APPENDIX L
ENBRIDGE'S NOISE ASSESSMENT OF BLASTING AND HORIZONTAL DIRECTIONAL DRILLING

Enbridge Line 5 Wisconsin Segment Relocation Project

Noise Assessment of Blasting and Horizontal Directional Drilling

Construction Noise Impact

Construction related sound levels are highly variable due to the locations of the equipment on site, how and when the equipment is being operated, and the specific phase of construction (e.g., clearing, grading, trenching, restoration). As discussed in the Project's Environmental Impact Report, the Project will result in an intermittent and localized increase in perceptible noise during the construction phase, but the effect will be temporary. Enbridge will minimize temporary construction noise increases to the extent practicable by requiring construction equipment to be fitted with standard muffler systems, working to complete construction near homes quickly, and by minimizing idling times near residences for equipment that is not in active use.

Enbridge reviewed construction activities that can result in elevated noise levels above standard construction activities (i.e., operation of excavators, grading equipment, mobile generators, and similar equipment). The two construction activities identified that could result in elevated noise levels above standard construction activities are rock blasting and use of the Horizontal Directional Drilling (HDD)/Direct Pipe installation techniques, which requires stationary equipment operation for an extended time at a specific location.

Blasting

Blasting activities result in a localized short duration (< 1 min) increase in Project-related noise during the detonation process. Due to the short duration, no noise abatement between blasting locations and noise receptors is proposed. Enbridge will implement blasting mitigation measures as discussed in the Blasting Plan. These measures include use of blasting mats near residences, conducting blasting only during daylight hours, and notification to nearby residents of the scheduled blasting activities.

HDD/Direct Pipe

Currently, HDD's and Direct Pipe installations are planned to be completed during daytime hours, except during the HDD pipe pullback (installation) process when 24-hour operation may be required. The Project's overall schedule will be determined by the timing of applicable permit receipt. Individual HDD progress may also alter the planned work hours at specific HDD locations. Either situation could require a modification to the planned work schedule, resulting in 24-hour construction at the HDD locations.

Enbridge conducted an acoustic analysis of the HDD/Direct Pipe locations to determine where noise abatement may be required should HDD drilling operation hours be extended beyond the planned daylight hours and limited timeframe for the pipe pull back. The assessment was based on the typical construction equipment used at an HDD site and the distance to the nearest residence from the HDD site. Enbridge conservatively used the closest residence to either the HDD entry or exit and conservatively assumed that the noise levels would be the same at either the entry or exit. Enbridge used a calculated Ldn (average noise level over a 24-hour period-dB) value above 55 dBA as the basis for identifying where noise abatement would be implemented if 24-hour construction at the HDD/Direct Pipe locations becomes necessary. The following information provides a detailed explanation of what equipment is assumed to be in

operation during a typical daily HDD operation and how the construction sound power levels are determined. The equipment for an HDD 24-hour operation does not change, so the Ld (average noise level during daylight hours- dB) and Ln (average noise level during nighttime hours – dB) are the same.

Construction Operation Sound Power Level Estimate

Table 1 provides the distance to the nearest residence at each HDD location. Appendix A provides the anticipated equipment list and operation for daytime construction activities at the HDD/Direct Pipe locations. If nighttime work is required, the same equipment would be used. These tables include for each equipment item: the number that may be in operation, the anticipated A-weighted sound pressure level at 50 feet, the utilization factor (UF), and the anticipated octave band and A-weighted sound emission level (Lw).

Table 1: Distance to Nearest Residence

HDD/Direct Pipe Site	Distance from Entry (feet)	Distance from Exit (feet)
White River	2,352	1,698
Deer Creek	1,516	927
Marengo River	1,513	480
Brunsweiler River	445	568
Highway 13	470	1,686
Trout Brook	155	398[a]
Billy Creek	585	1,410[a]
Silver Creek	1,008[a]	1,140[b]
Krause Creek	938	407
Bad River	512[a]	398
Tyler Forks	>3,000	>3,000
Potato River	>3,000	1,960
Vaughn Creek	2,510	763
[a] Excludes non-occupied structures [b] Excludes commercial facilities		

The effective octave band sound power level for each equipment item (LwE) was computed in accordance with Equation 1.

Equation 1: $\mathrm{LwE} = Lw + 10\,\mathrm{Log}(UF) + 10\,\mathrm{Log}(\mathrm{No.})$

Where:

- LwE is the computed effective sound power level with the utilization factor and number of sources.
- Lw is the individual equipment sound power level with no modifications for UF or number of equipment items.
- UF is the Utilization Factor or percentage of time of equipment operation.
- No. is the number of equipment items of that type.

