

Appendix C

Pavement Impact Assessment

Expected Heavy Vehicle Numbers - Construction Stage 1 (from Bruce's Camp)



Construction days per week: 5
Bus Occupancy: 30

	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10
No. staff at camp	40	40	80	160	200	240	320	400	400	400	400	400	560	720	880	1040	1280	1280	1280	1280	1280	1280	1040	1040	1040	1040	880	880	720	480	400	360	320	280	280	280
% by bus (workers)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
No Staff Arriving by bus per day	36	36	72	144	180	216	288	360	360	360	360	360	504	648	792	936	1152	1152	1152	1152	1152	1152	936	936	936	936	792	792	648	432	360	324	288	252	252	252
No Bus Trips per day (4 trips/day)	8	8	12	20	24	32	40	48	48	48	48	48	68	88	108	128	156	156	156	156	156	156	128	128	128	128	108	108	88	60	48	44	40	36	36	36
No Buses per month	173	173	260	433	520	693	867	1,040	1,040	1,040	1,040	1,040	1,473	1,907	2,340	2,773	3,380	3,380	3,380	3,380	3,380	3,380	2,773	2,773	2,773	2,773	2,340	2,340	1,907	1,300	1,040	953	867	780	780	780
Staff Bus Trips 2007	173																																			
Staff Bus Trips 2008	9,620																																			
Staff Bus Trips 2009	35,620																																			
Staff Bus Trips 2010	15,860																																			

Expected Heavy Vehicle Numbers During Construction Phase 1 - Staff Bus Pick Up/Drop Off (30 seater Bus)

Link	Section	Direction	%	%	Volume 2007	Volume 2008	Volume 2009	Volume 2010
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Southbound (G)	10%	5.0%	9	481	1,781	793
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Northbound (A)		5.0%	9	481	1,781	793
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Southbound (G)	85%	42.5%	74	4,089	15,139	6,741
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Northbound (A)		42.5%	74	4,089	15,139	6,741
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Westbound (G)	75%	37.5%	65	3,608	13,358	5,948
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Eastbound (A)		37.5%	65	3,608	13,358	5,948
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Westbound (G)	10%	5.0%	9	481	1,781	793
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Eastbound (A)		5.0%	9	481	1,781	793
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Westbound (G)	5%	2.5%	4	241	891	397
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Eastbound (A)		2.5%	4	241	891	397
Gladstone-Mt Larcom Rd	West of Blain Drive	Westbound (G)	5%	2.5%	4	241	891	397
Gladstone-Mt Larcom Rd	West of Blain Drive	Eastbound (A)		2.5%	4	241	891	397
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Southbound (G)	0%	0.0%	0	0	0	0
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Northbound (A)		0.0%	0	0	0	0
Dawson Highway	North of Bruce Highway	Southbound (G)	0%	0.0%	0	0	0	0
Dawson Highway	North of Bruce Highway	Northbound (A)		0.0%	0	0	0	0
Bruce Highway	West of Gladstone Mt-Larcom Road	Westbound (G)	10%	5.0%	9	481	1,781	793
Bruce Highway	West of Gladstone Mt-Larcom Road	Eastbound (A)		5.0%	9	481	1,781	793

Assessment is based on Class 3 Vehicles - 50% loaded

Expected Heavy Vehicle Numbers - Construction Stage 2 - Staff Movements

	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15
No. staff at camp	28	28	56	112	140	168	196	224	224	224	224	224	336	448	560	672	840	840	840	840	840	840	672	672	672	672	560	560	448	280	224	196	168	140	140	140
% by bus	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
No Staff Arriving by bus per day	26	26	51	101	126	152	177	202	202	202	202	202	303	404	504	605	756	756	756	756	756	756	605	605	605	605	504	504	404	252	202	177	152	126	126	126
No Bus Trips per day (4 trips/day)	4	4	8	16	20	24	24	28	28	28	28	28	44	56	68	84	104	104	104	104	104	104	84	84	84	84	68	68	56	36	28	24	24	20	20	20
No Buses per month	87	87	173	347	433	520	520	607	607	607	607	607	953	1,213	1,473	1,820	2,253	2,253	2,253	2,253	2,253	2,253	1,820	1,820	1,820	1,820	1,473	1,473	1,213	780	607	520	520	433	433	433
Staff Bus Trips 2012	87																																			
Staff Bus Trips 2013	6,067																																			
Staff Bus Trips 2014	23,487																																			
Staff Bus Trips 2015	9,707																																			

