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Western Michigan University

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THE EFFECT OF THE MIXING RATIO OF
FLY ASH AND PAPER INDUSTRY SLUDGE
ON HYDRAULIC CONDUCTIVITY

BY

CHRISTINE J. LUPU

A Thesis submitted
in partial fulfillment for
The Bachelor of Science Degree

Western Michigan University
Kalamazoo, Michigan
April, 1991

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INTRODUCTION

Groundwater contamination is a large concern for everyone. Because of this many precautions are being taken to protect the groundwater. In addition, the availability of landfill area is decreasing because of the difficulty in siting new landfills due to the latest legislation. Therefore, landfill and/or design alternatives must be created to reduce the increasing cost of landfilling.

Two of the major sources of waste produced by the pulp and paper industry are wastewater treatment sludge and fly ash from the combustion of wood waste and coal. The current disposal method of these two wastes are in landfills. Alternatives are being looked at for disposing of the sludge including spreading on agricultural land or using it as a hydraulic barrier material for landfills.

Clay is the most common hydraulic barrier material because of its low hydraulic conductivity. Hydraulic conductivity is the measure of the ability of a material to transmit water(1). Research has been conducted showing that certain sludge could also be used as a hydraulic barrier(1,2). This could be economically beneficial to pulp and paper companies knowing that if clay is not readily available, waste generated on site could potentially be used as an alternative. A variation to this would be the use of a mixture of fly ash and sludge as a hydraulic barrier. Research has been

conducted describing some of the properties of pulp and paper industry sludge mixed with fly ash but the effect of this mixing on hydraulic conductivity has not been studied. This design project was proposed to do that.

BACKGROUND INFORMATION

Fly Ash

Fly ash is the finer portion of the residue from the combustion of sludge, wood wastes and coal. One typical collection device for fly ash is electrostatic precipitators. Disposal has been a great concern. Only 20% of it is being used and the remaining 80% is now disposed of on land(3). One use of fly ash has been as a pozzolanic material in cement. Research has also been conducted on the feasibility of using fly ash alone as a liner material(4). According to Edil, development of fly ash as a chemically resistant waste liner material may provide a new and cost-effective alternative to soil and synthetic liners. Fly ash or fly ash-stabilized soils if effective would have potential for use as a liner at fly ash and/or scrubber sludge landfill sites, non hazardous waste lagoons, industrial, mining and hazardous waste facilities, and in slurry trenches.

Fly ash physical and chemical characteristics can affect its strength, durability and hydraulic conductivity properties. Bowders found average hydraulic conductivities of

ash/stabilizer mixtures higher than the maximum value of 1×10^{-7} cm/s established by most regulatory agencies(3).

A study of fly ash used as liner material was conducted by Edil et al. (4). During the set up of the permeability test it was noticed that there were constraints on the time available for compaction after the fly ash and water was mixed. After 30 minutes the material began to set and harden. Since this would pose difficulties in field construction, a study was run to examine the effect of compaction conditions on the resulting density and permeability. Results from this study showed that to obtain permeabilities less than the maximum would require careful selection of compaction conditions and perhaps the use of set retarders. Another test conducted showed the effect of wet/dry cycles and freeze/thaw cycles on the permeability of the fly ash. It was determined that the permeability was not significantly effected by those cycles which are typical of northern climates.

In an attempt to learn the hydraulic conductivity values, Vesperman et al. studied the effect of combining fly ash and sand(5). Some of the results of fly ash and sand included (a) moisture content at compaction had a greater effect on density and permeability, (b) compaction had only a small effect on density and the effect on permeability was not noticeable, (c) at the 40% fly ash-60% sand level, the permeability of the sample was essentially identical to the 100% fly ash sample.

Sludge

Pulp and paper mill sludges are a mixture of organic and inorganic solids and water. Wood fibers and bio-mass are the organic materials. Fillers such as clay and calcium carbonate are examples of the inorganic materials. Traditionally, paper mill sludge has been disposed of in landfills. Recently though, alternatives for sludge disposal have been tried. These include land spreading for soil conditioning and containment barriers(2).

The National Council of the Paper Industry for Air and Stream Improvement (NCASI) studied 15 sludges and 8 fly ashes from the pulp and paper industry to predict their ability to be used as a hydraulic barrier(1). It was found that the sludges had hydraulic conductivities between 10^{-4} and 10^{-8} cm/sec. NCASI concluded that several of the sludges would be suitable as a hydraulic barrier material.

Helm (6) studied the possibility of the use of combined fly ash and wastewater sludge for use in structural fill. Desirable permeabilities for the mixtures were below 20×10^{-7} cm/sec. Some biological decomposition occurred with mixtures containing more than 20% sludge. A decrease in permeability and strength was observed as the sludge content increased.

PROCEDURE

There are two common types of permeameters, rigid-wall and flexible-wall, that are used for the determination of hydraulic conductivity. The difference in these are that flexible-wall permeameters minimize the effect of side-wall flow but are costly and difficult to operate. Rigid-wall permeameters may simulate the worst case scenario for liner material tests(3). Cracking is an undesirable property. Even though a high strength, high durability and low permeability liner is preferred, a certain amount of flexibility is desired to avoid cracking(5). A rigid-wall permeameter will be used because it will give the most accurate example of true operating conditions. A procedure modified by NCASI for running the permeameters was used.

To minimize changes in hydraulic conductivity which can result from biological activity within the samples, the hydraulic conductivity determinations were run at 10 degrees Celsius. Back pressure was also applied at approximately 60 psi to maximize sample saturation. In an attempt to simulate compactive stress on typical landfill cover materials twenty-five pounds of lead weights which is equivalent to two and a half feet of overburden was applied to each sample.

The fly ash was obtained from a local paper mill burning pulverized coal in the boiler. The fly ash is sprayed down with water for dust control before being transported to a

local type III landfill. Combined sludge was also obtained from a local mill. Primary and secondary treatment are used in the wastewater treatment plant. The combined sludge is dewatered by a belt filter press and then transported to a landfill. The sludge and fly ash were placed in double lined and sealed plastic bags and stored at 10 degrees Celsius until testing began.

Seven permeameters were assembled to determine hydraulic conductivity. Tap water was used as the permeant for all permeameters. The organization of the seven permeameters according to sample and ratio are listed in Table 1.

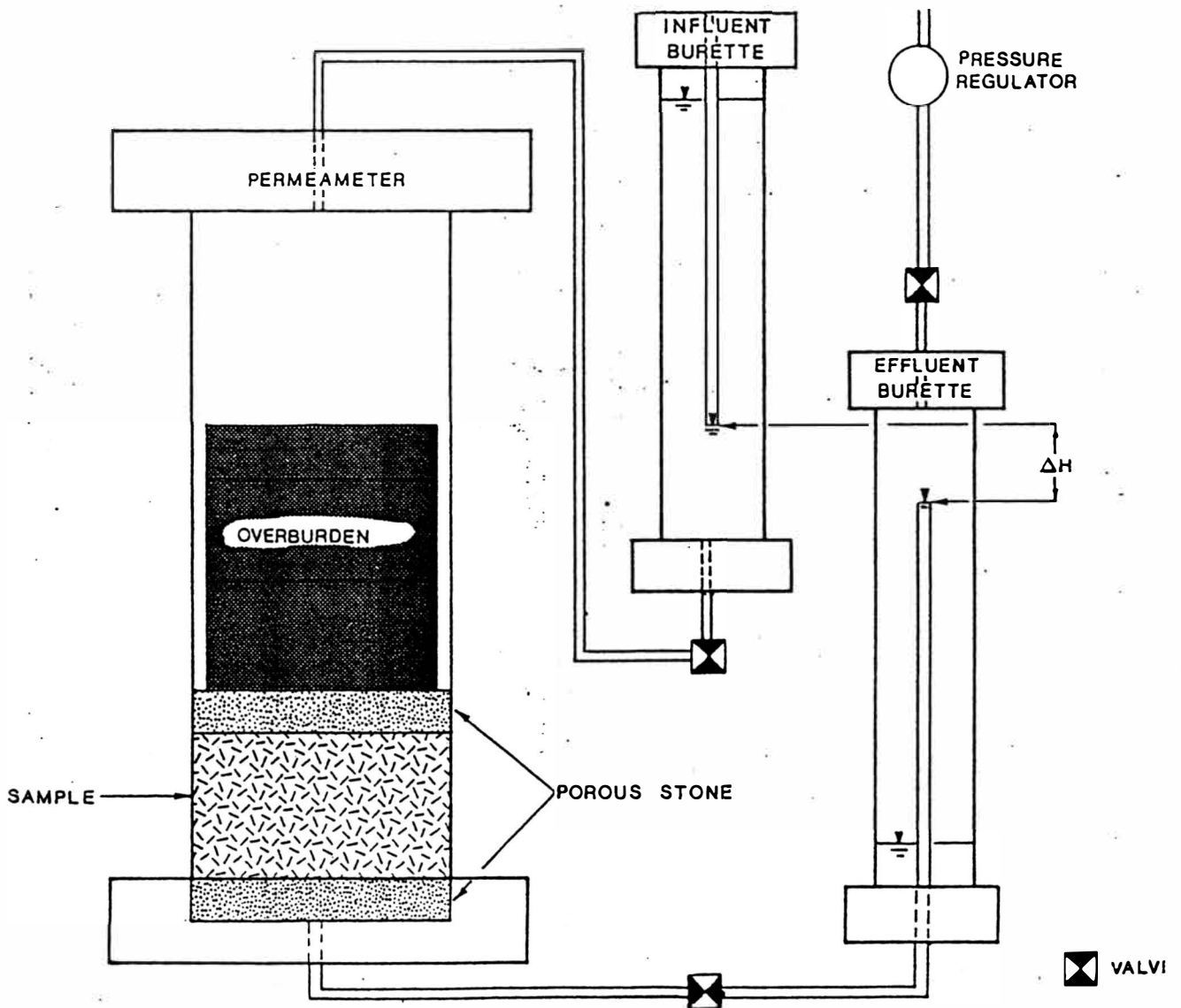
TABLE 1 SUMMARY OF PERMEAMETER SAMPLES

<u>PERMEAMETER</u>	<u>RATIOS USED</u>
1, 2	30% FLY ASH/70% SLUDGE
3, 4	50% FLY ASH/50% SLUDGE
5, 6	70% FLY ASH/30% SLUDGE
7	100% SLUDGE

Figure 1 presents a schematic of a rigid-wall permeameter. Clear acrylic cylinders of approximately 4 inch inner diameter and 3/4 inch wall thickness were used for the permeameters and the influent and effluent burettes. The influent and effluent burettes were long enough to allow for

FIGURE 1

RIGID-WALL PERMEAMETER DESIGN



large time delays before refilling and good visual inspection during the course of testing.

Before the fly ash and sludge samples were compacted, a moisture-density relationship was performed to determine the optimum moisture content of the fly ash. Dry bulk density of a soil upon compaction is a function of its water content. Usually the dry bulk density increases with increasing moisture content until a maximum dry bulk density is reached. This moisture content is referred to as the optimum moisture content. This relationship is significant because the minimum hydraulic conductivity for soils usually occurs at or near the maximum density(7). All fly ash samples were adjusted to this optimum point. The test was performed according to ASTM method D698. Unexplained errors occurred in the first trial of that test. Procedures were reviewed and it was performed again.

The fly ash and sludge were cured in double plastic bags for 24 hours. Following curing the fly ash and sludge were mixed at the respective ratios: 70/30, 50/50 and 30/70. The samples were then allowed to cure another 48 hours. Compaction into the permeameters was accomplished following the NCASI version of ASTM D698. The inside wall of the chamber was coated with silicone grease to minimize side-wall flow. Silicone coated rubber gaskets were also used to seal the ends of the cylinders preventing leakage. The permeameters and the influent burette were then filled with

permeant and connections were made to the nitrogen gas tank, the back pressure supply source. The influent and effluent burettes water levels were marked for date and time to establish a reference point. Over the next two months, the flow of permeant through each sample was monitored.

Hydraulic Conductivity

The hydraulic conductivity in the rigid-wall permeameters were calculated using Darcy's Law:

$$Q = KAi$$

where

Q = the average flow rate, ml/sec
 K = hydraulic conductivity, cm/sec
 A = sample cross sectional area, cm²
 i = hydraulic gradient, unitless

the average flow rate was determined by:

$$Q = (h_i a_i + h_e a_e) / 2t$$

where

h_i = change in permeant level in
 influent burette, cm
 a_i = cross-sectional area of
 influent burette, cm²
 h_e = change in permeant level in
 effluent burette, cm
 a_e = cross-sectional area of
 effluent burette, cm²

Hydraulic conductivity values were then corrected to the reference temperature of 20 degrees Celsius to account for changes in permeant viscosity and density due to temperature.

Pore volume, or the total void volume in a sample, was determined. The calculation for pore volume is as follows:

$$V_p = V - (WS_c/100G_sq_o)$$

where

V_p = pore volume, cc
 V = sample volume, cc
 W = weight of sample, g
 S_c = solids content of sample
 G_s = specific gravity, unitless
 q_o = density of water at 4 degrees C

The calculation for the pore volumes of permeant passed into the sample at a given time is:

$$P_v = Q_T/V_p$$

where

P_v = pore volumes passed, unitless
 Q_T = cumulative volume of flow of permeant into sample, cc
 V_p = pore volume, cc

A NCASI computer program was used to calculate hydraulic conductivities for each of the permeameters. Appendix A contains statistics to determine steady state. Linear regression was used to find the slope of the line of best fit through the last five points. A steady state was obtained if the slope was not statistically different from zero at the 95-percent confidence level. This was found by determining the R value and comparing it to a significant value table. If the slope was statistically different the test was run again using the last ten points. The last reading was reported if steady state was not obtained.

RESULTS

The testing for hydraulic conductivity was run performed over a two month period. Table 2 lists each permeameter sample and its final hydraulic conductivity. Appendix A contains the linear regression and R values to determine steady state. Figures 2a, 3a and 4a represent typical trends for hydraulic conductivity with respect to pore volume. Figures 2b, 3b and 4b show trends with sample length with respect to pore volume.

Hydraulic conductivity values and sample length measurements were plotted against pore volume data for each permeameter and can be found in Appendix B. Appendix C contains computer generated data from original raw data.

The sample with the ratio of 30% fly ash/70% sludge in permeameters 1 and 2 shown conductivities in the range of $.93 \times 10^{-7}$ to 1.2×10^{-7} cm/sec. Permeameters 3 and 4 containing the 50% fly ash/50% sludge ratio, shown conductivities in the range of 4.0×10^{-7} to 4.5×10^{-7} cm/sec. Conductivities ranging from 3.74×10^{-6} to 21.3×10^{-6} were found in permeameters 5 and 6, which contained the 70% fly ash/30% sludge ratio. The final permeameter, number 7, contained a 100% sludge sample and had a conductivity of 2.1×10^{-8} cm/sec.

