

Hydrostratigraphic Database of West-Central Wisconsin



Site:	Wilkins Towing
Location:	River Falls, Pierce County, Wisconsin
Unit Evaluated:	Ordovician Prairie du Chien

File includes excerpts from:

Cedar Corporation, 1993, Proposed Groundwater and Soil Remediation at the Former Wilkins Towing, River Falls, Wisconsin, on file at Wisconsin Department of Natural Resources.

- Text: introduction
- Figures: site plan, cross-sections, potentiometric surface maps
- Table: water-level data
- Slug test summary and data analyses

Proposed Groundwater
and Soil Remediation
at the
Former Wilkens Towing
River Falls, WI
WDOT Project #0637-06-01

February, 1993

Prepared By:

Cedar Corporation
604 Wilson Avenue
Menomonie, WI 54751

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I. INTRODUCTION

A. General:

Cedar Corporation of Menomonie, Wisconsin has completed an environmental investigation at the Former Wilkens Towing site in River Falls, Wisconsin. During the initial investigation in February, 1991, soil sampling and analyses defined the presence of petroleum contamination. Subsequently, three additional water table observation wells were installed to better determine the degree and extent of soil and groundwater contamination. The results of these investigations have defined the groundwater parameters and have delineated a dissolved phase gasoline contaminant plume. A small area of floating free product has also been identified at the site at monitoring Well #2.

This report and accompanying plans comprise the latest investigative results, as well as a proposal for remedial action.

B. Objectives:

Definite goals or objectives in a remediation project are necessary for design considerations. However, due to the limited amount of data available in subsurface investigations, the objectives must be typically very broad and open mindedness is a prerequisite. The main objectives are:

- 1) groundwater management to prevent further downgradient migration of the contaminant plume;
- 2) begin recovering the floating free product; and
- 3) reduce the soil and groundwater contaminant levels to a limit acceptable to the DNR for groundwater. These levels may reflect the Preventive Action Limits described in Wisconsin Administrative Code NR 140.10.

II. ADDITIONAL INVESTIGATIONS

A. Procedures:

Previously, five soil borings were completed on the site. Four of these borings, MW-1 through MW-4, were completed as water table observation wells. The report entitled "A Report on An Environmental Investigation at Jerry Wilkens, Inc., River Falls, Wisconsin, December, 1991" details the previous investigations.

On October 27, 1992, Cedar Corporation conducted additional subsurface investigations to better determine the extent of petroleum contamination.

The investigation using the split spoon sampling method was completed by Wisconsin Test Drilling. This method was chosen to determine the following:

- * the local lithology
- * the extent of contamination
- * physical and chemical groundwater and soil characteristics

Three (3) additional boreholes were placed adjacent to the property. All three (3) were completed as water table observation wells (See Figure 1). A record of the encountered geology is presented on Driller's Logs in Appendix A. In addition the following two cross sections, A-A¹ and B-B¹, are presented to document the geologic variations at this site. A detailed review of regional geology can be found in the previous report.

During borings samples were recovered at various depths as directed by the environmental specialist on location. These samples were logged, field screened, and sampled as discussed in Appendix B. Where desired, two soil samples (one for field screening and one for laboratory analysis) were collected and sealed in glass jars having teflon lined septums.

Samples for laboratory analysis were transported in a preserved state (cooled at 4° celsius) to a laboratory with a completed chain-of-custody document for detailed analysis (see Appendix B for field protocols).

The following analyses and methods were completed by NET Midwest, Rockford, IL, Wisconsin DNR Certified Laboratory, #999447240 and CBC Environmental Laboratories, Oak Creek, Wisconsin, Wisconsin DNR Certified Laboratory, #241283020.

SOILS:

Gasoline Range Organics
Volatile Organic Compounds (PVOC's)

