



## American Engineering Testing, Inc.

550 Cleveland Avenue North

St. Paul, Minnesota 55114

Phone: (651) 659-9001

Fax: (651) 659-1379

SUMMARY OF PAVEMENT EVALUATION	
JURISDICTION	PEPIN County
ROAD	CTH D
TERMINI	CTH SS to KLEIN LN

INVENTORY	
LENGTH	1.4 miles PCI 59
SURFACE	AC SURFACE THICKNESS 3 inches
2012 AADT	56 BASE THICKNESS 6 inches
HAUL AADT	127 SOIL TYPE A-6

FRAC SAND MINES			
NAME	BECHEL QUARRY	NAME	ANDERSON QUARRY
ANNUAL TONNAGE	0.5 million tons	ANNUAL TONNAGE	8,000 tons
TRUCK TYPE	QUAD	TRUCK TYPE	QUAD
PAY LOAD	22 tons	PAY LOAD	22 tons
DAILY LANE ESAL	63	DAILY LANE ESAL	1
USE OF SECTION	1.4 miles	USE OF SECTION	1.4 miles

GPR RESULTS			
SURFACE THICKNESS		BASE THICKNESS	
AVERAGE	3.2 inches	AVERAGE	6.5 inches
15TH PERCENTILE	2.9 inches	15TH PERCENTILE	5.6 inches

FWD RESULTS			
EFFECTIVE SN		SPRING LOAD CAPACITY	
AVERAGE	2.4	AVERAGE	9 tons/axle
COEFFICIENT OF VARIATION	6%	COEFFICIENT OF VARIATION	13%
15TH PERCENTILE	2.3	15TH PERCENTILE	7.7 tons/axle

OVERLAY DESIGN (SPRING LOAD RESTRICTION)			
PRESENT TRAFFIC		SAND HAULING	
10 YEAR	0.0 inches	10 YEAR	1.7 inches
20 YEAR	0.0 inches	20 YEAR	2.4 inches

**EXHIBIT**

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SUMMARY OF PAVEMENT EVALUATION					
JURISDICTION	PEPIN County				
ROAD	CTH P				
TERMINI	600' W	to	CTH O		
INVENTORY					
LENGTH	1.7	miles	PCI	95	
SURFACE	AC		SURFACE THICKNESS	3	inches
2012 AADT	955		BASE THICKNESS	6	inches
HAUL AADT	127		SOIL TYPE	A-3	
FRAC SAND MINES					
NAME	BEHEL QUARRY		NAME	ANDERSON QUARRY	
ANNUAL TONNAGE	0.5 million tons		ANNUAL TONNAGE	8,000 tons	
TRUCK TYPE	QUAD		TRUCK TYPE	QUAD	
PAY LOAD	22	tons	PAY LOAD	22	tons
DAILY LANE ESAL	63		DAILY LANE ESAL	1	
USE OF SECTION	1.7	miles	USE OF SECTION	1.7	miles
GPR RESULTS					
SURFACE THICKNESS			BASE THICKNESS		
AVERAGE	3.1	inches	AVERAGE	9.7	inches
15TH PERCENTILE	2.8	inches	15TH PERCENTILE	7.2	inches
FWD RESULTS					
EFFECTIVE SN			SPRING LOAD CAPACITY		
AVERAGE	3.0		AVERAGE	11.3	tons/axle
COEFFICIENT OF VARIATION	5%		COEFFICIENT OF VARIATION	8%	tons/axle
15TH PERCENTILE	2.9		15TH PERCENTILE	10.4	tons/axle
OVERLAY DESIGN (SPRING LOAD RESTRICTION)					
PRESENT TRAFFIC			SAND HAULING		
10 YEAR	0	inches	10 YEAR	0.2	inches
20 YEAR	0.2	inches	20 YEAR	0.7	inches



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SUMMARY OF PAVEMENT EVALUATION			
JURISDICTION	PEPIN County		
ROAD	CTH P		
TERMINI	CTH O	to	CTH N

INVENTORY				
LENGTH	1.5	miles	PCI	95
SURFACE	AC		SURFACE THICKNESS	3 inches
2012 AADT	957		BASE THICKNESS	6 inches
HAUL AADT	127		SOIL TYPE	A-3

