Rintala Pit & Quarry

City of Greater Sudbury

Traffic Impact Study for

Tulloch Engineering Inc.

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John Northcote, P.Eng.
Professional License #: 100124071

ENGINEERING

JD Northcote Engineering Inc.
86 Cumberland Street
Barrie, ON
705.725.4035
www.JDEngineering.ca

Legal Notification

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Executive Summary

This report summarizes the traffic impact study prepared for the proposed Pit and Quarry located at 787 Municipal Road 4 (Fairbank Lake Road) in the City of Greater Sudbury [City]. The report assesses the impact of traffic related to the development on the adjacent roadway and provides recommendations to accommodate this traffic in a safe and efficient manner.

The development will include the construction of new internal gravel surfaced roadways with a single connection to Fairbank Lake Road [Site Access].

The scope of this analysis includes a review of the following intersections:

- Site Access / Fairbank Lake Road

Conclusions

1. The proposed development is expected to generate a total of 24 AM and 24 PM peak hour trips.
2. Midblock counts were obtained on Fairbank Lake Road, conducted on Wednesday and Thursday, August 29th & 30th 2018.
3. A road section analysis was completed for Fairbank Lake Road, using the existing and background (2025 and 2030) traffic volumes without the proposed development traffic. This enabled a review of existing and future traffic deficiencies that would be present without the influence of the proposed development. No improvements are recommended within the study area.
4. An estimate of the amount of traffic that would be generated by the Subject Site was prepared and assigned to the study area streets and intersections.
5. An intersection operation analysis was completed under total (2025 and 2030) traffic volumes with the proposed development operational at the study area intersections. No external infrastructure improvements are recommended within the study area.
6. The proposed Site Accesses will operate efficiently with one-way stop control for egress movements. A single lane for ingress and egress movements will provide the necessary capacity to convey the traffic volume generated by the proposed development.
7. The location of the proposed site access is appropriate with respect to minimum corner clearance and spacing requirements as identified in the Transportation Association of Canada Design Guide for Canadian Roads (2017).
8. It is recommended that the asphalt apron incorporate asphalt shoulder tapers (2.0-metre-wide paved shoulder taper over a 20 metre length, on both sides of the entrance) and 21 metre driveway radius.
9. In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network.

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1 Introduction

1.1 Background

On behalf of the property owner, **Tulloch Engineering Inc.** [Tulloch] is proposing a Pit & Quarry on a site located at 787 Municipal Road 4 (Fairbank Lake Road) in the City of Greater Sudbury.

The development will include the construction of new internal gravel surfaced roadways with a single connection to Fairbank Lake Road [Site Access].

The Client has retained **JD Engineering Inc.** [JD Engineering] to prepare this traffic impact study in support of the proposed rezoning.

1.2 Study Area

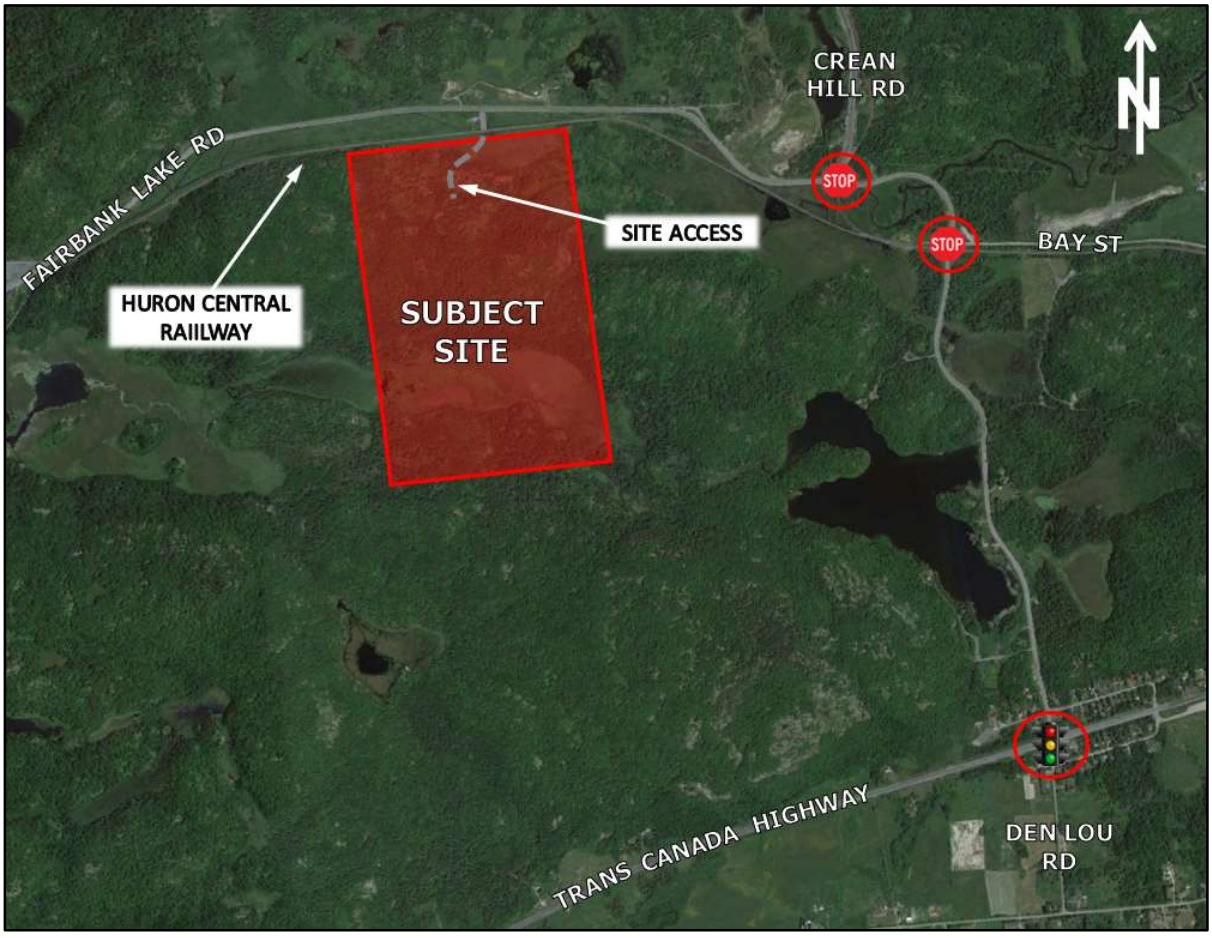
Figure 1 shows the location of the subject site and study area intersections in relation to the surrounding area. The Site Plan by Tulloch is provided in **Appendix A**.

The subject site is bound by vacant land to the south, east and west and the Huron Central Railway Line to the north.

Through consultation with the City, the following intersections are included in the traffic impact study:

- Site Access / Fairbank Lake Road

Figure 1 – Proposed Site Location and Study Area



1.3 Study Scope and Objectives

The purpose of this study is to identify the potential impacts to traffic flow at the site access and on the surrounding roadway network. The study analysis includes the following tasks:

- Consult with the City to address any traffic-related issues or concerns they have with the proposed development;
- Determine existing traffic volumes and circulation patterns;
- Estimate future traffic volumes if the proposed development was not constructed, including the impact of additional proposed developments in the area;
- Complete level-of-service [LOS] analysis of horizon year (without the proposed development) traffic conditions and identify operational deficiencies;
- Estimate the amount of traffic that would be generated by the proposed development and assign to the roadway network;
- Complete LOS analysis of horizon year (with the proposed development) traffic conditions and identify additional operational deficiencies;
- Identify improvement options to address operational deficiencies;
- Review the proposed intersection spacing;

- Complete a review of available haul routes in the study area for truck access to the subject site; and
- Document findings and recommendations in a final report.

1.4 Horizon Year and Analysis Periods

Traffic scenarios for the existing year, ultimate buildout horizon year (2025) and 5-year post-buildout horizon year (2030) were selected for analysis of traffic operations in the study area. The weekday morning [AM] and weekday afternoon [PM] peak hours have been selected as the analysis periods for this study.