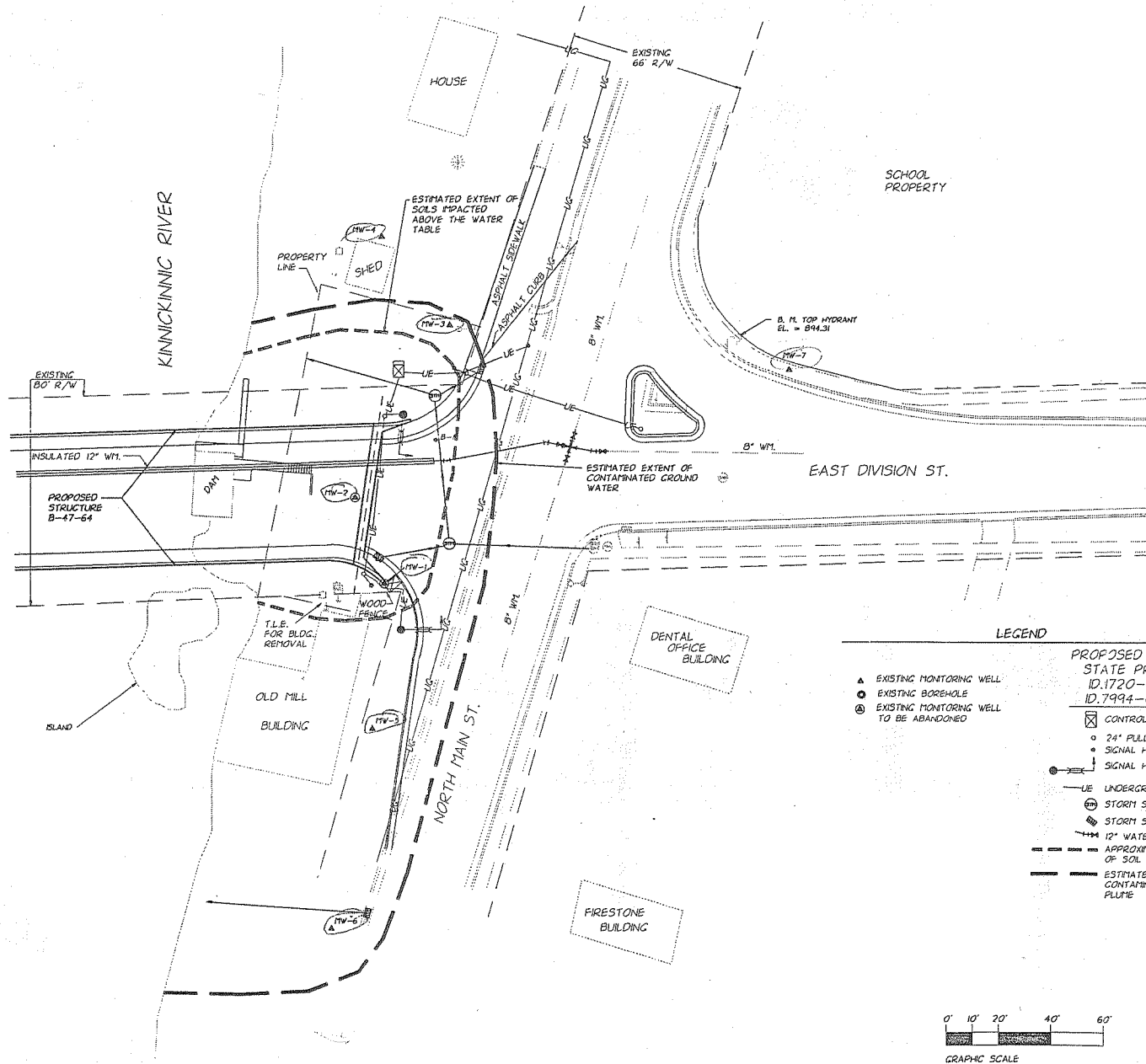
WDNR - GRO
EPA Method 8020

WATER:

Volatile Organic Compounds (VOC's)
Total Lead
Gasoline Range Organics
Polynuclear Aromatic Hydrocarbons

EPA Method 8021 & 8020
EPA Method 3020/7421
WDNR - GRO
EPA Method 8310 (HPLC)

5

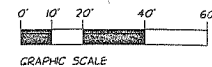


LEGEND

- ▲ EXISTING MONITORING WELL
- EXISTING BOREHOLE
- Ⓢ EXISTING MONITORING WELL TO BE ABANDONED

PROPOSED UTILITIES STATE PROJECT 1D.1720-05-81 1D.7994-00-27

- ☐ CONTROL CABINET BASE
- 24" PULL BOX
- SIGNAL HEAD-PEDESTAL MOUNTED
- ⌋ SIGNAL HEAD-MAST ARM MOUNTED
- UE UNDERGROUND ELECTRIC
- Ⓢ STORM SEWER MANHOLE
- Ⓢ STORM SEWER INLET
- ⌋ 12" WATERMAIN
- - - APPROXIMATE BOUNDARY OF SOIL CONTAMINATION
- ESTIMATED EXTENT OF CONTAMINATED GROUND WATER PLUME

