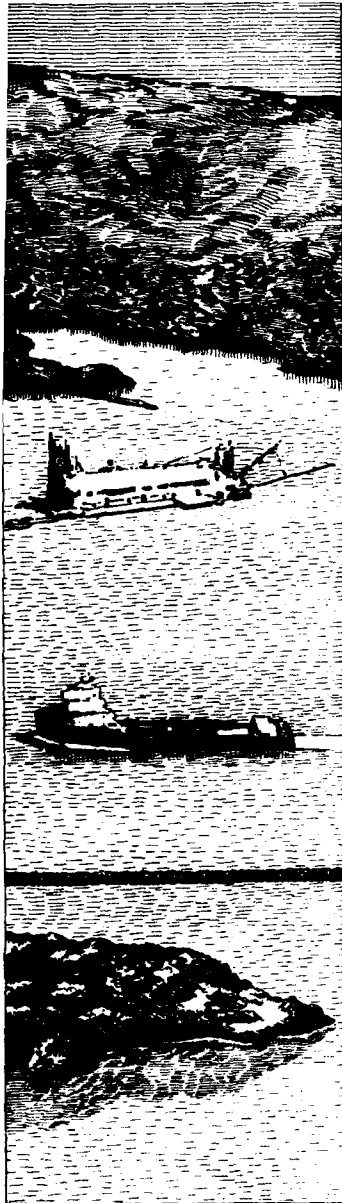


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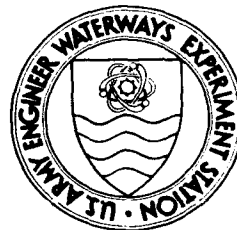
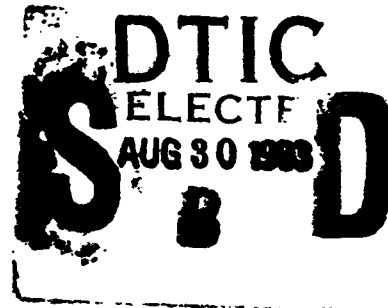
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DREDGING RESEARCH PROGRAM

DRP PRODUCT INVENTORY

Prepared by

Dredging Research Program
Coastal Engineering Research Center
US Army Engineer Waterways Experiment Station
Vicksburg, Mississippi 39180-6199



January 1991

Approved For Public Release; Distribution Unlimited

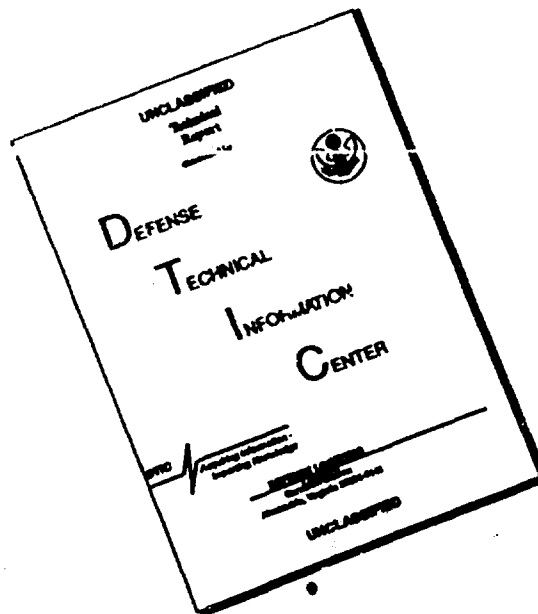
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Prepared for DEPARTMENT OF THE ARMY
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Washington, DC 20314-1000

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- Area 1 - Analysis of Dredged Material Placed in Open Waters
- Area 2 - Material Properties Related to Navigation and Dredging
- Area 3 - Dredge Plant Equipment and Systems Processes
- Area 4 - Vessel Positioning, Survey Controls, and Dredge Monitoring Systems
- Area 5 - Management of Dredging Projects

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13. ABSTRACT (Maximum 200 words) The DRP Product Inventory has been published to inform the Corps dredging community about 47 products that are now available or soon will be available from research conducted under the Dredging Research Program. Products include reports, specifications, personal computer programs, equipment, and other items. Knowledge of these products will allow Dredging offices sufficient time to plan for product use.				
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PREFACE

This report was prepared by the Coastal Engineering Research Center (CERC) of the US Army Engineer Waterways Experiment Station (WES). This report was sponsored by the Headquarters, US Army Corps of Engineers (HQUSACE) as a part of the Dredging Research Program (DRP), managed by WES CERC. HQUSACE Technical Monitors and Advisors for the DRP were Messrs. Robert H. Campbell, Glenn Drummond, John Sanda, Gerald E. Greener, M.K. Miles, David Mathis, James Crews, and Thomas M. Verna.

This report was prepared by Mr. Russell K. Tillman, Program Management Office, CERC, under the direct supervision of Mr. E. Clark McNair, DRP Manager, CERC, and the general supervision of Dr. James R. Houston, Chief, CERC. Assistant DRP Manager was Dr. Lyndell Z. Hales, CERC.

COL Larry B. Fulton, EN, was the Commander and Director of WES. Dr. Robert W. Whalin was Technical Director.

For further information on this report or the Dredging Research Program, please contact Mr. E. Clark McNair, Program Manager, at (601) 634-2070.

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**Instructions
for Using the DRP Product Inventory
January 1991**

1. WHAT IS THE DRP PRODUCT INVENTORY? Based on a DRP Field Review Group recommendation, we have identified all DRP products which are being prepared for Corps divisions and districts in hopes of providing:

- a. understanding of the various types and diversity of DRP products.
- b. awareness of any necessary training, skills, or equipment required to operate DRP products.
- c. ample time to anticipate, plan and budget for DRP products.
- d. DRP points of contact for additional product information.

2. WHAT IS A DRP PRODUCT? A DRP product is a collection of results from a work unit, that when grouped together, present cost-effective assistance to a Corps dredging situation. DRP products are not just a DRP report, rather, they may be a collection of reports, plans and specifications, PC programs, or equipment that when synergistically combined, provide unified guidance and approach to a problem.

3. HOW IS THE DRP PRODUCT INVENTORY ORGANIZED? We have prepared an inventory of all DRP Products in an outline format. For easy reference, we have numbered these products based on the year they were identified and the technical area that they are located in (for example 90-1-A). We have also prepared abbreviated results of the inventory on a Lotus 1-2-3 spreadsheet file. To obtain this file, simply complete the request form on the last page of this report. Using the spreadsheet file will allow you to quickly customize DRP product information in unlimited ways using query, sort, and print commands.

Each product identified in this inventory contains the following information:

- a. Product Information:** Identifies and describes product, purpose, and estimated distribution date.
- b. DRP Work Unit Information:** Provides DRP work unit information including Principal Investigator telephone number.

c. Required Skills & Training to Use Product: Identifies required skills or recommended training necessary to operate the product.

d. Required Equipment or System Components to Use Product: Identifies equipment necessary to operate products and/or system components that the product supports. Also provided are associated costs and procurement information.

e. Supporting Field Experiments & Demonstrations: Identifies past and future DRP field experiments and demonstrations which support the product.

f. Additional Comments: Identifies pertinent information such as published DRP documents which supports the product.

4. WHAT KIND OF SKILLS OR EXPERTISE ARE REQUIRED TO USE DRP PRODUCTS? DRP products have been prepared under the premise that users have basic dredging knowledge. In addition, some products may require basic personal computer skills. Every effort has been made to make DRP products "user friendly." In addition, nearly all DRP products are designed to be implemented entirely within Corps dredging offices. While no "required" training is necessary to use DRP products, "recommended" training and special skills are identified that will assist users in quickly learning how to use the product.

5. WHAT TYPE OF EQUIPMENT IS NEEDED TO OPERATE DRP PRODUCTS? Two types of equipment support DRP Products:

a. Equipment that is required to use the actual DRP product, which includes items such as PC's, software, and data collection tools such as sea bed drifters. This type of equipment is referred to as "equipment" in the inventory.

b. Equipment which a DRP product "supports," such as dredge production meters and sand bypassing systems. This support equipment is not necessary to use the actual DRP product, and is referred to as "system components" in the inventory.

In both cases, the information is provided to give you an idea of equipment cost and needs. Also, a non-inclusive and non-DRP endorsed list of potential commercial sources are provided for equipment that are not commonly available to the Corps dredging community.

6. ARE THERE PLANS FOR UPDATING THE DRP PRODUCT INVENTORY? Yes. The scope of DRP work units may change because of funding and customer guidance. Therefore, we will update this inventory

annually to reflect any changes. We solicit your comments about the layout and utility of this inventory because we want to make it as understandable and useful as possible.

7. DISCLAIMER: It is very difficult to provide the Corps dredging community with an "entire" list of DRP product information as each division and district has diverse and different needs. No doubt, in an attempt to provide this information, we may have omitted something, confused you, or opened up a new set of questions about DRP products. Our DRP principal investigators' name and telephone number are provided with every product. We strongly encourage you to contact them if you have questions, are confused, or just want to comment on the nature of the product. Feedback and communications from you, the user of DRP products are extremely important to principal investigators because it allows us to prepare field responsive products. Furthermore, knowledgeable and participating users are an important ingredient in assuring the success of the DRP.

8. STILL CONFUSED? Contact Russ Tillman, 601-634-2016 (FTS-542-2016) or Clark McNair, DRP Manager, at 601-634-2070 (FTS-542-2070) or leave a message via Dredgenet.

Technical Area 1

Analysis of Dredged Material Placed in Open Water

Nick Kraus, Technical Area Manager
601-634-2018
(FTS) 542-2018

Objectives of Technical Area 1

I. Technical Area 1 Objectives: The objectives of Technical Area 1, entitled "Analysis of Dredged Material Placed in Open Waters" are to:

- a. Calculate boundary layer fluid properties and sediment motion for analyzing behavior of open-water disposal areas.
- b. Acquire field data sets for improving calculation of fluid and sediment motion.
- c. Improve and develop computational techniques to predict short- and long-term fate of dredged material.
- d. Collect field data to improve simulation methods and site-monitoring techniques.

II. Program development/structure guidelines. There are seven general guidelines for developing PC programs in Technical Area 1.

- a. Any common computer language can be used (e.g., FORTRAN, Pascal, C), with preference given to languages particularly suited to the PC environment (Pascal, C).
- b. Technical Area 1 programs should have the same feel to the user, and follow general protocols on opening menu, work menus, function keys, help, etc., not discussed in detail here.
- c. As much as possible, no proprietary software is required to run the programs. (This has not been a problem except for three-dimensional graphics, and we are working to eliminate even use of commercial graphics packages here as well). The basic concept is to give the user a diskette that stands alone, together with a user's manual and technical manuals, as appropriate.
- d. As a general rule, only executable files are provided to users. This assures the possibility of support of the products, as otherwise changes in the source code would not allow tracking of problems.
- e. The programs are user-friendly, and have the appearance and features of commercial products on PC's: in other words, we do not want to implement awkward mainframe-type programs on a PC.
- f. Effort is made to make the programs "crash proof" by providing help menus and checks of input data, default values, and recovery procedures. This is an ongoing process, as all programs are sophisticated models.

g. We have as an assumption that users will use a VGA 386, 20-MHz or faster machine with a math co-processor and hard disk. However, most programs will run on slower and less powerful machines. We only support Hewlett-Packard language printers, recommending the LaserJet Series II or compatible HP compatible printers. (Otherwise, we would be spending our lives writing printer drivers.) However, all output files are also printed to ASCII files so that the user can import the data to any graphics software package for printing on any printer.

III. Workshops. Technical Area 1 held a workshop in June 1990 to allow field users to test and comment on five of the models to be described. The field users had 2-1/2 days of hands-on PC training and testing of these models after almost 2 days of presentations on model background and theory. This interaction was quite helpful in furthering development of the models, and it validated the approach being taken as outlined in the seven guidelines as judged by the responses of the participants. Other, more model-specific workshops are planned as part of the technology transfer and model training process.

IV. Targeted users and availability. Most models are targeted toward engineers and planners with the technical ability to understand model capabilities and limitations. The June 1990 workshop demonstrated that field office personnel presently dealing with technical issues of dredged material disposal projects can come on line with the models in relatively short time. Beta versions of all models are available now, and wide-release versions will be available after the documentation is published in FY91.