The total effective octave band sound power level (LwT) shown on Line 16 of the Tables was computed by summing the individual octave band sound effective power level (LwE) as derived from Equation 1 above. A sound power level (PWL) to sound pressure level (SPL) calculation was used to calculate Ld and Ln. Equation 2 (below) was used to calculate Ldn.

Equation 2:

$$L_{dn} = 10\log_{10}\left(\frac{15}{24}10^{L_d/10} + \frac{9}{24}10^{(L_n+10)/10}\right)$$

Table 2 provides the Ld, Ln, and corresponding Ldn for the closest occupied residence at each HDD/Direct Pipe crossing location.

Table 2: Noise Analysis

Site	Closest Occupied Residence (feet)[a]	Ld	Ln	Ldn
White River	1,698	47.8	47.8	54.20978
Deer Creek	927	54.2	54.2	60.60978
Marengo River	480	60.6	60.6	67.00978
Brunsweiler River	445	61.3	61.3	67.70978
Hwy 13	470	60.8	60.8	67.20978
Trout Brook	155	70.9	70.9	77.30978
Billy Creek	585	58.7	58.7	65.10978
Silver Creek	1,008	53.3	53.3	59.70978
Krause Creek	407	62.1	62.1	68.50978
Bad River	398	62.3	62.3	68.70978
Tyler Forks[a]	>3,000	41.4	41.4	47.80978
Potato River	1,960	46.3	46.3	52.70978
Vaughn Creek	763	56.1	56.1	62.50978

[a] Closest occupied residence to either the entry or exit. Calculations conservatively assume the same level of noise at both the entry and exit. No adjustment of sound attenuation due to factors such as topography or vegetation has been made.

[b] Ld, Ln, and Ldn calculated based on a distance of 3,000 feet.

If 24-hour HDD operation is required at the highlighted HDDs locations. Enbridge would consult with the closest residents and implement noise abatement, if requested, such as installation of sound barrier walls, to reduce the Ldn.

Appendix A

General Equipment List per HDD/Direct Pipeline Location

43

Enbridge
Noise analysis
MP 4.04 - White River

Description Day Construction
Tag Closest Residential Impacts

Project Line 5 WSRP

DATE: 04/15/24

Sheet 43 A

	DESCRIPTION			31	63	125	250	500	1000	2000	4000	8000	dBA
1	**PWL Daytime**												
2	Hydraulic Hoe	(63 dBA at 50 ft)	Lw	107	104	102	100	97	97	90	86	86	100.6
	FHWA (Backhoe)		**No =**	1		Utilization =		20%					
3	Generator Set	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA		**No =**	2		Utilization =		100%					
4	Light Plant	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA (Front End Loader)		**No =**	2		Utilization =		100%					
5	Mud Rig	(77.6 dBA at 50 ft)	Lw	106	110	110	106	106	106	101	89	86	109.3
	RHK estimate		**No =**	0		Utilization =		100%					
6	Mud Pump	(75.6 dBA at 50 ft)	Lw	99	**107**	107	104	103	103	101	**93**	91	107.4
	FHWA		**No =**	1		Utilization =		100%					
7	Power Unit	(79.4 dBA at 50 ft)	Lw	112	**116**	112	109	108	107	103	**96**	91	111.1
	RHK estimate		No =	1		Utilization =		100%					
8	Mud Pump	(47.6 dBA at 50 ft)	Lw	89	92	87	79	73	73	71	63	71	79.3
	FHWA		**No =**	2		Utilization =		100%					
9	Power Unit	(51.9 dBA at 50 ft)	Lw	102	101	92	84	78	77	73	66	71	83.6
			No =	0		Utilization =		100%					
10			Lw										
			No =			Utilization =							
11													
12													
13													
14													
15													
16	Total PWL with # Sources and Source Utilization Factor			113	117	113	110	109	109	105	98	95	112.7
17	Divergance to	1698 ft		62.3	62.3	62.3	62.3	62.3	62.3	62.3	62.3	62.3	
18	Atmosp. Attn to **Std. Day. 59 d F and 70% rh, L Miller tbl 6-1**	1698 ft		0.2	0.2	0.3	0.7	1.2	2.5	5.1	12.9	23.3	
19	Sound Level at	1698 ft		50.9	54.2	50.7	47.4	45.8	43.7	37.8	22.8	8.9	47.8
20													
21													
22													
23													
24													
25													

