APPENDIX G

CUP APPLICATION for the MORGAN FAMILY GRAVEL PIT

Gallatin County

July 2008

Traffic Impact Study, TIS Update & MDT Recommendations

MORRISON MAIERLE, INC.
An Employee-Owned Company

TRAFFIC ASSESSMENT

FOR THE

MORGAN FAMILY, LLC GRAVEL PIT

GALLATIN GATEWAY, MONTANA

February 2008

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MMI Project No. 2850.008.010.0310

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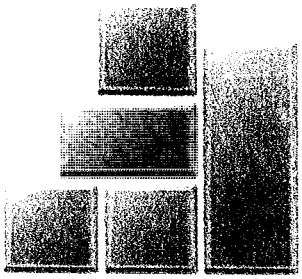
for the

Morgan Family, LLC
Gravel Pit



Morrison Maierle, Inc.

An Employee-Owned Company

INTRODUCTION

This traffic assessment summarizes the potential impacts from the Morgan Family, LLC Gravel Pit proposed to be located in Gallatin Gateway, Montana. The information presented in this report is intended to evaluate the safety and operational aspects of the transportation system in the area of the proposed gravel pit under existing conditions as well as with estimated impacts. Study recommendations and conclusions are intended to provide guidance with respect to the short- and long-term function of the proposed site access and the area transportation system.

PROPOSED DEVELOPMENT

Land Use and Intensity

The proposed Morgan Family, LLC Gravel Pit would encompass an area of approximately 53 acres. As included in the *Opencut Mining Permit Application* that was submitted to the Montana Department of Environmental Quality (DEQ), the proposed mine would be for the excavation of sand and gravel. It is estimated that the maximum depth of mining would be 25 feet, generating an estimated 1,450,000 cubic yards (CY) of material over a 10 year period. For permitting purposes, this is approximately the maximum amount of material that could potentially be generated by the mining operations.

There is an existing residence on the property that will remain in use as long as it does not interfere with the mine operation. It is assumed that the residential use will cease to exist during the life of the mine; however, the current traffic associated with the residence (which is reflected in the current daily traffic volumes) will be included in the traffic assessment of the proposed gravel pit.

Location

The proposed gravel pit is located in Gallatin County, Montana near Gallatin Gateway in the southeast quarter of Section 35, Township 2 South, Range 4 East, Principal Meridian of Montana. Generally, the property is bordered by Gallatin Road (US 191) to the west and agricultural lands to the north, south, and east. The site location is depicted in Figure 1 on the following page.

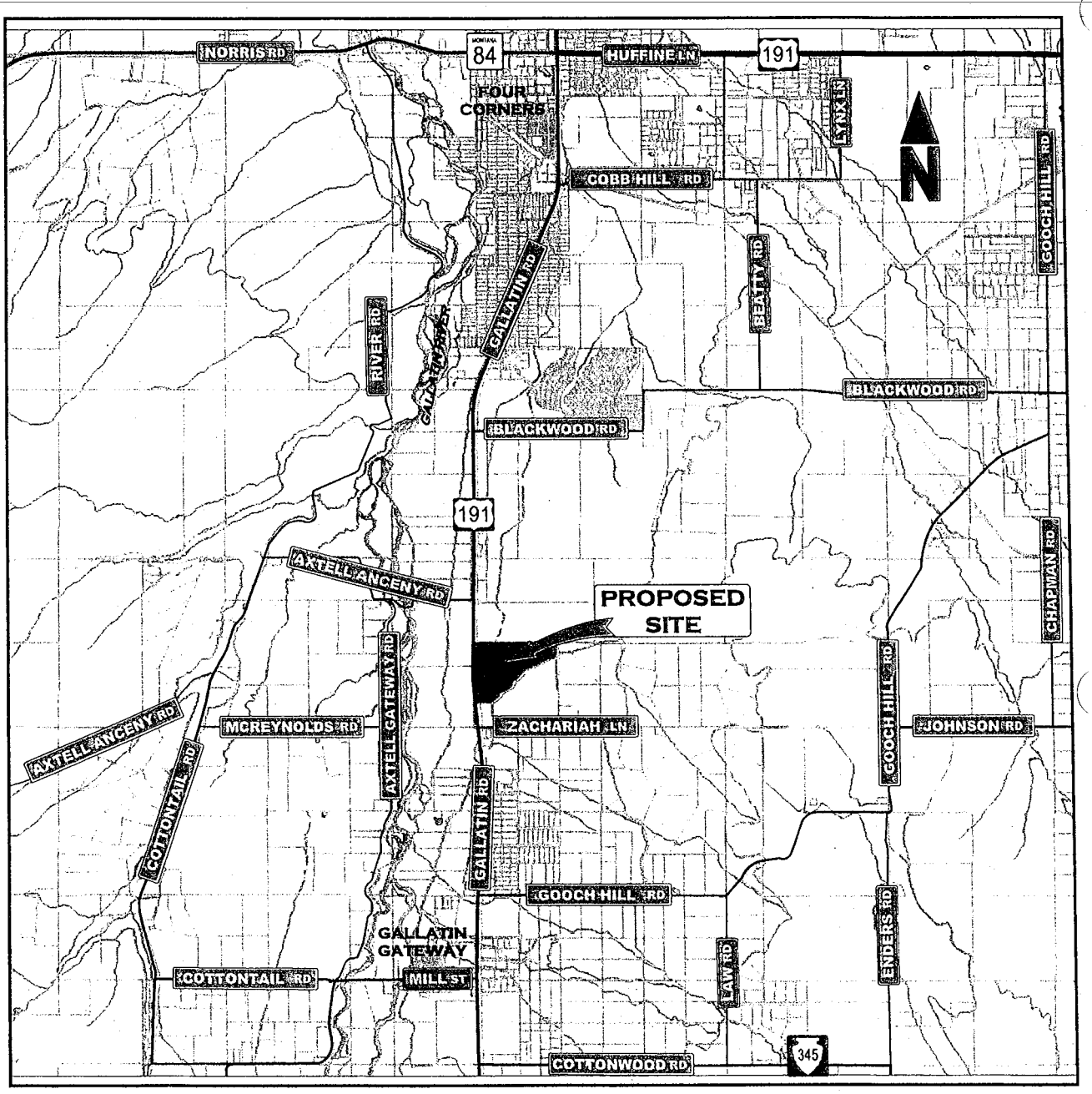


Figure 1 Site Location

Site Plan

As stated previously, the proposed Morgan Family, LLC Gravel Pit would encompass an area of approximately 53 acres. The mine would be served by a single roadway that is proposed to be approximately 24 feet wide. Access would be provided from Gallatin Road (US 191) to the west, which would be designed to accommodate a WB-67 (interstate tractor-semitrailer truck combination having an approximate wheelbase of 65 feet) design vehicle. The roadway would have a paved surface from its intersection with Gallatin Road a distance of approximately 100 feet and would then transition to a gravel surface. The proposed site layout is shown in Figure 2 on the following page.

Zoning

The proposed Morgan Family, LLC Gravel Pit is not currently located within a Gallatin County zoning district. However, the site is located within the proposed Gallatin Gateway Community Planning Area. As noted by the Gallatin County Planning Department, permanent zoning regulations may be enacted for this area in the future upon adoption of a neighborhood plan by the Gallatin County Commission.

Development Horizon

Under the current opencut mining plan as submitted to DEQ, the gravel pit is estimated to operate over the course of the next 10 years. It is proposed to be developed in three phases, with the first phase encompassing approximately 18.43 acres. Phases 2 and 3 would cover an estimated area of 27.30 acres.

EXISTING AREA CONDITIONS

Area of Significant Transportation Impact

The transportation impacts from a development are largely dependant on its location and size as well as the characteristics of the surrounding transportation system. Because the proposed gravel pit will generate a small volume of traffic (<100 peak hour trips), this assessment will focus on the function of the proposed site access to Gallatin Road.

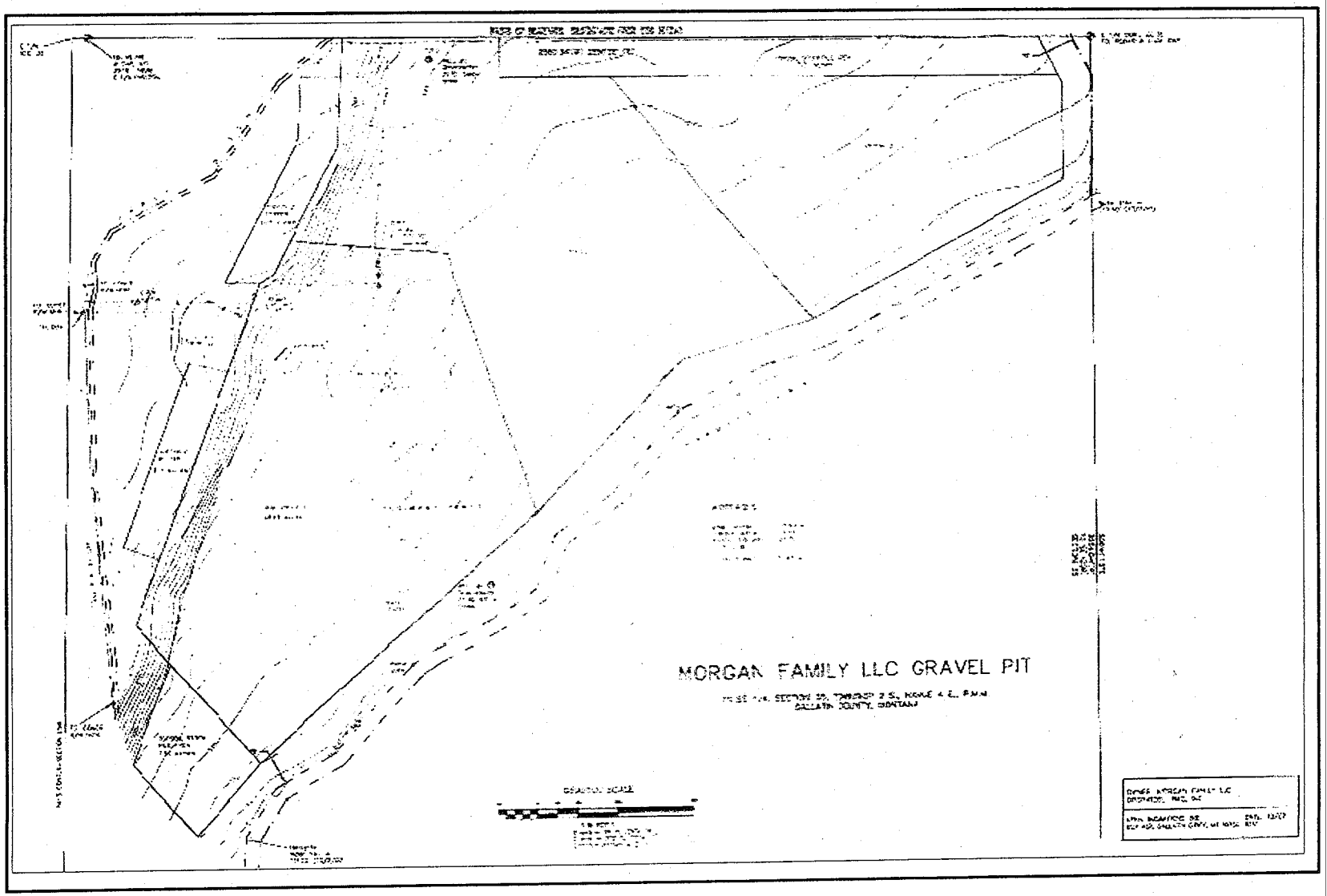


Figure 2 Site Layout

Site Accessibility

Area Roadway System

The development could have potential impacts to Gallatin Road (US 191) at its intersection with the proposed site access. Gallatin Road is a National Highway System (NHS) route (N-50) and is under the jurisdiction of the Montana Department of Transportation (MDT). It is classified as a principal arterial roadway by the *Greater Bozeman Area Transportation Plan Year 2001 Update* (Robert Peccia & Associates, June 2001) and a rural principal arterial under the MDT classification system. It serves as a major commuter route between Big Sky, Gallatin Gateway, and Bozeman. This route is used by recreational and tourism related traffic for access to Yellowstone National Park and freight transportation for access to Big Sky and West Yellowstone, Montana and areas south in Idaho, Wyoming, and Utah. Gallatin Road is currently a two-lane paved roadway adjacent to the site, having approximately 12-foot wide travel lanes in each direction. The posted speed limit adjacent to the site is 70 miles per hour (mph) during the day and 65 mph at night for passenger vehicles and 60 mph during the day and 55 mph at night for trucks.

The intersection of Gallatin Road and the existing residential access currently functions as a two-way stop controlled intersection with stop control on the access approach. This access is proposed to remain in use, having the same functionality with widening to accommodate truck traffic.

Traffic Volumes

Intersection turning movement counts were conducted at the intersection of Gallatin Road and the existing residential access by Morrison-Maierle, Inc. on January 24, 2008. The counts found total entering volumes of 705 and 978 vehicles during the AM and PM peak hours, respectively. The peak hours were found to occur between 7:45 and 8:45 a.m. and 4:45 and 5:45 p.m. The count data was adjusted for monthly variations using count factors generated by MDT for 2007 count data. Count factors for 2008 counts were not available at the time of this assessment. The count data is summarized in Figure 3 on the following page.

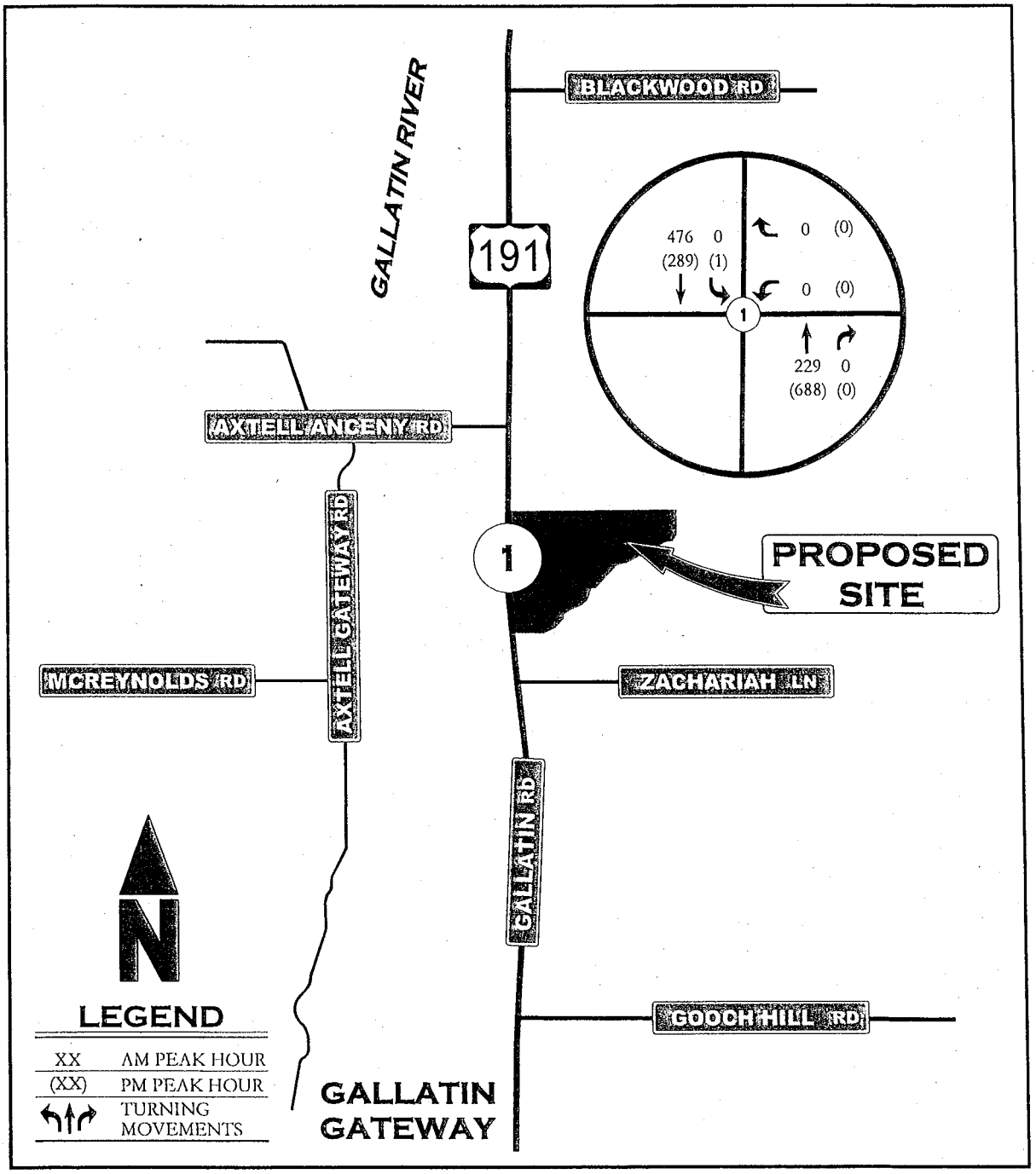


Figure 3 Current Daily Traffic Volumes

PROJECTED TRAFFIC

Site Traffic

Trip Generation

One of the most important elements in assessing the traffic impacts associated with a new development is an accurate estimate of the traffic to be generated. There are a number of options available for estimating trip generation. *Trip Generation, 7th Edition* published by the Institute of Transportation Engineers (ITE) does not provide trip generation data for a quarry, gravel pit, or other similar land use. Therefore, it was necessary to utilize alternative methods for determining the estimated site trip generation.