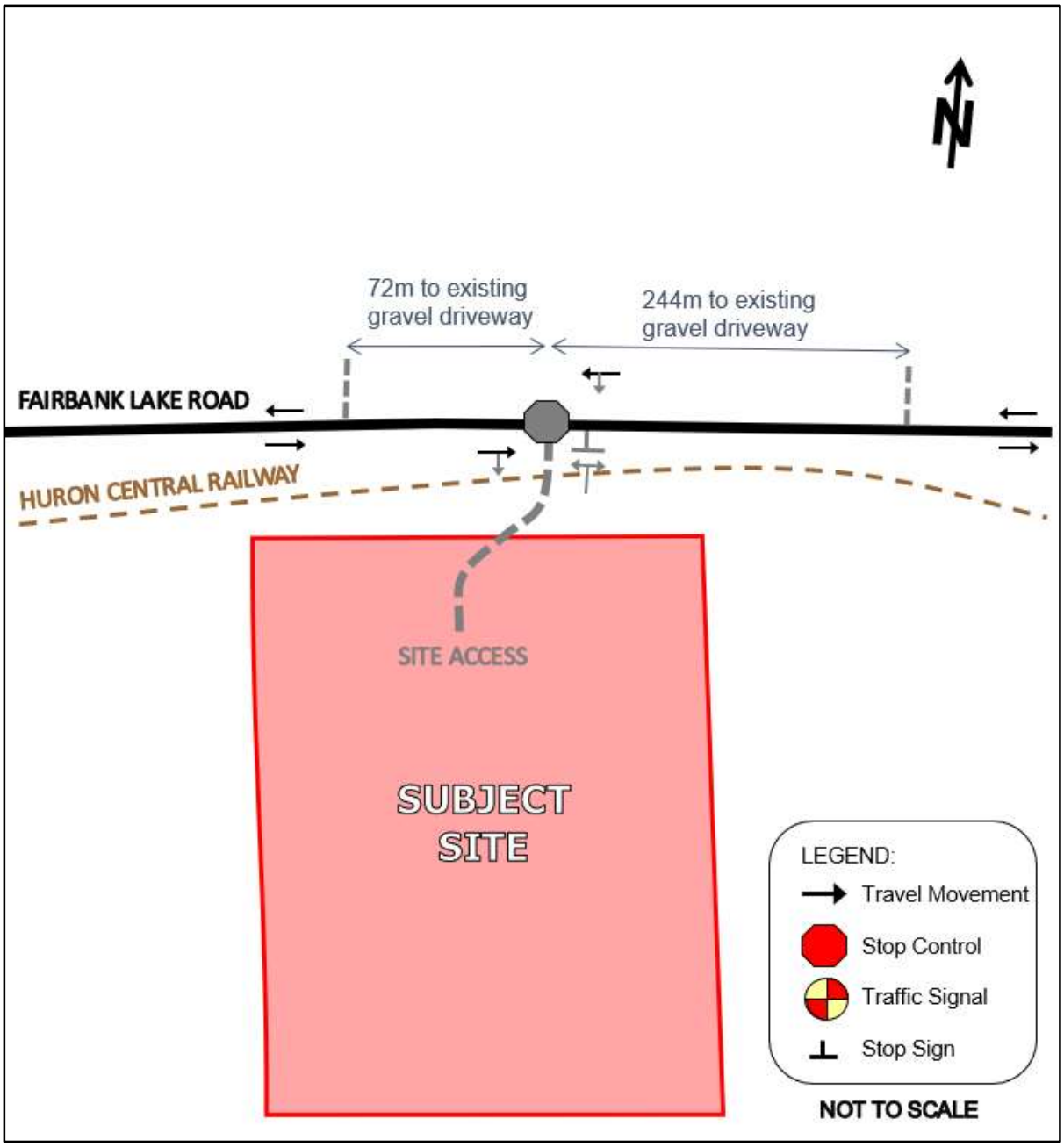
2 Information Gathering

2.1 Street and Intersection Characteristics

Fairbank Lake Road (Municipal Road 4) is a two-lane collector road with a rural cross-section (gravel shoulders and grassed ditches) through the study area. Adjacent the subject site, Fairbank Lake Road has an approximate 7.5 metre asphalt platform with 2.5 metres gravel shoulders on both sides of the road. Fairbank Lake Road has a posted speed limit of 60 km/h and is under the jurisdiction of City.

The existing intersection spacing and lane configuration within the study area is illustrated in **Figure 2**.

Figure 2 – Existing (2020) Intersection Spacing and Lane Configuration with in Study Area



2.2 Local Transportation Infrastructure Improvements

Based on the City of Greater Sudbury Transportation Study Report [City TSR] (December 2016) and City's 2020 Capital Budget Project Summary, there are no significant infrastructure improvements anticipated to be completed within the study area that would have any impact on local traffic volumes or traffic distribution.

2.3 Transit Access

There is currently no municipal transit service within the study area.

2.4 Development Growth

In review of the City's Development Application Map and through correspondence with City Staff, there are no planned developments near the study area that warrant consideration with respect to impacts on the local traffic volumes / infrastructure capacity.

2.5 Background Traffic Growth

City Staff have indicated a typical traffic growth rate of 1.5% per annum for upper tier City roads.

2.6 Traffic Counts

An hourly traffic volume report was obtained from the City for Fairbank Lake Road, west of the subject site. Counts were conducted on Wednesday and Thursday, August 29th & 30th 2018. **Table 1** summarizes the traffic count data collection information.

Table 1 – Traffic Count Data

Road	AM Peak Hour	PM Peak Hour	2018 Peak Hour Directional Volumes	
			AM	PM
Fairbank Lake Road	10:00 – 11:00	16:00 – 17:00	26E / 16W	21E / 47W

Detailed traffic count data can be found in **Appendix B**.

2.7 Existing Traffic Volumes

The 2020 existing AM and PM peak hour traffic volumes at the study area are illustrated in **Figure 3** established based on the hourly volumes adjusted to reflect the annual background growth rate of 1.5%.

2.8 Horizon Year Traffic Volumes

The background (2025 and 2030) horizon year traffic volumes are illustrated in **Figure 4** and **Figure 5**. The background volumes are based on the existing (2020) traffic volumes, adjusted to reflect the annual background growth rate of 1.5%.

3 Road Section Operations without Proposed Development

Recognizing that the existing and future road network (without the proposed development) does not include any intersection movements, the operations have been limited to a review of the midblock traffic volumes. As per **Figure 3** through **Figure 5** traffic volumes on Fairbank Lake Road, adjacent the subject site, are in the range of 27 to 48 and 31 to 56 vehicles per lane during the AM and PM peak hours, respectively. In context with the capacity of a typical collector road (600 vehicles per hour per lane), the road way is expected to operate below 10% capacity. As such, no improvements are necessary to facilitate the existing and background conditions.

4 Proposed Development Traffic Generation and Assignment

4.1 Traffic Generation

The traffic generation for the proposed pit & quarry operations has been based on estimates and the intended business operational information provided by the Client. The following summarizes the proposed pit & quarry operations:

- Year-round operations;
- Daily operations - Ideally 24 hours, however there is potential for operations to be limited to the hours of 06:00 – 20:00;
- Expected Daily tonnage –1,200 tonnes on a typical day; 3,000 tonnes maximum;
- Truck sizes ranging from 22 to 40 tonnes loads (average of 28 tonnes assumed);
- Truck traffic to originate and terminate off-site; and
- On-site staff – 4 employees.

In order to create a conservative estimate, a daily tonnage of 2,500 tonnes has been assumed, which reflects more than double the estimated typical day haulage of 1,200 tonnes. Although the client is seeking a 24-hour operating schedule, it has been assumed that restricted 06:00 - 20:00 operations will apply, recognizing that reduced working hours will result in a higher concentration of trips over a shorter period of time and thus; a more conservative analysis.

