RMT, Inc.
Suite 124
1406 East Washington Ave.
Madison, WI 53703-3009
Phone: 608-255-2134
FAX: 608-255-0234

June 1, 1988

Ms. Kathryn A. Curtner
Assistant Administrator
Division of Enforcement
WI Department of Natural Resources
P.O. Box 7921
Madison, WI 53707

Re: Special Consent Order SOD-88-02A

Dear Ms. Curtner:

Per the conditions of the Special Consent Order SOD-88-02A for Refuse Hideaway Landfill (RHL), the information required from Order Numbers 2 and 5 has been developed.

Order No. 2a: The required updated topographic map has been provided as Figure 1 (see index tab labeled "Figures").

Order No. 2b: The revised final grade plan for RHL has been provided in Figure 2. Details for the revised plan are provided in Figure 3. It should be noted that this plan provides the overall concept for site closure, but does not reflect the actual final grades for the site. A fixed final grading plan could not be established for this submittal for the following reasons: 1) the time constraint for this submittal; 2) the required necessary regrading of waste; and 3) the undocumented thickness of the grading layer over the site. The actual grading plan will be developed as areas of the site are graded and depths of the grading layer are verified. Where possible, the actual grading plan will conform to the grades of the revised final grade plan submittal. Note that the actual grades and resulting cap thicknesses will be documented and submitted to the Department as part of the closure documentation submittal.

As shown in Figure 2, the minimum and maximum slopes for the revised final grade plan have been adhered to. Note that these minimum and maximum slopes will be the major constraint as the actual grading plan is developed during site closure.

Order No. 2c: The drainage system requirements of NR 506.08 (3)(b), Wisconsin Administrative Code (i.e., surface water run-on diversion and clay lined drainage swales when flowing over waste disposal areas) have been adhered to as part of the revised final grading plan (see Figures 2 and 3).

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Additionally, the concepts of over-all surface water management, that were approved by the Department in 1987 (see Plan Sheet 6 of 13 of the In-Field Conditions report Plan Set dated January 12, 1988), have also been adhered to.

Order No. 2d: The final cover system design proposed for site closure is presented in Detail 1 on Figure 3. The proposed final cover system meets the design requirements of NR 504.07, Wisconsin Administrative Code. Note that no gas venting layer has been proposed due to an anticipated internal/external vertical gas well migration control system being proposed for the site. The actual details of this system will be submitted on July 1, 1988. Additionally, the cover layer thickness of 1.5 feet has been proposed due to the geographic location of the site (i.e., local frost penetration) and the type of material to be used for the cover layer (on-site till soil). Till soils have been proven to be good cover layer soils because of their good moisture-holding capacity.

Order No. 2e: The documentation of the clay borrow source was prepared for RHL by Soils and Engineering Services, Inc. (SES) and is presented in Appendix A. The physical laboratory results performed by SES to document the clay borrow source meet or exceed in all cases the physical requirements required from the Consent Order. Additionally, the clay volume at the borrow source available for site closure was also estimated by SES and exceeds that required for site closure (12 acres is the estimated limit of clay placement resulting in a required clay volume of 40,000 cubic yards).

Order No. 5: The ten wells required to be installed by June 1, 1988, could not be completed. To date, 6 of the 15 wells proposed in the Consent Order are now installed, and two others are partially completed. Every indication is that all the proposed wells will be completed by the July 1, 1988, deadline. Two drilling contractors have been on-site in an attempt to complete the ten wells required by the June 1 deadline; however, there have been numerous delays brought on by equipment breakdowns, difficult drilling, and access problems. Some of the difficulties encountered are the following:

- One of the two drilling contractors on-site has decided that his equipment is not suitable to handle the difficult drilling and has left the site.
- Drilling equipment has been stuck in three different boreholes. A percussion bit broke off in one borehole, and recovery of the bit will be necessary for completing some of the remaining borings.
- The frame to one drilling rig was cracked in two different places. Both drill rigs have broken down several times in the past two weeks.

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- Permission has not been granted as of Friday, May 29, 1988, for drilling two of the wells on property adjacent to the landfill.

While delays have been numerous, they are becoming less frequent because ways are being found for dealing with the most commonly encountered drilling difficulties, and thus progress is being made. Additional specifics of the drilling progress are summarized in the letter to Mr. Raymond Tierney of the Department, dated May 31, 1988 (see Appendix B).

The issue of closure of the south and west slopes has still not been resolved. The Department's response of May 24, 1988, did not address the technical nature of this issue as well as the requirements for the site closure, as understood by John DeBeck. In order to keep this project on schedule and to meet the requirements of the Special Consent Order, we ask that the Department re-evaluate this issue based on the following:

1. When John DeBeck signed the Consent Order, he understood the requirements for clay capping to be used for covering the top of the landfill and not the south and west slopes which have been previously closed and revegetated (see Attachment C-1, Appendix C).

2. The existing cover system on the south and west slopes performs in a manner similar to that of the proposed NR 500 series cover system selected for the top areas of the landfill (see Attachment C-2, Appendix C). The cover systems were evaluated using the USEPA HELP model. Based on our knowledge of on-site soil conditions, the existing cover configuration and NR 500 cover were simulated. Due to the limitations of the model, the maximum allowable slope was 10 percent. The model was run for both the existing and NR 500 cover conditions using a 10-inch and 14-inch root zone (or evaporative zone, as referenced in the model). Although the existing conditions cover system does not contain contrasting hydraulic conductivity layers that would promote lateral drainage, that "lateral drainage" layer was simulated by inputting a layer of equivalent soil properties to the underlying barrier soil layer. This manipulation was necessary to allow vertical penetration of roots below the topsoil layer. Root zone penetration is not permitted into barrier soil layers.

   The results of these analyses indicate that the net percolation through the two cover systems is very similar. Since the actual slope of the existing cover is 33 percent and not 10 percent, the increase in slope should result in a decrease in net percolation of approximately equivalent magnitude. In fact, the percolation on these steep slopes is expected to be minimal compared to the remainder of the site.

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3. The structural integrity of the south slope and the practicality of constructing the clay cover down the south slope are also issues. RMT feels that construction of the clay layer on the side slopes would be an unwarranted risk which would needlessly put additional liability concerns on RHL.

We hope the Department will work with RHL to resolve the issues regarding the south and west slopes. We feel that if the Department agrees with our technical evaluation, we can resolve the issues and develop an environmentally sound closure plan which meets the needs of everyone.

Please call if we can be of any assistance in your review of the enclosed materials or with any other aspects of the site.