In order to develop a representative average of the truck trip generation for a gravel pit, this assessment evaluated a traffic impact study completed by the Crane Transportation Group (CTG) from San Francisco, California. CTG completed a traffic analysis for the Blue Rock and Canyon Rock Quarries in the County of Sonoma, California. CTG's analyses evaluated truck trip generation based on the annual production of the quarries. A representative portion of the annual extraction volume occurred during the month of October, which was the peak month of activity. Using this as the baseline and assuming that 14.2 CY of material was hauled by each truck, the data was analyzed for annual, monthly, weekly, and weekday variations to arrive at an average daily number of truck trips. Morrison-Maierle, Inc.'s analyses further determined an average weekday truck trip generation rate of 0.65 truck trips (Blue Rock Quarry) and 0.99 truck trips (Canyon Rock Quarry) per 1,000 CY of material extracted annually.

Kenai Engineering, Inc. provided truck load data for the Nuss Pit in Gallatin Gateway, Montana. This data included the total cubic yards of material hauled from the gravel pit on a monthly basis from October 2006 to September 2007. Similarly to CTG's study, the Nuss Pit data was analyzed and an average weekday truck trip generation rate of 0.76 truck trips per 1,000 CY of material extracted annually. An average of the rates from the three quarries determined a 90% confidence level truck average weekday truck trip generation rate of 0.97 truck trips per 1,000 CY of material extracted annually.

In order to determine trip generation during the AM and PM peak hours, it was necessary to evaluate the hourly traffic variations of the quarries during their hours of operation. Hourly data for the Nuss Pit was not available; however, data collected by Engineering, Inc. in September 2005 for the JTL-Belgrade Pit (Knife River Corporation) access in Belgrade, Montana was available. Analyzing data from the three sites, it was determined that AM peak hour trips represent approximately eight percent (8%) of the average weekday trips. PM peak hour trips represent an estimated six percent (6%) of the average weekday trips.

It is not estimated that customer traffic will represent a significant portion of the trip making characteristics of a gravel pit. However, employee related trips will comprise a portion of the gravel pit traffic. A maximum of seven (7) employees is estimated for the proposed Morgan Family, LLC Gravel Pit as provided in data from Kenai Engineering, Inc. Using assumed values of 1.3 employees per vehicle and three (3) trips per vehicle, employees are estimated to make 16 average weekday trips to and from the proposed Morgan Family, LLC Gravel Pit. It should be noted that the estimated number of employee trips is unique to this site and will vary from quarry to quarry depending on its employment characteristics. Detailed analyses of the trip generation rate determination and the trip generation calculations are provided in Appendix B. The estimated trip generation for the proposed gravel pit is summarized in the table below.

Table 1 Estimated Site Traffic Generation

Land Use	Units	Average Weekday			AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Gravel Pit	145	79	78	157	7	6	13	6	4	10
Totals	**145**	**79**	**78**	**157**	**7**	**6**	**13**	**6**	**4**	**10**

Trip Distribution

The estimated traffic generated by the development must be distributed and assigned in order to analyze the impacts on the roadway system and intersections within the study area. Various methods are available for estimating trip distribution, including the analogy, trip distribution model, area of influence, origin-destination (O-D), and surrogate data methods. This study utilizes the analogy method, which bases the trip distribution on existing travel patterns in the area. The trip distributions for the proposed gravel pit are shown in Figures 4 and 5 on the following page.

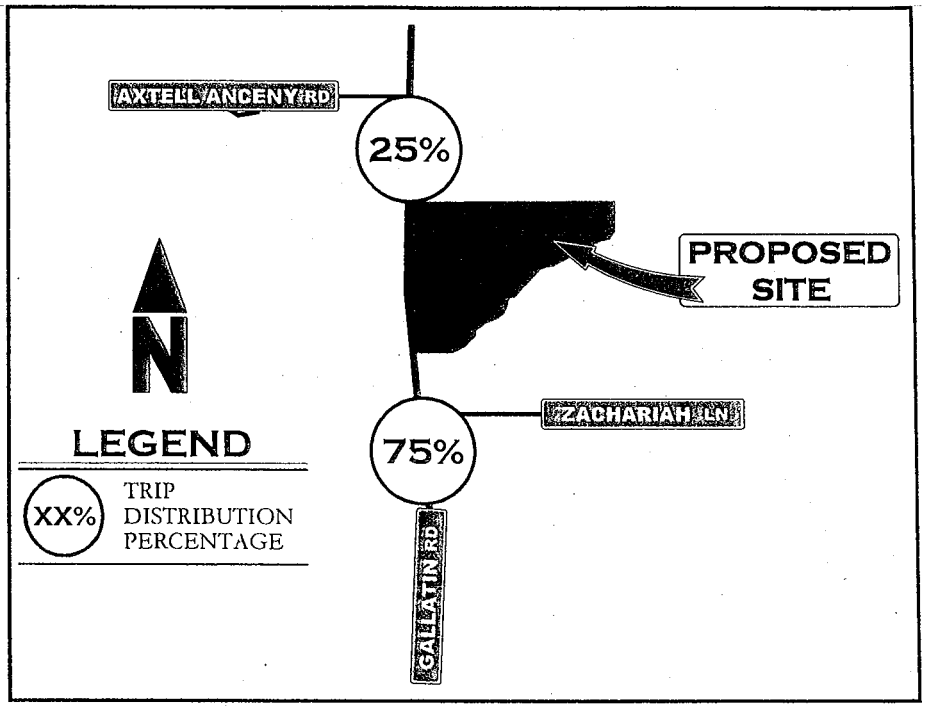


Figure 4 Directional Distribution of Site Truck Traffic

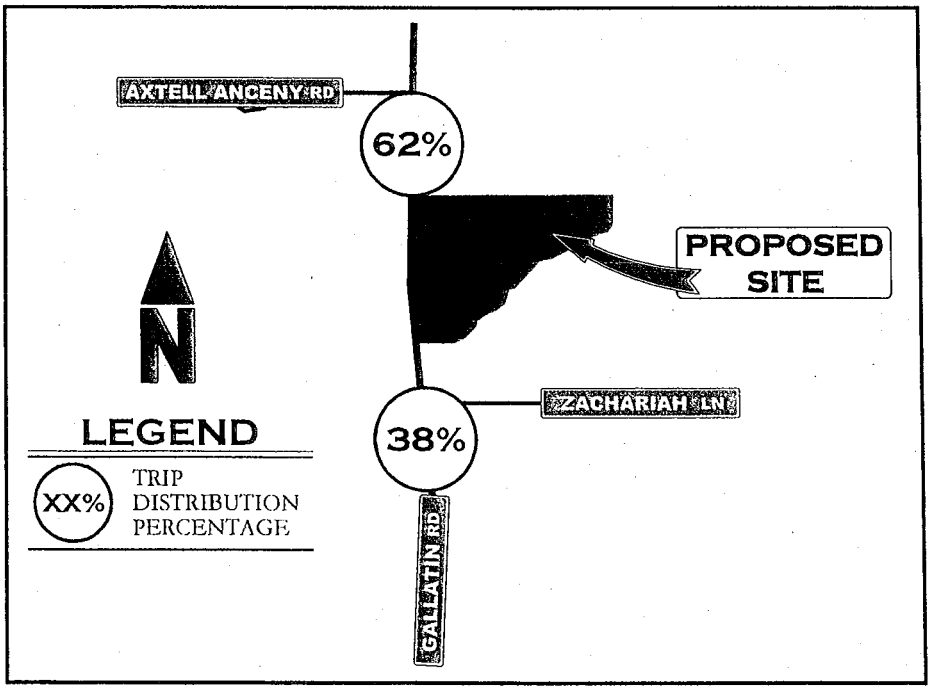


Figure 5 Directional Distribution of Site Employee Traffic

Trip Assignment

The assignment of development related traffic provides the information necessary to determine the level of site related impacts to the area roadway system and intersections. It involves determining the volume of traffic and its movements along the roadway system and at area intersections. At a minimum, trip assignment must also consider route choice, how the existing transportation system functions, and travel times to and from the site. The resulting Morgan Family, LLC Gravel Pit site traffic assignment is shown in Figure 6.

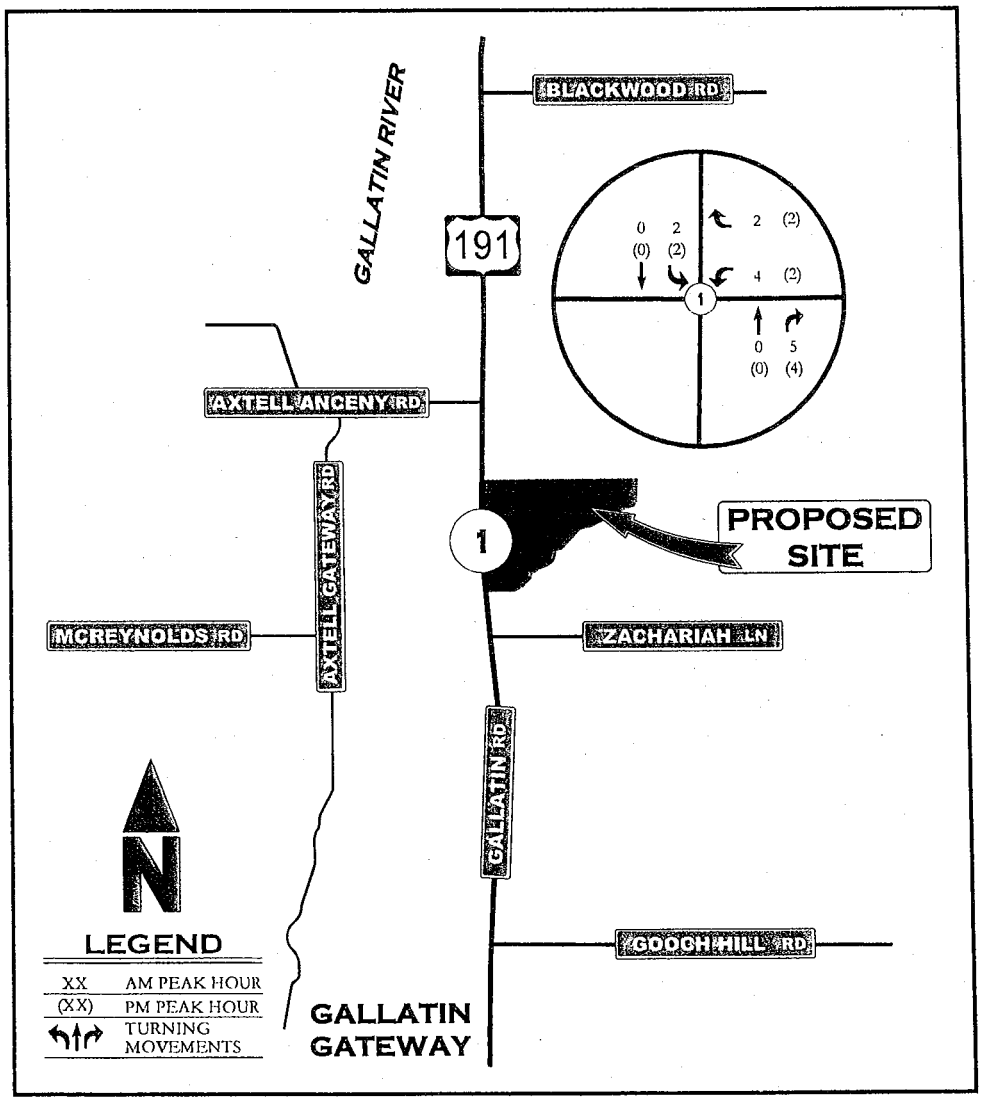


Figure 6 Site Traffic

Total Traffic

Site-generated traffic is combined with existing traffic to establish the total traffic volumes that will be used in the analyses of intersection operations at the site access. The total estimated traffic at the study intersection is shown in Figure 7.