Expected Heavy Vehicle Numbers During Construction Stage 2 - Staff Pick Up/Drop Off (30 seater Bus)

Link	Section	Direction	%	%	Volume 2012	Volume 2013	Volume 2014	Volume 2015
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Southbound (G)	10%	5.0%	4	303	1,174	485
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Northbound (A)		5.0%	4	303	1,174	485
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Southbound (G)	85%	42.5%	37	2,578	9,982	4,125
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Northbound (A)		42.5%	37	2,578	9,982	4,125
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Westbound (G)	75%	37.5%	33	2,275	8,808	3,640
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Eastbound (A)		37.5%	33	2,275	8,808	3,640
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Westbound (G)	10%	5.0%	4	303	1,174	485
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Eastbound (A)		5.0%	4	303	1,174	485
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Westbound (G)	5%	2.5%	2	152	587	243
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Eastbound (A)		2.5%	2	152	587	243
Gladstone-Mt Larcom Rd	West of Blain Drive	Westbound (G)	5%	2.5%	4	241	891	397
Gladstone-Mt Larcom Rd	West of Blain Drive	Eastbound (A)		2.5%	4	241	891	397
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Southbound (G)	0%	0.0%	0	0	0	0
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Northbound (A)		0.0%	0	0	0	0
Dawson Highway	North of Bruce Highway	Southbound (G)	0%	0.0%	0	0	0	0
Dawson Highway	North of Bruce Highway	Northbound (A)		0.0%	0	0	0	0
Bruce Highway	West of Gladstone Mt-Larcom Road	Westbound (G)	10%	5.0%	4	303	1,174	485
Bruce Highway	West of Gladstone Mt-Larcom Road	Eastbound (A)		5.0%	4	303	1,174	485

Assessment is based on Class 3 Vehicles - 50% loaded

Expected Heavy Vehicle Numbers During Construction - Deliveries (Materials)

Stage 1 December 2007 - November 2010
Stage 2 December 2012 - November 2015

Port Access Road to the Refinery (Semi-trailer)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Months of Operation	1	12	12	11	0	1	12	12	11
Deliveries per day	10	10	10	10	10	10	10	10	10
Deliveries per month (6 day week)	260	260	260	260	260	260	260	260	260
Annual Deliveries	260	3,120	3,120	2,860	0	260	3,120	3,120	2,860
Incoming Trips (assumed to be 100% loaded)	260	3,120	3,120	2,860	0	260	3,120	3,120	2,860
Outgoing Trips (assumed to be 50% loaded)	260	3,120	3,120	2,860	0	260	3,120	3,120	2,860

Expected Annual Heavy Vehicle Numbers During Construction - 100% Loaded Semi-trailers

Link	Section	Direction	Volume 2007	Volume 2008	Volume 2009	Volume 2010	Volume 2011	Volume 2012	Volume 2013	Volume 2014	Volume 2015
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Southbound (G)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Northbound (A)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Southbound (G)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Northbound (A)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Westbound (G)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Eastbound (A)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Westbound (G)	260	3,120	3,120	2,860	0	260	3,120	3,120	2,860
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Eastbound (A)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Westbound (G)	260	3,120	3,120	2,860	0	260	3,120	3,120	2,860
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Eastbound (A)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	East of Blain Drive	Westbound (G)	260	3,120	3,120	2,860	0	260	3,120	3,120	2,860
Gladstone-Mt Larcom Rd	East of Blain Drive	Eastbound (A)	0	0	0	0	0	0	0	0	0
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Southbound (G)	0	0	0	0	0	0	0	0	0
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Northbound (A)	0	0	0	0	0	0	0	0	0
Dawson Highway	North of Bruce Highway	Southbound (G)	0	0	0	0	0	0	0	0	0
Dawson Highway	North of Bruce Highway	Northbound (A)	0	0	0	0	0	0	0	0	0
Bruce Highway	West of Gladstone Mt-Larcom Road	Westbound (G)	0	0	0	0	0	0	0	0	0
Bruce Highway	West of Gladstone Mt-Larcom Road	Eastbound (A)	0	0	0	0	0	0	0	0	0