FRAC SAND MINES			
NAME	BEHEL QUARRY	NAME	ANDERSON QUARRY
ANNUAL TONNAGE	0.5 million tons	ANNUAL TONNAGE	8,000 tons
TRUCK TYPE	QUAD	TRUCK TYPE	QUAD
PAY LOAD	22 tons	PAY LOAD	22 tons
DAILY LANE ESAL	63	DAILY LANE ESAL	1
USE OF SECTION	1.5 miles	USE OF SECTION	1.50 miles

GPR RESULTS			
SURFACE THICKNESS		BASE THICKNESS	
AVERAGE	3.1 inches	AVERAGE	8.9 inches
15TH PERCENTILE	2.8 inches	15TH PERCENTILE	7.0 inches

FWD RESULTS			
EFFECTIVE SN		SPRING LOAD CAPACITY	
AVERAGE	2.5	AVERAGE	10.6 tons/axle
COEFFICIENT OF VARIATION	6%	COEFFICIENT OF VARIATION	10% tons/axle
15TH PERCENTILE	2.3	15TH PERCENTILE	9.5 tons/axle

OVERLAY DESIGN (SPRING LOAD RESTRICTION)			
PRESENT TRAFFIC		SAND HAULING	
10 YEAR	0 inches	10 YEAR	0.7 inches
20 YEAR	0.7 inches	20 YEAR	1.4 inches



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SUMMARY OF PAVEMENT EVALUATION			
JURISDICTION	PEPIN County		
ROAD	CTH SS		
TERMINI	0.8 MI W	to	CTH D

INVENTORY				
LENGTH	0.9	miles	PCI	82
SURFACE	AC		SURFACE THICKNESS	3 inches
2012 AADT	270		BASE THICKNESS	6 inches
HAUL AADT	127		SOIL TYPE	A-6

FRAC SAND MINES					
NAME	BECHTEL QUARRY		NAME	ANDERSON QUARRY	
ANNUAL TONNAGE	0.5 million tons		ANNUAL TONNAGE	8,000 tons	
TRUCK TYPE	QUAD		TRUCK TYPE	QUAD	
PAY LOAD	22	tons	PAY LOAD	22	tons
DAILY LANE ESAL	63		DAILY LANE ESAL	1	
USE OF SECTION	0.9	miles	USE OF SECTION	0.9	miles

GPR RESULTS				
SURFACE THICKNESS		BASE THICKNESS		
AVERAGE	2.4	inches	AVERAGE	8.0 inches
15TH PERCENTILE	2.2	inches	15TH PERCENTILE	7.0 inches

FWD RESULTS				
EFFECTIVE SN		SPRING LOAD CAPACITY		
AVERAGE	3.0		AVERAGE	12.7 tons/axle
COEFFICIENT OF VARIATION	17%		COEFFICIENT OF VARIATION	36%
15TH PERCENTILE	2.4		15TH PERCENTILE	7.2 tons/axle

OVERLAY DESIGN (SPRING LOAD RESTRICTION)				
PRESENT TRAFFIC		SAND HAULING		
10 YEAR	0.2	inches	10 YEAR	1.4 inches
20 YEAR	1.0	inches	20 YEAR	2.1 inches



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SUMMARY OF PAVEMENT EVALUATION			
JURISDICTION	PEPIN County		
ROAD	CTH SS		
TERMINI	CTH N	to	0.8 MI W

INVENTORY					
LENGTH	0.8	miles	PCI	60	
SURFACE	AC		SURFACE THICKNESS	3	inches
2012 AADT	225		BASE THICKNESS	6	inches
HAUL AADT	127		SOIL TYPE	A-3	

FRAC SAND MINES					
NAME	BECHTEL QUARRY		NAME	ANDERSON QUARRY	
ANNUAL TONNAGE	0.5 million	tons	ANNUAL TONNAGE	8,000	tons
TRUCK TYPE	QUAD		TRUCK TYPE	QUAD	
PAY LOAD	22	tons	PAY LOAD	22	tons
DAILY LANE ESAL	63		DAILY LANE ESAL	1	
USE OF SECTION	0.8	miles	USE OF SECTION	0.8	miles

GPR RESULTS					
SURFACE THICKNESS			BASE THICKNESS		
AVERAGE	3.7	inches	AVERAGE	3.0	inches
15TH PERCENTILE	3.4	inches	15TH PERCENTILE	1.7	inches