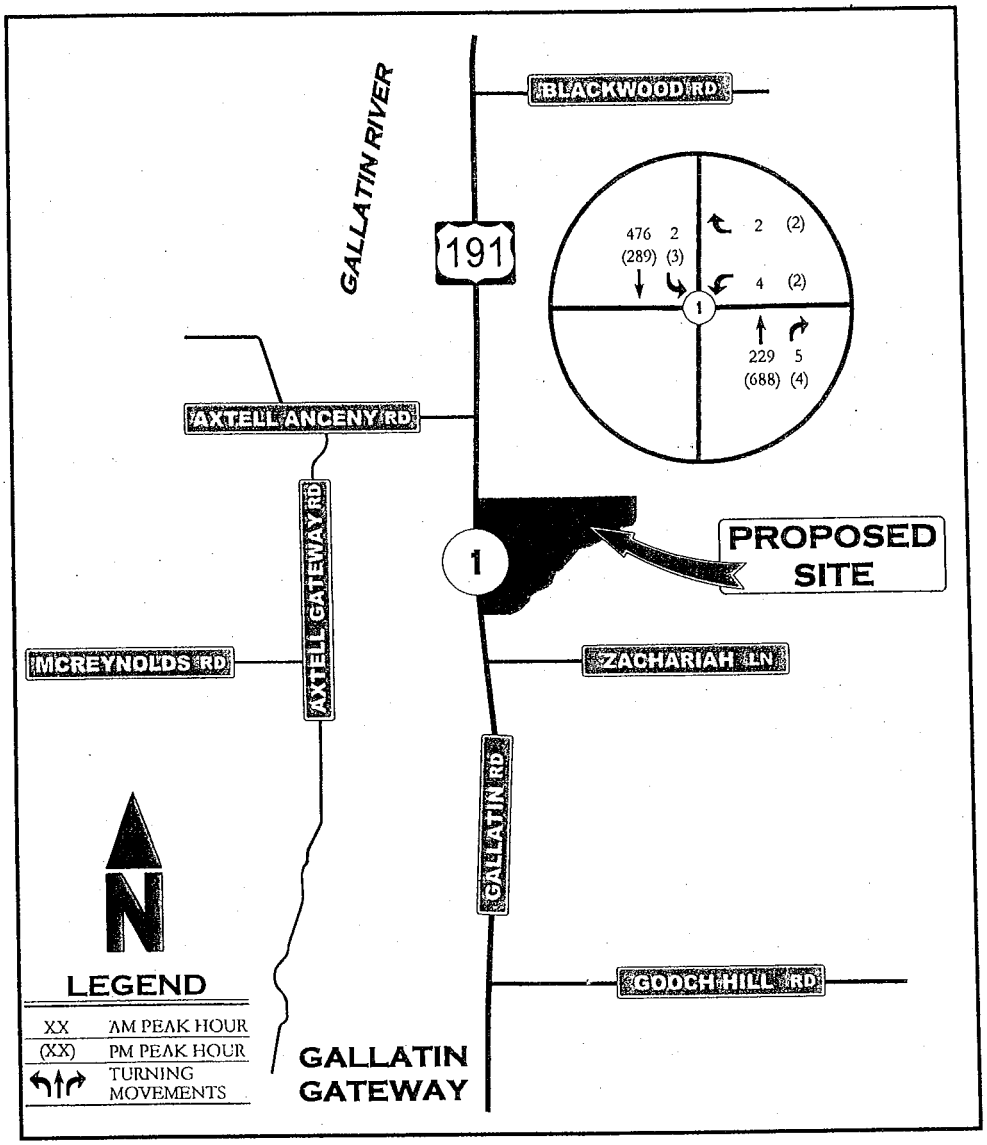


Figure 7 Total Traffic

TRANSPORTATION ANALYSIS

Capacity and Level of Service

Two-way stop control capacity and level of service analyses were performed for both existing conditions and with the addition of site generated traffic at the intersection of Gallatin Road with the proposed site access using *Highway Capacity Software Plus, Version 5.21* (HCS+) developed and maintained by the McTrans Center at the University of Florida. The stop controlled intersection analyses are based on Chapter 17 of HCM 2000. Level of service (LOS) is the performance measure used to evaluate the cumulative effects of such things as travel speed, traffic volume, roadway and intersection geometry, and traffic interruptions. Operating conditions are designated as "LOS A" through "LOS F", which represents the most favorable to the least favorable operating conditions. The results of the capacity and level of services analyses are summarized in Table 2.

Table 2 Intersection Operations Summary

Intersection	Approach	AM Peak Hour			PM Peak Hour		
		Approach LOS	Delay (s/veh)	95% Queue Length (veh)	Approach LOS	Delay (s/veh)	95%Queue Length (veh)
Gallatin Road (US 191) & Site Access (Existing)	WB	No Vehicles Observed			No Vehicles Observed		
	NB	A	-	-	A	-	-
	SB	A	7.7	0.00	A	9.1	0.00
Gallatin Road (US 191) & Site Access (w/ Site)	WB	C	15.7	0.05	C	21.2	0.05
	NB	A	-	-	A	-	-
	SB	A	8.8	0.01	B	11.1	0.02

Site Access

The site access was evaluated for sight distance, approach geometry, and queue storage requirements. Sight distance is and would be acceptable at the proposed access. The level terrain in the area does not present any sight obstructions due to changes in grade, and there are no sight obstructions resulting from vegetation or other fixed objects adjacent to the roadway.

Because a majority of site generated traffic from the proposed gravel pit will consist of trucks, access to Gallatin Road would need to be designed to accommodate a WB-67 design vehicle. The proposed approach geometry is shown graphically in Figure 8 on the following page.

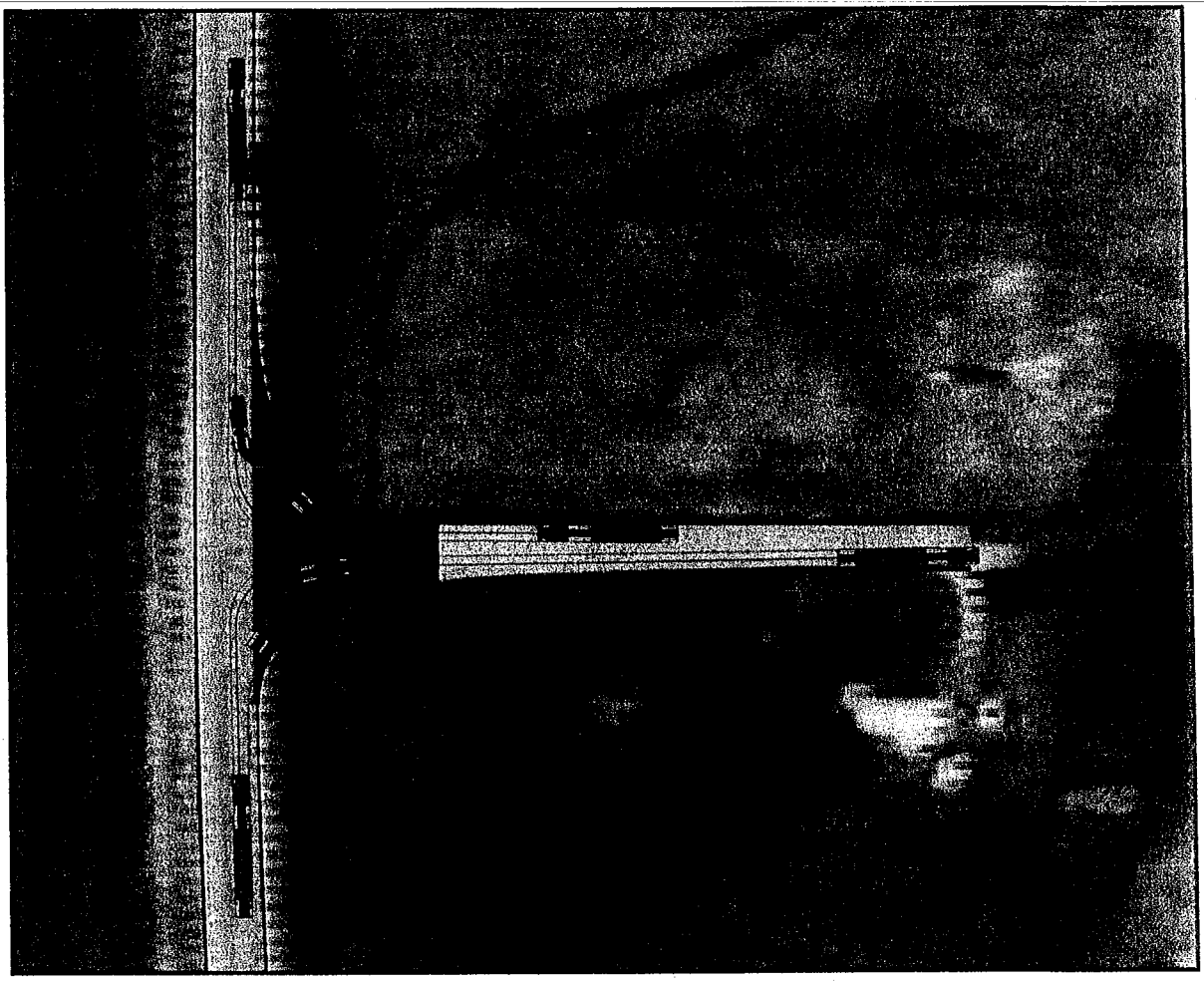


Figure 8 Proposed Site Access Geometry with WB-67 Design Vehicle

The site access was also evaluated for the need to include auxiliary turn lanes on Gallatin Road (US 191) to accommodate the estimated site traffic. A right-turn lane would not be justified because the estimated right-turn volume is less than absolute recommended minimum of 40 vehicles per hour as provided in Figure 13.3A of the MDT *Road Design Manual* (June 2006). An auxiliary left-turn lane is not recommended at this time for the following reasons: (1) The left turns during the AM and PM peak hours represent 0.42% and 1.03%, respectively, of the advancing volume on each approach, (2) the approaches would function at acceptable levels of service with the addition of site related traffic, and (3) there is more than adequate sight distance for vehicles approaching the intersection from the north or the south.

FINDINGS

Transportation Impacts

Based on the analyses included with this study, the addition of site generated traffic would have minimal impact to the area transportation system. The intersection of Gallatin Road and the site access would function at acceptable levels of service during both the AM and PM peak hours. Having adequate sight distance and relatively low site generated traffic, auxiliary turn lanes are not justified at this time. Therefore, no additional improvements would be necessary at the intersection.

Compliance with Applicable Local Codes

MDT requires that approach permits be obtained for access to state maintained highways and roadways. The proposed access is subject to review and approval (for both location and design) by MDT.

CONCLUSIONS AND RECOMMENDATIONS

Having no significant development related traffic impacts, the proposed Morgan Family, LLC Gravel Pit would not require any specific improvements to mitigate any traffic related impacts. The proposed access should be designed to accommodate a WB-67 design vehicle, and all traffic control improvements should be installed in accordance with MDT standards and the MUTCD.

REFERENCES

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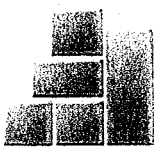
APPENDIX A

TRAFFIC COUNT DATA



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INTERSECTION TURNING MOVEMENT COUNT SUMMARY

Intersection:	Gallatin Road (US 191) & Morgan Family, LLC Gravel Pit Access
Location:	Gallatin County, Montana
Date Count Performed:	1/24/2008
Count Time Period:	AM Peak Period
Seasonal Adjustment Factor:	1.15

Street/ Road	Movement	Start Time 7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	Total	Approach %	Total %	Peak Hour Volume	PHF
Gravel Pit Access From the East	L	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	T	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	R	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	Ped	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	L													
	T													
	R													
	Ped													
Gallatin Road From the North	L	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	T	114	98	85	98	123	123	132	101	874	100.00%	66.90%	476	0.90
	R	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	Ped	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
Gallatin Road From the South	L	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	T	38	61	61	60	63	58	48	44	432	100.00%	33.10%	229	0.90
	R	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	Ped	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
Intersection Totals		152	159	146	158	186	181	181	145	1306		100.00%	705	0.95
Hourly Volume					614	649	670	705	692					

Printed On: 2/1/2008

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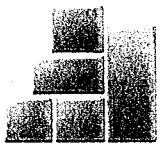
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

Intersection:	Gallatin Road (US 191) & Morgan Family, LLC Gravel Pit Access
Location:	Gallatin County, Montana
Date Count Performed:	1/24/2008
Count Time Period:	PM Peak Period
Seasonal Adjustment Factor:	1.15

Street/ Road	Movement	Start Time 4:00	4:15	4:30	4:45	5:00	5:15	5:30	5:45	Total	Approach %	Total %	Peak Hour Volume	PHF
Gravel Pit Access From the East	L	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	T	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	R	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	Ped	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	L													
	T													
	R													
	Ped													
Gallatin Road From the North	L	0	0	0	1	0	0	0	0	1	0.20%	0.07%	1	0.25
	T	83	75	66	67	77	66	79	58	569	99.80%	32.82%	289	0.91
	R	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	Ped	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
Gallatin Road From the South	L	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	T	101	114	124	148	184	177	178	137	1164	100.00%	67.11%	688	0.93
	R	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
	Ped	0	0	0	0	0	0	0	0	0	0.00%	0.00%	0	0.00
Intersection Totals		184	189	190	216	261	243	258	194	1734		100.00%	978	0.94
Hourly Volume					779	856	910	978	956					

APPENDIX B

TRIP GENERATION DATA



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Truck Trip Generation

Blue Rock Quarry - Sonoma County, California

As provided in *Blue Rock Quarry Expansion: Draft Environmental Impact Report* prepared by Leonard Charles and Associates with contributions from the Crane Transportation Group (CTG) dated August 2005.

Determine Yearly Truck Trips		
Average Volume of Excavated Material Hauled from Quarry Annually	114,603 CY	
Estimated Average Annual Truck Traffic *(Assuming 14.2 CY/Truck and each truck that leaves the quarry must also return.)*	8,071	Trucks Entering
	8,071	Trucks Exiting
Determine Monthly Truck Trips		
Truck Trips During the Month of October *(Peak activity month at Blue Rock Quarry based on year 2000 sales. Monthly truck trips determined to be approximately 8.76% of yearly volumes. Again, each truck that leaves the quarry must also return.)*	707	Trucks Entering
	707	Trucks Exiting
Determine Weekly Truck Trips		
Weekly Truck Trips During October *(The month of October has a total of 31 days. Based on seven days per week there would be 4.4 weeks.)*	160	Trucks Entering
	160	Trucks Exiting
Determine Daily Truck Trips		
Daily Truck Trips on Peak Weekday *(The peak day for the Blue Rock Quarry was found to occur on Wednesday. Wednesday trips accounted for approximately 23.2% of the weekly volume.)*	37	Trucks Entering
	37	Trucks Exiting
Determine Average Daily Trip Generation Rate		
Average Daily Truck Trip Generation Rate per 1,000 CY of Annual Material Hauled	0.65	Trips per 1,000 CY

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Truck Trip Generation

Canyon Rock Quarry - Sonoma County, California

As provided in *Blue Rock Quarry Expansion: Draft Environmental Impact Report* prepared by Leonard Charles and Associates with contributions from the Crane Transportation Group (CTG) dated August 2005.

Determine Yearly Truck Trips		
Average Volume of Excavated Material Hauled from Quarry Annually	375,000	CY
Estimated Average Annual Truck Traffic *(Assuming 14.2 CY/Truck and each truck that leaves the quarry must also return.)*	26,408	Trucks Entering
	26,408	Trucks Exiting
Determine Monthly Truck Trips		
Truck Trips During the Month of October *(Peak activity month at Canyon Rock Quarry based on activity report for previous four year period. Monthly truck trips determined to be approximately 14.4% of yearly volumes.)*	3,803	Trucks Entering
	3,803	Trucks Exiting
Determine Weekly Truck Trips		
Weekly Truck Trips During October *(The month of October has a total of 31 days. Based on seven days per week there would be 4.4 weeks.)*	859	Trucks Entering
	859	Trucks Exiting
Determine Daily Truck Trips		
Daily Truck Trips on Peak Weekday *(The peak day for the Canyon Rock Quarry was found to occur on Wednesday. Wednesday trips accounted for approximately 21.6% of the weekly volume.)*	185	Trucks Entering
	185	Trucks Exiting
Determine Average Daily Trip Generation Rate		
Average Daily Truck Trip Generation Rate per 1,000 CY of Annual Material Hauled	0.99	Trips per 1,000 CY

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Truck Trip Generation

Nuss Pit - Gallatin Gateway, Montana

As provided in *Nuss Pit (Gallatin Gateway) Load Data* prepared by Kenai Engineering, Inc. dated January 29, 2008.