Sincerely,

Ed Scaro co

Ed C. Scaro, P.E.
Senior Project Engineer

Lee A. Bartlett

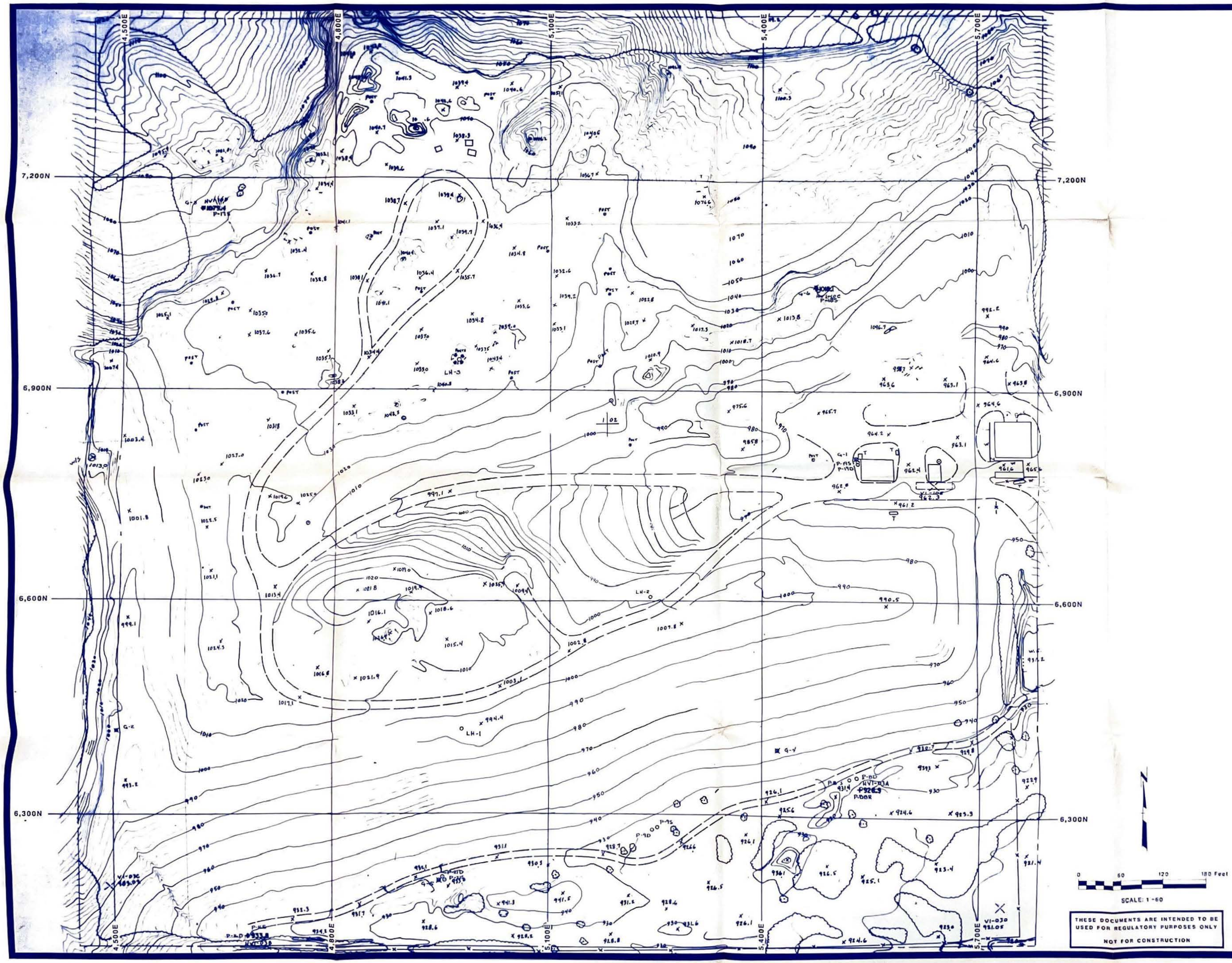
Lee A. Bartlett, P.E.
Project Manager

ljv

Enclosure

cc: John DeBeck
Tom DeBeck
Dave Neeb

1181.05 208:LJV:curtner



0 60 120 180 Feet

SCALE: 1"=60'

THESE DOCUMENTS ARE INTENDED TO BE USED FOR REGULATORY PURPOSES ONLY

NOT FOR CONSTRUCTION

LEGEND

- APPROXIMATE PROPERTY LINE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING SPOT ELEVATION
- TREES AND / OR BRUSH
- EDGE OF WATER
- WET AREA

NOTES

1. SITE LOCATION: SW1/4 OF THE NW1/4, SECTION 8, T7N, R8E, TOWN OF MIDDLETON, DANE COUNTY, WISCONSIN.
2. TOPOGRAPHIC MAP PREPARED BY ARNOLD AND O'SHERIDAN INC., MADISON, WI, FROM AERIAL SURVEY BY OWEN AYRES AND ASSOCIATES, EAU CLAIRE, WI. DATE OF PHOTOGRAPHY: MAY 5, 1988. TOPOGRAPHY IN SOUTH FILL AREA UPDATED BY GROUND SURVEY BY ARNOLD AND O'SHERIDAN INC., MAY 20, 1988.
3. VERTICAL DATUM IS USGS MEAN SEA LEVEL. CONTOUR INTERVAL IS 2 FEET.

NO	BY	DATE	REVISION	APP'D.
3				
2				
1				

PROJECT: REFUSE HIDEAWAY
SPECIAL CONSENT ORDER SOD-88-02A
SUBMITTAL

SHEET TITLE: EXISTING CONDITIONS MAP

DRAWN BY: PPD	SCALE: 1"=60'	PROJ. NO. 1181.05
CHECKED BY:		DRWG. NO.
APPROVED BY:	DATE PRINTED: JUN 1 1988	SHEET OF: Figure 1
DATE: 06/01/88		

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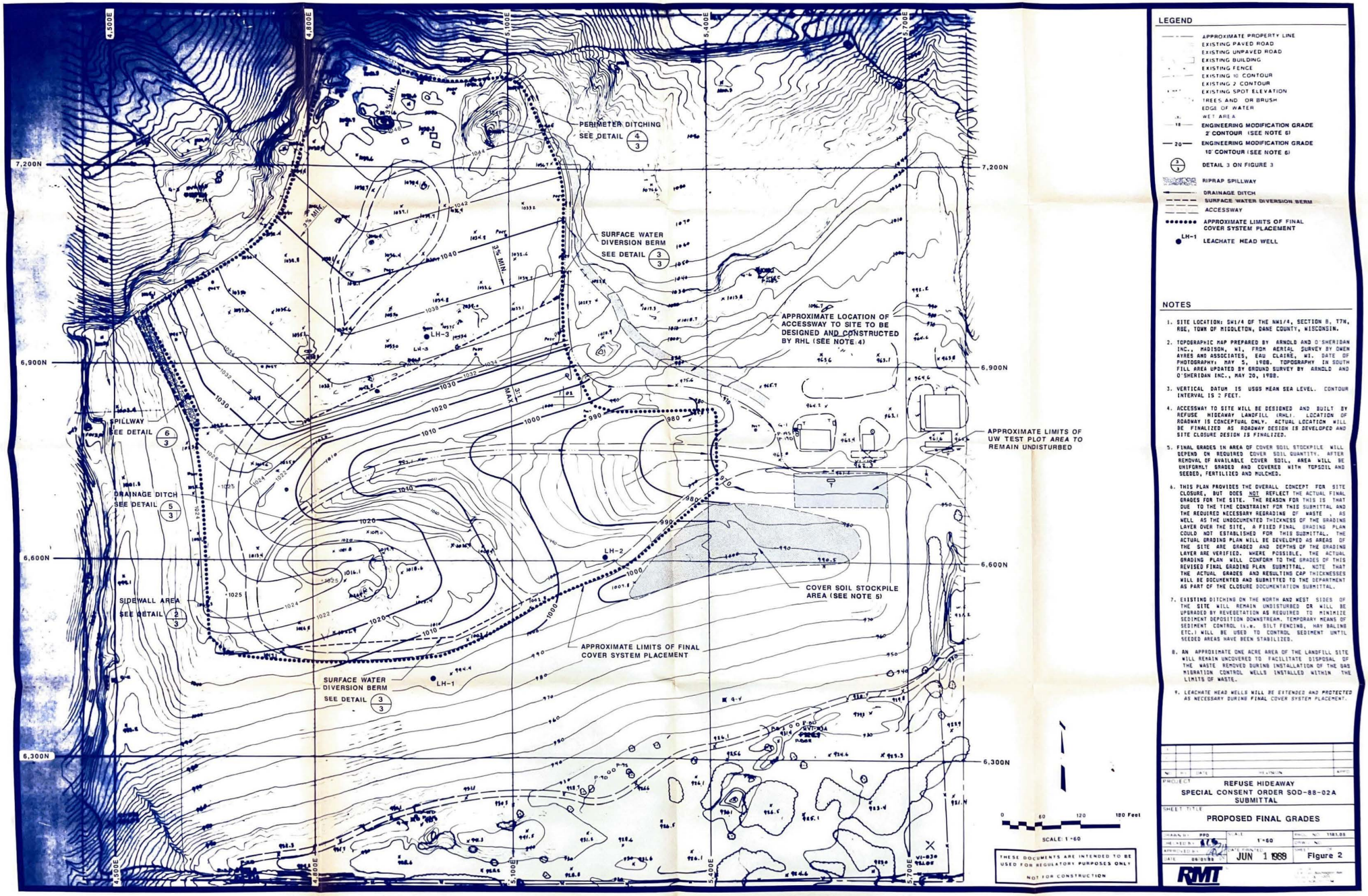