FWD RESULTS					
EFFECTIVE SN			SPRING LOAD CAPACITY		
AVERAGE	1.5		AVERAGE	9.4	tons/axle
COEFFICIENT OF VARIATION	23%		COEFFICIENT OF VARIATION	21%	
15TH PERCENTILE	1.2		15TH PERCENTILE	7.5	tons/axle

OVERLAY DESIGN (SPRING LOAD RESTRICTION)					
PRESENT TRAFFIC			SAND HAULING		
10 YEAR	1.8	inches	10 YEAR	3.4	inches
20 YEAR	2.4	inches	20 YEAR	4.1	inches



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JURISDICTION	PEPIN County		
ROAD	CTH N		
TERMINI	CTH P	to	CTH SS

INVENTORY				
LENGTH	2.1	miles	PCI	89
SURFACE	AC		SURFACE THICKNESS	3 inches
2012 AADT	1029		BASE THICKNESS	6 inches
HAUL AADT	127		SOIL TYPE	A-3

FRAC SAND MINES			
NAME	BEHEL QUARRY	NAME	ANDERSON QUARRY
ANNUAL TONNAGE	0.5 million tons	ANNUAL TONNAGE	8,000 tons
TRUCK TYPE	QUAD	TRUCK TYPE	QUAD
PAY LOAD	22 tons	PAY LOAD	22 tons
DAILY LANE ESAL	63	DAILY LANE ESAL	1
USE OF SECTION	2.1 miles	USE OF SECTION	2.1 miles

GPR RESULTS			
SURFACE THICKNESS		BASE THICKNESS	
AVERAGE	3.6 inches	AVERAGE	8.6 inches
15TH PERCENTILE	2.9 inches	15TH PERCENTILE	7.5 inches

FWD RESULTS			
EFFECTIVE SN		SPRING LOAD CAPACITY	
AVERAGE	2.3	AVERAGE	9.3 tons/axle
COEFFICIENT OF VARIATION	6%	COEFFICIENT OF VARIATION	7% tons/axle
15TH PERCENTILE	2.2	15TH PERCENTILE	8.7 tons/axle

OVERLAY DESIGN (SPRING LOAD RESTRICTION)			
PRESENT TRAFFIC		SAND HAULING	
10 YEAR	0.0 inches	10 YEAR	0.7 inches
20 YEAR	0.7 inches	20 YEAR	1.5 inches



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JURISDICTION	PEPIN County		
ROAD	CTH P		
TERMINI	US 10	to	600' W