V. Management of Open-Water Disposal Sites (MODS):. Most Technical Area 1 PC products will be incorporated in the MODS system, an integrated expert system being developed in the work unit "Open-Water Disposal Site Planning, Design, and Operation," of DRP Technical Area 5, with Jim Clausner as the work unit Principal Investigator. The first version of MODS will be completed by March 1992 and provide site managers with a PC-based software tool to develop management plans for open-water disposal sites. MODS incorporates state-of-the-art DRP technology, including Technical Area 1 PC programs, to examine short- and long-term physical processes with the aim of maximizing site capacity.

Product Number: 1-A-90

I. Product Information

a. Product Name: NMLONG

b. Product Key Word: PC Program

c. Technical Key Word: Longshore Transport

d. Description: NMLONG (Numerical Model of the LONGshore current) calculates the wave height distribution, mean water surface elevation, and longshore current over a beach profile of arbitrary shape, given wave qualities specified either in deep water or at a known water depth. The model can use random or regular wave height as input options, and linear or nonlinear bottom friction. Multiple wave breaking can occur over bars constructed from dredged material, allowing for calculation of complex wave and longshore current distributions across the nearshore. The major assumption is longshore uniformity. Graphics and sophisticated error checking and menuing, including self-contained data input editor and spreadsheet, are part of the NMLONG system.

e. Technology Availability Date: Jan-91

II. DRP Work Unit Information

a. Work Unit #: 32463

b. Work Unit Title: Calculation of Boundary Layer Properties (Non-Cohesive Sediments)

c. Technical Area: 1

d. Principal Investigator: Nick Kraus, CEWES-CR

e. Telephone: 601-634-2018/(FTS) 542-2018

III. Required Skills & Training to Use Product

a. Required Skills: Basic coastal process knowledge

b. Recommended Training: DRP Technical Area 1 Workshop

c. DRP Training Date (Est): Sep-94

IV. Required Equipment or System Components to Use Product

a. Equipment A:

1. Item: 286/386 PC, hard disk, math co-processor, VGA
2. Price Range: \$2,000-4,000
3. Available via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Field Data Verification
2. Date (Est): Oct-90
3. District Participant: N/A (CERC Field Research Facility)
4. District Contact: N/A (Nick Kraus, CEWES-CR, 601-634-2018/FTS-542-2018)

VI. Additional Comments:

Product Number: 1-B-90

I. Product Information

- a. Product Name: NMLONGT
- b. Product Key Word: PC Program
- c. Technical Key Word: Longshore Transport
- d. Description: NMLONGT (Numerical Model of LONGshore Transport) calculates longshore sand transport on a barred beach bathymetry using input from NMLONG. This program is useful for obtaining the distribution of transport across the surf zone on an irregular bottom to be used, for example, to obtain a first estimation of impoundment and bypassing at jetties, and channel infilling by longshore sand transport. Graphics and sophisticated error checking and menuing, including self-contained data input editor and spreadsheet, are part of the NMLONGT system.
- e. Technology Availability Date: Dec-91

II. DRP Work Unit Information

- a. Work Unit #: 32463
- b. Work Unit Title: Calculation of Boundary Layer Properties (Non-Cohesive Sediments)
- c. Technical Area: 1
- d. Principal Investigator: Nick Kraus, CEWES-CR
- e. Telephone: 601-634-2018/(FTS) 542-2018

III. Required Skills & Training to Use Product

- a. Required Skills: Basic coastal process knowledge
- b. Recommended Training: DRP Technical Area 1 Workshop
- c. DRP Training Date (Est): Sep-94

IV. Required Equipment or System Components to Use Product

- a. Equipment A:
 - 1. Item: 286/386 PC, hard disk, math co-processor, VGA

2. Price Range: \$2,000-4,000

3. Available via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Field Data Verification

2. Date (Est): Oct-90

3. District Participant: N/A (CERC Field Research Facility)

4. District Point of Contact: N/A (Nick Kraus, CEWES-CR, 601-634-2018/FTS-542-2018)

VI. Additional Comments:

Product Number: 1-C-90

I. Product Information

a. Product Name: SEDTRAN

b. Product Key Word: PC Program

c. Technical Key Word: Transport

d. Description: SEDTRAN (SEDiment TRANsport) calculates entrainment and transport of noncohesive sediments at a point. This program is useful for obtaining a first estimate of whether a site is dispersive or non-dispersive, and determining the direction of transport for given hydrodynamic forcing, water depth, and material grain size.

e. Technology Availability Date: Sep-93

II. DRP Work Unit Information

a. Work Unit #: 32463

b. Work Unit Title: Calculation of Boundary Layer Properties (Non-Cohesive Sediments)

c. Technical Area: 1

d. Principal Investigator: Nick Kraus, CEWES-CR

e. Telephone: 601-634-2018/(FTS) 542-2018

III. Required Skills & Training to Use Product

a. Required Skills: Basic coastal sediment process knowledge

b. Recommended Training: DRP Technical Area 1 Workshop

c. DRP Training Date (Est): Sep-94

IV. Required Equipment or System Components to Use Product

a. Equipment A:

1. Item: 286/386 PC, hard disk, math co-processor, VGA

2. Price Range: \$2,000-5,000

3. Available via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Mobile Berm Field Demonstration
2. Date (Est): Aug thru Sep-89
3. District Participant: CESAM
4. District Point of Contact: S. Rees, 205-690-2724

VI. Additional Comments:

Product Number: 1-D-90

I. Product Information

- a. Product Name: NMCSMM (preliminary name)
- b. Product Key Word: PC Program
- c. Technical Key Word: Cross-shore transport
- d. Description: NMCSMM (Numerical Model of Cross-Shore Mound Movement) calculates cross-shore movement of dredged material mounds placed in the nearshore. This model will allow calculation (prediction) of cross-shore and longshore movement of sand mounds placed in the nearshore. Input data required include; (a) ambient beach bathymetry, (b) mound dimensions, (c) material grain size, and (d) representative wave and tidal time series for the simulation period, including storms. Graphics and sophisticated error checking and menuing, including self-contained data input editor and spreadsheet, will be part of the NMCSMM system.
- e. Technology Availability Date: Sep-93

II. DRP Work Unit Information

- a. Work Unit #: 32463
- b. Work Unit Title: Calculation of Boundary Layer Properties (Non-Cohesive Sediments)
- c. Technical Area: 1
- d. Principal Investigator: Nick Kraus, CEWES-CR
- e. Telephone: 601-634-2018/ (FTS) 542-2018

III. Required Skills & Training to Use Product

- a. Required Skills: Basic coastal sediment process knowledge
- b. Recommended Training: DRP Technical Area 1 Workshop
- c. DRP Training Date (Est): Sep-94

IV. Required Equipment or System Components to Use Product

- a. Equipment A:

1. Item: 386/486 PC, hard disk, math co-processor, VGA
2. Price Range: \$3,000-6,000
3. Available via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Silver Strand Demonstration
2. Date (Est): 1988-89
3. District Participant: CESPL
4. District Point of Contact: C. Andrassy, CESPL-ED-DC, 213-894-2691

b. Activity B:

1. Title: Morro Bay Demonstration
2. Date (Est): 1990-91
3. District Participant: CESPL
4. District Point of Contact: C. Andrassy, CESPL-ED-DC, 213-894-2691

c. Activity C:

1. Title: Humboldt Bay Demonstration
2. Date (Est): 1990-91
3. District Participant: CESPNI
4. District Point of Contact: D. Hodges, CESPNI-CO-C, 415-774-3295

VI. Additional Comments:

Product Number: 1-E-90

I. Product Information

a. Product Name: ARMS

b. Product Key Word: Instrument

c. Technical Key Word: Transport

d. Description: ARMS (Acoustic Re-suspension Measurement System) measures near-bottom stress, fluid motion (waves and currents), sediment entrainment, and concentration. This instrument provides state-of-the art capability to measure actual dredged material or ambient material motion near the sea bottom. Can be used to characterize the dispersiveness of a site, and is suited for use on large and sensitive projects.

e. Technology Availability Date: Jun 91

II. DRP Work Unit Information

a. Work Unit #: 32464

b. Work Unit Title: Measurement of Entrainment & Transport (Non-Cohesive Sediments)

c. Technical Area: 1

d. Principal Investigator: Nick Kraus, CEWES-CR

e. Telephone: 601-634-2018/(FTS) 542-2018

III. Required Skills & Training to Use Product

a. Required Skills: Product is a highly specialized instrument and must be operated by the contractor at the present time.

b. Recommended Training: Technical Area 1 Workshop (to gain familiarity with capabilities of ARMS)

c. DRP Training Date (Est): Sep-94

IV. Required Equipment or System Components to Use Product

a. Equipment A:

1. Item: ARMS (available through contractor)

2. Price Range: \$10,000-50,000 (Rental, including data analysis & ship time)

3. Available via Multiple Vendors or Sole Source: Sole Source (w/ future multiple vendors)

4. Potential Source: Ohio State University
Dept. of Civil Engineering

Contracting through CERC recommended (see II-d)

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Mobile Berm Field Demonstration

2. Date (Est): Aug thru Sep-89

3. District Participant: CESAM

4. District Point of Contact: Susan Rees, 205-690-2724

VI. Additional Comments:

Product Number: 1-F-90

I. Product Information

- a. Product Name: PLUMES
- b. Product Key Word: Measurement System
- c. Technical Key Word: Sediment plumes

d. Description: PLUMES (PLUme MEasurement System) is a remote-sensing method to measure fluid velocities and suspended dredged material clouds at dredging operations (turbidity), or at disposal sites (plumes). The instrument is acoustic based and provides ship track, current velocity through the water column, and suspended sediment concentration through the water column.

e. Technology Availability Date: Prototype presently available through the POC, (see II-d). Specifications available 9/94.

II. DRP Work Unit Information

- a. Work Unit #: 32464
- b. Work Unit Title: Measurement of Entrainment & Transport (Non-Cohesive Sediments)
- c. Technical Area: 1
- d. Principal Investigator: Nick Kraus, CEWES-CR
- e. Telephone: 601-634-2018/(FTS) 542-2018

III. Required Skills & Training to Use Product

- a. Required Skills: Must attend Technical Area 1 workshop
- b. Recommended Training: N/A

IV. Required Equipment or System Components to Use Product: Purchase or lease of PLUMES, which provides hardware and software as a turn-key system. Procedures for obtaining equipment presently under discussion.

V. Supporting Field Experiments & Demonstrations

- a. Activity A:

1. Title: Mobile Berm Field Demonstration
2. Date (Est): Aug thru Sep-89
3. District Participant: CESAM
4. District Point of Contact: Susan Rees, 205-690-2724

b. Activity B:

1. Title: Miami Harbor Monitoring Project
2. Date: April thru June-90
3. District Participant: CESAJ
4. District Point of Contact: Mark Skarbeck, CESAJ, 904-791-1131

VI. Additional Comments:

Product Number: 1-G-90

I. Product Information

a. Product Name: PC Program for Predicting Short-term Fate of Dredged Material

b. Product Key Word: PC Program

c. Technical Key Word: Short-term fate

d. Description: Models known as DIFID (Disposal From an Intermediate Dump), DIFCD (Disposal From a Continuous Discharge), and DIFHD (Disposal From a Hopper Dredge) predict multi-dredged material deposits from individual disposal operations in open water.

Mathematical models that account for the physical processes determining the short-term fate of dredged material disposed at open-water sites area available. These models estimate suspended sediment concentrations in the receiving water, and the initial deposition pattern and thickness of material on the bottom.

