APPENDIX F
ACOUSTIC ENVIRONMENT

Attachment 4A FIELD SURVEY DATA

Attachment 4A Field Survey Data
March 2018

Unattended sound pressure level measurements were conducted over a period of approximately 48 hours to qualify and confirm the existing acoustic environment at receptor locations. The measurement data was post-processed to removed periods of inclement weather (e.g., rain, snow) and events considered non-representative of the ambient acoustic environment (e.g., dogs barking, vehicle idling). Non-representative data points were excluded from further analysis in determining the hourly, daily daytime, daily nighttime equivalent sound levels and overall average of all measured data (spanning multiple days). These sound levels are summarized in Table 4A-1 to Table 4A-4 for each monitoring location.

Table 4A-1 Monitoring Location M1 – Measurement Results

Date	Measurement Period	Equivalent Sound Level (dBA)		
		Hourly (L_{eq})	Daytime (L_d) [1]	Nighttime (L_n)[1]
Sept. 7, 2016	15:00	40.7		
	16:00	39.4		
	17:00	35.5		
	18:00	47.6	41.1	
	19:00	34.7		
	20:00	32.8		
	21:00	34.0		
	22:00	34.7		
	23:00	36.7		
Sept. 8, 2016	00:00	33.6		
	01:00	30.4		32.9
	02:00	28.6		
	03:00	30.2		
	04:00	27.5		
Overall Average of All Valid Measurement Data			41.1	32.9

NOTES:
[1] Average daily sound level for the daytime or nighttime period.

Table 4A-2 Monitoring Location M2 – Measurement Results

Date	Measurement Period	Equivalent Sound Level (dBA)		
		Hourly (L_{eq})	Daytime (L_d)[1]	Nighttime (L_n)[1]
Sept. 7, 2016	12:00	50.7	52.8	
	13:00	51.4		
	14:00	52.1		
	15:00	51.1		
	16:00	51.7		
	17:00	52.3		
	18:00	53.4		
	19:00	54.6		
	20:00	54.8		
	21:00	52.7		
	22:00	50.6		49.5
	23:00	48.4		
Sept. 8, 2016	00:00	47.2		
	01:00	45.8		
	02:00	46.6		
	03:00	45.3		
	04:00	47.3		
	05:00	50.3		
	06:00	54.6		
	07:00	55.8	55.5	
	08:00	56.5		
	09:00	54.4		
	10:00	55.0		
	11:00	55.3		
	12:00	54.1		
	13:00	54.9		
	14:00	58.1		
	15:00	-[2]		
	16:00	59.5		
	17:00	-[2]		

Table 4A-2 Monitoring Location M2 – Measurement Results

Date	Measurement Period	Equivalent Sound Level (dBA)		
		Hourly (L_{eq})	Daytime (L_d)[1]	Nighttime (L_n)[1]
Sept. 8, 2016 (cont'd)	18:00	55.9		
	19:00	55.5		
	20:00	55.8		
	21:00	55.6		
	22:00	53.3		52.1
	23:00	52.5		
Sept. 9, 2016	00:00	50.9		
	01:00	49.8		
	02:00	49.0		
	03:00	48.2		
	04:00	49.6		
	05:00	50.9		
	06:00	57.0		
	07:00	58.2	54.6	
	08:00	56.9		
	09:00	47.9		
	10:00	44.2		
	11:00	43.9		
Overall Average of All Valid Measurement Data			54.5	51.1

NOTES:

[1] Average daily sound level for the daytime or nighttime period.

[2] Insufficient valid data points in this time period to calculate hourly equivalent sound level.