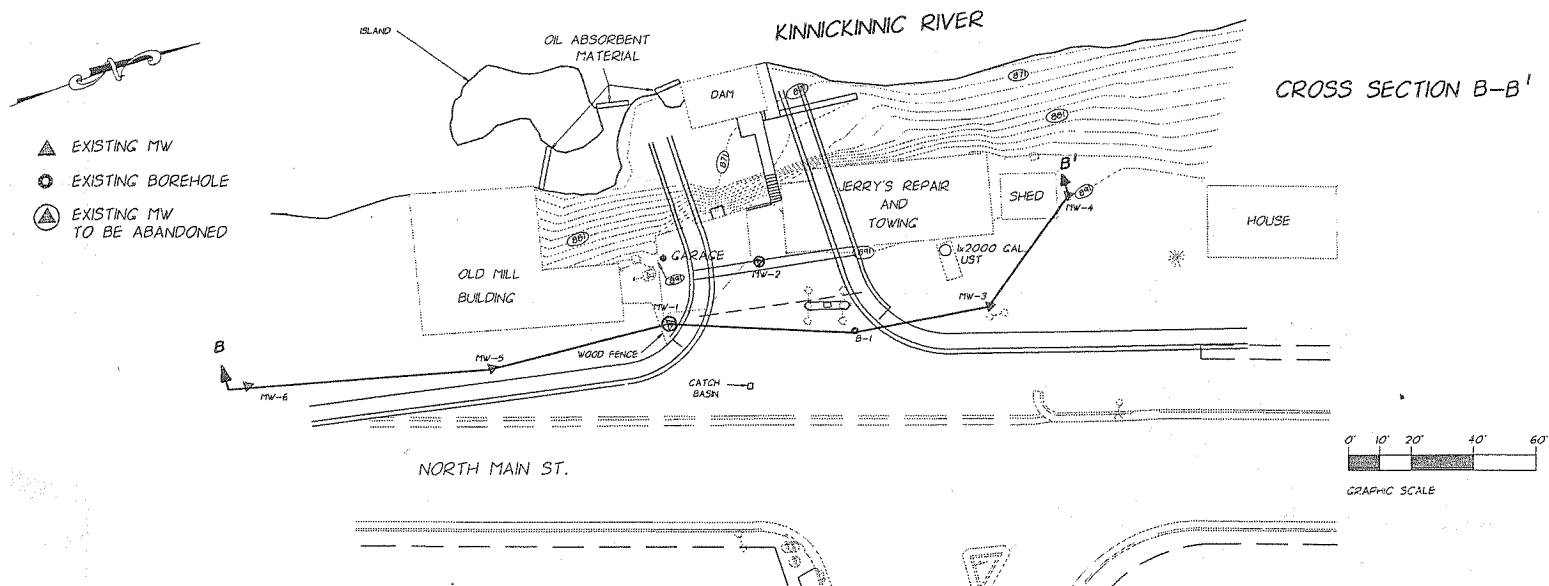


DATE	FEB. '93
REV.	
CCD FILE	JFR1PLAN.DWG

architects	engineers	land surveyors	planners
cedar corporation			
504 Main Avenue Nashua, New Hampshire 03061 703-235-5500 703-235-2777			

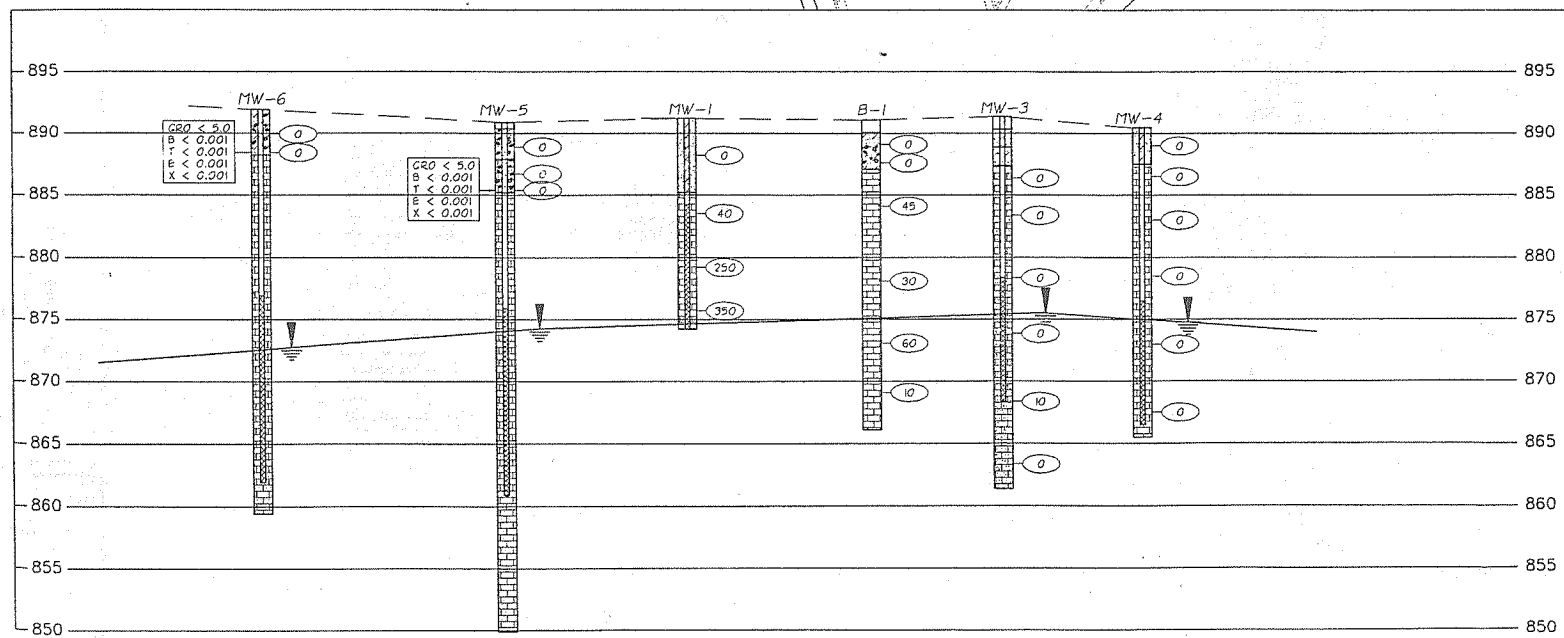
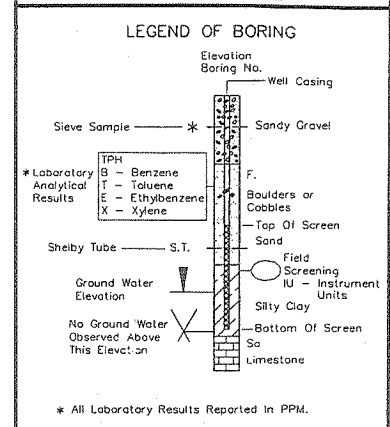
project	FIGURE 1
location	PARCEL #2 DIVISION STREET RIVER FALLS, PERCE COUNTY
description	EXTENT OF CONTAMINATION

drawn by	JME
checked by	WEE
scale	AS NOTED
sheet no.	FIGURE 1
job no.	1557-002-014