The models simulate movement of disposed material as it falls through the water column, spreads over the bottom, and finally is transported and diffused as suspended sediment by the ambient current. DIFID is designed to simulate the movement of material from an instantaneous dump falling as a hemispherical cloud. DIFCD computes the movement of material disposed in a continuous fashion at a constant discharge rate. DIFHD has been constructed to simulate the fate of material disposed from stationary hopper dredges.

e. Technology Availability Date: Jun-90

II. DRP Work Unit Information

a. Work Unit #: 32465

b. Work Unit Title: Evaluating Short-term Fate & Stability of Dredged Material Disposed in Open Waters

c. Technical Area: 1

d. Principal Investigator: Billy Johnson, CEWES-HR-M

e. Telephone: 601-634-3425/(FTS) 542-3425

III. Required Skills & Training to Use Product

a. Required Skills: N/A

- b. Recommended Training: DRP Technical Area 1 Workshop
- c. DRP Training Date (Est): Sep-94

IV. Required Equipment or System Components to Use Product

a. Equipment A:

- 1. Item: 386/486 PC, hard disk, math co-processor, VGA
- 2. Price Range: \$3,000-6,000
- 3. Available via Multiple Vendors or Sole Source: Multiple Vendors

b. Equipment B:

- 1. Item: SURFER (three-dimensional graphics program)
- 2. Price Range: \$300
- 3. Available via Multiple Vendors or Sole Source: Sole Source
- 4. Potential Source: Golden Software, Inc.
P.O. Box 281
Golden, CO 80402-0281

V. Supporting Field Experiments & Demonstrations

a. Activity A:

- 1. Title: WES Physical Model Tests & Demonstrations
- 2. Date (Est): 1989-91
- 3. District Participant: N/A (WES)
- 4. District Point of Contact: N/A (Billy Johnson, CEWES-HR-M, 601-634-3425/FTS-542-3245)

b. Activity B:

- 1. Title: Mobile Berm Field Demonstration
- 2. Date (Est): Aug thru Sep-89
- 3. District Participant: CESAM
- 4. District Point of Contact: S. Rees, 205-690-2724

VI. Additional Comments:

Product Number: 1-H-90

I. Product Information

a. Product Name: PC Program for Predicting Short-term Fate and Mounding of Dredged Material

b. Product Key Word: PC Program

c. Technical Key Word: Short-term fate

d. Description: This model predicts dredged material deposits from multi-disposals in open water. Mathematical models account for the physical processes determining the short-term fate of dredged material from individual disposals at open-water sites and provide estimates of suspended sediment concentrations in the receiving water and initial deposition pattern and thickness of material over the bottom. Based upon an anticipated disposal schedule, statistics and the principle of superposition, results from individual disposal operations can be extended to provide the estimates of disposal mounds created by multi-disposals.

e. Technology Availability Date: Jun-94

II. DRP Work Unit Information

a. Work Unit #: 32465

b. Work Unit Title: Evaluating Short-term Fate & Stability of Dredged Material Disposed in Open Water

c. Technical Area: 1

d. Principal Investigator: Billy Johnson, CEWES-HR-M

e. Telephone: 601-634-3425/(FTS) 542-3245

III. Required Skills & Training to Use Product

a. Required Skills: N/A

b. Recommended Training: Technical Area 1 Workshop

c. DRP Training Date (Est): Sep-94

IV. Required Equipment or System Components to Use Product

a. Equipment A:

1. Item: 386/486 PC, hard disk, math co-processor, VGA
2. Price Range: \$4,000-6,000
3. Available via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: WES Physical Model Test Demonstrations
2. Date (Est): 1989-91
3. District Participant: N/A (WES)
4. District Point of Contact: N/A (Billy Johnson, CEWES-HR-M, 601-634-3425/FTS-542-3245)

b. Activity B:

1. Title: Mobile Berm Field Demonstration
2. Date (Est): Aug thru Sep-89
3. District Participant: CESAM
4. District Point of Contact: S. Rees, 205-690-2724

VI. Additional Comments:

Product Number: 1-I-90

I. Product Information

- a. Product Name: HPDPRE & HPDSIM
- b. Product Key Word: PC Program
- c. Technical Key Word: Wave Hindcast

d. Description: HPDPRE (Height, Period, Direction PREprocessor) computes the correlation matrix for a specific Wave Information Study (WIS) station. The time series data base of wave height, period, and direction for the station of interest are required input to HPDPRE. Because of the large size of a 20-year hindcast time series (10,000 blocks), a mainframe computer or PC with large memory is required by HPDPRE. The correlation matrix can also be made available through the DRP for specific WIS stations.

HPDSIM (Height, Period, Direction SIMulation) generates an arbitrary long-term statistically correct and representative time sequence (3-hr interval) of wave height, period, and direction corresponding to the specific WIS station correlation matrix generated by HPDPRE. The resultant sequence(s) can be used as input to all DRP numerical models requiring wave input data for an open-ocean coast.

- e. Technology Availability Date: Oct-90

II. DRP Work Unit Information

- a. Work Unit #: 32466
- b. Work Unit Title: Evaluating Long-term Fate & Stability of Dredge Material Disposed in Open Water
- c. Technical Area: 1
- d. Principal Investigator: Norm Scheffner, CEWES-CR-P
- e. Telephone: 601-634-3220/(FTS) 542-3220

III. Required Skills & Training to Use Product

- a. Required Skills: Basic coastal process knowledge
- b. Recommended Training: DRP Technical Area 1 Workshop
- c. DRP Training Date (Est): Sep-94

IV. Required Equipment or System Components to Use Product

a. Equipment A:

1. Item: 386/486 PC, hard disk, math co-processor, VGA (for HPDPRE)
2. Price Range: \$3,000-6,000
3. Available via Multiple Vendors or Sole Source: Multiple Vendors

b. Equipment B:

1. Item: 286/386 PC, hard disk, math co-processor, VGA (for HPDSIM)
2. Price Range: \$2,000-5,000
3. Available via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments:

Product Number: 1-J-90

I. Product Information

a. Product Name: PCDREDGE

b. Product Key Word: PC Program

c. Technical Key Word: Long-term fate

d. Description: PCDREDGE (Personal Computer DREDGED material Estimation) computes the long-term stability of a dredged disposal mound by computing the time evolution of the mound as a function of waves, currents, depths, and geometry. Required input includes the simulated wave fields from the program HPDSIM, tidal constituent velocity amplitudes, and mean currents at the disposal site. At present, the commercial software SURFER / GRAPHER are required for generating graphical displays and statistical summaries of the output of HPDSIM, as well as output of the time-evolution of the disposal mound.

e. Technology Availability Date: Oct-90

II. DRP Work Unit Information

a. Work Unit #: 32466

b. Work Unit Title: Evaluating Long-term Fate & Stability of Dredge Material Disposed in Open Waters

c. Technical Area: 1

d. Principal Investigator: Norm Scheffner, CEWES-CR-P

e. Telephone: 601-634-3220/(FTS) 542-3220

III. Required Skills & Training to Use Product

a. Required Skills: Basic coastal processes knowledge

b. Required Training: DRP Technical Area 1 Workshop

c. DRP Training Date (Est): Sep-94

IV. Required Equipment or System Components to Use Product

a. Equipment A:

1. Item: 386/486 PC, hard disk, math co-processor, VGA

2. Price Range: \$3,000-6,000

3. Available via Multiple Vendors or Sole Source: Multiple Vendors

b. Equipment B:

1. Item: SURFER (three-dimensional graphics program)

2. Price Range: \$300

3. Available via Multiple Vendors or Sole Source: Sole Source

4. Potential Source: Golden Software, Inc.
P.O. Box 281
Golden, CO 80402-0281

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments:

Product Number: 1-K-90

I. Product Information

a. Product Name: CEDREDGE

b. Product Key Word: Mainframe Based Program

c. Technical Key Word: Long-term Fate

d. Description: CEDREDGE (Corps of Engineer DREDGed material Estimation) computes the long-term stability of a dredged material disposal mound by computing the time evolution of the mound as a function of local waves, currents, depths, and geometry. Required input includes simulated wave fields from the program HPDSIM, tidal constituent velocity amplitudes, storm surge hydrographs, and mean currents at the site. CEDREDGE differs from the simplified version PCDREDGE as disposal sites located in sheltered locations where shoreline or structures significantly effect the flow field (i.e. within estuaries, harbors, barrier islands, etc.) can be investigated. The model also will allow more detailed investigations of open water sites. This modeling capability will require large site specific grids and the specification of complex boundary conditions; hence, the program is targeted for mainframe computer applications. The exact format and methodology of the program has not yet been formulated.

e. Technology Availability Date: Sep-1993

II. DRP Work Unit Information

a. Work Unit #: 32466

b. Work Unit Title: Evaluation Long-Term Fate and Stability of Dredge Material Disposed in Open Waters

c. Technical Area: 1

d. Principal Investigator: Norm Scheffner, CEWES-CR-P

e. Telephone: 601-634-3220/(FTS) 542-3220

III. Required Skills & Training to Use Product:

a. Required Skills: Advanced knowledge and experience in FORTRAN programming, grid generation, numerical methods, data analysis, hydrodynamics, and coastal processes.

b. Recommended Training: Numerical modeling experience and DRP Technical Area 1 Workshop.

c. DRP Training Date (Est): Sept-1994

IV. Required Equipment or System Components to Use Product:

a. **Equipment:** Advances in personal computer technology can not be reasonably predicted at this time for applications in 1993. It is possible that present mainframe application will be possible on future PC based machines. This is also true of graphics capabilities. Therefore, any statement regarding personal computer price, availability, or source is premature at this time, but will be provided at a later date.

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments: This component of the work unit has not yet been formally considered as a user product. The non-user version is presently under development for in-house WES use in generating the tidal and storm surge boundary conditions necessary for input to the model PCDREDGE. When this has been completed, attention will be directed to a user version of CEDREDGE.

Product Number: 1-L-90

I. Product Information

a. Product Name: Empirical Guidance on Predicting Physical Fate of Dredged Material

b. Product Key Word: PC Program

c. Technical Key Word: Placement assessment

d. Description: This PC program predicts the fate of dredged material to be placed in an open-water disposal site, based on knowledge gained from monitoring similar sites. The program will first guide the user in determining similarities between the target site and previously monitored sites, then access a data base containing information from documented sites to make a general prediction if the site falls in the empirical data base range. The data base also will be accessible outside the program environment for other uses, such as direct examination of previous monitoring experiences.

e. Technology Availability Date: Sep-94

II. DRP Work Unit Information

a. Work Unit #: 32467

b. Work Unit Title: Field Techniques & Data Analysis to Assess Fate of Open Water Disposal Deposits

c. Technical Area: 1

d. Principal Investigator: Ed Hands, CEWES-CD-SE

e. Telephone: 601-634-2088/(FTS) 542-2088

III. Required Skills & Training to Use Product

a. Required Skills: N/A

b. Recommended Training: DRP Technical Area 1 Workshop

c. DRP Training Date (Est): Sep-94

IV. Required Equipment or System Components to Use Product

a. Equipment A:

1. Item: 286/386 PC w/VGA, hard disk, math co-processor, VGA
2. Price Range: \$2,000-4,000
3. Available via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations: N/A

a. Activity A:

1. Title: Mobile Berm Field Data Collection
2. Date (Est): 1988-91
3. District Participant: CESAM
4. District Point of Contact: P. Langan, CESAM-OP-O, 205-694-3702 & P. Bradley, CESAM

b. Activity B:

1. Title: Humboldt Nearshore Berm Field Data Collection
2. Date (Est): 1989-92
3. District Participant: CESPNI
4. District Point of Contact: H. Cheong or D. Hodges, CENSPN-CO-C, 415-774-3295.

c. Activity C:

1. Title: Morro Bay Nearshore Berm Field Data Collection
2. Date (Est): 1990-92
3. District Participant: CESPL
4. Division/District Point of Contact: D. Pirie, CESPDI-CO-O, 415-705-1542 or C. Andrassy, CESPL-ED-C, 213-894-2691

d. Activity D:

1. Title: Illinois Beach State Park Field Data Collection
2. Date (Est): 1990-91
3. Division Participant: CENCID
4. Division Point of Contact: C. Johnson, CENCID-ED-C, 312-353-0584

e. Activity E:

1. Title: Long Island Sound Field Data Collection
2. Date (Est): 1990-93
3. Division Participant: CENED
4. Division Point of Contact: T. Fredette, CENED, 617-647-8819

f. Activity F:

1. Title: Gilgo Beach Field Data Collection
2. Date (Est): 1987-91
3. District Participant: CENAN
4. District Point of Contact: P. Flax, CENAN-EN-RQ, 212-264-5627

g. Activity G:

1. Title: Brazos Santiago Berm Field Data Collection
2. Date (Est): 1990-91
3. District Participant: CESWG
4. District Point of Contact: R. Medina, CESWG-CO-M

h. Activity H:

1. Title: Nearshore Placement, Gold Coast, Australia, Field Data Exchange
2. Date (Est): 1991
3. District Participant: N/A
4. District Point of Contact: N/A (Ed Hands, CEWES-CD-SE, 601-634-2088/FTS-542-2088)

i. Activity I:

1. Title: Grays Harbor Nearshore Placement Field Data Collection
2. Date (Est): 1991
3. District Participant: CENPS
4. District Point of Contact: D. Schuldt, CENPS-EN-PL, 206-764-3555

VI. Additional Comments:

Product Number: 1-M-90

I. Product Information

a. Product Name: Improved Monitoring Technology

b. Product Key Word: Field Techniques

c. Technical Key Word: Monitoring Technology

d. Description: Proven, cost-effective monitoring methods are recommended to document the actual fate of placed material. These methods include:

Bathymetric surveys

Direct material assessments

Aerial photographs

Wind and wave measurements

Side-scan sonar surveys

Indirect material characterizations

Improved water-level measurements

Bottom current information

Initial bathymetry documents the geometry of the placed deposit. Subsequent changes are monitored by repeating bathymetric and side-scan surveys. Under some circumstances, side-scan is the best tool for identifying the boundary between placed and native bottom material. It also is useful for tracking bottom current-following drogues. Sediment samples (a) establish how the placed material differs from ambient sediment, (b) indicate predominant directions of spread, and (c) establish whether transport is affecting only certain grain sizes and armoring is developing at the site in question. Aerial photography is an inexpensive method to investigate wave/berm interactions, major sediment resuspension, and impacts on adjacent shores and shallow-water features.