Note: Semi-trailers are assessed as Class 9 Vehicles - 100% loaded

Expected Annual Heavy Vehicle Numbers During Construction - 50% Loaded Semi-trailers

Link	Section	Direction	Volume 2007	Volume 2008	Volume 2009	Volume 2010	Volume 2011	Volume 2012	Volume 2013	Volume 2014	Volume 2015
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Southbound (G)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Northbound (A)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Southbound (G)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Northbound (A)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Westbound (G)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Eastbound (A)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Westbound (G)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Eastbound (A)	260	3,120	3,120	2,860	0	260	3,120	3,120	2,860
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Westbound (G)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Eastbound (A)	260	3,120	3,120	2,860	0	260	3,120	3,120	2,860
Gladstone-Mt Larcom Rd	East of Blain Drive	Westbound (G)	0	0	0	0	0	0	0	0	0
Gladstone-Mt Larcom Rd	East of Blain Drive	Eastbound (A)	260	3,120	3,120	2,860	0	260	3,120	3,120	2,860
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Southbound (G)	0	0	0	0	0	0	0	0	0
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Northbound (A)	0	0	0	0	0	0	0	0	0
Dawson Highway	North of Bruce Highway	Southbound (G)	0	0	0	0	0	0	0	0	0
Dawson Highway	North of Bruce Highway	Northbound (A)	0	0	0	0	0	0	0	0	0
Bruce Highway	West of Gladstone Mt-Larcom Road	Westbound (G)	0	0	0	0	0	0	0	0	0
Bruce Highway	West of Gladstone Mt-Larcom Road	Eastbound (A)	0	0	0	0	0	0	0	0	0

Assessment is based on Class 9 Vehicles - 50% loaded

Delivery days per week: 5

Gladstone to the Residue Storage Facility (B-double)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Months of Operation	1	12	12	11	0	1	12	12	11
Deliveries per day	33	33	33	33	33	33	33	33	33
Deliveries per month	715	715	715	715	715	715	715	715	715
Annual Deliveries	715	8,580	8,580	7,865	0	715	8,580	8,580	7,865
Incoming Trips (assumed to be 100% loaded)	715	8,580	8,580	7,865	0	715	8,580	8,580	7,865
Outgoing Trips (assumed to be 0% loaded)	715	8,580	8,580	7,865	0	715	8,580	8,580	7,865

Expected Annual Heavy Vehicle Numbers During Construction - 100% Loaded B-doubles

[illegible]

Expected Annual Heavy Vehicle Numbers During Construction - 0% Loaded B-doubles

[illegible]

Stage 1 Operation (December 2010 - November 2015)

Operational days per year:

340

Expected Annual Heavy Vehicle Numbers During Stage 1 Operations - Loaded

Link	Section	Direction	Class 3	Class 9	Class 10
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Southbound (G)	0	0	0
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Northbound (A)	0	39	1,943
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Southbound (G)	0	0	0
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Northbound (A)	72	39	1,943
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Westbound (G)	0	262	0
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Eastbound (A)	72	371	1,943
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Westbound (G)	0	411	578
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Eastbound (A)	3	4	6,210
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Westbound (G)	0	411	578
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Eastbound (A)	3	4	6,210
Gladstone-Mt Larcom Rd	East of Blain Drive	Westbound (G)	0	411	578
Gladstone-Mt Larcom Rd	East of Blain Drive	Eastbound (A)	3	4	6,210
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Southbound (G)	0	0	0
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Northbound (A)	0	0	0
Dawson Highway	North of Bruce Highway.	Southbound (G)	0	0	0
Dawson Highway	North of Bruce Highway.	Northbound (A)	0	0	0
Bruce Highway	West of Gladstone Mt-Larcom Road	Westbound (G)	0	0	0
Bruce Highway	West of Gladstone Mt-Larcom Road	Eastbound (A)	0	39	1,943