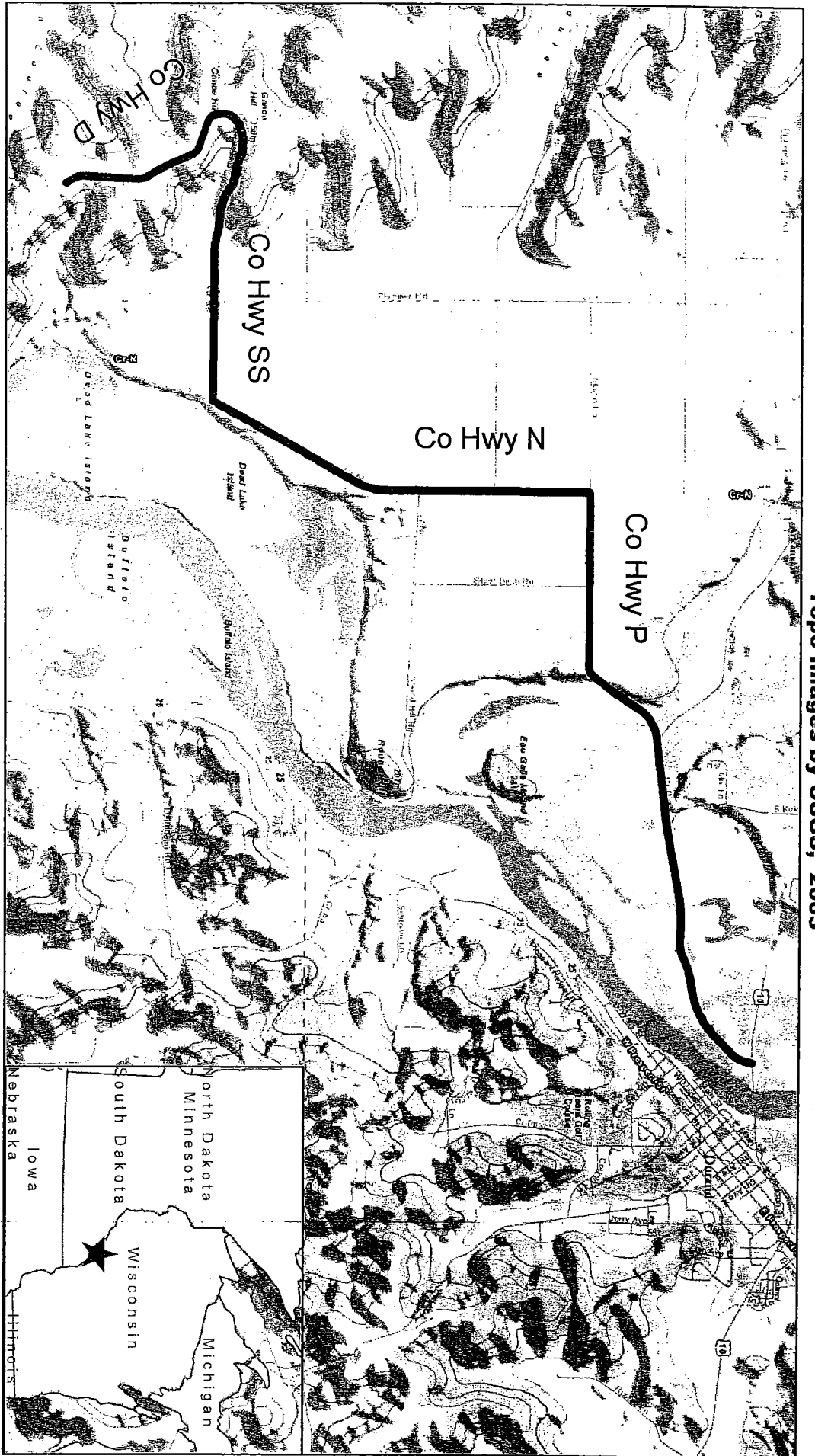
INVENTORY				
LENGTH	600	feet	PCI	99
SURFACE	AC		SURFACE THICKNESS	3 inches
2012 AADT	955		BASE THICKNESS	6 inches
HAUL AADT	127		SOIL TYPE	A-3

FRAC SAND MINES			
NAME	BEHEL QUARRY	NAME	ANDERSON QUARRY
ANNUAL TONNAGE	0.5 million tons	ANNUAL TONNAGE	8,000 tons
TRUCK TYPE	QUAD	TRUCK TYPE	QUAD
PAY LOAD	22 tons	PAY LOAD	22 tons
DAILY LANE ESAL	63	DAILY LANE ESAL	1
USE OF SECTION	600 feet	USE OF SECTION	600 feet

GPR RESULTS			
SURFACE THICKNESS		BASE THICKNESS	
AVERAGE	5.0 inches	AVERAGE	1.7 inches
15TH PERCENTILE	4.6 inches	15TH PERCENTILE	1.1 inches

FWD RESULTS			
EFFECTIVE SN		SPRING LOAD CAPACITY	
AVERAGE	3.1	AVERAGE	14.6 tons/axle
COEFFICIENT OF VARIATION	1%	COEFFICIENT OF VARIATION	1%
15TH PERCENTILE	3.1	15TH PERCENTILE	14.5 tons/axle

OVERLAY DESIGN (SPRING LOAD RESTRICTION)			
PRESENT TRAFFIC		SAND HAULING	
10 YEAR	0.0 inches	10 YEAR	0.0 inches
20 YEAR	0.0 inches	20 YEAR	0.2 inches