Wave and bottom current information is necessary to translate observed responses into better management guidelines. New methods will use existing wave hindcast statistics to more easily characterize climatology, and to generate multiple short-term scenarios. Actual measurement of on-site processes can be accomplished with systems ranging from commercially available recording electronic instruments or DRP-developed real-time systems to multiple seabed drifter releases. Seabed drifters represent a low-cost, high-profile technology that generates public involvement and provides a fresh insight into circulation patterns and their temporal/spatial variations via new interpretation techniques and adjustment of drogue characteristics to fit specific applications.

e. Technology Availability Date: Sep-94

II. DRP Work Unit Information

a. Work Unit #: 32467

b. Work Unit Title: Field Techniques & Data Analysis to Assess Fate of Open Water Dredged Deposits

c. Technical Area: 1

d. Principal Investigator: Ed Hands, CEWES-CD-SE

e. Telephone: 601-634-2088/(FTS) 542-2088

III. Required Skills & Training to Use Product: N/A

IV. Required Equipment or System Components to Use Product

a. Equipment A:

1. Item: Seabed drifters

2. Price Range: \$5,000-25,000

3. Available via Multiple Vendors or Sole Source: Sole Source

4. Potential Sources: Kahl Scientific Instrument Corp
El Cajon, CA
619-444-2158

Insul-tab, Inc.
Woburn, MA
617-935-0800

b. Equipment B:

1. Item: Wave Bottom Current System

2. Price Range:

3. Available via Multiple Vendors or Sole Source: Multiple Vendors

4. Potential Sources: Pacer System, Inc.
Billerica, MA
508-667-8800

Inter-Ocean, Inc
San Diego, CA
619-565-8400

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Mobile Berm Field Data Collection

2. Date (Est): 1988-91

3. District Participant: CESAM

4. District Point of Contact: P. Langan, CESAM-OP-0, 205-694-3702 or
P. Bradley, CESAM-OP-OM, 205-690-3319

b. Activity B:

1. Title: Humboldt Nearshore Berm Field Data Collection

2. Date (Est): 1989-92

3. District Participant: CESPAN

4. District Point of Contact: H. Cheong or D. Hodges, CENSPN-CO-C,
415-774-3295.

c. Activity C:

1. Title: Morro Bay Nearshore Berm Field Data Collection

2. Date (Est): 1990-92

3. District Participant: CESPL

4. Division/District Point of Contact: D. Pirie, CESPAN-CO-O, 415-
705-1542 or C. Andrassy, CESPL-ED-DC, 213-894-2691

d. Activity D:

1. Title: Illinois Beach State Park Field Data Collection

2. Date (Est): 1990-91

3. Division Participant: CENCD

4. Division Point of Contact: C. Johnson, CENCD-ED-C, 312-353-0584

e. Activity E:

1. Title: Long Island Sound Field Data Collection

2. Date (Est): 1990-93

3. Division Participant: CENED

4. Division Point of Contact: T. Fredette, CENED, 617-647-8819

f. Activity F:

1. Title: Gilgo Beach Field Data Collection
2. Date (Est): 1987-91
3. District Participant: CENAN
4. District Point of Contact: P. Flax, CENAN-EN-RQ, 212-264-5527

g. Activity G:

1. Title: Brazos Santiago Berm Field Data Collection
2. Date (Est): 1990-91
3. District Participant: CESWG
4. District Point of Contact: R. Medina, CESWG-CO-M

h. Activity H:

1. Title: Nearshore Placement, Gold Coast, Australia, Field Data Exchange
2. Date (Est): 1991
3. District Participant: N/A
4. District Point of Contact: N/A (Ed Hands, CEWES-CD-SE, 601-634-2088/FTS-542-2088)

i. Activity I:

1. Title: Grays Harbor Nearshore Placement Field Data Collection
2. Date (Est): 1991
3. District Participant: CENPS
4. District Point of Contact: D. Schuldt, CENPS-EN-PL-NC, 206-764-3555

VI. Additional Comments:

Product Number: 1-N-90

I. Product Information

a. Product Name: Cohesive Sediments PC Program

b. Product Key Word: PC Program

c. Technical Key Word: Cohesive erodibility

d. Description: This PC program predicts estuarine flow and shear stresses over mounds and trenches, mud structure, and erosion for the purposes of evaluating capacity retention/dispersion rates, turbidity generation, and/or migration pathways for an existing or proposed disposal site.

e. Technology Availability Date: Sep-90 (First module, others to follow)

II. DRP Work Unit Information

a. Work Unit #: 32590

b. Work Unit Title: Calculation of Boundary Layer Properties (Cohesive Sediments)

c. Technical Area: 1

d. Principal Investigator: Allen Teeter, CEWES-HE-P

e. Telephone: 601-634-2820/(FTS) 542-2088

III. Required Skills & Training to Use Product

a. Required Skills: Physical process knowledge

b. Recommended Training: DRP Technical Area 1 Workshop

c. DRP Training Date (Est): Sep-94

IV. Required Equipment or System Components to Use Product

a. Equipment A:

1. Item: 286/386 PC with EGA or VGA

2. Price Range: \$2,000-5,000

3. Available via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Mobile Stable Mound Demonstration
2. Date (Est): 1991-93
3. District Participant: CESAM
4. District Point of Contact: Unavailable at this time

b. Activity B:

1. Title: San Francisco Central Bay Demonstration
2. Date (Est): 1991-93
3. District Participant: CESPAN
4. District Point of Contact: T. Chase, 415-744-3263

VI. Additional Comments:

Product Number: 1-0-90

I. Product Information

- a. Product Name: Fluidization and Erodibility of Fine-Grained Sediments
- b. Product Key Word: PC Program
- c. Technical Key Word: Cohesive erodibility
- d. Description: This PC program guides the user through a series of questions about the source and nature of sediment material, for the purpose of estimating its erodibility and susceptibility to fluidization.
- e. Technology Availability Date: Jan-92

II. DRP Work Unit Information

- a. Work Unit #: 32590
- b. Work Unit Title: Calculation of Boundary Layer Properties (Cohesive Sediments)
- c. Technical Area: 1
- d. Principal Investigator: Allen Teeter, CEWES-HE-P
- e. Telephone: 601-634-2820/(FTS) 542-2820

III. Required Skills & Training to Use Product

- a. Required Skills: Coastal knowledge
- b. Recommended Training: N/A

IV. Required Equipment or System Components to Use Product: N/A

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments:

Product Number: 1-P-90

I. Product Information

- a. Product Name: Cohesive Sediment Coefficient Data Base
- b. Product Key Word: Technical Information
- c. Technical Key Word: Cohesive sediment
- d. Description: An one-of-a-kind information source regarding transport-related parameters (such as yield stress) for actual cohesive dredged material and related descriptors.
- e. Technology Availability Date: Jan-92

II. DRP Work Unit Information

- a. Work Unit #: 32590
- b. Work Unit Title: Calculation of Boundary Layer Properties (Cohesive Sediments)
- c. Technical Area: 1
- d. Principal Investigator: Allen Teeter, CEWES-HE-P
- e. Telephone: 601-634-2820/(FTS) 542-2820

III. Required Skills & Training to Use Product

- a. Required Skills: N/A
- b. Recommended Training: DRP Training: Technical Area 1 Workshop
- c. DRP Training Date (Est): Sep-94

IV. Required Equipment or System Components to Use Product: N/A

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments:

Technical Area 2

Material Properties Related to Navigation & Dredging

Don Banks, Technical Area Manager

601-634-2630

(FTS) 542-2630

Objectives of Technical Area 2

The objectives for Technical Area 2, entitled "Material Properties Related to Navigation and Dredging" are to:

- a. develop instruments and operating procedures for rapid surveys of fluid mud properties.
- b. define navigable depth in fine-grained sediments.
- c. develop instruments for analyzing properties of consolidated sediments.
- d. establish dredging-related soil and rock descriptors.

Product Number: 2-A-90

I. Product Information

- a. Product Name: Fluid Mud Survey System
- b. Product Key Word: Plans, specifications, and software
- c. Technical Key Word: Fluid mud, aerial extent, vertical density

d. Description: This system provides hardware specifications and software for non-acoustic surveying of navigable depths in areas of fluid mud. A system developed according to plans and specifications will interface with (most) existing survey systems, and will provide density and thickness information on fluid mud deposits. Various configurations are possible to meet specific needs, including a towed sled, nuclear transmission density gauge, or resistivity gauge.

- e. Technology Availability Date: Dec-91 (draft)

II. DRP Work Unit Information

- a. Work Unit #: 32469
- b. Work Unit Title: Measurement and Definition of Navigable Depth in Fluff and Fluid Mud
- c. Technical Area: 2
- d. Principal Investigator: Allen Teeter, CEWES-HE-P
- e. Telephone: 601-634-2820/(FTS) 542-2820

III. Required Skills & Training to Use Product

- a. Required Skills: Use of optional nuclear density gauge requires special licensing.
- b. Recommended Training: On site training available on request

IV. Required Equipment or System Components to Use Product: The following system components are being tested by the DRP, and are presently not commercially available. Plans and specification will be provided upon prototype testing, along with potential sources for acquiring equipment. The following information is provided to give users a magnitude of estimated capital expenditures.

