

Technical Reclamation Memorandum

TRM # 6

Date: December 21, 1982
From: William C. Eddins, Director
Division of Reclamation Services



Kentucky Department for
Surface Mining Reclamation
and Enforcement

Subject: Input Parameters for SEDIMOT II
and DEPOSITS

Since the release of TRM #2 recommending the use of the SEDIMOT II or DEPOSITS computer programs to design sediment ponds to meet the settleable solids effluent limitation, the department has received numerous requests to develop input parameters for SEDIMOT II and DEPOSITS which can be used in lieu of site specific data collection. This TRM contains (1) recommended input parameter values for SEDIMOT II and DEPOSITS which the department will accept in permanent program applications without an accompanying description of the procedure used to determine the parameter value and (2) recommendations on the type of SEDIMOT II and DEPOSITS computer output which should be submitted for permit review.

The input parameter values provided herein are based on SEDIMOT II and DEPOSITS default values and standard reference sources, and generally represent average values. The department is not requiring that the recommended input parameter values be used. Professionals who feel that the average values provided by the department are not representative of their particular situation may perform site specific data collection and analysis to determine alternate input parameters. If site specific parameter values are used, the procedures used to develop the parameters should be documented in the permit application. Although the recommended input parameter values were developed primarily for SEDIMOT II and DEPOSITS, the parameter values may be used for other erosion determination and pond evaluation methods where appropriate.

The department has also received requests from those using SEDIMOT II and DEPOSITS for guidance on the type and amount of computer output which should be furnished with the permit application for review purposes. In those cases where SEDIMOT II or DEPOSITS is used to design a sediment pond to meet the settleable solids effluent limitation, the department recommends that one complete unseparated original computer printout for the final effluent limitation run be submitted with the original copy of the permit application. Photocopies of the final effluent limitation run should be included in the other required copies of the application. Those using SEDIMOT II should use print option "1" for each subwatershed and for the entire watershed to obtain summary tables for individual watersheds and sediment ponds.

If SEDIMOT II or DEPOSITS is used to determine the 25-year, 24-hour peak discharge for the pre-mining and active mining conditions for cumulative impact assessment flood control (see TRM #2), the applicant may submit original computer runs or copies of computer runs for only those portions of the printout which contain input and output summaries pertinent to the 25-year, 24-hour storm analysis.

The following material contains separate tables of input parameter values for SEDIMOT II and DEPOSITS, respectively. For convenience, input parameter values have been organized according to the input order used in the SEDIMOT II and DEPOSITS computer programs.

TRM #6
December 21, 1982
Page Two

SEDIMOT II Input Parameters
Parameter (Program Variable) - Value

Rainfall pattern (ITYPE)- U.S. Soil Conservation Service Type II

Specific gravity of eroded sediment (SG)- 2.50

Coefficient for distributing sediment load with runoff hydrograph (APLUS1)- 1.5

Bulk specific gravity of deposited sediment (SBSG)- 1.25

Particle size distribution of detached material (PS & PF)

Size (mm)	Percent Finer	
	Disturbed Area	Undisturbed Area
3	100	100
2	93	100
1	86	98
0.5	78	92
0.3	73	87
0.2	67	80
0.1	55	70
0.05	44	60
0.03	35	50
0.02	27	42
0.01	18	32
0.005	14	21
0.003	9	15
0.001	3	4
0.0001	0	0

Curve numbers (PARAH (I,2))(1)

<u>Surface Condition</u>	<u>Hydrologic Soil Condition</u>	
	<u>Subsurface⁽²⁾ Disturbed (Mine Spoil)</u>	<u>Subsurface⁽³⁾ Undisturbed (Natural Soil)</u>
Cleared and grubbed; bare	-	88
Active mining, pit	86	-
Spoil, spoil with topsoil; graded, bare . .	86	-
Grass, legumes; seeded and mulched		
0-2 months after seeding	79	86
2-12 months after seeding	74	82
Hay, pasture, grassland; fully established, fair hydrologic condition	69	79
Forest, woods; fair hydrologic condition. .	60	73
Roads; dirt, gravel	95	95
Roads; paved	98	98

(1) Soil Conservation Service, "SCS National Engineering Handbook, Section 4, Hydrology," Soil Conservation Service, U.S. Department of Agriculture, U.S. Government Printing Office, Washington, D.C., 1971.