FIGURE 2a HYDRAULIC CONDUCTIVITY OF 30/70 RATIO, PERMEAMETER 2

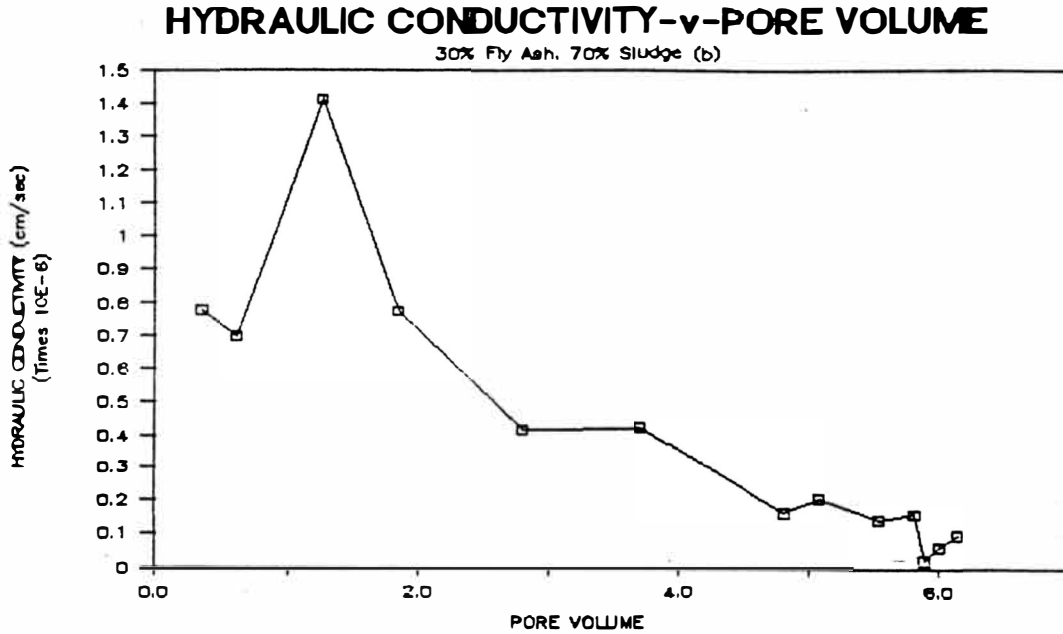


FIGURE 2b SAMPLE LENGTH OF 30/70 RATIO, PERMEAMETER 2

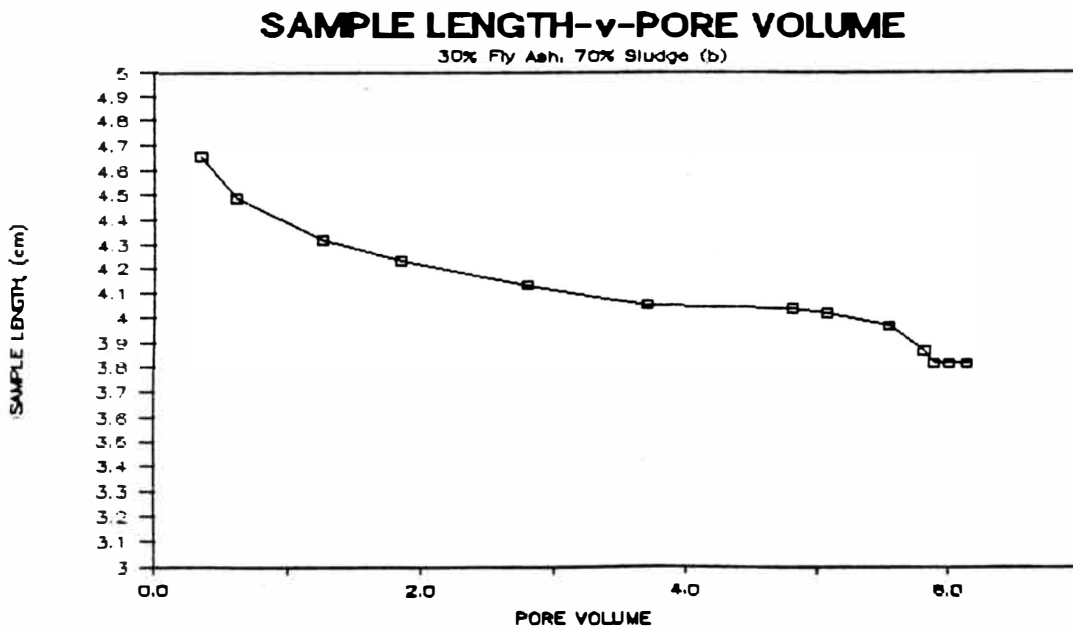


FIGURE 3a

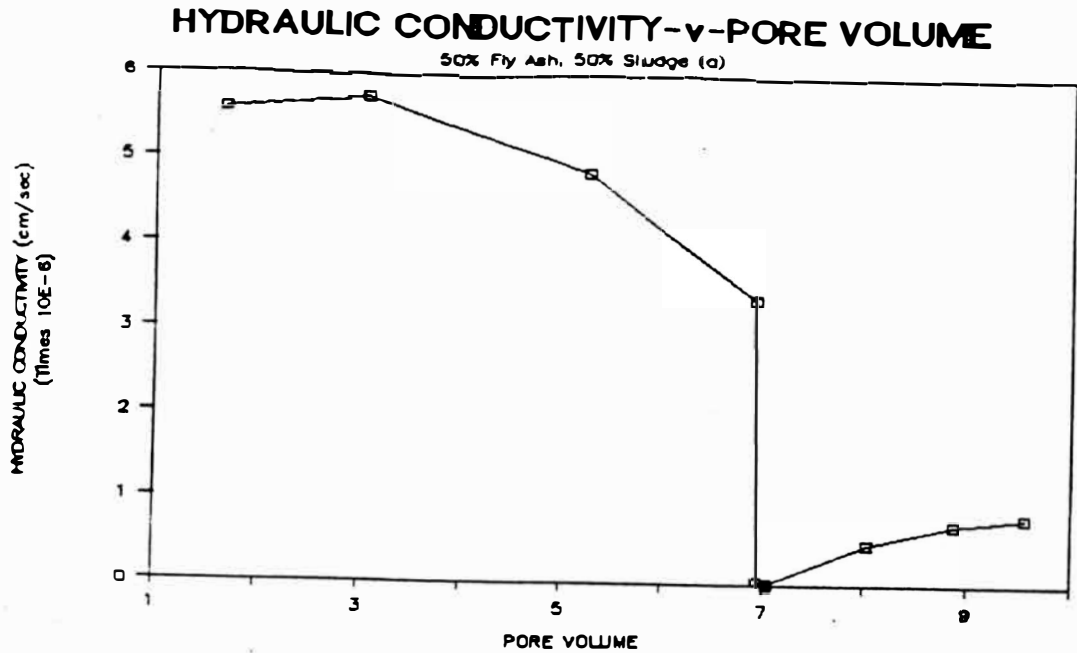
HYDRAULIC CONDUCTIVITY OF 50/50 RATIO,
PERMEAMETER 3

FIGURE 3b

SAMPLE LENGTH OF 50/50 RATIO, PERMEAMETER 3

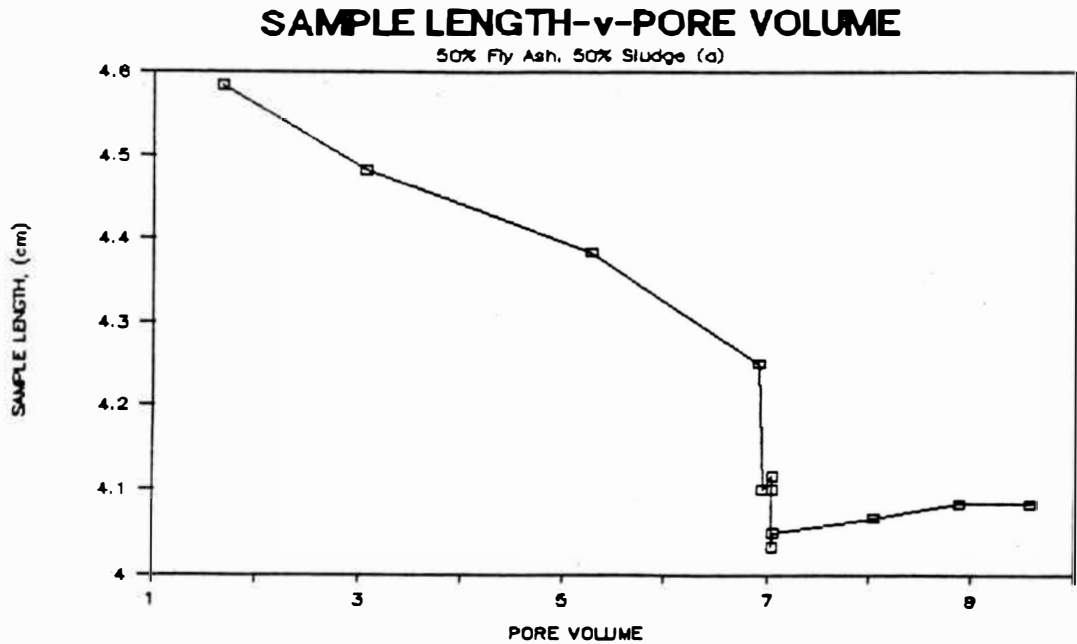


FIGURE 4a

HYDRAULIC CONDUCTIVITY OF 50/50 RATIO,
PERMEAMETER 4

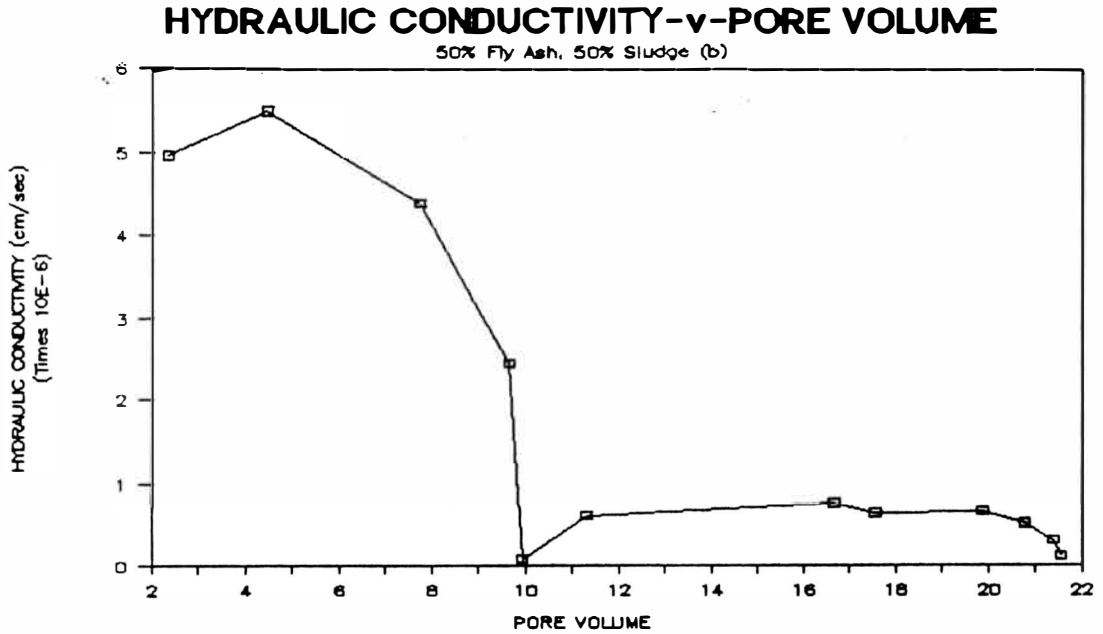


FIGURE 4b

SAMPLE LENGTH OF 50/50 RATIO, PERMEAMETER 4

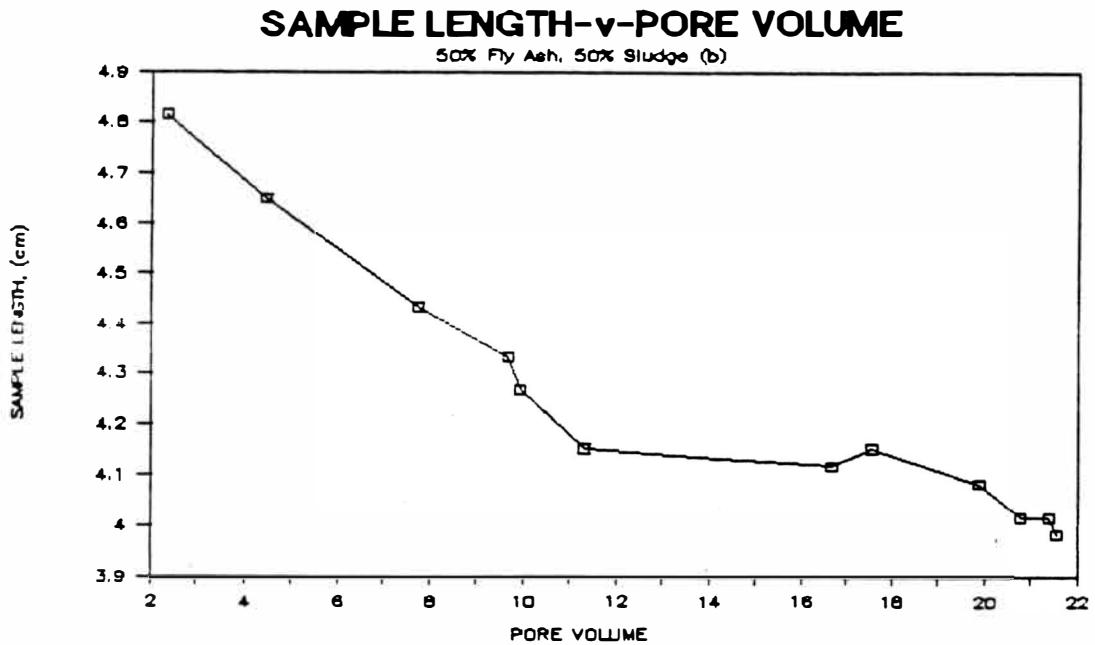


TABLE 2 SUMMARY OF HYDRAULIC CONDUCTIVITIES, (cm/sec)

<u>PERMEAMETER</u>	<u>SAMPLE</u>	STEADY STATE H.C. READING (TIMES 10E-6)
1	30% Fly Ash/70% Sludge	.12
2	30% Fly Ash/70% Sludge	.09
3	50% Fly Ash/50% Sludge	.40
4	50% Fly Ash/50% Sludge	.45
5	70% Fly Ash/30% Sludge	3.74 (1)
6	70% Fly Ash/30% Sludge	21.30
7	100% Sludge	.02

(1) Hydraulic conductivity values not at steady state. Last reading reported.

DISCUSSION

The ratios tested in permeameters 1 and 2 exhibited lower hydraulic conductivity than those in permeameters 3, 4, 5, and 6. Permeameter 7 containing the 100% sludge achieved the lowest hydraulic conductivity.

Typical results in Figures 2a, 3a and 4a show a decrease in hydraulic conductivity with respect to pore volume. This decrease may be caused by sample consolidation or biological activity.

As represented in Figures 2b, 3b and 4b, sample length decreased (7% to 26% of original sample length) with respect

to pore volume for all samples. With the available pore volume decreased by sample consolidation, the resistance to flow increases. This is the most probable cause for decreasing hydraulic conductivity.

CONCLUSIONS

The results of the hydraulic conductivity determination indicate that the ratio of sludge in a sample does effect the hydraulic conductivity. The hydraulic conductivity increased during the early portion of the test followed by a decrease over time. The reduction in hydraulic conductivity appeared to be caused by the consolidation due to overburden stress on the sample. In comparing the hydraulic conductivity results with those of 100% sludge it would not be advantageous to use this sludge in a fly ash/sludge mixture for hydraulic barrier material.

RECOMMENDATIONS

Further research should be done to determine the effect of the mixing ratio on leachate. Also, the measurement of hydraulic conductivity should be conducted for a greater period of time. Another possible avenue of research could be noting the effect of different types of sludge/fly ash mixtures and their effect on hydraulic conductivity.

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- (1) "Experience with and Laboratory Studies of the Use of Pulp and Paper Mill Solid Waste in Landfill Cover Systems", NCASI Technical Bulletin No. 559 (January 1989)
- (2) Jedele, L.P., "Evaluation of Compacted Inert Paper Solids as a Cover Material", Proceedings of Geotechnical Practice for Waste Disposal '87, American Society of Civil Engineers, New York, NY(1987)
- (3) Bowders Jr., J.J., M.A. Usmen, J.S. Gridley, "Stabilized Fly Ash for Use as Low-Permeability Barriers", Proceedings of Geotechnical Practice for Waste Disposal '87, American Society of Civil Engineers, New York, NY (1987)
- (4) Edil T.B., P.M. Berthouex, K.D. Vesperman, "Fly Ash as a Potential Waste Liner", Proceedings of Geotechnical Practice for Waste Disposal '87, American Society of Civil Engineers, New York, NY(1987)
- (5) Vesperman, K.D., T.B. Edil, P.M. Berthoux, "Permeability of Fly Ash and Fly Ash-Sand Mixtures", in Hydraulic Barriers in Soil and Rock, ASTM STP 874, A.I. Johnson, R.K.Frobel, N.J. Cavalli, and C.B. Pettersson, Eds., American Society for Testing and Materials, Philadelphia PA (1985).
- (6) Helm, R.B., "Evaluation of Leachate Characteristics and Physical Properties of Compacted Mixtures of Fly Ash and Wastewater Sludge", Ph.D. Thesis, West Virginia University, Morgantown, WV (1976).
- (7) Hillel, D., "Fundamentals of Soil Physics", Academic Press, New York (1980)

APPENDIX A
STATISTICAL ANALYSIS RESULTS

Regression Output:

sample 1

Constant	0.000000137
Std Err of Y Est	0.0000000104
R Squared	0.2885942631
No. of Observations	5
Degrees of Freedom	3

X Coefficient(s)	-0.0000000076
Std Err of Coef.	0.0000000691
R =	0.5372097013

Regression Output:

sample 2

Constant	0.0000000345
Std Err of Y Est	0.0000000038
R Squared	0.6442816828
No. of Observations	5
Degrees of Freedom	3

X Coefficient(s)	0.0000002758
Std Err of Coef.	0.0000001183
R =	0.8026715909

Regression Output:

sample 3

Constant	0.0000000505
Std Err of Y Est	0.0000002286
R Squared	0.730856519
No. of Observations	5
Degrees of Freedom	3

X Coefficient(s)	0.0000006914
Std Err of Coef.	0.0000002422
R =	0.8549014674

Regression Output:

sample 4

Constant	0.0000002238
Std Err of Y Est	0.0000001661
R Squared	0.6235055119
No. of Observations	5
Degrees of Freedom	3

X Coefficient(s)	0.0000002297
Std Err of Coef.	0.0000001031
R =	0.7896236521

Regression Output:

sample 5

Constant	0.0000004485
Std Err of Y Est	0.0000009532
R Squared	0.8524611
No. of Observations	10
Degrees of Freedom	8

X Coefficient(s)	0.0000005421
Std Err of Coef.	0.0000000797
R =	0.9232881999

Regression Output:

sample 6

Constant	0.000022547
Std Err of Y Est	0.0000146836
R Squared	0.0000838344
No. of Observations	5
Degrees of Freedom	3

X Coefficient(s)	-0.0000000099
Std Err of Coef.	0.0000062525
R =	0.0091561147

Regression Output:

sample 7

Constant	0.0000000166
Std Err of Y Est	0.0000000023
R Squared	0.5160702053
No. of Observations	5
Degrees of Freedom	3

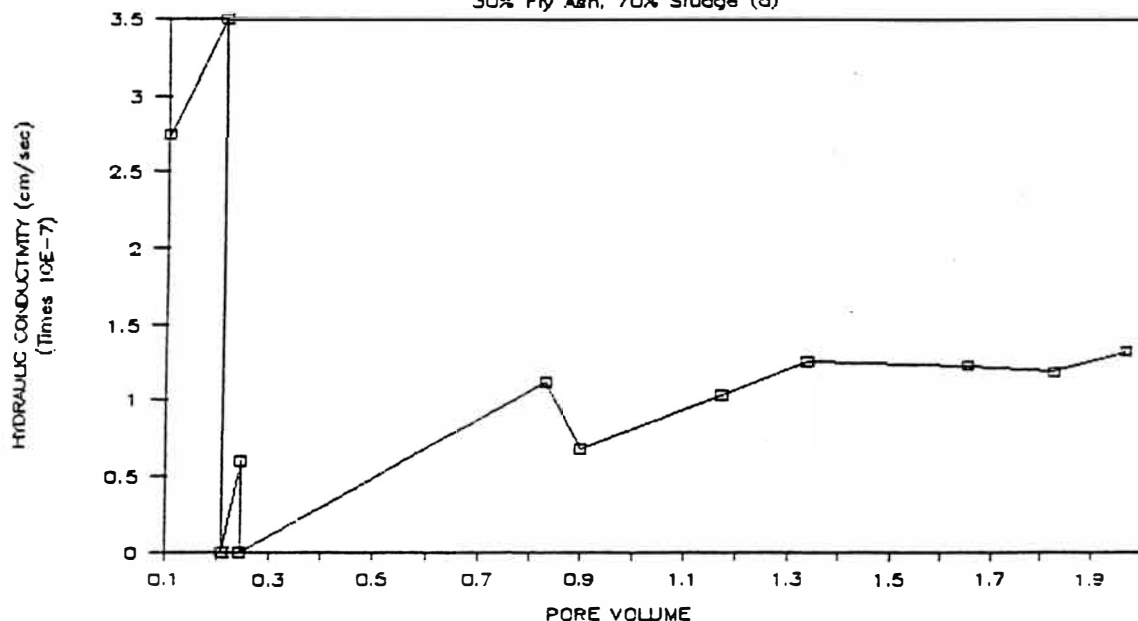
X Coefficient(s)	0.0000000087
Std Err of Coef.	0.0000000049
R =	0.7183802651