- a. System Component A:

1. Item: Towed sled system

2. Price Range: \$30,000

3. Available Via Multiple Vendors or Sole Source:

b. System Component B:

1. Item: Nuclear Transmission Density Gauge

2. Price Range: \$20,000

3. Available Via Multiple Vendors or Sole Source:

c. System Component C:

1. Item: Resistivity Gauge

2. Price Range: \$30,000

3. Available Via Multiple Vendors or Sole Source:

d. Equipment A:

1. Item: Hewlett-Packard 10310M (Instrument controller for product software interface with existing survey system)

2. Price Range: \$6,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Calcasieu, LA Field Test

2. Date: 1989-90

3. District Participant: CELMN

4. District Contact: Mike Park

b. Activity B:

1. Title: Gulfport, MS Field Test

2. Date: 1990-91

3. District Participant: CESAM

4. District Contact:

c. Activity C:

1. Title: Sabine, TX Field Demonstration

2. Date (Est): 1991

3. District Participant: CESWG

4. District Contact:

d. Activity D:

1. Title: Savannah, GA

2. Date (Est): 1992

3. District Participant: CESAS

4. District Contact:

VI. Additional Comments:

Product Number: 2-B-90

I. Product Information

- a. Product Name:** Navigable Depth Assessment Technique
- b. Product Key Word:** Technical Information
- c. Technical Key Word:** Navigable depth, rheology
- d. Description:** This product provides field-tested techniques for sampling and analyzing navigable depth-density-viscosity relationships at specific sites. Example applications will be developed.
- e. Technology Availability Date:** Jan-91

II. DRP Work Unit Information

- a. Work Unit #:** 32469
- b. Work Unit Title:** Measurement and Definition of Navigable Depth in Fluff and Fluid Mud
- c. Technical Area:** 2
- d. Principal Investigator:** Allen Teeter, CEWES-HE-P
- e. Telephone:** 601-634-2820/(FTS) 542-2820

III. Required Skills & Training to Use Product

- a. Required Skills:** Hydrographic survey and physical science
- b. Recommended Training:** On-site DRP training is available on request

IV. Required Equipment or System Components to Use Product

- a. System Component A:**
 - 1. Item:** Survey system developed by work unit
 - 2. Price Range:** \$60,000
 - 3. Available Via Multiple Vendors or Sole Source:**
- b. System Component B:**

1. Item: Laboratory analysis services
 2. Price Range: \$15,000
 3. Available Via Multiple Vendors or Sole Source: Multiple Vendors
- c. System Component C:
1. Item: 30' Survey boat with portioning and echo sounding systems
 2. Price Range: \$200,000
 3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Calcasieu, LA Field Test
2. Date: 1989-90
3. District Participant: CELMN
4. District Contact: Mike Park

b. Activity B:

1. Title: Gulfport, MS Field Test
2. Date (Est): 1990-91
3. District Participant: CESAM
4. District Contact:

c. Activity C:

1. Title: Sabine, TX Field Demonstration
2. Date: 1991
3. District Participant: CESWG
4. District Contact:

d. Activity D:

1. Title: Savannah, GA

2. Date (Est): 1992

3. District Participant: CESAS

4. District Contact:

e. Activity E:

1. Title: Georgetown, SC Field test

2. Date: 1989-90

3. District Participant: CESAC

4. District Contact:

VI. Additional Comments:

Product Number: 2-C-90

I. Product Information

a. Product Name: A Method to Rapidly Measure Consolidated Sediment Properties

b. Product Key Word: Technique

c. Technical Key Word: Cohesive sediment, aerial extent, vertical properties

d. Description: This method provides a technique to characterize pre- and post-dredge sub-bottom characteristics using conventional acoustical equipment and proprietary software. Characterization of materials are by type, density, and impedance.

e. Technology Availability Date: Dec-90 (draft)

II. DRP Work Unit Information

a. Work Unit #: 32470

b. Work Unit Title: Rapid Measurement of Properties of Consolidated Sediments

c. Technical Area: 2

d. Principal Investigator: Bob Ballard, CEWES-GG

e. Telephone: 601-634-2201/(FTS) 542-2201

III. Required Skills & Training to Use Product

a. Required Skills: Acoustic sub-bottom profile operators, basic geophysics and geology

b. Recommended Training: WES introductory training can be scheduled

IV. Required Equipment or System Components to Use Product

a. Equipment A:

1. Item: Acoustic Sub-bottom Profiler

2. Price Range: \$100,000-200,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

b. Equipment B:

1. Item: 386 PC with special amplifiers

2. Price Range: \$55,000-65,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

c. Equipment C:

1. Item: Acoustic Impedance Algorithms Computer Software

2. Price Range: \$12,000-15,000

3. Available Via Multiple Vendors or Sole Source: Sole Source

4. Potential Source: Caulfield Engineering Group
RR #1
Oyama, British Columbia VOH1WO
CANADA
Telephone: 604-548-3244

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Gulfport, MS Fluid Mud Field Test

2. Date: Jul-90

3. District Participant: CESAM

4. District Contact: Jim Reeves, CENPD-PL-ER, 503-326-3832

b. Activity B:

1. Title: Bayou La Batterie, AL Pre-Dredge Demonstration

2. Date: Jul-90

3. District Participant: CESAM

4. District Contact: Jim Reeves, CENPD-PL-ER, 503-326-3832

c. Activity C:

1. Title: Oakland Bay Harbor, CA

2. Date: Aug-90

3. District Participant: CESP

4. District Contact: Roger Golden

VI. Additional Comments:

Product Number: 2-D-90

I. Product Information

a. Product Name: Geotechnical Site Investigation Guidance for Dredging Projects

b. Product Key Word: Guidance

c. Technical Key Word: Geotechnical site investigation

d. Description: This product will provide guidance for project engineer to cost effectively plan site investigation strategy by using a wide variety of geotechnical techniques. Analytical techniques will be specified which will allow the use of site investigation data to more reliably estimate dredge difficulty, excavatability, transportability, and production rates for various bottom sediments, and to help select dredging equipment and methodology.

e. Technology Availability Date: Sep-94

II. DRP Work Unit Information

a. Work Unit #: 32471

b. Work Unit Title: Descriptors for Bottom Sediments to be Dredged

c. Technical Area: 2

d. Principal Investigator: Jack Fowler, CEWES-GS-S

e. Telephone: 601-634-2703/(FTS) 542-2703

III. Required Skills & Training to Use Product: Capability to conduct geotechnical investigations (land based and overwater) including ability to obtain general and undisturbed soil samples; ability to conduct and interpret geophysical surveys, ability to perform basic laboratory tests; knowledge of geotechnical site investigation and general soil mechanics and analytical techniques. Also necessary is a general background knowledge of dredging operations and techniques.

IV. Required Equipment or System Components to Use Product: Commercially available geotechnical equipment such as split spoon penetrometer, cone penetrometer, vane shear, fixed piston Shelby tubes, etc. will be required. Commercially available geotechnical laboratory equipment for performing routine tests such as Atterberg limits, natural water content, in-situ density, shear strength, mechanical gradations, etc., also will be necessary. Geophysical equipment such as acoustic sub-bottom profiler being developed in work unit

entitled "Rapid Measurement of Properties of Consolidated Sediments" (32470) which rapidly measure properties of consolidated sediments may also be employed.

V. Supporting Field Experiments & Demonstrations:

a. Activity A:

1. Title: Mobile Ship Channel Deepening
2. Date: 1991
3. District Participant: CESAM
4. District Contact: Jim Baxter

b. Activity B:

1. Title: Dredging Chesapeake Bay
2. Date: 1991
3. District Participant: CENAO
4. District Contact: Ronn Vann, CENAO-EN-W, 804-441-3057

c. Activity C:

1. Title: Dredging in New Orleans District
2. Date: 1991
3. District Participant: CELMN
4. District Contact: Charles Settoon, CELMN-EN-DD, 504-862-2726

VI. Additional Comments:

Product Number: 2-E-90

I. Product Information

- a. Product Name:** Drilling Parameter Recorder
- b. Product Key Word:** Instrumentation
- c. Technical Key Word:** Site characterization
- d. Description:** Drilling Parameter Recorder (DPR) is the instrumentation and interpretive software for a drill rig which provides continuous records of drilling parameters related to dredging operations in lieu of lost cores.
- e. Technology Availability Date:** Jan-90

II. DRP Work Unit Information

- a. Work Unit #:** 32472
- b. Work Unit Title:** Descriptors for Rock Materials to be Dredged
- c. Technical Area:** 2
- d. Principal Investigator:** Hardy Smith, CEWES-GS-R
- e. Telephone:** 601-634-2431/(FTS) 542-2431

III. Required Skills & Training to Use Product

- a. Required Skills:** Experience in instrumentation and electronics. Geotechnical engineer or geologist for interpretation.
- b. Recommended Training:** WES introductory training can be scheduled

IV. Required Equipment or System Components to Use Product: Presently a Drilling Parameter Recorder installed on a hydraulic drill rig is available via a cost reimbursable basis. Target date for operational techniques for routine field use of district or contractor-owned equipment is Sep-92.

- a. Equipment A: (Product)**
 - 1. Item:** Drilling Parameter Recorder instrumentation and software
 - 2. Price Range:** \$90,000-100,000
 - 3. Available Via Multiple Vendors or Sole Source:** Sole Source

4. Potential Source: Soletanche
8 Rue de Watford-BP 511
92005 Nanterre Cedex FRANCE

b. Equipment B:

1. Item: 286 PC or better with any HP printer/plotter
2. Price Range: \$5,000-6,000
3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

c. Equipment C:

1. Item: Drill rig, drilling platform and laboratory testing of some rock cores for correlations (these items are commonly used for dredging site exploration).
2. Price Range: Varies
3. Available Via Multiple Vendors or Sole Source: Multiple Sources

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: New York Harbor Project
2. Date: Dec-88
3. District Participant: CENAN
4. District Contact: John Cimmino, CENAN-EN-DF, 212-264-9110

b. Activity B:

1. Title: Grays Harbor Field Test
2. Date: Aug-89
3. District Participant: CENPS
4. District Contact: Hen Graybeal, CENPS, 206-764-3712

c. Activity C:

1. Title: Wilmington Harbor Field Test
2. Date: Sep-89

3. District Participant: CESAW

4. District Contact: John Golden, 919-343-4702 and Barry Holliday, 919-251-4823

d. Activity D:

1. Title: Kings Bay Field Test

2. Date: Oct-89

3. District Participant: CESAS

4. District Contact: Bob O'Kelly, 912-944-5672

VI. Additional Comments:

Product Number: 2-F-90

I. Product Information

- a. Product Name: Point Load Test for Dredged Material Strengths
- b. Product Key Word: Procedure
- c. Technical Key Word: Rock strength index
- d. Description: Point Load Tests of core and rock fragments can be performed quickly on site to produce a strength index which may be correlated with other common parameters such as unconfined compressive strength.
- e. Technology Availability Date: Mar-91 (Tests may be performed at present for strength indices, but strength correlations for these indices are being developed for weak/saturated materials at this time.)

II. DRP Work Unit Information

- a. Work Unit #: 32472
- b. Work Unit Title: Descriptors for Rock Materials to be Dredged
- c. Technical Area: 2
- d. Principal Investigator: Hardy Smith, CEWES-GS-R
- e. Telephone: 601-634-2431/(FTS) 542-2431

III. Required Skills & Training to Use Product

- a. Required Skills: Geologist, engineer with geotechnical background, geotechnician.
- b. Recommended Training: N/A

IV. Required Equipment or System Components to Use Product

- a. Equipment A:
 - 1. Item: Point Load Tester
 - 2. Price Range: \$3,000-4,000
 - 3. Available Via Multiple Vendors or Sole Source: Multiple Sources

4. Potential Sources: Terrametrics
16027 West 5th Avenue
Golden, CO 80401

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments: Recommend following special procedures for weak/saturated materials as given in "*Suggested Methods for Use of Point Load Tester in Dredging Applications*," DRP Technical Note 2-01, Aug-90.

Technical Area 3

Dredge Plant Equipment & Systems Processes

Virginia Pankow, Technical Area Manager

601-634-2838

(FTS) 542-2838

Objectives of Technical 3

The objectives of Technical Area 3, entitled "Dredge Plant Equipment and Systems Processes" are to:

- a. improve draghead design for dredging compacted fine sands and cohesive muds.
- b. improve eductor (jet pump) designs for sand bypassing operations.
- c. develop systems to monitor and equipment to increase dredge payloads for fine-grained sediments.
- d. design portable single-point mooring buoy for hopper dredge direct pumpout.

Product Number: 3-A-90

I. Product Information

a. Product Name: Design Recommendations for Improved Draghead Design Components

b. Product Key Word: Technical Information

c. Technical Key Word: Draghead design

d. Description: Design recommendations for trailing suction draghead modifications to increase production when dredging compacted fine sands. The design recommendations are based on laboratory data and prototype field tests.

e. Technology Availability Date: Feb-92 (Laboratory and field tests results)

II. DRP Work Unit Information

a. Work Unit #: 32473

b. Work Unit Title: Improved Draghead Design

c. Technical Area: 3

d. Principal Investigator: Glynn Banks, CEWES-HE-E

e. Telephone: 601-634-3597/(FTS) 542-3597

III. Required Skills & Training to Use Product: N/A

IV. Required Equipment or System Components to Use Product

a. System Component A:

1. Item: Sub-soiler blades attached to shop-modified grates

2. Price Range: \$5,000-10,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

4. Potential Source: Adams Hardfacing, Co.
Attn: Mr. Edmisson
P.O. Box 1859
Guyton, OK 73942

b. System Component B:

1. Item: Waterjets attached to shop-modified grates
2. Price Range: \$5,000-15,000
3. Available Via Multiple Vendors or Sole Source: Multiple Vendors
4. Potential Source: Mobile Pulley
 Mobile, AL

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Dredge Wheeler Field Tests
2. Date (Est): Jan-91
3. District Participant: CELMN
4. District Contact: Henry Schorr, CELMN-OD, 504-862-2281

VI. Additional Comments: Available information:

Banks, G. E., 1988 "Improved Draghead Design," In Proceedings. 21st Annual Dredging Seminar, Metairie, LA, October 20-21, 1988, College Station, TX, Texas A&M University, p. 111-122.