43

Enbridge
Noise analysis
MP 6.35 Deer Creek

Description Day Construction
Tag Closest Residential Impacts

Project Line 5 WSRP

DATE: 04/15/24

Sheet 43 A

	DESCRIPTION			31	63	125	250	500	1000	2000	4000	8000	dBA
1	**PWL Daytime**												
2	Hydraulic Hoe	(63 dBA at 50 ft)	Lw	107	104	102	100	97	97	90	86	86	100.6
	FHWA (Backhoe)		**No =**	1		Utilization =		20%					
3	Generator Set	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA		**No =**	2		Utilization =		100%					
4	Light Plant	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA (Front End Loader)		**No =**	2		Utilization =		100%					
5	Mud Rig	(77.6 dBA at 50 ft)	Lw	106	110	110	106	106	106	101	89	86	109.3
	RHK estimate		**No =**	0		Utilization =		100%					
6	Mud Pump	(75.6 dBA at 50 ft)	Lw	99	**107**	107	104	103	103	101	**93**	91	107.4
	FHWA		**No =**	1		Utilization =		100%					
7	Power Unit	(79.4 dBA at 50 ft)	Lw	112	**116**	112	109	108	107	103	**96**	91	111.1
	RHK estimate		No =	1		Utilization =		100%					
8	Mud Pump	(47.6 dBA at 50 ft)	Lw	89	92	87	79	73	73	71	63	71	79.3
	FHWA		**No =**	2		Utilization =		100%					
9	Power Unit	(51.9 dBA at 50 ft)	Lw	102	101	92	84	78	77	73	66	71	83.6
			No =	0		Utilization =		100%					
10			Lw										
			No =			Utilization =							
11													
12													
13													
14													
15													
16	Total PWL with # Sources and Source Utilization Factor			113	117	113	110	109	109	105	98	95	112.7
17	Divergance to	927 ft		57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	
18	Atmosp. Attn to **Std. Day. 59 d F and 70% rh, L Miller tbl 6-1**	927 ft		0.1	0.1	0.2	0.4	0.6	1.4	2.8	7.0	12.7	
19	Sound Level at	927 ft		56.3	59.5	56.1	52.9	51.6	50.1	45.4	33.9	24.8	54.2
20													
21													
22													
23													
24													
25													

43

Enbridge
Noise analysis
MP 11.40 - Marengo River

Description Day Construction
Tag Closest Residential Impacts

Project Line 5 WSRP

DATE: 04/15/24

Sheet 43 A

	DESCRIPTION			31	63	125	250	500	1000	2000	4000	8000	dBA
1	**PWL Daytime**												
2	Hydraulic Hoe	(63 dBA at 50 ft)	Lw	107	104	102	100	97	97	90	86	86	100.6
	FHWA (Backhoe)		**No =**	1		Utilization =		20%					
3	Generator Set	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA		**No =**	2		Utilization =		100%					
4	Light Plant	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA (Front End Loader)		**No =**	2		Utilization =		100%					
5	Mud Rig	(77.6 dBA at 50 ft)	Lw	106	110	110	106	106	106	101	89	86	109.3
	RHK estimate		**No =**	0		Utilization =		100%					
6	Mud Pump	(75.6 dBA at 50 ft)	Lw	99	**107**	107	104	103	103	101	**93**	91	107.4
	FHWA		**No =**	1		Utilization =		100%					
7	Power Unit	(79.4 dBA at 50 ft)	Lw	112	**116**	112	109	108	107	103	**96**	91	111.1
	RHK estimate		No =	1		Utilization =		100%					
8	Mud Pump	(47.6 dBA at 50 ft)	Lw	89	92	87	79	73	73	71	63	71	79.3
	FHWA		**No =**	2		Utilization =		100%					
9	Power Unit	(51.9 dBA at 50 ft)	Lw	102	101	92	84	78	77	73	66	71	83.6
			No =	0		Utilization =		100%					
10			Lw										
			No =			Utilization =							
11													
12													
13													
14													
15													
16	Total PWL with # Sources and Source Utilization Factor			113	117	113	110	109	109	105	98	95	112.7
17	Divergance to	480 ft		51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	
18	Atmosp. Attn to **Std. Day. 59 d F and 70% rh, L Miller tbl 6-1**	480 ft		0.0	0.0	0.1	0.2	0.3	0.7	1.4	3.6	6.6	
19	Sound Level at	480 ft		62.0	65.3	61.9	58.8	57.6	56.5	52.5	43.0	36.6	60.6
20													
21													
22													
23													
24													
25													