APPENDIX B

FIGURES OF FLY ASH/SLUDGE HYDRAULIC CONDUCTIVITY RESULTS

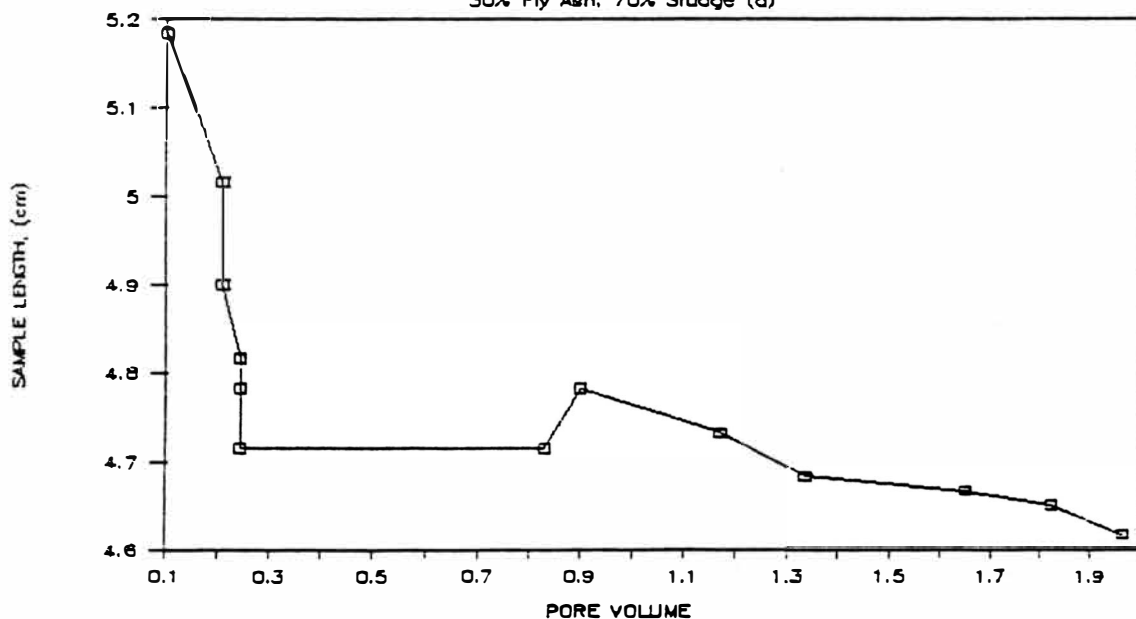
HYDRAULIC CONDUCTIVITY-v-PORE VOLUME

30% Fly Ash, 70% Sludge (a)



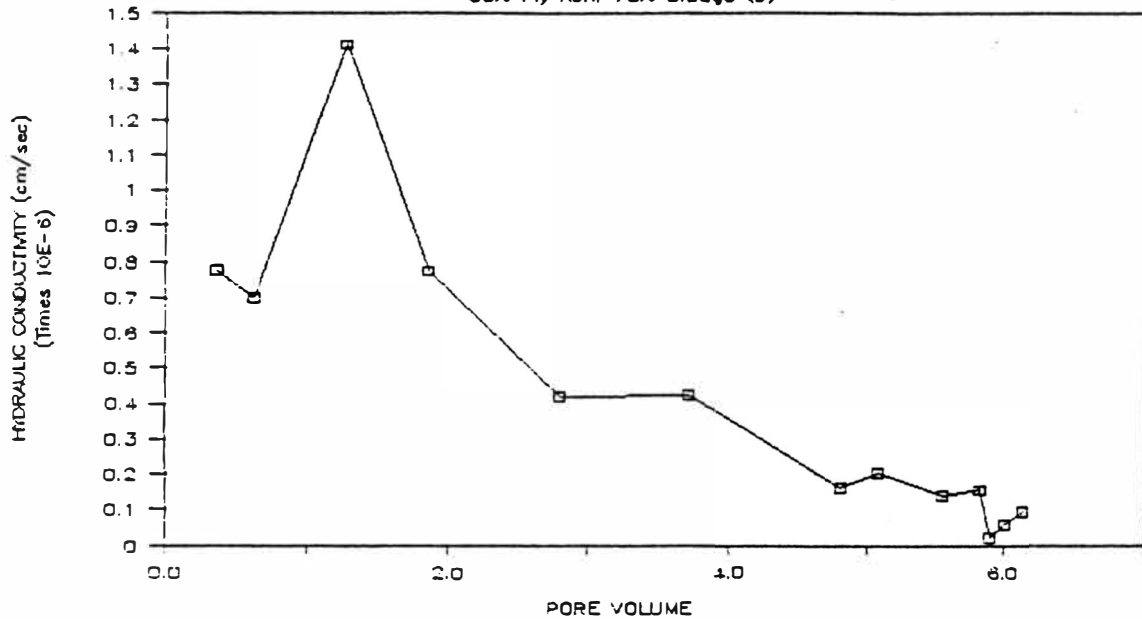
SAMPLE LENGTH-v-PORE VOLUME

30% Fly Ash, 70% Sludge (a)



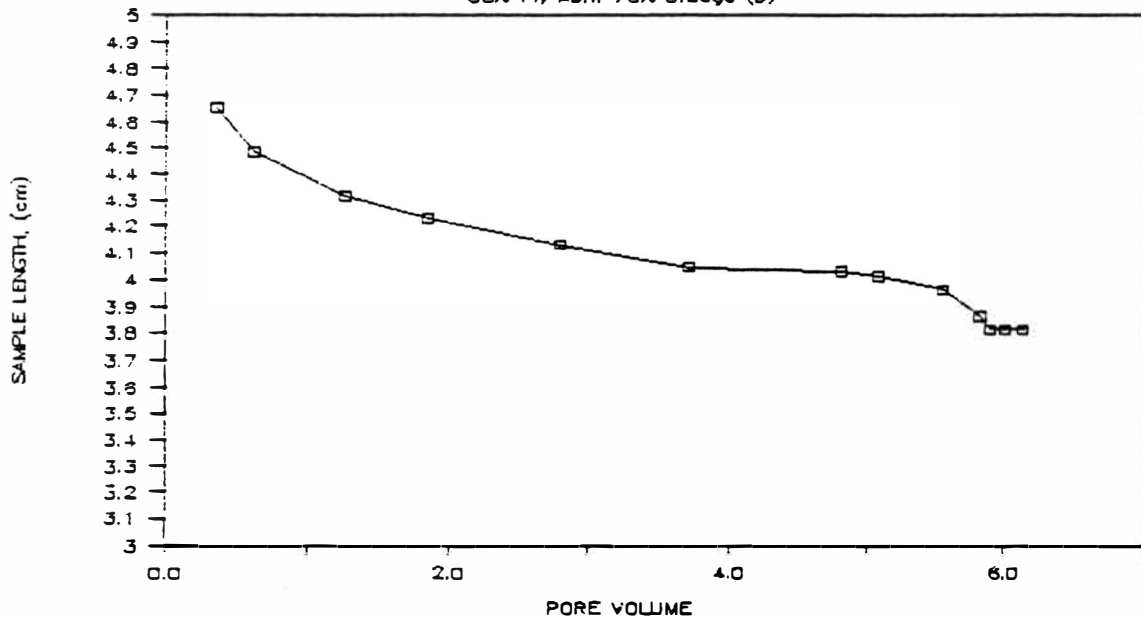
HYDRAULIC CONDUCTIVITY-v-PORE VOLUME

30% Fly Ash, 70% Sludge (b)



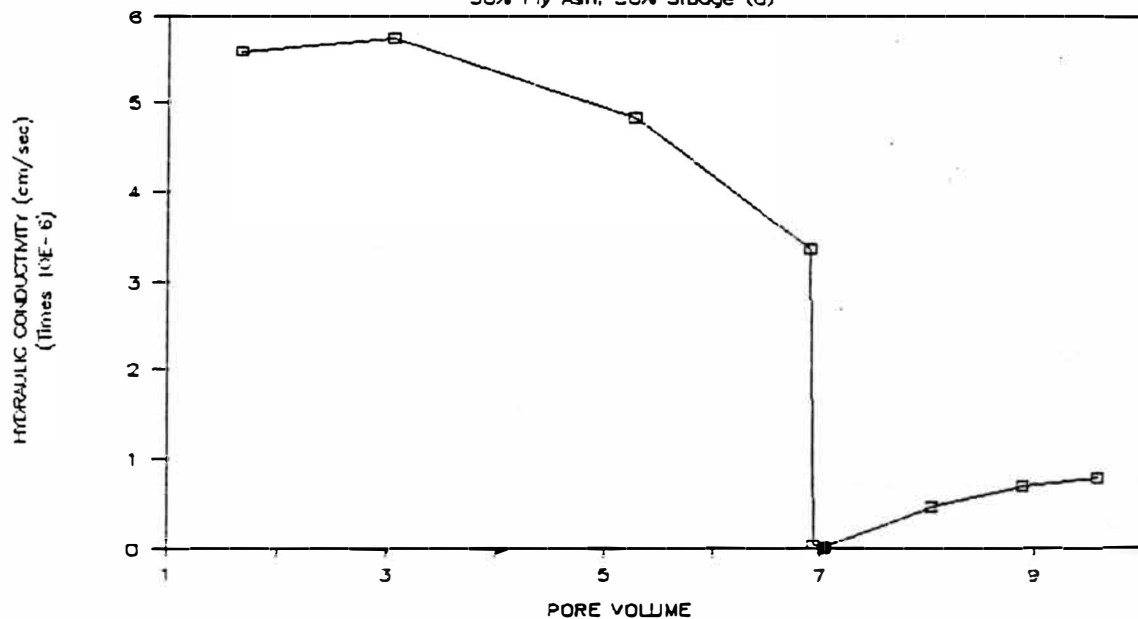
SAMPLE LENGTH-v-PORE VOLUME

30% Fly Ash, 70% Sludge (b)



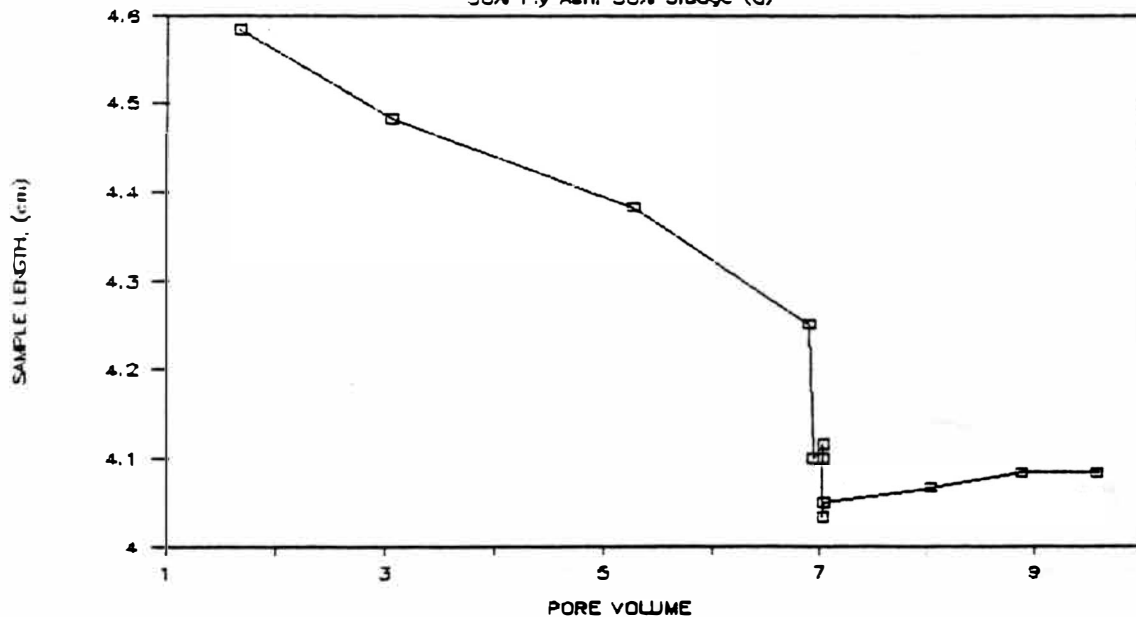
HYDRAULIC CONDUCTIVITY-v-PORE VOLUME

50% Fly Ash, 50% Sludge (a)



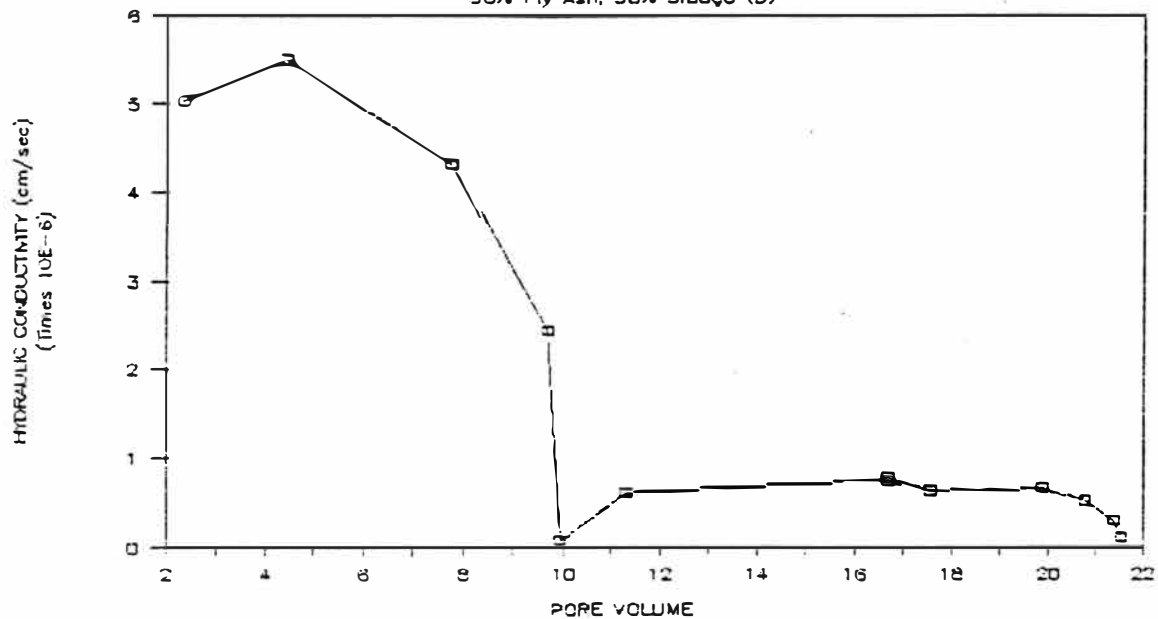
SAMPLE LENGTH-v-PORE VOLUME

50% Fly Ash, 50% Sludge (a)



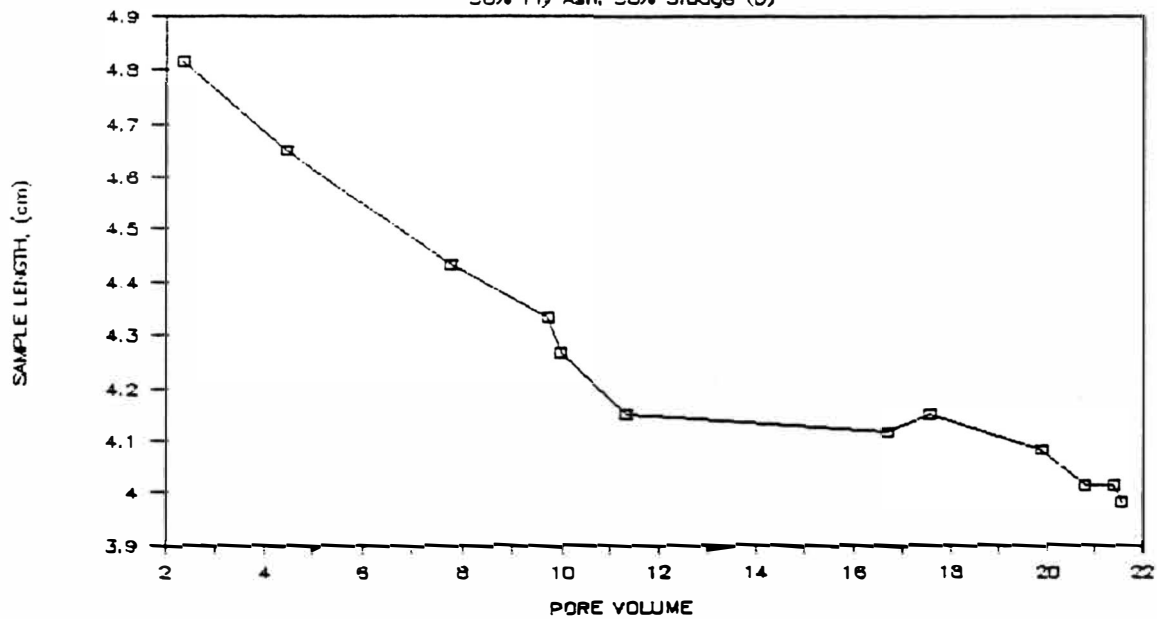
HYDRAULIC CONDUCTIVITY-v-PORE VOLUME

50% Fly Ash, 50% Sludge (b)



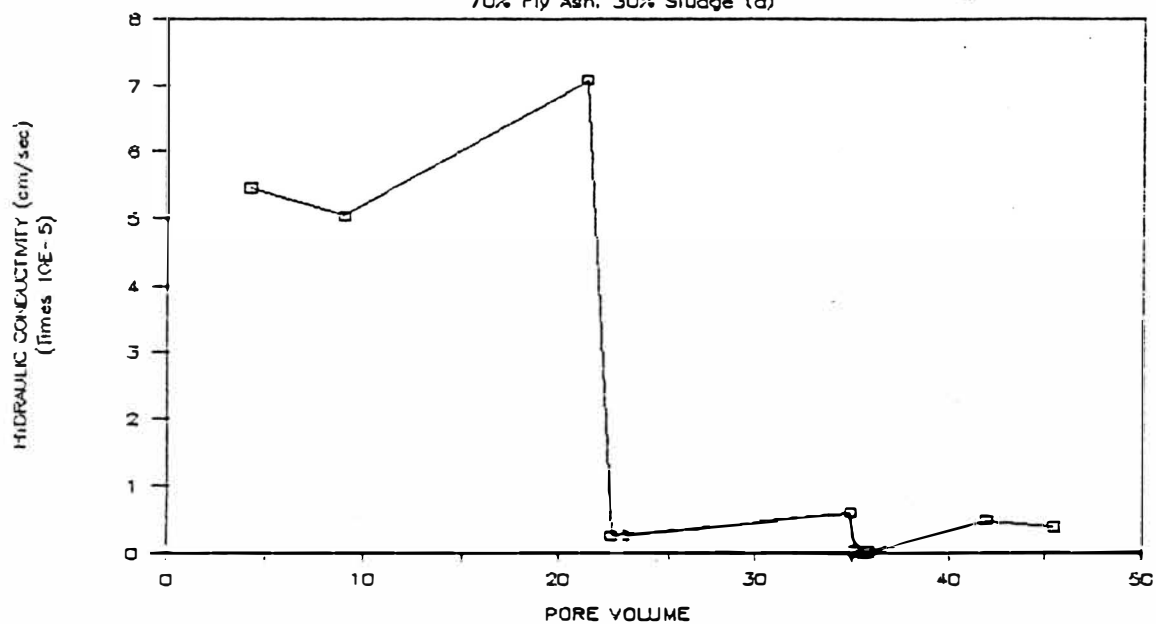
SAMPLE LENGTH-v-PORE VOLUME

50% Fly Ash, 50% Sludge (b)