ABBREVIATIONS		
F---Fine	M---Medium	C---Coarse
Ws---Weathered	So---Sound	

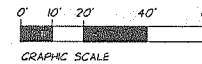
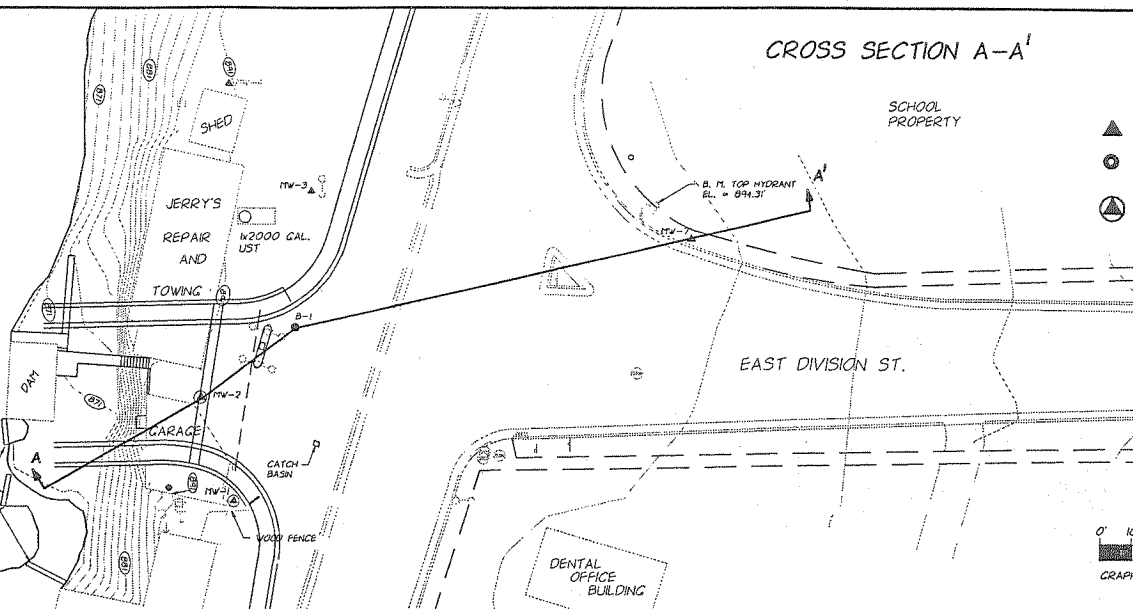
MATERIAL SYMBOLS		



CROSS SECTION A-A'

KINNICKINNIC RIVER

OIL ABSORBENT MATERIAL

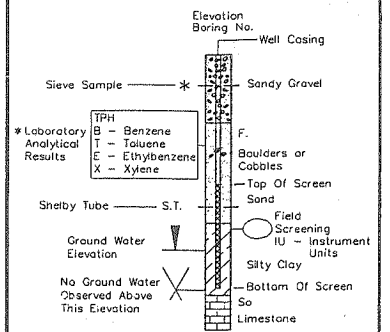


- ▲ EXISTING MW
- EXISTING BOREHOLE
- ⊗ EXISTING MW TO BE ABANDONED

ABBREVIATIONS		
F---Fine	M---Medium	C---Coarse
Ws---Weathered	So---Sound	

MATERIAL SYMBOLS		
Topsoil	Silt	Sandstone
Sand	Peat	Limestone
Gravel	Clay	Igneous Rock

LEGEND OF BORING



* All Laboratory Results Reported In PPM.