LEGEND

- APPROXIMATE PROPERTY LINE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING SPOT ELEVATION
- TREES AND OR BRUSH
- EDGE OF WATER
- WET AREA
- 18 — ENGINEERING MODIFICATION GRADE 2' CONTOUR (SEE NOTE 6)
- 20 — ENGINEERING MODIFICATION GRADE 10' CONTOUR (SEE NOTE 6)
- 3/3 — DETAIL 3 ON FIGURE 3
- RIPRAP SPILLWAY
- DRAINAGE DITCH
- SURFACE WATER DIVERSION BERM
- ACCESSWAY
- APPROXIMATE LIMITS OF FINAL COVER SYSTEM PLACEMENT
- LH-1 — LEACHATE HEAD WELL

NOTES

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3. VERTICAL DATUM IS USGS MEAN SEA LEVEL. CONTOUR INTERVAL IS 2 FEET.
4. ACCESSWAY TO SITE WILL BE DESIGNED AND BUILT BY REFUSE HIDEAWAY LANDFILL (RHL). LOCATION OF ROADWAY IS CONCEPTUAL ONLY. ACTUAL LOCATION WILL BE FINALIZED AS ROADWAY DESIGN IS DEVELOPED AND SITE CLOSURE DESIGN IS FINALIZED.
5. FINAL GRADES IN AREA OF COVER SOIL STOCKPILE WILL DEPEND ON REQUIRED COVER SOIL QUANTITY. AFTER REMOVAL OF AVAILABLE COVER SOIL, AREA WILL BE UNIFORMLY GRADED AND COVERED WITH TOPSOIL AND SEEDED, FERTILIZED AND MULCHED.
6. THIS PLAN PROVIDES THE OVERALL CONCEPT FOR SITE CLOSURE, BUT DOES NOT REFLECT THE ACTUAL FINAL GRADES FOR THE SITE. THE REASON FOR THIS IS THAT DUE TO THE TIME CONSTRAINT FOR THIS SUBMITTAL AND THE REQUIRED NECESSARY REGRADING OF WASTE , AS WELL AS THE UNDOCUMENTED THICKNESS OF THE GRADING LAYER OVER THE SITE, A FIXED FINAL GRADING PLAN COULD NOT ESTABLISHED FOR THIS SUBMITTAL. THE ACTUAL GRADING PLAN WILL BE DEVELOPED AS AREAS OF THE SITE ARE GRADED AND DEPTHS OF THE GRADING LAYER ARE VERIFIED. WHERE POSSIBLE, THE ACTUAL GRADING PLAN WILL CONFORM TO THE GRADES OF THIS REVISED FINAL GRADING PLAN SUBMITTAL. NOTE THAT THE ACTUAL GRADES AND RESULTING CAP THICKNESSES WILL BE DOCUMENTED AND SUBMITTED TO THE DEPARTMENT AS PART OF THE CLOSURE DOCUMENTATION SUBMITTAL.
7. EXISTING DITCHING ON THE NORTH AND WEST SIDES OF THE SITE WILL REMAIN UNDISTURBED OR WILL BE UPGRADED BY REVEGETATION AS REQUIRED TO MINIMIZE SEDIMENT DEPOSITION DOWNSTREAM. TEMPORARY MEANS OF SEDIMENT CONTROL (i.e. SILT FENCING, HAY BALING ETC.) WILL BE USED TO CONTROL SEDIMENT UNTIL SEEDED AREAS HAVE BEEN STABILIZED.
8. AN APPROXIMATE ONE ACRE AREA OF THE LANDFILL SITE WILL REMAIN UNCOVERED TO FACILITATE DISPOSAL OF THE WASTE REMOVED DURING INSTALLATION OF THE GAS MIGRATION CONTROL WELLS INSTALLED WITHIN THE LIMITS OF WASTE.
9. LEACHATE HEAD WELLS WILL BE EXTENDED AND PROTECTED AS NECESSARY DURING FINAL COVER SYSTEM PLACEMENT.

NO.	DATE	REVISION	APP'D

PROJECT
REFUSE HIDEAWAY
SPECIAL CONSENT ORDER SOD-88-02A
SUBMITTAL

SHEET TITLE
PROPOSED FINAL GRADES

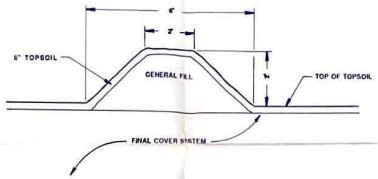
DRAWN BY	PPD	SCALE	1"=60'
CHECKED BY			
APPROVED BY		DATE PLOTTED	JUN 1 1988
DATE	06-01-88		

PROJECT NO. 1181.05
DRAWING NO.
SHEET NO.
Figure 2

RMT

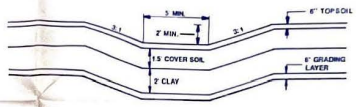
1/3 **FINAL COVER SYSTEM DETAIL**

NOT TO SCALE



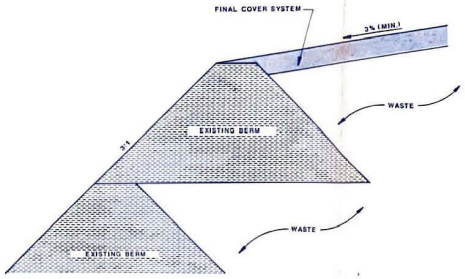
3/3 **DIVERSION BERM DETAIL**

(NOT TO SCALE)



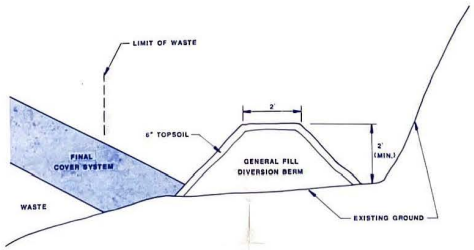
5/3 **DRAINAGE DITCH DETAIL**

(NOT TO SCALE)



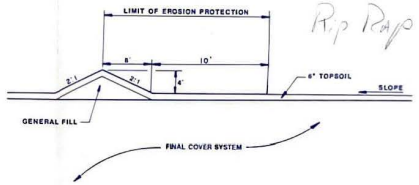
2/3 **SIDEWALL DETAIL**

(NOT TO SCALE)



4/3 **EASTERN PERIMETER DITCHING DETAIL**

(NOT TO SCALE)



Rip Rap ?

6/3 **SPILLWAY DETAIL**

(NOT TO SCALE)

NO	BY	DATE	REVISION	APP'D.
3.				
2.				
1.				

PROJECT: REFUSE HIDEAWAY
SPECIAL CONSENT ORDER SOD-88-02A
SUBMITTAL

SHEET TITLE: DETAILS

DRAWN BY: GDB	SCALE: NO SCALE	PROJ. NO. 1181.05
CHECKED BY:		DRWG. NO. 3
APPROVED BY:	DATE PRINTED: JUN 1 1988	SHEET OF Figure 3
DATE: 06/01/88		

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Appendix A

SOILS & ENGINEERING SERVICES, INC.

CONSULTING CIVIL ENGINEERS 10048

1102 STEWART STREET • MADISON, WISCONSIN 53713 • TELEPHONE 608 • 274-7600

Earl H. Reichel, P.E.
Octavio Tejeda, P.E.

May 25, 1988

Residuals Management Technology, Inc.
1406 E. Washington Ave.,
Madison, WI 53703

Attn: Mr. Lee A. Bartlett

Subject: Soil Testing - Clay Cap
Refuse Hideaway
Town of Middleton
Dane County, Wisconsin

Gentlemen;

In accordance with the authorization of Mr. John W. DeBeck, we have performed various tests on soil samples for the clay capping layer. Initially, Mr. DeBeck constructed test pits with a backhoe on the Jungbluth property to determine a source of borrow. This property is a part of the S. E. ¼; N.W. ¼, Section 8, Town of Middleton. The purpose of this testing was to determine the suitability of the clay on this property to satisfy the requirements for clay cap.

The locations of the test pits were established by transit - stadia surveying methods by our personnel on May 24, 1988. See Drawing 10048-1 for the location map. Sample C-10 is from a hand auger boring. The soil descriptions and depths of soils were provided by Mr. DeBeck and are shown in the table below:

Test Pit No.	Soils Description
0	Stoney - Shallow Pit
1	Clay to 4.5 feet
2	Clay to 4.5 feet
3	Blue Clay - Water at 3 feet
4	Blue Clay in bottom - Water at 4 feet
5	Clay to 5 feet - 2 Samples recovered for testing
6	Clay to 5 feet
7	Clay - Stoney at 6 feet
8	Clay - Stoney
9	Clay
10	Clay
C-10	Clay to 5 feet plus (Soils & Engineering services, Inc.)