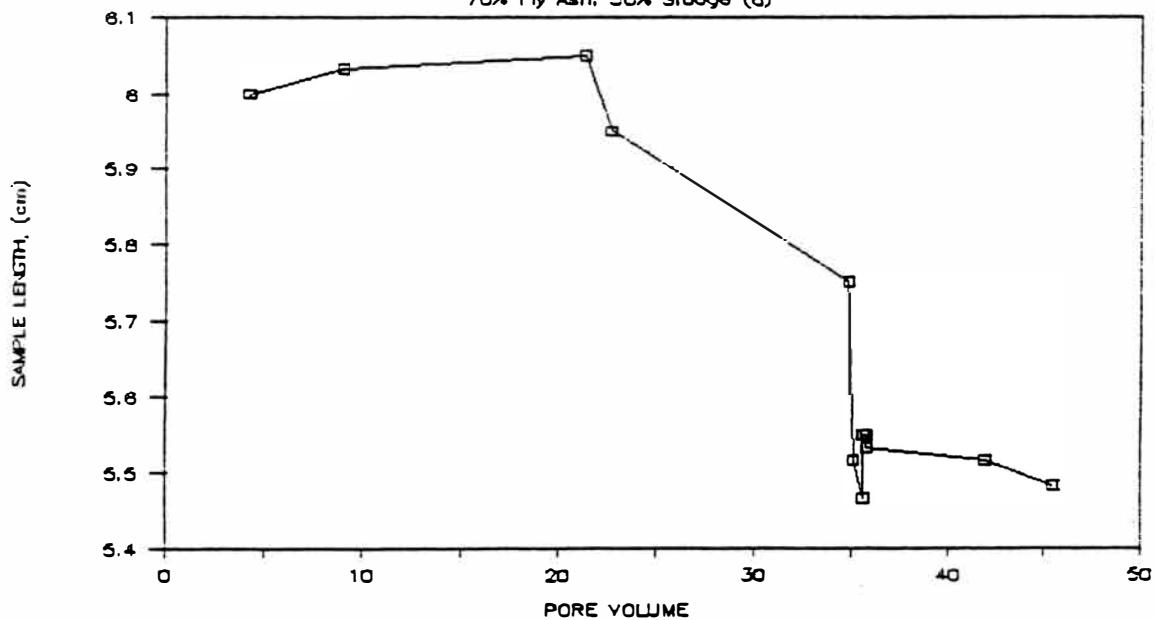
HYDRAULIC CONDUCTIVITY-v-PORE VOLUME

70% Fly Ash, 30% Sludge (a)



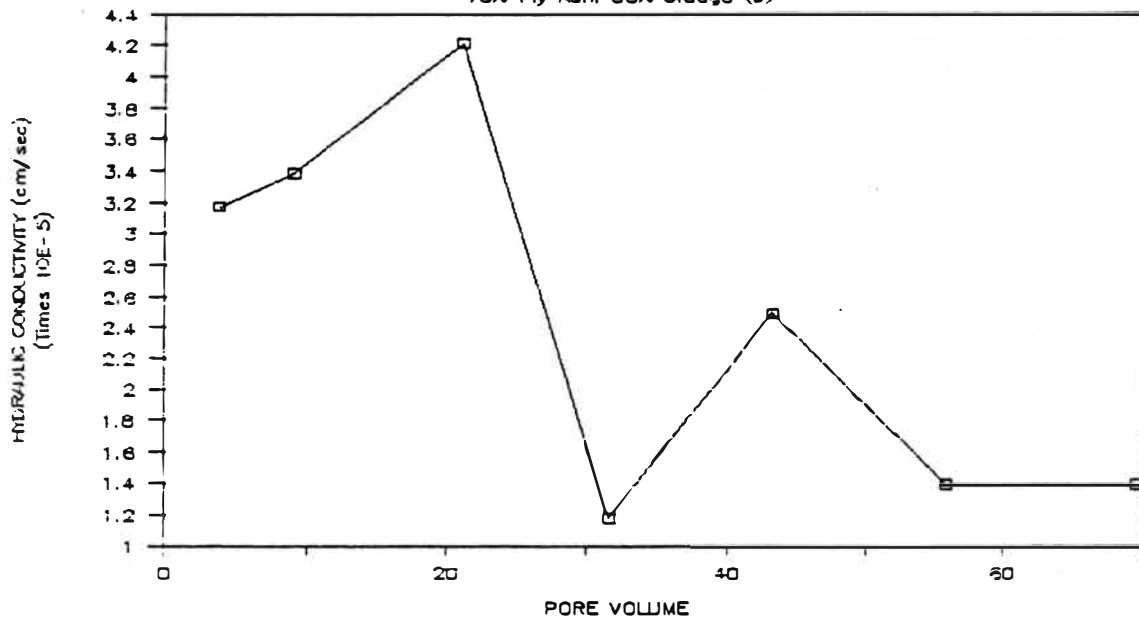
SAMPLE LENGTH-v-PORE VOLUME

70% Fly Ash, 30% Sludge (a)



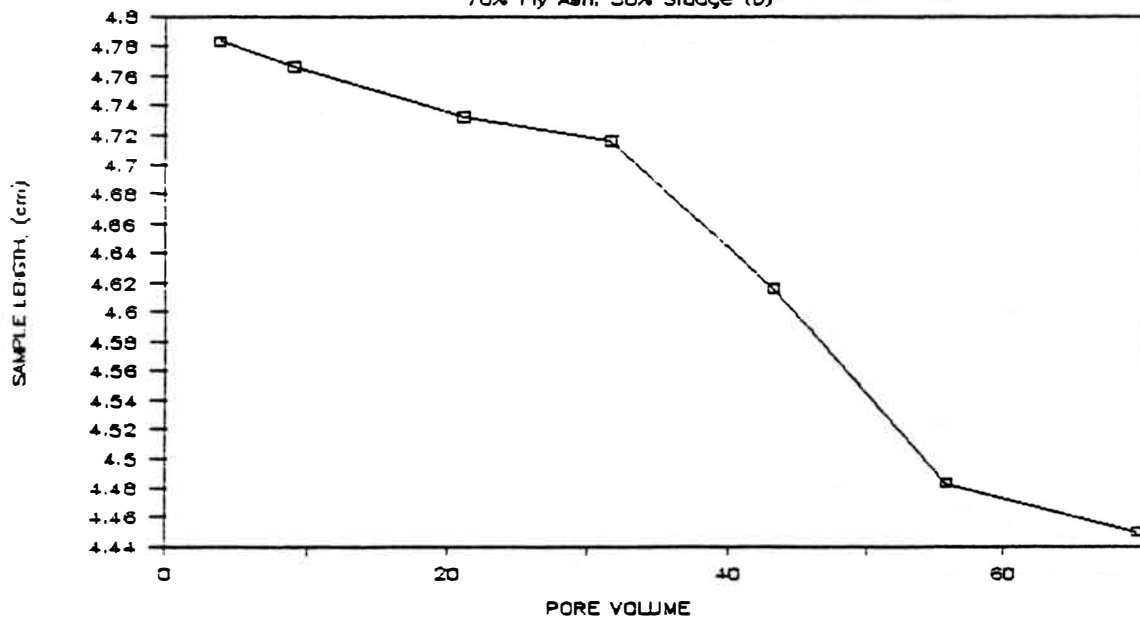
HYDRAULIC CONDUCTIVITY-v-PORE VOLUME

70% Fly Ash, 30% Sludge (b)



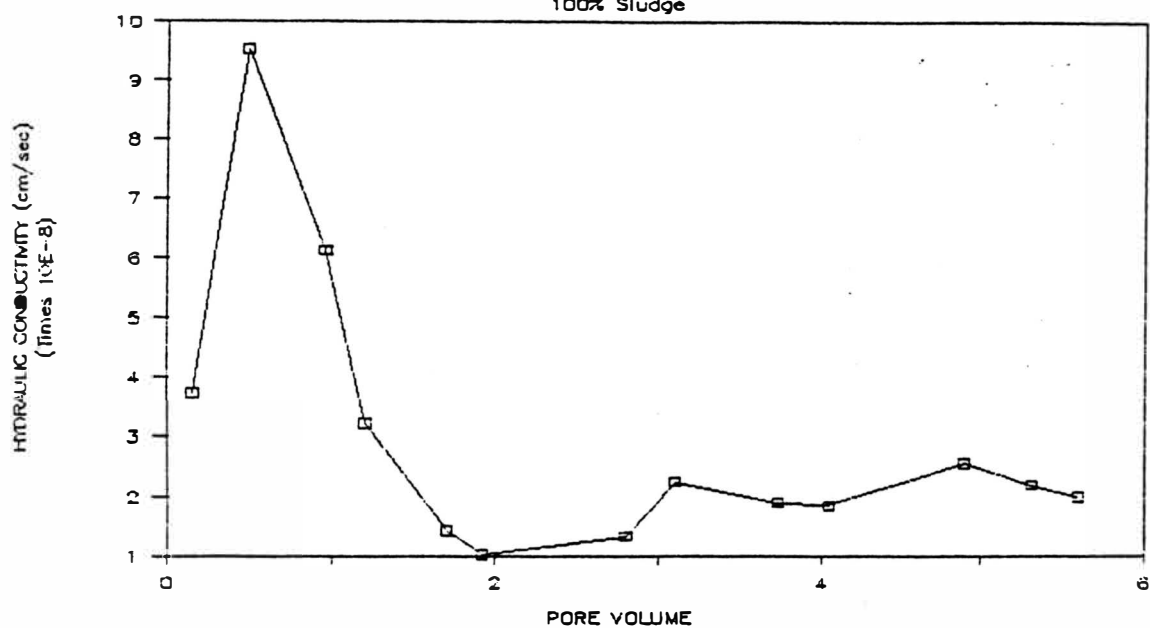
SAMPLE LENGTH-v-PORE VOLUME

70% Fly Ash, 30% Sludge (b)



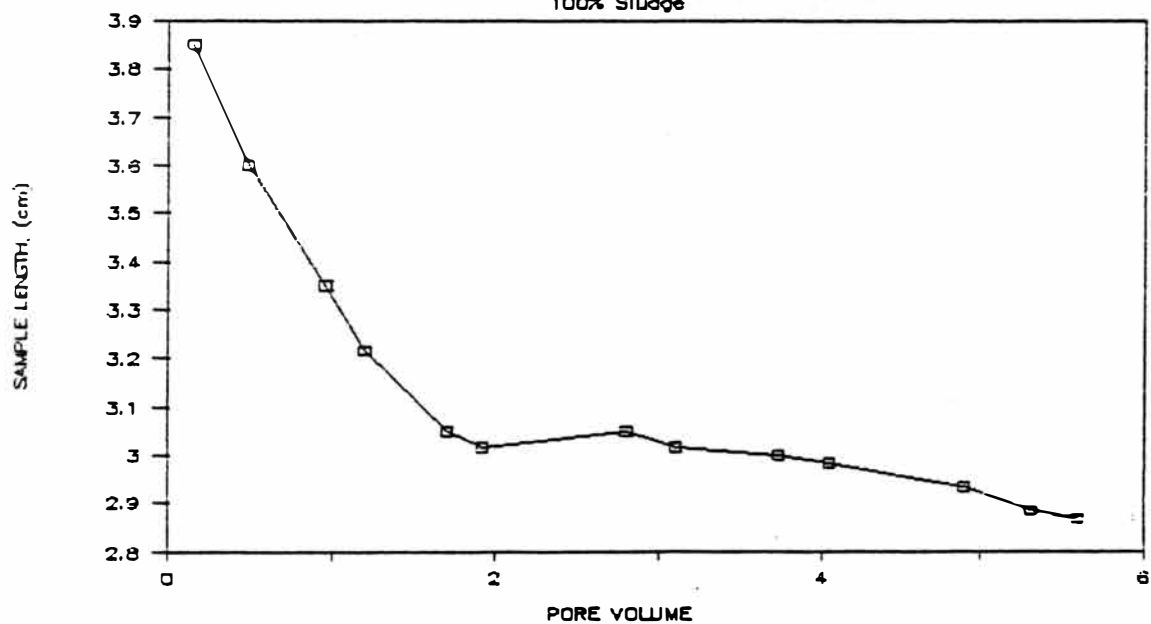
HYDRAULIC CONDUCTIVITY-v-PORE VOLUME

100% Sludge



SAMPLE LENGTH-v-PORE VOLUME

100% Sludge



APPENDIX C
COMPUTER GENERATED DATA

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 1

RUN: T-RW-L-003-A

READING NO: 1

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 22 / 13 / 16

END OF READING : 1 / 23 / 16 / 55

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .2900009

EFFLUENT LEVEL CHANGE (cm): .3699989

INFLOW (cm³): 23.30448

OUTFLOW (cm³): 29.73312

PERCENT FLOW DIFF (IN & OUT): 24.24183

AVERAGE FLOWRATE (cm³/sec): 2.664135E-04

ELAPSED TIME (sec): 99540

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 3.356179E-06

SAMPLE LENGTH AT START (cm) : 5.283334

SAMPLE LENGTH AT END (cm) : 5.083334

AVG SAMPLE LENGTH OVER READING (cm): 5.183334

HYDRAULIC GRADIENT: 15.31447

VISCOSITY CORRECTION FACTOR: 1.267959

HYDRAULIC CONDUCTIVITY @ 11 ° C= 2.165052E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 2.745198E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 1

RUN: T-RW-L-003-A

READING NO: 2

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 23 / 16 / 55

END OF READING : 1 / 24 / 15 / 30

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .2899971

EFFLUENT LEVEL CHANGE (cm): .3900013

INFLOW (cm³): 23.30417

OUTFLOW (cm³): 31.3405

PERCENT FLOW DIFF (IN & OUT): 29.41307

AVERAGE FLOWRATE (cm³/sec): 3.360681E-04

ELAPSED TIME (sec): 81300

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 4.233662E-06

SAMPLE LENGTH AT START (cm) : 5.083334

SAMPLE LENGTH AT END (cm) : 4.95

AVG SAMPLE LENGTH OVER READING (cm): 5.016667

HYDRAULIC GRADIENT: 15.82326

VISCOSITY CORRECTION FACTOR: 1.323589

HYDRAULIC CONDUCTIVITY @ 9.5 ° C= 2.643294E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 3.498635E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 1

RUN: T-RW-L-003-A

READING NO: 3

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 24 / 15 / 30

END OF READING : 1 / 25 / 17 / 40

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 0

EFFLUENT LEVEL CHANGE (cm): 0

INFLOW (cm³): 0

OUTFLOW (cm³): 0

PERCENT FLOW DIFF (IN & OUT): 1.701412E+38

AVERAGE FLOWRATE (cm³/sec): 0

ELAPSED TIME (sec): 94200

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 0

SAMPLE LENGTH AT START (cm) : 4.95

SAMPLE LENGTH AT END (cm) : 4.85

AVG SAMPLE LENGTH OVER READING (cm): 4.9

HYDRAULIC GRADIENT: 16.2

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 0 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 0 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 1

RUN: T-RW-L-003-A

READING NO: 4

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 26 / 12 / 40

END OF READING : 1 / 28 / 8 / 35

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .2299996

EFFLUENT LEVEL CHANGE (cm): 0

INFLOW (cm³): 18.48276

OUTFLOW (cm³): 0

PERCENT FLOW DIFF (IN & OUT): 200

AVERAGE FLOWRATE (cm³/sec): 5.845276E-05

ELAPSED TIME (sec): 158100

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 7.363664E-07

SAMPLE LENGTH AT START (cm) : 4.85

SAMPLE LENGTH AT END (cm) : 4.783334

AVG SAMPLE LENGTH OVER READING (cm): 4.816667

HYDRAULIC GRADIENT: 16.48028

VISCOSITY CORRECTION FACTOR: 1.342982

HYDRAULIC CONDUCTIVITY @ 9 ° C= 4.414227E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20 ° C= 5.928228E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 1

RUN: T-RW-L-003-A

READING NO: 5

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 28 / 8 / 35

END OF READING : 2 / 5 / 15 / 20

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 0

EFFLUENT LEVEL CHANGE (cm): 0

INFLOW (cm³): 0

OUTFLOW (cm³): 0

PERCENT FLOW DIFF (IN & OUT): 1.701412E+38

AVERAGE FLOWRATE (cm³/sec): 0

ELAPSED TIME (sec): 715500

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 0

SAMPLE LENGTH AT START (cm) : 4.783334

SAMPLE LENGTH AT END (cm) : 4.783334

AVG SAMPLE LENGTH OVER READING (cm): 4.783334

HYDRAULIC GRADIENT: 16.59512

VISCOSITY CORRECTION FACTOR: 1.323589

HYDRAULIC CONDUCTIVITY @ 9.5 ° C= 0 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 0 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 1

RUN: T-RW-L-003-A

READING NO: 6

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 5 / 15 / 20

END OF READING : 2 / 10 / 11 / 30

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 0

EFFLUENT LEVEL CHANGE (cm): 0

INFLOW (cm³): 0

OUTFLOW (cm³): 0

PERCENT FLOW DIFF (IN & OUT): 1.701412E+38

AVERAGE FLOWRATE (cm³/sec): 0

ELAPSED TIME (sec): 418200

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 0

SAMPLE LENGTH AT START (cm) : 4.783334

SAMPLE LENGTH AT END (cm) : 4.65

AVG SAMPLE LENGTH OVER READING (cm): 4.716667

HYDRAULIC GRADIENT: 16.82968

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 0 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 0 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 1

RUN: T-RW-L-003-A

READING NO: 7

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 10 / 11 / 30
END OF READING : 2 / 25 / 11 / 35

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	53	AREA (cm ²):	80.36	
EFFLUENT STANDPIPE NO:	53	AREA (cm ²):	80.36	

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): 1.5
EFFLUENT LEVEL CHANGE (cm): 2.24
INFLOW (cm³): 120.54
OUTFLOW (cm³): 180.0064
PERCENT FLOW DIFF (IN & OUT): 39.57218
AVERAGE FLOWRATE (cm³/sec): 1.159247E-04