With an average truck load size of 28 tonnes, a daily tonnage of 2,500 tonnes results in 90 trucks loads per day. Considering a 14-hour operating day (06:00 – 20:00), this results in average of 6.4 truck trips per hour. The client has indicated that operations are expected to be relatively consistent throughout a typical day, with slightly more truck traffic occurring in the morning. To consider peak hour operations during the day, the average hourly volumes have been increased by a factor 1.5. This translates to an AM and PM peak hour volume of 10 truck loads, with the remaining 70 trips distributed over the remaining 12 hours of the operating day. It is further noted that each truck load will result in 2 truck trips (1 inbound and 1 outbound trip).

Further consideration has been given to on-site staff of the pit & quarry. It has been assumed that all staff will arrive and depart to/from the subject site in separate private vehicles during the AM (inbound) and PM (outbound) peak hours.

The estimated trip generation for the pit & quarry operations is illustrated below in **Table 2** and **Table 3.**

Table 2 – Pit & Quarry Truck Volumes

Daily Tonnage	Average Truck Load	Daily Truck Loads	Hourly Truck Loads	
			Average	Peak
2,500	28 tonnes	90	6.4	10[1]

[1]Peak hour volumes have been rounded up to the nearest digit to ensure a conservative estimate

Table 3 – Total Estimated Traffic Generation of Proposed Development

Generator	AM Peak Hour			PM Peak Hour		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Trucks	10	10	20	10	10	20
Employees	4	0	4	0	4	0
Total	**14**	**10**	**24**	**10**	**14**	**24**

As indicated, the proposed operations are conservatively estimated at 24 AM and PM peak hour trips (total of inbound and outbound trips).

4.2 Traffic Assignment

The traffic assignment for the development is based on a review of the existing truck routes and origins / destinations of expected clientele (as provided by the developer). **Table 4** illustrates the traffic distribution for the traffic generated by the Subject Site.

Table 4 – Proposed Development Traffic Distribution

Travel Direction (to / from)	Percent of Total Traffic Generation
East via Fairbank Lake Road	90%
West via Fairbank Lake Road	10%
TOTAL	**100%**

The site traffic assignment for buildout of the proposed developments for the AM and PM peak hour is illustrated in **Figure 6**.

4.3 Total Horizon Year Traffic Volumes with the Proposed Development

For the total (2025 and 2030) horizon year traffic volumes, the proposed development traffic was added to the background (2025 and 2030) traffic volumes. The resulting total (2025 and 2030) horizon year traffic volume for the AM and PM peak hour are illustrated in **Figure 7** and **Figure 8**.

5 Intersection Operation with Proposed Development

5.1 Introduction

Future horizon traffic operations within the study area were evaluated using the future traffic volumes with the existing road configuration and traffic control. The intersection performance was measured using the traffic analysis software, Synchro 10, a deterministic model that employs Highway Capacity Manual and Intersection Capacity Utilization methodologies for analyzing intersection operations. These procedures are accepted by provincial and municipal agencies throughout North America.

Synchro 10 enables the study area to be graphically defined in terms of streets and intersections, along with their geometric and traffic control characteristics. The user is able to evaluate both signalized and unsignalized intersections in relation to each other, thus not only providing level of service for the individual intersections, but also enabling an assessment of the impact the various intersections in a network have on each other in terms of spacing, traffic congestion, delay, and queuing.

Individual turning movements with a volume-to-capacity [V/C] ratio of 0.85 or greater are considered to be critical movements and have been highlighted in the LOS tables.

The intersection operations were also evaluated in terms of the LOS. LOS is a common measure of the quality of performance at an intersection and is defined in terms of vehicular delay. This delay includes deceleration delay, queue move-up time, stopped delay, and acceleration delay. LOS is expressed on a scale of A through F, where LOS A represents very little delay (i.e. less than 10 seconds per vehicle) and LOS F represents very high delay (i.e. greater than 50 seconds per vehicle for a stop sign controlled intersection and greater than 80 seconds per vehicle for a signalized intersection).

The LOS criteria for signalized and stop sign controlled intersections are shown in **Table 5**. A description of traffic performance characteristics is included for each LOS.

Table 5 – Level of Service Criteria for Intersections

LOS	LOS Description	Control Delay (seconds per vehicle)	
		Signalized Intersections	**Stop Controlled Intersections**
A	Very low delay; most vehicles do not stop (**Excellent**)	less than 10.0	less than 10.0
B	Higher delay; more vehicles stop (**Very Good**)	between 10.0 and 20.0	between 10.0 and 15.0
C	Higher level of congestion; number of vehicles stopping is significant, although many still pass through intersection without stopping **(Good**)	between 20.0 and 35.0	between 15.0 and 25.0
D	Congestion becomes noticeable; vehicles must sometimes wait through more than one red light; many vehicles stop (**Satisfactory**)	between 35.0 and 55.0	between 25.0 and 35.0
E	Vehicles must often wait through more than one red light; considered by many agencies to be the limit of **acceptable** delay	between 55.0 and 80.0	between 35.0 and 50.0
F	This level is considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection (**Unacceptable**)	greater than 80.0	greater than 50.0

5.2 Total (2025) Intersection Operation

The results of the LOS analysis under total (2025) traffic volumes during the AM and PM peak hour can be found below in **Table 6**. To account for the high truck traffic at the Site Access, the heavy truck parameter in the Synchro model has been adjusted. Existing intersection geometry has been utilized for this scenario, including stop control has been assumed at the Site Access egress movements. Detailed output of the Synchro analysis can be found in **Appendix C**.

Table 6 – Total (2025) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour			Weekday PM Peak Hour		
	V/C	Delay (s)	LOS	V/C	Delay (s)	LOS
Site Access / Fairbank Lake Road (unsignalized)	-	2.8	A	-	2.0	A
EB	0.02	0.0	-	0.02	0.0	-
WB	0.01	3.6	A	0.01	1.2	A
NB	0.01	9.4	A	0.02	9.4	A

The results of the LOS analysis indicate that the study intersection is operating within the typical design limits noted in Section 3.1.

A review of the need for auxiliary right and left turn lanes at unsignalized study area intersections was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, auxiliary turn lanes are not recommended at any unsignalized study area intersections.

No additional improvements are recommended within the study area.

5.3 Total (2030) Intersection Operation

The results of the LOS analysis under total (2030) traffic volumes during the AM and PM peak hour can be found below in **Table 7**. To account for the high truck traffic at the Site Access, the heavy truck parameter in the Synchro model has been adjusted. Existing intersection geometry has been utilized for this scenario, including stop control has been assumed at the Site Access egress movements. Detailed output of the Synchro analysis can be found in **Appendix C**.

Table 7 – Total (2030) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour			Weekday PM Peak Hour		
	V/C	Delay (s)	LOS	V/C	Delay (s)	LOS
Site Access / Fairbank Lake Road (unsignalized)	-	2.7	A	-	1.9	A
EB	002	0.0	-	0.02	0.0	-
WB	0.01	3.3	A	0.01	1.2	A
NB	0.01	9.4	A	0.02	9.4	A

The results of the LOS analysis indicate that the study intersection is operating within the typical design limits noted in Section 3.1.

A review of the need for auxiliary right and left turn lanes at unsignalized study area intersections was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, auxiliary turn lanes are not recommended at any unsignalized study area intersections.

No additional improvements are recommended within the study area.

5.4 Site Access

The Site Access will operate efficiently as a full-movement driveway, with one-way stop control for the egress movements. Single ingress and egress lane will provide the necessary capacity to service the proposed development.

As illustrated in **Figure 2**, the spacing between the proposed Site Access and the closest intersections to the east and west is in excess of the minimum intersection spacing requirements as identified in the Transportation Association of Canada Design Guide for Canadian Roads (2017) [TAC Guidelines] – Figure 8.8.2 (Suggested Minimum Corner Clearance to Accesses at Major Intersections) – 35 metres for arterial roads and unsignalized conditions.