Determine Yearly Truck Trips		
Volume of Excavated Material Hauled from Pit 2006-2007	143,307 CY	
Estimated Average Annual Truck Traffic *(Assuming 18 CY/Truck and each truck that leaves the pit must also return.)*	7,962	Trucks Entering
	7,962	Trucks Exiting
Determine Monthly Truck Trips		
Truck Trips During the Month of October *(Peak activity month at Nuss Pit based on activity report for previous year. Monthly truck trips determined to be approximately 13.6% of yearly volumes.)*	1,081	Trucks Entering
	1,081	Trucks Exiting
Determine Weekly Truck Trips		
Weekly Truck Trips During October *(The month of October has a total of 31 days. Based on seven days per week there would be 4.4 weeks.)*	244	Trucks Entering
	244	Trucks Exiting
Determine Daily Truck Trips		
Daily Truck Trips on Peak Weekday *(The peak day was estimated as the average of the peaks for the Blue Rock and Canyon Creek Quarries, which is approximately 22.4%)*	55	Trucks Entering
	55	Trucks Exiting
Determine Average Daily Trip Generation Rate		
Average Daily Truck Trip Generation Rate per 1,000 CY of Annual Material Hauled	0.76	Trips per 1,000 CY

MORRISON MAIERLE, Inc.

Truck Trip Generation

Quarry Land Use

Quarry	1,000 CY Material	Daily Trips	Avg. Trip Rate
Blue Rock Quarry	114.60	74	0.65
Canyon Rock Quarry	375.00	371	0.99
Nuss Pit	143.31	109	0.76

Sample Average = 0.80 Trips/Annual 1,000 CY Material
Sample Range = 0.34 Trips/Annual 1,000 CY Material
Std. Deviation = 0.17 Trips/Annual 1,000 CY Material

90% Avg. Rate = 0.97 Trips/Annual 1,000 CY Material

MORRISON MAIERLE, INC.

Truck Trip Generation

Weekday Hourly Truck Trip Variations

Source data from the *Blue Rock Quarry Expansion: Draft Environmental Impact Report* prepared by Leonard Charles and Associates with contributions from the Crane Transportation Group (CTG) dated August 2005 as well as driveway counts conducted from September 7 to the 11, 2005 at the Knife River (JTL) gravel pit in Belgrade, Montana.

Hour	Blue Rock Quarry				Canyon Rock Quarry				Knife River Gravel Pit			
	Entering		Exiting		Entering		Exiting		Entering		Exiting	
Beginning	Trucks	%	Trucks	%	Trucks	%	Trucks	%	Trips	%	Trips	%
6:00 AM	1	3%	0	0%	2	1%	0	0%	43	7%	40	6%
7:00 AM	4	10%	4	10%	21	9%	23	10%	42	7%	50	8%
8:00 AM	6	15%	4	10%	25	11%	25	11%	49	8%	34	5%
9:00 AM	8	21%	4	10%	27	12%	25	11%	38	6%	45	7%
10:00 AM	3	8%	8	21%	27	12%	29	13%	57	9%	54	9%
11:00 AM	6	15%	5	13%	27	12%	23	10%	40	7%	59	9%
12:00 PM	8	21%	4	10%	23	10%	23	10%	53	9%	65	10%
1:00 PM	3	8%	6	15%	25	11%	27	12%	71	12%	59	9%
2:00 PM	0	0%	1	3%	23	10%	25	11%	60	10%	83	13%
3:00 PM	0	0%	3	8%	18	8%	18	8%	62	10%	69	11%
4:00 PM	0	0%	0	0%	9	4%	9	4%	51	8%	43	7%
5:00 PM	0	0%	0	0%	0	0%	0	0%	35	6%	25	4%

Hour	Average Distribution		
	Total	Entering	Exiting
Beginning	% of Daily	% of Daily	% of Daily
6:00 AM	6%	6%	6%
7:00 AM	8%	7%	8%
8:00 AM	8%	9%	7%
9:00 AM	9%	9%	8%
10:00 AM	10%	9%	10%
11:00 AM	9%	9%	9%
12:00 PM	10%	9%	10%
1:00 PM	10%	11%	10%
2:00 PM	11%	9%	12%
3:00 PM	9%	9%	10%
4:00 PM	7%	7%	6%
5:00 PM	5%	5%	4%

Daily Averages

AM Peak Hour, % of Daily Trips	=	8%	Entering =	51%
			Exiting =	49%
Midday, % of Daily Trips	=	9%	Entering =	49%
			Exiting =	51%
PM Peak Hour, % of Daily Trips	=	6%	Entering =	57%
			Exiting =	43%

MORRISON MAIERLE, Inc.

Employee Trip Generation

Quarry Land Use

As provided in *Nuss Pit (Gallatin Gateway) Load Data* prepared by Kenai Engineering, Inc. dated January 29, 2008.

Equipment	Employee Type	# Employees
Loader	Operator	1
Scale	Operator	1
Crusher	Operator	4
Wash Plant (Add'l Loader)	Operator	1

Maximum Number of Employees	7	
Avg. Employees Per Vehicle:	1.3	*Assumed Value*
Avg. Number of Vehicles:	5.38	
Avg. Number of Trips Per Vehicle	3	*Assumed Value*
Avg. Number of Daily Trip Ends:	16.15	

TRIP GENERATION CALCULATIONS

	Land Use Description	Independent Variable	Total Units	Average Weekday Trips Enter	Exit	Total	Average AM Peak Hour Trips Enter	Exit	Total	Average PM Peak Hour Trips Enter	Exit	Total
	Gravel Pit[1]	1,000 CY of Material Extracted Annually	145	79	78	157	7	6	13	6	4	10
Totals				**79**	**78**	**157**	**7**	**6**	**13**	**6**	**4**	**10**

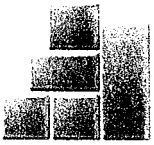
[1]Land Use: Gravel Pit

Average Vehicle Trip Ends On a: Weekday	**Average Trip Generation Rate Equation:** T = 0.97(X) + 16.15 T = Average Vehicle Trip Ends X = Independent Variable Units	**Directional Distribution:** 50% Entering 50% Exiting	**Coefficient of Determination:** R^2 = ***
Average Vehicle Trip Ends On a: Weekday, A.M. Peak Hour	**Average Trip Generation Rate Equation:** T = 0.08(X) + 1.29 T = Average Vehicle Trip Ends X = Independent Variable Units	**Directional Distribution:** 51% Entering 49% Exiting	**Coefficient of Determination:** R^2 = ***
Average Vehicle Trip Ends On a: Weekday, P.M. Peak Hour	**Average Trip Generation Rate Equation:** T = 0.06(X) + 0.97 T = Average Vehicle Trip Ends X = Independent Variable Units	**Directional Distribution:** 57% Entering 43% Exiting	**Coefficient of Determination:** R^2 = ***

Source: Truck Trip Generation & Employee Trip Generation estimates included in this study.

APPENDIX C

CAPACITY AND LEVEL OF SERVICE ANALYSES



MORRISON MAIERLE, INC.
An Employee-Owned Company

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Tom Eastwood*
Agency/Co.	*Morrison-Maierle, Inc.*
Date Performed	*1/31/2008*
Analysis Time Period	*AM Peak*

Site Information

Intersection	*US 191/Site Access*
Jurisdiction	*MDT*
Analysis Year	*2008 - Existing*

Project Description *Morgan Family, LLC Gravel Pit Traffic Assessment*

East/West Street: *Private Drive* | North/South Street: *Gallatin Road (US 191)*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*229*	*0*	*0*	*476*	
Peak-Hour Factor, PHF	*1.00*	*0.95*	*0.95*	*0.95*	*0.95*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*241*	*0*	*0*	*501*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*0*		*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.95*	*1.00*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (veh/h)		*0*		*0*				
C (m) (veh/h)		*1337*						
v/c		*0.00*						
95% queue length		*0.00*						
Control Delay (s/veh)		*7.7*						
LOS		*A*						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Tom Eastwood*
Agency/Co.	*Morrison-Maierle Inc.*
Date Performed	*1/31/2008*
Analysis Time Period	*PM Peak*

Site Information

Intersection	*US 191/Site Access*
Jurisdiction	*MDT*
Analysis Year	*2008 - Existing*

Project Description *Morgan Family, LLC Gravel Pit Traffic Assessment*

East/West Street: *Private Drive* | North/South Street: *Gallatin Road (US 191)*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*688*	*0*	*1*	*289*	
Peak-Hour Factor, PHF	*1.00*	*0.94*	*0.94*	*0.94*	*0.94*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*731*	*0*	*1*	*307*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*0*		*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.94*	*1.00*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (veh/h)		*1*		*0*				
C (m) (veh/h)		*883*						
v/c		*0.00*						
95% queue length		*0.00*						
Control Delay (s/veh)		*9.1*						
LOS		*A*						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Tom Eastwood*	Intersection	*US 191/Site Access*
Agency/Co.	*Morrison-Maierle, Inc.*	Jurisdiction	*MDT*
Date Performed	*1/31/2008*	Analysis Year	*2008 - Total*
Analysis Time Period	*AM Peak*		

Project Description *Morgan Family, LLC Gravel Pit Traffic Assessment*

East/West Street: *Private Drive*	North/South Street: *Gallatin Road (US 191)*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*229*	*5*	*2*	*476*	
Peak-Hour Factor, PHF	*1.00*	*0.95*	*0.95*	*0.95*	*0.95*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*241*	*5*	*2*	*501*	*0*
Percent Heavy Vehicles	*0*	--	--	*85*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*4*		*2*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.95*	*1.00*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*4*	*0*	*2*
Percent Heavy Vehicles	*0*	*0*	*0*	*85*	*0*	*85*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (veh/h)		*2*		*6*				
C (m) (veh/h)		*956*		*344*				
v/c		*0.00*		*0.02*				
95% queue length		*0.01*		*0.05*				
Control Delay (s/veh)		*8.8*		*15.7*				
LOS		*A*		*C*				
Approach Delay (s/veh)	--	--	*15.7*					
Approach LOS	--	--	*C*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Tom Eastwood*	Intersection	*US 191/Site Access*
Agency/Co.	*Morrison-Maierle Inc.*	Jurisdiction	*MDT*
Date Performed	*1/31/2008*	Analysis Year	*2008 - Total*
Analysis Time Period	*PM Peak*		

Project Description	*Morgan Family, LLC Gravel Pit Traffic Assessment*
East/West Street: *Private Drive*	North/South Street: *Gallatin Road (US 191)*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*688*	*4*	*3*	*289*	
Peak-Hour Factor, PHF	*1.00*	*0.94*	*0.94*	*0.94*	*0.94*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*731*	*4*	*3*	*307*	*0*
Percent Heavy Vehicles	*0*	--	--	*85*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

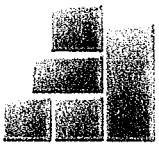
Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*2*		*2*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.94*	*1.00*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*2*	*0*	*2*
Percent Heavy Vehicles	*0*	*0*	*0*	*85*	*0*	*85*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (veh/h)		*3*		*4*				
C (m) (veh/h)		*589*		*226*				
v/c		*0.01*		*0.02*				
95% queue length		*0.02*		*0.05*				
Control Delay (s/veh)		*11.1*		*21.2*				
LOS		*B*		*C*				
Approach Delay (s/veh)	--	--	*21.2*					
Approach LOS	--	--	*C*					

APPENDIX D

AUXILIARY TURN LANE EVALUATIONS



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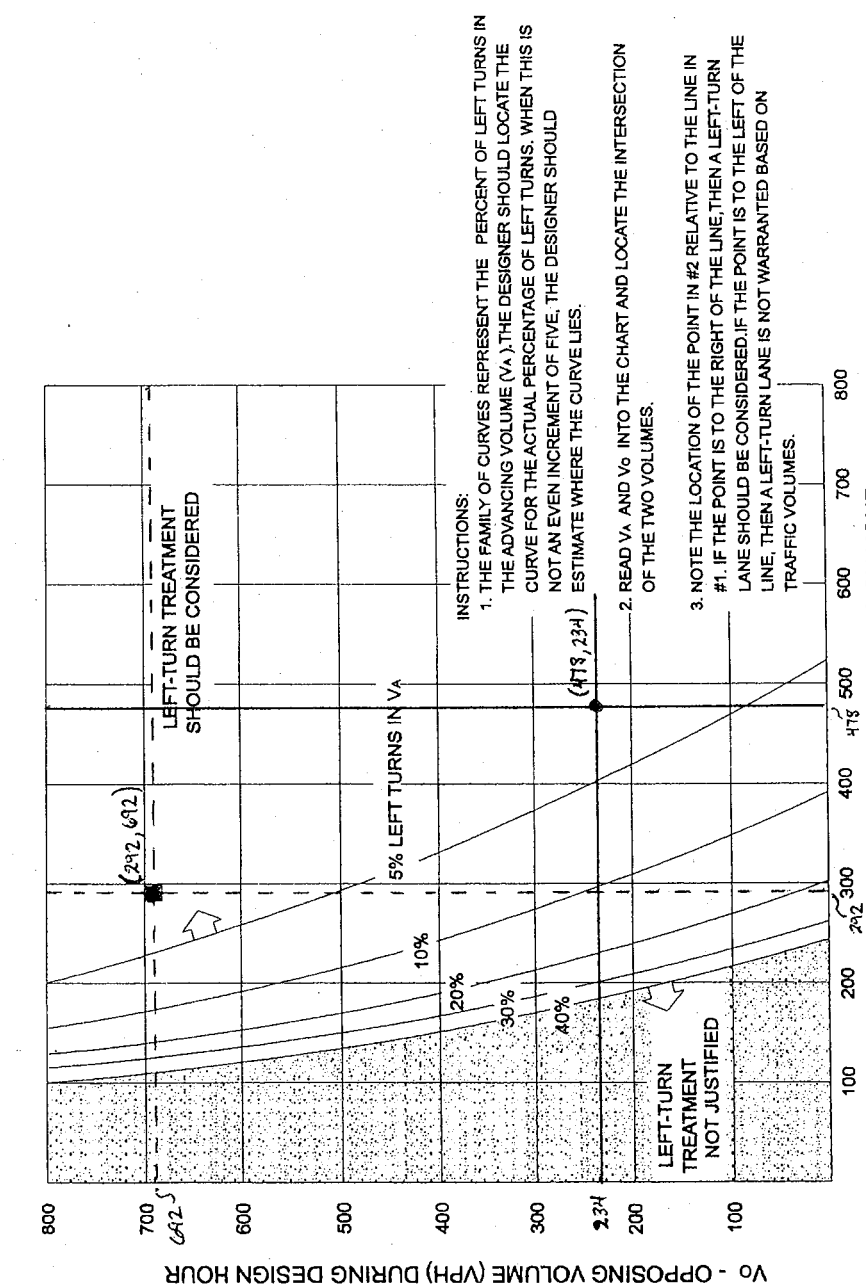

VOLUME GUIDELINES FOR LEFT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON 2-LANE HIGHWAYS 60 mph(100 km/h)

Figure 13.3C

$AM = \frac{\text{LEFT TURNS}}{} = \frac{2}{478} = 0.42\%$

$PM = \frac{\text{LEFT TURNS}}{} = \frac{3}{292} = 1.03\%$

TRAFFIC ASSESSMENT UPDATE

FOR THE

MORGAN FAMILY, LLC GRAVEL PIT

GALLATIN GATEWAY, MONTANA

July 2008

Prepared For:
TMC, Inc.
22540 Frontage Road
PO Box 69
Belgrade, MT 59714-0069

MORRISON MAIERLE, INC.
An Employee-Owned Company

Prepared By:
Morrison-Maierle, Inc.
2880 Technology Boulevard West
Bozeman, MT 59718
Phone: (406) 587-0721
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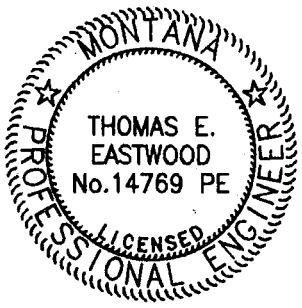
MMI Project No. 2850.008.010.0310



PURPOSE OF UPDATE

This traffic assessment update has been prepared to evaluate the need for the installation of auxiliary turn and acceleration lanes with the development of the proposed Morgan Family, LLC Gravel Pit in Gallatin Gateway, Montana. The information presented in this update is intended to evaluate the safety aspects associated with locations on high speed facilities experiencing a substantial number of truck turning movements. The methodology and analysis procedures utilized in this update are based on the standards found in the Montana Department of Transportation's *Traffic Engineering Manual, November 2007*. Recommendations made in this update are based on these standards and the professional judgment of the author.

