), and analyzing (also 67.6%). Prosecuting, auditing, and servicing were mentioned least frequently by both the aware and unaware respondents.

The respondents were then asked (in Question 6(b)) which three of the activities they had previously identified they considered to be primary to their jobs. The responses to this question are shown in Table B-15. This table should be interpreted in terms of the following example. With respect to authorizing, 3% of the

126 individuals who had listed it as an activity they usually perform, also identified it as a primary job activity. Of the 126 respondents who initially listed authorizing, 39 were aware of the DMRP. Of these 39, 2.6% (1) considered authorizing to be a primary job activity. Of the unaware respondents, 87 initially identified authorizing as a job-related activity; 3.5% of these respondents (3) also considered it to be primary. Those activities identified as primary by the largest percentages of the aware respondents were: administering (75.8%), supervising (49.3%), dredging (47.9%), report writing (32.8%), permit issuing and licensing (33.3%), and engineering (31.3%). Activities considered primary by the largest percentages of the unaware respondents were: supervising (41.2%), engineering (40.2%), coordinating (34.3%), administering (31.8%), and planning (28.2%). In the cases of some activities, percentage differences between their designations as primary by the aware and unaware respondents do not appear to be significant; for example, planning, construction, reviewing, analyzing, and conceptualizing. In some instances, however, these differences are substantial, as in the cases of administering, auditing, observing, and consulting.

Examination of Table B-15 shows that the 8 activities cited by most dredging-assigned personnel (in terms of absolute numbers rather than percentages) as (a) job-related and (b) primary to their jobs are:

Job Related Activities	
Activity	No. Respondents Identifying
Reviewing	286
Coordinating	285
Engineering	246
Recommending	240
Planning	240
Analyzing	237
Supervising	227
Investigating	218

Activities Primary to Job	
Activity	No. Respondents Identifying
Supervising	99
Engineering	93
Coordinating	92
Report Writing	68
Planning	66
Administering	60
Dredging	51
Reviewing	43

Job-Related Mobility

In Question 5, the survey participants were asked to estimate the percentages of their working time normally spent away from their usual job locations. The job-related mobility profile of the respondents is presented in Table B-16. Only 13.4% of all respondents spend more than 40% of their working time at other than their usual job locations. The data do not suggest any association between work-related mobility and awareness of the DMRP.

Respondents' Information Needs and Patterns of Information Use

The survey results presented in this section of the report reflect responses to those portions of the self-administered questionnaire that were primarily directed to the determination of the respondents' work-related information needs, their assessments of the usefulness of various information sources, and their patterns of use of informational materials.

Respondents Evaluations of Job-Related Activities in Terms of Their Informational Demands

In Question 7(a), the survey participants were asked to consider the activities which they had previously cited as job-related (Table B-14) in terms of the demands which these activities placed upon them to acquire and use new information. The respondents were to identify those activities that, in their view, imposed the greatest and second greatest informational demands. The distributions of response by activity are presented in Table B-17 (greatest demand) and in Table B-18 (second greatest demand). These tables are to be interpreted according to the following example. Table B-17 shows that 46 respondents identified permit issuing and licensing as a job-related activity (as is also shown in Table B-15). Of these 46, 23.9% (11 individuals) also considered that this activity imposed the greatest informational demand on them. Of these 11, in turn, 7 were DMRP aware and 4 unaware. The 6 activities considered by the respondents to require the greatest and second greatest use of new information are listed below (in terms of the numbers of individuals making the assessments).

Greatest Informational Demand		Second Greatest Informational Demand	
Activity	No. Respondents	Activity	No. Respondents
Engineering	52	Engineering	24
Planning	38	Planning	23
Administering	25	Analyzing	20
Estimating	19	Coordinating	19
Supervising	16	Report Writing	18
Coordinating	16	Supervising	18

If these assessments are now analyzed in terms of differences between the DMRP aware and unaware respondents as percentages, both similarities and differences between these groups can be identified. For example, the data in Table B-17 show that the assessments of

engineering (as an information-demanding activity) are not significantly different for the aware vs unaware. This is also true of planning and administering. However, estimating, supervising, and coordinating were considered to impose the greatest information demands by a markedly higher percentage of unaware than by aware survey participants. The reverse is true for permit issuing and licensing and for conceptualizing.

Respondents' Evaluation of Information Source Categories

The respondents were then asked (Q.7(b)) to rate several listed categories of sources from which they might acquire information needed in connection with the activities they had previously identified as information demanding, on the basis of their perceived usefulness. The ratings were performed using a 6-point scale in which 6 meant always useful and 1 signified seldom useful. The evaluations of information sources are presented in Table B-19 (in relation to activities imposing the greatest informational demands) and in Table B-20 (in relation to activities imposing the second greatest informational demands).

In reviewing Tables B-19 and B-20, it is helpful to consider that the relationship between the information receiver and the information sender, or source, may be impersonal or interpersonal. (This topic is discussed later in connection with the personal interview survey.) Impersonal information transfer modes, which are characteristically one way, include books, journals, lectures, etc. Interpersonal receiver/sender relationships such as workshops, discussions, conferences, and the like provide the receiver with the opportunity for participating actively in the transfer process by asking for additional information, clarification, and so forth.

The data presented in Tables B-19 and B-20 indicate that substantial percentages of the respondents consider a number of interpersonal forms of information transfer to be frequently useful. For example, 50% of the survey participants rated associate workers as 5 or 6 on the usefulness frequency scale (Table (B-19). The equivalent figure

for journals is only 30.1% and for technical magazines, 22.6%. (The latter two are obviously impersonal sources.) The data should not be interpreted, however, as meaning that preference for interpersonal transfer modes consistently dominates that for impersonal sources. What it does emphasize, however, is the relatively high importance of interpersonal communication as an information transfer medium. This point is apparent in the following listing of the most frequently highly rated information sources by category.

Percentages of All Respondents* Assigning 5 and 6 Ratings

Interpersonal Sources		Impersonal Sources	
Source	% of Respondents	Source	% of Respondents
Site Visits	67.4	Directives & Guidelines	50.3
Assoc. Workers	50.0	Manuals	44.4
Supervisors	48.6	Books	43.2
Conferences, etc.	44.3	Reports	43.0

In examining the differences between information source ratings by the DMRP aware and nonaware respondents with respect to impersonal sources, the DMRP-aware survey participants tended to favor books, journals, and technical magazines. The unaware respondents showed a slight preference for situation-specific materials (e.g., directives and manuals). This is shown in the following listing of impersonal source ratings:

* These listings were developed from data in Table B-19.

Percentages of DMRP Aware and Nonaware Respondents*
Assigning 5 and 6 Ratings to Impersonal Sources

Source	Aware	Unaware
Books	46.5%	41.9%
Journals	34.9	27.9
Technical Magazines	24.1	22.0
Directives & Guidelines	45.5	52.3
Manuals	35.6	48.1

In some instances (e.g., technical magazines), the trend is not pronounced and could be attributed to chance. It is, however, uniformly consistent.

Survey Respondent Reading Patterns

Question 8 addressed the reading patterns of the respondents with respect to various categories of published material. The responses are presented in Table B-21. It will be noted that Corps directives and guidelines are read in entirety by over half of the survey participants, while books, scientific journals, and trade and technical magazines are most frequently scanned for general information or for items of particular interest. The data in Table B-21 show few significant differences between the DMRP unaware and aware respondents. In general, a higher percentage of the unaware reads printed materials in their entirety. On the other hand, the unaware utilize such materials less frequently than the aware, with the exception of books. This difference between the two respondent classes is particularly marked with respect to technical reports, newsletters and scientific journals. For example, the percentage of the DMRP unaware which seldom utilizes technical reports is 6.4; in the case of the aware it is zero.

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* These listings were developed from data in Table B-19

In Question 10 the survey participants were asked about their reading patterns in terms of time. Initially, they were to estimate the total time per month devoted to reading of all types of materials, both technical and nontechnical (Q.10(a)). The responses are summarized in Table B-22. The data show that the percentage of DMRP-aware respondents devoting an aggregate time of more than 45 hours per month to reading (56.8%) is greater than the equivalent percentage of the unaware respondents (44%). This difference could be attributable to chance. In the next part of Question 10 (Q.10(b)), the respondents were asked to estimate the percentage of their total reading time (whether at home or at work) that was directed to work-related informational materials. Analysis of the response data presented in Table B-23 shows that while 60% of the aware respondents devote at least 31% of their reading time to work-related material, the equivalent percentage for the unaware group is only 38.2%. This difference in reading pattern, which can be regarded with 95% confidence as real rather than attributable to chance, is considered to be one of the most significant findings of this survey in the context of information transfer effectiveness. In responding to the last part of Question 10 (Q.10(c)), the survey participants estimated the percentage of job-related reading done during working hours. From the data summarized in Table B-24, it was calculated that 49.7% of the aware group does at least 31% of its job-related reading at work, as opposed to 36.4% of the unaware.

Question 11 addressed respondent patterns of job-related reading in terms of the specific publications they found useful, their modes of publication receipt, and their assessment of relevance of publication content to their job-related informational needs. They were initially asked (Q.11(a)) to identify the publications by title. Table B-25 summarizes the numbers of titles cited vs the readership by percentage. (For example, 5.7% of all respondents who cited periodicals listed 8 titles. 16% of the DMRP-aware group cited 10 or more.) Of all publications listed by the respondents, the readerships of the DMRP

information exchange bulletin and "World Dredging"* were examined in detail. Table B-26 presents the response data applicable to these periodicals, keyed to Question 11(b) (mode of receipt of publication either directly as primary, or indirectly as secondary recipient) and to Question 11(c) (evaluation of frequency of content relevance to job informational needs). As the data show, the DMRP bulletin was cited by 24 respondents and "World Dredging" by 45. The data also indicate a higher "pass along" ratio for "World Dredging" than for the bulletin. More DMRP-aware respondents considered that the content of "World Dredging" is more frequently relevant to their needs than was the case for the Bulletin (74.1% vs 46.7%). The equivalent comparison for the DMRP unaware evaluators of "World Dredging" was 50% vs 46.7%. The latter difference is not considered significant.

Respondent Awareness of Informationally Useful Research Studies

Question 9 addressed the respondents' awareness of studies being performed by organizations outside of their own Districts in technical areas about which they had informational needs. The first part of this question (Q.9(a)) related to other Corps elements. A summary of the responses is shown in Table B-27. Of a total of 336 dredging-involved survey participants, 211 identified one or more Corps organizational units. A striking finding was that, of these 211, 84.4% (178 individuals) identified WES. (This corresponds to 53% of the 336 personnel with dredging assignments.) In comparing the relative frequencies of WES citations among the DMRP aware and unaware respondents, it is not surprising that this organization was mentioned by nearly 97% of the aware group. It is interesting to note, however, that of the unaware group, nearly 75% also listed WES. The Coastal Engineering Research Center (CERC) was second to WES in terms of citation frequency,

* "World Dredging" is cited in particular because it is the most widely distributed and relevant journal in the field of dredging.

but by a considerable margin. It was listed by only 19% of the 211 survey participants who responded substantively to the question. (If the numbers in the percentage columns are totalized, they will be found to exceed 100%. This is because of multiple citations.) As part of Question 9(a), the respondents were also asked to identify the investigative area(s) of interest to them being studied by the Corps elemets they had cited. These responses are shown by category in Table B-28. Note that of all those who responded to the question (173), over 50% mentioned the DMRP and that of the aware group, 95.6% listed the DMRP. (The balance of this group - 4.4% - had been identified as DMRP aware because of citations of the Information Bulletin in answering Question 11(a).) Also, Table B-28 shows that, on a percentage basis, more of the unaware than of the aware are familiar with research being performed by various organizations (primarily within the Corps of Engineers) in certain specific non-DMRP areas about which they have informational needs, including hydraulics, explosive excavation, instrumentation and computers.

The second part of Question 9 (Q.9(b)) was similar to Question 9(a), except that it addressed the respondents' knowledge of studies relevant to their informational needs being conducted by non-Corps organizations. The study areas listed in the responses are summarized by category in Table B-29. As the data show, investigations relating to dredged materials were mentioned by 31% of the aware respondents who had answered this question (36), but by only 7.5% of the unaware (148). On the other hand, the percentage distribution of citations of other environmentally oriented research areas was similar for the two groups (aware: 37%); unaware: 34.5%). From other data (not appearing in Table B-29), it was found that 2 or more research studies were cited by 63.2% of the total aware group (95), but by only 39% of all unaware respondents (24).

Respondents' Use of Training/Educational Opportunities Offered by the Corps

In Question 17, the survey participants were asked whether, in the last 5 years, they had availed themselves of educational or training courses offered either by their Districts or by other Corps elements. The respondents were also asked to identify the broad characters of any courses they had taken (e.g., Technical/Professional, Administrative-Management; other). The responses to Question 17 are presented in Table B-30. The first part of this table summarizes respondent participation in courses in the Technical/Professional category. It is interesting to compare the percentages of aware vs unaware respondents who took 2 or more District courses in this category with the equivalent percentages of those who attended at least 2 courses offered by other Corps elements. With respect to District courses, the analysis of data shows that the percentages are very similar - aware: 27.5%, unaware: 26.5%. For courses provided by non-District Corps elements, however, a significant difference appears. Of the aware respondents, 43.2% participated in such courses, while the equivalent percentage for the unaware group was only 28.3%. The second part of Table B-30 shows the distribution of respondent participation in courses falling into the Administrative/Management category. As was true of the Professional/Technical category, there was no significant difference between the percentage of participation by DMRP-aware and by unaware respondents in 2 or more courses conducted under District auspices (aware: 24.3%; unaware: 21.9%). There is, however, more of a difference in relation to participation in courses offered by non-Corps elements (aware: 19%; unaware: 10%). These differences with respect to non-District course attendance could reflect differences in motivational strengths. The last part of Table B-30 presents an analysis of attendance at miscellaneous courses (i.e., courses that were not considered by the survey participants to belong in either of the two above categories). It will be noted that these courses were attended mainly by members of the unaware group. However, the absolute numbers of the attendees are quite small, so that the data are not regarded as statistically significant.

In reviewing the course participation data, it was considered that the relative propensities of the respondents for availing themselves of educational opportunities offered by the Corps might reflect differences of District climate. Such differences, if appreciable, could be significant in the more general context of District receptivity to information and new ideas. Accordingly, an analysis of course participation on the part of all survey respondents (i.e., not only those with dredging assignments) was prepared by District and is presented in Table B-31. This table is designed to identify those Districts (by code number) which represent the extremes of the course nonattendance ranges. Interpretation of the data shown in the table is as follows. The top 2 rows of figures relate to Technical/Professional courses conducted or sponsored by the Districts. The number of respondents from District 2 who answered Question 11 was 126. Of these 126, 51.6% had taken no courses within the last 5 years. Of the 12 Districts surveyed, none had a lower equivalent percentage than District 2 (for this category). The highest percentage of courses not taken (64.8%) was associated with District 9. This means, therefore, that for the course category in question, District 2 had the highest percentage of participation (100% - 51.6% = 48.4%) while District 9 had the lowest (100% - 64.8% = 35.2%). The percentages shown under each number of courses are the percentages of respondents who participated in the corresponding number of courses during the last 5 years. (For example, the top row shows that 7.1% of the survey participants from District 2 attended 3 courses.)

To the extent that the level of participation in Corps education programs by the personnel of a given District can be construed as an indicator or measure of that District's receptivity to information and technology transfer, the low percentage ratings (for the different course categories) shown in the third column of figures in Table B-31 should be associated with relatively high District receptivity, and conversely. Note, for example, that District 3 appears at the low end of the range in 4 instances (meaning that, in these instances, District 3 was that District out of the 12 surveyed in which the lowest percentages

of its personnel did not take courses). This implies that, at least in terms of the kind of measure being addressed here, District 3 may be potentially more receptive to information transfer than District 5, for example. Note, however, that this implication is based on only one receptivity indicator. Other indicators are examined later in the report.

Respondent Attitudes and Perceptions

This portion of the survey focused on the job and work-related attitudes and perceptions of the participants. The area was addressed in the study because the effectiveness of receiver assimilation and utilization of disseminated information may be as much influenced by the receptivity climate of the work environment as by the content and form of the transmitted information. In the context of this discussion, attitudes are understood to be various components or aspects of one's general orientation that are, to a considerable extent, situation independent. By perceptions are meant the ways in which particular situations are viewed or assessed. Perceptions may be influenced by attitudes. When the effect of such influence is low, the perceiver is said to be objective. Although this study was necessarily concerned with both the work-related attitudes of the respondents and the ways in which these respondents perceive the District work environments, it did not attempt to determine whether the respondents' perceptions were biased by their attitudes. The data suggest, however, that bias of this kind did not play a substantial role in affecting the responses of the participants. In general, there appears to be more uniformity of attitude among the survey participants than among their perceptions of the different District work climates.

In Question 12, the respondents were presented with a list of 36 statements about jobs and work. Some of these statements reflect attitudes, while others express perceptions. For example, the first statement in the list, "When the workday is finished a person should forget his job and enjoy himself," and the third statement, "A good

indication of a man's worth is how well he does his job," are primarily attitudinal in character. That is, an individual's position with respect to these statements will be substantially independent of his present work environment because they relate to general orientations rather than to a particular job situation. On the other hand, the seventh statement, "Some of my work assignments appear trivial," expresses a perception of a specific job environment that might not be considered appropriate to a different set of conditions.

The respondents were asked to review the 36 statements and then to express their levels of agreement or disagreement with each, using a 6-point scale. (1 represented complete disagreement and 6 meant complete agreement.) The responses are displayed in Table B-32 and are shown in terms of percentages, for each level of opinion, of the numbers of respondents to each statement, both by totals and by DMRP aware and unaware segments of the survey participants.

Work Related Attitudes

On examining the data, it is clear that most expressions of attitude are consistent with the traditional work ethic of this country. (See responses to statements 1, 3, 9, and 12.) Reference to Appendix Table C-17, which presents the responses to Question 12 for the entire survey sample of over 900 individuals, shows that these orientations are pervasive and independent of work assignments. This finding suggests that there exists, within the Districts, a relatively high level of inner personal motivation that is work directed and that offers the potential, at least, for the effective realization of COE objectives.

Respondent Perceptions of District Climates

The manner and degree to which the respondents' perceptions of the District climates may be in harmony or in conflict

with their inherent work attitudes can be inferred from their responses to various statements in the list shown in Table B-32. For example, most respondents consider that their job objectives and responsibilities are clear and well defined (Statements 2 and 11) and that they are members of effectively functioning teams (Statement 23). On the other hand, the majority (of the total survey sample, as well as of those engaged in dredging operations) believes that it sometimes receives assignments without the support required to do the job (Statement 8), that the Corps review and promotion system does not help the best man to rise to the top (Statement 16), that there is excessive red tape associated with District operations (Statement 17), that the locus of decision-making authority within the Districts is sometimes uncertain (Statement 24), and, of particular importance in the context of this study, that red tape and other institutional impediments make it difficult for new and original ideas to receive consideration within the Districts (Statement 29). Opinion was more equally divided on the question of whether top management is concerned more with formal organization and authority or with getting the right people together to do the job (Statement 36), but tended to the former view.

Another finding that emerges from the data shown in Table B-32 is that there is no significant difference between the distributions of work attitudes and perceptions of the District climates exhibited by the aware and unaware segments of the respondents. (This is not in itself surprising because the information dissemination efforts of the DMRP are obviously unrelated to, and in no way address, either recipient attitudes or their perceptions of their work environments. Furthermore, while many of the statements listed in Table B-32 were designed to elicit responses bearing on the District receptivity climates, these statements are not of a kind that would assess the propensity of the respondents for actively searching for new information that might have made them aware of the DMRP.)

After examination of the data made it clear that the respondents' attitudes and perceptions are characteristic of the survey

sample as a whole and independent of either awareness of the DMRP or nature of their job assignments, the distributions of the responses by District were then examined. The objective was to determine whether there were meaningful differences (i.e., differences for which there was a high probability that they could be attributed to other than chance) among these distributions which would suggest nonuniformity of the District receptivity climates. (See Table B-31 and related discussion.) Initially a Chi-square analysis was performed on each of the response data sets corresponding to a statement for all 12 Districts and for all survey participants. The criterion for designating differences of response distribution among Districts as meaningful was whether or not these differences, for a given statement, could, with a confidence level of at least 94%, be attributed to other than chance (i.e., whether the differences in response distribution by District could be interpreted as reflecting corresponding real differences among the District climates rather than chance variations in the data). This does not imply that those differences of District response distribution for which a confidence level of less than 94% (of being due to other than chance) applied, might not also have been real. However, the 94% criterion was adopted to ensure a high probability that the inter-District differences presented in this discussion are, in fact, meaningful.