43

Enbridge
Noise analysis
MP 15.1 - HWY 13

Description Day Construction
Tag Closest Residential Impacts

Project Line 5 WSRP

DATE: 04/15/24

Sheet 43 A

	DESCRIPTION			31	63	125	250	500	1000	2000	4000	8000	dBA
1	**PWL Daytime**												
2	Hydraulic Hoe	(63 dBA at 50 ft)	Lw	107	104	102	100	97	97	90	86	86	100.6
	FHWA (Backhoe)		**No =**	1		Utilization =		20%					
3	Generator Set	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA		**No =**	2		Utilization =		100%					
4	Light Plant	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA (Front End Loader)		**No =**	2		Utilization =		100%					
5	Mud Rig	(77.6 dBA at 50 ft)	Lw	106	110	110	106	106	106	101	89	86	109.3
	RHK estimate		**No =**	0		Utilization =		100%					
6	Mud Pump	(75.6 dBA at 50 ft)	Lw	99	**107**	107	104	103	103	101	**93**	91	107.4
	FHWA		**No =**	1		Utilization =		100%					
7	Power Unit	(79.4 dBA at 50 ft)	Lw	112	**116**	112	109	108	107	103	**96**	91	111.1
	RHK estimate		No =	1		Utilization =		100%					
8	Mud Pump	(47.6 dBA at 50 ft)	Lw	89	92	87	79	73	73	71	63	71	79.3
	FHWA		**No =**	2		Utilization =		100%					
9	Power Unit	(51.9 dBA at 50 ft)	Lw	102	101	92	84	78	77	73	66	71	83.6
			No =	0		Utilization =		100%					
10			Lw										
			No =			Utilization =							
11													
12													
13													
14													
15													
16	Total PWL with # Sources and Source Utilization Factor			113	117	113	110	109	109	105	98	95	112.7
17	Divergance to	470 ft		51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	
18	Atmosp. Attn to **Std. Day. 59 d F and 70% rh, L Miller tbl 6-1**	470 ft		0.0	0.0	0.1	0.2	0.3	0.7	1.4	3.6	6.4	
19	Sound Level at	470 ft		62.2	65.5	62.1	59.0	57.8	56.7	52.7	43.3	36.9	60.8
20													
21													
22													
23													
24													
25													

43

Enbridge
Noise analysis
MP 14.10 - Brunsweiler River

Description Day Construction
Tag Closest Residential Impacts

Project Line 5 WSRP

DATE: 04/15/24

Sheet 43 A

	DESCRIPTION			31	63	125	250	500	1000	2000	4000	8000	dBA
1	**PWL Daytime**												
2	Hydraulic Hoe	(63 dBA at 50 ft)	Lw	107	104	102	100	97	97	90	86	86	100.6
	FHWA (Backhoe)		**No =**	1		Utilization =		20%					
3	Generator Set	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA		**No =**	2		Utilization =		100%					
4	Light Plant	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA (Front End Loader)		**No =**	2		Utilization =		100%					
5	Mud Rig	(77.6 dBA at 50 ft)	Lw	106	110	110	106	106	106	101	89	86	109.3
	RHK estimate		**No =**	0		Utilization =		100%					
6	Mud Pump	(75.6 dBA at 50 ft)	Lw	99	**107**	107	104	103	103	101	**93**	91	107.4
	FHWA		**No =**	1		Utilization =		100%					
7	Power Unit	(79.4 dBA at 50 ft)	Lw	112	**116**	112	109	108	107	103	**96**	91	111.1
	RHK estimate		No =	1		Utilization =		100%					
8	Mud Pump	(47.6 dBA at 50 ft)	Lw	89	92	87	79	73	73	71	63	71	79.3
	FHWA		**No =**	2		Utilization =		100%					
9	Power Unit	(51.9 dBA at 50 ft)	Lw	102	101	92	84	78	77	73	66	71	83.6
			No =	0		Utilization =		100%					
10			Lw										
			No =			Utilization =							
11													
12													
13													
14													
15													
16	Total PWL with # Sources and Source Utilization Factor			113	117	113	110	109	109	105	98	95	112.7
17	Divergance to	445 ft		50.7	50.7	50.7	50.7	50.7	50.7	50.7	50.7	50.7	
18	Atmosp. Attn to **Std. Day. 59 d F and 70% rh, L Miller tbl 6-1**	445 ft		0.0	0.0	0.1	0.2	0.3	0.7	1.3	3.4	6.1	
19	Sound Level at	445 ft		62.7	66.0	62.6	59.5	58.3	57.2	53.2	43.9	37.7	61.3
20													
21													
22													
23													
24													
25													