Product Number: 3-B-90

I. Product Information

a. Product Name: Hydraulic Design Guidance for Fluidizers

b. Product Key Word: Design Guidance

c. Technical Key Word: Sand bypassing/Dredging equipment

d. Description: An Engineering Technical Letter will provide hydraulic design guidance on fluidizers used to liquify or "fluidize" a sand bed preparing it for movement by natural forces or controlled pumping. Using the procedures, equations, and nomographs in the ETL, the engineer will be able to conduct the preliminary design of a fluidizer system. This will include determining pipeline lengths, sizes, pump horsepower, elevation, etc. The procedures will be valid for both independent fluidizers and those used in conjunction with a jet pump or submersible pump.

e. Technology Availability Date: Jun-91 (Draft information available)

II. DRP Work Unit Information

a. Work Unit #: 32474

b. Work Unit Title: Improved Eductors for Sand Bypassing

c. Technical Area: 3

d. Principal Investigator: Jim Clausner, CEWES-CD-SE

e. Telephone: 601-634-2009/(FTS) 542-2009

III. Required Skills & Training to Use Product:

a. Required Skills: N/A

b. Recommended Training: Optional sand bypassing workshop covering eductors, fluidizers and submersible pumps is available

c. DRP Training Date (est): Feb-94

IV. Required Equipment or System Components to Use Product: N/A

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments:

Product Number: 3-C-90

I. Product Information

- a. Product Name: Plans and Specifications for Improved Eductors
- b. Product Key Word: Plans & Specifications
- c. Technical Key Word: Sand bypassing/dredging
- d. Description: Plans and specifications for a royalty-free eductor (jet pump) and deployment system design will be produced. The product will be both debris resistant and easy to deploy/retrieve. This product should be the basis for a reliable, reasonably priced sand bypassing system for small- to medium-sized inlets and harbors.
- e. Technology Availability Date: Jun-94

II. DRP Work Unit Information

- a. Work Unit #: 32474
- b. Work Unit Title: Improved Eductors for Sand Bypassing
- c. Technical Area: 3
- d. Principal Investigator: Jim Clausner, CEWES-CD-SE
- e. Telephone: 601-634-2009/(FTS) 542-2009

III. Required Skills & Training to Use Product:

- a. Required Skills: N/A
- b. Recommended Training: Optional sand bypassing workshop covering eductors, fluidizers and submersible pumps is available
- c. DRP Training Date (est): Feb-94

IV. Required Equipment or System Components to Use Product

- a. System Component A:
 - 1. Item: Jet Pump
 - 2. Price Range: \$30,000-100,000

3. Available Via Multiple Vendors or Sole Source: Sole Source

4. Potential Source: Genflo Jet Pumps
Standard Gravel Company
Route 7, Box 53
Franklinton, LA 70438

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Field Tests of New Design Eductor
2. Date (Est): Feb-91
3. District Participant: To be determined
4. District Contact: N/A (Jim Clausner, CEWES-CD-SE, 601-634-2009/FTS-542-2009)

b. Activity B:

1. Title: Indian River Inlet
2. Date (Est): Feb-92
3. District Participant: CENAP
4. District Contact: Gus Rambo, CENAP-EN-D, 215-597-1422

VI. Additional Comments: Available information:

"Jet Pump Sand Bypassing, Nerang River Entrance, Australia," Technical Note DRP -01, November 1989.

"Jet Pump Sand Bypassing, Indian River Inlet, Delaware," Dredging Research Information Exchange Bulletin, Vol DRP-89-2, Nov 1989.

Product Number: 3-D-90

I. Product Information

- a. Product Name: Sand Bypassing EM Update
- b. Product Key Word: Technical Guidance
- c. Technical Key Word: Sand bypassing/dredging maintenance
- d. Description: Information generated by this work will be used to update the Sand Bypass Engineer Manual (EM-1110-2-1616). The bypassing systems selection of the EM will be expanded to include new information and experience with jet pumps, fluidizers, and submersible pumps.
- e. Technology Availability Date: Sep-94 (Draft available)

II. DRP Work Unit Information

- a. Work Unit #: 32474
- b. Work Unit Title: Improved Eductors for Sand Bypassing
- c. Technical Area: 3
- d. Principal Investigator: Jim Clausner, CEWES-CD-SE
- e. Telephone: 601-634-2009/(FTS) 542-2009

III. Required Skills & Training to Use Product:

- a. Required Skills: N/A
- b. Recommended Training: Optional sand bypassing workshop covering eductors, fluidizers and submersible pumps is available
- c. DRP Training Date (est): Feb-94

IV. Required Equipment or System Components to Use Product: N/A

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments:

Product Number: 3-E-90

I. Product Information

- a. Product Name: Sand Bypassing Submersible Pump Applications
- b. Product Key Word: Equipment selection information
- c. Technical Key Word: Sand bypassing/dredging
- d. Description: Documented field tests with recommendations on applying and selecting appropriate submersible pumps for specific dredging situations.
- e. Technology Availability Date: Aug-90

II. DRP Work Unit Information

- a. Work Unit #: 32474
- b. Work Unit Title: Improved Eductors for Sand Bypassing
- c. Technical Area: 3
- d. Principal Investigator: Jim Clausner, CEWES-CD-SE
- e. Telephone: 601-634-2009/(FTS) 542-2009

III. Required Skills & Training to Use Product: N/A

IV. Required Equipment or System Components to Use Product

- a. System Component A:
 - 1. Item: Submersible pumps
 - 2. Price Range: \$10,000-30,000 (\$25,000-50,000 with power unit)
 - 3. Available Via Multiple Vendors or Sole Source: Multiple Vendors
 - 4. Potential Sources:
 - Barrett Haentjens & Co.
 - 225 N. Cedar St.
 - Hazleton, PA 18201
 - 717-455-7711

 - Crisafulli Pump Co.
 - Attn: Dwyane Seborg
 - P.O. Box 1051

Glendive, MT 59330
800-442-PUMP

Eddy Pump Corp.
Attn: Harry Weinrib
3166 Des Plaines Ave., Ste 30
Des Plaines, IL 60018
708-297-8080

H&H Pump Co.
Attn: Ricky Pollan
P.O. Box 486
Clarksdale, MS 38614
601-627-9631

Innovative Material Systems
Attn: Dean Wickoren
P.O. Box 2987
Olathe, KS 66062
913-829-2900

Toyo Pumps
Attn: Mike Donnelly
North American Corp
200-171 West Esplanade
North Vancouver, BC, V7M1A1 CANADA

Warman International, Inc.
Attn: Dick Chilson
2701 S. Stroughton Rd.
Madison, WI 53716
608-221-2261

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Red River Lock & Dam #1 Field Test
2. Date (Est): Jul-90
3. District Participant: CELMK
4. Division Contact: Larry Rabalais, CELMV-CO-O, 601-634-5814

VI. Additional Comments: Available information:

"Submersible Pumps for Sand Bypassing," *Dredging Research Information Exchange Bulletin*, Vol DRP-90-3, October 1990.

Product Number: 3-F-90

I. Product Information

a. Product Name: Summary of Increased Hopper Payload Experiments

b. Product Key Word: Technical Information

c. Technical Key Word: Solids retention

d. Description: This product summarizes experimental results using devices to increase solids retention within a hopper bin or barge. The devices can be applied to discharge from confined disposal sites, as well as to the design of a special purpose dredge.

e. Technology Availability Date: Jun-91

II. DRP Work Unit Information

a. Work Unit #: 32475

b. Work Unit Title: Monitoring and Increasing Dredge Payloads for Fine Grain Sediments

c. Technical Area: 3

d. Principal Investigator: Ginny Pankow, CEWES-HE-E

e. Telephone: 601-634-2838/(FTS) 542-2838

III. Required Skills & Training to Use Product: N/A

IV. Required Equipment or System Components to Use Product: N/A

V. Supporting Field Experiments & Demonstrations: N//A

VI. Additional Comments: Additional information:

"Inclined Plate Techniques," DRP Technical Note 3-04 (in-draft)

"Summary of Increased Payload Work" *Dredging Research Information Exchange Bulletin* (in-draft)

Product Number: 3-G-90

I. Product Information

a. Product Name: User Guidance and Specifications for Hopper Monitoring Systems

b. Product Key Word: Technical guidance, system specifications (hardware & software)

c. Technical Key Word: Hopper payload monitoring

d. Description: This product provides technical guidance on specifying and selecting components, installing, and using a hopper dredge monitoring system. Using field-tested sensors, hardware, and interpretive software, the hopper dredge operator or dredge inspector will be able to determine hopper load mass or volume for contract monitoring and, when desired, payment. The basic software for a computer output display is provided.

e. Technology Availability Date: Sep-94

II. DRP Work Unit Information

a. Work Unit #: 32475

b. Work Unit Title: Monitoring and Increasing Dredge Payloads for Fine Grain Sediments

c. Technical Area: 3

d. Principal Investigator: Ginny Pankow, CEWES-HE-E

e. Telephone: 601-634-2838/(FTS) 542-2838

III. Required Skills & Training to Use Product

a. Required Skills: Electronics fundamentals

b. Recommended Training: N/A

IV. Required Equipment or System Components to Use Product

a. System Component A:

1. Item: Draft indicator & interface (minimum of two units required)

2. Price Range: \$2,000-5,000 per unit (does not include installation)

labor)

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

b. System Component B:

1. Item: Slurry/water surface indicator & interface (minimum of two units required)

2. Price Range: \$2,000-5,000 per unit

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

c. System Component C:

1. Item: Output display

2. Price Range: \$1,000-10,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Vertical Density Probe Array Laboratory Test

2. Date (Est): Nov-90

3. District Participant: CENPP, CENAP, CELMN

4. District Contacts: Ken Patterson, 503-326-3404, Ron Kreh, 215-597-4883, Henry Schorr, 504-862-2281

b. Activity B:

1. Title: Hopper Monitoring Demonstration

2. Date (Est): Jul-91

3. District Participant: CELMN

4. District Contact: Henry Schorr, 504-862-2281

VI. Additional Comments: Additional information:

"Laboratory Results of Hopper Monitoring Devices," DRP Technical Note (in-draft)

Technical Area 4

Vessel Positioning, Survey Controls & Dredge Monitoring Systems

Andy Garcia, Technical Area Manager

601-634-3555

(FTS) 542-3555

Objectives for Technical Area 4

The objectives for Technical Area 4, entitled "Vessel Positioning, Survey Controls, and Dredge Monitoring Systems" are to:

- a. develop real-time system for measuring project site tide and wave conditions in offshore open waters.
- b. develop three-dimensional positioning system for dredging and hydrographic survey operations using Global Position System (GPS) satellite constellation.
- c. evaluate production meters used in various dredging situations.
- d. develop automated inspection monitoring and reporting system for use on any type of dredge.

Product Number: 4-A-90

I. Product Information

a. Product Name: Real-Time Tide Reporting System

b. Product Key Word: Measure and System

c. Technical Key Word: Hydrosurvey & Dredging Operations

d. Description: Accurate local real-time tide data permit more accurate hydrosurvey operations, and can minimize the over-depth dredging necessary to assure design channel depths. The system transmits real-time water level data for all locations within a designated offshore area. The system allows unlimited numbers of authorized-only users, yet requires only inexpensive, commercially available equipment to access.

e. Technology Availability Date: Jun-93 (draft)

II. DRP Work Unit Information

a. Work Unit #: 32478

b. Work Unit Title: Integrated Vertical Control System

c. Technical Area: 4

d. Principal Investigator: Andy Garcia, CEWES-CD-P

e. Telephone: 601-634-3555/(FTS) 542-3555

III. Required Skills & Training to Use Product: N/A

IV. Required Equipment or System Components to Use Product

a. Equipment A:

1. Item: VHF receiver

2. Price Range: \$150-300

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

b. Equipment B:

1. Item: 8086/286/386 PC with modem

2. Price Range: \$1,000-5,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Charleston Harbor Field Demonstration

2. Date (Est):

3. District Participant: CESAC

4. District Contact: J. Mims

VI. Additional Comments: This system includes a water level sensor, shore base transmitter and determination of local tide constituents.

