

TECHNICAL REPORT EL-80-4

AREA STRIP MINE RECLAMATION USING DREDGED MATERIAL: A FIELD DEMONSTRATION

by

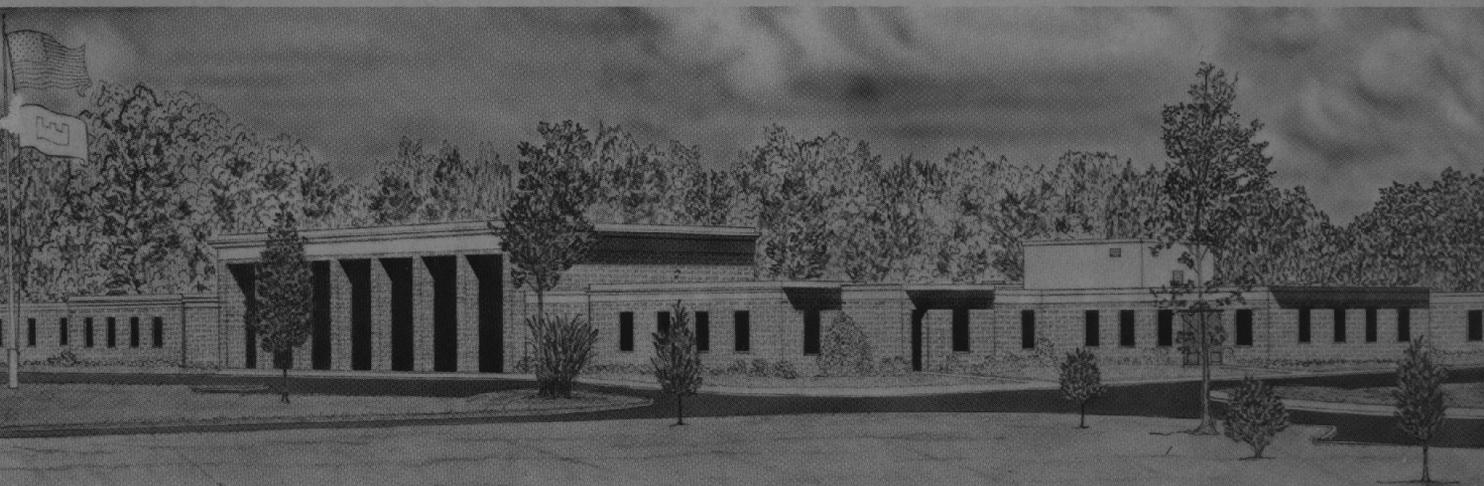
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July 1980

Final Report

Approved For Public Release; Distribution Unlimited



Prepared for Office, Chief of Engineers, U. S. Army
Washington, D. C. 20314

Under Dredging Operations Technical Support Program
(Formerly DMRP Work Unit No. 4C04)

20. ABSTRACT (Continued).

The demonstration site consisted of four 80- by 180-ft diked test plots treated as follows: (a) control plot of untreated mine spoil, (b) mine spoil with a 3-ft covering of dredged material, (c) 5 tons/acre of crushed limestone incorporated into the top 6 in. of mine spoil and covered by 3 ft of dredged material, and (d) 7.5 tons/acre of crushed limestone incorporated into the top 6 in. of mine spoil and covered by 3 ft of dredged material. A seed mixture of five grasses and a legume was sown for a vegetative cover as well as plant growth analyses.

Samples of the dredged material and the mine spoil were physically and chemically analyzed prior to the field demonstration. The dredged material used in this study was not high in contaminants. The chemical analysis of surface runoff and leachate samples of the dredged material showed no contamination as these samples were well within recommended limits for agricultural irrigation water standards. There was no increase or decrease in the low concentration of contaminants in the groundwater sampled throughout the duration of the reclamation demonstration.