EVALUATION OF CRASHES

In a letter dated April 18, 2008, the Montana Department of Transportation (MDT) provided comments in response to the *Traffic Assessment for the Morgan Family, LLC Gravel Pit* prepared by Morrison-Maierle, Inc. in February 2008. MDT's main concern is the safety for both the through traffic and the truck turning movements with consideration of the different vehicle types. MDT does not want to jeopardize safety at the gravel pit access location on Gallatin Road (US 191). The specific comments in regards to traffic included the following:

- A southbound left turn lane must be constructed on US 191 at [its intersection with the proposed gravel pit access.] This left turn lane is required as US 191 is a high speed facility and the trucks accessing the gravel pit require large gaps when turning left. This left turn lane must be designed to MDT standards.
- A northbound deceleration lane on US 191 must be constructed at [its intersection with the proposed gravel pit access] for the right turning movements. The lane must be designed as an 18:1 tapered slip ramp and meet MDT standards for design.
- A northbound acceleration lane on US 191 must be constructed at [its intersection with the proposed gravel pit access] for gravel trucks making a right turn and heading north on US 191. This acceleration will allow trucks heading north to accelerate to speed without affecting northbound through traffic. This acceleration lane must be designed to MDT standards.

In order to further evaluate the safety aspects of the proposed gravel pit access, it was elected to analyze crash trends for similar facilities within Gallatin County, Montana.

Site Selection

Access to the proposed Morgan Family, LLC Gravel Pit would be located on a high speed, two-lane rural principal arterial roadway. For the purposes of this update, high speed is defined as having a posted speed limit in excess of 45 miles per hour (mph). Comparative locations were selected based on the following: 1) having direct access to a high speed facility or access via an alternate roadway that accesses a high speed facility, 2) the presence of a substantial number of truck turning movements, 3) located within Gallatin County in order to have similar driver behaviors and/or characteristics, and 4) there are not presently any turn lanes serving the access or intersecting roadway. It should be noted that a review of gravel pits or other substantial truck activity sites within the vicinity of high speed, two-lane facilities in Gallatin or Madison County did not find any locations where turn lanes are presently in existence to accommodate truck movements.

Morrison-Maierle, Inc. requested information on crashes for four (4) roadway segments in addition to the proposed Morgan Family, LLC Gravel Pit access location. The crash data reflected crashes for 2003, 2004, 2005, 2006, and 2007. The segments selected included Norris Road (Montana State Highway 84 – MT 84) from milepost 26.7 to 27.7, Jackrabbit Lane (MT 85) from milepost 2.8 to 3.3 and from milepost 3.7 to 4.3, and the Frontage Road (Montana State Secondary Highway 205 – S 205) from milepost 21.4 to 22.0. Descriptions of the sites selected are as follows:

- The Norris Road segment includes the existing Storey Ranch Gravel Pit access operated by TMC, Inc. at approximately milepost 27.2. The posted speed limit along this roadway segment is 70 mph during the day and 65 mph at night for passenger vehicles. For trucks, the posted speed limit is 60 mph during the day and 55 mph at night.
- The Jackrabbit Lane segment from milepost 2.8 to 3.3 includes the intersection of Jackrabbit Lane and Hulbert Road. This intersection serves as an access for the Hulbert Road gravel pit operated by Gallatin Asphalt, which is located to the east of Jackrabbit Lane. The posted limit for this roadway segment is the same as that for Norris Road.
- The Jackrabbit Lane segment from milepost 3.7 to 4.3 includes the intersection of Jackrabbit Lane and Valley Center Road. Valley Center Road is also a state secondary highway (S 235). This intersection serves as an access for the ready mix plant operated by Kenyon Noble – Ready Mix, which is located to the west of Jackrabbit Lane. The posted speed limit for this roadway segment is also the same as that for Norris Road.

- The Frontage Road segment includes the intersection of the Frontage Road and Airport Road in Belgrade, Montana, which is also the location of the primary access serving the gravel pit operated by the Knife River Corporation to the south of the Frontage Road. The posted speed limit for this roadway segment is 55 mph for both trucks and passenger vehicles.

Crash Data Analyses

Total Crashes

The crash data provided by MDT was used to identify the reported crash rates per one million (1,000,000) vehicle miles traveled (MVMT) for each roadway segment. The rates for total crashes are summarized in Table 1 and were calculated utilizing the following equation:

$$RSCR = \frac{1{,}000{,}000 \cdot C}{365 \cdot T \cdot V \cdot L}$$

where

RSCR = Roadway Segment Crash Rate (MVMT)
C = Number of Reported Crashes
T = Timeframe of the Analysis (Years)
V = Annual Average Daily Traffic (AADT)
L = Length of Roadway Segment (Miles)

Table 1 Reported Roadway Segment Crash Rates for Total Crashes

Roadway Segment	Weighted Annual Average Daily Traffic, AADT	Segment Length, miles	Total Number of Reported Crashes for Years 2003-2007	Reported Crash Rate Per MVMT
Norris Road (MT 84) Milepost 26.7 – 27.7	6,170	1.00	8	0.71
Jackrabbit Lane (MT 85) Milepost 2.8 – 3.3	10,100	0.51	19	2.02
Jackrabbit Lane (MT 85) Milepost 3.7 – 4.3	10,824	0.61	41	3.39
Frontage Road (S 205) Milepost 21.4 – 22.0	8,108	0.59	14	1.59
Gallatin Road (US 191) Milepost 77.6 – 78.6	8,172	1.00	23	1.54
Averages	**8,675**	**0.74**	**21**	**1.85**
State of Montana Average Crash Rate Per MVMT 2003 – 2006				**2.02**

Truck Involvement in Crashes

The crash data was additionally analyzed to determine the frequency of truck crashes along the roadway segments. As reported in *Traffic Safety Problem Identification FY 2008* prepared by MDT (July 20, 2007), "The number of truck crashes [in Montana] reached a high in 1996 and has decreased by nearly 30% over the ten years since then." In order to calculate a reported crash rate for crashes involving trucks, it was necessary to determine the number of trucks comprising the weighted AADT for each roadway segment. Truck traffic percentages were determined based on vehicle classification or intersection turning movement counts in the immediate vicinity of the roadway segment being analyzed. These percentages were multiplied against the weighted AADT's to determine the weighted annual average daily truck traffic (AADTT) volumes. The resulting truck involvement in crashes is summarized in Table 2.

Table 2 Reported Roadway Segment Crash Rates for Crashes Involving Trucks

Roadway Segment	Estimated Annual Average Daily Truck Traffic, AADTT	Segment Length, miles	Total Number of Reported Crashes Involving Trucks for Years 2003-2007	Reported Crash Rate Involving Trucks Per MVMT	Crashes Involving Trucks as a Percentage of All Crashes
Norris Road (MT 84) Milepost 26.7 – 27.7	370	1.00	1	1.48	12.5%
Jackrabbit Lane (MT 85) Milepost 2.8 – 3.3	1,212	0.51	3	2.66	15.8%
Jackrabbit Lane (MT 85) Milepost 3.7 – 4.3	1,299	0.61	4	2.76	9.8%
Frontage Road (S 205) Milepost 21.4 – 22.0	973	0.59	2	1.90	14.3%
Gallatin Road (US 191) Milepost 77.6 -- 78.6	490	1.00	0	0.00	0.0%
Averages	**869**	**0.74**	**2**	**1.76**	**10.5%**
State of Montana Crashes Involving Trucks as a Percentage of All Crashes 2003 – 2006					**5.5%**

Crash Severity

Crash rates were also adjusted to account for the greater costs and perceptions by society of injury and fatal accidents. Reported crash involvements that included a fatal injury were multiplied by a factor of 9.50. Likewise, non-fatal injury involvements were multiplied by a factor of 3.50. All other crash involvements were multiplied by a factor of 1.00. Weighted crash severity index values were

calculated for each roadway segment, which were then multiplied by their respective crash rates to determine the reported crash severity rate. The analyses are summarized in Tables 3 and 4 below.

Table 3 Reported Roadway Segment Crash Severity Rates for Total Crashes (2003-2007)

Roadway Segment	Reported Crash Rate Per MVMT	Total # of Reported Fatal Injury Crashes	Total # of Reported Non-Fatal Injury Crashes	Total # of Reported Property Damage Only Crashes	Reported Crash Severity Index for Roadway Segment	Reported Crash Severity Rate Per MVMT
Norris Road (MT 84) Milepost 26.7 – 27.7	0.71	0	0	8	1.00	0.71
Jackrabbit Lane (MT 85) Milepost 2.8 – 3.3	2.02	0	5	14	1.66	3.35
Jackrabbit Lane (MT 85) Milepost 3.7 – 4.3	3.39	1	13	27	2.00	6.78
Frontage Road (S 205) Milepost 21.4 – 22.0	1.59	0	6	8	2.07	3.30
Gallatin Road (US 191) Milepost 77.6 – 78.6	1.54	1	6	16	2.02	3.12
All Sites Combined	**1.85**	**2**	**30**	**73**	**1.75**	**3.45**
State of Montana Averages 2003 – 2006	**2.02**	**225**	**6,135**	**16,012**	**1.77**	**3.58**

Table 4 Reported Roadway Segment Crash Severity Rates for Crashes Involving Trucks (2003-2007)

Roadway Segment	Reported Crash Rate Per MVMT	Total # of Reported Fatal Injury Crashes	Total # of Reported Non-Fatal Injury Crashes	Total # of Reported Property Damage Only Crashes	Reported Crash Severity Index for Roadway Segment	Reported Crash Severity Rate Per MVMT
Norris Road (MT 84) Milepost 26.7 – 27.7	1.48	0	0	1	1.00	1.48
Jackrabbit Lane (MT 85) Milepost 2.8 – 3.3	2.66	0	2	1	2.67	7.09
Jackrabbit Lane (MT 85) Milepost 3.7 – 4.3	2.76	1	0	3	3.13	8.62
Frontage Road (S 205) Milepost 21.4 – 22.0	1.90	0	2	0	3.50	6.64
Gallatin Road (US 191) Milepost 77.6 – 78.6	0.00	0	0	0	0.00	0.00
All Sites Combined	**1.76**	**1**	**4**	**5**	**2.06**	**4.77**
State of Montana Averages 2003 – 2006		**21**	**1,209**		**N/A**	

FINDINGS

Total Crashes

The average reported crash rate (1.85 crashes per MVMT) for all locations evaluated with this update was less than the statewide average (2.02 crashes per MVMT) for Montana. The Jackrabbit Lane (MT 85 – milepost 3.7 to 4.3) roadway segment near its intersection with Valley Center Road has a reported crash rate that is approximately 68% higher than the statewide average. It is also noteworthy that the existing gravel pit operated by TMC, Inc. on Norris Road (MT 84 – milepost 26.7 to 27.7) has the lowest reported crash rate of all the locations that were evaluated. This location has a reported crash rate that is approximately one third of the statewide average. Gallatin Road (US 191 – milepost 77.6 to 78.6) had the second lowest reported crash rate of the study locations.

Truck Involvement in Crashes

The average reported crash rate (1.76 crashes per MVMT) for crashes involving trucks along the study locations was less than both the average reported crash rate for total crashes and the statewide average for Montana. However, the crashes involving trucks as a percentage of all crashes were typically higher than the statewide average (5.5%) for Montana. The exception was the Gallatin Road roadway segment that did not experience any crashes involving trucks during the five year analysis period from 2003 through 2007.

Crash Severity

Considering total crashes, the locations evaluated with this update had a lower average reported crash severity rate (3.45 per MVMT) as compared to the statewide average (3.58 per MVMT) for Montana. However, the Jackrabbit Lane roadway segment near its intersection with Valley Center Road had a much higher reported crash severity rate (6.78 per MVMT) than either the overall or statewide average for total crashes.

As shown through the analyses, the average crash severity rate (4.77 per MVMT) for all of the evaluated locations is higher than the statewide average for total crashes in Montana. Data provided in the *Traffic Safety Problem Identification FY 2008* did not differentiate between non-fatal injury and

property damage only crashes involving trucks; therefore, it was not possible to determine a statewide average crash severity rate for crashes involving trucks in Montana. Comparing the existing gravel pit access operated by TMC, Inc. along Norris Road as well as the proposed access location along Gallatin Road, the reported crash severity indexes for the roadway segments are equal to or less than those for total crashes.

CONCLUSIONS AND RECOMMENDATIONS

It does not appear from the analyses conducted as a part of this update that the presence of significant truck turning movements contributes to an increase in the reported crash rate experienced along a roadway segment. In contrast, the locations included in this study found an average reported crash rate for crashes involving trucks which was less than that for crashes involving all vehicle types. As there are a number of factors contributing to fatal or non-fatal injury crashes and the arbitrary nature of the severity factors applied to the study data, the reported crash severity rates may not be fully representative of actual crashes involving trucks. Based on these considerations, recommendations for the proposed Morgan Family, LLC Gravel Pit access would be as follows:

- It is not recommended to install auxiliary turn lanes based solely on the presence of truck traffic at the intersection. Based on the average reported crash experience rate, it is estimated that the benefit gained from installing the auxiliary turn lanes would not outweigh the cost of their installation. Additionally, at the end of the ten year design life of the mine, there would no longer be a need for the turn lanes barring any expansion of the gravel pit or redevelopment of the site.

- Because of the limited number of crashes involving trucks, additional locations should be evaluated prior to the installation of auxiliary turn lanes based on the average reported crash severity rate.

- Alternative improvements consisting of the installation of warning signs with the legend "TRUCKS ENTERING HIGHWAY" (W42-7) would be recommended for installation along Gallatin Road (US 191) in advance of the proposed gravel pit access in accordance with the *Manual on Uniform Traffic Control Devices* (MUTCD). The proposed signage should be a minimum size of 36-inches square based on the 70 mph design speed for Gallatin Road. The proposed signage would be as shown in Figure 1 on the following page.

Figure 1 Proposed W42-7 Signage (36" x 36")

Although it is not related to access for the proposed Morgan Family, LLC Gravel Pit, it is recommended that the intersection of Jackrabbit Lane (MT 85) and Valley Center Road (S 235) be considered for additional safety improvements to address the present crash trends. A review of the crash data, included in Appendix A, indicates that this location may benefit from the installation of turn lanes on Jackrabbit Lane. Due to the significant number of crashes, there may be a benefit of installing these improvements ahead of MDT's "Four Corners North Project" Jackrabbit Lane between Four Corners and Belgrade.