GEOLOGIC LEGEND

A - SP - POORLY GRADED SANDS AND GRAVELS - BROWN/GREY

B - LIMESTONE BEDROCK

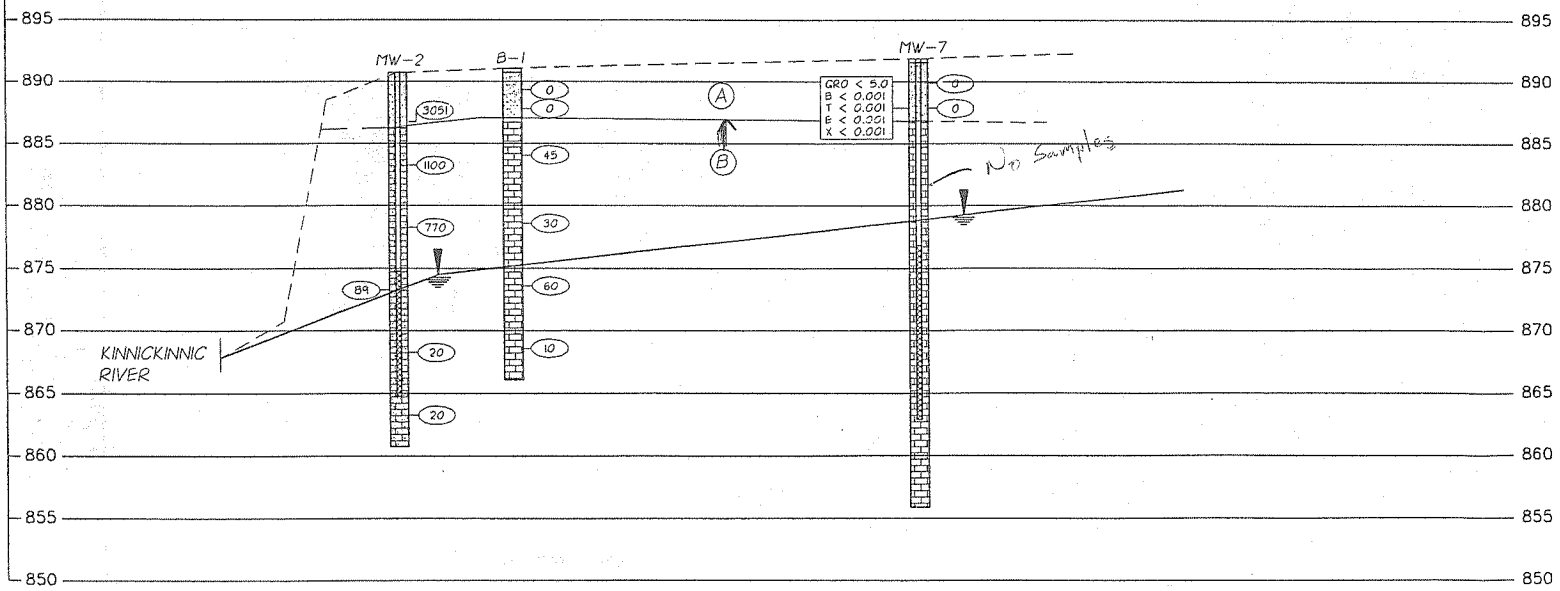
WHERE LITHOLOGIC CONTACTS ARE UNKNOWN, DASHED LINES ARE USED

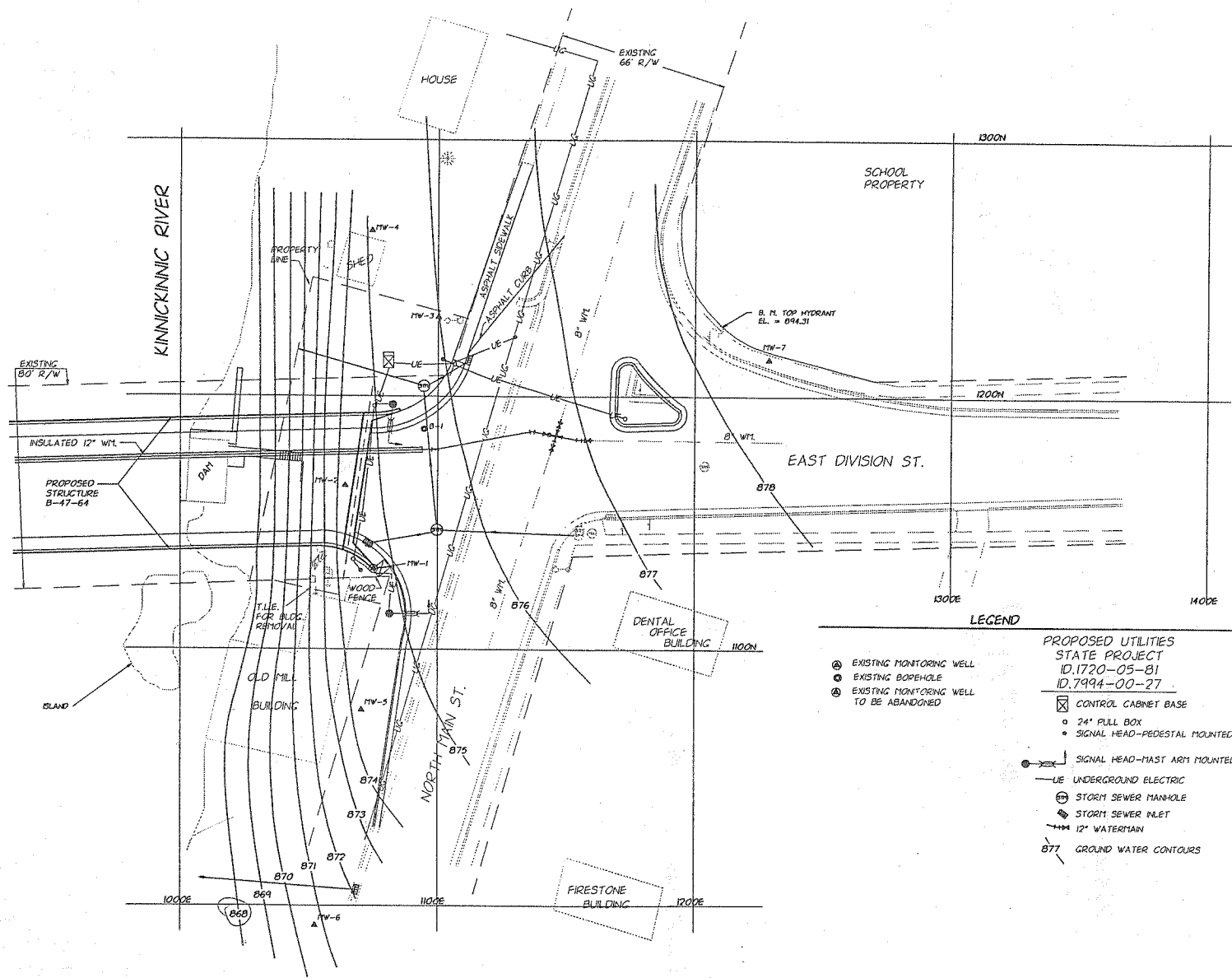
GROUNDWATER ELEVATIONS BASED ON NOVEMBER 10, 1992, DATA

WDOT-KINNICKINNIC RIVER
RIVER FALLS, WI

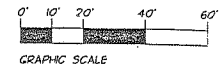
EAST - WEST
CROSS SECTION A - A'
FIGURE 2

Drawn By	PKF	Plans Checked	MEE
cedar corporation		CADD FILE	JWR1D/WG
		JOB NUMBER	1557-002-14