43

Enbridge
Noise analysis
MP 15.68 - Trout Brook

Description Day Construction
Tag Closest Residential Impacts

Project Line 5 WSRP

DATE: 04/15/24

Sheet 43 A

	DESCRIPTION			31	63	125	250	500	1000	2000	4000	8000	dBA
1	**PWL Daytime**												
2	Hydraulic Hoe	(63 dBA at 50 ft)	Lw	107	104	102	100	97	97	90	86	86	100.6
	FHWA (Backhoe)		**No =**	1		Utilization =		20%					
3	Generator Set	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA		**No =**	2		Utilization =		100%					
4	Light Plant	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA (Front End Loader)		**No =**	2		Utilization =		100%					
5	Mud Rig	(77.6 dBA at 50 ft)	Lw	106	110	110	106	106	106	101	89	86	109.3
	RHK estimate		**No =**	0		Utilization =		100%					
6	Mud Pump	(75.6 dBA at 50 ft)	Lw	99	**107**	107	104	103	103	101	**93**	91	107.4
	FHWA		**No =**	1		Utilization =		100%					
7	Power Unit	(79.4 dBA at 50 ft)	Lw	112	**116**	112	109	108	107	103	**96**	91	111.1
	RHK estimate		No =	1		Utilization =		100%					
8	Mud Pump	(47.6 dBA at 50 ft)	Lw	89	92	87	79	73	73	71	63	71	79.3
	FHWA		**No =**	2		Utilization =		100%					
9	Power Unit	(51.9 dBA at 50 ft)	Lw	102	101	92	84	78	77	73	66	71	83.6
			No =	0		Utilization =		100%					
10			Lw										
			No =			Utilization =							
11													
12													
13													
14													
15													
16	Total PWL with # Sources and Source Utilization Factor			113	117	113	110	109	109	105	98	95	112.7
17	Divergance to	155 ft		41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	
18	Atmosp. Attn to **Std. Day. 59 d F and 70% rh, L Miller tbl 6-1**	155 ft		0.0	0.0	0.0	0.1	0.1	0.2	0.5	1.2	2.1	
19	Sound Level at	155 ft		71.9	75.1	71.8	68.8	67.7	66.8	63.3	55.3	50.9	70.9
20													
21													
22													
23													
24													
25													

43

Enbridge
Noise analysis
MP 17.25 - Billy Creek

Description Day Construction
Tag Closest Residential Impacts

Project Line 5 WSRP

DATE: 04/15/24

Sheet 43 A

	DESCRIPTION			31	63	125	250	500	1000	2000	4000	8000	dBA
1	**PWL Daytime**												
2	Hydraulic Hoe	(63 dBA at 50 ft)	Lw	107	104	102	100	97	97	90	86	86	100.6
	FHWA (Backhoe)		**No =**	1		Utilization =		20%					
3	Generator Set	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA		**No =**	2		Utilization =		100%					
4	Light Plant	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA (Front End Loader)		**No =**	2		Utilization =		100%					
5	Mud Rig	(77.6 dBA at 50 ft)	Lw	106	110	110	106	106	106	101	89	86	109.3
	RHK estimate		**No =**	0		Utilization =		100%					
6	Mud Pump	(75.6 dBA at 50 ft)	Lw	99	**107**	107	104	103	103	101	**93**	91	107.4
	FHWA		**No =**	1		Utilization =		100%					
7	Power Unit	(79.4 dBA at 50 ft)	Lw	112	**116**	112	109	108	107	103	**96**	91	111.1
	RHK estimate		No =	1		Utilization =		100%					
8	Mud Pump	(47.6 dBA at 50 ft)	Lw	89	92	87	79	73	73	71	63	71	79.3
	FHWA		**No =**	2		Utilization =		100%					
9	Power Unit	(51.9 dBA at 50 ft)	Lw	102	101	92	84	78	77	73	66	71	83.6
			No =	0		Utilization =		100%					
10			Lw										
			No =			Utilization =							
11													
12													
13													
14													
15													
16	Total PWL with # Sources and Source Utilization Factor			113	117	113	110	109	109	105	98	95	112.7
17	Divergance to	585 ft		53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	
18	Atmosp. Attn to **Std. Day. 59 d F and 70% rh, L Miller tbl 6-1**	585 ft		0.1	0.1	0.1	0.2	0.4	0.9	1.8	4.4	8.0	
19	Sound Level at	585 ft		60.3	63.6	60.2	57.1	55.8	54.6	50.4	40.5	33.4	58.7
20													
21													
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23													
24													
25													