On the basis of the Chi-square test, differences in the patterns of District response to 19 of the 36 statements could be interpreted as meaningful. The detailed data reflecting the respondents' ratings of these 19 statements (from completely agree to completely disagree) were analyzed by District distribution. In this analysis, the percentages of respondents assigning ratings of completely and moderately were added, for that polarity of opinion (agreement/disagreement) that was more conducive to or compatible with receptivity to information and technology transfer. For example, in the case of Statement 21 (Table B-32), "There is a continual effort to improve our personal and group performance." it is obvious that agreement, rather

than disagreement, is suggestive of a District climate favoring receptivity. For each of the 19 statements, the District responses based on the sums of the completely and moderately ratings, were determined. The upper and lower extremes of the ranges were then identified. The results of this analysis are presented in Table B-33. For each statement, the table shows the number of the Districts at the high (upper number) and low (lower number) ends of the range of District response for that statement. Those Districts whose climates are considered to favor receptivity correspond in all cases with the upper numbers. As the table shows, District 6 ranks at the lower extremes of the ranges for 6 statements and Districts 8 and 11 for 5 each. That means that for 84% of the 19 statements, 3 Districts occupy all of the low end positions. With respect to the upper extremes of the ranges, Districts 10 and 12 appear in this position for 5 statements each and District 3 for 4 statements. Thus, 3 Districts occupy the upper end positions for 74% of the 19 statements. Reference to Table B-31 shows that District 3 also stands high in the District receptivity climate range with respect to the participation of its personnel in educational opportunities offered by the Corps.

In reviewing the data presented in Table B-33, it is important to bear in mind that they reflect only the relative positions of the Districts representing opinion extremes. A District which occupies the upper end of the range (the position most favorable to receptivity) of responses to a particular statement may or may not be conducive to receptivity (in the context of that statement) in an absolute sense. It may merely be the least unconducive of the Districts. For example, 71.4% of the respondents in District 10 agreed moderately or completely that their job objectives are clear and well formulated (Statement 2). (For this statement, agreement is considered to be compatible with receptivity.) In no District did the percentage of respondents agreeing with the statement exceed 71.4%, so that District 10 is the upper extreme for this range. Of equal, if not greater importance, is the fact that this opinion was held by a substantial majority of the

District personnel (nearly 3/4). This high percentage of agreement suggests that District 10 is receptive (in the context of Statement 2) in an absolute sense. If the responses to Statement 17, "Red tape is held to a minimum," are now examined, it will be seen that District 10 is again at the upper extreme of the range. However, only 16.7% of the respondents in this District agreed with the statement. (For this statement, agreement is considered to be compatible with receptivity.) This means that agreement is far from a majority view. If a sum of completely and moderately (agreeing/disagreeing) responses of at least 40% is arbitrarily set as a criterion of receptivity to information and technology transfer, the data presented in Table B-32 show that, even for those Districts at the upper extremes of the ranges, the majority of the personnel sampled held unfavorable opinions with respect to the following:

- Red tape is held to a minimum (17)
- The division is characterized by a relaxed, easy-going working climate (18)
- Excessive rules, etc., make it difficult for new ideas to receive consideration (29)
- Our productivity sometimes suffers from lack of proper planning (30)
- The philosophy of top management emphasizes the human factor, etc. (31)
- Our top management is less concerned with formal organization, etc. than with getting the right people together to do the job (36)

Thus, even for the most receptive Districts, preponderantly unfavorable perceptions were indicated by the respondents for 31.5% of the 19 statements. For the least receptive Districts, using the same criterion, such perceptions were expressed for 84.2% of the 19 statements. In addition, the preponderance of unfavorable opinion is substantially higher in the less receptive than in the more receptive Districts. For example, in District 4 (most receptive) 27.5% of the respondents moderately or

completely disagreed with the statement that "Our productivity sometimes suffers from lack of proper planning" (30). In District 8 (least receptive), the equivalent percentage was only 2.6.

Respondents' Perceptions of their Job Situations

In Question 13, the respondents were presented with a list of conditions relating to their job situations, such as opportunities for growth, the feeling of being adequately informed by their coworkers and supervisors, and so forth. These conditions were, for the most part, of a kind that, if prevalent, would contribute to the structuring of a work climate favoring the reception, testing and application of new ideas and concepts. The survey participants were asked to indicate, using a 6-point scale, the extent to which they considered that each condition (a) actually existed in their present jobs and (b) should exist. On the rating scale used, a 6 meant always exists or should always exist and a 1 signified seldom exists or should seldom exist. The responses from the survey participants with dredging assignments are presented in Table B-34. It will be noted that there are few significant differences between the response trends of the DMRP aware and unaware and, for this reason, the discussion of these data is based on the distributions for the total of the two groups. The data in the Table show considerable variations in the respondents' views of the prevalence of the different job situations listed. For example, although 41.6% of all dredging-assigned survey participants considered that they always received fair and impartial treatment from their supervisors (3), only 16.5% of the same group believed that the opportunities for growth and development (1) were always present. As might be expected, the percentage of respondents who believed that a given condition should always exist, exceeded, in all instances, the percentage of those who judged that the same condition does, in fact, always exist.

In order to present the findings from this portion of the survey in more readily interpretable forms, the data in Table B-34

were initially analyzed with respect to the participants' assessments of the prevalence of the various work-related conditions. This analysis was performed by adding, for each condition, the percentage totals of those who stated that the condition in question always exists and the percentages of those who believed that it usually exists*. As an example, for Condition #1 (opportunities for personal growth and development), 16.5% of the respondents believed that this condition always exists and 24.8% believed that it usually exists (Table B-34). The sum of these is 41.3%. These summed percentages were determined for all job conditions listed in Table B-34 and the conditions were then rank-ordered on the basis of decreasing percentages of respondents assessing them as prevalent. The result of this analysis is presented in Table B-35. It is apparent that about three-quarters or more of the dredging-assigned survey participants considered that they always or usually received fair and impartial treatment from both their supervisors and coworkers. About one-half believed that they always or usually had opportunities to participate in varied activities or in the selection of methods. Fewer than 30% regarded promotion opportunities or freedom to experiment as prevalent conditions.

As pointed out earlier, the percentages of respondents who considered that the different work situations should always exist were larger, in all cases, than those who believed that they did always exist. However, the excess of should always exist (in terms of percentage incidence of this view) over always exists varies over a considerable range. When this excess is small, for a given condition, it means that dissatisfaction with the perceived prevalence of that condition is relatively minor. When this excess is large, the dissatisfaction with

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* This procedure, or one similar to it, was also employed in other analyses performed during this study. Experience has shown that, when analyzing survey data based on a 6-point scale, the trend indications arrived at in this manner are more reliable than those based on responses which reflect the extreme points of the scale only.

the existing prevalence of that condition is relatively great.

Accordingly, the second step in the analysis of the data in Table B-34 was to determine the rank order of the respondents' relative dissatisfactions with their assessed prevalences of the different job conditions as perceived by them. For each work condition, the sum of the percentage incidences of the total respondents rating is as should always exist and should usually exist (Table B-34) was determined. The prevalence rating, as shown in Table B-35, for the same condition, was then substrated from this sum. For example, in the case of Condition #4 (opportunities to participate in varied activities), the total percentage response for should always exist is 39.5% and for should usually exist is 32.6%. The sum of these is 72.1%. On subtracting the prevalence rating for this condition of 52% (from Table B-35) from this sum, the excess is found to be 20.1%. The results based on the application of this analysis to all listed job conditions were then rank-ordered from the lowest to highest percentage excess and are presented in Table B-36. In reviewing Table B-36, it should be noted that not all of the respondents who assigned an actually exists rating to a particular condition, necessarily also assigned a should exist rating to the same condition. It is possible that, had these numbers of respondents been equal in all cases, the percentages excesses shown in the Table could have been somewhat higher.

The data shown in Table B-36 indicate that, as a general trend, the incidence of dissatisfaction was higher with respect to conditions relating to personal advancement and reward than to those pertaining to job performance as such. If these data are compared with those presented in Table B-35, it can also be seen that the perceived prevalence of a given condition is not necessarily associated with a corresponding level of opinion as to whether this prevalence should be greater than it is. For example, freedom to experiment was assigned a low prevalence rating. It ranked 14th (Table B-35), with only 25.3% of the respondents considering that this condition is prevalent. On the other hand, as Table B-36 shows, the should exist excess for this condition was only 12.6%. This

means that while most respondents believe that freedom to experiment is infrequent in the Districts, relatively few of them believe that it should be more frequent. As a contrasting example, opportunities for promotion within the District organizations are also seen as infrequent. This condition ranked 13th (Table B-35), with only 28.9% of the respondents regarding it as prevalent. However, as Table B-36 shows, this condition ranked highest in terms of relative dissatisfaction, with a percentage excess of 46.1. This means that not only do most respondents (over 70%) believe that promotional opportunities are relatively rare, but also that nearly one-half of them also believe that they should be prevalent. A possibly less predictable finding relates to the respondents' feelings about being adequately informed by their supervisors. As Table B-35 shows, the prevalence rating for this condition was fairly high - it ranked 5th on the list. More than one-half of the respondents (54%) considered that they were always or usually adequately informed. Nevertheless, a substantial percentage of the respondents feels that the existing prevalance of this condition is inadequate. The excess of the should exist percentage over the actually exists percentage was 38.3.

The rank ordering of work conditions and the identified excess of should exist over actually exists percentages for each case, presented in Table B-36, provides relative dissatisfaction indexes applicable to the perceived prevalences of these conditions. The Table does not, however, relate these indexes to those correspondents who believed that the work conditions were not prevalent. The relations of these indexes to this respondent group are useful indicators of the degrees of importance implicitly assigned to the conditions by the group. For example, consider Condition #4 in Table B-35 (8th rank). Of all respondents totaled in Table B-35, 52% believed that opportunities to participate in varied activities are prevalent. It follows, therefore, that 48% of the total did not consider these opportunities to be prevalent. (These are called "non-P respondents" for identification.) If all of these non-P respondents had considered that opportunities to participate in varied activities were of sufficient importance to them to warrant

assigning should always exist or should usually exist ratings to this condition (4), then it should be expected that the percentage excess shown in Table B-36 would have approximated 48%*. However, as reference to the Table shows, the actual excess was only 20.1% for Condition #4. Therefore, at least 42% (20.1%/48%) of the non-P respondents believed that the importance to them of opportunities to participate in varied activities was such that these opportunities should usually or always exist. The number, expressed as a percentage, obtained by dividing, for each work condition, the percentage excess shown in Table B-36 by the percentage of non-P respondents for that condition, is called a "relative importance rating."

As the third step of the analysis of the data in Table B-34, relative importance ratings were calculated for each of the 15 work conditions and rank-ordered in the sequence of increasing ratings. The results are shown in Table B-37.

On comparing Table B-36 with Table B-37, it will be seen that the general ranking patterns of the work conditions are not fundamentally unalike, although there are differences in a few cases. (Both of these Tables are rank-ordered in the same direction, i.e., increasing frequency of dissatisfaction and increasing relative importance ratings, in order to facilitate comparison.) Similarities between these Tables appear in the relatively low rankings assigned to freedom to experiment, opportunities for participating in budget setting, and the opportunities to participate in varied activities. Similarities also appear in the relatively high rankings of opportunities relating to personal growth and

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* This argument assumes that no respondent who assigned an always exists or usually exists rating to a given condition, also assigned a lower than should usually exist rating to the same condition. It also assumes that, for each condition, all respondents who assigned an actually exists rating, also assigned a should exist rating to that condition. There were several instances in which these assumptions did not apply, so that the analytic results discussed here, while valid in a relative sense, should not be construed as absolutes.

advancement. It will be noted, however, that the non-P respondents considered that fair treatment from their supervisors and the feeling of being adequately informed by supervisors and coworkers are somewhat more important to them than opportunities for promotion (81% and 83%, respectively, vs 65%).

The responses of the survey participants to Question 13a were analyzed on the basis of distribution by District (using the Chi-square test) to determine whether, for any of the work conditions listed in Table B-37, District variations of prevalence ratings could be attributed to other than chance with 94% confidence. It was found that, in most instances, the pervasiveness of distribution throughout the Districts was such that the Chi-square test was met for only four conditions. The results are shown below, for the Districts at the extremes of the ranges for each condition. (The percentages are the sums of the always and usually ratings.)

Upper and Lower Extremes of District Condition Prevalence Rating

Condition	District	%Prevalence Rating
Feeling of being adequately informed by supervisor and coworkers (5)	1	57.8
	5	37.8
Opportunity for promotion within the organization (6)	12	37.8
	10	12.2
Opportunity to find out how well I am doing (9)	9	53.6
	11	34.3
Receipt of fair and impartial treatment from supervisor and coworkers (15)	1	90.5
	5	70.4

The positions of Districts 1 and 5 with respect to conditions 5 and 15 suggest obvious differences of personnel interrelationships within these Districts. Generally a high percentage rating for a District is considered to be conducive to receptivity to information transfer. In

this connection, note that although District 10 had the lowest rating for the perceived prevalence of job advancement opportunity, this District, nevertheless, showed a good receptivity rating with respect to the job and work statements (see Table B-33). In particular, District 10 had the highest rating for the one work attitude for which the distribution by District (on the basis of the Chi-square test) appeared to be meaningful: namely, "A good indication of a man's worth is how well he does his job."

Respondents' Assessments of Promotion Criteria

Question 14 addressed the respondents' perceptions of relative weights afforded different personnel factors by the District divisions in awarding promotions. The respondents were presented with a list of such factors and asked to rate each according to a 6-point scale. A rating of 6 meant extremely important and a 1 meant extremely unimportant. The rating distributions by factor are presented in Table B-38. If the percentages of the extremely important and quite important ratings of each factor are added separately for the respondent categories (DMRP aware and unaware), it will be found that the aware and unaware response patterns are, for most factors, very similar. The actual differences between the aware and unaware responses are less than 6% for all factors but one, namely, education, training, and experience (2). This factor was rated as extremely important or quite important by 10.5% more of the aware than of the unaware respondents.

Based on the ratings assigned by the totals of survey participants with dredging assignments, the factors were rank ordered downward in terms of the percentages of those considering them to be extremely or quite important. The results are shown in Table B-39. The span of response percentages for those factors falling within the ranking range of 1 through 7 is relatively small (about 7.9%). The differences

of percentage within this range could be attributed to chance. On the other hand, the relatively low rankings assigned to job effort, contribution to knowledge, and length of service in the Corps probably reflect real differences of assessment of these factors in relation to those of ranks 1 - 7 taken collectively. A Chi-square analysis of the assessments of job promotion factors on a District by District basis showed that for all factors except one, the differences among the District responses could not, with a confidence level of at least 94%, be attributed to other than chance. This finding is significant in itself because it means that the way in which job promotion factors are assessed by District personnel tends to be relatively uniform and essentially independent of the individual District work climates.

Respondent Self-evaluation

In order to develop a pattern of the respondents' self-evaluations relative to their peers, they were asked to rate themselves, on a comparative basis, in terms of a number of job performance factors (Question 15). The intent was to determine whether there were marked variations among the patterns of self-evaluation from District to District that might relate to corresponding differences in the District receptivity climates. The responses are summarized in Table B-40. Analysis of the data, using the sums of the personnel percentages assigning outstanding and excellent ratings for each factor, shows both similarities and differences between the DMRP aware and unaware groups. The self ratings of both groups were about equal for:

- Job productivity
- Dependability
- Overall job effectiveness

More of the aware than the unaware assigned themselves high ratings for:

- Job performance quality
- Job effort
- Knowledge on the job

- Judgment and common sense on the job
- Ability to learn on the job
- Initiative on the job
- Cooperation with others on the job

The only factor for which more of the unaware assigned high self-ratings was personality on the job. (Note that these observations apply to the survey participants with dredging assignments.) Application of the Chi-square test (at the 94% confidence level) to the District distribution of the responses from all participants showed that, of the 11 factors, the differences of District distribution could be attributed to other than chance for 5. The Districts representing the range of response extremes (for the sums of the percentages for outstanding and excellent) are tabulated below.

Respondent Self-Ratings by District Range Extremes

Factor	District	Sum of Excellent % and Outstanding %
Quality of job performance (1)	5	69.5
	1	45.8
Knowledge on job (5)	5	78.2
	1	54.1
Judgment and common sense on job (6)	2	77.8
	6	59.5
Cooperation with others on job (10)	9	80.0
	6	64.6
Overall job effectiveness (11)	4	69.8
	11	52.8

The results shown are somewhat surprising with respect to District 5. This District had ranked at the low end of 2 ranges for the percentage incidence of courses taken (see Table B-30), but its personnel rank highest for the percentage incidence of favorable self-evaluation in terms of knowledge on the job. The position of District 6 is consistent with that reflected by Table B-33.

Inner- vs Other-Directedness of the Respondents

In Question 16 the survey participants were presented with a list of 12 trait descriptions considered by many to be requirements for success. The respondents were asked to rank order these in terms of the importance they assigned to them, beginning with 1. The ranked responses are shown in Table B-41. The significance of these trait descriptions lies in the fact that the tendencies of individuals to select one or another as primary (i.e., most necessary for success) is usually associated with their work orientations as either inner-directed or other-directed. As these terms are used in their technical senses, inner-directed individuals are usually more self-sufficient and aggressive in their work orientations than the other-directed who tend to be more interpersonally reliant. Two of the trait descriptions in the list (Table B-41) are neutral and are not indicators: efficient and intelligent. The trait descriptions usually selected by inner-directed individuals are:

- decisive
- forceful
- imaginative
- independent
- self-confident

Those usually chosen by other-directed individuals are:

- adaptable
- agreeable
- cautious
- cooperative
- tactful

It was suspected early in the study that the DMRP-aware group might show a somewhat higher trend to inner-directedness than the unaware. The basis for this was that inner-directed individuals would be somewhat more self-motivated than the other-directed to pursue new knowledge and information. For example, inner-directed individuals are

more prone toward optional job-related reading. (It should be understood that generalizations of this kind are only statements about broad tendencies; they should in no way be interpreted as absolutes.) In order to test this hypothesis, the data in Table B-41 were analyzed by adding, for each indicator trait, the percentages of aware and unaware respondents who had assigned first and second ranks to that trait. These composite percentages were then summed by category. The results, which are presented in Table B-42, show that not only does the aware group rate higher in the incidence of inner-directed personnel, but it also rates lower in terms of frequency distribution of other-directed individuals. This is consistent with the hypothesis.

As an independent test, the individual responses to Question 16 were rated by a scoring procedure according to which a score of 35 represents maximum-inner directedness and a score of 10 corresponds to minimum inner-directedness, or maximum other-directedness. The results are shown in Table B-43. Examination of this Table confirms the finding that inner-directedness is more prevalent among the aware group on a percentage basis. If the percentages for the aware and unaware are separately totaled for the scores from 35 through 30, the aggregate percentage for the aware is 27.5 while that for the unaware is 13.7.

An analysis was also made of the relative distribution of inner directedness by District in terms of total aware and unaware survey participants by adding the percentages, for each District, of the respondents falling within the 35-30 scoring range. The results were the following:

District Ranking by Inner-Directedness Score

Rank	District	Composite Percentage (35-30) Scores
1	7	28.3
2	10	25.0
3	6	23.6
4	2	19.5
5	5	19.4
6	11	18.0
7	8	16.9
8	1	15.8
9	12	15.7
10	3	15.2
11	9	13.8
12	4	12.8

The extent of this distribution range suggests that any single mode of information and technology transfer may not be uniformly effective for all Districts. For example, emphasis on supplementary interpersonal instruction would be appropriate for those Districts at the lower end of the above listing.

Resondents' Perceptions of Non-Corps Organizations

The purpose of this portion of the survey was to determine the degree to which the respondents with dredging assignments had working contacts with outside governmental agencies (at all levels) and with other organizations whose interests could relate to various aspects of dredging operations. It was considered that District personnel with such working contacts would have a need for familiarity with the DMRP and its research findings independently of the direct bearing of program results on the conduct of project operations. In Question 16, the respondents were initially asked whether their work afforded them the opportunities for working contacts with other (non-Corps) government or non-government personnel. Those who replied affirmatively were then asked to identify,

from a list, those organizations with which they had such contacts and to give their impressions of the groups by choosing 3 adjectives (from those listed on the questionnaire) which best described these impressions.