ELAPSED TIME (sec): 1296300

HYDRAULIC HEAD (cm): 79.38
SYSTEM RESISTANCE (cm²/sec): 1.460377E-06

SAMPLE LENGTH AT START (cm) : 4.65
SAMPLE LENGTH AT END (cm) : 4.783334
AVG SAMPLE LENGTH OVER READING (cm): 4.716667

HYDRAULIC GRADIENT: 16.82968
VISCOSITY CORRECTION FACTOR: 1.304629
HYDRAULIC CONDUCTIVITY @ 10 ° C= 8.572632E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.11841E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 1

RUN: T-RW-L-003-A

READING NO: 8

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 25 / 11 / 35

END OF READING : 2 / 28 / 12 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .2799988

EFFLUENT LEVEL CHANGE (cm): .1700001

INFLOW (cm³): 22.5007

OUTFLOW (cm³): 13.66121

PERCENT FLOW DIFF (IN & OUT): 48.88844

AVERAGE FLOWRATE (cm³/sec): 6.919615E-05

ELAPSED TIME (sec): 261300

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 8.717076E-07

SAMPLE LENGTH AT START (cm) : 4.783334

SAMPLE LENGTH AT END (cm) : 4.783334

AVG SAMPLE LENGTH OVER READING (cm): 4.783334

HYDRAULIC GRADIENT: 16.59512

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 5.189382E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 6.770218E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 1

RUN: T-RW-L-003-A

READING NO: 9

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 28 / 12 / 10

END OF READING : 3 / 7 / 19 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .7700005

EFFLUENT LEVEL CHANGE (cm): .960001

INFL OW (cm³): 61.87724OUTFLOW (cm³): 77.14568

PERCENT FLOW DIFF (IN & OUT): 21.96536

AVERAGE FLOWRATE (cm³/sec): 1.103357E-04

ELAPSED TIME (sec): 6.30000

HYDRAULIC HEAD (cm) : 79.38

SYSTEM RESISTANCE (cm²/sec): 1.389968E-06

SAMPLE LENGTH AT START (cm) : 4.783334

SAMPLE LENGTH AT END (cm) : 4.683333

AVG SAMPLE LENGTH OVER READING (cm): 4.733333

HYDRAULIC GRADIENT: 16.77042

VISCOSITY CORRECTION FACTOR: 1.267959

HYDRAULIC CONDUCTIVITY @ 11 ° C = 8.188154E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.038225E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 1

RUN: T-RW-L-003-A

READING NO: 10

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 7 / 19 / 10

END OF READING : 3 / 11 / 10 / 40

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .6000004

EFFLUENT LEVEL CHANGE (cm): .4599991

INFLOW (cm³): 48.21603

OUTFLOW (cm³): 36.96553

PERCENT FLOW DIFF (IN & OUT): 26.41535

AVERAGE FLOWRATE (cm³/sec): 1.352088E-04

ELAPSED TIME (sec): 315000

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 1.703311E-06

SAMPLE LENGTH AT START (cm) : 4.683333

SAMPLE LENGTH AT END (cm) : 4.683333

AVG SAMPLE LENGTH OVER READING (cm): 4.683333

HYDRAULIC GRADIENT: 16.94947

VISCOSITY CORRECTION FACTOR: 1.267959

HYDRAULIC CONDUCTIVITY @ 11 ° C= 9.92803E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.258834E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 1

RUN: T-RW-L-003-A

READING NO: 11

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 11 / 10 / 40
END OF READING : 3 / 18 / 15 / 15

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	53	AREA (cm ²):	80.36	
EFFLUENT STANDPIPE NO:	53	AREA (cm ²):	80.36	

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): 1
EFFLUENT LEVEL CHANGE (cm): 1.02
INFLOW (cm³): 80.36
OUTFLOW (cm³): 81.96724
PERCENT FLOW DIFF (IN & OUT): 1.980245
AVERAGE FLOWRATE (cm³/sec): 1.306352E-04

ELAPSED TIME (sec): 621300

HYDRAULIC HEAD (cm): 79.38
SYSTEM RESISTANCE (cm²/sec): 1.645694E-06

SAMPLE LENGTH AT START (cm)	:	4.683333
SAMPLE LENGTH AT END (cm)	:	4.65
AVG SAMPLE LENGTH OVER READING (cm):		4.666667

HYDRAULIC GRADIENT: 17.01
VISCOSITY CORRECTION FACTOR: 1.28609
HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 9.558062E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.229253E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 1

RUN: T-RW-L-003-A

READING NO: 12

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 18 / 15 / 15

END OF READING : 3 / 22 / 16 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .58

EFFLUENT LEVEL CHANGE (cm): .5200005

INFLOW (cm³): 46.6088

OUTFLOW (cm³): 41.78724

PERCENT FLOW DIFF (IN & OUT): 10.909

AVERAGE FLOWRATE (cm³/sec): 1.266782E-04

ELAPSED TIME (sec): 348900

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 1.595845E-06

SAMPLE LENGTH AT START (cm) : 4.65

SAMPLE LENGTH AT END (cm) : 4.65

AVG SAMPLE LENGTH OVER READING (cm): 4.65

HYDRAULIC GRADIENT: 17.07097

VISCOSITY CORRECTION FACTOR: 1.28609

HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 9.235445E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.187761E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 1

RUN: T-RW-L-003-A

READING NO: 13

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 22 / 16 / 10
END OF READING : 3 / 25 / 14 / 35

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	53	AREA (cm ²):	80.36	
EFFLUENT STANDPIPE NO:	53	AREA (cm ²):	80.36	

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): .4400006
EFFLUENT LEVEL CHANGE (cm): .4699974
INFLOW (cm³): 35.35845
OUTFLOW (cm³): 37.76899
PERCENT FLOW DIFF (IN & OUT): 6.592726
AVERAGE FLOWRATE (cm³/sec): 1.442356E-04

ELAPSED TIME (sec): 253500

HYDRAULIC HEAD (cm): 79.38
SYSTEM RESISTANCE (cm²/sec): 1.817027E-06

SAMPLE LENGTH AT START (cm) : 4.65
SAMPLE LENGTH AT END (cm) : 4.583334
AVG SAMPLE LENGTH OVER READING (cm): 4.616667

HYDRAULIC GRADIENT: 17.19422
VISCOSITY CORRECTION FACTOR: 1.267959
HYDRAULIC CONDUCTIVITY @ 11 ° C= 1.044008E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.32376E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 2

RUN: T-RW-L-003-B

READING NO: 1

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 22 / 13 / 16

END OF READING : 1 / 23 / 16 / 55

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .8400001

EFFLUENT LEVEL CHANGE (cm): 1.24

INFLOW (cm³): 67.50241

OUTFLOW (cm³): 99.64642

PERCENT FLOW DIFF (IN & OUT): 38.46155

AVERAGE FLOWRATE (cm³/sec): 8.396063E-04

ELAPSED TIME (sec): 99540

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 1.057705E-05

SAMPLE LENGTH AT START (cm) : 4.716667

SAMPLE LENGTH AT END (cm) : 4.583334

AVG SAMPLE LENGTH OVER READING (cm): 4.65

HYDRAULIC GRADIENT: 17.07097

VISCOSITY CORRECTION FACTOR: 1.267959

HYDRAULIC CONDUCTIVITY @ 11 ° C= 6.121132E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 7.761346E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 2

RUN: T-RW-L-003-B

READING NO: 2

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 23 / 16 / 55

END OF READING : 1 / 24 / 15 / 30

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .8999996

EFFLUENT LEVEL CHANGE (cm): .6199999

INFLOW (cm³): 72.32397

OUTFLOW (cm³): 49.8232

PERCENT FLOW DIFF (IN & OUT): 36.84208

AVERAGE FLOWRATE (cm³/sec): 7.512126E-04

ELAPSED TIME (sec): 81300

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 9.463499E-06

SAMPLE LENGTH AT START (cm) : 4.583334

SAMPLE LENGTH AT END (cm) : 4.383333

AVG SAMPLE LENGTH OVER READING (cm): 4.483334

HYDRAULIC GRADIENT: 17.70557

VISCOSITY CORRECTION FACTOR: 1.323589

HYDRAULIC CONDUCTIVITY @ 9.5 ° C= 5.280402E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 6.989081E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 2

RUN: T-RW-L-003-B

READING NO: 3

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 24 / 15 / 30

END OF READING : 1 / 25 / 17 / 40

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 2.98

EFFLUENT LEVEL CHANGE (cm): .7700005

INFLOW (cm³): 239.4728

OUTFLOW (cm³): 61.87724

PERCENT FLOW DIFF (IN & OUT): 117.8666

AVERAGE FLOWRATE (cm³/sec): 1.599522E-03

ELAPSED TIME (sec): 94200

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 2.015019E-05

SAMPLE LENGTH AT START (cm) : 4.383333

SAMPLE LENGTH AT END (cm) : 4.25

AVG SAMPLE LENGTH OVER READING (cm): 4.316667

HYDRAULIC GRADIENT: 18.38919

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 1.082535E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.412306E-06 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 2

RUN: T-RW-L-003-B

READING NO: 4

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 26 / 12 / 40

END OF READING : 1 / 28 / 8 / 35

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 1.709999

EFFLUENT LEVEL CHANGE (cm): 1.709999

INFLOW (cm³): 137.4155

OUTFLOW (cm³): 137.4155

PERCENT FLOW DIFF (IN & OUT): 0

AVERAGE FLOWRATE (cm³/sec): 8.691684E-04

ELAPSED TIME (sec): 158100

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 1.094946E-05

SAMPLE LENGTH AT START (cm) : 4.25

SAMPLE LENGTH AT END (cm) : 4.216667

AVG SAMPLE LENGTH OVER READING (cm): 4.233334

HYDRAULIC GRADIENT: 18.75118

VISCOSITY CORRECTION FACTOR: 1.342982

HYDRAULIC CONDUCTIVITY @ 9 ° C= 5.768854E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 7.747467E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 2

RUN: T-RW-L-003-B

READING NO: 5

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 31 / 11 / 5

END OF READING : 2 / 5 / 15 / 20

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 3.32

EFFLUENT LEVEL CHANGE (cm): 2.16

INFLOW (cm³): 266.7952

OUTFLOW (cm³): 173.5776

PERCENT FLOW DIFF (IN & OUT): 42.33576

AVERAGE FLOWRATE (cm³/sec): 4.922566E-04

ELAPSED TIME (sec): 447300

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 6.201268E-06

SAMPLE LENGTH AT START (cm) : 4.216667

SAMPLE LENGTH AT END (cm) : 4.05

AVG SAMPLE LENGTH OVER READING (cm): 4.133333

HYDRAULIC GRADIENT: 19.20484

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 3.190032E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 4.161808E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 2

RUN: T-RW-L-003-B

READING NO: 6

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 5 / 15 / 20

END OF READING : 2 / 10 / 11 / 30

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 2.610001

EFFLUENT LEVEL CHANGE (cm): 2.69

INFLOW (cm³): 209.7397

OUTFLOW (cm³): 216.1684

PERCENT FLOW DIFF (IN & OUT): 3.018826

AVERAGE FLOWRATE (cm³/sec): 5.092157E-04

ELAPSED TIME (sec): 418200

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 6.414912E-06

SAMPLE LENGTH AT START (cm) : 4.05

SAMPLE LENGTH AT END (cm) : 4.05

AVG SAMPLE LENGTH OVER READING (cm): 4.05

HYDRAULIC GRADIENT: 19.6

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 3.233403E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 4.218391E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 2

RUN: T-RW-L-003-B

READING NO: 7

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 10 / 11 / 30

END OF READING : 2 / 25 / 11 / 35

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 1.74

EFFLUENT LEVEL CHANGE (cm): 4.600001

INFLOW (cm³): 139.8264

OUTFLOW (cm³): 369.656

PERCENT FLOW DIFF (IN & OUT): 90.22083

AVERAGE FLOWRATE (cm³/sec): 1.965141E-04

ELAPSED TIME (sec): 1296300

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 2.475612E-06

SAMPLE LENGTH AT START (cm) : 4.05

SAMPLE LENGTH AT END (cm) : 4.016667

AVG SAMPLE LENGTH OVER READING (cm): 4.033334

HYDRAULIC GRADIENT: 19.68099

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 1.242685E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.621242E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 2

RUN: T-RW-L-003-B

READING NO: 8

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 25 / 11 / 35
END OF READING : 2 / 28 / 12 / 10

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	53		AREA (cm ²):	80.36
EFFLUENT STANDPIPE NO:	53		AREA (cm ²):	80.36

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): .5900001
EFFLUENT LEVEL CHANGE (cm): .9899998
INFLOW (cm³): 47.41241
OUTFLOW (cm³): 79.55638
PERCENT FLOW DIFF (IN & OUT): 50.63287
AVERAGE FLOWRATE (cm³/sec): 2.42956E-04

ELAPSED TIME (sec): 261300

HYDRAULIC HEAD (cm): 79.38
SYSTEM RESISTANCE (cm²/sec): 3.06067E-06

SAMPLE LENGTH AT START (cm)	:	4.016667
SAMPLE LENGTH AT END (cm)	:	4.016667
AVG SAMPLE LENGTH OVER READING (cm):		4.016667

HYDRAULIC GRADIENT: 19.76265
VISCOSITY CORRECTION FACTOR: 1.304629
HYDRAULIC CONDUCTIVITY @ 10 ° C= 1.530018E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.996105E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 2

RUN: T-RW-L-003-B

READING NO: 9

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 28 / 12 / 10

END OF READING : 3 / 7 / 19 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 1.35

EFFLUENT LEVEL CHANGE (cm): 1.35

INFLOW (cm³): 108.486

OUTFLOW (cm³): 108.486

PERCENT FLOW DIFF (IN & OUT): 0

AVERAGE FLOWRATE (cm³/sec): 1.722001E-04

ELAPSED TIME (sec): 630000

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 2.169313E-06

SAMPLE LENGTH AT START (cm) : 4.016667

SAMPLE LENGTH AT END (cm) : 3.916667

AVG SAMPLE LENGTH OVER READING (cm): 3.966667

HYDRAULIC GRADIENT: 20.01177

VISCOSITY CORRECTION FACTOR: 1.28609

HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 1.070932E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.377315E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 2

RUN: T-RW-L-003-B

READING NO: 10

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 7 / 19 / 10
END OF READING : 3 / 11 / 10 / 40

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	53		AREA (cm ²):	80.36
EFFLUENT STANDPIPE NO:	53		AREA (cm ²):	80.36

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): .7199993
EFFLUENT LEVEL CHANGE (cm): .8500004
INFLOW (cm³): 57.85915
OUTFLOW (cm³): 68.30603
PERCENT FLOW DIFF (IN & OUT): 16.56065
AVERAGE FLOWRATE (cm³/sec): 2.002622E-04

ELAPSED TIME (sec): 315000

HYDRAULIC HEAD (cm): 79.38
SYSTEM RESISTANCE (cm²/sec): 2.52283E-06

SAMPLE LENGTH AT START (cm)	:	3.916667
SAMPLE LENGTH AT END (cm)	:	3.816667
AVG SAMPLE LENGTH OVER READING (cm)	:	3.866667

HYDRAULIC GRADIENT: 20.52931
VISCOSITY CORRECTION FACTOR: 1.267959
HYDRAULIC CONDUCTIVITY @ 11 ° C= 1.214056E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.539374E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 2

RUN: T-RW-L-003-B

READING NO: 11

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 11 / 10 / 40

END OF READING : 3 / 18 / 15 / 15

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .4300003

EFFLUENT LEVEL CHANGE (cm): 0

INFLOW (cm³): 34.55483

OUTFLOW (cm³): 0

PERCENT FLOW DIFF (IN & OUT): 200

AVERAGE FLOWRATE (cm³/sec): 2.780849E-05

ELAPSED TIME (sec): 621300

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 3.503211E-07

SAMPLE LENGTH AT START (cm) : 3.816667

SAMPLE LENGTH AT END (cm) : 3.816667

AVG SAMPLE LENGTH OVER READING (cm): 3.816667

HYDRAULIC GRADIENT: 20.79825

VISCOSITY CORRECTION FACTOR: 1.28609

HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 1.664043E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 2.140109E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 2

RUN: T-RW-L-003-B

READING NO: 12

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 18 / 15 / 15
END OF READING : 3 / 22 / 16 / 10

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	53		AREA (cm ²):	80.36
EFFLUENT STANDPIPE NO:	53		AREA (cm ²):	80.36

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): .2399998
EFFLUENT LEVEL CHANGE (cm): .3999996
INFLOW (cm³): 19.28638
OUTFLOW (cm³): 32.14397
PERCENT FLOW DIFF (IN & OUT): 50.00001
AVERAGE FLOWRATE (cm³/sec): 7.370358E-05

ELAPSED TIME (sec): 348900

HYDRAULIC HEAD (cm): 79.38
SYSTEM RESISTANCE (cm²/sec): 9.284905E-07

SAMPLE LENGTH AT START (cm) : 3.816667
SAMPLE LENGTH AT END (cm) : 3.816667
AVG SAMPLE LENGTH OVER READING (cm): 3.816667

HYDRAULIC GRADIENT: 20.79825
VISCOSITY CORRECTION FACTOR: 1.28609
HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 4.410378E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 5.672142E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 2

RUN: T-RW-L-003-B

READING NO: 13

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 22 / 16 / 10

END OF READING : 3 / 25 / 14 / 35

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .3600006

EFFLUENT LEVEL CHANGE (cm): .4200001

INFLOW (cm³): 28.92965

OUTFLOW (cm³): 33.75121

PERCENT FLOW DIFF (IN & OUT): 15.38446

AVERAGE FLOWRATE (cm³/sec): 1.236309E-04

ELAPSED TIME (sec): 253500

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 1.557456E-06

SAMPLE LENGTH AT START (cm) : 3.816667

SAMPLE LENGTH AT END (cm) : 3.816667

AVG SAMPLE LENGTH OVER READING (cm): 3.816667

HYDRAULIC GRADIENT: 20.79825

VISCOSITY CORRECTION FACTOR: 1.267959

HYDRAULIC CONDUCTIVITY @ 11 ° C= 7.397998E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 9.38036E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 3

RUN: T-RW-L-005-A

READING NO: 1

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 22 / 13 / 16
END OF READING : 1 / 23 / 16 / 55

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	53		AREA (cm ²):	80.36
EFFLUENT STANDPIPE NO:	53		AREA (cm ²):	80.36