43

Enbridge
Noise analysis
MP 19.09 - Silver Creek

Description Day Construction
Tag Closest Residential Impacts

Project Line 5 WSRP

DATE: 04/10/24

Sheet 43 A

	DESCRIPTION			31	63	125	250	500	1000	2000	4000	8000	dBA
1	**PWL Daytime**												
2	Hydraulic Hoe	(63 dBA at 50 ft)	Lw	107	104	102	100	97	97	90	86	86	100.6
	FHWA (Backhoe)		**No =**	1		Utilization =		20%					
3	Generator Set	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA		**No =**	2		Utilization =		100%					
4	Light Plant	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA (Front End Loader)		**No =**	2		Utilization =		100%					
5	Mud Rig	(77.6 dBA at 50 ft)	Lw	106	110	110	106	106	106	101	89	86	109.3
	RHK estimate		**No =**	0		Utilization =		100%					
6	Mud Pump	(75.6 dBA at 50 ft)	Lw	99	**107**	107	104	103	103	101	**93**	91	107.4
	FHWA		**No =**	1		Utilization =		100%					
7	Power Unit	(79.4 dBA at 50 ft)	Lw	112	**116**	112	109	108	107	103	**96**	91	111.1
	RHK estimate		No =	1		Utilization =		100%					
8	Mud Pump	(47.6 dBA at 50 ft)	Lw	89	92	87	79	73	73	71	63	71	79.3
	FHWA		**No =**	2		Utilization =		100%					
9	Power Unit	(51.9 dBA at 50 ft)	Lw	102	101	92	84	78	77	73	66	71	83.6
			No =	0		Utilization =		100%					
10			Lw										
			No =			Utilization =							
11													
12													
13													
14													
15													
16	Total PWL with # Sources and Source Utilization Factor			113	117	113	110	109	109	105	98	95	112.7
17	Divergance to	1008	ft	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	
18	Atmosp. Attn to **Std. Day. 59 d F and 70% rh, L Miller tbl 6-1**	1008	ft	0.1	0.1	0.2	0.4	0.7	1.5	3.0	7.7	13.8	
19	Sound Level at	1008	ft	55.5	58.8	55.4	52.2	50.8	49.3	44.4	32.5	22.9	53.3
20													
21													
22													
23													
24													
25													

43

Enbridge
Noise analysis
MP 22.28 - Krause Creek

Description Day Construction
Tag Closest Residential Impacts

Project Line 5 WSRP

DATE: 04/15/24

Sheet 43 A

	DESCRIPTION			31	63	125	250	500	1000	2000	4000	8000	dBA
1	**PWL Daytime**												
2	Hydraulic Hoe	(63 dBA at 50 ft)	Lw	107	104	102	100	97	97	90	86	86	100.6
	FHWA (Backhoe)		**No =**	1		Utilization =		20%					
3	Generator Set	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA		**No =**	2		Utilization =		100%					
4	Light Plant	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA (Front End Loader)		**No =**	2		Utilization =		100%					
5	Mud Rig	(77.6 dBA at 50 ft)	Lw	106	110	110	106	106	106	101	89	86	109.3
	RHK estimate		**No =**	0		Utilization =		100%					
6	Mud Pump	(75.6 dBA at 50 ft)	Lw	99	**107**	107	104	103	103	101	**93**	91	107.4
	FHWA		**No =**	1		Utilization =		100%					
7	Power Unit	(79.4 dBA at 50 ft)	Lw	112	**116**	112	109	108	107	103	**96**	91	111.1
	RHK estimate		No =	1		Utilization =		100%					
8	Mud Pump	(47.6 dBA at 50 ft)	Lw	89	92	87	79	73	73	71	63	71	79.3
	FHWA		**No =**	2		Utilization =		100%					
9	Power Unit	(51.9 dBA at 50 ft)	Lw	102	101	92	84	78	77	73	66	71	83.6
			No =	0		Utilization =		100%					
10			Lw										
			No =			Utilization =							
11													
12													
13													
14													
15													
16	Total PWL with # Sources and Source Utilization Factor			113	117	113	110	109	109	105	98	95	112.7
17	Divergance to	407 ft		49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	
18	Atmosp. Attn to **Std. Day. 59 d F and 70% rh, L Miller tbl 6-1**	407 ft		0.0	0.0	0.1	0.2	0.3	0.6	1.2	3.1	5.6	
19	Sound Level at	407 ft		63.5	66.7	63.4	60.3	59.1	58.0	54.1	45.0	39.0	62.1
20													
21													
22													
23													
24													
25													