Table B-44 shows the distribution of working contacts of both the DMRP aware and unaware respondents with each of the listed organizations. It will be noted that in every case the percentage of aware personnel having such contacts is higher than that of the unaware. (Although this is consistent with the finding that the aware group includes a higher percentage of inner-directed personnel than the unaware group, it does not necessarily imply a causal relationship, because other factors, such as specific job responsibilities, also determine the opportunity and need for contacts with outside groups.) As might be expected, the highest incidence of personnel contacts occurs in connection with those agencies whose orientations and roles are essentially environmental and conservationist. It will be noted that U. S. Fish and Wildlife Service (FWS)(in terms of percentages of the aware group having contacts with this agency) ranks as high as the U. S. Environmental Protection Agency (78.9). This is not surprising in view of the relationship of FWS to Corps permitting actions.

Respondent evaluations of the listed organizations are shown in Table B-45. The results for the aware group were analyzed by adding the percentages, for each organization, for impartial, informative, and helpful assessments (these represent favorably polarized orientations) and then subtracting from this sum the equivalent percentages for obstructive, persistent, and demanding, which reflect negatively polarized perceptions. The results, as net ratings, are listed as follows:

Federal Agencies

Agency	Net Rating %
USGS	220.4
USN	207.7
NOAA	202.3
DOT	200.0
NPS	138.1
EPA	41.4
F&WS	-22.7

State and Regional Agencies

Agency	Net Rating %
Planning Commission	139.0
Port Development	123.7
Game, Fishery or Wildlife	123.5
Conservation/Water Resources	94.0
Pollution Control	59.7

Private Organizations and Groups

Group	Net Rating %
Testing Laboratories	234.3
Information Services/Libraries	170.5
Engineering	156.6
Construction Industry	129.6
News Media	-9.7
Legal Profession	-46.8
Environmental Organizations	-146.8

It will be noted that the U. S. Fish and Wildlife Service is the only Federal agency for which the net orientation of the aware respondents was found to be negative. Of all non-Federal agencies and organizations, private environmental groups are the most negatively perceived. This is

consistent with the fact that their positions with respect to dredging operations are not typically characterizable as supportive.

B. Personal Interview Survey of Corps Personnel at Six Districts

As stated in Part II of this report, the sample selected for the personal interview survey was drawn from the population that had previously participated in the self-administered questionnaire survey and consisted largely (about 75%) of individuals whose job assignments had previously been identified as dredging-related. (The criteria used for selecting the sample were presented in Part II.) The personal interviews differed from the self-administered questionnaire survey in that they focused largely on considerations pertaining to dredging operations and on the DMRP and its publications.

Major objectives of this survey were:

- To determine the respondents' involvement with, or knowledge of, innovative Corps District project activities.
- To determine the respondents' assessments of the availability of technical information required for performance of their jobs.
- To determine the respondents' knowledge and opinions of new trends in dredging operations and the factors influencing these trends.
- To assess the respondents' awareness of the DMRP and their knowledge of the scope and content of the Program.
- To determine the respondents' assessments of both the usefulness to them of major DMRP objectives and the adequacy of the Program's topical scope.

- To determine respondents' awareness of the DMRP information exchange bulletin and their assessments of its topical usefulness.
- To determine the modes of receipt of the DMRP information exchange Bulletin.
- To determine the patterns of utilization of the DMRP Bulletin by its recipients.
- To determine how the respondents perceive the DMRP reports in terms of their relatedness to their own job informational needs.
- To determine learning mode preferences of the respondents.

The personal interview questionnaire used in this survey is shown on pages A-10 through A-22 of Appendix A at the end of this volume. The data developed from the responses to the questionnaire were analyzed and then arranged in tabular form, both by totals and by distributions among the 6 Districts in which the interviews were conducted. Most of the findings which were considered to be relatively important or significant in the context of the survey objectives are presented in Appendix B (Tables B-46 through B-93). Additional personal interview survey data will be found in Appendix D (Volume II). Both of these appendixes are referenced in the following discussions in this section of Part III.

Audience Characterization

Inasmuch as the characterization of the respondents had previously been established through the self-administered questionnaire survey, this area was not explored in detail during the personal interviews. The respondents (134) were asked merely to provide descriptions of their jobs. These descriptions were furnished as either titles or major activities, sometimes including identification of the District organizational elements with which the survey participants were associated.

A detailed presentation of the responses is shown in Table A-1 in Appendix D. This Table contains additional data showing the distribution of readership of the DMRP Bulletin by job category. Table D-2 presents job distributions by District.

Respondent Involvement in Innovative Project Activities

This portion of the interview was designed to assess District personnel initiative in suggesting new approaches to dredging related operations. The responses to these questions were considered useful in gauging the receptivity of the Districts to innovation which, in turn, bears directly on the question of technology transfer to them.

The respondents were asked about their opportunities for suggesting new or different approaches to dredging operations (Q.2a). The responses, which are totaled in Table B-46, show that 52% replied affirmatively and that of these, 60% were readers of the DMRP bulletin. The respondents were then asked (Q.2b) whether their suggestions were made at their own initiative (see Table B-47). The District distributions of responses to Question 2a and Question 2b are shown in Tables D-3 and D-4, respectively. The data in summary Table B-47 show that the suggestions were initiated by the respondents in 40% of the cases. In Question 2c, the respondents were then asked to identify the situations or circumstances to which the suggestions related. The responses are shown in Tables D-5 and D-6. It is interesting to note that out of 69 situations mentioned, 33 related to some aspect of dredged material disposal.

Those respondents who had stated that they had not had opportunities to suggest new dredging operation approaches were then asked if they were aware of any changes in the way that their Districts conduct disposal operations (Q.2d). The summary data in Table B-48 show that of 77 responses to this question, 39 were positive. (The

District response breakdown is shown in Table D-7.) The respondents who answered Yes to this question (Q.2d) were then asked to identify the group or job title of the individual principally responsible for the changes (Q.2e). The responses are shown in Tables D-8 and D-9.

The respondents were next asked whether they could recall any other suggestions they had made in the past with respect to Corps projects (not restricted to dredging) (Q.3a). At this point they were not yet asked to identify such suggestions. The responses are summarized in Table B-49 and shown by District distribution in Table D-10. In response to the following question (Q.3b), the respondents who replied affirmatively (to Q. 3a) then identified a variety of types of projects to which their suggestions related. These projects are listed in Tables D-11 (by totals) and D-12 (by District distribution). It will be noted that proposed construction sites were most frequently mentioned. The following part of the question (Q.3c) was designed to elicit the nature of the suggestions offered by the respondents. These suggestions are listed in Tables D-13 (by totals) and D-14 (by District distributions). It will be noted that in 9 instances these pertained to dredged material disposal. In the last part of the question, (Q.3d), the interviewees were asked what prompted their ideas. A summary of the responses is shown in Table B-50 (by totals) and in Table D-15 (by District). Note that in 17 out of 51 replies (33%), the stimulus was indicated as economic.

Respondents' Assessments of Adequacy of Available Required Project-Related Information

In Question 4a, the respondents were asked if they could cite instances in which proposed project alternatives could not be supported on technical grounds because of inadequate data. The response summaries presented in Table B-51 show that 63 interviewees out of 133 responding to this question stated they could cite such instances. (A breakdown of the responses by District is shown in Table D-16.) These 63 respondents were then asked to identify the issue involved (Q.4b) and the nature of

the required information (Q.4c). The responses are displayed in Table D-17 (by totals) and D-18 (by District). Out of 62 identified areas of information need, 9 related to water quality and 5 to dredged material and disposal sites.

Those respondents who had stated that adequacy of technical support information was not a problem were asked whether this was because they never had an occasion to require documented information or because the available information was sufficient (Q.4d). A summary of the responses is shown in Table D-19 and the District breakdown in Table D-20. 61% of the respondents indicated that the information they needed was always available. These interviewees were then asked if they could cite typical cases for which information was available, indicating the type of information required (Q.4e) and its documentary source (Q4f). The responses are shown in Tables D-21, D-22, D-23, and D-24. Note that 9 out of 32 responses *related in some way* to dredged material disposal. Of the 24 respondents who identified information sources (Table D-23), 2 cited the DMRP.

The interviewees were then asked if they knew of cases independent of their direct experience in which environmental analyses of proposed design alternatives were constrained because of inadequate information. They were also asked to identify (a) the nature of the difficulty, (b) the type of information that was required, and (c) how the difficulty was resolved, if at all. Tables D-25 and D-26 list the types of problem areas reported (Q.5a). Of 42 responses, 7 related to dredged material.

Tables D-27 and D-28 list the types of information needed by topical area. 16 out of 35 respondents identified dredged material and dredged material disposal as such areas (Q.5b). Tables D-29 and D-30 present the interviewee responses (36) to the question of how the difficulty was resolved. In two cases, the project was abandoned or its location changed; in 11 cases, no resolution had been reached at the time of the interviews.

Respondents' Perceptions of New Dredging Trends and the Factors Influencing Them

In exploring this topical area, the respondents were intially asked whether they considered that new trends in dredging operations are occurring (Q.6a). The results are summarized in Table B-52. As the data show, the respondents overwhelmingly agreed (116 to 13) that new trends in dredging are taking place. The 116 respondents were then asked to identify both the new trends (Q.6b) and the factors which they believed stimulated their development (Q.6c). The new trends identified by the interviewees are summarized in Table B-53 and are shown by District distribution in Table D-31. It will be noted that nearly 74% of the trends identified related in one way or another to improvements in dredged material disposal and treatment. The factors which were believed to stimulate new trends are shown in summary Table B-54 and are presented by District distribution in Table D-32. Note that nearly 74% of all factors identified are essentially environmental in type. Limited availability and cost of disposal sites constitute 13% of these factors.

The respondents were also asked to cite examples of what they considered to be new or different approaches to dredging operations. The responses are summarized in Table B-55 and analyzed by District distribution in Table D-33. 127 new disposal approach examples were cited by 115 respondents. As the tables show, marshland creation was most frequently mentioned. The productive use of dredged material, both as a generality and in specific terms, was mentioned in 59 instances.

The respondents were also asked whether or not there should be changes in disposal procedures and, in either case, the reasons for their opinions (Q.7). As Table B-56 shows, nearly three-fourths of those responding believed that there should be changes in disposal procedures. The distribution of response by District is displayed in Table D-34. The reasons for the respondents' opinions are summarized in Table B-57 and broken down by District in Table D-35. Of the 133 responses from 113 individuals (some interviewees gave multiple answers),

65 were in some way environmentally related (49%). Of those respondents who thought there should be no changes in dredged material disposal practice, 7 stated that present methods were, in their view, satisfactory.

At the end of this portion of the interview, the respondents were read a list of seven categories of external influences that may play roles in influencing decisions regarding dredged material disposal. They were then asked to pick the three that they believed, on the basis of their own experience, were most frequently influential (Q.8). The summary of these opinions is presented in Table B-58 and their distributions by District in Table D-36. 75% of those responding to the question identified economic costs as the most frequently influential external force. Environmental interest groups were cited by 53% of the respondents.

Respondent Awareness and Knowledge of the DMRP

In the exploration of this topic, the respondents were initially asked whether they were aware of existence of DMRP (Q.9a). Of 130 interviewees who answered the question, 112 (86%) answered that they were. Of these 112, about 40%, had previously been identified as DMRP aware on the basis of the results of the self-administered questionnaire survey. The District distribution of responses to Question 9a is shown in Table B-59. As this Table shows, the overall range of variation of DMRP awareness among the Districts was not very great, extending from a minimum of 84% to a maximum of 89%. The average level of awareness was 86%.

As pointed out earlier, the self-administered questionnaire did not employ a recall-assist mechanism. Therefore, the meaning of the term awareness as used in the context of that survey is different from that which applies in the case of the personal interviews. An individual responding to the self-administered questionnaire might have known of DMRP, but might not necessarily have thought of it consciously in the

context of that survey situation. In the case of the personal interview in which the program was clearly identified by interviewers (recall-assist), it would be expected that any interviewee who had at least heard of the program would recall it. Therefore, awareness in the context of the self-administered questionnaire denotes primarily conscious awareness, while the same term in the context of the direct interview survey would include latent as well as conscious awareness.

The importance of recall-assist in relation to awareness levels becomes evident on comparing the data shown in Table B-39 with that presented in Table B-2 for the same Districts. (This comparison is an approximation only, because the survey samples on which the two tables are based were differently selected.) The approximation is good enough, however, to illustrate the point. The range of incidence of DMRP awareness, on the part of dredging-assigned personnel, without recall-assist, extended, for Districts 2, 4, 5, 7, 9, and 11, from a low extreme of 16.6% (District 4) to a high extreme of 35.6% (District 2). (These data appear in Table B-2.) It is apparent that, even after making a reasonable allowance for differences among the survey samples, the incidence of awareness under recall-assist conditions was, as would be expected, substantially higher than in the absence of such assist (84%/89% vs 16.6%/35.6%).

In the next question (Q.9b), the respondents who were familiar with DMRP were asked how they first learned about the program. The responses are shown in summary form in Table B-60 and by District in Table D-37. Although more respondents had first heard about the program through verbal communication than printed matter, the verbal mode is not overwhelmingly dominant. (In general, first impressions tend to be lasting ones. Such impressions of the DMRP derived from printed materials would probably be more uniform than those resulting from verbal descriptions from diverse sources.)

The next question addressed the respondents' general impressions of the DMRP (Q.10 - If someone were to ask you about the program, what would you say about it? How would you describe it?). The

responses are broken down by District in Table B-61. Some of the responses were basically opinions about the quality and usefulness of the DMRP, while others were identifications of topical areas which the respondents believed the program addressed. The data indicate that about 25% of those who knew that the program existed were not also familiar with its broad goals. However, 42% of those responding to the question understood, at least in a general way, that the DMRP is concerned with dredged material disposal.

On the basis of the responses to Question 10, the respondents' knowledge (as opposed to awareness only) of the DMRP was then estimated. A key criterion in forming these estimates was the degree to which the respondents identified the broad project areas of DMRP and the program's significant project objectives. Thus knowledge of the DMRP should be interpreted as knowledge of its topical structure rather than detailed familiarity with its research results. These estimates are shown by District distribution in Table B-62. Of all interviewees, 49% had virtually no substantive knowledge of the program; 30% had a partial understanding of the DMRP in terms of its key project areas; 18% had a reasonably comprehensive, but uneven understanding of the program; one individual exhibited fairly complete and accurate knowledge of the DMRP. The interviewees at Districts 4, 7, and 9 appeared to be relatively the best informed.

Respondent Assessments of the Usefulness of DMRP Information Objectives and the Adequacy of the Program's Scope

This section of the interview was designed to elicit the respondents' perceptions of the DMRP in terms of its relatedness to their own job informational needs. It was assumed when the questionnaire was designed that few if any interviewees would be familiar with the program in sufficient detail to address this area meaningfully without the assistance of printed materials identifying appropriate structural elements of DMRP. Initially, therefore, the respondents were provided with 20 cards, each presenting a defined program objective

as identified by the DMRP. The respondents were asked to sort these cards, employing a 6-point usefulness scale, and to rank the objectives on the basis of estimated usefulness to them of information likely to result from the pursuit of each (Q.11). The results are presented in Table B-63, which displays the respondents' assessment of each objective in this context. The objectives are listed in decreasing order of their perceived usefulness scores. The Table should be interpreted as follows. As an example, 134 respondents evaluated the objective at the top of the list, "Determine on a regional basis the short- and long-term effects on water quality. . ." Of these 134, 38% considered it of major usefulness with a ranking of 1; 21% ranked it 2; 12% ranked it 3; and so forth. The usefulness score was obtained by adding the percentages of respondents who assigned this objective 1st and 2nd ranks. This total is 59%, the highest for any objective. The objective receiving the second highest score relates to the effects of confined disposal of dredged material. On the other hand, the usefulness of studies pertaining to the manufacture of marketable products (from dredged material) ranked lowest. (The assessments of usefulness of DMRP objectives by District distribution is shown in Tables D-38 through D-57.)

Note that any prior knowledge the respondents may have had about the DMRP was essentially irrelevant in the context of this question, which dealt only with the usefulness of program findings (already developed or to be developed) in terms of their perceived pertinence to the job-related informational needs of the audience. Because of this, the question was addressed to all interviewees, independently of their awareness or unawareness of the DMRP.

The following question (Q.12), which concerned the respondents' assessments of adequacy of the scope of DMRP, was also addressed to all interviewees (unaware as well as aware). They were shown a card that displayed the DMRP technical structure. This card listed the defined program research tasks (as of August, 1975), appropriately grouped under the four major research projects. The respondents were asked first to review these tasks and then suggest other topical areas which they

believed should be included in the DMRP. An aggregate listing of the suggested topical areas is presented in Table D-58 and the distribution by District in Table D-59. Of the 131 interviewees who responded to this question, 80 made no substantive comments. In some instances the suggested topics closely relate to DMRP planned or existing studies. Some of the topics suggested, such as dredging cost analysis, would appear to lie outside the scope of an essentially technical program.

Awareness and Knowledge of DMRP Bulletin

The interviewees were shown copies of DMRP Information Exchange Bulletin and asked if they had seen the publication before (Q.13). Table B-64 presents a summary of the responses, cross-referenced against awareness/unawareness of the DMRP as based on the results from the self-administered questionnaire survey. (The comments made earlier in this discussion with reference to different meanings of awareness of DMRP in context of the two surveys apply here also.) It is interesting to note that of 78 interviewees who stated that they had previously seen the Bulletin, 38 were in the self-administered survey unaware group. Response distribution by District is shown in Table B-65. The incidence of awareness of the Bulletin was highest in Districts 2 and 5.

In Question 14, the interviewees were then asked to describe the Information Exchange Bulletin in general terms. The substantive responses were in some instances assessments of, and in others descriptive statements about, the character or content of the publication. About 76% of all respondents who expressed evaluations of the Bulletin commented favorably. Table B-66 summarizes the responses to Question 14 and Table D-60 presents the distribution of responses by District. From the interviewees' complete replies to Question 14, estimates were made of respondents' knowledge of the Bulletin's topical content. These estimates are presented in Table B-67, cross-referenced against awareness/unawareness of the DMRP as based on results from the self-administered questionnaire survey. Note that of 129 respondents, 55

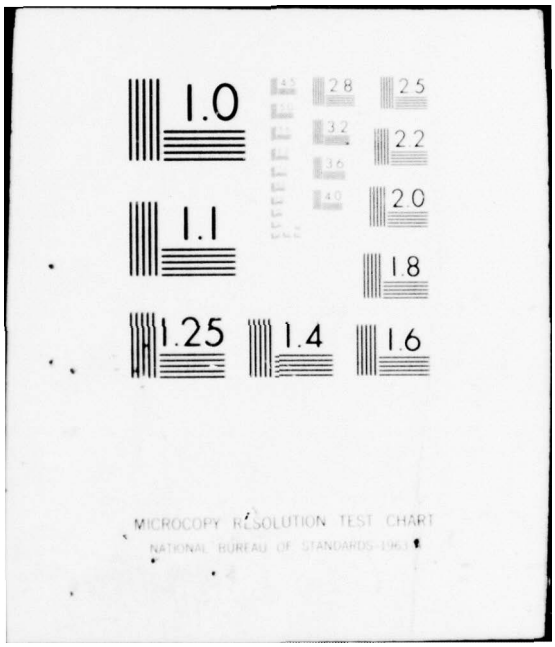
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had little or no knowledge of Bulletin content; 45 of these had been previously identified as unaware of DMRP. Of 47 respondents with moderate to extensive knowledge of Bulletin, 25 were aware of DMRP in terms of the self-administered questionnaire survey results. It should also be noted, however, that of 2 individuals whose knowledge of the Bulletin was considered to be extensive, 1 fell into the SA unaware group. This illustrates the point made earlier in these discussions to the effect that awareness has significantly different meanings in the two Corps District surveys. Table D-61 presents the distribution of knowledge of the DMRP Bulletin by district. It can be seen that the relative incidence of moderate to extensive knowledge of the publication is highest in Districts 2 and 9.