Table 4A-3 Monitoring Location M3 – Measurement Results

Date	Measurement Period	Equivalent Sound Level (dBA)		
		Hourly (L_{eq})	Daytime (L_d) [1]	Nighttime (L_n) [1]
Sept. 7, 2016	13:00	48.3	46.4	
	14:00	50.2		
	15:00	48.1		
	16:00	50.1		
	17:00	44.5		
	18:00	44.0		
	19:00	41.3		
	20:00	41.3		
	21:00	40.2		
	22:00	38.0		37.3
	23:00	38.5		
Sept. 8, 2016	00:00	37.5		
	01:00	33.7		
	02:00	35.6		
	03:00	35.0		
	04:00	34.2		
	05:00	37.8		
	06:00	40.8		
	07:00	50.7	46.7	
	08:00	49.7		
	09:00	50.6		
	10:00	49.1		
	11:00	41.3		
	12:00	41.1		
	13:00	44.8		
	14:00	48.1		
	15:00	-[2]		
	16:00	47.9		
	17:00	47.2		
	18:00	42.5		

Table 4A-3 Monitoring Location M3 – Measurement Results

Date	Measurement Period	Equivalent Sound Level (dBA)		
		Hourly (L_{eq})	Daytime (L_d) [1]	Nighttime (L_n) [1]
Sept. 8, 2016 (cont'd)	19:00	41.7		
	20:00	41.7		
	21:00	42.3		
	22:00	40.9		43.4
	23:00	43.3		
Sept. 9, 2016	00:00	43.0		
	01:00	39.9		
	02:00	39.5		
	03:00	43.1		
	04:00	44.9		
	05:00	44.6		
	06:00	46.3		
	07:00	47.8	44.2	
	08:00	46.3		
	09:00	42.9		
	10:00	40.6		
	11:00	41.3		
	12:00	42.6		
Overall Average of All Valid Measurement Data			46.2	41.3

NOTES:

[1] Average daily sound level for the daytime or nighttime period.

[2] Insufficient valid data points in this time period to calculate hourly equivalent sound level

Table 4A-4 Monitoring Location M4 – Measurement Results

Date	Measurement Period	Equivalent Sound Level (dBA)		
		Hourly (L_{eq})	Daytime (L_d) [1]	Nighttime (L_n) [1]
Sept. 7, 2016	16:00	39.9	37.3	
	17:00	37.4		
	18:00	35.9		
	19:00	38.8		
	20:00	38.0		
	21:00	34.9		
	22:00	35.1		34.6
	23:00	36.0		
Sept. 8, 2016	00:00	33.6		
	01:00	33.6		
	02:00	33.1		
	03:00	33.6		
	04:00	34.2		
	05:00	34.6		
	06:00	36.5		
	07:00	40.4	39.4	
	08:00	41.4		
	09:00	39.5		
	10:00	41.8		
	11:00	38.7		
	12:00	37.2		
	13:00	38.9		
	14:00	40.6		
	15:00	-[2]		
	16:00	-[2]		
	17:00	-[2]		
	18:00	39.5		
	19:00	38.0		
	20:00	38.7		
	21:00	36.6		

Table 4A-4 Monitoring Location M4 – Measurement Results

Date	Measurement Period	Equivalent Sound Level (dBA)		
		Hourly (L_{eq})	Daytime (L_d) [1]	Nighttime (L_n) [1]
Sept. 8, 2016 (cont'd)	22:00	36.3		
	23:00	35.7		
Sept. 9, 2016	00:00	35.9		
	01:00	35.0		
	02:00	34.2		35.2
	03:00	34.4		
	04:00	34.6		
	05:00	34.7		
	06:00	35.8		
	07:00	40.5	39.9	
	08:00	42.8		
	09:00	42.4		
	10:00	37.3		
	11:00	36.0		
	12:00	37.0		
	13:00	38.0		
	14:00	36.9		
Overall Average of All Valid Measurement Data			39.2	34.9

NOTES:
[1] Average daily sound level for the daytime or nighttime period.
[2] Insufficient valid data points in this time period to calculate hourly equivalent sound level

Attachment 4B NOISE THRESHOLDS

Attachment 4B Noise Thresholds
March 2018

The assessment of Project environmental effects on the acoustic environment was carried in accordance with the Health Canada preferred approach. This approach provides guidance on determining the quantitative limit of project noise at identified receptor locations. Table 4B-1 and Table 4B-2 provides details on the establishment of the noise thresholds used in the assessment for each receptor for scenarios assessed with a duration less than 2 months as well as greater than 2 months but less than 1 year, respectively.