Class 10 Vehicles are assessed as 9 Axle B Doubles

Expected Annual Heavy Vehicle Numbers During Stage 1 Operations - Unloaded

Link	Section	Direction	Class 3	Class 9	Class 10
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Southbound (G)	0	39	1,943
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Northbound (A)	0	0	0
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Southbound (G)	72	39	1,943
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Northbound (A)	0	0	0
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Westbound (G)	72	371	1,943
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Eastbound (A)	0	262	0
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Westbound (G)	3	4	6,210
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Eastbound (A)	0	411	578
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Westbound (G)	3	4	6,210
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Eastbound (A)	0	411	578
Gladstone-Mt Larcom Rd	East of Blain Drive	Westbound (G)	3	4	6,210
Gladstone-Mt Larcom Rd	East of Blain Drive	Eastbound (A)	0	411	578
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Southbound (G)	0	0	0
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Northbound (A)	0	0	0
Dawson Highway	North of Bruce Highway.	Southbound (G)	0	0	0
Dawson Highway	North of Bruce Highway.	Northbound (A)	0	0	0
Bruce Highway	West of Gladstone Mt-Larcom Road	Westbound (G)	0	39	1,943
Bruce Highway	West of Gladstone Mt-Larcom Road	Eastbound (A)	0	0	0

Class 10 Vehicles are assessed as 9 Axle B Doubles

Stage 2 Operation (December 2015 onwards)

Operational days per year:

340

Expected Annual Heavy Vehicle Numbers During Stage 2 Operations - Loaded

Link	Section	Direction	Class 3	Class 9	Class 10
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Southbound (G)	0	0	0
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Northbound (A)	0	78	3,849
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Southbound (G)	0	0	0
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Northbound (A)	109	78	3,849
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Westbound (G)	0	523	0
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Eastbound (A)	109	817	3,849
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Westbound (G)	0	659	675
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Eastbound (A)	4	7	10,689
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Westbound (G)	0	659	675
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Eastbound (A)	4	7	10,689
Gladstone-Mt Larcom Rd	East of Blain Drive	Westbound (G)	0	659	675
Gladstone-Mt Larcom Rd	East of Blain Drive	Eastbound (A)	4	7	10,689
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Southbound (G)	0	0	0
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Northbound (A)	0	0	0
Dawson Highway	North of Bruce Highway.	Southbound (G)	0	0	0
Dawson Highway	North of Bruce Highway.	Northbound (A)	0	0	0
Bruce Highway	West of Gladstone Mt-Larcom Road	Westbound (G)	0	0	0
Bruce Highway	West of Gladstone Mt-Larcom Road	Eastbound (A)	0	78	3,849

Class 10 Vehicles are assessed as 9 Axle B Doubles

Expected Annual Heavy Vehicle Numbers During Stage 2 Operations - Unloaded

Link	Section	Direction	Class 3	Class 9	Class 10
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Southbound (G)	0	78	3,849
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Northbound (A)	0	0	0
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Southbound (G)	109	78	3,849
Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Northbound (A)	0	0	0
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Westbound (G)	109	817	3,849
Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Eastbound (A)	0	523	0
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Westbound (G)	4	7	10,689
Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Eastbound (A)	0	659	675
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Westbound (G)	4	7	10,689
Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Eastbound (A)	0	659	675
Gladstone-Mt Larcom Rd	East of Blain Drive	Westbound (G)	4	7	10,689
Gladstone-Mt Larcom Rd	East of Blain Drive	Eastbound (A)	0	659	675
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Southbound (G)	0	0	0
Dawson Highway	West of Don Young Dr (Red Rover Rd)	Northbound (A)	0	0	0
Dawson Highway	North of Bruce Highway.	Southbound (G)	0	0	0
Dawson Highway	North of Bruce Highway.	Northbound (A)	0	0	0
Bruce Highway	West of Gladstone Mt-Larcom Road	Westbound (G)	0	78	3,849
Bruce Highway	West of Gladstone Mt-Larcom Road	Eastbound (A)	0	0	0