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APPENDIX A

CRASH DATA ANALYSES

MORRISON MAIERLE, INC.
An Employee-Owned Company

Crash Data Analysis
Gallatin Road (US 191) - Milepost 77.6 to 78.6
Near Morgan Family Gravel Pit Access (± Milepost 78.1)

Overall Roadway Segment Reported Crash Rate Analysis	
Weighted Annual Average Daily Traffic (ADT) Reported by MDT	8,172
Total Number of Reported Crashes for Years 2003 Through 2007	23
Roadway Segment Length in Miles	1.00
Reported Crash Rate Per Million Vehicle Miles Traveled (MVMT) for Roadway Segment	**1.54**

Overall Roadway Segment Crash Severity Analysis	
Total Number of Reported Fatal Injury Crashes in Roadway Segment	1
Total Number of Reported Non-Fatal Injury Crashes in Roadway Segment	6
Total Number of Reported Property Damage Only Crashes in Roadway Segment	16
Fatal Injury Crash Severity Index Factor	9.50
Non-Fatal Injury Crash Severity Index Factor	3.50
Property Damage Only Crash Severity Index Factor	1.00
Reported Crash Severity Index for Roadway Segment	**2.02**
Reported Crash Severity Rate Per MVMT for Roadway Segment	**3.12**

Truck Traffic Roadway Segment Reported Crash Rate Analysis	
Weighted Annual Average Daily Traffic (ADT) Reported by MDT	8,172
Percentage Truck Traffic of ADT Based on 2008 Traffic Counts	6%
Estimated Annual Average Daily Truck Traffic (ADTT)	490
Total Number of Reported Crashes Involving Trucks for Years 2003 Through 2007	0
Roadway Segment Length in Miles	1.00
Reported Crash Rate Involving Trucks Per MVMT for Roadway Segment	**0.00**

Truck Traffic Roadway Segment Crash Severity Analysis	
Total Number of Reported Fatal Injury Crashes Involving Trucks in Roadway Segment	0
Total Number of Reported Non-Fatal Injury Crashes Involving Trucks in Roadway Segment	0
Total Number of Reported Property Damage Only Crashes Involving Trucks in Roadway Segment	0
Fatal Injury Crash Severity Index Factor	9.50
Non-Fatal Injury Crash Severity Index Factor	3.50
Property Damage Only Crash Severity Index Factor	1.00
Reported Crash Severity Index Involving Trucks for Roadway Segment	**0.00**
Reported Crash Severity Rate Involving Trucks Per MVMT for Roadway Segment	**0.00**

Crash Data Analysis
Gallatin Road (US 191) - Milepost 77.6 to 78.6
Near Morgan Family Gravel Pit Access (± Milepost 78.1)

Reported Crashes By Time of Day

Hour Beginning and Ending	2003	2004	2005	2006	2007	Total
12:00 a.m. - 3:00 a.m.		1				1
3:00 a.m. - 6:00 a.m.					1	1
6:00 a.m. - 9:00 a.m.		1	2	1		4
9:00 a.m. - 12:00 p.m.				1	2	3
12:00 p.m. - 3:00 p.m.		1	1		1	3
3:00 p.m. - 6:00 p.m.	3		1		3	7
6:00 p.m. - 9:00 p.m.		1				1
9:00 p.m. - 12:00 a.m.		1	2			3
Total Annual Reported Crashes	3	5	6	2	7	23

Reported Crashes By Day of Week

Day of Week	2003	2004	2005	2006	2007	Total
Monday	1	1	2			4
Tuesday		1			1	2
Wednesday		1	1	1	1	4
Thursday	1	1	1	1	2	6
Friday					2	2
Saturday			1		1	2
Sunday	1	1	1			3
Total Annual Reported Crashes	3	5	6	2	7	23

Reported Crashes By Month of Year

Month of Year	2003	2004	2005	2006	2007	Total
January		1	2		1	4
February			1		1	2
March			1			1
April						0
May						0
June				1		1
July	2					2
August		2				2
September						0
October	1	1	1	1	3	7
November					2	2
December		1	1			2
Total Annual Reported Crashes	3	5	6	2	7	23

Crash Data Analysis
Gallatin Road (US 191) - Milepost 77.6 to 78.6
Near Morgan Family Gravel Pit Access (± Milepost 78.1)

Reported Crashes By Road and Weather Conditions

Weather	Road	2003	2004	2005	2006	2007	Total
Clear	Dry	3	3	4		1	11
	Wet						0
	Snow/Slush						0
	Ice						0
	Sand/Mud/Dirt						0
Cloudy	Dry		1	2	2	4	9
	Wet						0
	Snow/Slush						0
	Ice		1				1
	Sand/Mud/Dirt						0
Snow/ Rain	Dry						0
	Wet						0
	Snow/Slush					1	1
	Ice					1	1
	Sand/Mud/Dirt						0
Fog	Dry						0
	Wet						0
	Snow/Slush						0
	Ice						0
	Sand/Mud/Dirt						0
Total Annual Reported Crashes		3	5	6	2	7	23

Reported Crashes By Light Conditions

Lighting Conditions	2003	2004	2005	2006	2007	Total
Dawn						0
Dusk						0
Daylight	3	3	2	2	6	16
Dark - Lighted						0
Dark - Not Lighted		2	4		1	7
Total Annual Reported Crashes	3	5	6	2	7	23

Reported Crashes Involving Injuries/Damage

Injury/Damage	2003	2004	2005	2006	2007	Total
Fatal Injury					1	1
Non-Fatal Injury	1	1	1	1	2	6
Property Damage Only	2	4	5	1	4	16
Total Annual Reported Crashes	3	5	6	2	7	23

Crash Data Analysis
Gallatin Road (US 191) - Milepost 77.6 to 78.6
Near Morgan Family Gravel Pit Access (± Milepost 78.1)

Drivers Involved in Reported Crashes By Age Group and Sex

Age Group	Sex	2003	2004	2005	2006	2007	Total
15-24	M		1	3	2	3	9
	F	2		1			3
25-29	M	1	1			2	4
	F		1				1
30-34	M		1				1
	F	1					1
35-39	M				1		1
	F						0
40-49	M		2			1	3
	F		1			1	2
50-59	M			1	1	2	4
	F			2		1	3
60-69	M	1		1		1	3
	F						0
70+	M			1			1
	F						0
Total Annual Drivers Involved		5	7	9	4	11	36

Drivers Involved in Reported Crashes By Vehicle Type

Vehicle Type	2003	2004	2005	2006	2007	Total
Compact Car					1	1
Mid-Size Car			1	2	2	5
Passenger Car	3	3	4		1	11
Large Car						0
Mid-Size Wagon						0
Small Pickup						0
Pickup	2	1	1		2	6
Standard Pickup		2	1	1	2	6
SUV		1	2	1	1	5
Van					2	2
Truck/Tractor						0
Other						0
Total Annual Vehicles Involved	5	7	9	4	11	36

Crash Data Analysis
Gallatin Road (US 191) - Milepost 77.6 to 78.6
Near Morgan Family Gravel Pit Access (± Milepost 78.1)

Drivers Involved in Reported Crashes By Direction of Travel and Intent

Dir Trvl	Intent	2003	2004	2005	2006	2007	Total
EB	Go Straight						0
	Overtake						0
	Slow/Stop						0
	Remain Stop						0
	Left Turn						0
	Right Turn						0
WB	Go Straight					1	1
	Overtake						0
	Slow/Stop						0
	Remain Stop						0
	Left Turn						0
	Right Turn						0
NB	Go Straight	2	3	4		4	13
	Overtake						0
	Slow/Stop	2					2
	Remain Stop						0
	Left Turn						0
	Right Turn	1					1
SB	Go Straight		3	3	2	5	13
	Overtake						0
	Slow/Stop						0
	Remain Stop					1	1
	Left Turn		1	2	1		4
	Right Turn				1		1
Total Annual Drivers Involved		5	7	9	4	11	36

Reported Crashes By Type

Crash Type	2003	2004	2005	2006	2007	Total
Head On		1				1
Rear End	2	1	1	1	2	7
Right Angle			1		1	2
Left Turn						0
Sideswipe				1		1
Animal-Vehicle		1	3		3	7
Fixed Object	1					1
Overturn		2			1	3
Other			1			1
Total Annual Reported Crashes	3	5	6	2	7	23

Crash Data Analysis
Norris Road (MT 84) - Milepost 26.7 to 27.7
Near Storey Ranch Gravel Pit Access (± Milepost 27.2)

Overall Roadway Segment Reported Crash Rate Analysis	
Weighted Annual Average Daily Traffic (ADT) Reported by MDT	6,170
Total Number of Reported Crashes for Years 2003 Through 2007	8
Roadway Segment Length in Miles	1.00
Reported Crash Rate Per Million Vehicle Miles Traveled (MVMT) for Roadway Segment	**0.71**

Overall Roadway Segment Crash Severity Analysis	
Total Number of Reported Fatal Injury Crashes in Roadway Segment	0
Total Number of Reported Non-Fatal Injury Crashes in Roadway Segment	0
Total Number of Reported Property Damage Only Crashes in Roadway Segment	8
Fatal Injury Crash Severity Index Factor	9.50
Non-Fatal Injury Crash Severity Index Factor	3.50
Property Damage Only Crash Severity Index Factor	1.00
Reported Crash Severity Index for Roadway Segment	**1.00**
Reported Crash Severity Rate Per MVMT for Roadway Segment	**0.71**

Truck Traffic Roadway Segment Reported Crash Rate Analysis	
Weighted Annual Average Daily Traffic (ADT) Reported by MDT	6,170
Percentage Truck Traffic of ADT Based on 2008 Traffic Counts	6%
Estimated Annual Average Daily Truck Traffic (ADTT)	370
Total Number of Reported Crashes Involving Trucks for Years 2003 Through 2007	1
Roadway Segment Length in Miles	1.00
Reported Crash Rate Involving Trucks Per MVMT for Roadway Segment	**1.48**

Truck Traffic Roadway Segment Crash Severity Analysis	
Total Number of Reported Fatal Injury Crashes Involving Trucks in Roadway Segment	0
Total Number of Reported Non-Fatal Injury Crashes Involving Trucks in Roadway Segment	0
Total Number of Reported Property Damage Only Crashes Involving Trucks in Roadway Segment	1
Fatal Injury Crash Severity Index Factor	9.50
Non-Fatal Injury Crash Severity Index Factor	3.50
Property Damage Only Crash Severity Index Factor	1.00
Reported Crash Severity Index Involving Trucks for Roadway Segment	**1.00**
Reported Crash Severity Rate Involving Trucks Per MVMT for Roadway Segment	**1.48**

Crash Data Analysis
Norris Road (MT 84) - Milepost 26.7 to 27.7
Near Storey Ranch Gravel Pit Access (± Milepost 27.2)

Reported Crashes By Time of Day

Hour Beginning and Ending	2003	2004	2005	2006	2007	Total
12:00 a.m. - 3:00 a.m.						0
3:00 a.m. - 6:00 a.m.						0
6:00 a.m. - 9:00 a.m.				1		1
9:00 a.m. - 12:00 p.m.				3		3
12:00 p.m. - 3:00 p.m.						0
3:00 p.m. - 6:00 p.m.	1			1		2
6:00 p.m. - 9:00 p.m.		1				1
9:00 p.m. - 12:00 a.m.		1				1
Total Annual Reported Crashes	1	2	0	5	0	8

Reported Crashes By Day of Week

Day of Week	2003	2004	2005	2006	2007	Total
Monday				2		2
Tuesday		1		1		2
Wednesday						0
Thursday				1		1
Friday	1			1		2
Saturday		1				1
Sunday						0
Total Annual Reported Crashes	1	2	0	5	0	8

Reported Crashes By Month of Year

Month of Year	2003	2004	2005	2006	2007	Total
January						0
February						0
March				1		1
April						0
May		1				1
June						0
July				1		1
August						0
September				1		1
October						0
November						0
December	1	1		2		4
Total Annual Reported Crashes	1	2	0	5	0	8

Crash Data Analysis
Norris Road (MT 84) - Milepost 26.7 to 27.7
Near Storey Ranch Gravel Pit Access (± Milepost 27.2)

Reported Crashes By Road and Weather Conditions

Weather	Road	2003	2004	2005	2006	2007	Total
Clear	Dry		1		3		4
	Wet						0
	Snow/Slush						0
	Ice				1		1
	Sand/Mud/Dirt						0
Cloudy	Dry	1	1		1		3
	Wet						0
	Snow/Slush						0
	Ice						0
	Sand/Mud/Dirt						0
Fog	Dry						0
	Wet						0
	Snow/Slush						0
	Ice						0
	Sand/Mud/Dirt						0
Total Annual Reported Crashes		1	2	0	5	0	8

Reported Crashes By Light Conditions

Lighting Conditions	2003	2004	2005	2006	2007	Total
Dawn				1		1
Dusk						0
Daylight				3		3
Dark - Lighted						0
Dark - Not Lighted	1	2		1		4
Total Annual Reported Crashes	1	2	0	5	0	8

Reported Crashes By Type

Crash Type	2003	2004	2005	2006	2007	Total
Head On						0
Rear End				1		1
Right Angle						0
Left Turn						0
Sideswipe						0
Animal-Vehicle	1	2		2		5
Fixed Object						0
Other				2		2
Total Annual Reported Crashes	1	2	0	5	0	8

Crash Data Analysis
Norris Road (MT 84) - Milepost 26.7 to 27.7
Near Storey Ranch Gravel Pit Access (± Milepost 27.2)

Drivers Involved in Reported Crashes By Age Group and Sex

Age Group	Sex	2003	2004	2005	2006	2007	Total
16-24	M		1		1		2
	F				1		1
25-29	M						0
	F						0
30-34	M				1		1
	F						0
35-39	M						0
	F						0
40-49	M						0
	F		1				1
50-59	M						0
	F	1			1		2
60-69	M						0
	F						0
70+	M				2		2
	F						0
Total Annual Drivers Involved		1	2	0	6	0	9

Drivers Involved in Reported Crashes By Vehicle Type

Vehicle Type	2003	2004	2005	2006	2007	Total
Compact Car						0
Mid-Size Car				1		1
Passenger Car	1	1		2		4
Large Car						0
Mid-Size Wagon						0
Small Pickup						0
Pickup		1		1		2
Standard Pickup				1		1
SUV						0
Van						0
Truck/Tractor				1		1
Other						0
Total Annual Vehicles Involved	1	2	0	6	0	9

Crash Data Analysis
Norris Road (MT 84) - Milepost 26.7 to 27.7
Near Storey Ranch Gravel Pit Access (± Milepost 27.2)

Drivers Involved in Reported Crashes By Direction of Travel and Intent

Dir Trvl	Intent	2003	2004	2005	2006	2007	Total
EB	Go Straight		1		1		2
	Overtake				1		1
	Slow/Stop						0
	Remain Stop						0
	Left Turn						0
	Right Turn						0
WB	Go Straight	1	1		2		4
	Overtake						0
	Slow/Stop				1		1
	Remain Stop						0
	Left Turn				1		1
	Right Turn						0
NB	Go Straight						0
	Overtake						0
	Slow/Stop						0
	Remain Stop						0
	Left Turn						0
	Right Turn						0
SB	Go Straight						0
	Overtake						0
	Slow/Stop						0
	Remain Stop						0
	Left Turn						0
	Right Turn						0
Total Annual Drivers Involved		1	2	0	6	0	9

Reported Crashes Involving Injuries/Damage

Injury/Damage	2003	2004	2005	2006	2007	Total
Fatal Injury						0
Non-Fatal Injury						0
Property Damage Only	1	2		5		8
Total Annual Reported Crashes	1	2	0	5	0	8

Crash Data Analysis
Jackrabbit Lane (MT 85) - Milepost 2.8 to 3.3
Near Hulbert Road (± Milepost 3.0) - Hulbert Road Gravel Pit Access