Table 4B-1 Health Canada Guidance Construction Noise Thresholds, Less than two Months Duration

Receptor ID	Basic Mitigation Noise Level (dB, L_{dn})	Community Category Adjustment	Construction Duration Adjustment	Winter	Negligible Tonal or Impulsive Noise	Mitigation Noise Level
SR01	47	0	+10	0	0	57
SR02	47	+5	+10	0	0	62
SR03	47	+5	+10	0	0	62
SR04	47	0	+10	0	0	57
SR05	47	0	+10	0	0	57
SR06	47	0	+10	0	0	57
SR07	47	0	+10	0	0	57
SR08	47	0	+10	0	0	57
SR09	47	0	+10	0	0	57
SR10	47	0	+10	0	0	57
SR11	47	0	+10	0	0	57
SR12	47	0	+10	0	0	57
SR13	47	0	+10	0	0	57
SR14	47	0	+10	0	0	57
SR15	47	0	+10	0	0	57
SR16	47	0	+10	0	0	57
SR17	47	0	+10	0	0	57
SR18	47	0	+10	0	0	57
SR19	47	0	+10	0	0	57
SR20	47	0	+10	0	0	57
SR21	47	0	+10	0	0	57
SR22	47	0	+10	0	0	57
SR23	47	0	+10	0	0	57

Table 4B-1 Health Canada Guidance Construction Noise Thresholds, Less than two Months Duration

Receptor ID	Basic Mitigation Noise Level (dB, L_{dn})	Community Category Adjustment	Construction Duration Adjustment	Winter	Negligible Tonal or Impulsive Noise	Mitigation Noise Level
SR24	47	0	+10	0	0	57
SR25	47	0	+10	0	0	57
SR26	47	0	+10	0	0	57
SR27	47	0	+10	0	0	57
SR28	47	0	+10	0	0	57
SR29	47	0	+10	0	0	57
SR30	47	0	+10	0	0	57
SR31	47	0	+10	0	0	57
SR32	47	0	+10	0	0	57
SR33	47	0	+10	0	0	57
SR34	47	0	+10	0	0	57
SR35	47	0	+10	0	0	57
SR36	47	0	+10	0	0	57
SR37	47	0	+10	0	0	57
SR38	47	0	+10	0	0	57
SR39	47	0	+10	0	0	57
SR40	47	0	+10	0	0	57
SR41	47	0	+10	0	0	57
SR42	47	+5	+10	0	0	62
SR43	47	+5	+10	0	0	62
SR51	47	0	+10	0	0	57
SR57	47	0	+10	0	0	57

Table 4B-2 Health Canada Guidance Construction Noise Thresholds, Greater than 2 Months but less than 1 Year Duration

Receptor ID	Basic Mitigation Noise Level (dB, L_{dn})	Community Category Adjustment	Construction Duration Adjustment	Winter	Negligible Tonal or Impulsive Noise	Mitigation Noise Level
SR01	47	0	0	0	0	47
SR02	47	+5	0	0	0	52
SR03	47	+5	0	0	0	52
SR04	47	0	0	0	0	47
SR05	47	0	0	0	0	47
SR06	47	0	0	0	0	47
SR07	47	0	0	0	0	47
SR08	47	0	0	0	0	47
SR09	47	0	0	0	0	47
SR10	47	0	0	0	0	47
SR11	47	0	0	0	0	47
SR12	47	0	0	0	0	47
SR13	47	0	0	0	0	47
SR14	47	0	0	0	0	47
SR15	47	0	0	0	0	47
SR16	47	0	0	0	0	47
SR17	47	0	0	0	0	47
SR18	47	0	0	0	0	47
SR19	47	0	0	0	0	47
SR20	47	0	0	0	0	47
SR21	47	0	0	0	0	47
SR22	47	0	0	0	0	47
SR23	47	0	0	0	0	47
SR24	47	0	0	0	0	47
SR25	47	0	0	0	0	47
SR26	47	0	0	0	0	47
SR27	47	0	0	0	0	47
SR28	47	0	0	0	0	47