- LEGEND**
- ⊕ EXISTING MONITORING WELL
 - ⊙ EXISTING BOREHOLE
 - ⊗ EXISTING MONITORING WELL TO BE ABANDONED
 - ☒ CONTROL CABINET BASE
 - 24" PULL BOX
 - SIGNAL HEAD-PEDESTAL MOUNTED
 - SIGNAL HEAD-MAST ARM MOUNTED
 - U.E. UNDERGROUND ELECTRIC
 - ⊕ STORM SEWER MANHOLE
 - ⊕ STORM SEWER INLET
 - 12" WATERMAIN
 - GROUND WATER CONTOURS



Date	Elev.
FEB. '93	
rev.	
cod. file	STORMFLOW

architects engineers land surveyors planners

cedar corporation

804 Allen Avenue
P.O. Box 100
Marquette, Michigan 49801
735-335-5081
800-422-2372
Fax 735-335-5082

FIGURE 4

PARCEL #2 DIVISION STREET,
RIVER FALLS, PERCE COUNTY
GROUND WATER CONTOUR PLAN

drawn by	JME
checked by	MEJ
scale	AS NOTED
sheet no.	
FIGURE 4	
job no.	1557-002-014

TABLE 3
WISCONSIN D.O.T. PARCEL #2 RIVER FALLS
GROUND WATER ELEVATIONS

[illegible]

February 9, 1993

Wilken's Property

1. Results of slug tests.

Data files	a. DOTRF4-1.DAT	Bail Down
	b. DOTRF7-1.DAT	True Slug Test
	c. DOTRF7-2.DAT	Recovery After Slug Out

A. MW-4 Bail Down

1. Slug test data matching 5 points on steep part of curve:

$(1.9 \times 10^{-5} \text{ ft/s or } 5.79 \times 10^{-4} \text{ cm/sec})$

2. Matching 12 points on shallow curve

$(6.63 \times 10^{-6} \text{ ft/s or } 2.02 \times 10^{-4} \text{ cm/sec})$

Geometric mean = $3.42 \times 10^{-4} \text{ cm/sec}$

B. MW-7 (piezometer) Slug Test

3. Matching 6 points on steep part of curve:

$(3.677 \times 10^{-5} \text{ ft/s or } 1.12 \times 10^{-3} \text{ c/s})$

4. Matching 18 points on curve:

$(4.59 \times 10^{-6} \text{ ft/s or } 1.399 \times 10^{-4} \text{ c/s})$

Geometric mean = $2.96 \times 10^{-4} \text{ c/s}$

C. MW-7 (piezometer) Recovery Test

5. Matching 5 points on the steep curve (initial)

$4.25 \times 10^{-5} \text{ ft/s or } 1.295 \times 10^{-3} \text{ c/s}$

6. Matching 15 points overall

$9.51 \times 10^{-6} \text{ ft/s or } 2.899 \times 10^{-4} \text{ c/s}$

2. Hydraulic conductivity ranges (values in cm/sec).

MW-4	2.02×10^{-4}	to	5.79×10^{-4}
MW-7 (slug)	1.399×10^{-4}	to	1.12×10^{-3}
MW-7 (recovery)	2.899×10^{-4}	to	1.295×10^{-3}

3. Recommendations:

- A. Calculations should be based on the range of values (in cm/sec):
 1.399×10^{-4} to 1.295×10^{-3}
Geometric mean = 4.36×10^{-4}

The higher value is similar to what is found in sands and gravels and possibly reflects:

- 1). Filter pack influence
- 2). Fractured bedrock flow regime

- B. Design of recovery system should be such as to influence the groundwater flow.

Converting K to feet/day

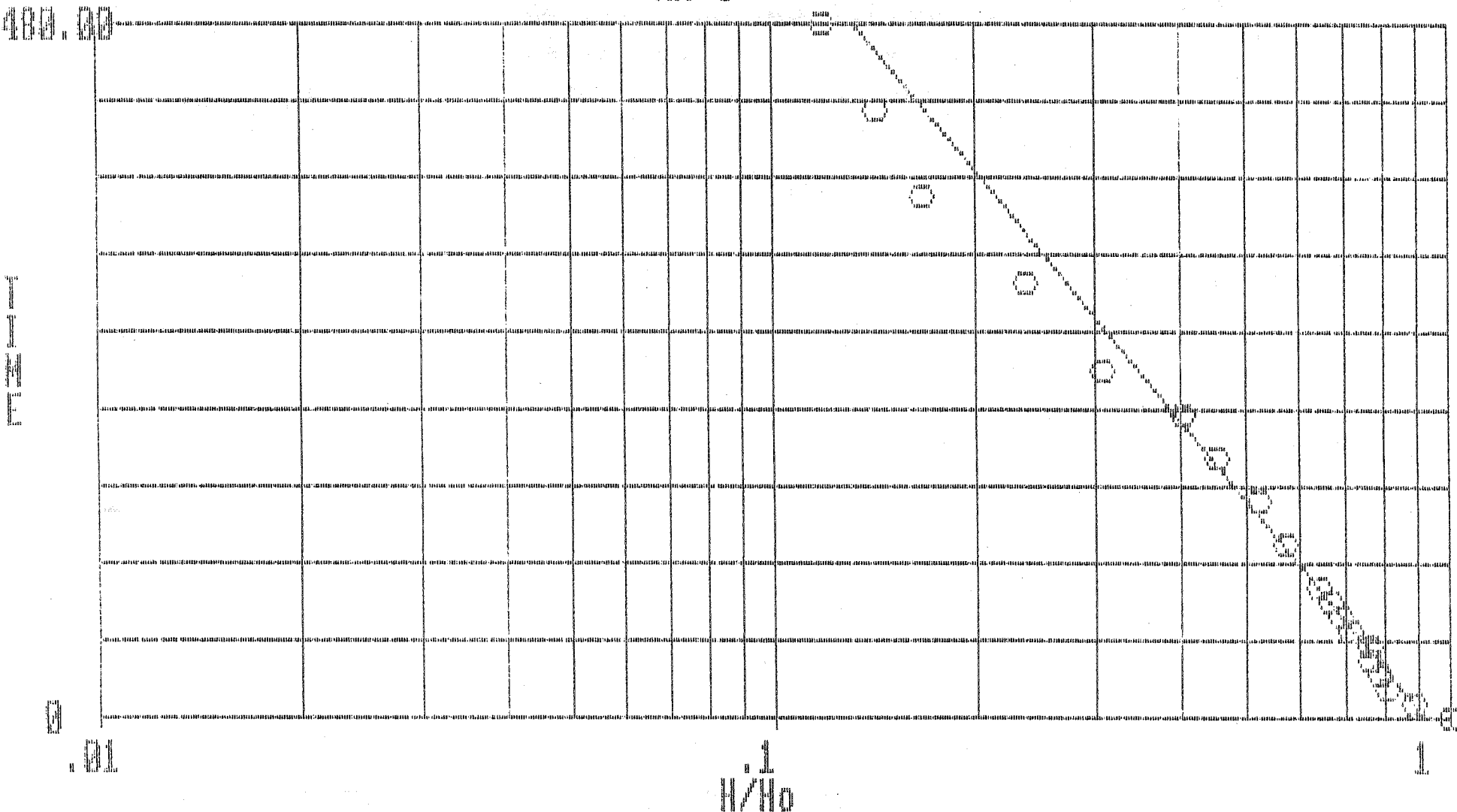
$$1.295 \times 10^{-3} \text{ c/s} = 3.67 \text{ ft/d}$$