Product Number: 4-B-90

I. Product Information

a. Product Name: Plans and Specifications for Universal Heave Compensation System

b. Product Key Word: Plans and Specifications

c. Technical Key Word: Hydrosurvey

d. Description: A common problem when performing offshore hydrosurveys is compensating for the wave induced vertical motion of the survey vessel. The vertical motion (heave) compensation system is specifically for CE offshore operating environments (i.e., relatively small survey vessels and relatively short period waves). The system determines the vertical vessel motion at the sounding transducer positions. The prototype system accommodates a maximum of five transducers. Development efforts include investigating the feasibility of accommodating more transducers.

e. Technology Availability Date: Apr-93

II. DRP Work Unit Information

a. Work Unit #: 32478

b. Work Unit Title: Integrated Vertical Control System

c. Technical Area: 4

d. Principal Investigator: Andy Garcia, CEWES-CD-P

e. Telephone: 601-634-3555/(FTS) 542-3555

III. Required Skills & Training to Use Product

a. Required Skills: N/A

b. Recommended Training: One day familiarization training available

IV. Required Equipment or System Components to Use Product

a. System Component A:

1. Item: Heave compensator system

2. Price Range: \$12,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

b. Equipment A:

1. Item: 286/386 PC

2. Price Range: \$2,000-5,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments: A DRP-developed prototype compensation system will be field tested and demonstrated.

Product Number: 4-C-90

I. Product Information

a. Product Name: Vertical Motion Compensator Interface Requirements Document

b. Product Key Word: Specifications

c. Technical Key Word: Hydrosurvey

d. Description: The Corps of Engineers (CE) uses a variety of sounding systems on CE hydrosurvey vessels. The heave compensation system being developed under the DRP must interface with existing CE sounding systems to correct soundings contaminated with vertical vessel motion. This document will determine relevant electrical and mechanical characteristics of existing CE sounding systems. Acquired information will be used to develop specifications for a universal interface.

e. Technology Availability Date: Sep-91 (draft)

II. DRP Work Unit Information

a. Work Unit #: 32478

b. Work Unit Title: Integrated Vertical Control System

c. Technical Area: 4

d. Principal Investigator: Andy Garcia, CEWES-CD-P

e. Telephone: 601-634-3555/(FTS) 542-3555

III. Required Skills & Training to Use Product: N/A

IV. Required Equipment or System Components to Use Product: N/A

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments:

Product Number: 4-D-90

I. Product Information

a. Product Name: Sea State Indicators

b. Product Key Word: Technical Information

c. Technical Key Word: Sea state (wave climate)

d. Description: Estimates of sea-state (local wave height and period) are often necessary for design, monitoring, or contract administration of dredging projects. Means of acquiring sea-state information for the aforementioned purposes must be robust and low-cost. Both conventional and innovative approaches toward best achieving these opposing goals will be documented.

e. Technology Availability Date: Oct-93 (draft)

II. DRP Work Unit Information

a. Work Unit #: 32478

b. Work Unit Title: Integrated Vertical Control System

c. Technical Area: 4

d. Principal Investigator: Andy Garcia, CEWES-CD-P

e. Telephone: 601-634-3555/(FTS) 542-3555

III. Required Skills & Training to Use Product

a. Required Skills: N/A

b. Recommended Training: One day optional WES training available

IV. Required Equipment or System Components to Use Product: Varies (specific application dependent)

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments:

Product Number: 4-E-90

I. Product Information

a. Product Name: GPS Performance Specifications

b. Product Key Word: Specifications

c. Technical Key Word: GPS

d. Description: This document provides performance specifications intended to assist FOA's in procuring a decimeter-accuracy GPS positioning system for hydrographic surveying. The document will contain:

1. reference station network hardware and software
2. data link between reference and survey vessel(s)
3. roll, pitch, and heave system interface
4. acoustic interface
5. data formats
6. high accuracy frequency standard

e. Technology Availability Date: Sep-93 (draft)

II. DRP Work Unit Information

a. Work Unit #: 32479

b. Work Unit Title: Horizontal/Vertical Positioning System Using GPS Satellites

c. Technical Area: 4

d. Principal Investigator: Carl Lanigan, CEETL-TL-SP

e. Telephone: 703-355-2752

III. Required Skills & Training to Use Product

a. Required Skills: Hydrographic survey experience

b. Recommended Training:

1. Interim GPS Training: This training will update potential users of the decimeter-accuracy GPS positioning system regarding progress of the prototype development. In addition, this training will familiarize potential users with the GPS technology. Instruction on mission planning, GPS receiver deployment, data link requirements, and vessel installation considerations will be discussed.

2. GPS Prototype Demonstration & Training: Three demonstrations of the prototype decimeter-accuracy GPS positioning system will be conducted at approximately six month intervals. During these demonstration periods, training will be provided to those FOA's who are interested in using the system. The operation manual and performance specifications will be available at that time and will be discussed. Demonstrations are planned at sites located on the east and west coasts, and the Gulf of Mexico, in order to equally cover the U.S. and reduce FOA's travel distances.

c. DRP Training Date (Est): To be announced at a later date

IV. Required Equipment or System Components: Presently, this work unit is identifying all necessary GPS hardware, software, and communications required for decimeter accuracy. Since this product will address all required GPS system components, current systems requirements are presently unavailable. GPS system components requirements will be identified in future DRP Product Inventory editions as the information becomes available.

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments:

Product Number: 4-F-90

I. Product Information

a. Product Name: GPS Operations Manual

b. Product Key Word: Guidance

c. Technical Key Word: GPS

d. Description: This manual will provide guidance to FOA's on how to install and operate a decimeter-accuracy GPS positioning system. The documentation will provide information concerning:

1. installation and location of reference station networks
2. communications recommendations
3. interfacing the positioning system with other on board systems (input and output formats)
4. surveying operations

e. Technology Availability Date: Sep-93 (draft)

II. DRP Work Unit Information

a. Work Unit #: 32479

b. Work Unit Title: Horizontal/Vertical Positioning System Using GPS Satellites

c. Technical Area: 4

d. Principal Investigator: Carl Lanigan, CEETL-TL-SP

e. Telephone: 703-355-2752

III. Required Skills & Training to Use Product

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c. DRP Training Date (Est): To be announced at a later date

IV. Required Equipment or System Components to Use Product: N/A

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Field Demonstration A
2. Date (Est): Nov-93
3. District Participant: To be announced at a later date
4. District Contact: N/A (Carl Lanigan, 703-355-2752)

b. Activity B:

1. Title: Demonstration B
2. Date (Est): May-94
3. District Participant: To be announced at a later date
4. District Contact: N/A (Carl Lanigan, 703-355-2752)

c. Activity C:

1. Title: Demonstration C
2. Date (Est): Oct-94
3. District Participant: To be announced at a later date
4. District Contact: N/A (Carl Lanigan, 703-355-2752)

VI. Additional Comments:

Product Number: 4-G-90

I. Product Information

a. Product Name: Production Meter User Guidance

b. Product Key Word: Technical Information

c. Technical Key Word: Dredge Production meters

d. Description: This user guidance consists of technical information on selecting, installing, and using a dredge production meter system. By selecting the best combination of density and velocity gauges, as well as an optimized output display, a dredge operator can improve the overall dredging performance of the dredge, and establish an improved dredging data base for dredge and equipment.

e. Technology Availability Date: Mar-92 (draft)

II. DRP Work Unit Information

a. Work Unit #: 32480

b. Work Unit Title: Production Meter Technology

c. Technical Area: 4

d. Principal Investigator: Ginny Pankow, CEWES-HE-E

e. Telephone: 601-634-2838

III. Required Skills & Training to Use Product: N/A

IV. Required Equipment or System Components to Use Product

a. System Component A:

1. Item: Velocity meter & interface

2. Price Range: \$3,000-30,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

b. System Component B:

1. Item: Density gauge & interface

2. Price Range: \$10,000-50,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

c. System Component C:

1. Item: Output device

2. Price Range: \$2,000-50,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

d. Potential Sources:

1. Doppler Flow Meters:

Leeds and Northrup
Mail Drop 390
Sumneytown Pike
Northwales, PA 19454

Polysonics
P.O. Box 22428
Houston, TX 77027
713-623-2134

Texas Nuclear
Box 9627
Austin, TX 78766
512-836-0801

2. Magnetic Flow Meters:

Brook Instruments
407 West Vine Street
Hatfield, PA 19440

Dredge Technology Corporation
One World Trade Center Suite 3047
New York, NY 10048

Fischer & Porter
125 East County Line Road
Warminster, PA 18947
215-674-6000

Kent Processes Control, Inc.
165 Fieldcrest Avenue
Raritan Center
Edison, NJ 08837

201-225-1717

Rosemont, Inc.
1395 Marietta Pkwy
Bldg 700, Ste 702
Marietta, GA 30067

3. Nuclear Density Gauge:

Berthold Systems, Inc.
79 North Industrial Park
Sewickley, PA 15143
412-741-1273

Kay Ray, Inc.
516 West Campus Drive
Arlington Heights, IL 60004

Omart Corp
4241 Allendorf Drive
Cincinnati, OH 45209
513-272-0131

Texas Nuclear
Box 9627
Austin, TX 78766
512-836-0801

4. Entire Production Meter Systems:

Dredge Technology Corporation
One World Trade Center Suite 3047
New York, NY 10048

Texas Nuclear
Box 9627
Austin, TX 78766
512-836-0801

Ellicott Machine Corp.
1600 Block of Bush Street
Baltimore, MD 21230
301-837-7900

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Dredge Jadwin Field Demonstration

2. Date (Est): May thru Oct-90

3. District Participant: CELMK

4. District Contact: Steve Jones, 601-631-5584

b. Activity B:

1. Title: Dredge *Wheeler* Field Test

2. Date (Est): Jul-91 (estimated, planned in conjunction with hopper load monitoring test)

3. District Participant: CELMN

4. District Contact: Henry Schorr, 504-862-2281

VI. Additional Comments:

Product Number: 4-H-90

I. Product Information

a. Product Name: Dredge Operations Silent Inspector (DOSIS) Plans and Specifications

b. Product Key Word: Plans & Specifications

c. Technical Key Word: Monitoring dredging projects

d. Description: Dredge Operations Silent Inspector System (DOSIS) is a dredge project management and contract administration tool. Plans and specifications are provided to implement DOSIS. This will enable the user to develop an independent and consistent source of information to monitor and manage dredging projects.

e. Technology Availability Date: Jul-91 (pre-field test specifications)

II. DRP Work Unit Information

a. Work Unit #: 32482

b. Work Unit Title: Silent Inspector

c. Technical Area: 4

d. Principal Investigator: Jay Rosati, CEWES-CD-P

e. Telephone: 601-634-2022/(FTS) 542-2022

III. Required Skills & Training to Use Product

a. Required Skills: N/A

b. Recommended Training: DRP DOSIS Workshop

c. DRP Training Date (Est): To be announced at a later date

IV. Required Equipment or System Components to Use Product

a. System Component A:

1. Item: Dredge monitoring system (DOSIS)

2. Price Range: \$30,000-100,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: DOSIS Prototype Field Demonstration
2. Date (Est): Mar-92
3. District Participant: To be announced at a later date
4. District Contact: James Rosati, CEWES-CD-P, 601-634-2022

VI. Additional Comments: A requirements report scheduled for Jan-91 (draft) identifies requirements for DOSIS. The document surveys Corps personnel and hopper dredge fleet to determine requirements for a dredge monitoring and reporting system. In addition, the report contains a contractor's report detailing system requirements, reviewers comments of that report, and a full list of system requirements in DOD standard format.