Table 4B-2 Health Canada Guidance Construction Noise Thresholds, Greater than 2 Months but less than 1 Year Duration

Receptor ID	Basic Mitigation Noise Level (dB, L_{dn})	Community Category Adjustment	Construction Duration Adjustment	Winter	Negligible Tonal or Impulsive Noise	Mitigation Noise Level
SR29	47	0	0	0	0	47
SR30	47	0	0	0	0	47
SR31	47	0	0	0	0	47
SR32	47	0	0	0	0	47
SR33	47	0	0	0	0	47
SR34	47	0	0	0	0	47
SR35	47	0	0	0	0	47
SR36	47	0	0	0	0	47
SR37	47	0	0	0	0	47
SR38	47	0	0	0	0	47
SR39	47	0	0	0	0	47
SR40	47	0	0	0	0	47
SR41	47	0	0	0	0	47
SR42	47	+5	0	0	0	52
SR43	47	+5	0	0	0	52
SR51	47	0	0	0	0	47
SR57	47	0	0	0	0	47

For construction activities with a duration greater than one year, the change in %HA should not exceed 6.5% according to the Health Canada approach. Table 4B-3 provides the calculated existing sound levels %HA for each receptor location.

Table 4B-3 Receptor Existing Sound Levels %HA Calculation

Receptor ID	Existing Sound Level (dBA)			Quiet Rural Area Adjustment (dB, L_{dn})	Adjusted Existing Sound Level	
	Daytime (L_d)	Nighttime (L_n)	Day-Night Equivalent (L_{dn})		Day-Night Equivalent (L_{dn})	%HA
SR01	48.8	45.5	52.6	0	52.6	3.0
SR02	52.8	49.5	56.6	0	56.6	5.1
SR03	52.8	49.5	56.6	0	56.6	5.1
SR04	45.0	35.0	45.0	0	45.0	1.1
SR05	45.0	35.0	45.0	0	45.0	1.1
SR06	45.0	35.0	45.0	10	55.0	4.1
SR07	45.0	35.0	45.0	10	55.0	4.1
SR08	45.0	35.0	45.0	0	45.0	1.1
SR09	43.6	36.8	45.6	0	45.6	1.2
SR10	43.6	36.8	45.6	0	45.6	1.2
SR11	43.6	36.8	45.6	0	45.6	1.2
SR12	45.0	35.0	45.0	0	45.0	1.1
SR13	45.0	35.0	45.0	0	45.0	1.1
SR14	45.0	35.0	45.0	0	45.0	1.1
SR15	45.0	35.0	45.0	0	45.0	1.1
SR16	45.0	35.0	45.0	10	55.0	4.1
SR17	45.0	35.0	45.0	10	55.0	4.1
SR18	44.2	37.3	45.6	0	45.6	1.2
SR19	44.2	37.3	45.6	0	45.6	1.2
SR20	44.2	37.3	45.6	0	45.6	1.2
SR21	45.0	35.0	45.0	0	45.0	1.1
SR22	45.0	35.0	45.0	0	45.0	1.1
SR23	45.0	35.0	45.0	0	45.0	1.1
SR24	45.0	35.0	45.0	10	55.0	4.1
SR25	44.2	37.3	45.6	0	45.6	1.2