The seed mixture produced a complete vegetative ground cover early in the spring. By midseason, smartweed, which is an invading specie particularly attractive to wildlife, emerged as the primary specie. Chemical analysis of heavy metal uptake by tall fescue showed that the dredged material provided a suitable noncontaminating growth media. In addition, vegetation did not grow on the mine spoil control plot, but on the dredged material plots vegetation was produced that was both environmentally beneficial and aesthetically pleasing.

PREFACE

This report is the result of a field demonstration concerning the use of dredged material as a cover material to reclaim an area strip mine spoil. The study was performed under Work Unit No. 4C04 of the completed Dredged Material Research Program (DMRP). This report was part of the DMRP Productive Uses Project (PUP), Mr. Thomas R. Patin, Project Manager. MAJ Robert M. Meccia, CE, was manager of PUP during the planning phase of the project.

The project was conducted by the Environmental Engineering Division (EED), of the Environmental Laboratory (EL), at the U. S. Army Engineer Waterways Experiment Station (WES), under the general supervision of Dr. John Harrison, Chief, EL, Dr. Roger T. Saucier, Special Assistant, EL, and Mr. A. J. Green, Chief, EED. The work was under the direct supervision of Dr. Raymond L. Montgomery, Chief, Water Resources Engineering Group (WREG), EED.

This report was written by Dr. Eugene R. Perrier, Mr. Jose L. Llopis, and Ms. Patricia A. Spaine, WREG. Appendix B was written by Mr. Raymond E. Jones, Louisiana Tech University, Ruston, Louisiana. Valuable assistance was provided by Mr. Michael R. Walsh, EED, in developing the study activities. Appreciation is expressed to Dr. C. R. Lee, Dr. B. L. Folsom, Jr., and Mr. Robert Peters, Ecosystems Research and Simulation Division, for technical assistance in the design and implementation phases of the project.

Commanders and Directors of WES during this study were COL John L. Cannon, CE, and COL Nelson P. Conover, CE. Technical Director was Mr. F. R. Brown.

CONTENTS

	<u>Page</u>
PREFACE	1
LIST OF TABLES	3
LIST OF FIGURES	4
CONVERSION FACTORS, U. S. CUSTOMARY TO METRIC (SI) UNITS OF MEASUREMENT	6
PART I: INTRODUCTION	7
Purpose and Scope	7
Project Development	8
Site Selection	11
PART II: SUMMARY OF INFORMATION ON STRIP MINE RECLAMATION	14
Description of Surface Mines	14
Acid Drainage from Strip Mining	16
Types of Strip Mines	17
Strip Mine Reclamation	19
PART III: DESCRIPTION OF OTTAWA DEMONSTRATION SITE	25
Background	25
Geology and Soils	25
After Mining	27
Physical and Chemical Characteristics	27
Vegetative Cover	32
PART IV: DESIGN OF FIELD DEMONSTRATION	39
Project Design	39
Site Preparation	40
Runoff, Leachate, and Groundwater Monitoring	43
Vegetative Cover	47
Operation and Maintenance	48
PART V: RESULTS AND DISCUSSION	50
Vegetative Production	50
Runoff, Leachate, and Groundwater	56
PART VI: CONCLUSIONS AND RECOMMENDATIONS	60
Conclusions	60
Recommendations	61
REFERENCES	62
APPENDIX A: VEGETATION OF THE ALSIP DREDGED MATERIAL DISPOSAL SITE	A1
APPENDIX B: VEGETATION OF THE STRIP MINE RECLAMATION PROJECT	B1

LIST OF TABLES

<u>No.</u>		<u>Page</u>
1	Physical Measurements of Mine Spoil from the Demonstration Site	28
2	Physical Characteristics of Dredged Material from the Demonstration Site	29
3	Procedures Used in Chemical Analyses of Dredged Material and Mine Spoil	30
4	Chemical Analysis of Mine Spoil from the Demonstration Site	31
5	Concentrations of Chemical Constituents and Characteristics from Selected Samples of Dredged Material	33
6	Concentrations of Chemical Constituents and Characteristics from Selected Samples of Dredged Material from Brackish Water	34
7	Allowable Metal Contents in Digested Sewage Sludges for Agricultural Use	38
8	Selected Water Quality Data for Runoff Samples from the Plots for the 10 April 1978 Storm with Respect to Initial Runoff (I), Peak Flow of Runoff (P), and Final Runoff (F)	57