The following laboratory tests were perfomed and the results are shown in the table:

Sample From Pit No.	Liquid Limit	Plasticity Index	P200	Permeability, K CM/SEC	Remarks
S1	29.7	12.3	83.4	-	Brown Clay
S2	34.4	14.9	95.7	-	Brown Clay
S3	60.7	28.1	75.6	1 P	Top Soil
S4	32.9	15.5	82.8	1 P	Gray - Black Clay
S5A**	39.8	16.9	96.8	-	Organic
S5B**	42.7	22.7	98.1	-	-
S6	42.6	23.1	95.3	-	-
S7	27.7	13.0	44.3	-	Sandy Gravel
S8	32.1	15.0	69.5	-	Brown Clay
S9	36.3	19.5	77.8	1 P	-
S10	38.3	22.9	71.7	-	-
C-10	46.5	26.0	95.8	2.5×10^{-9} @ 101.6 PCF	
				*5.3×10^{-9} @ 112.1 PCF	
Sample from Capitol Sand & Gravel Co.	28.9	11.9	68.6	9.6×10^{-8} @ 110.7 PCF	
Sample from Watts/Kottke	33.4	14.6	97.3	1.2×10^{-8} @ 107.3 PCF	
				*9.6×10^{-9} @ 116.8 PCF	

1 P = Permeability test in progress. No preliminary test results obtained as yet.

* = Preliminary test results after 7 days. Test still in progress.

** = Two soil samples from Test Pit 5.

After construction of the test pits, we were instructed to perform two soil borings to determine the vertical extent of the clays. Boring 1 was performed at Test Pit 8 and Boring 2 at test pit 5. The Soil Boring Records are presented on Drawings 10048-4 and 10048-5. No laboratory tests were performed on these samples, although all samples from these borings are preserved in glass jars.

Another phase of sampling and testing was performed in the existing soil capping cover on the North portion of the existing landfill. The location sketches for this phase are shown on Drawings #10048-2 and 10048-3. In addition to the sample locations (shown as C1, C2, etc.) several stockpiles of soil are also shown. Samples from some of these piles were tested to determine quality for clay capping layer.

Sample No.	Liquid Limit	Plasticity Index	P200	Remarks
C1				Estimated to be too Sandy
C2	28.8	12.5	56.8	
C3				Estimated to be too Sandy
C4	27.5	11.4	40.6	Not acceptable

Sample No.	Liquid Limit	Plasticity Index	P200	Remarks
C5	26.7	12.8	51.5	
C6	28.3	14.3	59.3	
C7				Estimated to be too Sandy
C8	28.8	14.0	54.5	

Field density tests were performed in the area of Clay Cap C7 and the percentages of compaction range from approximately 85% to 90%. Thus, we are confident that the clays can be compacted to the required density by achieving optimum moisture and using six - inch layers.

There are a number of Stockpiles of soils at various locations on site, which were sampled and show the following results:

Stockpile No.	Liquid Limit	Plasticity Index	P200	Remarks
#1 - North	31.0	13.7	62.6	
1 - Middle	24.1	10.5	42.6	Too Sandy
2 - North	22.6	9.8	44.5	Too Sandy
3 - West	32.1	14.7	66.1	
3 - North	33.9	17.2	59.4	
3 - South	28.7	13.6	67.3	
4 - Southwest	28.8	13.9	56.2	
5	No tests - Estimated not acceptable			
6	No tests - Mostly Glacial Till - Not acceptable			
7	No tests - Too Sandy - Not acceptable			
8	No tests - Very small pile - Not acceptable			
9	No tests - Very small pile - Not acceptable			

On the basis of these tests and visual evaluation of samples, it is concluded that only Stockpiles 3 and 4 are acceptable for use as clay cap. It is estimated that about 2,000 cubic yards are available in these two acceptable stockpiles.

Quantity computations were made as to estimated yardages of suitable clay soils from the Jungbluth property. We understand that approximately 40,000 cubic yards of materials are needed to cover the landfill. The majority of the test pits show that at least three feet, and in many cases four to five feet, of clays are present. Thus, an area of 350 feet by 1000 feet would provide the required quantity with only a three - foot excavation. This area is assumed as the most likely area to be borrowed and extends 350 feet South of the woods. Since the property is 1320 feet long, we believe this estimate of available clay is very conservative for this property.

Please note that permeability tests are still in progress. The final results will be submitted when completed. Many clay samples require from one to two weeks minimum to achieve stabilized test results.

We trust this provides you with the information needed at this time.

If you have any questions concerning this work, please contact us.

Respectfully submitted,

SOILS & ENGINEERING SERVICES, INC.

Earl H. Reichel

Earl H. Reichel
EHR:lh

Duplicate: Mr. John W. DeBeck

REFUSE HIDEAWAY
SCALE AND
BUILDINGS

WOODS

MW=2
ELEV. 962.15

TOP OF STEEL

963.9

DIRT PATH

TP=0

WOODS

ELEV. 953.3

TOP OF STEEL

WOODS

ELEV. 951.0

940.5

B1

TP=8
ELEV. 948.8

TP=6
ELEV. 933.2

TP=9
ELEV. 943.8

C10
ELEV. 940.8'

GATE

943.1

O HAND Auger #1

0 - 1" Silt Loam
1 - 1.5" Si'L - SiCL
1.5 - 3 SiCL
3 - 4 CL

B2

TP=5
ELEV. 931.1

TP=10
ELEV. 937.3

953.9

TP=2
ELEV. 933.8

924.9

ORANGE STAKE

925

ORANGE STAKE

ALFALFA

TP=4
ELEV. 923.8

TREE LINE

TP=3
ELEV. 925.6

GRAVEL DRIVE

TREE LINE

CANARY GRASS

922.9

Ditch

920.9

922.9

SCALE 1" = 100'

LEGEND
C10 = HAND AUGER BORING
TP = BACKHOE TEST PIT
B = MACHINE BORING
MW = MONITORING WELL

PROPOSED CLAY BORROW
JUNGBLUTH PROPERTY
REFUSE HIDEAWAY
MIDDLETON, WISCONSIN

10048-1

1030

C4

1035

4" SOIL
OVER RUBBISH

C2

C3

APROX. SCALE 1" = 60'