Class 10 Vehicles are assessed as 9 Axle B Doubles

Detailed Pavement Impact Assessment

Project: Gladstone Pacific Nickel
Scenario: All Scenarios Combined



Road		Section	Direction	Length (KM)	% Growth Per Annum	2006 Existing Daily Volume (vpd)	Existing Heavy Vehicle Daily Volume (vpd)	Existing Annual ESA	Base Roughness	Base Year	Roughness Count Deficiency	Roughness Deterioration Rate	Rehabilitation Year (No Development)	ESA Breakpoint (No Development)	Breakpoint Year (With Development)	Bring Forward Time Period (Years)	Bring Forward (%)
1	Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Southbound (G)	15.9	5.00%	1,413	239	279,152	53.0	2007	120.0	3.0	2029.4	10,797,599	Not in Assessment Period	N/A	N/A
2	Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	Northbound (A)	15.9	5.00%	1,471	257	300,176	53.0	2007	120.0	3.0	2029.4	11,610,808	Not in Assessment Period	N/A	N/A
3	Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Southbound (G)	4	5.00%	1,413	239	279,152	59.0	2007	120.0	3.0	2027.4	9,600,037	Not in Assessment Period	N/A	N/A
4	Gladstone-Mt Larcom Rd	Targinie Road to Landing Road	Northbound (A)	4	5.00%	1,471	257	300,176	59.0	2007	120.0	3.0	2027.4	10,323,053	2026.7	0.70	1.3%
5	Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Westbound (G)	2.5	5.00%	2,707	467	545,456	73.0	2007	120.0	3.0	2022.7	13,688,218	2022.6	0.10	0.2%
6	Gladstone-Mt Larcom Rd	Landing Road to Reid Road	Eastbound (A)	2.5	5.00%	2,753	442	516,256	73.0	2007	120.0	3.0	2022.7	12,955,444	2022.3	0.40	0.9%
7	Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Westbound (G)	6	5.00%	2,707	467	545,456	81.0	2007	120.0	3.0	2020.0	11,045,484	2019.8	0.20	0.5%
8	Gladstone-Mt Larcom Rd	Reid Road to Red Rover Road	Eastbound (A)	6	5.00%	2,753	442	516,256	81.0	2007	120.0	3.0	2020.0	10,454,184	2019.4	0.60	1.7%
9	Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Westbound (G)	0.5	5.00%	4,019	498	581,664	87.0	2007	120.0	3.0	2018.0	9,830,122	2017.8	0.20	0.6%
10	Gladstone-Mt Larcom Rd	Red Rover Road to Blain Drive	Eastbound (A)	0.5	5.00%	3,988	498	581,664	87.0	2007	120.0	3.0	2018.0	9,830,122	2017.5	0.50	1.6%
11	Gladstone-Mt Larcom Rd	Blain Drive to Port Access Road	Westbound (G)	3	5.00%	4,681	568	663,424	76.0	2007	120.0	3.0	2021.7	15,431,242	2021.6	0.10	0.2%
12	Gladstone-Mt Larcom Rd	Blain Drive to Port Access Road	Eastbound (A)	3	5.00%	4,410	578	675,104	76.0	2007	120.0	3.0	2021.7	15,702,919	2021.2	0.50	1.3%
13	Dawson Highway	West of Don Young Dr (Red Rover Rd)	Southbound (G)	3.2	5.00%	2,857	177	206,736	63.0	2007	120.0	3.0	2026.0	6,512,184	2026.0	0.00	0.0%
14	Dawson Highway	West of Don Young Dr (Red Rover Rd)	Northbound (A)	3.2	5.00%	2,866	186	217,248	63.0	2007	120.0	3.0	2026.0	6,843,312	2026.0	0.00	0.0%
15	Dawson Highway	North of Bruce Highway	Southbound (G)	8.7	5.00%	2,244	186	217,248	58.0	2007	120.0	3.0	2027.7	7,608,025	Not in Assessment Period	N/A	N/A
16	Dawson Highway	North of Bruce Highway	Northbound (A)	8.7	5.00%	2,218	182	212,576	58.0	2007	120.0	3.0	2027.7	7,444,412	Not in Assessment Period	N/A	N/A

Notes:

- Existing pavement roughness calculated from 2004 and 2006 data using a 3 counts/year roughness increase (advised by DMR)
- Rehabilitation years calculated by determining the year at which the pavement roughness will reach the deficiency limit assuming a constant deterioration rate of 3 counts per annum (as discussed with DMR)
- ESA Breakpoint (No development) is the anticipated ESA loading at the time of rehabilitation assuming appropriate background traffic growth in ESAs for the life of the pavement.
- The Rehabilitation year with development identifies the year at which the ESA breakpoint (no development) is reached with the additional ESA loading generated by the development
- Bring forward percentage is the difference in net present value percentage between the 2 rehabilitation years identified (with and without development)

[illegible][illegible]

Road	Section	Length (km)	Development Maintenance Contribution																			Average	
			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025		2026
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	15.9	0.87%	10.14%	10.48%	10.24%	1.98%	2.59%	9.92%	9.99%	9.94%	3.26%	3.15%	3.05%	2.95%	2.86%	2.78%	2.70%	2.62%	2.55%	2.48%	2.42%	4.8%
	Targinie Road to Landing Road	4	0.05%	2.66%	9.42%	5.59%	2.02%	1.96%	3.22%	6.85%	5.07%	3.37%	3.26%	3.15%	3.06%	2.96%	2.88%	2.79%	2.72%	2.64%	2.57%	2.51%	3.4%
	Landing Road to Reid Road	2.5	0.02%	1.28%	4.53%	3.00%	1.36%	1.32%	1.91%	3.65%	3.21%	2.50%	2.42%	2.34%	2.27%	2.20%	2.14%	2.07%	2.02%	1.96%	1.91%	1.86%	2.2%
	Reid Road to Red Rover Road	6	0.20%	2.38%	2.72%	5.16%	3.89%	3.89%	5.47%	5.51%	6.67%	5.38%	5.20%	5.04%	4.88%	4.73%	4.59%	4.46%	4.34%	4.22%	4.11%	4.00%	4.3%
	Red Rover Road to Blain Drive	0.5	0.18%	2.10%	2.20%	4.59%	3.55%	3.55%	4.95%	4.88%	6.03%	4.91%	4.75%	4.60%	4.45%	4.32%	4.19%	4.07%	3.96%	3.85%	3.75%	3.65%	3.9%
Dawson Highway	Blain Drive to Port Access Road	3	0.15%	1.82%	1.92%	3.99%	3.09%	3.09%	4.32%	4.31%	5.00%	3.92%	3.79%	3.67%	3.55%	3.45%	3.35%	3.26%	3.16%	3.07%	2.99%	2.92%	3.2%
	West of Don Young Dr	3.2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.0%
	North of Bruce Highway	8.7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.28%	0.35%	0.34%	0.33%	0.32%	0.31%	0.30%	0.29%	0.29%	0.28%	0.27%	0.26%