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): 7.619999
EFFLUENT LEVEL CHANGE (cm): 7.66
INFLOW (cm³): 612.3431
OUTFLOW (cm³): 615.5576
PERCENT FLOW DIFF (IN & OUT): .5235729
AVERAGE FLOWRATE (cm³/sec): 6.167876E-03

ELAPSED TIME (sec): 99540

HYDRAULIC HEAD (cm): 80.01
SYSTEM RESISTANCE (cm²/sec): 7.708881E-05

SAMPLE LENGTH AT START (cm)	:	4.616667
SAMPLE LENGTH AT END (cm)	:	4.55
AVG SAMPLE LENGTH OVER READING (cm):		4.583333

HYDRAULIC GRADIENT: 17.45673
VISCOSITY CORRECTION FACTOR: 1.267959
HYDRAULIC CONDUCTIVITY @ 11 ° C= 4.397308E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 5.575607E-06 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 3

RUN: T-RW-L-005-A

READING NO: 2

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 23 / 16 / 55

END OF READING : 1 / 24 / 15 / 30

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 6.270001

EFFLUENT LEVEL CHANGE (cm): 6.299999

INFLOW (cm³): 503.8573

OUTFLOW (cm³): 506.268

PERCENT FLOW DIFF (IN & OUT): .4773083

AVERAGE FLOWRATE (cm³/sec): 6.212332E-03

ELAPSED TIME (sec): 81300

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 7.764445E-05

SAMPLE LENGTH AT START (cm) : 4.55

SAMPLE LENGTH AT END (cm) : 4.416667

AVG SAMPLE LENGTH OVER READING (cm): 4.483333

HYDRAULIC GRADIENT: 17.8461

VISCOSITY CORRECTION FACTOR: 1.323589

HYDRAULIC CONDUCTIVITY @ 9.5 ° C= 4.33237E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 5.734276E-06 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 3

RUN: T-RW-L-005-A

READING NO: 3

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 24 / 15 / 30
END OF READING : 1 / 26 / 9 / 5

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	53	AREA (cm ²):	80.36	
EFFLUENT STANDPIPE NO:	53	AREA (cm ²):	80.36	

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): 10.36
EFFLUENT LEVEL CHANGE (cm): 9.68
INFLOW (cm³): 832.5296
OUTFLOW (cm³): 777.8848
PERCENT FLOW DIFF (IN & OUT): 6.786417
AVERAGE FLOWRATE (cm³/sec): 5.378805E-03

ELAPSED TIME (sec): 149700

HYDRAULIC HEAD (cm): 80.01
SYSTEM RESISTANCE (cm²/sec): 6.722666E-05

SAMPLE LENGTH AT START (cm) : 4.416667
SAMPLE LENGTH AT END (cm) : 4.35
AVG SAMPLE LENGTH OVER READING (cm): 4.383333

HYDRAULIC GRADIENT: 18.25323
VISCOSITY CORRECTION FACTOR: 1.323589
HYDRAULIC CONDUCTIVITY @ 9.5 ° C= 3.667416E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 4.854151E-06 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 3

RUN: T-RW-L-005-A

READING NO: 4

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 26 / 12 / 40
END OF READING : 1 / 28 / 8 / 35

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	53	AREA (cm ²):	80.36	
EFFLUENT STANDPIPE NO:	53	AREA (cm ²):	80.36	

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): 8.32
EFFLUENT LEVEL CHANGE (cm): 6.63
INFLOW (cm³): 668.5951
OUTFLOW (cm³): 532.7868
PERCENT FLOW DIFF (IN & OUT): 22.60869
AVERAGE FLOWRATE (cm³/sec): 3.799437E-03

ELAPSED TIME (sec): 158100

HYDRAULIC HEAD (cm): 80.01
SYSTEM RESISTANCE (cm²/sec): 4.748703E-05

SAMPLE LENGTH AT START (cm)	:	4.35
SAMPLE LENGTH AT END (cm)	:	4.15
AVG SAMPLE LENGTH OVER READING (cm):		4.25

HYDRAULIC GRADIENT: 18.82588
VISCOSITY CORRECTION FACTOR: 1.342982
HYDRAULIC CONDUCTIVITY @ 9 ° C= 2.51176E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 3.373248E-06 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 3

RUN: T-RW-L-005-A

READING NO: 5

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 6 / 15 / 30

END OF READING : 2 / 10 / 11 / 30

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .3600006

EFFLUENT LEVEL CHANGE (cm): 0

INFLOW (cm³): 28.92965

OUTFLOW (cm³): 0

PERCENT FLOW DIFF (IN & OUT): 200

AVERAGE FLOWRATE (cm³/sec): 4.367399E-05

ELAPSED TIME (sec): 331200

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 5.458566E-07

SAMPLE LENGTH AT START (cm) : 4.15

SAMPLE LENGTH AT END (cm) : 4.05

AVG SAMPLE LENGTH OVER READING (cm): 4.1

HYDRAULIC GRADIENT: 19.51464

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 2.785329E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20 ° C= 3.633821E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 3

RUN: T-RW-L-005-A

READING NO: 6

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 10 / 11 / 30

END OF READING : 2 / 25 / 11 / 35

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .3499985

EFFLUENT LEVEL CHANGE (cm): .48

INFLOW (cm³): 28.12588

OUTFLOW (cm³): 38.5728

PERCENT FLOW DIFF (IN & OUT): 31.32573

AVERAGE FLOWRATE (cm³/sec): 2.572656E-05

ELAPSED TIME (sec): 1296300

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 3.215418E-07

SAMPLE LENGTH AT START (cm) : 4.05

SAMPLE LENGTH AT END (cm) : 4.183334

AVG SAMPLE LENGTH OVER READING (cm): 4.116667

HYDRAULIC GRADIENT: 19.43563

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 1.647393E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 2.149237E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 3

RUN: T-RW-L-005-A

READING NO: 7

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 25 / 11 / 35

END OF READING : 2 / 28 / 12 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 0

EFFLUENT LEVEL CHANGE (cm): 0

INFLOW (cm³): 0

OUTFLOW (cm³): 0

PERCENT FLOW DIFF (IN & OUT): 1.701412E+38

AVERAGE FLOWRATE (cm³/sec): 0

ELAPSED TIME (sec): 261300

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 0

SAMPLE LENGTH AT START (cm) : 4.183334

SAMPLE LENGTH AT END (cm) : 4.016667

AVG SAMPLE LENGTH OVER READING (cm): 4.1

HYDRAULIC GRADIENT: 19.51464

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 0 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 0 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 3

RUN: T-RW-L-005-A

READING NO: 8

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 28 / 12 / 10

END OF READING : 3 / 7 / 19 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 1.000214E-02

EFFLUENT LEVEL CHANGE (cm): 0

INFLOW (cm³): .8037717

OUTFLOW (cm³): 0

PERCENT FLOW DIFF (IN & OUT): 200

AVERAGE FLOWRATE (cm³/sec): 6.37914E-07

ELAPSED TIME (sec): 630000

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 7.972928E-09

SAMPLE LENGTH AT START (cm) : 4.016667

SAMPLE LENGTH AT END (cm) : 4.05

AVG SAMPLE LENGTH OVER READING (cm): 4.033333

HYDRAULIC GRADIENT: 19.83719

VISCOSITY CORRECTION FACTOR: 1.28609

HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 4.002175E-10 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 5.147157E-10 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 3

RUN: T-RW-L-005-A

READING NO: 9

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 7 / 19 / 10

END OF READING : 3 / 11 / 10 / 40

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 7.999802E-02

EFFLUENT LEVEL CHANGE (cm): 0

INFLOW (cm³): 6.428641

OUTFLOW (cm³): 0

PERCENT FLOW DIFF (IN & OUT): 200

AVERAGE FLOWRATE (cm³/sec): 1.020419E-05

ELAPSED TIME (sec): 315000

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 1.275365E-07

SAMPLE LENGTH AT START (cm) : 4.05

SAMPLE LENGTH AT END (cm) : 4.05

AVG SAMPLE LENGTH OVER READING (cm): 4.05

HYDRAULIC GRADIENT: 19.75555

VISCOSITY CORRECTION FACTOR: 1.267959

HYDRAULIC CONDUCTIVITY @ 11 ° C= 6.428409E-09 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 8.150961E-09 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 3

RUN: T-RW-L-005-A

READING NO: 10

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 11 / 10 / 40

END OF READING : 3 / 18 / 15 / 15

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 4.780001

EFFLUENT LEVEL CHANGE (cm): 4.310001

INFLOW (cm³): 384.1209

OUTFLOW (cm³): 346.3516

PERCENT FLOW DIFF (IN & OUT): 10.34104

AVERAGE FLOWRATE (cm³/sec): 5.878581E-04

ELAPSED TIME (sec): 621300

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 7.347308E-06

SAMPLE LENGTH AT START (cm) : 4.05

SAMPLE LENGTH AT END (cm) : 4.083334

AVG SAMPLE LENGTH OVER READING (cm): 4.066667

HYDRAULIC GRADIENT: 19.67459

VISCOSITY CORRECTION FACTOR: 1.28609

HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 3.718612E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 4.78247E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 3

RUN: T-RW-L-005-A

READING NO: 11

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 18 / 15 / 15

END OF READING : 3 / 22 / 16 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 3.949999

EFFLUENT LEVEL CHANGE (cm): 3.699999

INFLOW (cm³): 317.4219

OUTFLOW (cm³): 297.3319

PERCENT FLOW DIFF (IN & OUT): 6.535949

AVERAGE FLOWRATE (cm³/sec): 8.809885E-04

ELAPSED TIME (sec): 348900

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 1.101098E-05

SAMPLE LENGTH AT START (cm) : 4.083334

SAMPLE LENGTH AT END (cm) : 4.083334

AVG SAMPLE LENGTH OVER READING (cm): 4.083334

HYDRAULIC GRADIENT: 19.59429

VISCOSITY CORRECTION FACTOR: 1.28609

HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 5.595707E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 7.196581E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 3

RUN: T-RW-L-005-A

READING NO: 12

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 22 / 16 / 10

END OF READING : 3 / 25 / 14 / 35

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 3.190001

EFFLUENT LEVEL CHANGE (cm): 3.09

INFLOW (cm³): 256.3485

OUTFLOW (cm³): 248.3124

PERCENT FLOW DIFF (IN & OUT): 3.184729

AVERAGE FLOWRATE (cm³/sec): 9.953862E-04

ELAPSED TIME (sec): 253500

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 1.244077E-05

SAMPLE LENGTH AT START (cm) : 4.083334

SAMPLE LENGTH AT END (cm) : 4.083334

AVG SAMPLE LENGTH OVER READING (cm): 4.083334

HYDRAULIC GRADIENT: 19.59429

VISCOSITY CORRECTION FACTOR: 1.267959

HYDRAULIC CONDUCTIVITY @ 11 ° C= 6.322318E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 8.016441E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 4

RUN: T-RW-L-005-B

READING NO: 1

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 22 / 13 / 16

END OF READING : 1 / 23 / 16 / 55

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 6.26

EFFLUENT LEVEL CHANGE (cm): 6.540001

INFLOW (cm³): 503.0536

OUTFLOW (cm³): 525.5545

PERCENT FLOW DIFF (IN & OUT): 4.375005

AVERAGE FLOWRATE (cm³/sec): 5.166808E-03

ELAPSED TIME (sec): 99540

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 6.508955E-05

SAMPLE LENGTH AT START (cm) : 4.85

SAMPLE LENGTH AT END (cm) : 4.783334

AVG SAMPLE LENGTH OVER READING (cm): 4.816667

HYDRAULIC GRADIENT: 16.48028

VISCOSITY CORRECTION FACTOR: 1.267959

HYDRAULIC CONDUCTIVITY @ 11 ° C= 3.901862E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 4.947403E-06 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 4

RUN: T-RW-L-005-B

READING NO: 2

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 23 / 16 / 55

END OF READING : 1 / 24 / 15 / 30

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 6.100001

EFFLUENT LEVEL CHANGE (cm): 5.419998

INFLOW (cm³): 490.1961

OUTFLOW (cm³): 435.5511

PERCENT FLOW DIFF (IN & OUT): 11.8056

AVERAGE FLOWRATE (cm³/sec): 5.693401E-03

ELAPSED TIME (sec): 81300

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 7.172337E-05

SAMPLE LENGTH AT START (cm) : 4.783334

SAMPLE LENGTH AT END (cm) : 4.516667

AVG SAMPLE LENGTH OVER READING (cm): 4.65

HYDRAULIC GRADIENT: 17.07097

VISCOSITY CORRECTION FACTOR: 1.323589

HYDRAULIC CONDUCTIVITY @ 9.5 ° C= 4.150762E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 5.493903E-06 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 4

RUN: T-RW-L-005-B

READING NO: 3

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 24 / 15 / 30

END OF READING : 1 / 26 / 9 / 5

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 8.950001

EFFLUENT LEVEL CHANGE (cm): 9.34

INFLOW (cm³): 719.2221

OUTFLOW (cm³): 750.5625

PERCENT FLOW DIFF (IN & OUT): 4.264625

AVERAGE FLOWRATE (cm³/sec): .0049091

ELAPSED TIME (sec): 149700

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 6.184303E-05

SAMPLE LENGTH AT START (cm) : 4.516667

SAMPLE LENGTH AT END (cm) : 4.350001

AVG SAMPLE LENGTH OVER READING (cm): 4.433334

HYDRAULIC GRADIENT: 17.90526

VISCOSITY CORRECTION FACTOR: 1.28609

HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 3.412207E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 4.388404E-06 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 4

RUN: T-RW-L-005-B

READING NO: 4

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 26 / 12 / 40

END OF READING : 1 / 28 / 8 / 35

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 5.640001

EFFLUENT LEVEL CHANGE (cm): 4.93

INFLOW (cm³): 453.2305

OUTFLOW (cm³): 396.1748

PERCENT FLOW DIFF (IN & OUT): 13.43427

AVERAGE FLOWRATE (cm³/sec): 2.686291E-03

ELAPSED TIME (sec): 158100

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 3.384091E-05

SAMPLE LENGTH AT START (cm) : 4.350001

SAMPLE LENGTH AT END (cm) : 4.316667

AVG SAMPLE LENGTH OVER READING (cm): 4.333334

HYDRAULIC GRADIENT: 18.31846

VISCOSITY CORRECTION FACTOR: 1.342982

HYDRAULIC CONDUCTIVITY @ 9 ° C= 1.825065E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 2.451029E-06 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 4

RUN: T-RW-L-005-B

READING NO: 5

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 28 / 12 / 30

END OF READING : 2 / 5 / 15 / 20

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 1.09

EFFLUENT LEVEL CHANGE (cm): .3499994

INFLOW (cm³): 87.59241

OUTFLOW (cm³): 28.12595

PERCENT FLOW DIFF (IN & OUT): 102.7779

AVERAGE FLOWRATE (cm³/sec): 8.2491E-05

ELAPSED TIME (sec): 701400

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 1.039191E-06

SAMPLE LENGTH AT START (cm) : 4.316667

SAMPLE LENGTH AT END (cm) : 4.216667

AVG SAMPLE LENGTH OVER READING (cm): 4.266667

HYDRAULIC GRADIENT: 18.60469

VISCOSITY CORRECTION FACTOR: 1.323589

HYDRAULIC CONDUCTIVITY @ 9.5 ° C= 5.518211E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 7.303842E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 4

RUN: T-RW-L-005-B

READING NO: 6

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 5 / 15 / 20

END OF READING : 2 / 10 / 11 / 30

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 3.440003

EFFLUENT LEVEL CHANGE (cm): 4.08

INFLOW (cm³): 276.4386

OUTFLOW (cm³): 327.8688

PERCENT FLOW DIFF (IN & OUT): 17.02121

AVERAGE FLOWRATE (cm³/sec): 7.2251E-04

ELAPSED TIME (sec): 418200

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 9.101914E-06

SAMPLE LENGTH AT START (cm) : 4.216667

SAMPLE LENGTH AT END (cm) : 4.083334

AVG SAMPLE LENGTH OVER READING (cm): 4.15

HYDRAULIC GRADIENT: 19.12771

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 4.701052E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 6.133128E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 4

RUN: T-RW-L-005-B

READING NO: 7

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 10 / 11 / 30

END OF READING : 2 / 25 / 11 / 35

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 15.3

EFFLUENT LEVEL CHANGE (cm): 14.26

INFLOW (cm³): 1229.508

OUTFLOW (cm³): 1145.934

PERCENT FLOW DIFF (IN & OUT): 7.036521

AVERAGE FLOWRATE (cm³/sec): 9.162392E-04

ELAPSED TIME (sec): 1296300

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 1.154244E-05

SAMPLE LENGTH AT START (cm) : 4.083334

SAMPLE LENGTH AT END (cm) : 4.15

AVG SAMPLE LENGTH OVER READING (cm): 4.116667

HYDRAULIC GRADIENT: 19.28259

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 5.913678E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 7.715155E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 4

RUN: T-RW-L-005-B

READING NO: 8

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 25 / 11 / 35

END OF READING : 2 / 28 / 12 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 2.329999

EFFLUENT LEVEL CHANGE (cm): 2.57

INFLOW (cm³): 187.2387

OUTFLOW (cm³): 206.5252

PERCENT FLOW DIFF (IN & OUT): 9.795947

AVERAGE FLOWRATE (cm³/sec): 7.53471E-04

ELAPSED TIME (sec): 261300

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 9.491949E-06

SAMPLE LENGTH AT START (cm) : 4.15

SAMPLE LENGTH AT END (cm) : 4.15

AVG SAMPLE LENGTH OVER READING (cm): 4.15

HYDRAULIC GRADIENT: 19.12771

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 4.902501E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 6.395944E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 4

RUN: T-RW-L-005-B

READING NO: 9

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 28 / 12 / 10

END OF READING : 3 / 7 / 19 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 6.63

EFFLUENT LEVEL CHANGE (cm): 6.09

INFLOW (cm³): 532.7868

OUTFLOW (cm³): 489.3925

PERCENT FLOW DIFF (IN & OUT): 8.490562

AVERAGE FLOWRATE (cm³/sec): 8.112534E-04

ELAPSED TIME (sec): 630000

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 1.021987E-05

SAMPLE LENGTH AT START (cm) : 4.15

SAMPLE LENGTH AT END (cm) : 4.016667

AVG SAMPLE LENGTH OVER READING (cm): 4.083334

HYDRAULIC GRADIENT: 19.44

VISCOSITY CORRECTION FACTOR: 1.28609

HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 5.19367E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 6.679526E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 4