In order to mitigate the impact of the truck turning movements on the existing asphalt on Fairbank Lake Road, an asphalt driveway apron is recommended at the Site Access. It is recommended that the asphalt apron incorporate asphalt shoulder tapers (2.0-metre-wide paved shoulder taper over a 20 metre length, on both sides of the entrance) and 21 metre driveway radius.

5.5 Truck Haul Route Review

Fairbank Lake Road (Municipal Road 4) is designated as a haul route within the City's TSR. This route identifies the transportation network and site access necessary to meet the needs of the aggregate industry to transport their product to market, while also minimizing the impact of aggregate extraction related traffic on the communities within the City.

The Site Access, in relation to the local transportation network, has direct access to the haul route along Fairbank Lake Road. As noted in Section 4.1 the proposed expansion will add 20 heavy vehicles along the roadway, during both the AM and PM peak hour. As illustrated in the analyses completed in Section 5.1 & 5.2, the additional truck traffic generated by the proposed expansion will have a negligible impact on traffic operations in the study area.

It is expected that all truck traffic will utilize Fairbank Lake Road with ultimate connection to the Trans Canada Highway. The haul routes are expected to consist of upper tier City roads and highways, the purpose of which is to serve high volume of vehicles and all vehicle types year-round. The exception occurs with the truck route to the west, where trucks will utilize a small portion of local roadways (McIntyre Road and Smith Street) prior to connection to the Trans-Canada Highway. In consideration of the relatively minimal amount of westbound truck traffic (10% of the sites total truck traffic, or 2 trips during the AM and PM peak hours), such use of the local road network is not considered a concern.

6 Summary

Tulloch Engineering Inc. retained **JD Engineering** to prepare this traffic impact study in support of the proposed Pit & Quarry development located at 787 Municipal Road 4 (Fairbank Lake Road) in the City of Greater Sudbury. The proposed Site Plan is shown in **Appendix A**. This chapter summarizes the conclusions and recommendations from the study.

1. The proposed development is expected to generate a total of 24 AM and 24 PM peak hour trips.
2. Midblock counts were obtained on Fairbank Lake Road, conducted on Wednesday and Thursday, August 29th & 30th 2018.
3. A road section analysis was completed for Fairbank Lake Road, using the existing and background (2025 and 2030) traffic volumes without the proposed development traffic. This enabled a review of existing and future traffic deficiencies that would be present without the influence of the proposed development. No improvements are recommended within the study area.
4. An estimate of the amount of traffic that would be generated by the Subject Site was prepared and assigned to the study area streets and intersections.
5. An intersection operation analysis was completed under total (2025 and 2030) traffic volumes with the proposed development operational at the study area intersections. No external infrastructure improvements are recommended within the study area.
6. The proposed Site Accesses will operate efficiently with one-way stop control for egress movements. A single lane for ingress and egress movements will provide the necessary capacity to convey the traffic volume generated by the proposed development.
7. The location of the proposed site access is appropriate with respect to minimum corner clearance and spacing requirements as identified in the Transportation Association of Canada Design Guide for Canadian Roads (2017).
8. It is recommended that the asphalt apron incorporate asphalt shoulder tapers (2.0-metre-wide paved shoulder taper over a 20 metre length, on both sides of the entrance) and 21 metre driveway radius.
9. In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network.