43

Enbridge
Noise analysis
MP 24.18 - Bad River

Description Day Construction
Tag Closest Residential Impacts

Project Line 5 WSRP

DATE: 04/10/24

Sheet 43 A

	DESCRIPTION			31	63	125	250	500	1000	2000	4000	8000	dBA
1	**PWL Daytime**												
2	Hydraulic Hoe	(63 dBA at 50 ft)	Lw	107	104	102	100	97	97	90	86	86	100.6
	FHWA (Backhoe)		**No =**	1		Utilization =		20%					
3	Generator Set	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA		**No =**	2		Utilization =		100%					
4	Light Plant	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA (Front End Loader)		**No =**	2		Utilization =		100%					
5	Mud Rig	(77.6 dBA at 50 ft)	Lw	106	110	110	106	106	106	101	89	86	109.3
	RHK estimate		**No =**	0		Utilization =		100%					
6	Mud Pump	(75.6 dBA at 50 ft)	Lw	99	**107**	107	104	103	103	101	**93**	91	107.4
	FHWA		**No =**	1		Utilization =		100%					
7	Power Unit	(79.4 dBA at 50 ft)	Lw	112	**116**	112	109	108	107	103	**96**	91	111.1
	RHK estimate		No =	1		Utilization =		100%					
8	Mud Pump	(47.6 dBA at 50 ft)	Lw	89	92	87	79	73	73	71	63	71	79.3
	FHWA		**No =**	2		Utilization =		100%					
9	Power Unit	(51.9 dBA at 50 ft)	Lw	102	101	92	84	78	77	73	66	71	83.6
			No =	0		Utilization =		100%					
10			Lw										
			No =			Utilization =							
11													
12													
13													
14													
15													
16	Total PWL with # Sources and Source Utilization Factor			113	117	113	110	109	109	105	98	95	112.7
17	Divergance to	398 ft		49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	
18	Atmosp. Attn to **Std. Day. 59 d F and 70% rh, L Miller tbl 6-1**	398 ft		0.0	0.0	0.1	0.2	0.3	0.6	1.2	3.0	5.5	
19	Sound Level at	398 ft		63.6	66.9	63.6	60.5	59.3	58.2	54.3	45.2	39.4	62.3
20													
21													
22													
23													
24													
25													

43

Enbridge
Noise analysis
MP 34.01 - Tyler Forks

Description Day Construction
Tag Closest Residential Impacts

Project Line 5 WSRP

DATE: 04/15/24

Sheet 43 A

	DESCRIPTION			31	63	125	250	500	1000	2000	4000	8000	dBA
1	**PWL Daytime**												
2	Hydraulic Hoe	(63 dBA at 50 ft)	Lw	107	104	102	100	97	97	90	86	86	100.6
	FHWA (Backhoe)		**No =**	1		Utilization =		20%					
3	Generator Set	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA		**No =**	2		Utilization =		100%					
4	Light Plant	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA (Front End Loader)		**No =**	2		Utilization =		100%					
5	Mud Rig	(77.6 dBA at 50 ft)	Lw	106	110	110	106	106	106	101	89	86	109.3
	RHK estimate		**No =**	0		Utilization =		100%					
6	Mud Pump	(75.6 dBA at 50 ft)	Lw	99	**107**	107	104	103	103	101	**93**	91	107.4
	FHWA		**No =**	1		Utilization =		100%					
7	Power Unit	(79.4 dBA at 50 ft)	Lw	112	**116**	112	109	108	107	103	**96**	91	111.1
	RHK estimate		No =	1		Utilization =		100%					
8	Mud Pump	(47.6 dBA at 50 ft)	Lw	89	92	87	79	73	73	71	63	71	79.3
	FHWA		**No =**	2		Utilization =		100%					
9	Power Unit	(51.9 dBA at 50 ft)	Lw	102	101	92	84	78	77	73	66	71	83.6
			No =	0		Utilization =		100%					
10			Lw										
			No =			Utilization =							
11													
12													
13													
14													
15													
16	Total PWL with # Sources and Source Utilization Factor			113	117	113	110	109	109	105	98	95	112.7
17	Divergance to	3000 ft		67.2	67.2	67.2	67.2	67.2	67.2	67.2	67.2	67.2	
18	Atmosp. Attn to **Std. Day. 59 d F and 70% rh, L Miller tbl 6-1**	3000 ft		0.3	0.3	0.6	1.2	2.1	4.5	9.0	22.8	41.1	
19	Sound Level at	3000 ft		45.8	49.1	45.5	41.9	39.9	36.8	29.0	7.9	-13.8	41.4
20													
21													
22													
23													
24													
25													