RUN: T-RW-L-005-B

READING NO: 10

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 7 / 19 / 10

END OF READING : 3 / 11 / 10 / 40

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 2.35

EFFLUENT LEVEL CHANGE (cm): 2.669998

INFLOW (cm³): 188.846

OUTFLOW (cm³): 214.5611

PERCENT FLOW DIFF (IN & OUT): 12.74894

AVERAGE FLOWRATE (cm³/sec): 6.403286E-04

ELAPSED TIME (sec): 315000

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 8.066625E-06

SAMPLE LENGTH AT START (cm) : 4.016667

SAMPLE LENGTH AT END (cm) : 4.016667

AVG SAMPLE LENGTH OVER READING (cm): 4.016667

HYDRAULIC GRADIENT: 19.76265

VISCOSITY CORRECTION FACTOR: 1.267959

HYDRAULIC CONDUCTIVITY @ 11 ° C= 4.032476E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 5.113015E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 4

RUN: T-RW-L-005-B

READING NO: 11

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 18 / 15 / 15

END OF READING : 3 / 22 / 16 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 1.46

EFFLUENT LEVEL CHANGE (cm): 1.820002

INFLOW (cm³): 117.3256

OUTFLOW (cm³): 146.2553

PERCENT FLOW DIFF (IN & OUT): 21.9513

AVERAGE FLOWRATE (cm³/sec): 3.777314E-04

ELAPSED TIME (sec): 348900

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 4.758521E-06

SAMPLE LENGTH AT START (cm) : 4.016667

SAMPLE LENGTH AT END (cm) : 4.016667

AVG SAMPLE LENGTH OVER READING (cm): 4.016667

HYDRAULIC GRADIENT: 19.76265

VISCOSITY CORRECTION FACTOR: 1.28609

HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 2.378767E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 3.059308E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 4

RUN: T-RW-L-005-B

READING NO: 12

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 22 / 16 / 10

END OF READING : 3 / 25 / 14 / 35

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .8600001

EFFLUENT LEVEL CHANGE (cm): 5.999947E-02

INFLOW (cm³): 69.10961

OUTFLOW (cm³): 4.821557

PERCENT FLOW DIFF (IN & OUT): 173.9133

AVERAGE FLOWRATE (cm³/sec): 1.458208E-04

ELAPSED TIME (sec): 253500

HYDRAULIC HEAD (cm): 79.38

SYSTEM RESISTANCE (cm²/sec): 1.836997E-06

SAMPLE LENGTH AT START (cm) : 4.016667

SAMPLE LENGTH AT END (cm) : 3.95

AVG SAMPLE LENGTH OVER READING (cm): 3.983334

HYDRAULIC GRADIENT: 19.92803

VISCOSITY CORRECTION FACTOR: 1.267959

HYDRAULIC CONDUCTIVITY @ 11 ° C= 9.106874E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.154715E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 5

RUN: T-RW-L-007-A

READING NO: 1

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 22 / 13 / 16

END OF READING : 1 / 22 / 19 / 15

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 12.37

EFFLUENT LEVEL CHANGE (cm): 13.35

INFLOW (cm³): 994.0531

OUTFLOW (cm³): 1072.806

PERCENT FLOW DIFF (IN & OUT): 7.620531

AVERAGE FLOWRATE (cm³/sec): 4.797723E-02

ELAPSED TIME (sec): 21540

HYDRAULIC HEAD (cm): 78.74

SYSTEM RESISTANCE (cm²/sec): 6.09312E-04

SAMPLE LENGTH AT START (cm) : 5.983334

SAMPLE LENGTH AT END (cm) : 6.016667

AVG SAMPLE LENGTH OVER READING (cm): 6

HYDRAULIC GRADIENT: 13.12333

VISCOSITY CORRECTION FACTOR: 1.1993

HYDRAULIC CONDUCTIVITY @ 13 ° C= 4.549934E-05 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 5.456735E-05 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 5

RUN: T-RW-L-007-A

READING NO: 2

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 23 / 8 / 35

END OF READING : 1 / 23 / 16 / 55

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 14.67

EFFLUENT LEVEL CHANGE (cm): 14.74

INFLOW (cm³): 1178.881

OUTFLOW (cm³): 1184.507

PERCENT FLOW DIFF (IN & OUT): .476053

AVERAGE FLOWRATE (cm³/sec): .0393898

ELAPSED TIME (sec): 30000

HYDRAULIC HEAD (cm): 78.74

SYSTEM RESISTANCE (cm²/sec): 5.002514E-04

SAMPLE LENGTH AT START (cm) : 6.016667

SAMPLE LENGTH AT END (cm) : 6.05

AVG SAMPLE LENGTH OVER READING (cm): 6.033333

HYDRAULIC GRADIENT: 13.05083

VISCOSITY CORRECTION FACTOR: 1.342982

HYDRAULIC CONDUCTIVITY @ 9 ° C= 3.756295E-05 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 5.044637E-05 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 5

RUN: T-RW-L-007-A

READING NO: 3

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 25 / 17 / 42

END OF READING : 1 / 26 / 9 / 5

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 37.33

EFFLUENT LEVEL CHANGE (cm): 38.57

INFLOW (cm³): 2999.839

OUTFLOW (cm³): 3099.485

PERCENT FLOW DIFF (IN & OUT): 3.267452

AVERAGE FLOWRATE (cm³/sec): 5.506794E-02

ELAPSED TIME (sec): 55380

HYDRAULIC HEAD (cm): 78.74

SYSTEM RESISTANCE (cm²/sec): 6.993642E-04

SAMPLE LENGTH AT START (cm) : 6.05

SAMPLE LENGTH AT END (cm) : 6.05

AVG SAMPLE LENGTH OVER READING (cm): 6.05

HYDRAULIC GRADIENT: 13.01488

VISCOSITY CORRECTION FACTOR: 1.342982

HYDRAULIC CONDUCTIVITY @ 9 ° C= 5.265904E-05 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 7.072014E-05 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 5

RUN: T-RW-L-007-A

READING NO: 4

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 26 / 12 / 40

END OF READING : 1 / 28 / 8 / 35

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 3.84

EFFLUENT LEVEL CHANGE (cm): 3.9

INFLOW (cm³): 308.5824

OUTFLOW (cm³): 313.404

PERCENT FLOW DIFF (IN & OUT): 1.550386

AVERAGE FLOWRATE (cm³/sec): 1.967066E-03

ELAPSED TIME (sec): 158100

HYDRAULIC HEAD (cm): 78.74

SYSTEM RESISTANCE (cm²/sec): 2.49818E-05

SAMPLE LENGTH AT START (cm) : 6.05

SAMPLE LENGTH AT END (cm) : 5.85

AVG SAMPLE LENGTH OVER READING (cm): 5.95

HYDRAULIC GRADIENT: 13.23361

VISCOSITY CORRECTION FACTOR: 1.342982

HYDRAULIC CONDUCTIVITY @ 9 ° C= 1.849928E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 2.48442E-06 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 5

RUN: T-RW-L-007-A

READING NO: 5

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 28 / 12 / 30

END OF READING : 2 / 4 / 10 / 40

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 34.58

EFFLUENT LEVEL CHANGE (cm): 40.13

INFLOW (cm³): 2778.849

OUTFLOW (cm³): 3224.847

PERCENT FLOW DIFF (IN & OUT): 14.85744

AVERAGE FLOWRATE (cm³/sec): 5.018134E-03

ELAPSED TIME (sec): 598200

HYDRAULIC HEAD (cm): 78.74

SYSTEM RESISTANCE (cm²/sec): 6.373043E-05

SAMPLE LENGTH AT START (cm) : 5.85

SAMPLE LENGTH AT END (cm) : 5.65

AVG SAMPLE LENGTH OVER READING (cm): 5.75

HYDRAULIC GRADIENT: 13.69391

VISCOSITY CORRECTION FACTOR: 1.323589

HYDRAULIC CONDUCTIVITY @ 9.5 ° C= 4.560671E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 6.036454E-06 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 5

RUN: T-RW-L-007-A

READING NO: 6

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 5 / 15 / 20

END OF READING : 2 / 10 / 11 / 30

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .8800011

EFFLUENT LEVEL CHANGE (cm): .6999998

INFLOW (cm³): 70.71689

OUTFLOW (cm³): 56.25199

PERCENT FLOW DIFF (IN & OUT): 22.78496

AVERAGE FLOWRATE (cm³/sec): 1.51804E-04

ELAPSED TIME (sec): 418200

HYDRAULIC HEAD (cm): 78.74

SYSTEM RESISTANCE (cm²/sec): 1.927915E-06

SAMPLE LENGTH AT START (cm) : 5.65

SAMPLE LENGTH AT END (cm) : 5.383333

AVG SAMPLE LENGTH OVER READING (cm): 5.516667

HYDRAULIC GRADIENT: 14.27311

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 1.323667E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.726894E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 5

RUN: T-RW-L-007-A

READING NO: 7

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 10 / 11 / 30

END OF READING : 2 / 25 / 11 / 35

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 1.139999

EFFLUENT LEVEL CHANGE (cm): 1.87

INFLOW (cm³): 91.61035

OUTFLOW (cm³): 150.2732

PERCENT FLOW DIFF (IN & OUT): 48.50503

AVERAGE FLOWRATE (cm³/sec): 9.329767E-05

ELAPSED TIME (sec): 1296300

HYDRAULIC HEAD (cm): 78.74

SYSTEM RESISTANCE (cm²/sec): 1.184883E-06

SAMPLE LENGTH AT START (cm) : 5.383333

SAMPLE LENGTH AT END (cm) : 5.550001

AVG SAMPLE LENGTH OVER READING (cm): 5.466667

HYDRAULIC GRADIENT: 14.40366

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 8.061432E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.051718E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 5

RUN: T-RW-L-007-A

READING NO: 8

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 25 / 11 / 35

END OF READING : 2 / 28 / 12 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 0

EFFLUENT LEVEL CHANGE (cm): 0

INFLOW (cm³): 0

OUTFLOW (cm³): 0

PERCENT FLOW DIFF (IN & OUT): 1.701412E+38

AVERAGE FLOWRATE (cm³/sec): 0

ELAPSED TIME (sec): 261300

HYDRAULIC HEAD (cm): 78.74

SYSTEM RESISTANCE (cm²/sec): 0

SAMPLE LENGTH AT START (cm) : 5.550001

SAMPLE LENGTH AT END (cm) : 5.550001

AVG SAMPLE LENGTH OVER READING (cm): 5.550001

HYDRAULIC GRADIENT: 14.18739

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 0 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 0 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 5

RUN: T-RW-L-007-A

READING NO: 9

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 28 / 12 / 10

END OF READING : 3 / 7 / 19 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .2399979

EFFLUENT LEVEL CHANGE (cm): 0

INFLOW (cm³): 19.28623

OUTFLOW (cm³): 0

PERCENT FLOW DIFF (IN & OUT): 200

AVERAGE FLOWRATE (cm³/sec): 1.530653E-05

ELAPSED TIME (sec): 630000

HYDRAULIC HEAD (cm): 78.74

SYSTEM RESISTANCE (cm²/sec): 1.943933E-07

SAMPLE LENGTH AT START (cm) : 5.550001

SAMPLE LENGTH AT END (cm) : 5.550001

AVG SAMPLE LENGTH OVER READING (cm): 5.550001

HYDRAULIC GRADIENT: 14.18739

VISCOSITY CORRECTION FACTOR: 1.323589

HYDRAULIC CONDUCTIVITY @ 9.5 ° C= 1.342729E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.777222E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 5

RUN: T-RW-L-007-A

READING NO: 10

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 7 / 19 / 10

END OF READING : 3 / 11 / 10 / 40

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .5800018

EFFLUENT LEVEL CHANGE (cm): .3600006

INFLOW (cm³): 46.60895

OUTFLOW (cm³): 28.92965

PERCENT FLOW DIFF (IN & OUT): 46.80865

AVERAGE FLOWRATE (cm³/sec): 1.199025E-04

ELAPSED TIME (sec): 315000

HYDRAULIC HEAD (cm): 78.74

SYSTEM RESISTANCE (cm²/sec): 1.522765E-06

SAMPLE LENGTH AT START (cm) : 5.550001

SAMPLE LENGTH AT END (cm) : 5.550001

AVG SAMPLE LENGTH OVER READING (cm): 5.550001

HYDRAULIC GRADIENT: 14.18739

VISCOSITY CORRECTION FACTOR: 1.267959

HYDRAULIC CONDUCTIVITY @ 11 ° C= 1.051817E-07 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.333661E-07 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 5

RUN: T-RW-L-007-A

READING NO: 11

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 11 / 10 / 40

END OF READING : 3 / 18 / 15 / 15

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 0

EFFLUENT LEVEL CHANGE (cm): 0

INFLOW (cm³): 0

OUTFLOW (cm³): 0

PERCENT FLOW DIFF (IN & OUT): 1.701412E+38

AVERAGE FLOWRATE (cm³/sec): 0

ELAPSED TIME (sec): 621300

HYDRAULIC HEAD (cm): 78.74

SYSTEM RESISTANCE (cm²/sec): 0

SAMPLE LENGTH AT START (cm) : 5.550001

SAMPLE LENGTH AT END (cm) : 5.516667

AVG SAMPLE LENGTH OVER READING (cm): 5.533334

HYDRAULIC GRADIENT: 14.23012

VISCOSITY CORRECTION FACTOR: 1.28609

HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 0 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 0 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 5

RUN: T-RW-L-007-A

READING NO: 12

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 18 / 15 / 15

END OF READING : 3 / 22 / 16 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 18.69

EFFLUENT LEVEL CHANGE (cm): 18.65

INFLOW (cm³): 1501.928

OUTFLOW (cm³): 1498.714

PERCENT FLOW DIFF (IN & OUT): .2142363

AVERAGE FLOWRATE (cm³/sec): 4.300147E-03

ELAPSED TIME (sec): 348900

HYDRAULIC HEAD (cm): 78.74

SYSTEM RESISTANCE (cm²/sec): 5.461198E-05

SAMPLE LENGTH AT START (cm) : 5.516667

SAMPLE LENGTH AT END (cm) : 5.516667

AVG SAMPLE LENGTH OVER READING (cm): 5.516667

HYDRAULIC GRADIENT: 14.27311

VISCOSITY CORRECTION FACTOR: 1.28609

HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 3.749547E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 4.822253E-06 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 5

RUN: T-RW-L-007-A

READING NO: 13

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 22 / 16 / 10
END OF READING : 3 / 25 / 14 / 35

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	53		AREA (cm ²):	80.36
EFFLUENT STANDPIPE NO:	53		AREA (cm ²):	80.36

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): 10.84
EFFLUENT LEVEL CHANGE (cm): 10.66
INFLOW (cm³): 871.1024
OUTFLOW (cm³): 856.6376
PERCENT FLOW DIFF (IN & OUT): 1.674424
AVERAGE FLOWRATE (cm³/sec): 3.407771E-03

ELAPSED TIME (sec): 253500

HYDRAULIC HEAD (cm): 78.74
SYSTEM RESISTANCE (cm²/sec): 4.327878E-05

SAMPLE LENGTH AT START (cm)	:	5.516667
SAMPLE LENGTH AT END (cm)	:	5.45
AVG SAMPLE LENGTH OVER READING (cm):		5.483333

HYDRAULIC GRADIENT: 14.35988
VISCOSITY CORRECTION FACTOR: 1.267959
HYDRAULIC CONDUCTIVITY @ 11 ° C= 2.953478E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 3.74489E-06 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 6

RUN: T-RW-L-007-B

READING NO: 1

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 22 / 13 / 16

END OF READING : 1 / 22 / 19 / 15

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 9.219999

EFFLUENT LEVEL CHANGE (cm): 9.84

INFLOW (cm³): 740.9191

OUTFLOW (cm³): 790.7425

PERCENT FLOW DIFF (IN & OUT): 6.505785

AVERAGE FLOWRATE (cm³/sec): 3.555389E-02

ELAPSED TIME (sec): 21540

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 4.443681E-04

SAMPLE LENGTH AT START (cm) : 4.783334

SAMPLE LENGTH AT END (cm) : 4.783334

AVG SAMPLE LENGTH OVER READING (cm): 4.783334

HYDRAULIC GRADIENT: 16.72683

VISCOSITY CORRECTION FACTOR: 1.1993

HYDRAULIC CONDUCTIVITY @ 13 ° C= 2.645378E-05 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 3.1726E-05 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 6

RUN: T-RW-L-007-B

READING NO: 2

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 23 / 8 / 35

END OF READING : 1 / 23 / 16 / 55

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 12.45

EFFLUENT LEVEL CHANGE (cm): 12.88

INFLOW (cm³): 1000.482

OUTFLOW (cm³): 1035.037

PERCENT FLOW DIFF (IN & OUT): 3.395184

AVERAGE FLOWRATE (cm³/sec): 3.392531E-02

ELAPSED TIME (sec): 30000

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 4.240134E-04

SAMPLE LENGTH AT START (cm) : 4.783334

SAMPLE LENGTH AT END (cm) : 4.75

AVG SAMPLE LENGTH OVER READING (cm): 4.766667

HYDRAULIC GRADIENT: 16.78532

VISCOSITY CORRECTION FACTOR: 1.342982

HYDRAULIC CONDUCTIVITY @ 9 ° C= 2.515408E-05 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 3.378148E-05 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 6

RUN: T-RW-L-007-B

READING NO: 3

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 25 / 17 / 42

END OF READING : 1 / 26 / 9 / 5

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 28.64

EFFLUENT LEVEL CHANGE (cm): 30.99

INFLOW (cm³): 2301.51

OUTFLOW (cm³): 2490.357

PERCENT FLOW DIFF (IN & OUT): 7.881947

AVERAGE FLOWRATE (cm³/sec): 4.326352E-02

ELAPSED TIME (sec): 55380

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 5.407263E-04

SAMPLE LENGTH AT START (cm) : 4.75

SAMPLE LENGTH AT END (cm) : 4.716667

AVG SAMPLE LENGTH OVER READING (cm): 4.733334

HYDRAULIC GRADIENT: 16.90352

VISCOSITY CORRECTION FACTOR: 1.323589

HYDRAULIC CONDUCTIVITY @ 9.5 ° C= 3.185362E-05 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 4.216109E-05 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 6

RUN: T-RW-L-007-B

READING NO: 4

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 26 / 12 / 20

END OF READING : 1 / 28 / 12 / 30

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 27.98

EFFLUENT LEVEL CHANGE (cm): 23.57

INFLOW (cm³): 2248.473

OUTFLOW (cm³): 1894.085

PERCENT FLOW DIFF (IN & OUT): 17.1096

AVERAGE FLOWRATE (cm³/sec): 1.194509E-02

ELAPSED TIME (sec): 173400

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 1.49295E-04

SAMPLE LENGTH AT START (cm) : 4.716667

SAMPLE LENGTH AT END (cm) : 4.716667

AVG SAMPLE LENGTH OVER READING (cm): 4.716667

HYDRAULIC GRADIENT: 16.96325

VISCOSITY CORRECTION FACTOR: 1.342982

HYDRAULIC CONDUCTIVITY @ 9 ° C= 8.763841E-06 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.176968E-05 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 6