Overall Roadway Segment Reported Crash Rate Analysis	
Weighted Annual Average Daily Traffic (ADT) Reported by MDT	10,100
Total Number of Reported Crashes for Years 2003 Through 2007	19
Roadway Segment Length in Miles	0.51
Reported Crash Rate Per Million Vehicle Miles Traveled (MVMT) for Roadway Segment	**2.02**

Overall Roadway Segment Crash Severity Analysis	
Total Number of Reported Fatal Injury Crashes in Roadway Segment	0
Total Number of Reported Non-Fatal Injury Crashes in Roadway Segment	5
Total Number of Reported Property Damage Only Crashes in Roadway Segment	14
Fatal Injury Crash Severity Index Factor	9.50
Non-Fatal Injury Crash Severity Index Factor	3.50
Property Damage Only Crash Severity Index Factor	1.00
Reported Crash Severity Index for Roadway Segment	**1.66**
Reported Crash Severity Rate Per MVMT for Roadway Segment	**3.35**

Truck Traffic Roadway Segment Reported Crash Rate Analysis	
Weighted Annual Average Daily Traffic (ADT) Reported by MDT	10,100
Percentage Truck Traffic of ADT Based on 2006 Traffic Counts	12%
Estimated Annual Average Daily Truck Traffic (ADTT)	1,212
Total Number of Reported Crashes Involving Trucks for Years 2003 Through 2007	3
Roadway Segment Length in Miles	0.51
Reported Crash Rate Involving Trucks Per MVMT for Roadway Segment	**2.66**

Truck Traffic Roadway Segment Crash Severity Analysis	
Total Number of Reported Fatal Injury Crashes Involving Trucks in Roadway Segment	0
Total Number of Reported Non-Fatal Injury Crashes Involving Trucks in Roadway Segment	2
Total Number of Reported Property Damage Only Crashes Involving Trucks in Roadway Segment	1
Fatal Injury Crash Severity Index Factor	9.50
Non-Fatal Injury Crash Severity Index Factor	3.50
Property Damage Only Crash Severity Index Factor	1.00
Reported Crash Severity Index Involving Trucks for Roadway Segment	**2.67**
Reported Crash Severity Rate Involving Trucks Per MVMT for Roadway Segment	**7.09**

Crash Data Analysis
Jackrabbit Lane (MT 85) - Milepost 2.8 to 3.3
Near Hulbert Road (± Milepost 3.0) - Hulbert Road Gravel Pit Access

Reported Crashes By Time of Day

Hour Beginning and Ending	2003	2004	2005	2006	2007	Total
12:00 a.m. - 3:00 a.m.						0
3:00 a.m. - 6:00 a.m.	1			1		2
6:00 a.m. - 9:00 a.m.	1	1			1	3
9:00 a.m. - 12:00 p.m.			1	1		2
12:00 p.m. - 3:00 p.m.	1		1			2
3:00 p.m. - 6:00 p.m.	1		1	3	1	6
6:00 p.m. - 9:00 p.m.	1	3				4
9:00 p.m. - 12:00 a.m.						0
Total Annual Reported Crashes	5	4	3	5	2	19

Reported Crashes By Day of Week

Day of Week	2003	2004	2005	2006	2007	Total
Monday	2	1		1		4
Tuesday			1	1	2	4
Wednesday	1	1	1	2		5
Thursday			1			1
Friday		1				1
Saturday	1	1		1		3
Sunday	1					1
Total Annual Reported Crashes	5	4	3	5	2	19

Reported Crashes By Month of Year

Month of Year	2003	2004	2005	2006	2007	Total
January	1	1				2
February				1	1	2
March	1					1
April						0
May			1	1		2
June						0
July			1			1
August		1		1		2
September		1				1
October	1			1		2
November	1		1	1	1	4
December	1	1				2
Total Annual Reported Crashes	5	4	3	5	2	19

Crash Data Analysis
Jackrabbit Lane (MT 85) - Milepost 2.8 to 3.3
Near Hulbert Road (± Milepost 3.0) - Hulbert Road Gravel Pit Access

Reported Crashes By Road and Weather Conditions

Weather	Road	2003	2004	2005	2006	2007	Total
Clear	Dry	1	1	3	1		6
	Wet						0
	Snow/Slush						0
	Ice						0
	Sand/Mud/Dirt				1	1	2
Cloudy	Dry	3	3		2		8
	Wet						0
	Snow/Slush						0
	Ice	1			1	1	3
	Sand/Mud/Dirt						0
Snow/ Rain	Dry						0
	Wet						0
	Snow/Slush						0
	Ice						0
	Sand/Mud/Dirt						0
Fog	Dry						0
	Wet						0
	Snow/Slush						0
	Ice						0
	Sand/Mud/Dirt						0
Total Annual Reported Crashes		5	4	3	5	2	19

Reported Crashes By Light Conditions

Lighting Conditions	2003	2004	2005	2006	2007	Total
Dawn						0
Dusk						0
Daylight	3	2	2	3	2	12
Dark - Lighted						0
Dark - Not Lighted	2	2	1	2		7
Total Annual Reported Crashes	5	4	3	5	2	19

Reported Crashes Involving Injuries/Damage

Injury/Damage	2003	2004	2005	2006	2007	Total
Fatal Injury						0
Non-Fatal Injury	2		1	2		5
Property Damage Only	3	4	2	3	2	14
Total Annual Reported Crashes	5	4	3	5	2	19

Crash Data Analysis
Jackrabbit Lane (MT 85) - Milepost 2.8 to 3.3
Near Hulbert Road (± Milepost 3.0) - Hulbert Road Gravel Pit Access

Drivers Involved in Reported Crashes By Age Group and Sex

Age Group	Sex	2003	2004	2005	2006	2007	Total
15-24	M	2	3		2		7
	F	1		1	2		4
25-29	M	1	1	1		2	5
	F						0
30-34	M		1			1	2
	F				1		1
35-39	M						0
	F	1					1
40-49	M				3		3
	F						0
50-59	M	2	1				3
	F	1		1		1	3
60-69	M	1					1
	F						0
70+	M						0
	F			1			1
Total Annual Drivers Involved		9	6	4	8	4	31

Drivers Involved in Reported Crashes By Vehicle Type

Vehicle Type	2003	2004	2005	2006	2007	Total
Compact Car					1	1
Mid-Size Car						0
Passenger Car	2	3	2	1		8
Large Car	1					1
Mid-Size Wagon						0
Small Pickup	1					1
Pickup	1	3	1			5
Standard Pickup	2			4	2	8
SUV				2		2
Van	1					1
Truck/Tractor			1	1	1	3
Other	1					1
Total Annual Vehicles Involved	9	6	4	8	4	31

Crash Data Analysis
Jackrabbit Lane (MT 85) - Milepost 2.8 to 3.3
Near Hulbert Road (± Milepost 3.0) - Hulbert Road Gravel Pit Access

Drivers Involved in Reported Crashes By Direction of Travel and Intent

Dir Trvl	Intent	2003	2004	2005	2006	2007	Total
EB	Go Straight		1		1		2
	Overtake						0
	Slow/Stop		1				1
	Remain Stop						0
	Left Turn		1				1
	Right Turn						0
WB	Go Straight						0
	Overtake						0
	Slow/Stop					1	1
	Remain Stop					1	1
	Left Turn						0
	Right Turn						0
NB	Go Straight	2	1	2	4	1	10
	Overtake						0
	Slow/Stop	5			2	1	8
	Remain Stop			1			1
	Left Turn						0
	Right Turn						0
SB	Go Straight	2	2	1	1		6
	Overtake						0
	Slow/Stop						0
	Remain Stop						0
	Left Turn						0
	Right Turn						0
Total Annual Drivers Involved		9	6	4	8	4	31

Reported Crashes By Type

Crash Type	2003	2004	2005	2006	2007	Total
Head On						0
Rear End	2		1	2	1	6
Right Angle		1				1
Left Turn						0
Sideswipe		1		1		2
Animal-Vehicle	2	2				4
Fixed Object				1		1
Overturn	1					1
Other			2	1	1	4
Total Annual Reported Crashes	5	4	3	5	2	19

Crash Data Analysis
Jackrabbit Lane (MT 85) - Milepost 3.7 to 4.3
Near Valley Center Road (± Milepost 4.0) - Kenyon Noble Ready Mix Plant

Overall Roadway Segment Reported Crash Rate Analysis	
Weighted Annual Average Daily Traffic (ADT) Reported by MDT	10,824
Total Number of Reported Crashes for Years 2003 Through 2007	41
Roadway Segment Length in Miles	0.61
Reported Crash Rate Per Million Vehicle Miles Traveled (MVMT) for Roadway Segment	**3.39**

Overall Roadway Segment Crash Severity Analysis	
Total Number of Reported Fatal Injury Crashes in Roadway Segment	1
Total Number of Reported Non-Fatal Injury Crashes in Roadway Segment	13
Total Number of Reported Property Damage Only Crashes in Roadway Segment	27
Fatal Injury Crash Severity Index Factor	9.50
Non-Fatal Injury Crash Severity Index Factor	3.50
Property Damage Only Crash Severity Index Factor	1.00
Reported Crash Severity Index for Roadway Segment	**2.00**
Reported Crash Severity Rate Per MVMT for Roadway Segment	**6.78**

Truck Traffic Roadway Segment Reported Crash Rate Analysis	
Weighted Annual Average Daily Traffic (ADT) Reported by MDT	10,824
Percentage Truck Traffic of ADT Based on 2006 Traffic Counts	12%
Estimated Annual Average Daily Truck Traffic (ADTT)	1,299
Total Number of Reported Crashes Involving Trucks for Years 2003 Through 2007	4
Roadway Segment Length in Miles	0.61
Reported Crash Rate Involving Trucks Per MVMT for Roadway Segment	**2.76**

Truck Traffic Roadway Segment Crash Severity Analysis	
Total Number of Reported Fatal Injury Crashes Involving Trucks in Roadway Segment	1
Total Number of Reported Non-Fatal Injury Crashes Involving Trucks in Roadway Segment	0
Total Number of Reported Property Damage Only Crashes Involving Trucks in Roadway Segment	3
Fatal Injury Crash Severity Index Factor	9.50
Non-Fatal Injury Crash Severity Index Factor	3.50
Property Damage Only Crash Severity Index Factor	1.00
Reported Crash Severity Index Involving Trucks for Roadway Segment	**3.13**
Reported Crash Severity Rate Involving Trucks Per MVMT for Roadway Segment	**8.62**

Crash Data Analysis
Jackrabbit Lane (MT 85) - Milepost 3.7 to 4.3
Near Valley Center Road (± Milepost 4.0) - Kenyon Noble Ready Mix Plant

Reported Crashes By Time of Day

Hour Beginning and Ending	2003	2004	2005	2006	2007	Total
12:00 a.m. - 3:00 a.m.	1	1		1		3
3:00 a.m. - 6:00 a.m.			1	1		2
6:00 a.m. - 9:00 a.m.	1	2		1	2	6
9:00 a.m. - 12:00 p.m.	2	2		2		6
12:00 p.m. - 3:00 p.m.		2	1		1	4
3:00 p.m. - 6:00 p.m.	3	2	2		3	10
6:00 p.m. - 9:00 p.m.	2	1		1		4
9:00 p.m. - 12:00 a.m.		1	1	3	1	6
Total Annual Reported Crashes	9	11	5	9	7	41

Reported Crashes By Day of Week

Day of Week	2003	2004	2005	2006	2007	Total
Monday	2	1	1	2	2	8
Tuesday		2		2	1	5
Wednesday	1	3		1	3	8
Thursday	2	1	1			4
Friday	1	3	2	2		8
Saturday	2		1	2		5
Sunday	1	1			1	3
Total Annual Reported Crashes	9	11	5	9	7	41

Reported Crashes By Month of Year

Month of Year	2003	2004	2005	2006	2007	Total
January	3	1		1	1	6
February	2	1		1		4
March		2	2	1		5
April		1			1	2
May					1	1
June	1			1		2
July		2			1	3
August		3		1		4
September	1			1		2
October	1		1	2		4
November			1	1	1	3
December	1	1	1		2	5
Total Annual Reported Crashes	9	11	5	9	7	41

Crash Data Analysis
Jackrabbit Lane (MT 85) - Milepost 3.7 to 4.3
Near Valley Center Road (± Milepost 4.0) - Kenyon Noble Ready Mix Plant

Reported Crashes By Road and Weather Conditions

Weather	Road	2003	2004	2005	2006	2007	Total
Clear	Dry	2	4	2	6	2	16
	Wet						0
	Snow/Slush		1				1
	Ice						0
	Sand/Mud/Dirt						0
Cloudy	Dry	2	3	2		2	9
	Wet						0
	Snow/Slush						0
	Ice	3			2		5
	Sand/Mud/Dirt						0
Snow/ Rain	Dry						0
	Wet	1	1	1	1		4
	Snow/Slush		1			2	3
	Ice	1	1			1	3
	Sand/Mud/Dirt						0
Fog	Dry						0
	Wet						0
	Snow/Slush						0
	Ice						0
	Sand/Mud/Dirt						0
Total Annual Reported Crashes		9	11	5	9	7	41

Reported Crashes By Light Conditions

Lighting Conditions	2003	2004	2005	2006	2007	Total
Dawn	1				2	3
Dusk		1				1
Daylight	5	8	3	4	4	24
Dark - Lighted	1	1	1	1	1	5
Dark - Not Lighted	2	1	1	4		8
Total Annual Reported Crashes	9	11	5	9	7	41

Reported Crashes Involving Injuries/Damage

Injury/Damage	2003	2004	2005	2006	2007	Total
Fatal Injury	1					1
Non-Fatal Injury	3	3	1	3	3	13
Property Damage Only	5	8	4	6	4	27
Total Annual Reported Crashes	9	11	5	9	7	41

Crash Data Analysis
Jackrabbit Lane (MT 85) - Milepost 3.7 to 4.3
Near Valley Center Road (± Milepost 4.0) - Kenyon Noble Ready Mix Plant

Drivers Involved in Reported Crashes By Age Group and Sex

Age Group	Sex	2003	2004	2005	2006	2007	Total
15-24	M	2	10	3	4	5	24
	F	2	1	1	1	3	8
25-29	M	2				1	3
	F	1	1				2
30-34	M		1		1		2
	F	1	1		1		3
35-39	M		2				2
	F						0
40-49	M	4	3	1	2	1	11
	F	1	1	1	1	3	7
50-59	M	1			1	1	3
	F						0
60-69	M	1	1				2
	F			1	1		2
70+	M	1	1				2
	F					1	1
Total Annual Drivers Involved		16	22	7	12	15	72

Drivers Involved in Reported Crashes By Vehicle Type

Vehicle Type	2003	2004	2005	2006	2007	Total
Compact Car	1				2	3
Mid-Size Car		2		3	2	7
Passenger Car	3	6	4	3		16
Large Car		1	2		1	4
Mid-Size Wagon					2	2
Small Pickup		2		1		3
Pickup	4	5	2	2		13
Standard Pickup	3	3		3	6	15
SUV	1			1	1	3
Van	1			1	1	3
Truck/Tractor	3	1				4
Other		1	1			2
Total Annual Vehicles Involved	16	21	9	14	15	75

Crash Data Analysis
Jackrabbit Lane (MT 85) - Milepost 3.7 to 4.3
Near Valley Center Road (± Milepost 4.0) - Kenyon Noble Ready Mix Plant