Figure 3: Existing (2020) Traffic Volumes

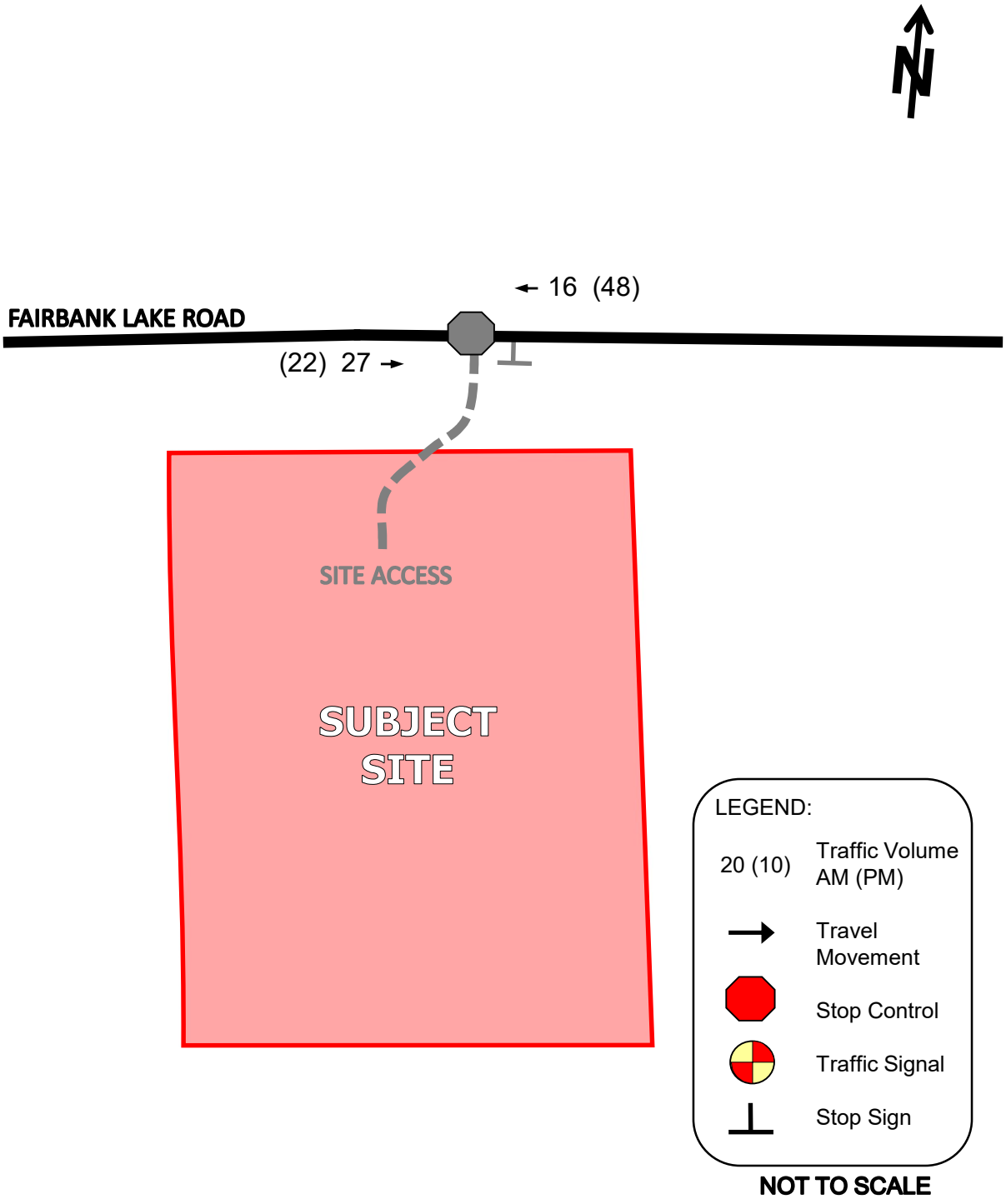


Figure 4: Background (2025) Traffic Volumes

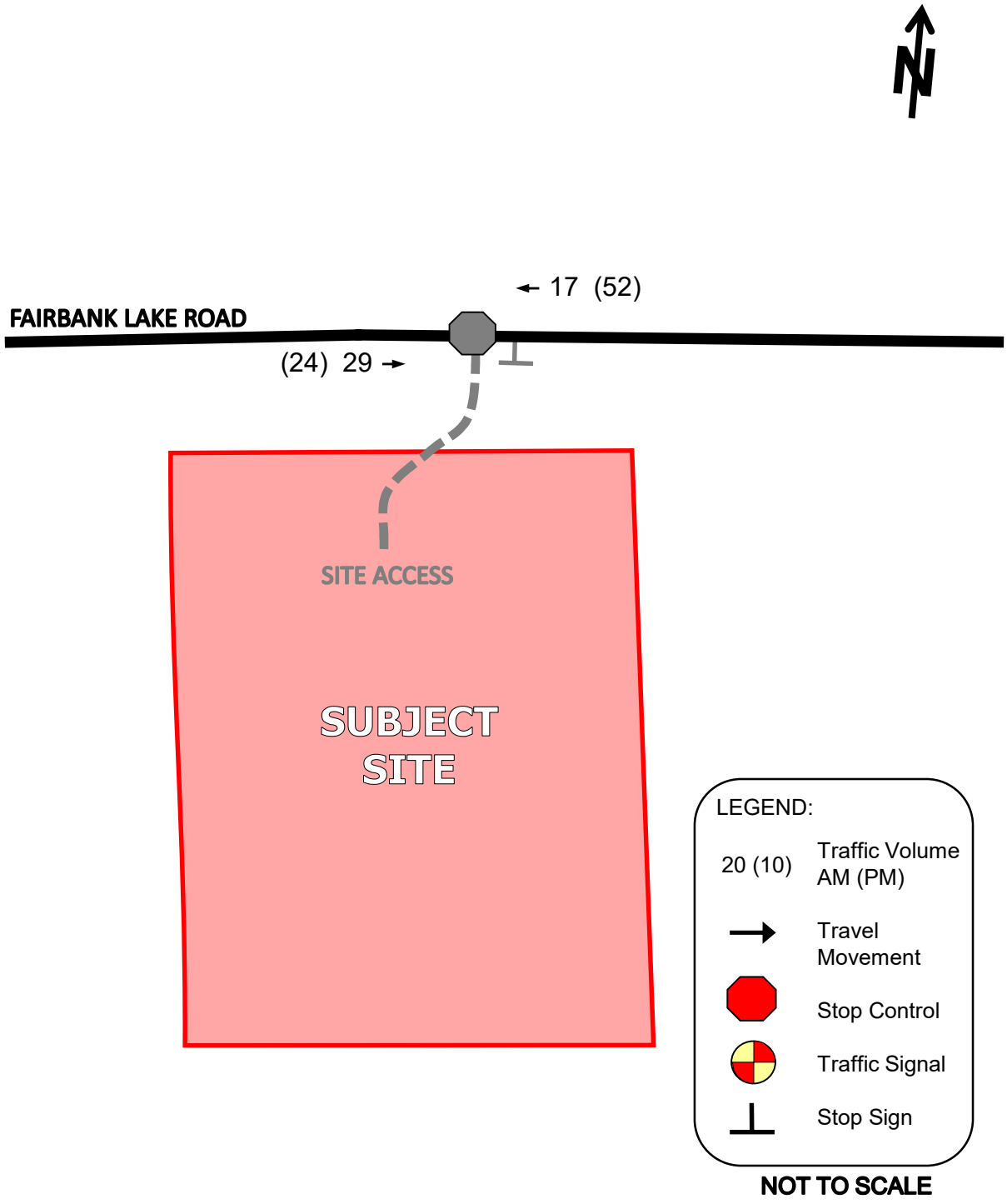


Figure 5: Background (2030) Traffic Volumes