In a further analysis, the distribution of knowledge of the Bulletin was cross-referenced with the distribution of knowledge of the DMRP. The results are presented in Table B-68. Note that of 55 respondents whose knowledge of the Bulletin was virtually nil, 78% had also virtually no knowledge of the Program. Of 48 individuals with moderate to extensive knowledge of the Bulletin (based on rating of 4 - 6), nearly 40% had comparable familiarity with the DMRP. Conversely, of 31 respondents with moderate to extensive knowledge of the Program, 61% also exhibited moderate to extensive knowledge of the Bulletin. Some degree of association between familiarity with the DMRP and familiarity with the Bulletin would be expected as a matter of course. However, it is interesting that knowledge of the Bulletin implies knowledge of the Program less frequently (on a percentage basis), than is true of the converse case. This suggests a difference in interest orientation between those whose familiarity with the DMRP is comprehensive, or approximately so, and those whose knowledge of the Program is more limited.

Modes of Bulletin Receipt

This portion of the interview was designed to identify the mechanisms through which recipients of DMRP Information Exchange Bulletins received their copies. Several transmission modes (direct mail, routing

slip, etc.) were identified for the respondents who were then requested to state which one applied to them (Q.15). The summary of responses, cross-referenced against awareness/unawareness, is presented in Table B-69. Note that out of 80 individuals who replied to the question, 21 received it directly from DMRP, while the balance received their copies through secondary distribution within the Districts. The fact that 42 individuals received the Bulletin via routing slips affirms that there is multiple readership of single copies. The breakdown of mode of Bulletin receipt by District is presented in Table D-62.

Respondent Utilization and Evaluation of the Bulletin

In this part of the interview, the respondents were asked what kind of information they first looked for in the Bulletin (Q.16a), and then what they looked for afterwards (Q.16b). The summary of responses to Question 16a is shown in Table B-70 and distribution by District in Table D-63. Of 78 interviewees who answered this question, 15 did not look for any particular item. Of the balance, 11 were primarily interested in disposal related problems. Responses to Question 16b (what the readers look for subsequently) are totaled in Table B-71 and analyzed by District in Table D-64. Of 74 who replied to this question, 14 stated that they did not look for anything else, while 11 read the entire issue. The interviewees were then asked whether the topical information presented in the Bulletin was usually sufficiently detailed for their needs (Q.17a). The responses are summarized in Table B-72 and shown by District breakdown in Table D-65. As the tables show, nearly 70% of all respondents considered that the level of detail presented in the Bulletin is adequate. Opinions varied among Districts, however. For example, 100% of all interviewees in District 9 expressing an opinion responded affirmatively. In the case of District 7, this was true of only 43%. (These percentages should be regarded with some caution because of the small sizes of the individual District samples.) Those interviewees who considered the information Bulletin

insufficiently detailed were then asked the reasons for their opinion (Q.17b). The responses, relatively few of which were substantive, are summarized in Table B-73 and shown by District distribution in Table D-66. In the following question (Q.18) the interviewees were asked what additional types of information they would like to see in the DMRP Bulletin beyond those typically presented. The responses are shown in summary form in Table D-67 and by District distribution in Table D-68. Of 77 interviewees who responded to this question, 34 considered that the current topical coverage of the Bulletin is adequate, and 9 respondents stated that they would like to see articles on innovative dredging studies conducted by Districts. (Some of the topical areas suggested by the interviewees for discussion in the Bulletin [example, dredging activities abroad] are of questionable appropriateness for this publication whose basic purpose is to provide an account of the DMRP and its constituent operations.)

In the following question (Q.19a), the interviewees were asked what they usually did with their issues of the Bulletin after they had read them. Of 75 who answered the question, only 2 discard their copies; the balance either saves them or passes them on (Table B-74). This suggests that the Bulletin readers in the Districts place a real measure of value on the publication. In Question 19b, those respondents who said they passed their issues on were asked if they knew their final dispositions and if so what the final dispositions were (Q.19c). The responses are summarized in Tables B-75 and B-76, and presented by District distribution in Tables D-69 and D-70. Nearly all of the issues that are passed along are ultimately filed (93%). This confirms the impression that the publication is generally regarded as useful and worth keeping.

In the next question the survey participants were asked whether they had ever had a need to refer to past issues of the Bulletin (Q.20s) and if so, whether it was easy or difficult for them to locate specific items (Q.20b). Of 33 respondents who had this need, only 6 found it difficult to locate desired items. These 6 respondents were

then asked for suggestions which would simplify their finding specific topics in past issues. Nearly all suggested that the DMRP publish a periodic index sheet or an index issue.

The interviewees who previously had had occasion to refer to back issues of the Bulletin were then asked if they could remember the topical areas they wished to look up (Q.21a). 29 out of 33 individuals answered affirmatively. These individuals were then asked to identify the topics. The responses are summarized in Table B-77 and are shown by District distribution in Table D-71. The relatively wide interest in marsh creation and turbidity studies is evident from the tables.

In the final question specifically relating to the DMRP Bulletin, the interviewees were asked whether they had ever had a need to request or prepare additional copies (Q.22). As summary, Table B-78 shows only 16% answered affirmatively (the breakdown by District is shown in Table D-72).

Respondents' Familiarity with and Assessments of the DMRP Research Reports

The next group of questions asked during the personal interviews related to the DMRP research reports describing studies performed under the individual Program work units. The interviewees were initially shown a list of the 16 DMRP report titles which had been published prior to the interview period (April 12, 1976 through May 28, 1976). The survey participants were asked to review the titles and then indicate whether or not the individual study areas did or could relate to their work needs or interests (Q.23). They were then asked whether they had been previously aware of the existence of any of the reports (Q.24) and, if so, to identify the titles. Those respondents who answered Question 24 affirmatively (i.e., they had prior knowledge of one or more titles) were then requested to state which of these reports they had read or scanned (Q.25) and to express their opinions of their clarity and understandability (Q.26). In the final question of this group, which was addressed to all interviewees, the respondents were asked to mention tech-

nical reports (other than those published by the DMRP) that they considered particularly clearly written (Q.27).

The distribution of the responses to Questions 23, 24, and 25 by Corps District are shown in Appendix D. The replies to Question 23 (assessment of report relevance to the respondents' informational needs) are presented in Tables D-73 through D-88. Responses to the first part of Question 24 (prior awareness of any report titles) are shown in Table D-89 and to the second part (if aware, which titles) in Tables D-90 through D-106. These last tables also list the responses to Question 25 (identifications of reports read or scanned). A summary of the numbers of different reports read by the survey participants is presented in Table B-79. The distribution of these numbers by District is displayed in Table D-106. The data in these two tables show that 35 respondents read or scanned a total of 215 reports, averaging about 6 reports per individual reader. The District distributions of the responses to Question 26 (readers' assessments of the clarity of the reports) are shown in Tables D-107 through D-122.

In order to facilitate review of the findings developed from this part of the survey, the raw data presented in the Appendix D tables referenced above were organized and consolidated into two summary tables, Table B-80 and B-81.

Table B-80 presents the responses to Questions 23, 24 and 25 for each report title. The first data column shows the number of interviewees who responded, either way, to Question 23. The second column lists the percentages of these individuals who considered that the report topical areas related to their job information needs and interests. The third column shows, for each report, the number of respondents to Question 24 (total of report aware and unaware). The next column lists the number of those <u>not</u> previously aware of the DMRP report title. The last two columns show the numbers of report aware personnel who (a) had not read or scanned copies and (b) who had read or scanned the reports. Thus, taking as an example the 6th title, "Practices and Problems in the

Confinement of Dredged Material in Corps of Engineers Projects," of 125 respondents to Question 23, 80% (100 individuals) considered that the subject area was relevant to their needs and interests. Of 102 participants responding to Question 24 and Question 25 about the same report, 59 had not known of the title prior to the survey. Of those who were aware of the title (43), 28 had read or scanned the document.

The data presented in Table B-80 may appear in clearer perspective if viewed against the background of overall respondent familiarity with the DMRP reports. The findings shown in Tables D-89 and B-79 indicate that, of all survey participants in the 6 Districts, 41% had known of at least one report title prior to the interviews and that about 65% of this 41% had read or scanned at least one report. The number of those who had examined two or more reports (29) was 21.6% of the total survey sample (29 of 134), or about 53% of the DMRP report aware.

The data in Table B-80 show that more than 50% of the respondents (including both the report aware and unaware) considered that 9 of 16 report titles suggested technical areas that were relevant to their informational needs and interests. Only two titles were considered relevant by fewer than 30% of the respondents. The Table B-80 data also show that 13 of the 16 reports had been examined by at least 50% of those who had been aware of the existence of each (prior to the survey).

Table B-81 displays the respondents' evaluations of the reports in terms of their clarity of presentation. The respondents' assessments, as the table shows, were expressed according to a 6-point scale, with 6 representing high clarity of expression and 1 indicating obscurity. As the table shows, on the whole the respondents considered that the authors of the reports communicated well to their readers. Most of these evaluations by the respondents fall within the 4-6 portion of the scale. No report was assigned a 1, or lowest rating.

Respondent Identification of Non-DMRP Publications as Examples of Clarity of Presentation

In order to provide a reference framework for the respondents' assessments of clarity of DMRP reports, the interviewees were asked to cite titles of non-DMRP reports which they considered to be unusually good examples of lucidity (Q.27). The responses to Question 27 were elicited from 51 interviewees. The titles they mentioned are totalized in Table D-123 and presented by District distribution in Table D-124. "World Dredging" and "Engineering News Record" were most frequently identified by the respondents (10% in each case). These publications are periodicals, however, with writing styles that are characteristically different from those typical of reports in that they tend to be semi- rather than wholly technical and may be considered somewhat easier to read for this reason in itself.

Respondent Assessments of Learning Modes

This portion of the interviews addressed the respondents' assessments of various modes of information transfer (Q.28). The interviewees were initially presented with a list of 26 modes of information and technology transfer such as conferences, seminars, workshops, meetings, etc. Initially, they were asked to list those with which they had had direct experience (Q.28a). The summary of the responses is shown in Table B-82 and their distributions by District in Table D-125. As Table B-82 shows, of the 128 individuals who responded to this question, a substantial percentage (about 80%) had participated in meetings and conferences. Respondents' experience with dog and pony shows, tape cassettes, and videotapes was relatively low (about 21%). The respondents were then asked whether there were other forms of communication of technical ideas that were not included in the list (presented to them) but with which they had had experience (Q.28b). Of the 132 who responded to this question, 73% indicated that they had not

experienced other forms of information transfer and 27% identified various other communication modes, such as informal conversations, television, etc. These responses are summarized in Table B-83 and presented by District distribution in Table D-126.

The respondents were next asked to identify their first and second choices of modes that they considered most conducive to the ease and rapidity of their learning processes (Q.28c). These preferences are summarized in Table B-84 and their distributions by District are displayed in Tables D-127 and D-128. As Table B-84 shows, the respondents favored interpersonal communications modes (conferences, workshops, seminars, etc.) as their first choices. Impersonal modes (e.g., journal articles and reports) were favored somewhat more by the respondents as their second selections. The respondents were then asked, in connection with their first choices of communication methods, what there was about these methods that contributed most to the ease and rapidity of their learning (Q.28d). The responses are presented categorically in Table B-85. The upper portion of this table shows the first choice information transfer modes classified on the basis of whether they are characteristically interpersonal or impersonal. (Interpersonal modes are those which provide or favor opportunities for interchange between the information sender and receiver (e.g., questions/answers, open discussion, etc.). Impersonal transfer modes, in the context of this discussion, are those that are essentially one-way and typically do not permit the information receiver to communicate with the sender.) The lower portion of Table B-85 lists the various reasons given by the respondents for selecting their first choices of transfer modes. These reasons are grouped by the class of mode to which they apply.

The interviewees were next requested to identify those learning modes or methods that they had found <u>least</u> effective (Q.28e). The responses are summarized in Table B-86. The data show that news releases, newsletters, and trade shows were most frequently cited. It is interesting to note that of the various interpersonal modes listed, conferences and meetings were considered by more respondents to be

ineffective (for them) than were workshops, seminars, and symposia. As part of Question 28e, the interviewees were also asked what it was about the transfer modes they had just mentioned that caused them to be considered ineffective. The responses are shown by category in Table B-87, which follows the format used in Table B-85. In general, the reasons for considering impersonal modes as ineffective tend to be more substantive than those adduced in association with interpersonal methods. A frequently cited basis for not favoring impersonal transfer modes was their failure, as perceived by the respondents, to address specific problems or areas of particular interest.

In the last part of Question 28 (Q.28f) the interviewees were asked whether, if they were to transmit technical information to a group, they would necessarily employ the same methods they found most effective for themselves. The responses are shown in Table B-88; of 129 respondents to this question, 60% answered that they would. Information transfer modes that would be considered by the 40% who responded "no" to this question are identified in the table. It will be noted that most of these modes are of the interpersonal type.

Respondent Perceptions of DMRP Staff Presentations

During the history of the DMRP, its staff has from time to time conducted audio-visual presentations at various Corps Districts and elsewhere. These presentations are intended to provide an overview of the Program objectives and research activities. Question 29 of the personal interviews was designed to elicit the respondents' impressions of these presentations. The interviewees were first asked whether they had ever attended a staff presentation of the DMRP. The responses by District are presented in Table B-89. Of 216 individuals who replied to this question, 24 (19%) stated that they had observed a presentation. These respondents were then asked (Q.29a) if they felt that the presentation had provided them with a satisfactory understanding of the DMRP and its main goals. The District distribution of responses, including

reasons given, is shown in Table B-90. 67% of the respondents considered that the presentation had accomplished its purpose.

In the next question (Q.29b), the interviewees who had attended DMRP presentations were asked to rate the experience in terms of a 6-point stimulating/dull scale. The responses by District are shown in Table B-91. The overall trend of opinion was to the effect that the presentations were dull rather than stimulating. In Question 29c, the same interviewees were asked to rate the presentations they had attended on the basis of their informational value. A 6-point excellent/poor scale was used. The District distribution of responses is shown in Table B-92. Opinion was divided, with a slight trend toward a poor assessment.

Respondent Perceptions of Intra-District Communications

Because of the importance of derivative information dissemination as part of the overall transfer process, the respondents, in the final question of the interview (Q.30), were asked to express their assessments of the fluidity of interchange of ideas within their local groups using a 6-point scale. The 6 end of the scale corresponded to "frequent + unrestrained", while 1 represented "infrequent + restrained" exchange of ideas. The responses are shown by District distribution in Table B-93. It is clear that most respondents considered that intra-office communications were good. This is true of all Districts, although this opinion is less pronounced in some than in others. It is marginal in District 5, but is widely maintained among the respondents in Districts 2, 4, and 11.

C. Non-Corps DMRP Information User Survey

As explained in Part II of this report, the survey of non-Corps DMRP information users was conducted through telephone inverviews. The survey sample was drawn from a DMRP Information Exchange Bulletin

mailing list provided by the Environmental Effects Laboratory, WES. The interviews were addressed chiefly to the broad environmental interests of the respondents and to their assessments of the Bulletin. In the analysis presented here, the responses of the interviewees are organized by topical areas (TA's) to facilitate interpretation of the findings. A listing of these areas is presented in Appendix A, pages A-23 and A-24.

Classification and Characterization of Respondents

Respondent classification has already been summarized in Part II and is presented here again for convenience.

Respondent Group	Number of Telephone Interviews
Non-Corps Government Agencies Other than EPA	68
Individuals	11
Conservation Organizations	8
U.S. Environmental Protection Agency (EPA)	13

Early in the interviews, the respondents were invited to identify their broad areas of environmental interest (air quality, water quality, solid waste) (TA 1). The distribution of respondent interests is presented in Table B-94, both separately and combined. For example, of the 100 interviewees, 95 identified water quality as an interest. Of these, 21 were also interested in air quality. Six of these 21 were also interested in solid waste. The number of those interested in water quality and solid waste, but not in air quality, was 9. Thus, the total interested in water quality exclusively was 65, as shown. (95 less 21 less 9 = 65.) Interest in water quality was thus clearly dominant in the group, with 95% having an interest in this area, either alone or in combination.

Respondent characterization was developed further during the interviews in relation to a variety of factors which fell within the

following topical areas:

Topical Area 2: Environmental subjects of specific interest

Topical Area 3: Environmental publications read by the respondents

Topical Area 4: Recent articles of particular interest (to the respondents)

Topical Area 5: Respondents' evaluation of the communication effectiveness of the publications

Topical Area 6: Improvements in publications respondents would like

Topical Area 25: Work relatedness of respondents' environmental interests

Topical Area 26: Number employed at respondents' location, if environmental interests were work related

Topical Area 27: Number of professional personnel employed at above location

Table B-95 presents the data identifying environmental areas of specific interest to the respondents (TA 2). Note that, in the cases of those whose general environmental interests included water quality, the most frequently appearing specific interest categories (e.g., ambient pollutant levels; bacteriological, chemical, and biological effects, etc.) are not surprising. On the other hand, of those respondents who cited air quality as an interest (21), only a few (3) indicated an interest in emissions. This may reflect the fact that no respondent had an interest in air quality only. When such interest was indicated, it was always in association with other general environmental areas.

The distribution of respondent readership of various environmentally oriented periodicals (TA 3) is presented in Table B-96. The 11 interviewees who cited the DMRP Information Exchange Bulletin did so spontaneously, since no effort was made to bias the response by recall-assist. Of these 11, 10 had previously indicated an interest in water quality. As Table B-96 indicates, there is no single periodical

that dominates the readership, thus suggesting a wide diversity of interest that is not satisfied by any particular journal.

Table B-97 lists the technical subject areas of articles that had been read recently by the respondents and were of specific interest to them (TA 4). Note that water quality related topics predominate.

Topical Area 5 dealt with the interviewees' evaluations of the publications they had previously cited (TA 5) in terms of their communication effectiveness. These evaluations, which are summarized in Table B-98 were, on the whole, favorable. 84% of those responding considered that the publications communicated well.

Although the respondents did not identify specific publications which they believed could or should be improved (TA 6), some did express opinions about the types of modifications they would prefer. These views, which are summarized in Table B-98, relate to both informational content and format. Of the 15 individuals who suggested improvements, 6 considered that the publications they read could be better organized on a topical basis (i.e., "should be more subject oriented.")

During the course of the interviews, it was determined that the environmental interests of most of the respondents (97 out of 100) were related to their work (Table B-100). In order to develop an estimate of the potential for secondary or derivative distribution of DMRP informational materials within the organizations with which the interviewees were associated, both the total numbers employed and the numbers of professional personnel at the respondents' places of work were ascertained. Tables B-101 and B-102 summarize these findings. It will be noted that 58% of the interviewees work at locations where at least 17 professional personnel are employed.

Respondent Use and Evaluation of the DMRP Information Exchange Bulletin

One of the key purposes of the interviews with the non-Corps DMRP information users was to determine their use and assessments of the

Information Exchange Bulletin. The discussions relating to this subject addressed a number of pertinent topical areas. These were:

- Length of time the respondents had received the Bulletin
- Respondents' overall impression of the Bulletin
- The kinds of information the respondents look for first and afterwards
- Recipients' estimates of adequacy of Bulletin information
- Reasons, if any, for considering informational content inadequate
- Additional kinds of information the Bulletin recipients would like
- Disposition of Bulletin after reading
- Estimated numbers of subsequent readers of recipients' copies
- Referrals to past issues of the Bulletin
- Ease/difficulty of locating desired items in past issues
- Suggestions for increasing ease of locating items in past issues
- Examples of topics looked up in past issues
- Experience in reproducing Bulletin articles
- Recipients' views of why the Bulletin is published

Table B-103 summarizes the respondents' estimates of the lengths of time during which they had been receiving the DMRP Bulletin as of the interview dates. (These interviews were completed during the first half of July 1976.) The first issue was dated May 1973 and the table shows that 29% of the recipients believed that they had been on the circulation list during most of the publication's existence. Note that one respondent indicated nonreceipt of the Bulletin, even though this respondent is an addressee.

The recipients' general impressions of the Bulletin, as elicited during the interviews, are presented in Table B-104 from which it can be seen that most of the respondents (about 85%) regard the publication quite favorably. (The aggregate percentages in the table exceed 100% because of multiple comments.)

The type of information that Bulletin recipients look for initially and subsequently in reviewing a new issue was discussed during the interviews with the view of developing an overall profile of the dredging related interests of the readers (TA 9). Table B-105 indicates that 21% of the interviewees who discussed this topic initially examine the total content of each issue. Other readers first look for information bearing on subjects of specific interest to them. Of these, some (9) merely stated this without identifying any particular subjects. Others did identify specific topics, among which marsh creation and restoration were mentioned by 6 interviewees. Four of the respondents said that they had not read the Bulletin.