$$4.36 \times 10^{-4} \text{ c/s} = 1.24 \text{ ft/d}$$

$$1.399 \times 10^{-4} \text{ c/s} = 0.40 \text{ ft/d}$$

As calculated, K is less than 4 ft/d. Adding a 15% margin of error we recommend the well system be designed based on a 4.25 ft/d hydraulic conductivity (0.0015 cm/sec).

MW-4

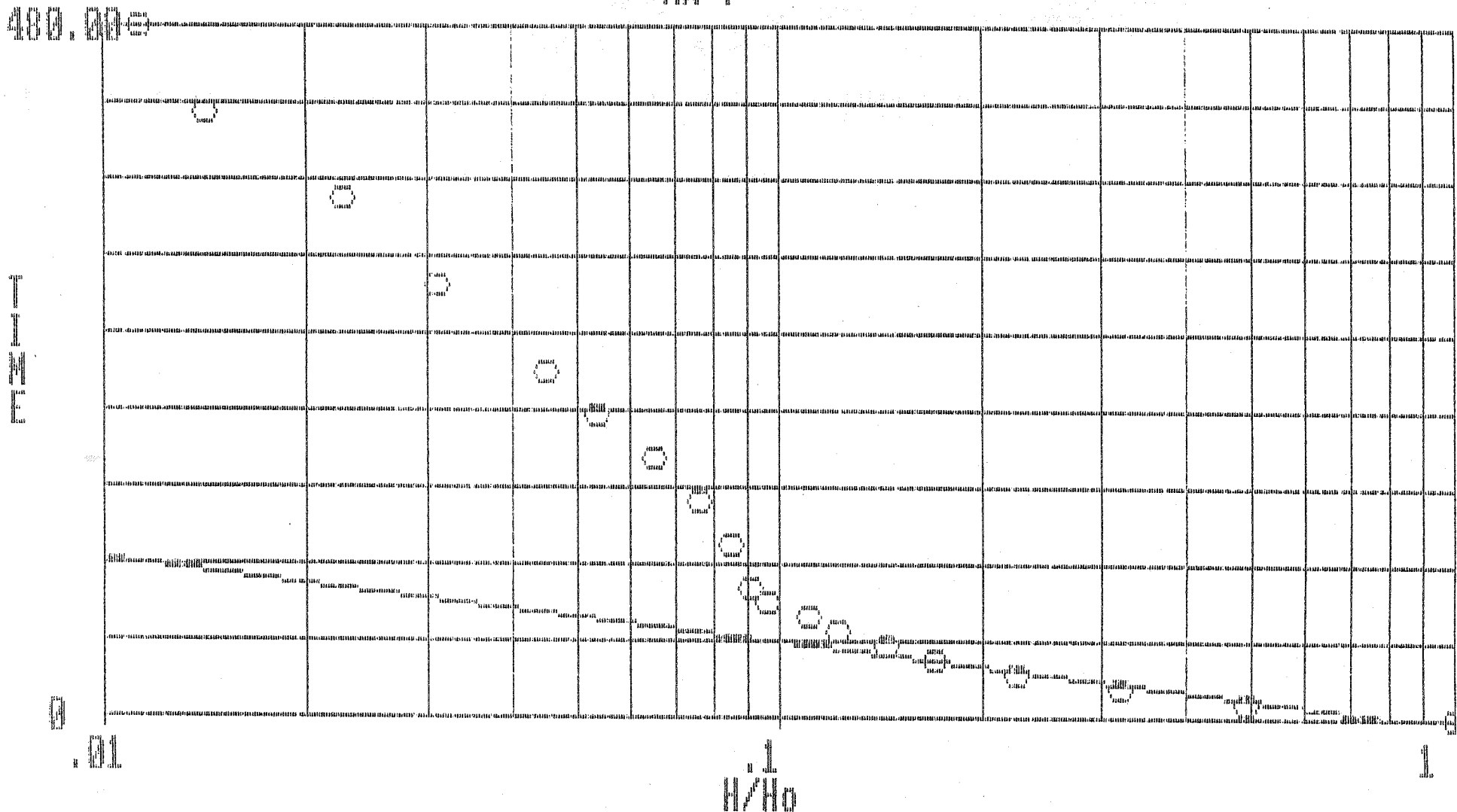


Do you want to change this plot (Y=yes, <RETURN>-no)?

