

APPENDIX H

November 20, 2002 Sight Distance Evaluation



Partners

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November 20, 2002

Paul Doherty
Red Wing Sand & Gravel
675 Leetown Road
P.O. Box 408
Stormville, NY 12582

**RE: Sight Distance Evaluation for the Archer Mine, County Route 56,
Town of Milan, Dutchess County, New York
CME Project 02-111**

Dear Mr. Doherty:

As requested, Creighton Manning Engineering has completed a sight distance evaluation for the proposed driveway to the Archer Mine project site, located on County Route 56 (CR 56 – Turkey Hill Road), in the Town of Milan, Dutchess County, New York. The sight distance evaluation was conducted to determine if adequate intersection sight distance is available to accommodate trucks entering and exiting the site driveway. The following is a summary of this evaluation:

County Route 56 extends in an east-west direction from US Route 9 in the Town of Red Hook to CR 50 at Jackson Corners in the Town of Milan. In the vicinity of the site, CR 56 provides two travel lanes (one lane in each direction) with a posted speed limit of 55 mph. Curve warning signs in the area have advisory speeds of 25 mph to 35 mph. The proposed site driveway is approximately 1,400 feet west of the intersection of CR 56 and Odak Farm Road.

An automatic traffic recorder (ATR) was placed in the vicinity of the proposed site driveway in order to record traffic volumes and speed data. (See Attachment A.) The ATR recorded data from 3:00 PM on Thursday, October 17 to 2:00 PM Tuesday, October 22, 2002. The data collected indicated an average two-way traffic volume of 725 vehicles per day on CR 56. This equates to a daily average of 1 vehicle every 2 minutes, with a peak of approximately 1 vehicle per minute during certain hours of the day. These volumes are generally considered very minor. The ATR also recorded speeds on this section of CR 56. This data indicates that the average speed is approximately 44 mph and the 85th percentile speed is 51 mph. Approximately 95% of the vehicles observed are in compliance with the 55-mph posted speed limit.

Access to the Archer mine project site is currently provided via an existing access road through the site. The proposed site driveway will be located

Engineers, Planners and Surveyors

approximately 60 feet to the west of the existing driveway and provide 25 feet of travel way width, which is adequate to accommodate two-way travel of the material hauling trucks. The planned route of the material hauling trucks is to exit the site driveway, turn right onto CR 56, and proceed west to Route 9. Vehicles arriving to the site will travel east from Route 9 on CR 56 and turn left into the Archer site.

The sight distance evaluation was conducted at the location of the proposed driveway to document the available sight distance from the perspective of a truck driver exiting the site, and turning left into the site from CR 56. The available sight distances are compared to the standards for intersection sight distances, as contained in *A Policy on Geometric Design of Highway and Streets, 2001*, published by the American Association of State Highway and Transportation Officials (AASHTO). Table 1 illustrates the results of this analysis:

Table 1 – Summary of Existing Sight Distances

Movement at CR 56/ Site Driveway Intersection	Available D _L	AASHTO Standard D _L	Available D _R	AASHTO Standard D _R	Available D _S	AASHTO Standard D _S
Left Turn from Site	570'	865'	520'	865'	---	---
Right Turn from Site	570'	790'	---	---	---	---
Left Turn from CR 56	---	---	---	---	1025'	565'

D_L, D_R, D_S = Sight distance looking left and right exiting the site, and straight turning left into site. Improved sight distances are shown in Table 2.

The sight distance analysis indicates that the available distances exiting the site are less than the AASHTO standard for a 51-mph design speed. The available sight distance looking left and right from the proposed site driveway is 570 feet and 520 feet, respectively. The standard sight distance for a truck turning left from the site driveway is 865 feet in each direction and 790 feet if turning right. The available sight distance for a truck turning left from CR 56 into the site is 1,025 feet. This greatly exceeds the AASHTO standard and therefore requires no improvements. Since the proposed hauling route is to Route 9, the critical sight distance is the distance looking left, for a truck turning right from the site driveway. The sight distances looking left and right from the site driveway can be improved with the removal of vegetation and regrading of the embankments along CR 56. The improved sight distance condition is shown in Table 2.

Table 2 – Summary of Improved Sight Distances

Movement at CR 56/ Site Driveway Intersection	Improved D _L	AASHTO Standard D _L	Improved D _R	AASHTO Standard D _R
Left Turn from Site	1010'	865'	730'	865'
Right Turn from Site	1010'	790'	---	---

D_L, D_R, D_S = Sight distance looking left and right exiting the site, and straight turning left into site.

The proposed truck hauling route is to the west from the site, therefore the critical sight distance is looking left from the site driveway. It is recommended that the sight distance looking in this direction be maximized to the extent possible and to provide a minimum of 800 feet. The sight distance looking right from the site driveway can also be improved. Although not a critical distance, it is recommended that this distance also be improved with the clearing of vegetation along CR 56 to the extent possible.