LEGEND

SP= STOCKPILE
C = TEST AREA
OF CLAY CAP

1040

C5

SP#3

SP#8

SP#9

1042

6" SOIL
OVER RUBBISH

C6

C7

1042

EXISTING ROAD

SP#2

EXISTING ROAD

SP#5

C1

C8

1040

10" SOIL
OVER RUBBISH

SP#4

1035

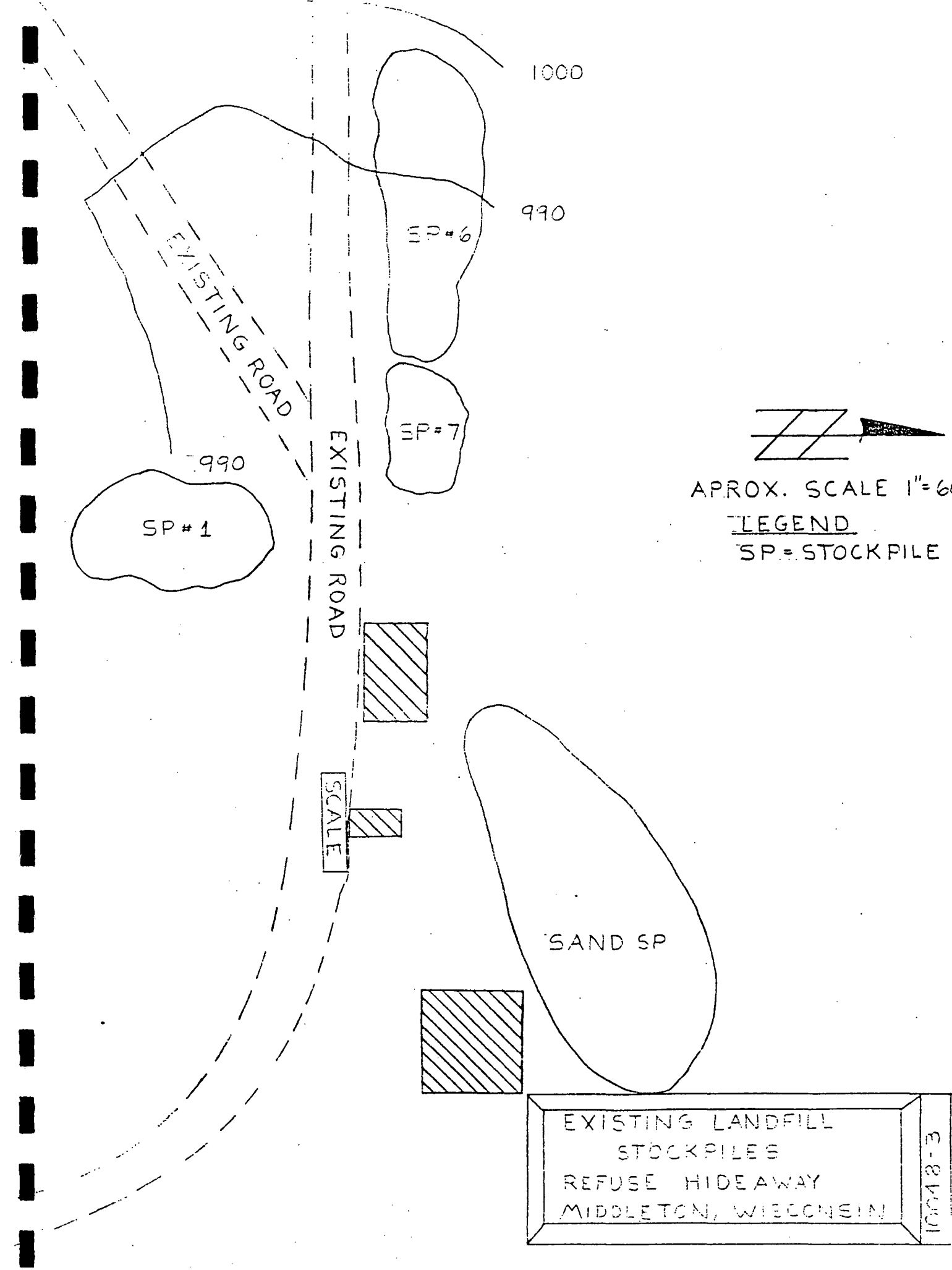
1020

1030

1010

EXISTING LANDFILL
CLAY CAP AND STOCKPILES
REFUSE HIDEAWAY
MIDDLETON, WISCONSIN

1004-R4001


1000
990
SP#6
EXISTING ROAD
SP#7
990
SP#1
EXISTING ROAD
SCALE
SAND SP
APROX. SCALE 1"=60'
LEGEND
SP.=STOCKPILE
EXISTING LANDFILL
STOCKPILES
REFUSE HIDEAWAY
MIDDLETON, WISCONSIN
10848-3

NOTES

1. Boring performed by standard procedures (A.S.T.M. Test Designation D1586).
2. The number of blows required to drive the 2-inch O.D. Split Spoon Sampler 12 inches with a 140-lb. weight falling 30 inches is recorded on the right hand edge of each boring log. This is the "Standard Penetration Test".
3. Borings were performed on May 11, 1988.
4. Holes filled in after water level checked.
5. The boundary lines shown on the Soil Boring Records between different soil strata are approximate and may be gradual. The drillers field logs contain soil conditions as interpreted by the drilling personnel, of soils between samples based on the equipment performance and the soil cuttings. The Soil Boring Records contain the soil conditions as interpreted by a geotechnical engineer after review of the drillers field logs and soil samples.
6. The Soil Boring Records are a part of the written report. When this information is to be included in bidding or reference documents, the written portion of the report, along with the Soil Boring Records, must be bound together as a separate document or section of the project specifications.

LEGEND


Fill Materials


Topsoil


Brown Lean Clay (CL)


Brown Silty Fine Sand, Some Gravel and occasional Cobbles (SM)


Gray Silt, Fine Sand(SM)

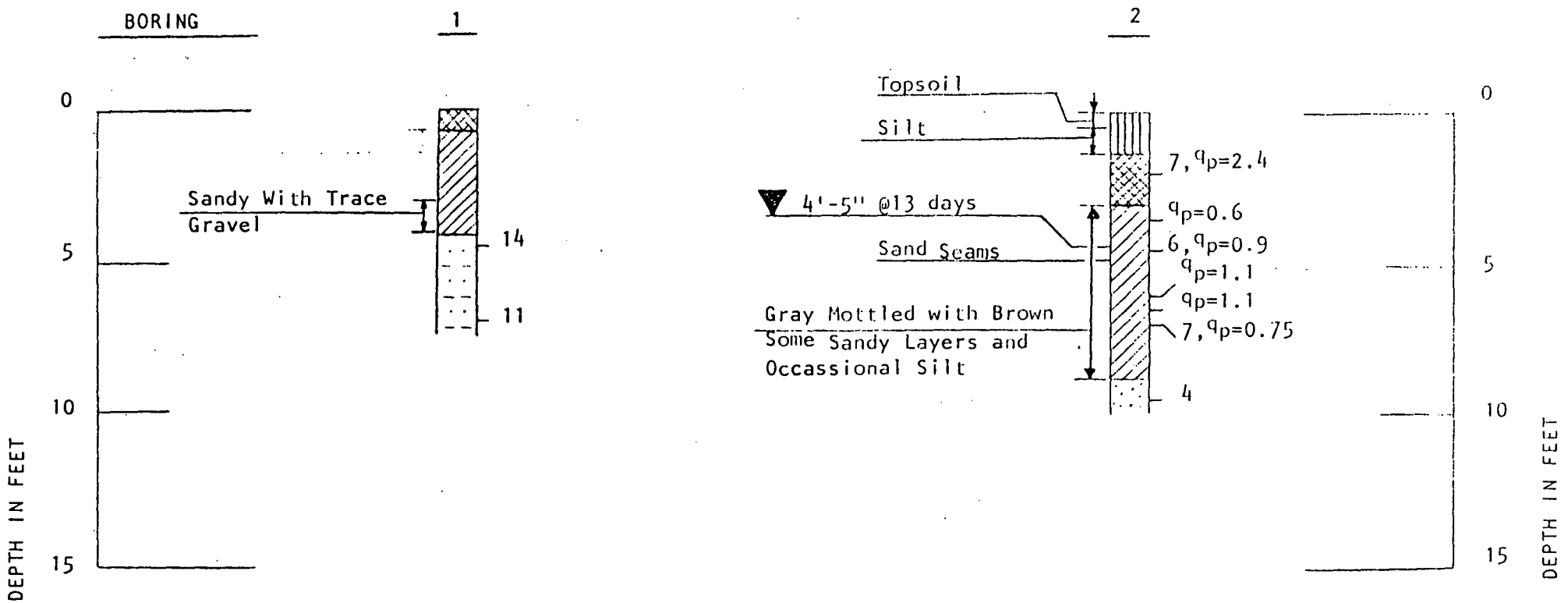

Water Level At Time Shown After Completion Of Boring

q_p = Penetrometer Reading; Tons/Sq.Ft.

SOILS & ENGINEERING SERVICES, INC.
MADISON, WISCONSIN

SOIL BORING RECORD
JUNGBLUTH PROPERTY
MIDDLETON, WISCONSIN

10848-1



For notes and Legend see drawing 10048-4

SOILS & ENGINEERING SERVICES, INC.
MADISON, WISCONSIN

SOIL BORING RECORD
JUNGBLUTH PROPERTY
MIDDLETON, WISCONSIN

10048-5

Appendix B

RMT, INC.

RMT, Inc.
Suite 124
1406 East Washington Ave.
Madison, WI 53703-3009
Phone: 608-255-2134
FAX: 608-255-0234

May 31, 1988

Mr. Raymond Tierney
Department of Natural Resources
SW-3
P.O. Box 7921
Madison, WI 53707

Dear Ray:

I would like to take this opportunity to update you on the drilling progress at Refuse Hideaway. I have included a map showing the revised locations and well identification numbers. As I mentioned to you on the telephone, progress has been slow the past few weeks. The following wells have been completed:

P-21BR	P-23S
P-24D	P-24E
P-25S	P-26S

Boreholes for wells P-27S and P-28S are partially completed.