Table B-106 lists the kinds of information the recipients look for after initially reviewing a new issue. The data show that, as is true of the initial reading patterns of the respondents, some scan the entire Bulletin contents, while others look for information of specific interest to them. About half of the interviewees, however, did not address this topic substantively.

Most of the Bulletin recipients (75%) considered that its informational content is adequate to their needs (see Table B-107). In the cases of 23 respondents who considered that the information provided in the Bulletin is insufficiently detailed, attempts were made to find out why they thought so. As Table B-108 shows, most of them (17) essentially reiterated their positions. Inasmuch as the Bulletin is designed primarily to present summaries of information, rather than detailed reports of DMRP studies, the viewpoints of these recipients appear to reflect a misunderstanding of the publication's purpose. In exploring the area of what, if any, additional information the respondents would like to see in the Bulletin, it was found that 55% were satisfied with the present topical content (Table B-109). Most of the others either suggested additional areas or the expansion of information presented with respect to areas that the Bulletin now addresses. Note that 5 recipients wished more information about the actual implementation and utilization of DMRP findings.

With regard to the disposition of the Bulletins after they are read by their primary recipients, it was found that in most instances (67%) they are saved for future reference or (28%) passed along to others. Only 4 respondents stated that they discarded the Bulletins after reviewing them (see Table B-110). These findings suggest that the Bulletin recipients interviewed perceive the publication as valuable. Sixty-one respondents made estimates of the secondary readership of their copies. These estimates are presented in Table B-111. The data indicate that the copies received by about 60% of the recipients (including both the copies saved and passed along) have an average secondary readership of about 8 each. This, in turn, implies an overall non-Corps secondary readership of approximately 4.8 per copy. Of those respondents who discussed the topic of referral to past issues, 63 of 85 (74%) indicated that they had had needs for consulting material that had appeared in earlier issues of the Bulletin (see Table B-112). Of these, 54 stated that it was easy to find the item they were looking for and 12 said that they had experienced difficulty (Table B-112). Of these 12, 8 recommended an annual index and 4 a table of contents for assisting in locating items in past issues (Table B-112). The discussions with the interviewees relating to their referrals to past issues of the Bulletin also addressed the topical areas that they had had occasion to look up. These areas are listed in Table B-115. It will be noted that the number of respondents who discussed this subject was 74, or 11 more than those who originally stated that they referred to past issues. (This suggests that these 11 may have forgotten such referral needs until they recalled them in association with specific topical contexts.) Note that of the 24 areas listed in Table B-115, 9 relate to dredged material.

It had been observed, during this study, that the particular shade of yellow paper on which the DMRP Bulletin is printed did not reproduce equally well on all types of copiers. For this reason, the discussions with the recipients included consideration of whether or not they had had experience in reproducing Bulletin articles and, if so, whether they felt the results were satisfactory. As Table B-116 shows,

of 26 individuals who had made reproductions of Bulletin copies, 21 considered the results to be good.

During the course of the interviews, the Bulletin recipients were invited to state why they thought the DMRP Bulletin was published. Of 100 individuals interviewed, 97 expressed 152 opinions (Table B-117). About 30% of the reasons advanced suggested a public relations motivation; 57% referenced information dissemination as the Bulletin's purpose.

In analyzing the information elicited from the Bulletin recipients, an effort was made to estimate the levels of their knowledge of the publication in terms of its topical content. The results, which are presented in Table B-118, necessarily reflect impressionistic estimates only and should not be regarded as in any way exact or precise. They do, however, outline a pattern of the relative distribution of familiarity with Bulletin content among its recipients. Of the 100 interviewees, only 8 were considered to be virtually without knowledge of the Bulletin content. Of the balance, 46% were judged to be somewhat familiar and 46% moderately to extensively familiar with the topical content of the publication.

In reviewing these estimates, it should be understood that by "knowledge" of the Bulletin is meant familiarity with the kinds of topical areas addressed in it, rather than with the details of the information published.

Identification of Respondents' Dredging Related Environmental Concerns

During the discussions with the interviewees, they were encouraged to identify the broad areas of environmental impact of dredging and related operations which they considered to be of highest and second highest priority in terms of further research needs. Their opinions are presented in Table B-119. Of 97 respondents who expressed opinions, 73% felt that research relating to the impact of dredging on water quality and aquatic organisms was of highest priority. In identifying impacts of second highest priority, the equivalent percentage was 46.

The combined percentage of those selecting land use and water use impact research needs as of highest priority was 13. The equivalent percentage, on the basis of second highest priority, was 36.

Respondents' Knowledge of DMRP Reports

Because some of the respondents were believed to be either direct recipients of DMRP reports or else associated with agencies or organizations receiving the reports, these Program issuances were discussed during the interviews.

It was initially established that 63% of the DMRP Information Exchange Bulletin recipients were also aware of the existence of the DMRP reports (see Table B-120). Of the 100 interviewees, 33 were found to be unaware of the reports and in four cases awareness/unawareness was not clearly determined. Table B-121 presents a listing of identifications of report technical areas provided by the 63 aware individuals. (Note that this list reflects the respondents' understandings of subject areas treated in the report and not their actual titles.) Of the aware group of 63, 36 or 57%, however, were unable to recall any particular report topical area.

In the cases of those who did cite specific subjects, dredged material disposal and marsh development were most frequently mentioned, but by relatively few individuals. The subject listing in Table B-121 suggests that some respondents apparently confused their recollections of other reports with those published by DMRP.

As part of the discussion of the DMRP reports, the respondents were invited to indicate how they had obtained the copies they had read and, also, how they would obtain copies in the future. This subject was introduced in order to assess the respondents' knowledge of the DMRP report distribution system. The findings are shown in Table B-122. Note that 20 interviewees received their copies directly from the COE. Also, while 18 of the respondents would attempt to obtain reports from the COE in the future, only 2 would order them from the National Technical Information Service (NTIS).

PART IV: CONCLUSIONS

This part of the report first presents an overall assessment of the effectiveness of DMRP information dissemination efforts directed to Corps District personnel as reflected by the incidence of their awareness and knowledge of the Program. Other conclusions reached during the study are grouped under headings identifying the surveys on which they are based.

Effectiveness of DMRP Information Dissemination

The results of the personal interview survey indicate that 86% of the respondent group (of whom about 75% were assigned to dredging operations and the balance to environmental inventory and assessment) were aware of the existence of the DMRP under conditions of assisted recall. This figure (86%) is considered good. However, of the same group, under the same conditions, only 62% stated that they had seen the DMRP Information Exchange Bulletin prior to the interviews. It follows, therefore, that 24% of the interviewees (86% less 62%) had become aware of the Program through some communcation mechanism other than the Bulletin. It cannot be assumed, though, that all of these 24% were necessarily aware because of other DMRP dissemination efforts, both structured and unstructured (such as distribution of work unit reports, audio-visual presentations at various Districts and informal meetings and conferences with Program staff personnel) as opposed to their learning of the Program through coworkers or other non-DMRP sources. The findings of this study indicate that substantial intra-District information transfer occurs through verbal communication. Consequently, with respect to the demonstrated incidence of DMRP awareness, under recall-assist, of 86% awareness, at least 72% (62%/86%) was almost certainly attributable to the direct effect of other DMRP information transfer efforts, with some unquantifiable fraction of the rest occurring as a consequence of secondary or derivative dissemination.

The findings of the self-administered questionnaire survey showed that 28% of all respondents who had dredging assignments exhibited spontaneous awareness (i.e., without recall-assist) of the DMRP. In view of the fact that the Program had been in existence for about two-and-a-half years at the time the survey was conducted, this figure might appear somewhat low. However, its proper assessment requires consideration of two factors. First, dredging operations constitute only one of many classes of District activities in which the survey participants were engaged and which, therefore, competed for their attention. The survey results show that more than 50% of dredging-assigned personnel devote less than 21% of their time to maintenance projects and that more than 70% of these personnel devote less than 21% of their time to new work. Second, the dredging-assigned personnel samples were somewhat different in the two surveys. Those participating in the direct interviews had been assigned to dredging operations for at least six months. The dredging-assigned participants in the self-administered questionnaire survey, on the other hand, included those with less than six months of such assignment experience. These individuals constituted about 23% of the dredging-assigned portion of the total survey sample. Both of these factors would tend to reduce the incidence of awareness of the DMRP as determined through the self-administered questionnaire survey. It should further be recognized that unawareness, in terms of this survey, does not <u>necessarily</u> mean ignorance of the Program. A respondent might have known about the Program at the time of the survey, but this knowledge could have lain outside of immediate consciousness and remained unevoked. Because of the nature of the survey procedure, it is impossible to distinguish between the absence of any awareness (i.e., ignorance) and unevoked knowledge.

The self-administered questionnaire survey was not designed to evaluate the respondent's factual knowledge of the DMRP, as opposed to his spontaneous awareness of the Program. However, such an evaluation was possible on the basis of the responses elicited during the personal interviews. For the purposes of this study, knowledge of the

DMRP was defined as a clear understanding of the scope of the Program in terms of its four major project areas, rather than familiarity with the details of its published technical findings. Analysis of the interview documents shows that while only one of the respondents had an accurate and comprehensive knowledge of the DMRP's technical structure, even at its most general level, about 24% had a good understanding of those Program research areas that related to their work. This is consistent with other study observations showing that most dredging-involved personnel tend to focus on subject areas of specific interest to them. The findings suggest that the District personnel do not perceive the DMRP as a cluster of individual, but coordinated and related project efforts, converging over time toward a relatively small number of defined goals, but rather as a mosaic in which some elements appear rather sharply outlined and others indistinct or barely visible. Aside from the fact that the District personnel tend to be selective in their dredging-related interests, it must also be noted that the Bulletin, on an issue by issue basis, is also selective in the sense that different issues focus on different areas of DMRP activity. This is inherent in the nature of the periodical. However, comprehensive summaries of the DMRP technical structure appear in the publication only occasionally and these can easily be forgotten by readers whose interests in dredging operations are not extensive.

Self-Administered Questionnaire Survey

Current DMRP information dissemination practice consists largely of the distribution of printed materials (Bulletins and reports) and is therefore appropriate to that segment of the Program audience that is inclined toward optional job-related reading. This is consistent with one of the key findings of this survey, namely, that more optional job-related reading is done by the DMRP aware than by the unaware portion of the survey sample. The study results also show that supplementary interpersonal forms of communication could materially

increase the extent of knowledge and understanding of the DMRP within the Districts. (This conclusion is consistent with the results of the personal interview survey which show that many District personnel believe that they learn more effectively through verbal than through printed communication modes.) Only about 25% of dredging-assigned personnel read newsletters and reports in their entirely. Most readers (about 70%) scan these publications for items of specific interest to them. On the other hand, Corps directives and guidelines are read in entirety by more than 50% of the personnel sampled, probably because familiarity with such issuances is considered more obligatory.

As already pointed out, most Corps District personnel with dredging assignments have other assignments also, so that their interest in dredging tends to be job-related rather than research oriented. This suggests that information and technology transfer which is keyed to self-oriented job-relatedness, rather than to dredging research as such, should be more effective in the majority of cases.

The turnover rate of 20% per six months among dredging-assigned personnel indicated by the results of the self-administered questionnaire survey is considered to be detrimental to effective information transfer. It strongly suggests the need for a continuing educational process.

Most job-related activities are perceived by the District personnel as imposing demands for the acquisition and use of new information. However, certain activities are so perceived by larger numbers of the respondents than are others. For example, engineering, planning and administering were most frequently rated as information demanding activities, while very few considered that organizing, selecting or testing imposed such demands. This suggests that the use in the Bulletin, within appropriate contexts, of job activity descriptors which are most frequently associated with perceived informational demands could prove useful in alerting its readers to the relevance of information items to their needs and interests.

There is a positive association between the relative incidence of awareness of the DMRP and GS (Civil Service) grade. Greater percentages of the aware (than of the unaware) respondents with dredging assignments fell within the higher GS ratings (of 13 and above) than within the lower. This finding is consistent with the presumptively greater need to know, longer history of Corps service and broader extra-District contacts which would be expected of those at higher GS levels.

"World Dredging" is considered more frequently relevant to the respondents' job information needs than the DMRP Bulletin by a substantial percentage of aware personnel. It should be noted, however, that "World Dredging" is much broader than the Bulletin in terms of the range and variety of subject matter treated and is thus more likely to appeal to the non-specialist segment of the District readership.

About 50% of the unaware respondents were found to be unaware not only of the DMRP, but also of other Corps research programs. This implies a broad gap in information transfer within the Corps that transcends the more specific question of the DMRP's communication effectiveness.

There appear to be identifiable differences between the DMRP aware and unaware with respect to the technical study areas of interest to them. For example, the unaware are more likely than the aware to know of Corps developed information relating to hydraulics, instrumentation and computers. It is therefore possible that many District personnel may be unaware of the DMRP because of a dominant orientation toward technical areas unrelated to dredging.

A higher percentage of aware than of unaware personnel takes (or has taken) two or more professional/technical courses offered by Corps elements other than their own Districts (43.2% vs 28.3%). This trend also applies to courses of the management/administrative type (19% vs 10%). In view of the fact that course attendance at Corps facilities other than the home Districts may

impose appreciable inconvenience, this finding suggests the possibility of a career directed characteristic with respect to which the orientations of the aware and unaware may differ.

The survey findings show that, on the whole, the inherent work-related attitudes of the survey respondents are conducive to high quality job performance. Thus, a considerable potential exists in the Districts for producing effective results, once technology has been effectively transferred. However, the respondents' perceptions of different District work climates, as distinguished form their overall work attitudes, vary considerably from District to District. Within any one District, these perceptions exhibit definite trends that are essentially independent of both DMRP awareness/unawareness and the individuals' job assignments. In evaluating the respondents' perceptions of specific District work climate factors from the perspective of how these factors could or might influence District receptivity to information and technology transfer, it was found that certain Districts consistently appear at the upper end of the receptivity range and others at the bottom. This consistency is not believed to be of chance occurrence. The existence of identifiable receptivity differences among Districts suggests that these differences should be considered in the design of information transfer mechanisms.

Major areas of District personnel dissatisfaction relate to:

(a) adequacy of information provided by supervisors and coworkers,
(b) opportunities for growth and development, and
(c) opportunities for promotion.

The study findings show that a significant fraction of the District personnel feels that its prospects for advancement and progress are limited or inadequate. As a problem area, this lies, of course, wholly outside the scope of the DMRP. It is suggested, however, that addressing this area effectively could contribute substantially to the stimulation of personnel motivation and consequent work effort and thus to the enhancement of District receptivity to technology transfer.

Dissatisfaction of District Personnel is minimal with respect to:

(a) receipt of fair and impartial treatment from coworkers,
(b) opportunities for participating in budget setting, and
(c) freedom to experiment.

It should be noted that the above three factors are considered by the survey respondents not to be problem areas for two quite different reasons. The District personnel feel that fair treatment from their coworkers is a prevalent condition. Therefore, there is no basis for dissatisfaction in this regard. On the other hand, while opportunities for participating in budget setting and freedom to experiment are not considered to be prevalent, neither, however, are they regarded as important, by most survey participants, in relation to personal goal attainment. Consequently, they are not significant foci of discontent unlike the previous set of factors which directly affect personal achievement possibilities. The lack of concern exhibited by the respondents with respect to the low prevalence of freedom to experiment is not conducive to receptivity to new and innovative technologies.

Most respondents believe that dependability on the job and cooperation with others are the most important factors considered by the District divisions in awarding promotions. Few respondents consider that either contribution to knowledge or length of service in the Corps is also important in this context. This reflects a "don't rock the boat" attitude which is appropriate for an organization engaged primarily in repetitive work. This attitude is not, however, highly conducive to technological innovation. (In this connection, it will be recalled that, while freedom to experiment was not considered prevalent, its lack of prevalence was not a source of widespread dissatisfaction.)

The DMRP aware personnel tend to be more inner-directed than the unaware in terms of job orientation and work relationships. (Inner-directed individuals are generally more self-sufficient than those characterizable as other-directed.) This is consistent with the finding

that the aware do more optional work-related reading than the unaware and also supports an earlier conclusion to the effect that printed information dissemination to other-directed personnel could be advantageously supplemented by interpersonal (verbal) communication modes.

A substantial percentage of dredging-assigned personnel, both aware and unaware, has working contacts with agencies and organizations outside of the Corps. Several of these agencies and organizations are environmentally oriented and, as perceived by many respondents, tend to adopt a critical anti-dredging stance. There is, therefore, a real requirement that District personnel having contacts of the above type be knowledgeable with respect to DMRP research findings, particularly those relating to the amelioration of the adverse effects of dredging operations and to the development of more environmentally compatible disposal alternatives.

The orientations of the survey respondents toward outside organizations and agencies vary considerably. Of the Federal agencies considered in the survey, the attitudes toward the USGS were the most favorable and toward the FWS were the most negative. The USGS is a cooperative information source which, typically, does not assume a critical position with respect to Corps District operations. The FWS, however, does comment, not always favorably, on proposed District operations and can delay or obstruct contemplated Corps permitting actions.

Personal Interview Survey

In reviewing the following conclusions based on the personal interview survey, it will be recalled that approximately three-fourths of the survey sample had been assigned to dredging operations for at least 6 months and that the balance of the sample was engaged in environmental inventory and assessment at least 20% of the time.

As already stated, awareness of the DMRP under recall-assist conditions was fairly widespread (86%) among the interviewees.

Approximately one-half of those who were aware of the Program had first learned of it through verbal communication, rather than through the DMRP Bulletin. The importance of interpersonal information transfer within the Districts can be inferred from this.

Knowledge and understanding of the broad scope of the DMRP, as distinguished from awareness that the Program exists, were found to be relatively rare. Knowledge of the DMRP is particularly low in at least two Districts that also had low information receptivity ratings, based on the self-administered questionnaire survey data. This association is not believed to be accidental.

Only a small percentage (roughly estimated as less than 20%) of the interviewees appeared to be interested in dredging and disposal operations in a comprehensive sense. The majority of them focus on those items of dredging-related information that are considered to apply to their particular project problems. This suggests the possibility that information that relates indirectly, rather than directly, to their technical work areas may not, even though this information could be important, be recognized as pertinent in all such instances, unless its relevance were identified and explained.

Awareness of the DMRP Bulletin, under recall-assist conditions, is less frequent than awareness of the Program under the same conditions (62% vs 86%). (Note that while all survey participants who were aware of the Bulletin were necessarily also aware of the DMRP, the reverse was not the case. Many interviewees who knew of the existence of the Program through some source other than the Bulletin, such as verbal communication or the receipt of work unit reports, did not know, prior to the interviews, that the DMRP published and distributed a periodical.) However, although awareness of the Bulletin was encountered less frequently in the survey than awareness of the DMRP, knowledge of the Bulletin was more widespread among the Bulletin aware than was know-

ledge of the DMRP among the DMRP aware.* Also, of those with moderate to extensive knowledge of the Bulletin, about 40% had comparable knowledge of the Program, while of those with moderate to extensive knowledge of the Program, 61% had comparable knowledge of the Bulletin. It is concluded, accordingly, that knowledge of Bulletin content in itself does not, in the cases of most Corps District readers, necessarily ensure their acquisition of a corresponding level of understanding of the scope of the DMRP. This is believed to be due to two factors that were previously identified. First, the Bulletin rarely summarizes the DMRP project areas in a manner which would reinforce the readers' recollections of the basic technical structure of the Program. Second, a large percentage of the Bulletins' recipients read the periodical very selectively. (This conclusion should not be interpreted to mean that knowledge of the Bulletin is not contributary to knowledge of the Program. It means that it is less contributary than might have been expected.)