43

Enbridge
Noise analysis
MP 37.86 - Potato River

Description Day Construction
Tag Closest Residential Impacts

Project Line 5 WSRP

DATE: 04/15/24

Sheet 43 A

	DESCRIPTION			31	63	125	250	500	1000	2000	4000	8000	dBA
1	**PWL Daytime**												
2	Hydraulic Hoe	(63 dBA at 50 ft)	Lw	107	104	102	100	97	97	90	86	86	100.6
	FHWA (Backhoe)		**No =**	1		Utilization =		20%					
3	Generator Set	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA		**No =**	2		Utilization =		100%					
4	Light Plant	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA (Front End Loader)		**No =**	2		Utilization =		100%					
5	Mud Rig	(77.6 dBA at 50 ft)	Lw	106	110	110	106	106	106	101	89	86	109.3
	RHK estimate		**No =**	0		Utilization =		100%					
6	Mud Pump	(75.6 dBA at 50 ft)	Lw	99	**107**	107	104	103	103	101	**93**	91	107.4
	FHWA		**No =**	1		Utilization =		100%					
7	Power Unit	(79.4 dBA at 50 ft)	Lw	112	**116**	112	109	108	107	103	**96**	91	111.1
	RHK estimate		No =	1		Utilization =		100%					
8	Mud Pump	(47.6 dBA at 50 ft)	Lw	89	92	87	79	73	73	71	63	71	79.3
	FHWA		**No =**	2		Utilization =		100%					
9	Power Unit	(51.9 dBA at 50 ft)	Lw	102	101	92	84	78	77	73	66	71	83.6
			No =	0		Utilization =		100%					
10			Lw										
			No =			Utilization =							
11													
12													
13													
14													
15													
16	Total PWL with # Sources and Source Utilization Factor			113	117	113	110	109	109	105	98	95	112.7
17	Divergance to	1960 ft		63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	
18	Atmosp. Attn to **Std. Day. 59 d F and 70% rh, L Miller tbl 6-1**	1960 ft		0.2	0.2	0.4	0.8	1.4	2.9	5.9	14.9	26.9	
19	Sound Level at	1960 ft		49.6	52.9	49.4	46.0	44.4	42.1	35.8	19.5	4.1	46.3
20													
21													
22													
23													
24													
25													

43

Enbridge
Noise analysis
MP 39.56 - Vaughn Creek

Description Day Construction
Tag Closest Residential Impacts

Project Line 5 WSRP

DATE: 04/15/24

Sheet 43 A

	DESCRIPTION			31	63	125	250	500	1000	2000	4000	8000	dBA
1	**PWL Daytime**												
2	Hydraulic Hoe	(63 dBA at 50 ft)	Lw	107	104	102	100	97	97	90	86	86	100.6
	FHWA (Backhoe)		**No =**	1		Utilization =		20%					
3	Generator Set	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA		**No =**	2		Utilization =		100%					
4	Light Plant	(55.3 dBA at 50 ft)	Lw	100	93	90	85	82	80	82	77	77	87.5
	FHWA (Front End Loader)		**No =**	2		Utilization =		100%					
5	Mud Rig	(77.6 dBA at 50 ft)	Lw	106	110	110	106	106	106	101	89	86	109.3
	RHK estimate		**No =**	0		Utilization =		100%					
6	Mud Pump	(75.6 dBA at 50 ft)	Lw	99	**107**	107	104	103	103	101	**93**	91	107.4
	FHWA		**No =**	1		Utilization =		100%					
7	Power Unit	(79.4 dBA at 50 ft)	Lw	112	**116**	112	109	108	107	103	**96**	91	111.1
	RHK estimate		No =	1		Utilization =		100%					
8	Mud Pump	(47.6 dBA at 50 ft)	Lw	89	92	87	79	73	73	71	63	71	79.3
	FHWA		**No =**	2		Utilization =		100%					
9	Power Unit	(51.9 dBA at 50 ft)	Lw	102	101	92	84	78	77	73	66	71	83.6
			No =	0		Utilization =		100%					
10			Lw										
			No =			Utilization =							
11													
12													
13													
14													
15													
16	Total PWL with # Sources and Source Utilization Factor			113	117	113	110	109	109	105	98	95	112.7
17	Divergance to	763 ft		55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	
18	Atmosp. Attn to **Std. Day. 59 d F and 70% rh, L Miller tbl 6-1**	763 ft		0.1	0.1	0.2	0.3	0.5	1.1	2.3	5.8	10.5	
19	Sound Level at	763 ft		58.0	61.2	57.9	54.7	53.4	52.0	47.6	36.8	28.7	56.1
20													
21													
22													
23													
24													
25													