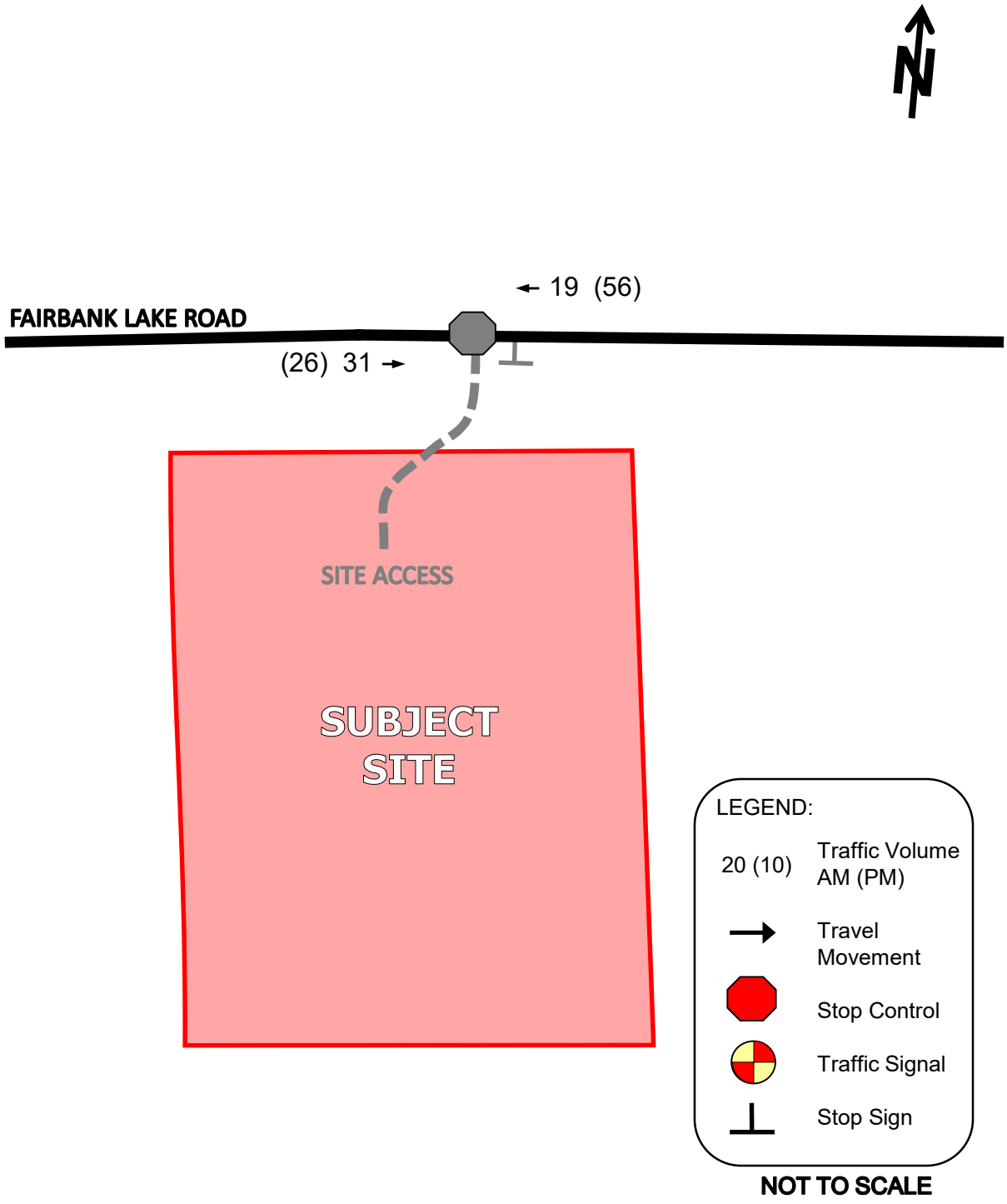


Figure 6: Site Traffic Assignment

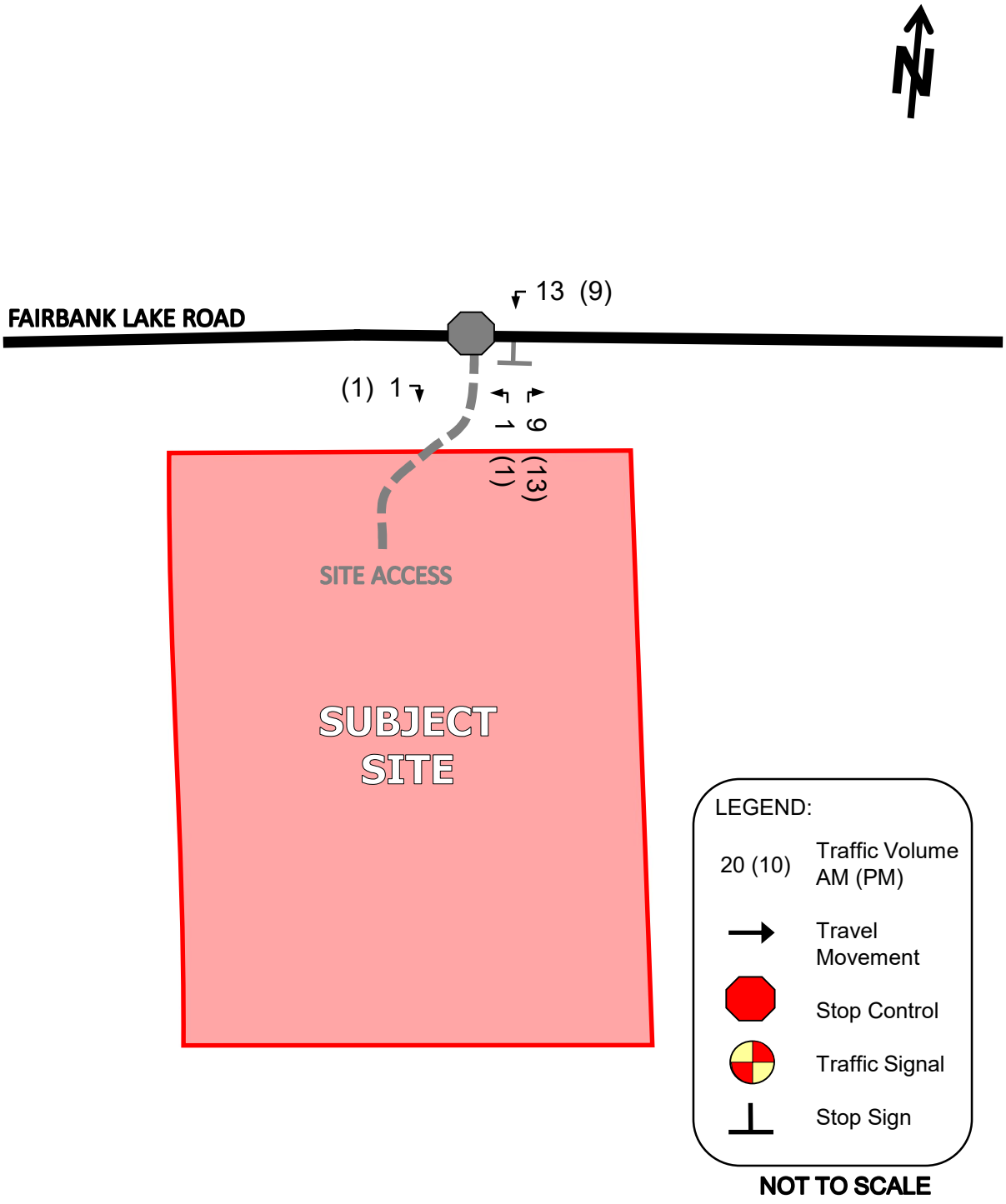


Figure 7: Total (2025) Traffic Volumes

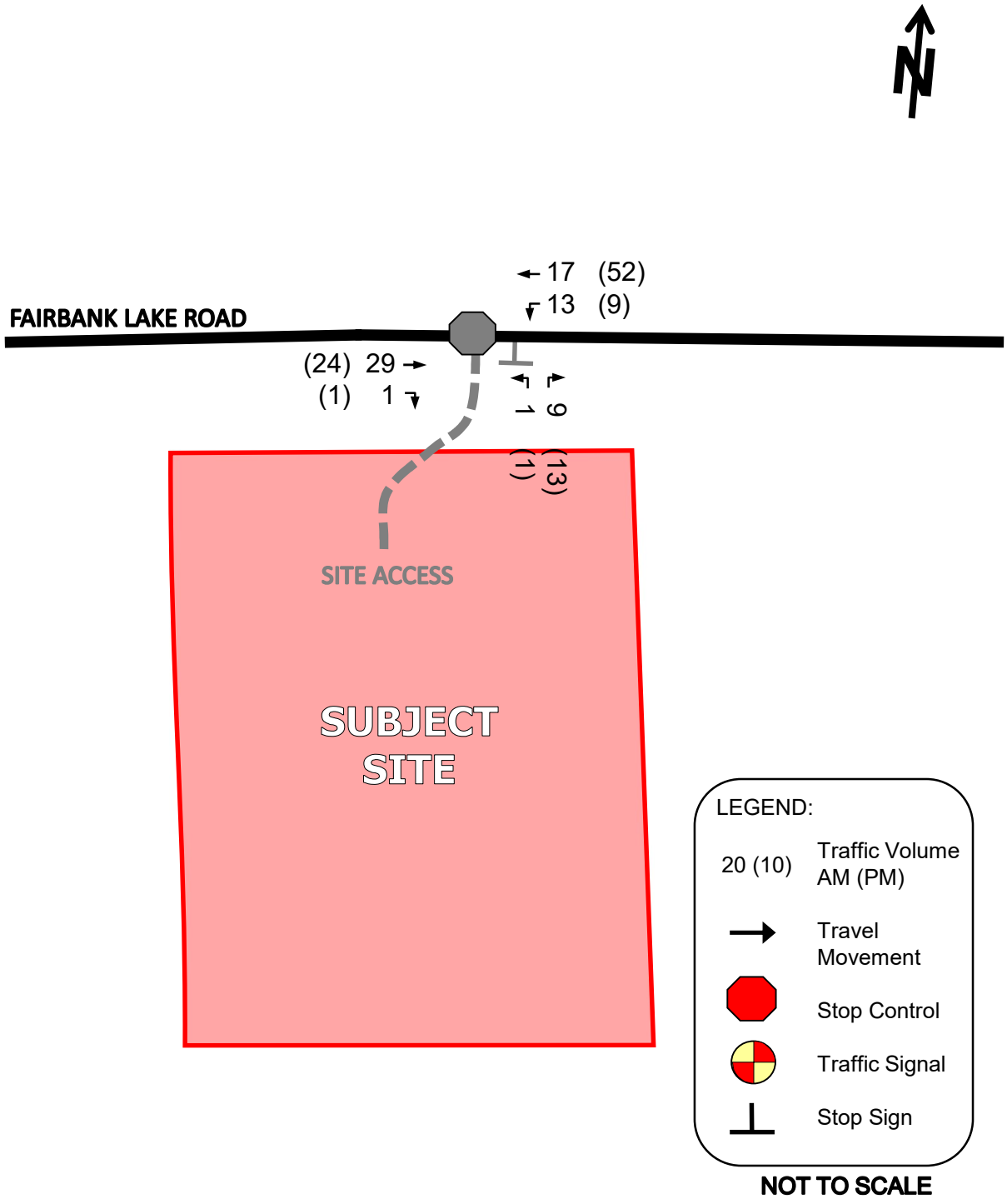
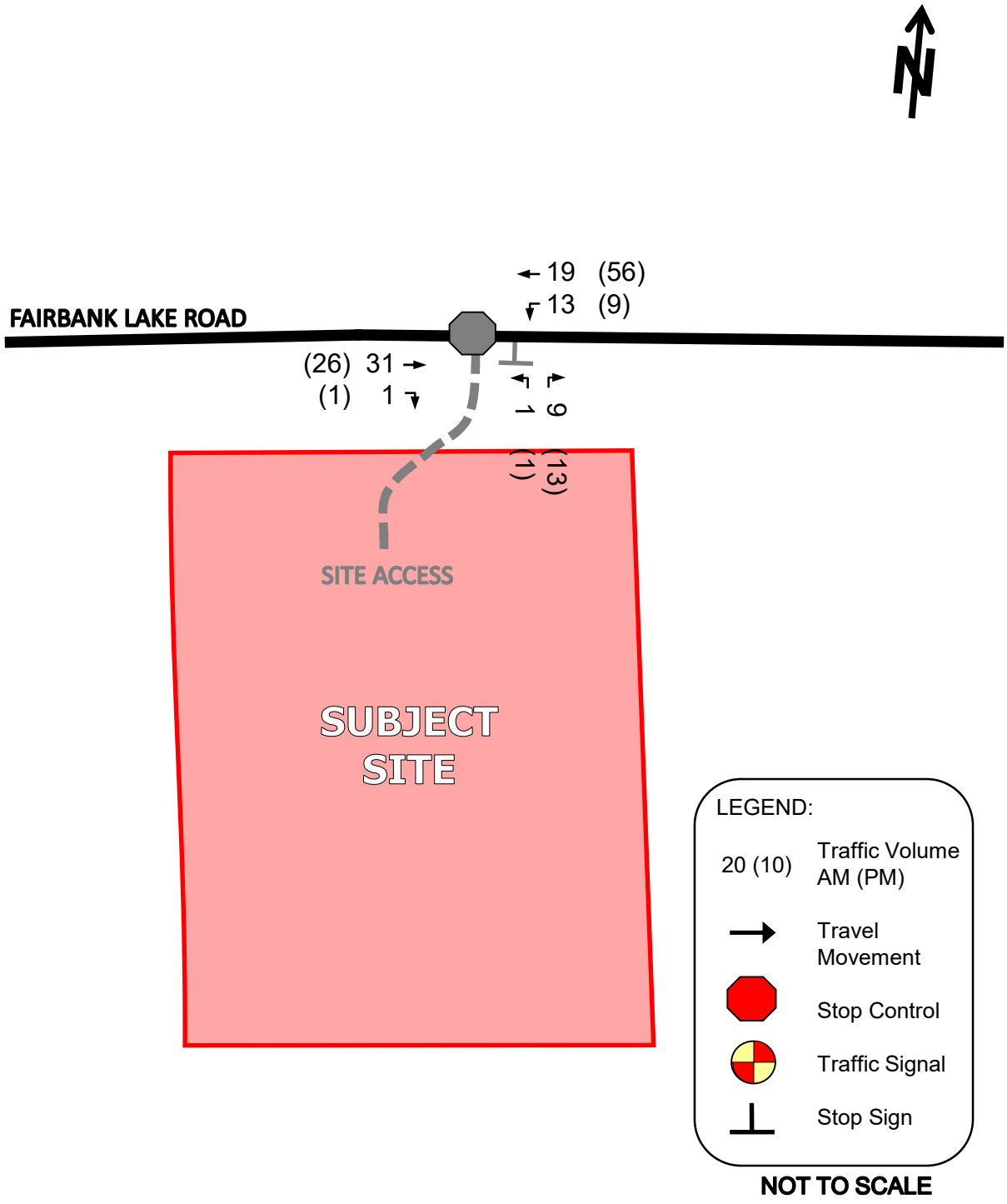