Technical Area 5

Management of Dredging Projects

Mike Trawle, Technical Area Manager
601-634-3518
(FTS) 542-3518

Objective for Technical Area 5

The objectives for Technical Area 5, entitled "Management of Dredging Projects" are to:

- a. evaluate the effects of dredging decisions and project changes.
- b. optimize use of open-water disposal sites.
- c. analyze dredging cost-estimating techniques.
- d. prepare dredging manuals incorporating state-of-the-art technology.

Product Number: 5-A-90

I. Product Information

a. Product Name: The Manual of Instruction for Hopper Dredge Operations and Standard Report Procedures (EM 1125-2-312) Revision

b. Product Key Word: Guidance

c. Technical Key Word: Hopper dredge

d. Description: This product is an EM that provides instructions for hopper dredge operations and standard report procedures. The most recent version of this EM was published in 1953. The revised edition will bring these guidelines up-to-date. The revision will be more understandable and comprehensible for present day hopper dredge operations.

e. Technology Availability Date: Jun-92 (draft available)

II. DRP Work Unit Information

a. Work Unit #: 32476

b. Work Unit Title: Dredge Plant Manuals

c. Technical Area: 5

d. Principal Investigator: Gary Lynch, CEWES-HR-N

e. Telephone: 601-634-4165/(FTS) 542-4165

III. Required Skills & Training to Use Product: Should be familiar with hopper dredge terms and general information.

IV. Required Equipment or System Components to Use Product: N/A

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments:

Product Number: 5-B-90

I. Product Information

a. Product Name: History of Corps Hopper Dredges, 2nd Edition

b. Product Key Word: Guidance

c. Technical Key Word: Hopper dredge

d. Description: This product will revise and update the "Redbook" presenting it in a published and optical disk format. The "Redbook" is a compiled history of the Corps hopper dredges as well as a training tool for dredge crewmen. The Redbook was last published date was 1954 and this revision will incorporate an additional 40 years of technology, as well as remove obsolete information.

e. Technology Availability Date: Jun-93 (draft available)

II. DRP Work Unit Information

a. Work Unit #: 32476

b. Work Unit Title: Dredge Plant Manuals

c. Technical Area: 5

d. Principal Investigator: Gary Lynch, CEWES-HR-N

e. Telephone: 601-634-4165/(FTS) 542-4165

III. Required Skills & Training to Use Product

a. Required Skills: Word Perfect skills for optical disk option

b. Recommended Training: N/A

IV. Required Equipment or System Components to Use Product

a. Equipment A:

1. Item: Optical disk & drive (optional)

2. Price Range: \$4,000-6,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

b. Equipment B:

1. Item: Word Perfect Software 5.1 Version

2. Price Range: \$700

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations: None

VI. Additional Comments:

Product Number: 5-C-90

I. Product Information

a. Product Name: Design, Construction, and Maintenance of Capping Sites

b. Product Key Word: Guidance

c. Technical Key Word: Capping sites

d. Description: Viable economic and environmental alternatives for subaqueous disposal, and isolation of contaminated dredged material, are being evaluated. Integral to each site design are site characteristics, construction methodology, and long term maintenance and monitoring. Step by step guidance will be developed to lead the site manager through the evaluation, construction, and maintenance of capping projects.

e. Technology Availability Date: Aug-94

II. DRP Work Unit Information

a. Work Unit #: 32489

b. Work Unit Title: Open Water Disposal Site Planning, Design and Operation

c. Technical Area: 5

d. Principal Investigator: James Clausner, CEWES-CD-SE

e. Telephone: 601-634-2009/(FTS) 542-2009

III. Required Skills & Training to Use Product:

a. Required Skills: A general knowledge of dredging disposal and requirements for capping operations. Good working knowledge of regulations pertinent to open water disposal and capping. Basic understanding of chemistry, hydrodynamics and geotechnical procedures.

b. Recommended Training: N/A

IV. Required Equipment or System Components to Use Product: N/A

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments:

Product Number: 5-D-90

I. Product Information

a. Product Name: Design of Nearshore Berms

b. Product Key Word: Design procedures

c. Technical Key Word: Nearshore berms

d. Description: Design of nearshore berms includes site evaluations, construction methodology, and the effect of placement in the nearshore zone. By quantifying these parameters, an economic analysis of each site can be conducted. Step-by-step guidance will be provided so that physical and economic analyses can be conducted on a site-specific basis. Work will be closely coordinated with Technical Area 1 modeling efforts.

e. Technology Availability Date: Aug-94

II. DRP Work Unit Information

a. Work Unit #: 32489

b. Work Unit Title: Open Water Disposal Site Planning, Design, and Operation

c. Technical Area: 5

d. Principal Investigator: James Clausner, CEWES-CD-SE

e. Telephone: 601-634-2009/(FTS) 542-2009

III. Required Skills & Training to Use Product

a. Required Skills: Coastal processes knowledge. Basic knowledge of Section 103, 104, etc., regulations that must be followed when placing sediments in open water.

b. Recommended Training: N/A

IV. Required Equipment or System Components to Use Product: N/A

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Mobile Feeder Berm Experiment (in conjunction with DRP Technical Area 1 work unit entitled "Field Techniques and Data Analysis to Assess Fate of Open Water Disposal Deposits")

2. Date (Est): Sep-90

3. District Participant: CESAM

4. District Contact: Paul Bradley, 205-694-3730

b. Activity B:

1. Title: Brazos Island Harbor Field Experiment

2. Date (Est): Sep-90

3. District Participant: CESWG

4. District Contact: R. Hauch, 409-766-3964

VI. Additional Comments:

Product Number: 5-E-90

I. Product Information

a. **Product Name:** Management of Open-Water Disposal (MOD) PC Program

b. **Product Key Word:** PC Program

c. **Technical Key Word:** Open water disposal

d. **Description:** By providing a long-term planning tool for open-water disposal sites, the site's usable life can be extended, and the cost of site identification and designation can be reduced. The PC management plan will provide a tool to analyze the short- and long-term fate of dredged sediments placed in open water. Much of the guidance will be derived from DRP Technical Area 1 models and placed within a single program. Site manager personnel will be able to determine the most efficient use of their site.

e. **Technology Availability Date:** Mar-92

II. DRP Work Unit Information

a. **Work Unit #:** 32489

b. **Work Unit Title:** Open-Water Disposal Site, Design and Operation

c. **Technical Area:** 5

d. **Principal Investigator:** James Clausner, CEWES-CD-SE

e. **Telephone:** 601-634-2009/(FTS) 542-2009

III. Required Skills & Training to Use Product

a. **Required Skills:** Knowledge pertaining to open-water disposal site knowledge. Knowledge of Technical Area 1 model limitations and applications.

b. **Recommended Training:** DRP Technical Area 1 Workshop

c. **DRP Training Date:** Sep-94

IV. Required Equipment or System Components to Use Product

a. **Equipment A:**

1. **Item:** 386 PC with VGA

2. Price Range: \$3,000-5,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: Data Collection
2. Date (Est): Sep-90
3. District Participant: CESWG
4. District Contact: C. Cutler, 409-766-3963

b. Activity B:

1. Title: Data Collection
2. Date (Est): Sep-90
3. District Participant: CESPEN
4. District Contact: D. Hodges, 415-744-3339

c. Activity C:

1. Title: Data Collection
2. Date (Est): Sep-90
3. District Participant: CESA-CO-N
4. District Contact: Barry Holliday, 919-251-4823

VI. Additional Comments: A user manual will be provided for the MOD program, and a series of Technical Reports describing Technical Area 1 models will be available.

Product Number: 5-F-90

I. Product Information

a. Product Name: Assessment of Corps of Engineers and Commercial PC Cost Estimating Programs

b. Product Key Word: PC Program

c. Technical Key Word: Cost estimating

d. Description: This report will summarize the CE and commercially available PC dredge production and estimating programs, including acquisition costs and example printouts from promising programs.

e. Technology Availability Date: Jun-91

II. DRP Work Unit Information

a. Work Unit #: 32491

b. Work Unit Title: Analysis of Dredging Cost-Estimating Techniques

c. Technical Area: 5

d. Principal Investigator: Mitch Granat, CEWES-HE-E

e. Telephone: 601-634-3146/(FTS) 542-3146

III. Required Skills & Training to Use Product:

a. Required Skills: Familiarity with dredging cost-estimating procedures

b. Recommended Training: N/A

IV. Required Equipment or System Components to Use Product: N/A

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments:

Product Number: 5-G-90

I. Product Information

- a. Product Name: CESAM Internal Evaluation of TCI Production Program
- b. Product Key Word: Guidance
- c. Technical Key Word: Cost estimating
- d. Description: This report provides a concise summary of the TCI dredge production program. Production rates obtained from the TCI program are compared with production rates obtained from the Engineer Regulation program and actual observed field production rates for several local completed dredging jobs.
- e. Technology Availability Date: Dec-90

II. DRP Work Unit Information

- a. Work Unit #: 32491
- b. Work Unit Title: Analysis of Dredge Cost Estimating Techniques
- c. Technical Area: 5
- d. Principal Investigator: Mitch Granat, CEWES-HE-E
- e. Telephone: 601-634-3146/(FTS) 542-3146

III. Required Skills & Training to Use Product

- a. Required Skills: Familiarity with dredging cost-estimating procedures, PC spreadsheet knowledge, and EM 1110-2-1300 are required.
- b. Recommended Training: N/A

IV. Required Equipment or System Components to Use Product

- a. System Component A:
 - 1. Item: TCI Dredge Estimating Program
 - 2. Price Range: \$20,000-50,000 individual FOA or \$250,000-350,000 CE-wide license

3. Available Via Multiple Vendors or Sole Source: Sole Source

4. Potential Source: Turner Consulting, Inc.
1459 Bay Point Drive
Sarasota, FL 34236
Telephone: 813-366-2513

b. System Component B:

1. Item: 286/386 PC with EGA or VGA

2. Price Range: \$2,000-5,000

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

c. System Component C:

1. Item: Spreadsheet software (Supercalc, Lotus, or Quatro)

2. Price Range: \$100-500

3. Available Via Multiple Vendors or Sole Source: Multiple Vendors

V. Supporting Field Experiments & Demonstrations

a. Activity A:

1. Title: TCI Program Demonstration

2. Date (Est): Open

3. District Participant: CESAM

4. District Contact: J. Baxter, FTS: 537-3137

VI. Additional Comments:

Product Number: 5-H-90

I. Product Information

a. **Product Name:** Improved Basis for Existing Engineer Regulation Entitled "Engineering and Design Government Estimates and Hired Labor Estimates for Dredging" (ER 1110-2-1300)

b. **Product Key Word:** Guidance

c. **Technical Key Word:** Cost estimating

d. **Description:** This report provides background information required in developing fair and accurate dredging cost estimates. This report documents the underlying rationale, supporting information, and expanded explanation for the procedures used and discussed in the existing ER. A procedure for further developing local material factors is also provided.

e. **Technology Availability Date:** Oct-90

II. DRP Work Unit Information

a. **Work Unit #:** 32491

b. **Work Unit Title:** Analysis of Dredge Cost-Estimating Techniques

c. **Technical Area:** 5

d. **Principal Investigator:** Mitch Granat, CEWES-HE-E

e. **Telephone:** 601-634-3146/(FTS) 542-3146

III. Required Skills & Training to Use Product: N/A

IV. Required Equipment or System Components to Use Product: N/A

V. Supporting Field Experiments & Demonstrations: N/A

VI. Additional Comments:

**DRP Product Inventory
Spreadsheet File Order Form**

Please send a DRP Product Inventory spreadsheet file to:

Name _____

Office Symbol _____

Mailing Address _____

Telephone Number _____

Please indicate the spreadsheet software format that you wish to receive the product inventory on:

_____ Lotus 1-2-3

_____ Symphony

_____ Quatro

_____ Supercalc

_____ Enable

_____ Other (Please list)

Please indicate what type of diskette you wish to have the inventory copied to:

_____ 5.25 inch/360 kb

_____ 3.5 inch/720 kb

_____ 5.25 inch/1.2 Mb

_____ 3.5 inch/1.44 Mb

Mail or Fax this request form to:

Commander
USAE Waterways Experiment Station
Attn: CEWES-CP-D/Tillman
3909 Halls Ferry Road
Vicksburg, MS 39180-9510

FAX Number 601-634-2055

For further assistance contact
Russ Tillman, CEWES-CP-D, 601-634-2016 (FTS 542-2016)