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**Legend**

- County Highway



1:47,520



**FIGURE 1**

**Project Location**

Frac Sand Haul Road Project  
Pepin County,  
Wisconsin

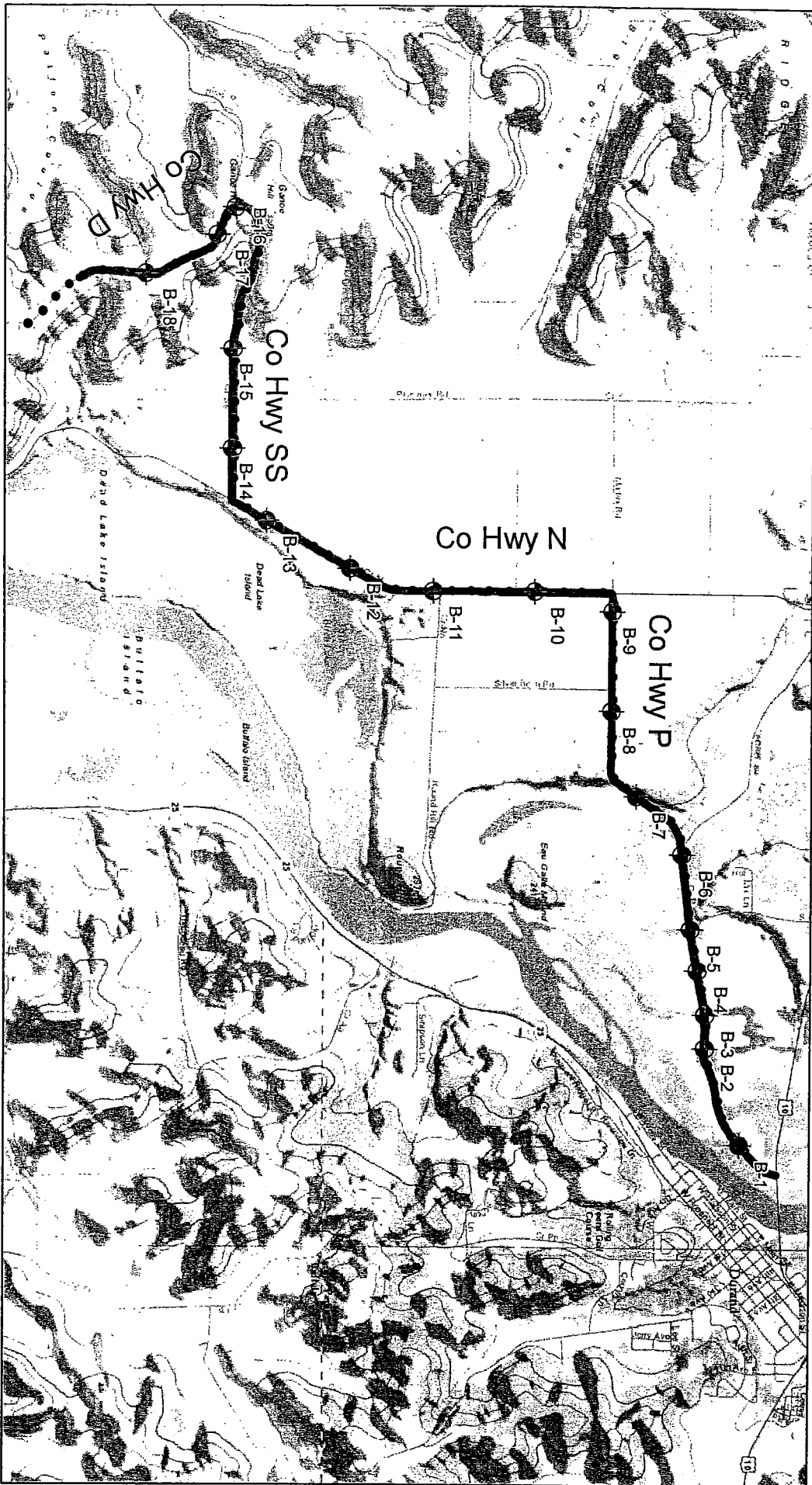
DRAWN BY: DRK

CHECKED BY: CH

DATE: 4/20/2012

AET NO. 28-00500





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ENGINEERING  
TESTING, INC.**