RUN: T-RW-L-007-B

READING NO: 5

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 5 / 15 / 20

END OF READING : 2 / 6 / 15 / 30

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 28.73

EFFLUENT LEVEL CHANGE (cm): 28.81

INFLOW (cm³): 2308.743

OUTFLOW (cm³): 2315.172

PERCENT FLOW DIFF (IN & OUT): .2780742

AVERAGE FLOWRATE (cm³/sec): 2.657422E-02

ELAPSED TIME (sec): 87000

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 3.321362E-04

SAMPLE LENGTH AT START (cm) : 4.716667

SAMPLE LENGTH AT END (cm) : 4.516667

AVG SAMPLE LENGTH OVER READING (cm): 4.616667

HYDRAULIC GRADIENT: 17.33069

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 1.908354E-05 cm/sec

HYDRAULIC CONDUCTIVITY @ 20 ° C= 2.489693E-05 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 6

RUN: T-RW-L-007-B

READING NO: 6

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 10 / 11 / 30

END OF READING : 2 / 12 / 8 / 30

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 30.99

EFFLUENT LEVEL CHANGE (cm): 30.77

INFLOW (cm³): 2490.357

OUTFLOW (cm³): 2472.677

PERCENT FLOW DIFF (IN & OUT): .7124451

AVERAGE FLOWRATE (cm³/sec): .015318

ELAPSED TIME (sec): 162000

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 1.914511E-04

SAMPLE LENGTH AT START (cm) : 4.516667

SAMPLE LENGTH AT END (cm) : 4.450001

AVG SAMPLE LENGTH OVER READING (cm): 4.483334

HYDRAULIC GRADIENT: 17.8461

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 1.06825E-05 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.39367E-05 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: FLY ASH/SLUDGE 6

RUN: T-RW-L-007-B

READING NO: 7

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 12 / 9 / 15

END OF READING : 2 / 14 / 9 / 50

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

EFFLUENT STANDPIPE NO: 53 AREA (cm²): 80.36

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 33.74

EFFLUENT LEVEL CHANGE (cm): 33.6

INFLOW (cm³): 2711.347

OUTFLOW (cm³): 2700.096

PERCENT FLOW DIFF (IN & OUT): .4158037

AVERAGE FLOWRATE (cm³/sec): .0154701

ELAPSED TIME (sec): 174900

HYDRAULIC HEAD (cm): 80.01

SYSTEM RESISTANCE (cm²/sec): 1.933521E-04

SAMPLE LENGTH AT START (cm) : 4.450001

SAMPLE LENGTH AT END (cm) : 4.450001

AVG SAMPLE LENGTH OVER READING (cm): 4.450001

HYDRAULIC GRADIENT: 17.97978

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 1.070836E-05 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.397044E-05 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: SLUDGE 7
RUN: T-RW-L-001-A

READING NO: 1

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 22 / 13 / 16
END OF READING : 1 / 23 / 16 / 55

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	8	AREA (cm ²):	11.4	
EFFLUENT STANDPIPE NO:	8	AREA (cm ²):	11.4	

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): .8500004
EFFLUENT LEVEL CHANGE (cm): 0
INFLOW (cm³): 9.690004
OUTFLOW (cm³): 0
PERCENT FLOW DIFF (IN & OUT): 200
AVERAGE FLOWRATE (cm³/sec): 4.867393E-05

ELAPSED TIME (sec): 99540

HYDRAULIC HEAD (cm): 79.06
SYSTEM RESISTANCE (cm²/sec): 6.156581E-07

SAMPLE LENGTH AT START (cm)	:	3.916667
SAMPLE LENGTH AT END (cm)	:	3.783334
AVG SAMPLE LENGTH OVER READING (cm):		3.85

HYDRAULIC GRADIENT: 20.53506
VISCOSITY CORRECTION FACTOR: 1.267959
HYDRAULIC CONDUCTIVITY @ 11 ° C= 2.949948E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 3.740414E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: SLUDGE 7

RUN: T-RW-L-001-A

READING NO: 2

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 23 / 16 / 55

END OF READING : 1 / 24 / 15 / 30

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 8 AREA (cm²): 11.4

EFFLUENT STANDPIPE NO: 8 AREA (cm²): 11.4

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 1.040001

EFFLUENT LEVEL CHANGE (cm): .7700005

INFLOW (cm³): 11.85601

OUTFLOW (cm³): 8.778004

PERCENT FLOW DIFF (IN & OUT): 29.83429

AVERAGE FLOWRATE (cm³/sec): 1.269005E-04

ELAPSED TIME (sec): 81300

HYDRAULIC HEAD (cm): 79.06

SYSTEM RESISTANCE (cm²/sec): 1.605116E-06

SAMPLE LENGTH AT START (cm) : 3.783334

SAMPLE LENGTH AT END (cm) : 3.416667

AVG SAMPLE LENGTH OVER READING (cm): 3.6

HYDRAULIC GRADIENT: 21.96111

VISCOSITY CORRECTION FACTOR: 1.323589

HYDRAULIC CONDUCTIVITY @ 9.5 ° C= 7.191559E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 9.518666E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: SLUDGE 7
RUN: T-RW-L-001-A

READING NO: 3

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 24 / 15 / 30
END OF READING : 1 / 26 / 12 / 40

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	8	AREA (cm ²):	11.4	
EFFLUENT STANDPIPE NO:	8	AREA (cm ²):	11.4	

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): 1.4
EFFLUENT LEVEL CHANGE (cm): 1.179999
INFLOW (cm³): 15.96
OUTFLOW (cm³): 13.45199
PERCENT FLOW DIFF (IN & OUT): 17.05429
AVERAGE FLOWRATE (cm³/sec): 9.044276E-05

ELAPSED TIME (sec): 162600

HYDRAULIC HEAD (cm): 79.06
SYSTEM RESISTANCE (cm²/sec): 1.143976E-06

SAMPLE LENGTH AT START (cm)	:	3.416667
SAMPLE LENGTH AT END (cm)	:	3.283334
AVG SAMPLE LENGTH OVER READING (cm):		3.35

HYDRAULIC GRADIENT: 23.6
VISCOSITY CORRECTION FACTOR: 1.28609
HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 4.769535E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 6.13405E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: SLUDGE 7
RUN: T-RW-L-001-A

READING NO: 4

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 26 / 12 / 40
END OF READING : 1 / 28 / 8 / 35

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	8		AREA (cm ²):	11.4
EFFLUENT STANDPIPE NO:	8		AREA (cm ²):	11.4

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): .7800007
EFFLUENT LEVEL CHANGE (cm): .54
INFLOW (cm³): 8.892008
OUTFLOW (cm³): 6.155999
PERCENT FLOW DIFF (IN & OUT): 36.36374
AVERAGE FLOWRATE (cm³/sec): 4.759016E-05

ELAPSED TIME (sec): 158100

HYDRAULIC HEAD (cm): 79.06
SYSTEM RESISTANCE (cm²/sec): 6.019499E-07

SAMPLE LENGTH AT START (cm)	:	3.283334
SAMPLE LENGTH AT END (cm)	:	3.15
AVG SAMPLE LENGTH OVER READING (cm):		3.216667

HYDRAULIC GRADIENT: 24.57824
VISCOSITY CORRECTION FACTOR: 1.342982
HYDRAULIC CONDUCTIVITY @ 9 ° C= 2.409797E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 3.236315E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: SLUDGE 7

RUN: T-RW-L-001-A

READING NO: 5

START OF READING (MONTH/DAY/HOUR/MINUTE): 1 / 28 / 8 / 35

END OF READING : 2 / 5 / 15 / 20

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 8 AREA (cm²): 11.4

EFFLUENT STANDPIPE NO: 8 AREA (cm²): 11.4

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 2.630001

EFFLUENT LEVEL CHANGE (cm): .1900005

INFLOW (cm³): 29.98201

OUTFLOW (cm³): 2.166006

PERCENT FLOW DIFF (IN & OUT): 173.0496

AVERAGE FLOWRATE (cm³/sec): 2.246542E-05

ELAPSED TIME (sec): 715500

HYDRAULIC HEAD (cm): 79.06

SYSTEM RESISTANCE (cm²/sec): 2.841566E-07

SAMPLE LENGTH AT START (cm) : 3.15

SAMPLE LENGTH AT END (cm) : 2.95

AVG SAMPLE LENGTH OVER READING (cm): 3.05

HYDRAULIC GRADIENT: 25.92131

VISCOSITY CORRECTION FACTOR: 1.323589

HYDRAULIC CONDUCTIVITY @ 9.5 ° C= 1.078628E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.42766E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: SLUDGE 7
RUN: T-RW-L-001-A

READING NO: 6

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 5 / 15 / 20
END OF READING : 2 / 10 / 11 / 30

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	8	AREA (cm ²):	11.4	
EFFLUENT STANDPIPE NO:	8	AREA (cm ²):	11.4	

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): .8199997
EFFLUENT LEVEL CHANGE (cm): .3800001
INFLOW (cm³): 9.347996
OUTFLOW (cm³): 4.332001
PERCENT FLOW DIFF (IN & OUT): 73.33328
AVERAGE FLOWRATE (cm³/sec): 1.635581E-05

ELAPSED TIME (sec): 418200

HYDRAULIC HEAD (cm): 79.06
SYSTEM RESISTANCE (cm²/sec): 2.068784E-07

SAMPLE LENGTH AT START (cm) : 2.95
SAMPLE LENGTH AT END (cm) : 3.083333
AVG SAMPLE LENGTH OVER READING (cm): 3.016667

HYDRAULIC GRADIENT: 26.20774
VISCOSITY CORRECTION FACTOR: 1.304629
HYDRAULIC CONDUCTIVITY @ 10 ° C= 7.767059E-09 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.013313E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: SLUDGE 7

RUN: T-RW-L-001-A

READING NO: 7

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 10 / 11 / 30

END OF READING : 2 / 25 / 11 / 35

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 8 AREA (cm²): 11.4

EFFLUENT STANDPIPE NO: 8 AREA (cm²): 11.4

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 2.440001

EFFLUENT LEVEL CHANGE (cm): 2.39

INFLOW (cm³): 27.81601

OUTFLOW (cm³): 27.24599

PERCENT FLOW DIFF (IN & OUT): 2.070441

AVERAGE FLOWRATE (cm³/sec): 2.123814E-05

ELAPSED TIME (sec): 1296300

HYDRAULIC HEAD (cm): 79.06

SYSTEM RESISTANCE (cm²/sec): 2.686332E-07

SAMPLE LENGTH AT START (cm) : 3.083333

SAMPLE LENGTH AT END (cm) : 3.016667

AVG SAMPLE LENGTH OVER READING (cm): 3.05

HYDRAULIC GRADIENT: 25.92131

VISCOSITY CORRECTION FACTOR: 1.304629

HYDRAULIC CONDUCTIVITY @ 10 ° C= 1.019703E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.330334E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: SLUDGE 7
RUN: T-RW-L-001-A

READING NO: 8

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 25 / 11 / 35
END OF READING : 2 / 28 / 12 / 10

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	8	AREA (cm ²):	11.4	
EFFLUENT STANDPIPE NO:	8	AREA (cm ²):	11.4	

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): .9799996
EFFLUENT LEVEL CHANGE (cm): .6800003
INFLOW (cm³): 11.17199
OUTFLOW (cm³): 7.752003
PERCENT FLOW DIFF (IN & OUT): 36.14449
AVERAGE FLOWRATE (cm³/sec): 3.621125E-05

ELAPSED TIME (sec): 261300

HYDRAULIC HEAD (cm): 79.06
SYSTEM RESISTANCE (cm²/sec): 4.580224E-07

SAMPLE LENGTH AT START (cm)	:	3.016667
SAMPLE LENGTH AT END (cm)	:	3.016667
AVG SAMPLE LENGTH OVER READING (cm):		3.016667

HYDRAULIC GRADIENT: 26.20774
VISCOSITY CORRECTION FACTOR: 1.304629
HYDRAULIC CONDUCTIVITY @ 10 ° C= 1.719603E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 2.243443E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: SLUDGE 7

RUN: T-RW-L-001-A

READING NO: 9

START OF READING (MONTH/DAY/HOUR/MINUTE): 2 / 28 / 12 / 10

END OF READING : 3 / 7 / 19 / 10

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 8 AREA (cm²): 11.4

EFFLUENT STANDPIPE NO: 8 AREA (cm²): 11.4

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 1.81

EFFLUENT LEVEL CHANGE (cm): 1.639999

INFLOW (cm³): 20.63399

OUTFLOW (cm³): 18.69599

PERCENT FLOW DIFF (IN & OUT): 9.855084

AVERAGE FLOWRATE (cm³/sec): 3.121428E-05

ELAPSED TIME (sec): 630000

HYDRAULIC HEAD (cm): 79.06

SYSTEM RESISTANCE (cm²/sec): 3.948176E-07

SAMPLE LENGTH AT START (cm) : 3.016667

SAMPLE LENGTH AT END (cm) : 2.983333

AVG SAMPLE LENGTH OVER READING (cm): 3

HYDRAULIC GRADIENT: 26.35333

VISCOSITY CORRECTION FACTOR: 1.28609

HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 1.474117E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.895846E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: SLUDGE 7

RUN: T-RW-L-001-A

READING NO: 10

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 7 / 19 / 10

END OF READING : 3 / 11 / 10 / 40

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 8 AREA (cm²): 11.4

EFFLUENT STANDPIPE NO: 8 AREA (cm²): 11.4

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): .6499996

EFFLUENT LEVEL CHANGE (cm): 1.060001

INFLOW (cm³): 7.409996

OUTFLOW (cm³): 12.08402

PERCENT FLOW DIFF (IN & OUT): 47.95339

AVERAGE FLOWRATE (cm³/sec): 3.094288E-05

ELAPSED TIME (sec): 315000

HYDRAULIC HEAD (cm): 79.06

SYSTEM RESISTANCE (cm²/sec): 3.913847E-07

SAMPLE LENGTH AT START (cm) : 2.983333

SAMPLE LENGTH AT END (cm) : 2.983333

AVG SAMPLE LENGTH OVER READING (cm): 2.983333

HYDRAULIC GRADIENT: 26.50056

VISCOSITY CORRECTION FACTOR: 1.267959

HYDRAULIC CONDUCTIVITY @ 11 ° C= 1.453181E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.842575E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: SLUDGE 7

RUN: T-RW-L-001-A

READING NO: 11

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 11 / 10 / 40

END OF READING : 3 / 18 / 15 / 15

SAMPLE CHAMBER NO : 8 AREA (cm²): 80.35

INFLUENT STANDPIPE NO: 8 AREA (cm²): 11.4

EFFLUENT STANDPIPE NO: 8 AREA (cm²): 11.4

BACK PRESSURE (psi): 60

INFLUENT LEVEL CHANGE (cm): 2.51

EFFLUENT LEVEL CHANGE (cm): 2.189999

INFLOW (cm³): 28.614

OUTFLOW (cm³): 24.96599

PERCENT FLOW DIFF (IN & OUT): 13.61709

AVERAGE FLOWRATE (cm³/sec): 4.311926E-05

ELAPSED TIME (sec): 621300

HYDRAULIC HEAD (cm): 79.06

SYSTEM RESISTANCE (cm²/sec): 5.453992E-07

SAMPLE LENGTH AT START (cm) : 2.983333

SAMPLE LENGTH AT END (cm) : 2.883333

AVG SAMPLE LENGTH OVER READING (cm): 2.933334

HYDRAULIC GRADIENT: 26.95227

VISCOSITY CORRECTION FACTOR: 1.28609

HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 1.991086E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 2.560716E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: SLUDGE 7
RUN: T-RW-L-001-A

READING NO: 12

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 18 / 15 / 15
END OF READING : 3 / 22 / 16 / 10

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	8		AREA (cm ²):	11.4
EFFLUENT STANDPIPE NO:	8		AREA (cm ²):	11.4

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): 1.290001
EFFLUENT LEVEL CHANGE (cm): 1
INFLOW (cm³): 14.70601
OUTFLOW (cm³): 11.4
PERCENT FLOW DIFF (IN & OUT): 25.32758
AVERAGE FLOWRATE (cm³/sec): 3.741188E-05

ELAPSED TIME (sec): 348900

HYDRAULIC HEAD (cm): 79.06
SYSTEM RESISTANCE (cm²/sec): 4.732087E-07

SAMPLE LENGTH AT START (cm)	:	2.883333
SAMPLE LENGTH AT END (cm)	:	2.883333
AVG SAMPLE LENGTH OVER READING (cm):		2.883333

HYDRAULIC GRADIENT: 27.41965
VISCOSITY CORRECTION FACTOR: 1.28609
HYDRAULIC CONDUCTIVITY @ 10.5 ° C= 1.698094E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 2.183901E-08 cm/sec

FIXED-WALL PERMEABILITY RESULT

SAMPLE: SLUDGE 7

RUN: T-RW-L-001-A

READING NO: 13

START OF READING (MONTH/DAY/HOUR/MINUTE): 3 / 22 / 16 / 10
END OF READING : 3 / 25 / 14 / 35

SAMPLE CHAMBER NO	:	8	AREA (cm ²):	80.35
INFLUENT STANDPIPE NO:	8	AREA (cm ²):	11.4	
EFFLUENT STANDPIPE NO:	8	AREA (cm ²):	11.4	

BACK PRESSURE (psi): 60
INFLUENT LEVEL CHANGE (cm): .83
EFFLUENT LEVEL CHANGE (cm): .7200013
INFLOW (cm³): 9.461999
OUTFLOW (cm³): 8.208014
PERCENT FLOW DIFF (IN & OUT): 14.19337
AVERAGE FLOWRATE (cm³/sec): 3.48521E-05

ELAPSED TIME (sec): 253500

HYDRAULIC HEAD (cm): 79.06
SYSTEM RESISTANCE (cm²/sec): 4.40831E-07

SAMPLE LENGTH AT START (cm) : 2.883333
SAMPLE LENGTH AT END (cm) : 2.85
AVG SAMPLE LENGTH OVER READING (cm): 2.866667

HYDRAULIC GRADIENT: 27.57907
VISCOSITY CORRECTION FACTOR: 1.267959
HYDRAULIC CONDUCTIVITY @ 11 ° C= 1.572764E-08 cm/sec

HYDRAULIC CONDUCTIVITY @ 20° C= 1.9942E-08 cm/sec