Figure 8: Total (2030) Traffic Volumes

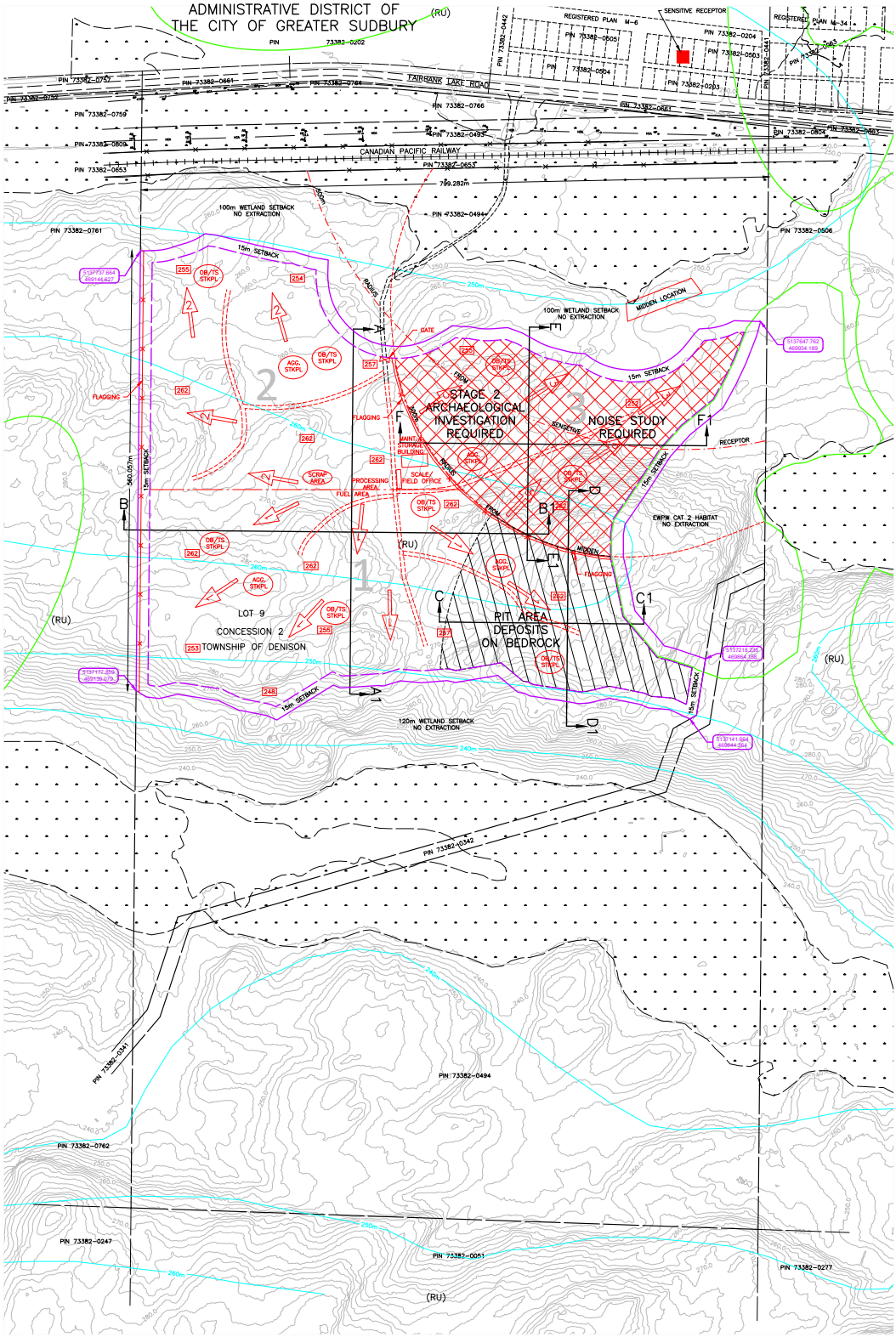


Appendix A – Site Plan

DISTRICT OF SUDBURY
TWP OF DENISON
TOWN OF WORTHINGTON
RINTALA
CATEGORY 3, CLASS A PIT AND CATEGORY 4, CLASS A QUARRY
OPERATIONS AND PROGRESSIVE REHABILITATION PLAN
DRAWING 2 of 5

PRELIMINARY
NOT FOR CONSTRUCTION
DECEMBER 11, 2020

SCALE 1:2500



LEGEND

- PROPERTY LINES
- GRAVEL SURFACED ROADS
- WATERCOURSES
- WETLAND ECOSITE
- EASTERN WHIP-POOR-WILL CAT 2 HABITAT
- RAILWAY
- CONTOURS-10m INTERVAL
- CONTOURS-2m INTERVAL
- GROUNDWATER TABLE
- LICENCE BOUNDARY
- EXTRACTION BOUNDARY
- 300m MIDDEN OFFSET
- 500m SENSITIVE RECEPTOR OFFSET
- 100m WETLAND OFFSET
- PIT AREA
- RURAL (RU) LAND USE DESIGNATION
- INTERNAL HAUL ROAD
- FLAGGING
- GATE
- PHASE BOUNDARY
- 2 PHASE No.
- DIRECTION OF EXTRACTION WITH PHASE NUMBER
- 262 FINAL EXTRACTION ELEVATION
- OB/TS STKPL OVERBURDEN & TOP SOIL STOCKPILE
- AGG. STKPL AGGREGATE STOCKPILE
- STAGE 2 ARCHEOLOGICAL INVESTIGATION REQUIRED PRIOR TO EXTRACTION IN THIS AREA

HORIZONTAL DATUM

OBSERVED REFERENCE POINTS (ORPS) DERIVED FROM GPS OBSERVATIONS USING THE PRECISE POINT POSITIONING (PPP) SERVICE, NAD83 UTM17 (CSRS) (2010.0).