Table 4B-3 Receptor Existing Sound Levels %HA Calculation

Receptor ID	Existing Sound Level (dBA)			Quiet Rural Area Adjustment (dB, L_{dn})	Adjusted Existing Sound Level	
	Daytime (L_d)	Nighttime (L_n)	Day-Night Equivalent (L_{dn})		Day-Night Equivalent (L_{dn})	%HA
SR26	45.0	35.0	45.0	0	45.0	1.1
SR27	45.0	35.0	45.0	0	45.0	1.1
SR28	45.0	35.0	45.0	0	45.0	1.1
SR29	45.0	35.0	45.0	0	45.0	1.1
SR30	45.0	35.0	45.0	0	45.0	1.1
SR31	45.0	35.0	45.0	0	45.0	1.1
SR32	45.0	35.0	45.0	0	45.0	1.1
SR33	45.0	35.0	45.0	0	45.0	1.1
SR34	45.0	35.0	45.0	0	45.0	1.1
SR35	45.0	35.0	45.0	0	45.0	1.1
SR36	45.0	35.0	45.0	10	55.0	4.1
SR37	45.0	35.0	45.0	0	45.0	1.1
SR38	45.0	35.0	45.0	0	45.0	1.1
SR39	45.0	35.0	45.0	0	45.0	1.1
SR40	44.2	37.3	45.6	0	45.6	1.2
SR41	44.2	37.3	45.6	0	45.6	1.2
SR42	52.8	49.5	56.6	0	56.6	5.1
SR43	52.8	49.5	56.6	0	56.6	5.1
SR51	45.0	35.0	45.0	0	45.0	1.1
SR57	45.0	35.0	45.0	0	45.0	1.1

Attachment 4C SOUND SOURCE SUMMARY

Attachment 4C Sound Source Summary
March 2018

Noise source emissions were established using manufacturer published data, past measurements of similar equipment, and commonly accepted conservative engineering methods in estimating machinery noise emissions. A complete list of all Project construction related noise sources is provided in Table 4C-1. Source sound power levels and quantities are also provided.

Attachment 4C Sound Source Summary
March 2018

Table 4C-1 Project Construction Noise Sources

Equipment	Sound Power Level (dB) in Octave Band Centre Frequency (Hz)									Overall (dBA)	Quantity	Notes
	31.5	63	125	250	500	1000	2000	4000	8000			
Off-Steam Storage Dam												
Dump Truck (CAT 740)	113	113	102	106	101	101	102	95	91	107	14	1,2
Backhoe (CAT 450)	98	98	97	93	92	92	91	84	77	97	4	1,5
Scraper (CAT 637G - Tractor)	108	108	112	104	105	107	109	97	87	113	5	1,5
Scraper (CAT 637G - Scraper)	101	101	103	98	94	96	92	86	78	99	5	1,5
Bulldozer (CAT D6)	106	106	104	103	101	95	94	87	86	103	2	1,5
Vibratory Soil Compactor (CAT CP56B)	98	98	103	98	94	96	92	86	78	100	2	1,5
Backup Alarm	0	0	0	0	0	114	78	80	66	114	20	1,4
Floodplain Berm												
Dump Truck (CAT 740)	113	113	102	106	101	101	102	95	91	107	1	1,2
Bulldozer (CAT D6)	106	106	104	103	101	95	94	87	86	103	2	1,5
Concrete Truck (350HP)	109	109	100	94	101	100	101	97	85	106	1	1,5
Backup Alarm	0	0	0	0	0	114	78	80	66	114	4	1,4
Diversion Channel Structure												
Truck-Mounted Crane (425 HP)	115	115	110	106	102	99	95	88	80	105	1	1,2
Concrete Truck (350HP)	109	109	100	94	101	100	101	97	85	106	1	1,5
Portable Diesel Generator (40 HP)	101	108	106	103	94	93	92	90	84	100	2	1,5