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**Legend**

- Boring Location
- FWD Testing
- GPR Route



1,47,520



**FIGURE 2**

**Testing Locations**

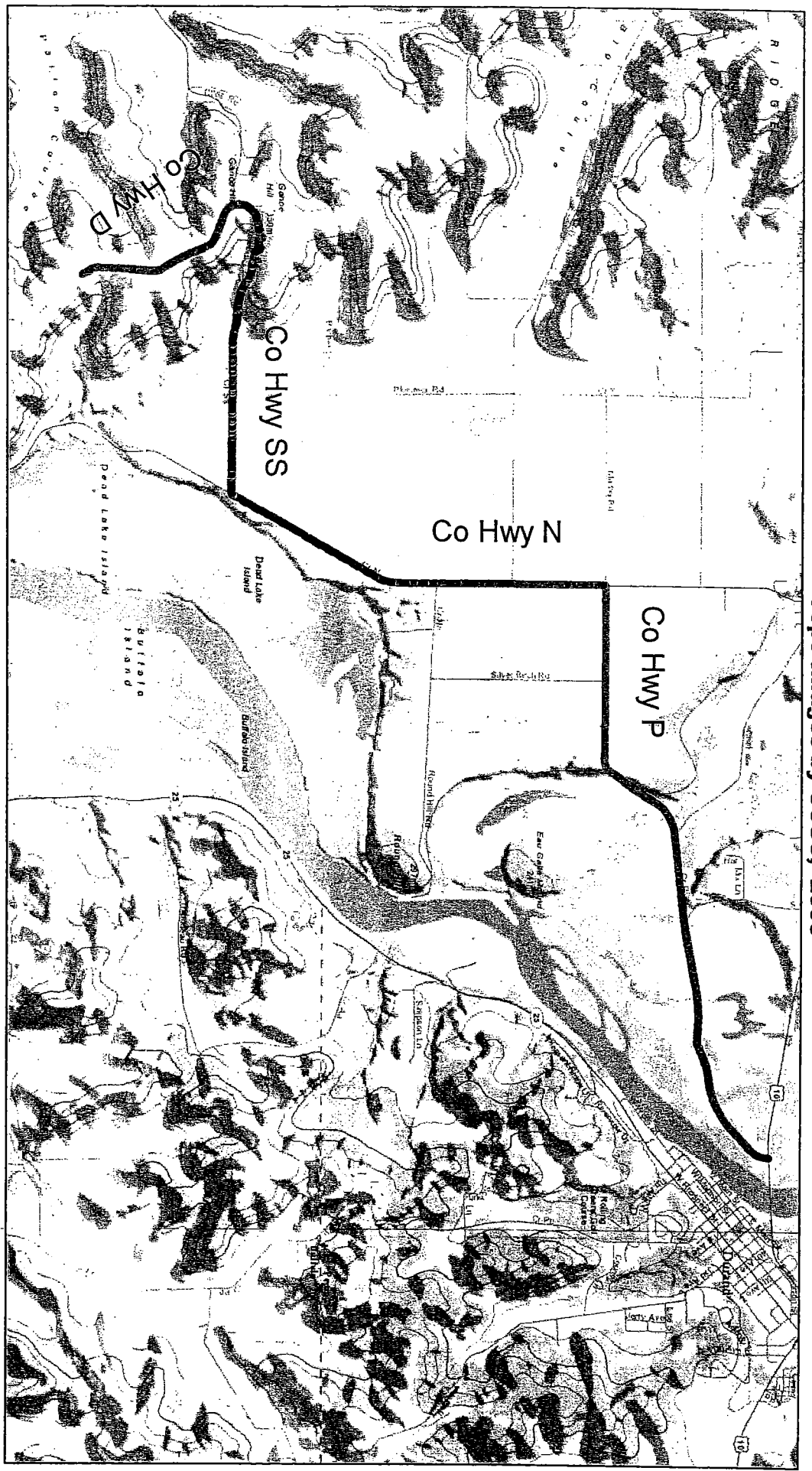
Frac Sand Haul Road Project  
Pepin County,  
Wisconsin

DRAWN BY: DRK

CHECKED BY: CH

DATE: 4/20/2012

AET NO. 28-00500



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- Legend**
- < 2.5 Inches
  - 2.5 - 3.5 Inches
  - > 3.5 Inches