Every indication is that all the proposed wells will be completed by the July 1, 1988, deadline; but, the well installation requirements of the June 1, 1988, deadline will not be achieved. Two drilling contractors have been on-site in an attempt to complete the ten wells required by the June 1, 1988, deadline. However, there have been numerous delays brought on by equipment breakdowns, difficult drilling, and access problems. I estimate that one of the two drilling rigs was delayed for 5 working days in the past two weeks, and the other was delayed 4.5 days. Some of the specific difficulties encountered are the following:

- One of the two drilling contractors on-site has decided that his equipment is not suitable to handle the difficult drilling and has left the site.

- Drilling equipment has been stuck in three different boreholes in the following locations:

  - A 6-inch percussion bit was broken off in P-28S. This bit is quite expensive and will be necessary for completing some of the remaining borings. Some time has also been lost trying to retrieve the bit.

  - A 4-inch percussion bit is presently stuck in the borehole at P-27S. This bit is still attached to the drill rod, but it will take some time to retrieve it.

1181.05 103:LJV:tierney2

- Casing was broken off in the borehole at P-21BR, and it took a day to retrieve it.

. The drilling rigs have broken down several times. Among the breakdowns were the following:

- The frame to one drilling rig was cracked in two different places and had to be welded.

- The clutch on the drilling mechanism of one rig broke down and had to be repaired.

- The brakes on one rig went out while moving between borings and had to be repaired.

- A pump on one rig broke and had to be repaired.

. Permission had not been granted prior to Friday, May 27, 1988, for drilling the two wells on Randall Swanson's property adjacent to the landfill.

. Personnel changes have been necessary for a variety of reasons, including a death in one driller's family.

While delays have been numerous, they are becoming less frequent because ways are being found to deal with the difficulties of drilling in rock and progress is being made. In addition, we hope to have a second drilling rig on-site within the next two weeks to speed progress.

Please call me if you have any questions.

Sincerely,

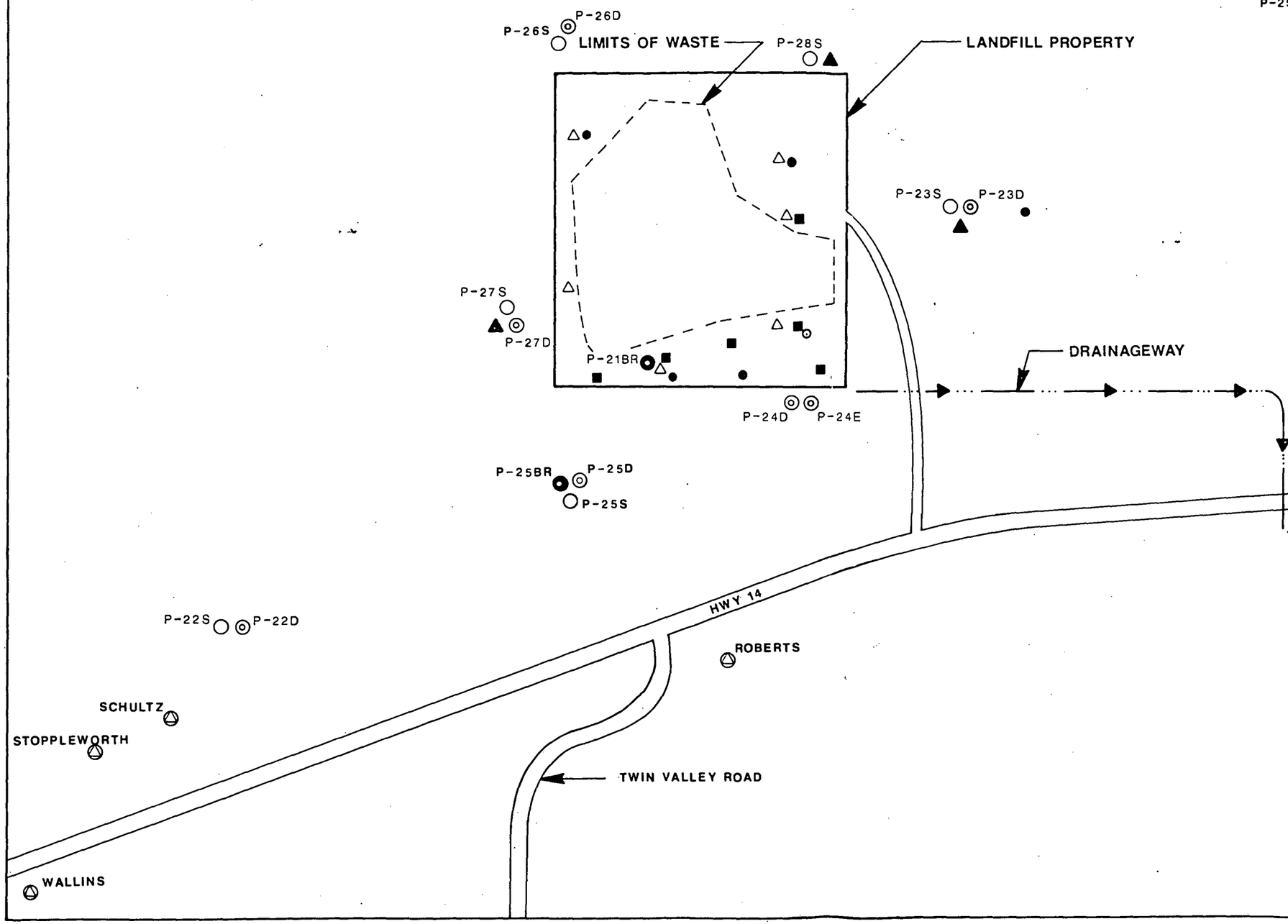
Howard Canfield

Howard Evan Canfield
Project Hydrogeologist

ljv

Enclosure

PROPOSED MONITORING WELL LOCATIONS AT REFUSE HIDEAWAY



LEGEND

- P-25S ○ PROPOSED WATER TABLE WELL
- P-25D ◎ PROPOSED PIEZOMETER
- P-25BR ◉ PROPOSED BEDROCK PIEZOMETER
- ▲ PROPOSED GAS PROBE
- ⏀ PRIVATE WELLS MONITORED
- ● EXISTING WATER TABLE WELLS
- ■ EXISTING MONITORING WELL NEST (2 WELLS)
- ⊙ EXISTING BEDROCK PIEZOMETER
- △ EXISTING GAS PROBES

NOTE: PROPOSED WELL LOCATIONS ARE APPROXIMATE. ACTUAL LOCATIONS WILL BE BASED ON IN-FIELD CONDITIONS AND ACCESSABILITY.

N (APPROXIMATE)

APPROXIMATE SCALE
1 IN. = 500 FT.

RMT INC.
Suite 124
1406 East Washington Ave.
Madison, WI 53703
Phone: 608-255-2134

Dwn. by: GDB | Date: 5/88 | Proj.#: 1181.05

REFUSE HIDEAWAY

Figure 1

Appendix C

REFUSE HIDEAWAY, INC.

LAND FILL

J. W. DE BECK

7182 HIGHWAY 14 • TELEPHONE (608) 836-1071 • MIDDLETON, WISCONSIN 53562

May 31, 1988

DNR
Attn: Bob Selk
3911 Fish Hatchery Rd.
Madison WI 53711

Re: Refuse Hideaway Closing

At the time I signed the consent order, I understood that the clay cap was for covering the top of the landfill rather than the berms.

Secondly, the berms constructed in the past were constructed per the plan which means the berms have 4' to 14' of dirt separator between the outside slope and the rubbish. The slopes are 3/1 and there is established vegetation on the slopes. My viewpoint is that common sense dictates that it is or was unreasonable to think that cover would be required on the berms which already have an average of 9' of dirt and an established vegetation cover.

Also the westerly slope has been completed years ago and vegetation cover is established. Here again I feel that it seems unreasonable to cover up a finished product.