Table 4C-1 Project Construction Noise Sources

Equipment	Sound Power Level (dB) in Octave Band Centre Frequency (Hz)									Overall (dBA)	Quantity	Notes
	31.5	63	125	250	500	1000	2000	4000	8000			
Backup Alarm	0	0	0	0	0	114	78	80	66	114	4	1,4
Dam Outlet Concrete Structure												
Concrete Truck (350HP)	109	109	100	94	101	100	101	97	85	106	1	1,5
Truck-Mounted Crane (425 HP)	115	115	110	106	102	99	95	88	80	105	1	1,2
Backup Alarm	0	0	0	0	0	114	78	80	66	114	2	1,4
Raising Highway 22 and Highway 22 Bridge Construction												
Dump Truck (CAT CT681)	112	112	113	113	109	108	106	104	95	113	10	1,2
Scraper (9470R)	108	108	112	104	105	107	109	97	87	113	3	15
Backhoe (CAT 450)	98	98	97	93	92	92	91	84	77	97	2	1,5
Bulldozer (CAT D6)	106	106	104	103	101	95	94	87	86	103	2	1,5
Excavator (CAT 325 FL)	103	103	104	100	96	93	91	85	77	100	2	1,5
Skid Steer (CAT 272D)	115	118	119	110	102	103	99	97	93	109	2	1,5
Grader (927G)	116	116	115	111	107	112	106	102	93	114	2	1,2
Vibratory Soil Compactor (CAT CP56B)	98	98	103	98	94	96	92	86	78	100	2	1,5
Smooth Drum Rollers (CAT CP56B)	98	98	103	98	94	96	92	86	78	100	2	1,5
Truck-Mounted Crane (425 HP)	115	115	110	106	102	99	95	88	80	105	1	1,2

Table 4C-1 Project Construction Noise Sources

Equipment	Sound Power Level (dB) in Octave Band Centre Frequency (Hz)									Overall (dBA)	Quantity	Notes
	31.5	63	125	250	500	1000	2000	4000	8000			
Concrete Truck (350 HP)	109	109	100	94	101	100	101	97	85	106	1	1,5
Asphalt Paver (CAT AP500F)	106	106	105	100	100	99	97	90	84	104	1	1,2
Tandem Vibratory Rollers / Compactor (CAT CB64B)	110	110	105	107	102	97	92	84	76	104	1	1,5
Mini Backhoe (CASE 580 N EP)	95	95	94	90	89	89	88	81	74	94	1	1,5
Backup Alarm	0	0	0	0	0	114	78	80	66	114	29	1,4
Hydraulic Impact Pile Driver (200 HP)	110	110	110	110	117	111	106	103	98	117	2	1,2
Highway 22 and Township Road 242 Bridge Construction												
Dump Truck (CAT 740)	112	112	113	113	109	108	106	104	95	113	19	1,2
Scraper (9470R)	108	108	112	104	105	107	109	97	87	113	1	1,5
Backhoe (CAT 450)	98	98	97	93	92	92	91	84	77	97	1	1,5
Bulldozer (CAT D6)	106	106	104	103	101	95	94	87	86	103	1	1,5
Excavator (CAT 325 FL)	103	103	104	100	96	93	91	85	77	100	1	1,5
Skid Steer (CAT 272D)	115	118	119	110	102	103	99	97	93	109	1	1,5
Grader (927G)	116	116	115	111	107	112	106	102	93	114	1	1,2
Vibratory Soil Compactor (CAT CP56B)	98	98	103	98	94	96	92	86	78	100	1	1,5
Smooth Drum Rollers (CAT CP56B)	98	98	103	98	94	96	92	86	78	100	1	1,5