(2) Subsurface soils or rock strata which have been fragmented by surface mining or other similar disturbance. Curve numbers for disturbed subsurface soils were based on the Soil Conservation Service hydrologic soil group "B."

(3) Subsurface soils or rock strata which exist in a natural undisturbed condition. Curve numbers for natural undisturbed soils were based on the Soil Conservation Service hydrologic soil group "C."

TRM #6
December 21, 1982
Page Four

Soil erodibility factor (PARAS(I,J,1))
Disturbed area - 0.22
Undisturbed area - 0.17

Control practice factor (PARAS(I,J,4))(1)

<u>Surface Condition</u>	<u>CP Factor</u>
Cleared and grubbed; bare	1.00
Active mining, pit	0.80
Spoil, spoil with topsoil; graded, bare	0.90
Grass, legumes; seeded and mulched(2)	
0-2 months after seeding	0.14
2-12 months after seeding	0.05
Hay, pasture, grassland; fully established.	0.01
Forest, woods	0.003
Roads; dirt, gravel	1.20
Roads; paved	0.0

(1) B. J. Barfield, R. C. Warner, and C. T. Haan, Applied Hydrology and Sedimentology for Disturbed Areas, Oklahoma Technical Press, Stillwater, Oklahoma, 1981

(2) Straw mulch at 1.5 ton per acre

Steep slope adjustment factor (PARAS (I,J,8)) - 10.0

Non-Ideal settling factor (FIX) - 1.0

Pond dead storage (DEAD) - 40%

Outflow withdrawal of sediment (FLOW)- Uniform

Inflow vertical distribution (FRACTN)- 0

Number of continuous stirred reactors (NCSTR)- 2.0

Pipe entrance loss coefficient (ELOSS) - 1.0

TRM #6
December 21, 1982
Page Five

Pipe bend loss coefficient (BLUSS) - 0.5

Weir flow coefficient (WCOE) - 3.1

Orifice flow coefficient (OCOE) - 0.6

Manning's roughness coefficient (MN) - 0.024

Principal spillway stage (EPS) - Must be equal to or greater than 40% of the peak stage for the 10-year, 24-hour storm.

DEPOSITS, Input Parameters
Parameter (Program Variable) - Value

Number of inflow events (NSTORM) - 1.0

Inflow sediment concentration (CONSED) - 1.0

Deposition option (DEPOST) - 1.0

Total mass of sediment (MASS) - To be calculated

Outflow conditions (FLOW) - 1.0

Trap efficiency (TRP) - 1.0

Deposition accumulation (FILTER) - 1.0

Density of deposited sediment (DENSITY) - 2.0

Specific gravity of sediment (SG) - 2.5

Viscosity of flow (VISCOS) - 0.009

Coefficient for distributing sediment load with runoff hydrograph (SET) - 1.5

Short circuiting simulator (SHORT) - 1.0

Correction factor for turbulence and flocculation (FIX) - 1.0

Particle size distribution variance (FLOWAV) - 0.0

Inflow vertical distribution (FRACTN) - 0.0

Slag modifier (SLAG) - 0.0

Pond dead storage (DEAD) - 40% of the permanent pool volume

Particle size distribution (PERENT and SIZE) - use the particle size distribution from SEDIMOT II input parameters for the area that is the major contributor to the sediment yield and adjust for sediment deposition in the watershed.

Correction factor for channel modification (CL) - 1.0

Correction factor for impervious area (CI) - 1.0

Initial Abstractions (AI) - 0.0 (determined by program)

Curve number (CN) - For the WASHMO subroutine use the table contained in SEDIMOT II Input Parameters.

Principal Spillway Stage - Must be equal to or greater than 40% of the peak stage for the 10-year, 24-hour storm.