John DeBeck

REFUSE HIDEAWAY
MIDDLETON, WI
JUNE 1, 1988

Existing Conditions, 10 in. root zone

GOOD GRASS

LAYER 1

VERTICAL PERCOLATION LAYER		
THICKNESS	=	6.00 INCHES
EVAPORATION COEFFICIENT	=	3.800 MM/DAY**0.5
POROSITY	=	0.5920 VOL/VOL
FIELD CAPACITY	=	0.5010 VOL/VOL
WILTING POINT	=	0.3780 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.03300000 INCHES/HR

LAYER 2

LATERAL DRAINAGE LAYER		
SLOPE	=	10.00 PERCENT
DRAINAGE LENGTH	=	200.0 FEET
THICKNESS	=	4.00 INCHES
EVAPORATION COEFFICIENT	=	3.100 MM/DAY**0.5
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.4500 VOL/VOL
WILTING POINT	=	0.3600 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.00142000 INCHES/HR

CSP 1/19/89 DHR

LAYER 3

BARRIER SOIL LAYER		
THICKNESS	=	44.00 INCHES
EVAPORATION COEFFICIENT	=	3.100 MM/DAY**0.5
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.4500 VOL/VOL
WILTING POINT	=	0.3600 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.00142000 INCHES/HR

GENERAL SIMULATION DATA

SCS RUNOFF CURVE NUMBER	=	90.00
TOTAL AREA OF COVER	=	462153. SQ. FT
EVAPORATIVE ZONE DEPTH	=	10.00 INCHES
EFFECTIVE EVAPORATION COEFFICIENT	=	3.749 MM/DAY**0.5
UPPER LIMIT VEG. STORAGE	=	5.6320 INCHES
INITIAL VEG. STORAGE	=	4.2570 INCHES

CLIMATOLOGIC DATA FOR MADISON WISCONSIN

MONTHLY MEAN TEMPERATURES, DEGREES FAHRENHEIT

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
18.51	20.89	29.72	42.62	56.16	66.68
71.39	69.01	60.18	47.28	33.74	23.22

MONTHLY MEANS SOLAR RADIATION, LANGLEYS PER DAY

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
139.34	204.42	301.51	404.61	486.09	524.11
508.49	443.42	346.32	243.22	161.74	123.72

LEAF AREA INDEX TABLE

DATE	LAI
1	0.00
117	0.00
135	1.23
152	2.01
170	2.01
187	2.01
205	2.01
223	2.01
240	1.81
258	1.31
275	0.64
293	0.34
366	0.00

GOOD GRASS

WINTER COVER FACTOR = 1.20

****

AVERAGE MONTHLY TOTALS FOR 74 THROUGH 78

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION (INCHES)	1.16	1.22	2.92	3.86	3.72	3.79
	4.92	3.75	2.04	1.66	1.99	1.05
RUNOFF (INCHES)	0.000	0.000	0.416	1.776	0.897	1.175
	1.810	0.481	0.494	0.070	0.250	0.000
EVAPOTRANSPIRATION (INCHES)	0.707	0.920	2.031	2.654	3.441	2.784
	2.977	3.181	1.351	1.290	0.975	0.757
PERCOLATION FROM BASE OF COVER (INCHES)	0.0000	0.0000	0.0504	0.7763	0.1768	0.0000
	0.0301	0.0000	0.0516	0.0476	0.2056	0.0113
DRAINAGE FROM BASE OF COVER (INCHES)	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

AVERAGE ANNUAL TOTALS FOR 74 THROUGH 78

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	32.07	1235258.	100.00
RUNOFF	7.369	283798.	22.97
EVAPOTRANSPIRATION	23.068	888428.	71.92
PERCOLATION FROM BASE OF COVER	1.3498	51984.	4.21
DRAINAGE FROM BASE OF COVER	0.000	0.	0.00

PEAK DAILY VALUES FOR 74 THROUGH 78

	(INCHES)	(CU. FT.)
PRECIPITATION	3.87	149814.6
RUNOFF	2.889	111262.1
PERCOLATION FROM BASE OF COVER	0.0435	1673.9
DRAINAGE FROM BASE OF COVER	0.000	0.0
HEAD ON BASE OF COVER	0.1	
SNOW WATER	3.43	131925.8

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.5520
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.3708

REFUSE HIDEAWAY
MIDDLETON, WI
JUNE 1, 1988

NR 500 conditions, 10 in. rootzone

GOOD GRASS

LAYER 1

VERTICAL PERCOLATION LAYER		
THICKNESS	=	6.00 INCHES
EVAPORATION COEFFICIENT	=	3.800 MM/DAY**0.5
POROSITY	=	0.5920 VOL/VOL
FIELD CAPACITY	=	0.5010 VOL/VOL
WILTING POINT	=	0.3780 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.03300000 INCHES/HR

LAYER 2

LATERAL DRAINAGE LAYER		
SLOPE	=	10.00 PERCENT
DRAINAGE LENGTH	=	200.0 FEET
THICKNESS	=	18.00 INCHES
EVAPORATION COEFFICIENT	=	3.800 MM/DAY**0.5
POROSITY	=	0.5920 VOL/VOL
FIELD CAPACITY	=	0.5010 VOL/VOL
WILTING POINT	=	0.3780 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.01420000 INCHES/HR

✓ DH&R

LAYER 3

BARRIER SOIL LAYER		
THICKNESS	=	24.00 INCHES
EVAPORATION COEFFICIENT	=	3.100 MM/DAY**0.5
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.4500 VOL/VOL
WILTING POINT	=	0.3600 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.00014200 INCHES/HR

GENERAL SIMULATION DATA

SCS RUNOFF CURVE NUMBER	=	90.00
TOTAL AREA OF COVER	=	462153. SQ. FT
EVAPORATIVE ZONE DEPTH	=	10.00 INCHES
EFFECTIVE EVAPORATION COEFFICIENT	=	3.800 MM/DAY**0.5
UPPER LIMIT VEG. STORAGE	=	5.9200 INCHES
INITIAL VEG. STORAGE	=	4.3950 INCHES

CLIMATOLOGIC DATA FOR MADISON WISCONSIN

MONTHLY MEAN TEMPERATURES, DEGREES FAHRENHEIT

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
18.51	20.89	29.72	42.62	56.16	66.68
71.39	69.01	60.18	47.28	33.74	23.22

MONTHLY MEANS SOLAR RADIATION, LANGLEYS PER DAY

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
139.34	204.42	301.51	404.61	486.09	524.11
508.49	443.42	346.32	243.22	161.74	123.72

LEAF AREA INDEX TABLE

DATE	LAI
1	0.00
117	0.00
135	1.23
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187	2.01
205	2.01
223	2.01
240	1.81
258	1.31
275	0.64
293	0.34
366	0.00

GOOD GRASS

WINTER COVER FACTOR = 1.20

****

AVERAGE MONTHLY TOTALS FOR 74 THROUGH 78

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION (INCHES)	1.16	1.22	2.92	3.86	3.72	3.79
	4.92	3.75	2.04	1.66	1.99	1.05
RUNOFF (INCHES)	0.000	0.000	0.282	1.343	0.950	1.174
	1.801	0.479	0.411	0.067	0.246	0.000
EVAPOTRANSPIRATION (INCHES)	0.707	0.920	2.032	2.638	3.633	2.896
	2.958	3.174	1.349	1.335	0.977	0.757
PERCOLATION FROM BASE OF COVER (INCHES)	0.0841	0.0470	0.0310	0.1494	0.1644	0.1545
	0.1545	0.1444	0.1342	0.1352	0.1277	0.1255
DRAINAGE FROM BASE OF COVER (INCHES)	0.001	0.001	0.001	0.013	0.013	0.009
	0.008	0.007	0.006	0.005	0.004	0.004

AVERAGE ANNUAL TOTALS FOR 74 THROUGH 78

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	32.07	1235258.	100.00
RUNOFF	6.754	260101.	21.06
EVAPOTRANSPIRATION	23.376	900261.	72.88
PERCOLATION FROM BASE OF COVER	1.4519	55915.	4.53
DRAINAGE FROM BASE OF COVER	0.072	2764.	0.22

PEAK DAILY VALUES FOR 74 THROUGH 78

	(INCHES)	(CU. FT.)
PRECIPITATION	3.89	149814.6
RUNOFF	2.888	111240.7
PERCOLATION FROM BASE OF COVER	0.0222	854.1
DRAINAGE FROM BASE OF COVER	0.001	54.8
HEAD ON BASE OF COVER	23.5	
SNOW WATER	3.43	131925.8