Secondary or derivative distribution of the Bulletin within the Districts contributes significantly to its total dissemination, but not necessarily to an increase of information transfer to its primary target audience in like proportion. Not all secondary recipients are necessarily personnel with dredging assignments or environmental interests. This is consistent with the finding that many of the interviewees had never seen the Bulletin prior to the survey. The percentages of these interviewees (i.e., interviewees who had seen the Bulletin for the first time during the interviews) do not appear to relate, on a District by District basis, to the proportional distributions of Bulletins to the Districts surveyed. (By proportional dis-

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* The term "knowledge" in the cases of both the Bulletin and the DMRP means moderate to extensive knowledge, corresponding to a scoring range of 4 - 6 on a scale of 1 - 6 which was used for these assessments. The ratio of percent knowledge of the Bulletin to percent awareness of the Bulletin was 0.76; for the DMRP, the equivalent ratio was 0.23.

tribution is meant the percentage ratio of Bulletin copies sent by the DMRP to a given District to the number of personnel, in that District, who had been identified through the self-administered questionnaire survey as assigned to dredging operations.) For example, 34 dredging-assigned personnel of GS-9 level or higher were identified in District 9. This District received (as of October 20, 1975) 10 copies of the Bulletin. The proportional distribution is, therefore 10/34 = 29.4%. In the case of District 5, the proportional distribution was 7/22 = 31.8%. Thus, the proportional distributions to thse two Districts were very similar. However, the percentage of District 9 interviewees who had not previously seen the Bulletin was 48, while for District 5 it was 19. From these findings it is clear that the effectiveness of secondary distribution within Corps Districts in expanding information transfer to the DMRP's prime audience varies significantly among the Districts. In addition, the numbers of copies of the Bulletin distributed to the Districts do not correlate with the sizes of the target audiences in them. (The proportional distribution, as defined above, ranged from 26.6% to 61.5% for the 12 Districts surveyed through the self-administered questionnaire.)

About three-quarters of the interviewees who exhibited at least some degree of familiarity with the Bulletin regard the publication favorably. Some areas of dissatisfaction with the Bulletin relate to the absence of topics the readers would like to see discussed, rather than to its existing contents. Criticism of this type reflects the fact that the Bulletin is in reality what it purports to be, namely, an account of the DMRP and its activities as opposed to a publication of more general scope that addresses dredging-related topics on a comprehensive basis.

Awareness of the DMRP reports was found to be limited among the District personnel. About 59% of the interviewees had not heard, prior to the interviews, of any of the 16 titles that had been issued at the time of the survey. The incidence of awareness of the reports

(41%) might seem somewhat low, in view of the presumptive need to know of the target audience. However, of the aware respondents, about 65% had read or scanned at least one copy and nearly 53% had examined two or more copies. This last figure corresponds, however, to somewhat less than 22% of the total survey sample. The general conclusion reached earlier in this study (on the basis of the self-administered questionnaire survey) to the effect that current DMRP information transfer methods are appropriate only for that fraction of the District audience that is inclined toward optional job-related reading is supported by the above findings. (This fraction is a minority of probably under 25%.)

A preponderance (over 50%) of the personnel assigned to dredging operations and to environmental inventory and assessment regards most of the DMRP report subject areas as relevant to its informational needs.

The usefulness of DMRP research objectives, as perceived by the survey participants, varies over a wide range. Program efforts that address (a) the effects of dredging on water quality, (b) effects of land disposal of dredged material, and (c) the beneficial uses of land disposal are at or near the top of this range. The concept of manufacturing marketable products from dredged material is at the bottom. This suggests an environmental and conservationist orientation which should, in itself, favor receptivity to DMRP developed information, provided that this information is presented in proper form and can be shown to be relevant at the local District project level.

There is a pervasive feeling among the District personnel that the amount of available basic information and data pertaining to dredging operations is inadequate to their needs. About one-half of the interviewees held this opinion. A systematic treatment of the fundamentals of dredging practice would be of considerable value in assisting relatively inexperienced District personnel in their understanding and use of the more sophisticated informational products of the DMRP. The high turnover rate of dredging-assigned personnel emphasizes the requirement for an introductory presentation of the subject.

Most respondents believe that economic costs (as compared with technological, environmental and other factors) most frequently affect the selection of dredged material disposal alternatives.

Although not always encouraged by the District climates, a substantial degree of technical initiative, as well as the capability for innovative problem solving, exists among the District personnel. The findings of this study clearly show that there is a high potential for the effective application and, possibly, even the further refinement of DMRP-developed technology.

As already stated, a substantial fraction of the District personnel favor interpersonal modes of information transfer. They believe, for various reasons, that they learn more easily and effectively through these modes than through the use of printed materials. This finding, which emerged in explicit form during the personal interviews, directly supports other conclusions reached in consequence of the self-administered questionnaire survey that strongly favor the desirability of supplementing written information materials with verbal tutorial methods.

Intra-District communications, at least within organizational groups, are generally perceived as good. This implies a favorable climate for local information transfer and diffusion through interpersonal learning modes.

It is difficult to assess the effectiveness of DMRP staff presentations of the Program because only 25% of the interviewees had observed these. Most of the attendees considered that the presentations satisfactorily explained the DMRP and its principal goals, but felt that they tended to be dull rather than stimulating. This impression may reflect the fact that while these presentations provide a good overview of the Program in terms of its technical structure, research activities, and so forth, they do not usually emphasize the relationships of DMRP objectives and findings to known major dredging or disposal problems within the District areas. It is suggested, therefore,

that the presentations may not be perceived as stimulating because they do not stress the potential applicability of Program activities to local problems in a manner which would trigger within the audience a sense of direct relevance of the DMRP to its immediate concerns.

Non-Corps Information User Survey

In terms of environmental orientation, most of the non-Corps recipients of the DMRP Bulletin are interested in water quality. This interest might be regarded as axiomatic because many of these recipients are on the mailing list at their own requests. It was not, however, assumed a priori that all those who requested the Bulletin necessarily did so out of technical interest, rather than out of curiosity or for some other reason. The findings indicate that the Bulletin is reaching an appropriate non-Corps audience.

Most non-Corps recipients of the Bulletin consider that its informational content is adequate, at least in terms of their own needs and interests.

Most non-Corps readers of the Bulletin consider the publication to be valuable. Referral to past issues is common and very few discard their copies after reading them.

Non-Corps secondary or derivative readership of the Bulletin is fairly high. Analysis of the findings from the telephone interviews suggests that this readership approximates 5 individuals per copy.

About one-fourth of the Bulletin's non-Corps readers believe that the publication is prepared and distributed as a public relations instrument, rather than for the primary purpose of information dissemination. (This view is not common within the Corps Districts.)

The relative incidence of moderate to extensive familiarity with the Bulletin content is somewhat higher among non-Corps, than among Corps readers (approximately 46% vs 35%). This may be explainable on the basis that, as stated, many of the non-Corps recipients of

the Bulletin requested the publication and, therefore, may be presumed to be more highly motivated to read their copies. Requests for the Bulletin from Corps District personnel, on the other hand are comparatively few.

Most of the non-Corps Bulletin recipients consider that the aquatic impacts of dredging operations present the highest priority of dredging-related research needs. This could be expected, in view of the fact that these recipients are predominately water-quality oriented.

Awareness of the existence of DMRP reports on a percentage basis is higher among the non-Corps recipients of the Bulletin than among the District personnel surveyed by direct interview (63% vs 41%). However, their (i.e., the non-Corps Bulletin recipients) knowledge of the report technical areas is often vague and impressionistic rather than exact.

PART V: RECOMMENDATIONS

The recommendations presented here include comprehensive system approaches to the enhancement of information transfer to Corps Districts, in addition to more specific suggestions. These approaches taken collectively, relate both to the DMRP as an information sender, and to the receptivity of the District audiences. This system orientation, which emphasizes the importance of the responsiveness of the receiver in the information transfer process, is, as the survey findings show, particularly appropriate in the context of this study. In the opinions of the authors of this report, the key objective of stimulating the acceptance and utilization of DMRP-developed information and technology by the District personnel will not be optimally achieved by either superficial modifications of existing dissemination methods or by single and isolated actions. Although much of the following discussion relates to the diffusion and transfer of DMRP-generated information to the Districts, it will be evident that many of the observations made could be directly applicable to other Corps technology transfer programs.

The immediately following section focuses on the transfer of DMRP-developed information to the Corps Districts from a system oriented standpoint. It first summarizes several pertinent system considerations and the system requirements these considerations define. It then identifies broad approaches that are directly responsive to these requirements. The next section lists various specific recommendations that are applicable to the existing pattern of DMRP information dissemination to its Corps and non-Corps audiences. This part of the report concludes with a final recommendation that is addressed to the Corps as a whole, rather than to the DMRP in particular.

System Approaches

Considerations and Requirements

Any system approach to information and technology transfer must take into account certain general considerations, of which the most critical are initially set forth below. Situation specific factors of immediate pertinence in the context of DMRP's information transfer objectives are then identified.

Broadly speaking, virtually all acquired knowledge is derived from either instruction (both impersonal and interpersonal) or direct experience. The degree to which presented knowledge is absorbed and assimilated is, in any individual case, influenced by:

a) Intensity of Motivation

Motivational intensity is, in turn, influenced by other factors, such as inherent or acquired interest. In the case of job-related information, this intensity also reflects the degree of need to know. Interest and the need to know may exist simultaneously and thus overlap. The extent of such overlap will clearly be higher in the case of an individual who likes and enjoys his job assignment than in the case of one to whom it is an obligatory chore.

b) Comprehension

The ease with which the receiver absorbs and assimilates information is obviously in part dependent on the relationship between the level of technical presentation of the information and the degree of his own technical sophistication*. The relative ease of comprehension will

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* The inherent character of the information is, of course, also a relevant factor in the general case. However, most of the DMRP-developed information disseminated to date is not considered, innately, to pose a serious conceptual challenge, although there is an appreciable range of variation of the technical level at which this information is presented in the work unit reports.

also be influenced by the receiver's overall informational background with respect to a particular topical area. New information that is perceived as additive to something already known is usually more easily comprehended than that which is, or appears to be, unrelated to a preexisting informational framework. (Aside from the influence of the relatedness of new information to previous knowledge on the ease with which it is understood, the same relatedness may also affect the perceived relevance of the new information. Thus, although this information may relate to the recipient's specific job assignment, an apparent lack of an obvious and direct association (as perceived by him) between this information and the familiar conceptual background underlying his work activities may leave him unaware that a need to know does, in fact, exist. In such a case, the information may be casually disregarded as irrelevant or extraneous.)

In the formulation of a system approach to DMRP information transfer to the Corps Districts, both the character of the audience and the nature of the work climate within which it functions must be considered in relation to the above factors and in relation to the DMRP and the information it disseminates. These relationships, when considered in the context of the specific sender and audience attributes they reflect, provide the basis for (a) the identification of the key requirements the total transfer system must meet for the effective accomplishment of its purposes and (b) the subsequent structuring of a system approach that will satisfy these requirements.

The various attributes of the Districts as institutional entities, of the Corps personnel audience, and of the DMRP that are cited below as particularly germane in the context of this discussion reflect facts and statistical findings arising directly from the surveys as well

as, to some extent, other information and impressions derived during the course of the study.

- District Attributes

  a) District Receptivity Climates

  The Districts, as a whole, are not viewed by Corps personnel as highly receptive to new ideas and technology originating from without. Further, specific District climate factors which may or do influence such receptivity are perceived by the survey respondents as varying substantially in their prevalences among the Districts

  b) Inter-District Communications

  As this study progressed, a strong impression was gained to the effect that the Corps Districts operate autonomously and, to a considerable extent, in isolation from each other*. For example, a particular solution to a dredging or disposal problem may have been developed by the personnel of District A. District B, though faced with a very similar problem, may be wholly unaware of District A's innovative approach.

- Attributes of the District Audiences

  a) Interest in Dredging Operations

  Most District personnel are not interested in dredging operations in a comprehensive sense. They tend to focus on the specific technical aspects of these operations with which they are directly and immediately involved.

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* This impression developed from, and was reinforced by, informal conversations with various Corps personnel. Because the topic of inter-District communications was not explicitly addressed in the survey questionnaires, it is not referenced in Part IV of the report.

b) Technical Sophistication

District personnel vary over a wide range in their levels of technical sophistication. This applies both to their degrees of professional training and experience and to the comprehensiveness of their knowledge of dredging and dredging-related operations.

c) Extent of Dredging-Related Experience

Typically, most District personnel who are assigned to dredging-related operations devote only a portion of their time to these activities because of other concurrent job assignments. Furthermore, there is a significant turnover in dredging-assigned personnel of about 20%/6 months. Because of these factors, relatively few individuals in any one District have both extensive and in-depth dredging experience.

d) Awareness of the DMRP

Inner-directed personnel, who tend to devote more time to optional job-related reading than the other-directed, also exhibit a higher incidence of awareness of the DMRP than the latter. Nevertheless, the data suggest that other-directed personnel could be made responsive to DMRP outputs if appropriately stimulated.

- Attributes of the DMRP

a) The Program as Perceived

The DMRP is viewed, not without justification, as generic in its technical approach, rather than as focusing on specific District dredging problems. Its underlying relatedness to local needs is not always evident to some of its intended audience.

b) Limited Duration

The fact that the DMRP will terminate in March 1978 is important because the Program staff will not be

indefinitely available for the provision of District support.

The above considerations, together with other findings presented in this report, identify the key system requirements, both institutional and methodological, to be satisfied, if the DMRP's information transfer objectives are to be realized to the maximum. In terms of the District audiences, the system must be self-motivating and self-perpetuating. These requirements are essentially institutional in character. In terms of the disseminative function of the DMRP, its information must be transmitted in a format that incorporates a bridge (correlating mechanism) between the Program findings on one hand and the local District needs on the other. This requirement is methodological.

System Approaches

Broad system approaches to the above requirements are:

- Self-Motivation

  As the findings of this study show, there is considerable evidence of initiative and resourcefulness on the part of District personnel in the development of innovative approaches and solutions to specific dredging-related problems. On the other hand, as pointed out, there is correspondingly little tendency to open and informal interchanges of new procedural ideas among the Districts. There could, therefore, be a real advantage in establishing a common center, within the Corps, for the collection and subsequent diffusion of District-developed technology as well as innovative District applications of DMRP-generated concepts and methods. Through the effective operation of such a center, the Districts would be assured that awareness and knowledge of their successes in meeting new technical challenges would be disseminated throughout the Corps.

- Self-perpetuation

  In view of the limited future duration of the DMRP and because of the relatively high District turnover rate of dredging-assigned personnel, the need for self-perpetuation of the overall information transfer system is self-evident. This, however, is not likely to be achieved except through the establishment within the Districts of teams of individuals with broad knowledge of dredging operations and familiarity with the specific dredging projects (and associated problems) within their District areas. The team members should also be knowledgeable with respect to DMRP-generated information and experienced in the use of the necessary information transfer mechanism to be developed and implemented for enabling and facilitating the application by District personnel of the DMRP products to their immediate job-related needs. These teams, operating as tutorial centers within the Districts, would serve a general role as local foci of information dissemination, as well as the more specific function of providing instruction and guidance in the use of the DMRP information transfer mechanisms amd in the application of Program findings.

  The surveys performed in this study show that a substantial percentage of the dredging-assigned personnel in all Districts favors interpersonal modes of information transfer. However, the scope, variety and complexity of the DMRP research outputs are clearly incompatible with their adequate and effective transfer through exclusively verbal forms of communication. This is one reason for the need of an appropriate transfer mechanism. Interpersonal dissemination within the Districts is thus seen as a necessary supplement to, though it cannot be a replacement for, impersonal (printed) modes of information transfer.

The organization and training of the District teams will require an appreciable measure of effort on the part of the DMRP staff. Groups of Program personnel are envisioned as circulating among the Districts, catalyzing the formation of District teams, and familiarizing them with both the technical outputs of the DMRP (in the context of District applications rather than from a programmatic orientation) and the design and operation of the information transfer mechanism. As the District teams gain increasing knowledge of DMRP-generated information and expertise in the operation of the information transfer mechanism, the role of the Program staff in relation to the Districts is seen as gradually waning and finally vanishing as the system achieves total self-perpetuation.

- Information Transfer Mechanism

  Two major conclusions of this study with respect to the transfer of DMRP-developed information and technology to the Districts were that the work unit reports, though necessary Program outputs, are not optimal transfer mechanisms and that there is a perceived disjunction between DMRP research results (regarded as generic) and local District informational needs which are virtually always project specific. There is thus a requirement for a DMRP information transfer mechanism which will (a) incorporate all practically applicable elements of the findings and methodologies developed by the Program, appropriately organized and classified on a topical basis and (b) provide a built-in information retrieval system that will permit the user to immediately identify and access those portions of the information base which relate to the dredging project of direct concern to him.

The general system approaches to the enhancement of DMRP information transfer to Corps Districts that are suggested above were formulated in response to well defined situational needs that became evident from the study findings, and not on the basis of what may be institutionally acceptable. In this context, implementation of the recommendations made with respect to stimulating District self-motivation might, admittedly, seem difficult to achieve because of reputed District tendencies to maintain isolation from each other. It is pointed out, however, that the greater the degree to which the Districts may view isolationist policies as supportive of their inter-District competitive positions, the greater is the likelihood that this motivation may be transferrable from a closed to an open pattern of rivalry, provided that acceptance of this pattern could be shown to be free of any threat to their respective autonomies in other areas of sensitivity or concern. The recommendation that DMRP information transfer be established within the Districts on a self-perpetuating basis through appropriately qualified teams is likely to be adopted and acted on by the Districts only if they perceive, whether spontaneously or otherwise, that the organization and support of these teams will directly and substantially contribute to their own interests. The findings of this study strongly suggest that the Districts would not establish and maintain information transfer centers on the basis of their academic desirability alone. They are basically mission, rather than tutorially, oriented.

The capability of the DMRP for implementing, or stimulating the implementation of, the three recommended system approaches varies considerably from one to another. The establishment and development of District-wide self-motivation, based on the approach suggested in this report, obviously lie wholly outside of the scope and authority of the DMRP. Its effective realization would require both broad administrative support within the Corps and enthusiastic, rather than merely formal, acceptance by the Districts. However, the findings of this study indicate that the adoption of this approach to self-motivation would

not only enhance the quality of the District climates in terms of their receptivity to information transfer, but would also stimulate and encourage the further expression and utilization of the innovative capabilities of the District personnel. In addition to a favorable impact on the transfer and application of DMRP-generated information and methodologies, the broader consequences would benefit the Corps throughout the total gamut of its programmatic activities. The requirements for the successful implementation of the recommendation made with respect to self-motivation (administrative support and District acceptance) are equally applicable to the creation of self-perpetuating local (i.e., intra-District) information and technology diffusion centers. In this case, although the DMRP obviously cannot initiate this approach. it would be a key participant in the training and support of these centers, particularly during their early stages. The third recommendation, unlike the other two, is entirely within the DMRP's implementary capability. The development and construction of an information transfer mechanism specifically designed to meet the criteria previously identified in this discussion could be readily initiated and supported as a component activity of the existing Program. The availability of this mechanism is an obvious prerequisite to the implementation of the second recommendation (self-perpetuation). However, the need for the information transfer mechanism is independent of whether or not the other two system approaches are ultimately realized, although such realization would improve the receptivity climates within which the system is to operate.

Specific Recommendations

The following recommendations apply to the current structure of the DMRP's information dissemination methods, with specific reference to the Bulletin and the work unit reports. These recommendations are presented in association with the considerations on which they are based.

- Distribution of the work unit reports to the Districts should be continued for at least two reasons. First, these reports are read by an appreciable, though small,

fraction of their intended audience. Second, the establishment of an appropriate DMRP information transfer mechanism of the kind alluded to earlier will not eliminate the need for complete District files of the reports. Report informational components which may not be appropriate for inclusion within the mechanism's information base for any reason should, nevertheless, be directly identifiable through citation provided by the retrieval system of the mechanism.

- Although the reports are issued as individual documents, they are often interrelated, either through direct association of the topical areas treated, or indirectly through their relationships to the overall DMRP technical organization. It is therefore suggested that each report include a summary presentation of both the DMRP technical structure, with an indicator identifying the Program Task to which the report relates, and a listing of the titles of other reports whose subject matter is topically relevant. This would serve the purposes of (a) familiarizing report readers with the programmatic scope of the DMRP, (b) providing a perspective from which a particular report can be viewed in proper relationship to the Program as a whole, and (c) alerting readers to the existence of other DMRP report materials of potential interest to them.
- Because of the relatively low levels of accurate knowledge of the technical structure of the DMRP as exhibited by both Corps and non-Corps recipients of the Bulletin, it is recommended this structure be presented in the publication more frequently (such as every second or third issue), even if space limitations preclude such presentation in other than synoptic form. Bulletin references to the project tasks to which cited work units relate would be

more meaningful to readers with only slight knowledge of the DMRP if these references could be keyed to a structural outline of the Program.