The available sight distances were also compared to the Guide for Intersection Sign Use, Figure 232-1 of the *New York State Codes, Rules, and Regulations* (NYSCR), otherwise known as the Manual on Uniform Traffic Control Devices (MUTCD). The NYSCR recommends that intersection warning signs be used when the available sight distances are considered critically limited. If the sight distance looking left is improved to a minimum of 800 feet, then an intersection warning sign and a "Truck Entrance Ahead" sign on the westbound approach of CR 56 is not required. The available sight distance looking right is close to the critically limited threshold. It is recommended that a warning sign be placed on the eastbound approach of CR 56 if no improvements to the sight distance are completed. Under this condition, the warning sign should be placed approximately 760 feet west of the site driveway. If the sight distance looking right is improved to a minimum of 600 feet, then a warning sign would not be required on the eastbound CR 56 approach.

In conclusion, adequate sight distances can be provided with minor improvements. It is recommended that a minimum of 800 feet of sight distance looking left from the site driveway be provided, and that the sight distance looking right be improved to the extent possible, by removing vegetation along the roadway. With these improvements to the available sight distances, intersection warning signs will not be required and AASHTO sight distance standards will be met or exceeded for the proposed hauling route.

Respectfully submitted,
Creighton Manning Engineering, LLP



Shelly A. Johnston, P.E., P.T.O.E.
Associate



Kenneth Wersted, I.E.
Project Engineer

Attachment

10/22/02
17:04:49

Automatic Traffic Recorder Count

*** Dual Channel Weekly ***

Site ID : p180-02

Info 1 : CR 56 (turkey hill

Info 2 : rd)/ town of milan

Lane 1 : EB, Normal, Prgs Sensor

Lane 9 : WB, Normal, Pres Sensor

Week Starts : Oct 14, 2002 Mon

Week Ends : Oct 20, 2002 Sun

Adj. Factor : 1.00

Hour Starts	Mon 14 1-EB 9-WB	Tue 15 1-EB 9-WB	Wed 16 1-EB 9-WB	Thu 17 1-EB 9-WB	Fri 18 1-EB 9-WB	Weekday Avg 1-EB 9-WB	Sat 19 1-EB 9-WB	Sun 20 1-EB 9-WB	Weekend Avg 1-EB 9-WB	Avg Day 1-EB 9-WB
12am					1 1	1 1	6 2	3 2	5 2	3 2
1					1 1	1 1	3 2	1 0	2 1	2 1
2					0 0	0 0	2 0	2 0	2 0	1 0
3					1 0	1 0	0 0	0 0	0 0	0 0
4					0 0	0 0	0 1	0 0	0 1	0 0
5					1 6	1 6	1 1	1 1	1 1	1 3
6					7 16	7 16	4 6	2 5	3 6	4 9
7					15 39	15 39	5 11	6 10	6 11	9 20
8					16 36	16 36	15 25	4 12	10 19	12 24
9					21 29	21 29	20 32	14 27	17 30	18 29
10					21 24	21 24	25 30	16 28	21 29	21 27
11					14 17	14 17	33 39	29 47	31 43	25 34
12pm					22 16	22 16	28 41	33 31	31 36	28 29
1					36 24	36 24	33 26	34 19	34 23	34 23
2					34 20	34 20	26 25	33 31	30 28	31 25
3				50 26	38 16	44 21	36 20	30 33	33 27	39 24
4				39 30	35 28	37 29	40 26	41 27	41 27	39 28
5				38 30	40 24	39 27	22 19	24 25	23 22	31 25
6				36 28	31 19	34 24	27 22	23 15	25 19	29 21
7				19 15	24 19	22 17	22 16	16 13	19 15	20 16
8				12 8	19 9	16 9	19 9	12 8	16 9	16 9
9				9 2	14 3	12 3	15 8	9 9	12 9	12 6
10				14 0	14 7	14 4	9 4	2 4	6 4	10 4
11				7 0	4 3	6 2	6 1	4 1	5 1	5 1
TOTALS				224 139	409 357	414 365	397 366	339 348	373 363	390 360
		Weekdays:	633 496				Weekend:	736 714	7 Day:	1369 1210

COMBINED TOTALS

12am					2	-2	8	5	7	5
1					2	2	5	1	3	3
2					0	0	2	2	2	1
3					1	1	0	0	0	0
4					0	0	1	0	1	0
5					7	7	2	2	2	4
6					23	23	10	7	9	13
7					54	54	16	16	16	29
8					52	52	40	16	28	36
9					50	50	52	41	47	48
10					45	45	55	44	50	48
11					31	31	72	76	74	60
12pm					38	38	69	64	67	57
1					60	60	59	53	56	57
2					54	54	51	64	58	56
3				76	54	65	56	63	60	62
4				69	63	66	66	68	67	67
5				68	64	66	41	49	45	56
6				64	50	57	49	38	44	50
7				34	43	39	38	29	34	36
8				20	28	24	28	20	24	24
9				11	17	14	23	18	21	17
10				14	21	18	13	6	10	14
11				7	7	7	7	5	6	7
TOTALS				363	766	775	763	687	731	750
		Weekdays:	1129				Weekend:	1450	7 Day:	2579