Drivers Involved in Reported Crashes By Direction of Travel and Intent

Dir Trvl	Intent	2003	2004	2005	2006	2007	Total
EB	Go Straight				1		1
	Overtake						0
	Slow/Stop						0
	Remain Stop		1				1
	Left Turn						0
	Right Turn						0
WB	Go Straight		1				1
	Overtake						0
	Slow/Stop						0
	Remain Stop						0
	Left Turn		1				1
	Right Turn						0
NB	Go Straight	1	4	3	2	2	12
	Overtake						0
	Slow/Stop	3					3
	Remain Stop						0
	Left Turn						0
	Right Turn		1	1			2
SB	Go Straight	6	6	3	4	6	25
	Overtake		1		1		2
	Slow/Stop	2	3	1	1	3	10
	Remain Stop	1	1		1	1	4
	Left Turn	3	2	1	4	2	12
	Right Turn					1	1
Total Annual Drivers Involved		16	21	9	14	15	75

Reported Crashes By Type

Crash Type	2003	2004	2005	2006	2007	Total
Head On	1					1
Rear End	3	3	3	3	6	18
Right Angle		2				2
Left Turn		1				1
Sideswipe	1	2		2		5
Animal-Vehicle				1		1
Fixed Object				1		1
Overturn	2	1	1			4
Other	2	2	1	2	1	8
Total Annual Reported Crashes	9	11	5	9	7	41

Crash Data Analysis
Frontage Road (S 205) - Milepost 21.4 to 22.0
Belgrade, Montana Near Airport Road (± Milepost 21.7) - Knife River Pit

Overall Roadway Segment Reported Crash Rate Analysis	
Weighted Annual Average Daily Traffic (ADT) Reported by MDT	8,108
Total Number of Reported Crashes for Years 2003 Through 2007	14
Roadway Segment Length in Miles	0.59
Reported Crash Rate Per Million Vehicle Miles Traveled (MVMT) for Roadway Segment	**1.59**

Overall Roadway Segment Crash Severity Analysis	
Total Number of Reported Fatal Injury Crashes in Roadway Segment	0
Total Number of Reported Non-Fatal Injury Crashes in Roadway Segment	6
Total Number of Reported Property Damage Only Crashes in Roadway Segment	8
Fatal Injury Crash Severity Index Factor	9.50
Non-Fatal Injury Crash Severity Index Factor	3.50
Property Damage Only Crash Severity Index Factor	1.00
Reported Crash Severity Index for Roadway Segment	**2.07**
Reported Crash Severity Rate Per MVMT for Roadway Segment	**3.30**

Truck Traffic Roadway Segment Reported Crash Rate Analysis	
Weighted Annual Average Daily Traffic (ADT) Reported by MDT	8,108
Percentage Truck Traffic of ADT Based on 2008 Traffic Counts	12%
Estimated Annual Average Daily Truck Traffic (ADTT)	973
Total Number of Reported Crashes Involving Trucks for Years 2003 Through 2007	2
Roadway Segment Length in Miles	0.59
Reported Crash Rate Involving Trucks Per MVM for Roadway Segment	**1.90**

Truck Traffic Roadway Segment Crash Severity Analysis	
Total Number of Reported Fatal Injury Crashes Involving Trucks in Roadway Segment	0
Total Number of Reported Non-Fatal Injury Crashes Involving Trucks in Roadway Segment	2
Total Number of Reported Property Damage Only Crashes Involving Trucks in Roadway Segment	0
Fatal Injury Crash Severity Index Factor	9.50
Non-Fatal Injury Crash Severity Index Factor	3.50
Property Damage Only Crash Severity Index Factor	1.00
Reported Crash Severity Index Involving Trucks for Roadway Segment	**3.50**
Reported Crash Severity Rate Involving Trucks Per MVMT for Roadway Segment	**6.64**

Crash Data Analysis
Frontage Road (S 205) - Milepost 21.4 to 22.0
Belgrade, Montana Near Airport Road (± Milepost 21.7) - Knife River Pit

Reported Crashes By Time of Day

Hour Beginning and Ending	2003	2004	2005	2006	2007	Total
12:00 a.m. - 3:00 a.m.				1		1
3:00 a.m. - 6:00 a.m.						0
6:00 a.m. - 9:00 a.m.			2	1	1	4
9:00 a.m. - 12:00 p.m.			1			1
12:00 p.m. - 3:00 p.m.			1	1	1	3
3:00 p.m. - 6:00 p.m.		1	2	1		4
6:00 p.m. - 9:00 p.m.						0
9:00 p.m. - 12:00 a.m.	1					1
Total Annual Reported Crashes	1	1	6	4	2	14

Reported Crashes By Day of Week

Day of Week	2003	2004	2005	2006	2007	Total
Monday				2		2
Tuesday		1	1			2
Wednesday			1			1
Thursday	1			1	1	3
Friday			2	1		3
Saturday					1	1
Sunday			2			2
Total Annual Reported Crashes	1	1	6	4	2	14

Reported Crashes By Month of Year

Month of Year	2003	2004	2005	2006	2007	Total
January			2			2
February					1	1
March						0
April			1			1
May						0
June						0
July				1		1
August			1	1	1	3
September		1	1	1		3
October						0
November			1	1		2
December	1					1
Total Annual Reported Crashes	1	1	6	4	2	14

Crash Data Analysis
Frontage Road (S 205) - Milepost 21.4 to 22.0
Belgrade, Montana Near Airport Road (± Milepost 21.7) - Knife River Pit

Reported Crashes By Road and Weather Conditions

Weather	Road	2003	2004	2005	2006	2007	Total
Clear	Dry			3	4		7
	Wet						0
	Snow/Slush						0
	Ice						0
	Sand/Mud/Dirt						0
Cloudy	Dry		1	1			2
	Wet			1			1
	Snow/Slush						0
	Ice			1		1	2
	Sand/Mud/Dirt						0
Snow/ Rain	Dry						0
	Wet						0
	Snow/Slush						0
	Ice	1					1
	Sand/Mud/Dirt						0
Fog	Dry					1	1
	Wet						0
	Snow/Slush						0
	Ice						0
	Sand/Mud/Dirt						0
Total Annual Reported Crashes		1	1	6	4	2	14

Reported Crashes By Light Conditions

Lighting Conditions	2003	2004	2005	2006	2007	Total
Dawn						0
Dusk						0
Daylight		1	5	3	2	11
Dark - Lighted						0
Dark - Not Lighted	1		1	1		3
Total Annual Reported Crashes	1	1	6	4	2	14

Reported Crashes Involving Injuries/Damage

Injury/Damage	2003	2004	2005	2006	2007	Total
Fatal Injury						0
Non-Fatal Injury			2	3	1	6
Property Damage Only	1	1	4	1	1	8
Total Annual Reported Crashes	1	1	6	4	2	14

Crash Data Analysis
Frontage Road (S 205) - Milepost 21.4 to 22.0
Belgrade, Montana Near Airport Road (± Milepost 21.7) - Knife River Pit

Drivers Involved in Reported Crashes By Age Group and Sex

Age Group	Sex	2003	2004	2005	2006	2007	Total
15-24	M				1		1
	F		1	2			3
25-29	M			3	1	1	5
	F			1	1		2
30-34	M			1	2		3
	F		1			1	2
35-39	M			2			2
	F						0
40-49	M				1	2	3
	F	1					1
50-59	M				2		2
	F						0
60-69	M	1		1			2
	F						0
70+	M						0
	F						0
Total Annual Drivers Involved		2	2	10	8	4	26

Drivers Involved in Reported Crashes By Vehicle Type

Vehicle Type	2003	2004	2005	2006	2007	Total
Compact Car			1	1	1	3
Mid-Size Car					1	1
Passenger Car	2	2	3			7
Large Car			1	1		2
Mid-Size Wagon						0
Small Pickup						0
Pickup			1			1
Standard Pickup			4	1	1	6
SUV				1		1
Van				2	1	3
Truck/Tractor				2		2
Other						0
Total Annual Vehicles Involved	2	2	10	8	4	26

Crash Data Analysis
Frontage Road (S 205) - Milepost 21.4 to 22.0
Belgrade, Montana Near Airport Road (± Milepost 21.7) - Knife River Pit

Drivers Involved in Reported Crashes By Direction of Travel and Intent

Dir Trvl	Intent	2003	2004	2005	2006	2007	Total
EB	Go Straight		1	2	1	2	6
	Overtake					1	1
	Slow/Stop			2		1	3
	Remain Stop						0
	Left Turn	1	1		2		4
	Right Turn						0
WB	Go Straight	1		2	5		8
	Overtake						0
	Slow/Stop			2			2
	Remain Stop						0
	Left Turn			1			1
	Right Turn			1			1
NB	Go Straight						0
	Overtake						0
	Slow/Stop						0
	Remain Stop						0
	Left Turn						0
	Right Turn						0
SB	Go Straight						0
	Overtake						0
	Slow/Stop						0
	Remain Stop						0
	Left Turn						0
	Right Turn						0
Total Annual Drivers Involved		2	2	10	8	4	26

Reported Crashes By Type

Crash Type	2003	2004	2005	2006	2007	Total
Head On			1			1
Rear End		1	2	1	1	5
Right Angle			1			1
Left Turn	1			1		2
Sideswipe				1	1	2
Animal-Vehicle			1			1
Fixed Object				1		1
Overturn						0
Other			1			1
Total Annual Reported Crashes	1	1	6	4	2	14

Montana Department of Transportation
2701 Prospect Avenue
PO Box 201001
Helena MT 59620-1001

Jim Lynch, Director
Brian Schweitzer, Governor

April 18, 2008

Jerry Ricc
TMC, Inc.
PO Box 69
Belgrade MT 59714

Subject: Morgan Family Gravel Pit – US 191
MDT File No. 65.71.516.01
Traffic Impact Study Comments

Dear Mr. Ricc

The Montana Department of Transportation (MDT) staff has reviewed the Traffic Impact Study (TIS) dated February 2008 for the above referenced gravel pit. We have the following comments:

Traffic Comments

- A southbound left turn lane must be constructed on US 191 at this intersection. This left turn lane is required as US 191 is a high speed facility and the trucks accessing the gravel pit require large gaps when turning left. This left turn lane must be designed to MDT standards.

- A northbound deceleration lane on US 191 must be constructed at this intersection for the right turning movements. The lane must be designed as an 18:1 tapered slip ramp and meet MDT standards for design.

- A northbound acceleration lane on US 191 must be constructed at this intersection for gravel trucks making a right turn and heading north on US 191. This acceleration will allow trucks heading north to accelerate to speed without affecting northbound through traffic. This acceleration lane must be designed to MDT standards.

Coordinating Comments

- MDT will require you to submit design plans for the left turn lane and the deceleration lane for MDT review, comment, and if appropriate approval. The review and approval of design plans may take multiple iterations.

- Once the design is approved, MDT will require you to enter into a Memorandum of Agreement (MOA) that details your responsibilities for mitigating impacts to US 191.

- You will need to provide full time construction inspection and certification during construction by qualified staff. You will need to provide construction inspection

reports upon MDT request during construction and will need to provide all construction inspections reports upon completion of the project. The MDT District Office will assign staff to provide construction inspection oversight.

- MDT cannot issue the approach permit until all other environmental clearances are obtained for the proposed gravel pit.

If you have any questions concerning this letter, or need additional information, please contact me at (406) 444-9456 or email at jriley@mt.gov.

Sincerely,

Jean A. Riley

Jean A. Riley, P.E., System Impact Coordinator
Program and Policy Analysis
Rail, Transit and Planning Division

Copies: Jeff Ebert, P.E., Butte District Administrator
Lee Alt, P.E., Butte Traffic Engineer
Joe Zody, Right of Way
Danielle Bolan, P.E., Traffic Engineer
Jim Skinner, Rail, Transit & Planning Division
Neil Harrington, DEQ Industrial & Energy Mineral Bureau
File

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Montana Department of Transportation
2701 Prospect Avenue
PO Box 201001
Helena MT 59620-1001

Jim Lynch, Director
Brian Schweitzer, Governor

July 29, 2008

Tom Eastwood, PE
Morrison Maierle, Inc.
PO Box 1113
Bozeman MT 59771

Subject: Morgan Family Gravel Pit – US 191
MDT File No. 65.71.516.01
Response to July 11, 2008 letter

Dear Mr. Eastwood,

The Montana Department of Transportation (MDT) staff has reviewed your letter dated July 11, 2008. MDT requirements for the mitigation remain, as previously stated. These mitigation requirements must be met before MDT will approve a change in use for the deeded approach.

The information provided in your letter does not address our concern for maintaining a safe facility for the traveling public. As stated in my letter to Mr. Rice dated April 18, 2008 (copy attached), the requirements for the southbound left turn lane, northbound acceleration, and northbound deceleration lanes are the mitigation for the proposed approach.

MDT reviews site conditions on a case by case basis when access to the State's facilities is requested. Each approach location is reviewed and the decisions are based on site conditions, traffic information, and the proposed development. Each individual approach location is reviewed on its own merits.

Please refer to the Coordinated Comments in the April 18, 2008 letter for the next steps in MDT's review process. If you have any questions, please contact me at jriley@mt.gov or (406) 444-9456.

Sincerely,

Jean A. Riley

Jean A. Riley, P.E., Transportation Planning Engineer
Program and Policy Analysis
Rail, Transit & Planning Division

Attachment: April 18, 2008 letter

Copies: Jim Lynch – Director
Sandra Straehl – Administrator Rail Tranist & Planning Division
Loran Frazier, P.E. – Chief Engineer
Jeff Ebert, P.E. – Butte District Administrator
Lee Alt – Butte Traffic Engineer
Joe Zody – Right of Way Bureau
Danielle Bolan, P.E. - Traffic Engineer
Jim Skinner – Rail Transit & Planning Division
Neil Harrington – DEQ Industrial & Energy Mineral Bureau
Jerry Rice, TMC, Inc.
File

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Montana Department of Transportation

2701 Prospect Avenue
PO Box 201001
Helena MT 59620-1001

Jim Lynch, Director
Brian Schweitzer, Governor

April 18, 2008

Jerry Rice
TMC, Inc.
PO Box 69
Belgrade MT 59714

Subject: Morgan Family Gravel Pit – US 191
MDT File No. 65.71.516.01
Traffic Impact Study Comments

Dear Mr. Rice

The Montana Department of Transportation (MDT) staff has reviewed the Traffic Impact Study (TIS) dated February 2008 for the above referenced gravel pit. We have the following comments:

Traffic Comments

- A southbound left turn lane must be constructed on US 191 at this intersection. This left turn lane is required as US 191 is a high speed facility and the trucks accessing the gravel pit require large gaps when turning left. This left turn lane must be designed to MDT standards.

- A northbound deceleration lane on US 191 must be constructed at this intersection for the right turning movements. The lane must be designed as an 18:1 tapered slip ramp and meet MDT standards for design.

- A northbound acceleration lane on US 191 must be constructed at this intersection for gravel trucks making a right turn and heading north on US 191. This acceleration will allow trucks heading north to accelerate to speed without affecting northbound through traffic. This acceleration lane must be designed to MDT standards.

Coordinating Comments

- MDT will require you to submit design plans for the left turn lane and the deceleration lane for MDT review, comment, and if appropriate approval. The review and approval of design plans may take multiple iterations.

- Once the design is approved, MDT will require you to enter into a Memorandum of Agreement (MOA) that details your responsibilities for mitigating impacts to US 191.

- You will need to provide full time construction inspection and certification during construction by qualified staff. You will need to provide construction inspection

Program & Policy Analysis Bureau
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