- Even though moderate to extensive knowledge of the Bulletin has not been found to assure comparable knowledge of the DMRP, it does contribute to some degree to this knowledge. Further, many readers, who may not be interested in the DMRP as a whole, are interested in specific topics addressed by the Program. These considerations, coupled with the finding that relatively high percentages of the personnel at various Districts who typify the DMRP's prospective audience had never seen the Bulletin, suggest that distributions to the Districts should be increased. Distribution could be appropriately targeted by supplying the Districts with simple forms to be filled out by personnel wishing to receive the Bulletin as primary recipients. This suggestion should be considered in association with the study finding to the effect that current Bulletin distributions to the different Districts do not relate to the sizes of the potential audiences.
- It is recommended that the Bulletin mailing list of non-Corps addressees be periodically corrected. It was noted that many of the individual list entries are no longer valid. Such correction can readily be accomplished by mailing a card to each addressee, asking whether continued receipt of the Bulletin is still desired. The message should make it clear that failure to return the card by some given date will result in termination of the mailing.
- There are many individuals who are unaware of the DMRP but who have environmental interests in dredging operations and who would be appropriate Bulletin recipients.

It is suggested that such candidate individuals be identified through review of recent Final Environmental Impact Statements (EIS's) addressing Corps dredging projects. Many persons, including both local officials and private individuals to whom these projects are matters of interest or concern, respond to the opportunities offered for commenting on the Draft EIS's and can be identified in the Final EIS's.

Dredging Primer

Independently of the recommended system for the transfer of DMRP-generated information and technology to the Districts, there is a clear need, as already stated in Part IV of this report, for an elementary, but fairly comprehensive documentary presentation of various important aspects of conventional dredging and related operations. This should be designed to provide the reader with a general understanding of dredging equipment, procedures, pertinent economic and environmental factors, dredged material disposal practice, and other relevant topics, rather than with minutely detailed descriptions and analyses of these areas. A presentation of this kind would be quite useful to a substantial number of dredging-assigned personnel whose knowledge of dredging operations is fragmentary and who expressed their need for an overview treatment of the topical area. A dredging primer would also be useful in providing conceptual framework which would facilitate the subsequent understanding and assimilation, by these individuals, of the more specialized DMRP outputs. The development and preparation of a document of this kind is, obviously, in no sense a DMRP responsibility. This recommendation is advanced for consideration by the Corps as a whole, rather than by any particular organizational element.

APPENDIX A

CORPS DISTRICT SURVEY QUESTIONNAIRES AND TOPICAL AREAS DISCUSSED WITH NON-CORPS DMRP BULLETIN RECIPIENTS

The self-administered questionnaire used in the survey of 12 Corps Districts is presented in pages A-2 through A-9.

The direct personal interview questionnaire used in the subsequent survey of 6 of the above Corps Districts is shown in pages A-10 through A-22.

The topical areas discussed during the telephone interviews with non-Corps recipients of the DMRP Bulletin are listed in pages A-23 and A-24.

Self-Administered Questionnaire

CIVIL WORKS JOB ENHANCEMENT AND INFORMATION SURVEY
(On completion estimate total time required) Date_____

What is your principal area of work responsibility?

Military ☐
Civil Works ☐
Both ☐

If your response is "Military", do not continue; return this questionnaire.
If "Civil Works" or "Both" continue.

1a. To which of the listed "project areas and related activities" are you presently assigned?

b. If you are assigned to more than one project area, indicate the approximate percent (%) of time you allocate to each in column b.

c. Has your assignment to the project been for more or less than a six month period. (Column c)

d. Do you have an interest, whether or not job related, in any project area?

Yes ☐ 1 No ☐ 2 If "Yes" check those project areas in the column headed "Have an Interest"

Civil Work Project Area and Related Activities		a. Assigned		b. % Time					c. Six Months		d. Have an Interest	
		Yes	No	1-20%	21-40%	41-60%	61-80%	81-100%	Less than	And More	Yes	No
Basin Planning	07	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
Bridge Construction, Alteration	11	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
Clearing Waterways	15	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
Dam, Reservoir and Water Control	19	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
Dredging												
a. Maintenance	23	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
b. New Work	27	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
Environmental Inventory and Assessment	31	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
Flood Control	35	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
Hydroelectric Power	39	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
Recreation Resources	43	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
Shore Protection and Restoration	47	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
Urban Development	51	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
Waste Treatment	55	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
Water Supply and Irrigation	59	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
Emergency Operations	63	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2	☐ 1	☐ 2
OTHER Projects (Specify)_____	67	☐ 1	☐ 2	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 1	☐ 2		

2. Name the organizational categories to which you are currently assigned. (Please Print) -70

Division _____ -71

Branch _____ -72

Section _____ -73 -74

3. What is your present Military or Civil Service job title? _____ -75

If civil service, what is your present GS rating? _____ -76

4. Identify your area of expertise or specialization. (ie, agronomy, administration, computers, environmental analysis, human factor engineering, civil, marine, etc. engineering, materials of construction, navigation, law, soil mechanics, wave propagation, etc.) -77

(Please Print) _____ -78 -79

5. In your job, what percent (%) of working time is normally spent away from your usual job location? -80

none ☐ 1 21 - 40% ☐ 3 61 - 80% ☐ 5
1 - 20% ☐ 2 41 - 60% ☐ 4 over 80% ☐ 6

6. In the list of job activities, below:
   a. Check all the activities you usually perform in connection with your job.
   b. Of these, identify the three (3) you consider primary to your job. (Answer by circling three (3) activity words.)

Authorizing . . 07 ☐	Arbitrating . . 19 ☐	Analyzing . . . 32 ☐	Delegating . . 47 ☐
Administering . 08 ☐	Appraising . . 20 ☐	Investigating . 33 ☐	Organizing . . 48 ☐
Coordinating . 09 ☐	Contracting . . 21 ☐	Observing . . . 34 ☐	Selecting . . 49 ☐
Directing . . . 10 ☐	Enforcing . . . 22 ☐	Researching . . 35 ☐	Staffing . . . 50 ☐
Persuading . . 11 ☐	Permit issuing and licensing 23 ☐	Report Writing 36 ☐	Advising . . . 51 ☐
Supervising . . 12 ☐	Prosecuting . . 24 ☐	Constructing . 37 ☐	Consulting . . 52 ☐
Auditing . . . 13 ☐	Representing . 25 ☐	Drafting . . . 38 ☐	Recommending . 53 ☐
Controlling . . 14 ☐	Approving . . . 26 ☐	Dredging . . . 39 ☐	Liason . . . . 54 ☐
Establishing specifications 15 ☐	Conceptualizing ☐	Engineering . 40 ☐	Other [55] _____
Inspecting . . . 16 ☐	Estimating . . 28 ☐	Maintaining . 41 ☐	
Monitoring . . 17 ☐	Initiating . . 29 ☐	Mapping . . . 42 ☐	_____
Recording . . 18 ☐	Planning . . . 30 ☐	Procurement . 43 ☐	
	Reviewing . . 31 ☐	Surveying . . 44 ☐	_____
		Servicing . . 45 ☐	
		Testing . . . 46 ☐	

-56
-57
-58
-59
-60
-62
-63
-64
-65

► 7a. Of all the activities checked in response to "6a" above consider those which place the greatest and second greatest demand on you to acquire and utilize new information. Write these activities in the spaces below.

(If none requires acquisition or use of new information, write "NONE" in either or both blanks.)

▼ ▼

7b. Consider the types of sources you would or might use in acquiring new information. Some are listed below. Rate each source in terms of its usefulness in furnishing information you need for the "greatest" and "second greatest" information demanding activity. Circle for each source, the appropriate number according to the following scale:

Always Useful 6 ←5—4—3—2→1 Seldom Useful

	Greatest	Second Greatest
Associate workers 67	6 5 4 3 2 1	6 5 4 3 2 1
Conferences; seminars, workshops 68	6 5 4 3 2 1	6 5 4 3 2 1
Demonstrations 71	6 5 4 3 2 1	6 5 4 3 2 1
Formal Course work 72	6 5 4 3 2 1	6 5 4 3 2 1
Non-Corps associates contacts at meetings, etc. . . 75	6 5 4 3 2 1	6 5 4 3 2 1
Site Visits 76	6 5 4 3 2 1	6 5 4 3 2 1
Supervisor 79	6 5 4 3 2 1	6 5 4 3 2 1
Trade Shows C3- 07	6 5 4 3 2 1	6 5 4 3 2 1
Books 10	6 5 4 3 2 1	6 5 4 3 2 1
Bulletins 11	6 5 4 3 2 1	6 5 4 3 2 1
Directives & Guidelines . . . 14	6 5 4 3 2 1	6 5 4 3 2 1
Journals (Scientific) . . . 15	6 5 4 3 2 1	6 5 4 3 2 1
Magazines (Trade & Technical) 18	6 5 4 3 2 1	6 5 4 3 2 1
Manuals 19	6 5 4 3 2 1	6 5 4 3 2 1
Motion pictures; Videotape 22	6 5 4 3 2 1	6 5 4 3 2 1
Newsletters 23	6 5 4 3 2 1	6 5 4 3 2 1
News Releases 26	6 5 4 3 2 1	6 5 4 3 2 1
Preprints, manuscripts, correspondence, etc. 27	6 5 4 3 2 1	6 5 4 3 2 1
Reports (Technical) 30	6 5 4 3 2 1	6 5 4 3 2 1
Tape Cassettes.	6 5 4 3 2 1	6 5 4 3 2 1

8. For each category of publications listed below, check the way in which you usually read it.

	Read in Entirety	Scan for General Information	Scan for Specific Interest Items	Seldom Utilize	
Books	☐ 1	☐ 2	☐ 3	☐ 4	-33
Bulletins(Technical)	☐ 1	☐ 2	☐ 3	☐ 4	
Corps Directives & Guidelines	☐ 1	☐ 2	☐ 3	☐ 4	-35
Journals (Scientific)	☐ 1	☐ 2	☐ 3	☐ 4	
Magazines (Trade & Technical)	☐ 1	☐ 2	☐ 3	☐ 4	-37
Newsletters	☐ 1	☐ 2	☐ 3	☐ 4	
Reports (Technical	☐ 1	☐ 2	☐ 3	☐ 4	-39

9a. Consider your job's informational needs, both now and in the future. Do you know of any organizational units, such as CERC, CERL, WES or Corps districts, other than your own district, studying and/or working on one or more areas about which you have informational needs?

Yes ☐ 1 No ☐ 2

If "Yes", print the name of the unit(s) and subject area(s) being studied or worked on.

Unit	Subject Area

b. Do you know of any major organizational or governmental agency effort outside the Corps which is related to an area about which you have informational needs?

Yes ☐ 1 No ☐ 2

If "Yes" print the name of the unit(s) and subject area(s) being studied or worked on.

Organization	Subject Area

10a. Estimate how much time per month you spend reading all kinds of publications (ie; novels, newspapers, newsletters, magazines, technical journals, textbooks etc.) at home or work?

1 - 15 hrs. ☐ 1
16 - 30 hrs. ☐ 2
31 - 45 hrs. ☐ 3
46 - 60 hrs. ☐ 4
61 - 75 hrs. ☐ 5
76 - 90 hrs. ☐ 6
91 - 105 hrs. ☐ 7
106 - 120 hrs. ☐ 8
121 and over ☐ 9

b. Of this total time, approximately what percent (%) is spent on job/career information reading at home or work?

None ☐ 1
1 - 10% ☐ 2
11 - 20% ☐ 3
21 - 30% ☐ 4
31 - 40% ☐ 5
41 - 50% ☐ 6
51 - 60% ☐ 7
61 - 70% ☐ 8
71 - 80% ☐ 9
81% and over ☐ 0

c. If you do job related information reading, what percent of your reading do you do during work hours?

None ☐ 1
5% & under ☐ 2
6 - 10% ☐ 3
11 - 20% ☐ 4
21 - 30% ☐ 5
31 - 40% ☐ 6
41 - 50% ☐ 7
51 - 60% ☐ 8
61 - 70% ☐ 9
71% and over ☐ 0

11a. List the titles of those publications, government and non government, which you find helpful in terms of your job in the spaces provided below under the column headed a/ "Titles". (If none, write "NONE" and proceed to Q. 13)

b. How do you receive the publication? One can receive a periodical either as a primary or secondary recipient. As a primary recipient you receive it directly from the publisher, addressed to your job title or surname. As a secondary recipient, you receive it from a source other than the publisher, such as a library, a friend, office copy, etc. Indicate as appropriate, by checking either "Prim. or Sec." in the boxes under the column headed "b/Recipient."

c. Now, consider the degree of relevance of content of each publication. Assess the content *relevance of each* to the information you need in your job by circling the appropriate number in the six point scale in the column headed "c/Relevance of Content." -69 -70

a/ TITLES (Please Print)	b/ Recipient	c/ Relevance of Content SCALE Always ← → Seldom	-71 -72
	Prim. / Sec.		
Government			
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
Non-Government (commercial; academic, etc.)			
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	
_____	☐ 1 ☐ 2	6 5 4 3 2 1	

12. Below is a number of statements about jobs and work. Please indicate the extent to which you agree or disagree with each statement.

	6 Completely Agree	5 Moderately Agree	4 Slightly Agree	3 Slightly Disagree	2 Moderately Disagree	1 Completely Disagree	
When the workday is finished, a person should forget his job and enjoy himself.	6	5	4	3	2	1	[07]
My job objectives are clear and well formulated.	6	5	4	3	2	1	
A good indication of a man's worth is how well he does his job.	6	5	4	3	2	1	
Given free choice, I would often use different methods and techniques in my work.	6	5	4	3	2	1	[10]
The policies and guidelines under which I work are inadequate.	6	5	4	3	2	1	
Whenever possible, a person should relax and accept life as it is, rather than always strive for unreasonable goals.	6	5	4	3	2	1	
Some of my work assignments appear trivial.	6	5	4	3	2	1	
I sometimes receive assignments without sufficient allocation of manpower or other resources to do the job.	6	5	4	3	2	1	
Wasting time is about as bad as wasting money.	6	5	4	3	2	1	[15]
The policies and guidelines under which I work are incompatible.	6	5	4	3	2	1	
I have a clear understanding of my responsibilities.	6	5	4	3	2	1	
Hard work makes a man a better person.	6	5	4	3	2	1	
I prefer job assignments bearing high levels of responsibility.	6	5	4	3	2	1	
The jobs and assignments in the district are clearly defined and logically structured.	6	5	4	3	2	1	[20]
The philosophy of our top management tends to be conservative; in the long run we get our work done by playing it slow, safe, and sure.	6	5	4	3	2	1	
Our review and promotion system helps the best man to rise to the top.	6	5	4	3	2	1	
Red tape is kept to a minimum.	6	5	4	3	2	1	
The division is characterized by a relaxed, easy -going working climate.	6	5	4	3	2	1	
We don't rely entirely on individual judgement; everything is double-checked.	6	5	4	3	2	1	[25]
Immediate management shows an interest in your career aspirations.	6	5	4	3	2	1	
There is continual effort to improve our personal and group performance.	6	5	4	3	2	1	
Frankness is encouraged, even if our views may differ from those of our superiors.	6	5	4	3	2	1	
I feel that I am a member of an effectively functioning team.	6	5	4	3	2	1	
In the district, it is sometimes unclear who has the formal decision making authority.	6	5	4	3	2	1	[30]
Our immediate management is willing to take a chance on a good idea.	6	5	4	3	2	1	
My supervisor considers it unecessary that I check every detail with him; if I think I have the right approach I just go ahead.	6	5	4	3	2	1	
If you make a mistake in the division, you will be reprimanded.	6	5	4	3	2	1	
Our effectiveness has been enhanced by taking calculated risks at the right time.	6	5	4	3	2	1	
Excessive rules, administrative details, and red-tape make it difficult for new and original ideas to receive consideration.	6	5	4	3	2	1	[35]
Our productivity sometimes suffers from lack of proper planning.	6	5	4	3	2	1	
The philosophy of our top management emphasizes the human factor, how people feel, etc.	6	5	4	3	2	1	

Continue to next page

6 ← 5 ← 4 ← 3 ← 2 ← 1

Completely Agree	Moderately Agree	Slightly Agree	Slightly Disagree	Moderately Disagree	Completely Disagree

Supervision in the division is mainly a matter of setting guidelines for subordinates.	6 5 4 3 2 1	(38)
Decision making in the division is too cautious for maximum effectiveness.	6 5 4 3 2 1	
You don't get ahead in the division without showing initiative.	6 5 4 3 2 1	
The policies of the district have been clearly explained.	6 5 4 3 2 1	(41)
Our top management is less concerned with formal organization and authority than with getting the right people together to do the job.	6 5 4 3 2 1	

13. Considering your experience in your present position, please indicate the extent to which each listed condition:
    a. actually exists in your present job, and
    b. in your opinion should exist in your present job.

Respond by circling a number (1 thru 6) which indicates the degree to which a condition or feeling actually exists and to which you believe should exist relative to the following scale definition.

6 ← 5 ← 4 ← 3 ← 2 ← 1

Always	Usually	Often	Sometimes	Occasionally	Seldom

	a. Actually Exists		b. Should Exist	
Opportunities for personal growth and development.	6 5 4 3 2 1	(43)	6 5 4 3 2 1	(44)
The regard received from people in the group.	6 5 4 3 2 1		6 5 4 3 2 1	
Receipt of fair and impartial treatment from my boss.	6 5 4 3 2 1		6 5 4 3 2 1	
Opportunities to participate in varied activities.	6 5 4 3 2 1		6 5 4 3 2 1	
Feeling of being adequately informed by my supervisor and co-workers.	6 5 4 3 2 1	(51)	6 5 4 3 2 1	(52)
The opportunity for promotion within the organization.	6 5 4 3 2 1		6 5 4 3 2 1	
Opportunities to use one's own capabilities.	6 5 4 3 2 1		6 5 4 3 2 1	
Opportunity to do a job from begining to end; that is, the chance to do the whole job.	6 5 4 3 2 1	(57)	6 5 4 3 2 1	(58)
Opportunity to find out how well I am doing.	6 5 4 3 2 1		6 5 4 3 2 1	
Opportunities for participating in the selection of methods and procedures.	6 5 4 3 2 1	(61)	6 5 4 3 2 1	(62
Opportunities for independent thought and action.	6 5 4 3 2 1		6 5 4 3 2 1	
The receipt of reprimands for my errors.	6 5 4 3 2 1		6 5 4 3 2 1	
Opportunities for participating in or making recommendations with respect to setting of budgets.	6 5 4 3 2 1	(67)	6 5 4 3 2 1	(68)
The freedom to experiment.	6 5 4 3 2 1		6 5 4 3 2 1	
Receipt of fair and impartial treatment from my co-workers.	6 5 4 3 2 1	(71)	6 5 4 3 2 1	(72)

14. Some factors often used by organizations in awarding promotions are listed below. Please indicate how important, in your opinion, your division considers each of these factors in considering you for promotion. Use this six-point scale to indicate the degree of importance of each factor in the promotion decision.

6 ← 5 ← 4 ← 3 ← 2 ← 1

Extremely Important	Quite Important	Moderately Important	Moderately Unimportant	Quite Unimportant	Extremely Unimportant

Length of your service in the Corps.	6 5 4 3 2 1	c-5 (07)
Your education, training, and experience.	6 5 4 3 2 1	
Quality of your job performance.	6 5 4 3 2 1	
Your productivity on the job.	6 5 4 3 2 1	(10)

Continue on next page

6 Extremely Important	5 Quite Important	4 Moderately Important	3 Moderately Unimportant	2 Quite Unimportant	1 Extremely Unimportant

Amount of effort you expend on the job.	6 5 4 3 2 1	(11)
Your contribution to the technical and scientific knowledge of your organization.	6 5 4 3 2 1	
Your dependability on the job.	6 5 4 3 2 1	
Your judgement and common sense on the job.	6 5 4 3 2 1	(14)
Your personality on the job.	6 5 4 3 2 1	
Your initiative on the job.	6 5 4 3 2 1	
Your cooperation with others on the job.	6 5 4 3 2 1	(17)

15. How do you rate yourself relative to most of the others in your district with comparable managerial, professional, or technical duties? Please rate each of the items below relative to the following six-point scale: For each item, circle only one value.