1.47, 520

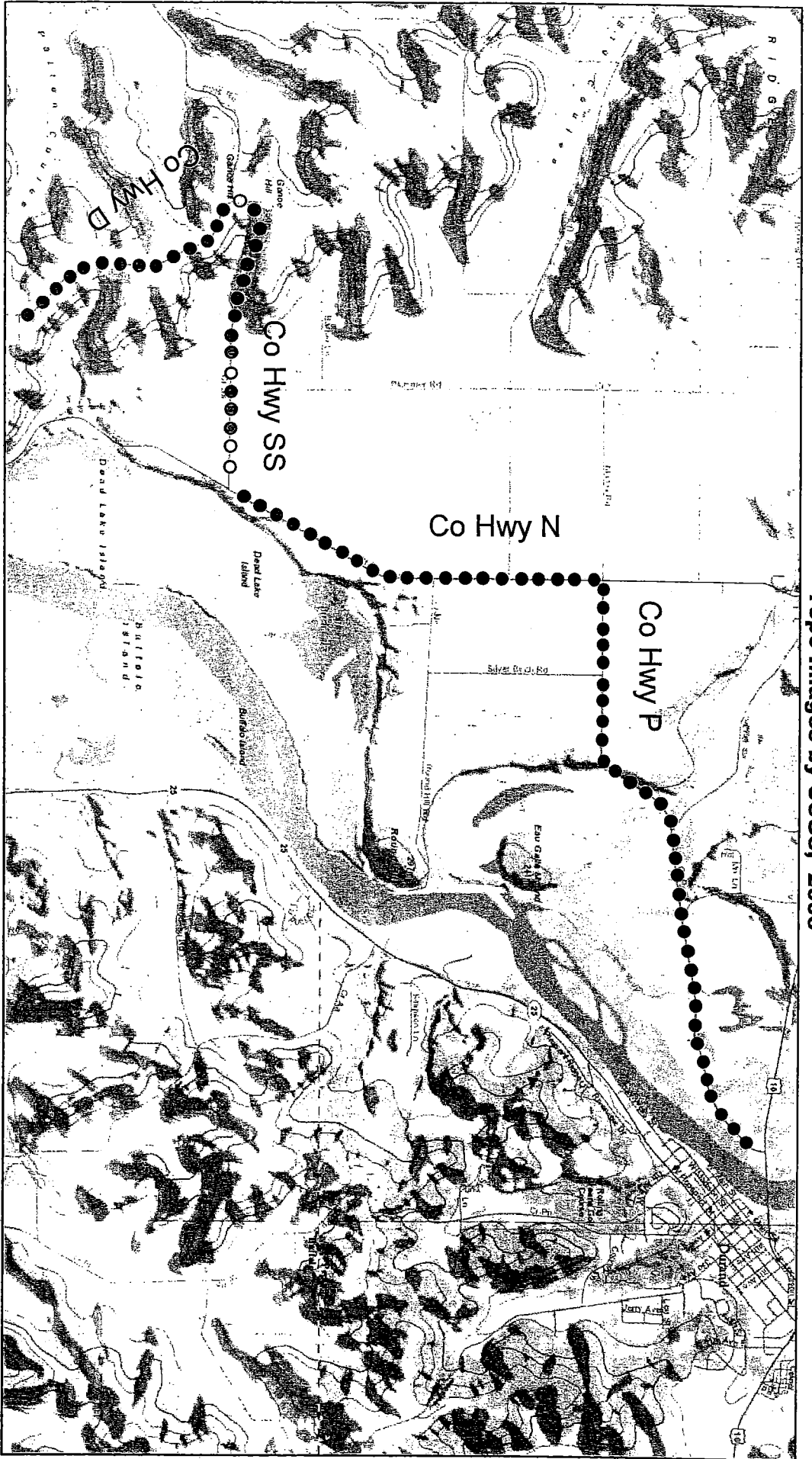


**FIGURE 3**

**Pavement Surface Thickness**

Frac Sand Haul Road Project  
Pepin County,  
Wisconsin

DRAWN BY: DRK	CHECKED BY: CH
DATE: 4/20/2012	AET NO. 28-00500



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**Legend**

**10 Year**

- < 1 Inch
- 1 - 2 Inches
- 2 - 3 Inches
- 3 - 4 Inches
- > 4 Inches



1:47,520



**FIGURE 4**

**Recommended Overlay**

Frac Sand Haul Road Project  
Pepin County,  
Wisconsin

DRAWN BY: DRK

CHECKED BY: CH

DATE: 4/23/2012

AET NO. 28-00500