Matching 12 points on curve
 Hydraulic Conductivity Calculated at
 6.63×10^{-6} ft/s
 2.02×10^{-4} c/s

MM-7

SLUG TEST



Do you want to change this plot (Y=yes, (RETURN)-no)?

MATCHING 6 points to steep curve:

Hydraulic Conductivity calculated at:

3.677×10^{-5} ft/s or 1.12×10^{-3} c/s

MM-7

SLUG TEST

480.000

I
H
E

Q

.01

.1
H/Ho

1

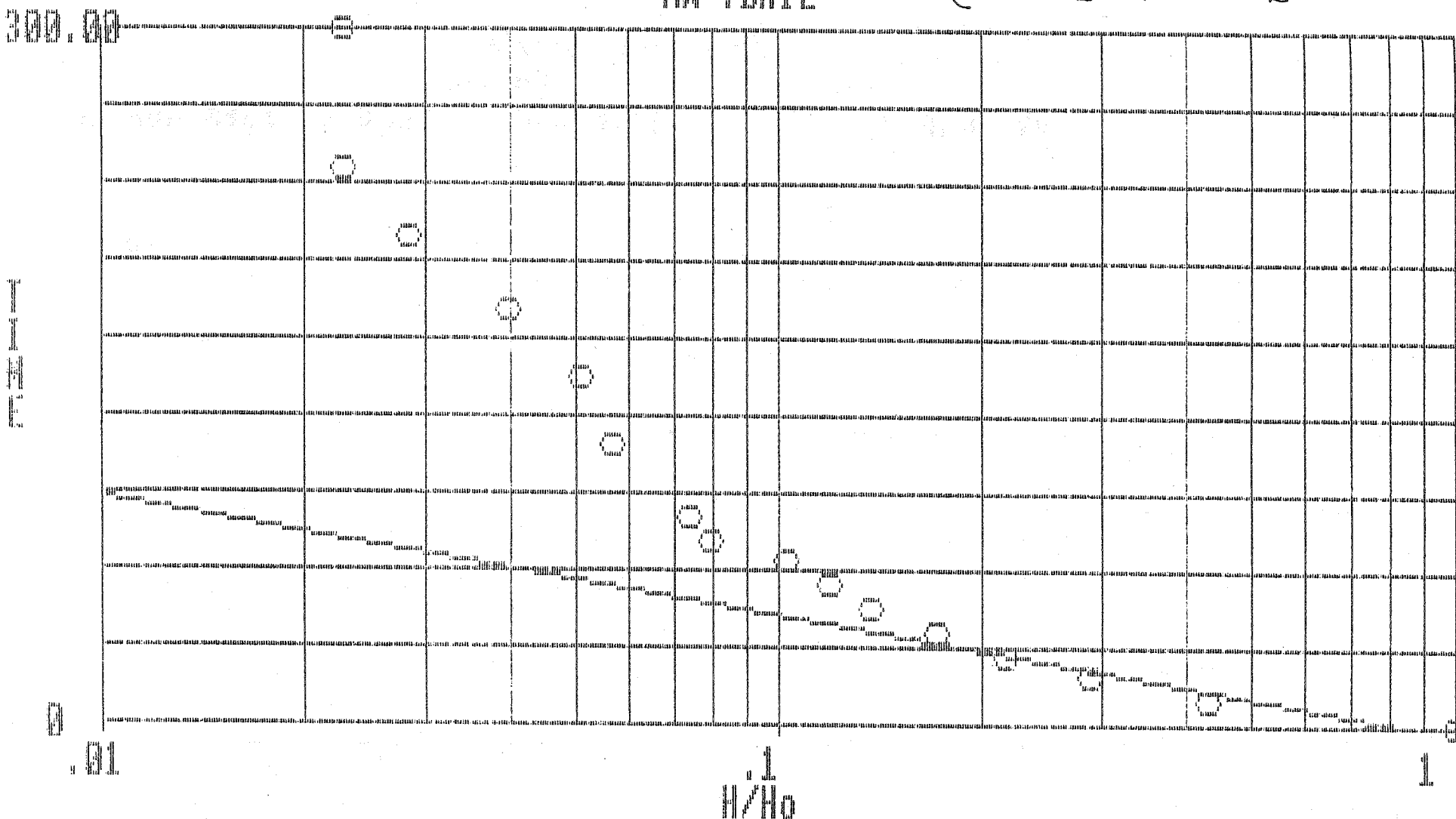
Do you want to change this plot (Y=yes, <RETURN>-no)?

MATCHING 18 pts on the curve:

$$\text{Hydraulic Conductivity} = 4.59 \times 10^{-6} \text{ ft/s}$$

$$1.399 \times 10^{-4} \text{ cm/s}$$

(Recovery after Slug Removed)



Do you want to change this plot (Y=yes, **RETURN**-no)?

MATCHING 5 pts on initial curve: $k = 4.25 \times 10^{-5} \text{ ft/s}$
or
 $1.295 \times 10^{-3} \text{ c/s}$