VERTICAL DATUM

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE CANADIAN VERTICAL DATUM OF 1928 CGVD28 AND ARE DERIVED FROM PRECISE POINT POSITIONING (PPP) SERVICE.

BOUNDARIES

PROPERTY BOUNDARIES ARE COMPILED FROM LAND REGISTRY OFFICE DOCUMENTATION AND RECORDS OF TULLOCH GEOMATICS INC..

PROGRESSIVE REHABILITATION

SEE SECTION 1.3 NOTES ON DRAWING 5 OF 5 FOR DESCRIPTION OF PROGRESSIVE REHABILITATION.

APPLICANT NAME: BRAD RINTALA
ADDRESS: 2339 MELINS Rd.
LIVELY, ON., P3Y 1H9

BRAD RINTALA

THIS SITE PLAN IS PREPARED UNDER THE AGGREGATE RESOURCES ACT FOR A CLASS "A" LICENCE, CATEGORY 3 PIT AND CATEGORY 4 QUARRY.

THIS PLAN IS PREPARED AND CERTIFIED UNDER THE DIRECTION OF KEVIN JARUS RPP, TULLOCH ENGINEERING INC.

KEVIN JARUS, RPP

AMENDMENTS TO THE SITE PLAN

AMENDMENT #1: DESCRIPTION OF THE AMENDMENT_____
_____
_____
APPROVED BY _____ DATE _____

AMENDMENT #2: DESCRIPTION OF THE AMENDMENT_____
_____
_____
APPROVED BY _____ DATE _____

AMENDMENT #3: DESCRIPTION OF THE AMENDMENT_____
_____
_____
APPROVED BY _____ DATE _____

AMENDMENT #4: DESCRIPTION OF THE AMENDMENT_____
_____
_____
APPROVED BY _____ DATE _____

RINTALA QUARRY/PIT LICENCE

EXTRACTION	AREA (ha)	VOLUME ESTIMATE (m^3)			TONNAGE ESTIMATE		
		QUARRY	PIT	TOTAL	QUARRY	PIT	TOTAL
w/o STAGE 2 ZONE	21.6	1,920,485	375,030	2,295,515	4,993,261	787,563	5,780,824
STAGE 2 ZONE	6.4	477,342	0	477,342	1,241,089	0	1,241,089
TOTAL (QUARRY & PIT)	28.0	2,397,827	375,030	2,772,857	6,234,350	787,563	7,021,913

NOTE: PIT AREA (~3.75ha) OVERLAYS THE QUARRY AREA IN SOUTHEAST CORNER OF THE EXTRACTION AREA, OUTSIDE THE STAGE 2 ZONE

LICENCE AREA = 33.8ha EXTRACTION AREA 28ha

TULLOCH ENGINEERING

QUARRY NAME RINTALA QUARRY LOCATION 3.9km N. VIA FAIRBANK LAKE ROAD FROM THE
CO-ORD E-469538 N-5137163 INTERSECTION OF HIGHWAY #17. S. SIDE OF ROAD.
SITE PLAN CATEGORY 3 & 4 LICENCE NUMBER **** APPROX SCALE 1:2500
DISTRICT ALGOMA TOWNSHIP DENISON LOT 9 CON 2
SURVEY BY TULLOCH GEOMATICS PLAN BY TULLOCH ENGINEERING SURVEY DATE APRIL 2020

19-1439-01_REV0

Appendix B –
Traffic Count Data

Volume Hourly Summary Report

Location..... Fairbank Lake Road btwn C Johnson Road & Unnamed Private Road 7

Municipality..... Greater Sudbury

Date	Start Time	Eastbound	Westbound	Grand Total
Wednesday, August 29, 2018	15	18	22	40
	16	21	47	68
	17	26	23	49
	18	14	14	28
	19	9	14	23
	20	7	11	18
	21	3	4	7
	22	1	6	7
	23	1	5	6
Wednesday, August 29, 2018		100	146	246
Thursday, August 30, 2018	0	0	0	0
	1	1	1	2
	2	0	0	0
	3	0	0	0
	4	5	2	7
	5	18	11	29
	6	28	6	34
	7	15	8	23
	8	16	18	34
	9	26	11	37
	10	26	16	42
	11	14	17	31
	12	14	15	29
	13	11	22	33
	14	19	17	36
	15	1	0	1
Thursday, August 30, 2018		194	144	338
Grand Total		294	290	584

Thursday, November 12, 2020

Appendix C –
Synchro Analysis Output –
Total Traffic Volumes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	29	1	13	17	1	9
Future Volume (Veh/h)	29	1	13	17	1	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	36	1	16	21	1	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			37		90	36
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			37		90	36
tC, single (s)			4.9		7.2	7.0
tC, 2 stage (s)						
tF (s)			3.0		4.3	4.1
p0 queue free %			99		100	99
cM capacity (veh/h)			1172		733	842

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	37	37	12
Volume Left	0	16	1
Volume Right	1	0	11
cSH	1700	1172	831
Volume to Capacity	0.02	0.01	0.01
Queue Length 95th (m)	0.0	0.3	0.3
Control Delay (s)	0.0	3.6	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	3.6	9.4
Approach LOS			A

Intersection Summary			
Average Delay		2.8	
Intersection Capacity Utilization		18.3%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	24	1	9	52	1	13
Future Volume (Veh/h)	24	1	9	52	1	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	30	1	11	65	1	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			31		118	30
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			31		118	30
tC, single (s)			4.9		7.2	7.0
tC, 2 stage (s)						
tF (s)			3.0		4.3	4.1
p0 queue free %			99		100	98
cM capacity (veh/h)			1178		707	849

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	31	76	17
Volume Left	0	11	1
Volume Right	1	0	16
cSH	1700	1178	839
Volume to Capacity	0.02	0.01	0.02
Queue Length 95th (m)	0.0	0.2	0.5
Control Delay (s)	0.0	1.2	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	1.2	9.4
Approach LOS			A

Intersection Summary			
Average Delay		2.0	
Intersection Capacity Utilization		19.9%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	31	1	13	19	1	9
Future Volume (Veh/h)	31	1	13	19	1	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	39	1	16	24	1	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			40		96	40
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			40		96	40
tC, single (s)			4.9		7.2	7.0
tC, 2 stage (s)						
tF (s)			3.0		4.3	4.1
p0 queue free %			99		100	99
cM capacity (veh/h)			1168		726	838

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	40	40	12
Volume Left	0	16	1
Volume Right	1	0	11
cSH	1700	1168	828
Volume to Capacity	0.02	0.01	0.01
Queue Length 95th (m)	0.0	0.3	0.3
Control Delay (s)	0.0	3.3	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	3.3	9.4
Approach LOS			A

Intersection Summary			
Average Delay		2.7	
Intersection Capacity Utilization		18.4%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	26	1	9	56	1	13
Future Volume (Veh/h)	26	1	9	56	1	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	33	1	11	70	1	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			34		126	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			34		126	34
tC, single (s)			4.9		7.2	7.0
tC, 2 stage (s)						
tF (s)			3.0		4.3	4.1
p0 queue free %			99		100	98
cM capacity (veh/h)			1175		699	845

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	34	81	17
Volume Left	0	11	1
Volume Right	1	0	16
cSH	1700	1175	835
Volume to Capacity	0.02	0.01	0.02
Queue Length 95th (m)	0.0	0.2	0.5
Control Delay (s)	0.0	1.2	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	1.2	9.4
Approach LOS			A

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	20.1%	ICU Level of Service	A
Analysis Period (min)	15		