Attachment 4C Sound Source Summary
March 2018

Table 4C-1 Project Construction Noise Sources

Equipment	Sound Power Level (dB) in Octave Band Centre Frequency (Hz)									Overall (dBA)	Quantity	Notes
	31.5	63	125	250	500	1000	2000	4000	8000			
Truck Mounted Crane (425 HP)	115	115	110	106	102	99	95	88	80	105	1	1,2
Concrete Truck (350 HP)	109	109	100	94	101	100	101	97	85	106	1	1,5
Asphalt Paver (CAT AP500F)	106	106	105	100	100	99	97	90	84	104	1	1,2
Tandem Vibratory Rollers / Compactor (CAT CB64B)	110	110	105	107	102	97	92	84	76	104	1	1,5
Mini Backhoe (CASE 580 N EP)	95	95	94	90	89	89	88	81	74	94	1	1,5
Backup Alarm	0	0	0	0	0	114	78	80	66	114	11	1,4
Hydraulic Impact Pile Driver (200 HP)	110	110	110	110	117	111	106	103	98	117	2	1,2
Diversion Channel – Excavate and Place as Topsoil												
Scraper (38 m3 capacity) - Tractor	108	108	112	104	105	107	109	97	87	113	5	1,5
Scraper (38 m3 capacity) - Scraper	101	101	103	98	94	96	92	86	78	99	5	1,5
River Reroute (Diversion Inlet)												
Excavator (CAT 325 FL)	103	103	104	100	96	93	91	85	77	100	2	1,5
Front End Loader (CAT 982M)	112	112	112	101	103	99	97	96	88	105	1	1,5

Table 4C-1 Project Construction Noise Sources

Equipment	Sound Power Level (dB) in Octave Band Centre Frequency (Hz)									Overall (dBA)	Quantity	Notes
	31.5	63	125	250	500	1000	2000	4000	8000			
Articulated Dump Truck (CAT 740)	120	120	117	111	112	107	103	96	92	113	2	1,2
Bulldozer (CAT D6)	106	106	104	103	101	95	94	87	86	103	1	1,5
Backup Alarm	0	0	0	0	0	114	78	80	66	114	6	1,4
Haul Routes – Dam Site from Borrow Pit 1												
Articulated Dump Truck (CAT 740)	120	120	117	111	112	107	103	96	92	113	4	1,2
Water Truck (380 HP)	108	108	109	103	107	101	102	98	93	109	1	1,2
Haul Routes – Dam Site from Diversion Channel												
Articulated Dump Truck (CAT 740)	120	120	117	111	112	107	103	96	92	113	6	1,5
Haul Routes – HWY 22 & Bridge Construction from Borrow Pit 2												
Dump Truck (CT 681)	121	121	118	112	113	108	104	97	93	114	1	1,5
Water Truck (380 HP)	108	108	109	103	107	101	102	98	93	109	1	1,2
Haul Routes – Topsoil Stockpile to Diversion Channel												
Dump Truck (CT 681)	121	121	118	112	113	108	104	97	93	114	10	1,5
Haul Routes – Dam Site from Diversion Channel												
Dump Truck (CAT 740)	120	120	117	111	112	107	103	96	92	113	6	1,2
Haul Routes – Dam Site from Topsoil Stockpile												
Dump Truck (CAT 740)	120	120	117	111	112	107	103	96	92	113	4	1,2

Attachment 4C Sound Source Summary
March 2018

Table 4C-1 Project Construction Noise Sources

Equipment	Sound Power Level (dB) in Octave Band Centre Frequency (Hz)									Overall (dBA)	Quantity	Notes
	31.5	63	125	250	500	1000	2000	4000	8000			
Haul Routes – Floodplain Berm from Diversion Channel												
Articulated Dump Truck (CAT 740)	120	120	117	111	112	107	103	96	92	113	1	1,2
Haul Routes – Floodplain Berm from Topsoil Stockpile												
Articulated Dump Truck (CAT 740)	120	120	117	111	112	107	103	96	92	113	1	1,2
General												
Portable Light Generator (CAT QX20)	99	106	104	101	92	91	90	88	82	98	Varies	1,3

NOTES:

[1] Single unit sound power level. Does not include adjustments for tonality, equipment quantity or time-based corrections for equipment usage

[2] Based on published measurement data of equally sized (capacity) equipment from the Department for Environment Food and Rural Affairs (DEFRA) document: Update of Noise database for Prediction of Noise on Construction and Open Sites (DEFRA 2005)

[3] Based on previous Stantec measurements of similar equipment

[4] Based on vendor or manufacturer data

[5] Based on engineering prediction calculations