LIST OF FIGURES

<u>No.</u>		<u>Page</u>
1	Schematic showing extensive mine spoil areas along the Illinois River west of Ottawa, Illinois	9
2	Irregularly shaped parallel ridges of mine spoil at Buffalo State Park, Illinois	9
3	Schematic of the area east of Ottawa, Illinois, showing the location of the site selected for the field demonstration .	12
4	Photograph showing site prior to establishment of the field demonstration	12
5	Schematic showing the relative location of the field demonstration site and the dredged material containment area	13
6	Cross section of a potential strip mine site showing the original land surface, mineral seam, and bedrock before and after contour mining	15
7	Schematic of the area mining method of strip mining	18
8	Aerial photograph of the site before the plot layout showing mine spoil ridges that entrap most of the surface acid mine drainage	19
9	A bulldozer striking off the mine spoil ridges prior to revegetation	20
10	Schematic showing operational techniques used to reclaim an area of strip mine spoil	22
11	Backfilling of surface mined area	23
12	Cross-sectional view of contour backfill technique	24
13	Topographical description of the Ottawa area strip mine field demonstration area	25
14	Stratigraphic section of the strip mine demonstration site.	26
15	Schematic showing the location of the dredged material borrow site for the strip mine reclamation demonstration .	35
16	Photograph taken from the northwest corner of the site . .	35
17	Photograph taken from the southern dike; in the foreground is a very wet trough area	36
18	Photograph taken down in the fill area along the edge of a wet trough	36
19	Photograph taken from the south dike	37
20	Site plan and profile views of test plots	39

<u>No.</u>		<u>Page</u>
21	Initial site topography, groundwater observation wells, and test plots	41
22	Leveling mine spoil ridges	42
23	Stockpiling dredged material in borrow area	42
24	Loading dredged material at borrow area	44
25	Spreading agricultural ground limestone on the dredged material in plot III	44
26	Spreading dredged material on plots	44
27	Plot IV scarified and prepared for seeding	45
28	Outflow end of a Parshall flume showing installation and water stage recorder	45
29	Inflow to a Parshall flume showing the inlet wing walls to train the runoff into the flume	46
30	Installing a pressure-vacuum soil-water sampler	47
31	Recurring erosion of the southeastern corner of the demonstration site	49
32	Photograph of plot I looking south showing ponded water following a rain	49
33	Aerial photograph of demonstration plots	50
34	Photograph of plot I (control) showing that none of the seed mixture germinated on the plot as of 8 June 78	51
35	Photograph of vegetative growth of seed mixture plus addi- tional specie on plot II as of 8 June 78	52
36	Photograph of vegetative growth of seed mixture on plot III as of 8 June 78	52
37	Photograph of vegetative growth of seed mixture on plot IV as of 8 June 78	53
38	Photograph taken on 22 August 1978 showing how smartweed dominated the plots	53
39	Photograph of the plots showing the rank growth of smartweed which was 7 to 8 ft in height	54
40	Plant identification of vegetation at the area strip mine site	54
A1	Photograph taken at the southwest corner of the site near the culvert showing the fall aspect of the open mudflat areas that occur along the 50-ft-wide troughs that extend along the southern and western borders of the spoil site . .	A2

CONVERSION FACTORS, U. S. CUSTOMARY TO METRIC (SI)
UNITS OF MEASUREMENT

U. S. customary units of measurement used in this report can be converted to metric (SI) units as follows:

<u>Multiply</u>	<u>By</u>	<u>To Obtain</u>
acres	4046.856	square metres
cubic yards	0.7645549	cubic metres
feet	0.3048	metres
inches	0.0254	metres
miles (U. S. statute)	1609.344	metres
pounds (mass) per acre	0.00012085	kilograms per square metre
tons (2000 lb, mass)	907.1847	kilograms
tons (mass) per acre	0.22417	kilograms per square metre