6 Outstanding	5 Excellent	4 Very Good	3 Good	2 Fair	1 Poor

Quality of your job performance.	6 5 4 3 2 1	(18)
Your productivity on the job.	6 5 4 3 2 1	
Amount of effort you expend on the job.	6 5 4 3 2 1	
Your dependability on the job.	6 5 4 3 2 1	
Your knowledge on the job.	6 5 4 3 2 1	
Your judgement and common sense on the job.	6 5 4 3 2 1	(23)
Your personality on the job.	6 5 4 3 2 1	
Your ability to learn from the job.	6 5 4 3 2 1	
Your initiative on the job.	6 5 4 3 2 1	
Your cooperation with others on the job.	6 5 4 3 2 1	
Your overall job effectiveness.	6 5 4 3 2 1	(28)

16. To the right are listed trait descriptions which many people consider to be requirements for success. Considering your present position, please rank these from the one you regard most necessary through those you believe least necessary for success. Assign the number 1 to most necessary, number 2 to the next most necessary and so on to number 12 for the least necessary trait. (Use each number once and only once in ranking.)

____ Adaptable	-29	-30
____ Agreeable	-31	-32
____ Cautious	-33	-34
____ Cooperative	-35	-36
____ Decisive	-37	-38
____ Efficient	-39	-40
____ Forceful	-41	-42
____ Imaginative	-43	-44
____ Independent	-45	-46
____ Intelligent	-47	-48
____ Self-Confident	-49	-50
____ Tactful	-51	-52

17. Have you ever had an opportunity within the last 5 years to avail yourself of any formal or informal educational or training courses conducted directly or sponsored by your district or other Corps element? Yes ☐ 1 No ☐ 2 (53)

If "Yes", write the number(s) of courses by general category for each type of administration.

CATEGORY	Conducted or Sponsored by: District	Other Corps elements		
Technical/ professional	___	___	-54	-55
Administrative/ management	___	___	-56	-57
Other	___	___	-58	-59

Specify please If "Other" _____

18. Does the nature of your job afford you opportunities for working contacts, personal or telephone, with non-Corps government and/or non-government personnel? Yes ☐ 1 No ☐ 2 (07)

If "Yes", indicate with which of the organizational groups listed you have or have had working contacts. Secondly, which three (3) listed adjectives best characterize your impressions of the group. (check only three)

	Working Contact		DESCRIPTIVE ADJECTIVES								
Federal:	Yes	No	Impartial	Informative	Helpful	Influential	Persuasive	Powerful	Obstructive	Persistent	Demanding
Environmental Protection Agency. .	(08)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
National Marine Fishery Service. .	(11)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
National Oceanic and Atmospheric Administration .	(14)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
National Park Service.	(17)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
U.S. Department of Transportation	(20)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
U.S. Fish and Wildlife Service . .	(23)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
U.S. Geological Survey	(26)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
U.S. Navy.	(29)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
Regional & State Agencies:											
Conservation, or Water Resources .	(32)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
Port Development	(35)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
Environmental Protection or Pollution Control	(38)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
Game, Fishery or Wildlife	(41)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
Planning Commission.	(44)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
Non-Government:											
Architecture, Engineering or Environmental Eng. firms . . .	(47)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
Attorneys, and legal profession. .	(50)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
Conservation, Environmental grps.	(53)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
Construction Industry	(56)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
Information Srv.;libraries, etc. .	(59)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
News media, journalists, technical writers, etc.	(62)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
Testing laboratories	(65)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9
University Institution or Research Center	(68)☐	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8	☐ 9

19. How long have you been either a civil or military member of the Corps? 5 yrs & less ☐ 1; 6 - 10 yrs. ☐ 2; 11 - 15 yrs. ☐ 3; 16 - 20 yrs. ☐ 4; 21 - 25 yrs. ☐ 5; 26 - 30 yrs. ☐ 6; 31 - 35 yrs. ☐ 7; 36 - 40 yrs. ☐ 8; 41 yrs. & more ☐ 9 (71)

20. Highest degree held: No degree ☐ 1; Bachelor's ☐ 2; Master's ☐ 3; Doctorate ☐ 4 (72) Year in which highest degree was obtained: ____ -73 -74

21. In what time period were you born? Before 1915 ☐ 1; 1915 - 1919 ☐ 2; 1920 - 1924 ☐ 3; 1925 - 1929 ☐ 4; 1930 - 1934 ☐ 5; 1935 - 1939 ☐ 6; 1940 - 1944 ☐ 7; 1945 - 1949 ☐ 8; 1950 & after ☐ 9 (75)

Estimated time required to complete questionnaire. _____

THANK YOU FOR YOUR COOPERATION!

Personal Interview Questionnaire

Teknekron, Inc.
Washington, D.C.

Army Corps of Engineers
Information Needs Survey

Survey #5129

Sample#_____ Date:_____ Time Interview began:_____

(SUGGESTED INTRODUCTION:) Hello, I am_____
a representative of TEKNEKRON, INC. of Washington, D.C. As you may recall, you recently participated in a survey concerning jobs and information needs conducted by our company in behalf of the Corps. The questions that related to information needs were general, as you may remember, in the sense that they did not focus on any specific work areas. We are now conducting a series of interviews with district personnel believed to be involved in or interested in dredging, dredged material disposal or derivative operations. Through your participation in this interview, the Corps will acquire a clearer understanding of the information requirements of distirct personnel in the dredging work areas.

1. Could you please give a brief description of your job?

_____

_____

_____

_____

_____

2. Have you ever had an opportunity to suggest new or different techniques methods, procedures, etc. to dredging or disposal operations?

Yes [1] No [2] (continue on next page)

(IF "Yes") Could you tell me what initiated the action. Was it taken in response to a request or was it your own idea?

Request [1] (continue) Own Idea [2] (continue)

Could you tell me what was the situation or circumstance?

_____

_____

_____

_____

_____

_____

_____

(IF "No") Do you know of any modification or recent change in the way the district conducts dredged material disposal operations?

Yes [1] (Continue)
No [2] (Ask Q. 3)

(If "Yes") Could you please identify the group or the job title of the person?

_____

3. Aside from this, can you recall any method, procedure or approach to a Corps engineering or construction project for which you made a suggestion or recommendation?

Yes [1]
No [2] CONTINUE ASK Q. 4

(If "Yes") Could you briefly indicate the type of project, your suggestion, and what prompted your idea?

type of project: _____

_____

suggestion: _____

_____

What prompted idea: _____

_____

4. Can you cite an instance in which you, either as an individual or as part of a group, found it difficult to provide scientific or engineering support for a dredging or disposal alternative because of insufficient data or information?

Yes [1]
No [2] CONTINUE ON NEXT PAGE

(If "Yes") What was the issue involved and what was the nature (substance) of the required information? _____

issue: _____

_____

_____

substance of information: _____

_____

_____

(If "No") Is your answer "No" because you never had an occasion to need documented information, or because available information was sufficient?

Never had occasion [1] Ask Q. 5
Information available [2] (Continue

(IF "Information Available") Could you tell me of a typical case, the type of information and its documentary source?

type of information: _____

_____

_____

_____

source: _____

_____

_____

5. Aside from your direct experiences, do you know of any instance in which the environmental analysis of a project design alternative could not be satisfactorily performed because of the lack of documented data or information?

Yes [1] Continue
No [2] Ask Q. 6

(If "Yes") a. What was the nature of the difficulty?
b. What kind of data or information was needed?
c. How was the difficulty resolved, if at all?

a. nature of difficulty: _____

_____

_____

_____

b. information needed: _____

_____

_____

_____

c. resolution: _____

_____

6. From your knowledge of dredging activities, is it your impression that there are or are not, new trends, either developing or occuring in dredged material disposal approaches and procedures? (In this question, the term "trends" is used in a general sense.)

Yes, occuring [1]
No, are not occuring [2]
(Go to Q. 7)

(IF "Yes") a. What in your opinion are the new trends and what factors do you think have stimulated their development?

new trends: _____

_____

_____

_____

_____

_____

stimulating factors:

_____

_____

_____

b. Could you give an example of what you consider to be a new or different disposal approach? _____

_____

_____

_____

7. In your opinion, should there be any changes in dredged material disposal methods and procedures?

Yes [1]
No [2]

Why are you of that opinion? _____

_____

_____

_____

_____

8. It is generally recognized that decisions concerning the disposal of dredged material may be influenced by objective considerations and external forces. There are seven categories which may operate to different degrees in any particular case. On the basis of your familiarity with and knowledge of district dredging operations, please indicate the three which have been most frequently influential.

Categories: (Listed Alphabetically)

1 Attitude and viewpoints of governmental agencies at all levels.
2 Characters and magnitudes of environmental impact of practicable alternatives.
3 Ease and/or facility of technical accomplishment.
4 Economic Costs.
5 Environmental and other special interest group concerns.
6 Institutional constraints (regulatory, legal, etc.)
7 State and local political forces.

9. Are you aware of the existence of the Corp's Dredged Material Research Program being conducted at the Waterways Experiment Station in Vicksburg?

Yes 1
No 2 SKIP TO Q 11

(IF "Yes") Could you tell me how you first learned about the program, that is, verbally, or through printed material or other means?

Verbal 1
Printed matter 2
Other 3

_____

_____

10. If someone were to ask you about the program, what would you say about it? How would you describe it? _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

11. The next few questions deal with your opinions about the scope and content of the Dredged Material Research Program. As you may or may not be aware, the program staff has published a number of specific research objectives. First, we would like your opinion on the potential usefulness to you of the kind of information and data likely to be developed under each objective. To assist you in responding, here is a set of cards, (HAND RESPONDENT CARDS) on each of which is typed a defined objective of the program. Look at each card and indicate your estimate of the usefulness to you of the kind of information that the pursuit of each objective will provide. To facilitate your response, here is a scale card (HAND RESPONDENT CARD # 1) showing a six point usefulness scale. Quickly read the described objective on each of the small cards and place the card in the space which you think most appropriate on the basis of your own informational needs.

Of Major Usefulness

Space										
1	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
2	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
3	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
4	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
5	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
Space 6	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20

Of Little or No Usefulness

(AFTER INTERVIEW, CIRCLE ABOVE THE IDENTIFYI NUMBERS OF THE CARDS SORTED INTO NUMBERED SPACES)

12. Here is a list of the project areas which collectively define the scope of the DMRP. (HAND CARD #2) Please review these and tell me of other possible areas which you think should also be included in the program.

_____

_____

_____

13. Here is a copy of a recent DMRP Newsletter. (HAND COPY TO RESPONDENT). Have you ever seen any copy or copies of this bulletin before?

Yes [1] ASK Q 14 thru Q 22

No [2] SKIP TO Q 23

14. If someone were to ask you about this publication, what would you say about it? How would you describe it? _____

_____

_____

_____

_____

_____

15. How does a copy reach you? (READ TO RESPONDENT)

By mail to you directly from DMRP [1]
Your name appears on publication routing slip [2]
From a co-worker or associate [3]
Request or seek copy from library [4]
Other, explain [5]

_____

16.a When you first examine an issue of the DMRP Newsletter what kind of information do you most often look for? _____

_____

_____

_____

_____

_____

b. Then, after that, what is it you look for?

_____

_____

_____

_____

_____

17. Is the information provided about topical areas usually sufficiently detailed for your needs?

Yes [1]
No [2]

(IF "No" ASK) Why do you say that? _____

18. Now, in addition to the kinds of information you might ordinarily expect to find in the DMRP periodical, what <u>other</u> kinds would you like to see; that is, what additional type of material, if any, should be added in order to make it more useful and interesting to you? _____

19. When you have completed reading an issue, what do you generally do with it? Do you: (READ TO RESPONDENT)

Save it [1]
Discard it [2]
Pass it on [3] ASK b

b. You said, you pass it on. Do you know where it finally ends up? That is, its final disposition.

Yes [1]
No [2]

(IF "Yes") What is its final disposition? _____

20. Have you ever had a need to refer back to a past issue of the DMRP Bulletin?

Yes [1] CONTINUE
No [2] ASK Q 22

(IF "Yes") Was it easy or difficult to locate the particular item you wanted?

Difficult [1] CONTINUE
Easy [2] ASK Q 21

(IF "Difficult") You said it was difficult. What *suggestions, if any,* could you propose to make it easier to find specific items in past issues? _____

_____

_____

_____

_____

_____

_____

21. Can you remember the topical area you wanted to look up?

Yes [1]
No [2]

(IF "Yes") What was it? _____

_____

22. Have you ever had a need to make a request or prepare additional copies of the bulletin either for yourself or for others?

Yes [1]
No [2]

23. Here is a list of titles of most of the technical reports published by the DMRP to date. (HAND RESPONDENT CARD #3) Tell me which, if any, of the indicated study areas does or could relate to your work needs or interests. To facilitate your response, simply read aloud the number and associated title, then respond with a Yes or No answer. (CIRCLE RESPONSE IN SPACE UNDER Q. 23 BELOW)

24. Were you aware of the existence of any of these other reports before reviewing this list of titles? Yes [1] No [2] (SKIP TO Q 27)

(IF "YES") Please name the titles you already know of by their corresponding report numbers as listed on the card. (RECORD IN Q. 24 SPACE)

25. Of these you mentioned, which have you scanned or read part or all of its content? (RECORD IN SPACE Q. 25)

26. We would like your opinion on the clarity and understandability of the reports you have read. (RECORD EVALUATION NUMBER IN SPACE Q. (26)
(HAND RESPONDENT CARD #4

TITLE	Report #	Q 23		Q 24 Title		Q 25 Read		Q 26 #
		Yes	No	Yes	No	Yes	No	
"Disposal of Dredge Spoil. . . . .Development"	01	1	2	1	2	1	2	____
"Feasibility Study of Hydrocyclone. .Operations "	02	1	2	1	2	1	2	____
"Effects of Open-Water Disposal...Gulf Coast"	03	1	2	1	2	1	2	____
"Discussion of Regulatory Criteria. .Materials"	04	1	2	1	2	1	2	____
"Investigation of Mathematical. . . .Materials "	05	1	2	1	2	1	2	____
"Practices and Problems in . . . . Projects "	06	1	2	1	2	1	2	____
"Literature Review on Research . . Criteria"	07	1	2	1	2	1	2	____
"Regional Landfill and Construction..Availability"	08	1	2	1	2	1	2	____
"Identification of Objectionable.....Areas"	09	1	2	1	2	1	2	____
"Demonstration of a Methodology....Drainage"	10	1	2	1	2	1	2	____
"Containment Area Facility. . . . Rehandling"	11	1	2	1	2	1	2	____
"Legal, Policy, and Institutional..Enhancement"	12	1	2	1	2	1	2	____
"Assessment of the Factors.....Areas"	13	1	2	1	2	1	2	____
"General Research Plan. . . . . .Areas"	14	1	2	1	2	1	2	____
"A Feasibility Study of Lawn Sod....Sites"	15	1	2	1	2	1	2	____
"Guidelines for Material . . . . . Creations"	16	1	2	1	2	1	2	____

27. Aside from the DMRP reports, could you cite the title of some other technical report you have read on any subject which you consider unusually good in terms of its clarity of presentation?

_____

28. a. Now consider a different area, the methods used to communicate and to convey information about new technical ideas and procedures. Here is a list (HAND CARD #5) Please tell me those with which you have had personal experience. To facilitate your response simply read aloud the number and associated method.
(RECORD BY CIRCLING THE APPROPRIATE NUMBER.)

01 Conference	10 On site visit demonstration	19 Motion pictures
02 Seminars	11 Consultant presentations	20 Consultant reports
03 Work Shop	12 "Dog and Pony" Show	21 In-House technical reports
04 Meetings	13 Professional Society Lecture Presentation	22 Journal articles
05 Peer (associate instruction)	14 Sponsor representative	23 Text and reference books
06 Supervisor instruction	15 Symposia	24 Newsletter
07 Subordinate suggestion	16 University course	25 Notes and memos
08 Demonstration	17 Tape cassettes	26 News releases
09 Trade Shows	18 Videotapes	

b. Are there any others that are not listed on the card with which you have had experience? No ☐ If "Yes" What? _____

_____

c. As you know, the type of communication may substantially affect the ease and rapidity with which new technical ideas and procedures can be learned. In terms of these factors ie. ease and rapidity, which of all the communication methods you just mentioned are usually most effective for you; which would you rate as first and second?

First_____; Second_____

d. Considering (FIRST METHOD GIVEN) what have you found in this type of learning method that contributes to the ease and rapidity of your learning?

_____

_____

_____

_____

e. Considering other methods you have experienced, which would you say has been the least effective for you in terms of ease and rapidity of learning.

_____

Why do you say that? _____

_____

_____

_____

f. If you were asked to transmit technical information to some group in your district, would you necessarily employ the method you identified as best in terms of your own learning efficiency? Yes [1] No [2]

(If "No") Which one(s) would you consider? _____

_____

29. Have you ever had an occasion to attend a presentation of the DMRP provided by the program staff? Yes[1] No[2] (Skip to Q. 30)

a. (If "Yes") Thinking about the content of the presentation, did you feel that *it provided you with a satisfactory* understanding of the DMRP and its principal goals? Yes[1] No[2]

Why do you say that? _____

_____

_____

_____

b. How would you rate the presentation (HAND CARD #6) in terms of the first 6 point scale. (CIRCLE #)

Stimulating ⟷ Dull

6 5 4 3 2 1

c. How would you rate it in terms of its contribution to your learning in terms of the second 6 point scale. (CIRCLE #)

Excellent ⟷ Poor

6 5 4 3 2 1

30. How would you characterize the exchange of ideas within your office group?

Frequent & Unrestrained 6 ← 5 — 4 — 3 — 2 → 1 Infrequent & Restrained

31. We would appreciate your not discussing the content of the questionnaire and interview. It is important that we get people's initial opinion and views.

THANK YOU! Time completed:_____

- - - -

Topical Areas Discussed During Telephone Interviews with non-Corps Recipients of the DMRP Bulletin

The sequence in which the topical areas are listed below is essentially the one followed during most of the telephone interviews. The ordering of these areas in the discussion of the survey findings (Part III(C)) was slightly modified to permit presentations of related topics within common contexts.

1) General environmental interest areas of the Bulletin recipients.
2) Environmental areas of special interest to them.
3) Environmentally oriented publications read by the interviewees.
4) Recently published article of particular interest.
5) Interviewees' evaluations of the communication effectiveness of the publications they read.
6) Identification of particular publications the interviewees thought could be improved.
7) Length of time the interviewees had received the DMRP Bulletin.
8) Their general impressions of the Bulletin.
9) The kind of information in the Bulletin the recipients look for initially and after.
10) Recipients' estimates of the adequacy of the information provided by the DMRP Bulletin.
11) Recipients' bases for their estimates.
12) Additional types of information the recipients would like to see in the Bulletin.
13) Recipients' disposition of Bulletin after reading.
14) Recipients' estimates of numbers of other readers of their copies.
15) Recipients' need for referral to past issues of the Bulletin.

16) Interviewees' judgments as to ease/difficulty of locating items of interest in past issues.
17) Interviewees' suggestions for enhancing ease of locating items in past issues.
18) Examples of topical areas looked up in past issues.
19) Recipients' experience in reproducing (photocopy or otherwise) Bulletin articles on the basis of good/poor.
20) Recipients' views of why the Bulletin is published.
21) Recipients' views of which environmental impacts of dredging operations are of highest research priority.
22) Recipients' awareness/nonawareness of the DMRP reports.
23) Recipients' familiarity with DMRP report content.
24) Interviewees' knowledge of sources from which copies of the DMRP reports can be obtained.
25) Work relatedness (yes/no) of the recipients' environmental interests.
26) Approximate numbers of people employed at recipients' work locations.
27) Approximate numbers of professional personnel employed at above locations.

In accordance with ER 70-2-3, paragraph 6c(1)(b), dated 15 February 1973, a facsimile catalog card in Library of Congress format is reproduced below.

Speaker, David M
Design requirements for an information dissemination and technology transfer system for the Dredged Material Research Program, v. 1, by David M. Speaker [and] William H. Weisgerber, Teknekron, Inc., Washington, D. C. Vicksburg, U. S. Army Engineer Waterways Experiment Station, 1977.
1 v. (various pagings) illus. 27 cm. (U. S. Waterways Experiment Station. Contract report D-77-1)
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1. Corps District surveys. 2. Dredged Material Research Program (DMRP) 3. Information dissemination. 4. Technology transfer. I. Weisgerber, William H., joint author. II. Teknekron, Inc. (Series: U. S. Waterways Experiment Station, Vicksburg, Miss. Contract report D-77-1)
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