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.5920
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.3780

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REFUSE HIDEAWAY
MIDDLETON, WI
JUNE 1, 1998

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Existing conditions, 14 in. root zone

GOOD GRASS

LAYER 1

VERTICAL PERCOLATION LAYER		
THICKNESS	=	6.00 INCHES
EVAPORATION COEFFICIENT	=	3.800 MM/DAY**0.5
POROSITY	=	0.5920 VOL/VOL
FIELD CAPACITY	=	0.5010 VOL/VOL
WILTING POINT	=	0.3780 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.03300000 INCHES/HR

LAYER 2

LATERAL DRAINAGE LAYER		
SLOPE	=	10.00 PERCENT
DRAINAGE LENGTH	=	200.0 FEET
THICKNESS	=	8.00 INCHES
EVAPORATION COEFFICIENT	=	3.100 MM/DAY**0.5
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.4500 VOL/VOL
WILTING POINT	=	0.3600 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.00142000 INCHES/HR

VCP 6/1/98 DJK

LAYER 3

BARRIER SOIL LAYER		
THICKNESS	=	40.00 INCHES
EVAPORATION COEFFICIENT	=	3.100 MM/DAY**0.5
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.4500 VOL/VOL
WILTING POINT	=	0.3600 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.00142000 INCHES/HR

GENERAL SIMULATION DATA

SCS RUNOFF CURVE NUMBER	=	90.00
TOTAL AREA OF COVER	=	462153. SQ. FT
EVAPORATIVE ZONE DEPTH	=	14.00 INCHES
EFFECTIVE EVAPORATION COEFFICIENT	=	3.684 MM/DAY**0.5
UPPER LIMIT VEG. STORAGE	=	7.7120 INCHES
INITIAL VEG. STORAGE	=	5.8770 INCHES

CLIMATOLOGIC DATA FOR MADISON WISCONSIN

MONTHLY MEAN TEMPERATURES, DEGREES FAHRENHEIT

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
18.51	20.89	29.72	42.62	56.16	66.68
71.39	69.01	60.18	47.28	33.74	23.22

MONTHLY MEANS SOLAR RADIATION, LANGLEYS PER DAY

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
139.34	204.42	301.51	404.61	486.09	524.11
508.49	443.42	346.32	243.22	161.74	123.72

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240	1.81
258	1.31
275	0.64
293	0.34
366	0.00

GOOD GRASS

WINTER COVER FACTOR = 1.20

****

AVERAGE MONTHLY TOTALS FOR 74 THROUGH 78

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION (INCHES)	1.16	1.22	2.92	3.86	3.72	3.79
	4.92	3.75	2.04	1.66	1.99	1.05
RUNOFF (INCHES)	0.000	0.000	0.369	1.788	0.908	1.134
	1.731	0.470	0.454	0.065	0.249	0.000
EVAPOTRANSPIRATION (INCHES)	0.707	0.920	2.020	2.627	3.794	2.963
	3.044	3.213	1.419	1.314	0.963	0.757
PERCOLATION FROM BASE OF COVER (INCHES)	0.0000	0.0000	0.0046	0.4987	0.2346	0.0000
	0.0000	0.0000	0.0000	0.0053	0.0449	0.0521
DRAINAGE FROM BASE OF COVER (INCHES)	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

AVERAGE ANNUAL TOTALS FOR 74 THROUGH 78

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	32.07	1235258.	100.00
RUNOFF	7.168	276068.	22.35
EVAPOTRANSPIRATION	23.740	914305.	74.02
PERCOLATION FROM BASE OF COVER	0.8403	32362.	2.62
DRAINAGE FROM BASE OF COVER	0.000	0.	0.00

PEAK DAILY VALUES FOR 74 THROUGH 78

	(INCHES)	(CU. FT.)
PRECIPITATION	3.89	149814.6
RUNOFF	2.865	110354.1
PERCOLATION FROM BASE OF COVER	0.0369	1419.6
DRAINAGE FROM BASE OF COVER	0.000	0.0
HEAD ON BASE OF COVER	0.1	
SNOW WATER	3.43	131925.8

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.5385
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.3677

EFUSE HIDEAWAY
IDDLETON, WI
JUNE 1, 1988

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NR 500 Conditions, 14 in. root zone

GOOD GRASS

LAYER 1

VERTICAL PERCOLATION LAYER		
THICKNESS	=	6.00 INCHES
EVAPORATION COEFFICIENT	=	3.800 MM/DAY**0.5
POROSITY	=	0.5920 VOL/VOL
FIELD CAPACITY	=	0.5010 VOL/VOL
WILTING POINT	=	0.3780 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.03300000 INCHES/HR

LAYER 2

LATERAL DRAINAGE LAYER		
SLOPE	=	10.00 PERCENT
DRAINAGE LENGTH	=	200.0 FEET
THICKNESS	=	18.00 INCHES
EVAPORATION COEFFICIENT	=	3.800 MM/DAY**0.5
POROSITY	=	0.5920 VOL/VOL
FIELD CAPACITY	=	0.5010 VOL/VOL
WILTING POINT	=	0.3780 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.01420000 INCHES/HR

JCSP
6/1/88 DJK

LAYER 3

BARRIER SOIL LAYER		
THICKNESS	=	24.00 INCHES
EVAPORATION COEFFICIENT	=	3.100 MM/DAY**0.5
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.4500 VOL/VOL
WILTING POINT	=	0.3600 VOL/VOL
EFFECTIVE HYDRAULIC CONDUCTIVITY	=	0.00014200 INCHES/HR

GENERAL SIMULATION DATA

SCS RUNOFF CURVE NUMBER	=	90.00
TOTAL AREA OF COVER	=	462153. SQ. FT
EVAPORATIVE ZONE DEPTH	=	14.00 INCHES
EFFECTIVE EVAPORATION COEFFICIENT	=	3.800 MM/DAY**0.5
UPPER LIMIT VEG. STORAGE	=	8.2880 INCHES
INITIAL VEG. STORAGE	=	6.1530 INCHES

CLIMATOLOGIC DATA FOR MADISON WISCONSIN

MONTHLY MEAN TEMPERATURES, DEGREES FAHRENHEIT

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
18.51	20.89	29.72	42.62	56.16	66.68
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MONTHLY MEANS SOLAR RADIATION, LANGLEYS PER DAY

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293	0.34
366	0.00

GOOD GRASS

WINTER COVER FACTOR = 1.20

****

AVERAGE MONTHLY TOTALS FOR 74 THROUGH 78

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION (INCHES)	1.16	1.22	2.92	3.86	3.72	3.79
	4.92	3.75	2.04	1.66	1.99	1.05
RUNOFF (INCHES)	0.000	0.000	0.247	1.212	0.952	1.137
	1.717	0.471	0.386	0.061	0.246	0.000
EVAPOTRANSPIRATION (INCHES)	0.707	0.920	2.026	2.630	4.019	3.244
	3.040	3.208	1.418	1.367	0.973	0.757
PERCOLATION FROM BASE OF COVER (INCHES)	0.0000	0.0000	0.0061	0.1223	0.1438	0.1254
	0.0974	0.0869	0.0862	0.0993	0.0920	0.0669
DRAINAGE FROM BASE OF COVER (INCHES)	0.000	0.000	0.000	0.010	0.010	0.006
	0.005	0.004	0.003	0.002	0.001	0.000

AVERAGE ANNUAL TOTALS FOR 74 THROUGH 78

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	32.07	1235258.	100.00
RUNOFF	6.428	247557.	20.04
EVAPOTRANSPIRATION	24.309	936196.	75.79
PERCOLATION FROM BASE OF COVER	0.9262	35670.	2.89
DRAINAGE FROM BASE OF COVER	0.041	1564.	0.13

PEAK DAILY VALUES FOR 74 THROUGH 78

	(INCHES)	(CU. FT.)
PRECIPITATION	3.89	149814.6
RUNOFF	2.865	110323.0
PERCOLATION FROM BASE OF COVER	0.0244	941.1
DRAINAGE FROM BASE OF COVER	0.001	42.1
HEAD ON BASE OF COVER	23.9	
SNOW WATER	3.43	131925.8

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.5920
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.3765