10/22/02

*** Dual Channel Weekly ***

Site ID : p180-02

Info 1 : CR 56 (turkey hill

Info 2 : rd)/ town of milan

Lane 1 : EB, Normal, Pres Sensor

Lane 9 : WB, Normal, Pres Sensor

Week Starts : Oct 21, 2002 Mon

Week Ends : Oct 27, 2002 Sun

Adj. Factor : 1.00

Hour Starts	Mon 21		Tue 22		Wed 23		Thu 24		Fri 25		Weekday Avg		Sat 26		Sun 27		Weekend Avg		Avg Day	
	1-EB	9-WB	1-EB	9-WB	1-EB	9-WB	1-EB	9-WB	1-EB	9-WB	1-EB	9-WB	1-EB	9-WB	1-EB	9-WB	1-EB	9-WB	1-EB	9-WB
12am	2	0	3	1							3	1							3	1
1	0	0	0	0							0	0							0	0
2	0	0	0	0							0	0							0	0
3	0	0	0	0							1	1							1	1
4	1	0	2	1							1	1							1	1
5	0	6	2	9							1	8							9	15
6	12	18	6	12							9	15							9	15
7	20	35	14	35							17	35							17	35
8	11	33	16	46							14	40							14	40
9	19	18	21	21							20	20							20	20
10	9	19	9	11							9	15							9	15
11	19	20	24	24							22	22							22	22
12pm	16	20	12	19							14	20							14	20
1	17	20	31	14							24	17							24	17
2	26	29									26	29							26	29
3	36	25									36	25							36	25
4	35	23									35	23							35	23
5	32	20									32	20							32	20
6	29	19									29	19							29	19
7	15	12									15	12							15	12
8	11	8									11	8							11	8
9	6	3									6	3							6	3
10	8	0									8	0							8	0
11	1	0									1	0							1	0
TOTALS	325	330	139	194	Weekdays: 464 524						334	334	Weekend:						7 Day: 464	524

COMBINED TOTALS

12am	2	4									3								3	
1	0	0									0								0	
2	0	0									0								0	
3	1	2									2								2	
4	2	1									2								2	
5	6	11									9								9	
6	30	18									24								24	
7	55	49									52								52	
8	44	62									53								53	
9	37	42									40								40	
10	28	20									24								24	
11	39	48									24								24	
12pm	39	48									44								44	
1	36	31									44								44	
2	37	45									44								44	
3	37	45									44								44	
4	55										41								41	
5	55										55								55	
6	61										61								61	
7	58										61								61	
8	58										58								58	
9	52										58								58	
10	48										52								52	
11	27										48								48	
12	19										27								27	
1	19										19								19	
2	9										9								9	
3	9										9								9	
4	8										8								8	
5	8										8								8	
6	1										1								1	
TOTALS	655	333	Weekdays: 988								666		Weekend:						7 Day: 666	988

Special Speed Study Final Report

Site ID : p180-02
 Info 1 : CR 56 (turkey hill
 Info 2 : rd)/ town of milan

Data Starts : 15:00 on 10/17/02
 Data Ends : 13:00 on 10/22/02
 Adj. Factor : 1.000%

Date	Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	Other	Error	Total
		0-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-	80-	85-				
		19.9	24.9	29.9	34.9	39.9	44.9	49.9	54.9	59.9	64.9	69.9	74.9	79.9	84.9	89.9				
Grand Total #1		4	6	21	86	282	673	513	185	46	14	1	2	0	0	0	0	0	0	1833
Percent		0%	0%	1%	5%	15%	37%	28%	10%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	51%
Cum. Percent		0%	0%	1%	6%	21%	58%	86%	96%	99%	99%	99%	100%	0	0	0	0	0	0	15
Average Hour		0	0	0	0	2	5	4	1	0	0	0	0	0	0	0	0	0	0	15
ADT:	369	Avg Speed: 43.9mph				50% Speed: 43.8mph				67% Speed: 46.7mph				85% Speed: 49.7mph						
Grand Total #9		4	3	22	79	248	518	506	255	76	18	5	0	0	0	0	0	0	0	1734
Percent		0%	0%	1%	5%	14%	30%	29%	15%	4%	1%	0%	0%	0%	0%	0%	0%	0%	0%	49%
Cum. Percent		0%	0%	1%	6%	20%	50%	79%	94%	98%	99%	100%	0	0	0	0	0	0	0	14
Average Hour		0	0	0	0	2	4	4	2	0	0	0	0	0	0	0	0	0	0	14
ADT:	349	Avg Speed: 44.9mph				50% Speed: 44.9mph				67% Speed: 47.8mph				85% Speed: 52.0mph						
Combined Total		8	9	43	165	530	1191	1019	440	122	32	6	2	0	0	0	0	0	0	3567
Percent		0%	0%	1%	5%	15%	33%	29%	12%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Cum. Percent		0%	0%	1%	6%	21%	54%	83%	95%	98%	99%	99%	100%	0	0	0	0	0	0	29
Average Hour		0	0	0	1	4	10	8	3	1	0	0	0	0	0	0	0	0	0	29
ADT:	719	Avg Speed: 44.4mph				50% Speed: 44.4mph				67% Speed: 47.2mph				85% Speed: 51.0mph						