Road	Section	Length (km)	Annual Maintenance Cost (based on \$8,300 per km and 2.5% Inflation Rate)																				Total
			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	15.9	\$131,970	\$135,269	\$138,651	\$142,117	\$145,670	\$149,312	\$153,045	\$156,871	\$160,793	\$164,812	\$168,933	\$173,156	\$177,485	\$181,922	\$186,470	\$191,132	\$195,910	\$200,808	\$205,828	\$210,974	\$3,371,128
	Targinie Road to Landing Road	4	\$33,200	\$34,030	\$34,881	\$35,753	\$36,647	\$37,563	\$38,502	\$39,464	\$40,451	\$41,462	\$42,499	\$43,561	\$44,650	\$45,767	\$46,911	\$48,083	\$49,286	\$50,518	\$51,781	\$53,075	\$848,083
	Landing Road to Reid Road	2.5	\$20,750	\$21,269	\$21,800	\$22,345	\$22,904	\$23,477	\$24,064	\$24,665	\$25,282	\$25,914	\$26,562	\$27,226	\$27,906	\$28,604	\$29,319	\$30,052	\$30,803	\$31,574	\$32,363	\$33,172	\$530,052
	Reid Road to Red Rover Road	6	\$49,800	\$51,045	\$52,321	\$53,629	\$54,970	\$56,344	\$57,753	\$59,197	\$60,676	\$62,193	\$63,748	\$65,342	\$66,975	\$68,650	\$70,366	\$72,125	\$73,928	\$75,777	\$77,671	\$79,613	\$1,272,124
	Red Rover Road to Blain Drive	0.5	\$4,150	\$4,254	\$4,360	\$4,469	\$4,581	\$4,695	\$4,813	\$4,933	\$5,056	\$5,183	\$5,312	\$5,445	\$5,581	\$5,721	\$5,864	\$6,010	\$6,161	\$6,315	\$6,473	\$6,634	\$106,010
	Blain Drive to Port Access Road	3	\$24,900	\$25,523	\$26,161	\$26,815	\$27,485	\$28,172	\$28,876	\$29,598	\$30,338	\$31,097	\$31,874	\$32,671	\$33,488	\$34,325	\$35,183	\$36,063	\$36,964	\$37,888	\$38,836	\$39,806	\$636,062
Dawson Highway	West of Don Young Dr	3.2	\$26,560	\$27,224	\$27,905	\$28,602	\$29,317	\$30,050	\$30,801	\$31,571	\$32,361	\$33,170	\$33,999	\$34,849	\$35,720	\$36,613	\$37,529	\$38,467	\$39,428	\$40,414	\$41,425	\$42,460	\$678,466
	North of Bruce Highway	8.7	\$72,210	\$74,015	\$75,866	\$77,762	\$79,706	\$81,699	\$83,741	\$85,835	\$87,981	\$90,180	\$92,435	\$94,746	\$97,114	\$99,542	\$102,031	\$104,582	\$107,196	\$109,876	\$112,623	\$115,439	\$1,844,580
																							\$9,286,500

Road	Section	Length (km)	Annual Development Maintenance Cost (based on \$8,300 per km and 2.5% Inflation Rate)																			Total	
			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025		2026
Gladstone-Mt Larcom Rd	Bruce Highway to Targinie Road	15.9	\$1,142	\$13,711	\$14,536	\$14,555	\$22,882	\$3,866	\$15,181	\$15,677	\$15,987	\$5,365	\$5,316	\$5,273	\$5,236	\$5,204	\$5,178	\$5,155	\$5,138	\$5,124	\$5,114	\$5,107	\$154,747
	Targinie Road to Landing Road	4	\$17	\$907	\$3,285	\$1,999	\$740	\$736	\$1,240	\$2,705	\$2,050	\$1,398	\$1,385	\$1,374	\$1,364	\$1,356	\$1,349	\$1,343	\$1,339	\$1,335	\$1,332	\$1,331	\$28,585
	Landing Road to Reid Road	2.5	\$5	\$273	\$989	\$670	\$312	\$310	\$460	\$900	\$811	\$649	\$643	\$638	\$633	\$629	\$626	\$623	\$621	\$620	\$618	\$618	\$11,648
	Reid Road to Red Rover Road	6	\$98	\$1,217	\$1,422	\$2,766	\$2,140	\$2,194	\$3,158	\$3,260	\$4,046	\$3,349	\$3,318	\$3,291	\$3,268	\$3,248	\$3,232	\$3,218	\$3,207	\$3,198	\$3,192	\$3,187	\$56,008
	Red Rover Road to Blain Drive	0.5	\$7	\$89	\$96	\$205	\$163	\$167	\$238	\$241	\$305	\$255	\$252	\$250	\$249	\$247	\$246	\$245	\$244	\$243	\$243	\$242	\$4,227
	Blain Drive to Port Access Road	3	\$39	\$465	\$501	\$1,070	\$849	\$870	\$1,249	\$1,275	\$1,517	\$1,220	\$1,209	\$1,199	\$1,190	\$1,183	\$1,177	\$1,172	\$1,168	\$1,165	\$1,163	\$1,161	\$20,841
Dawson Highway	West of Don Young Dr	3.2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	North of Bruce Highway	8.7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$242	\$320	\$317	\$314	\$312	\$310	\$309	\$307	\$306	\$305	\$305	\$304	\$3,653
																							\$279,709

Appendix D
Required Works

