

**Payne & Dolan, Inc.**  
**Racine Quarry - Village of Caledonia**  
**Recorded Ground Vibration and Airblast Levels for the East Quarry CUP (New) Area**  
**September 2023**

All Ground Vibrations (PPV) were below State of Wisconsin and Village of Caledonia Maximum Limits

All Airblasts (AO) were below State of Wisconsin and Village of Caledonia Maximum Limits

Time	Activity	Location	Distance	PPV	Freq	AO
9/29/2023 11:27	EAST 54	Ellis	1,224	0.063	9.3	106
9/29/2023 11:27	EAST 54	St. Rita	1,103	0.058	15.2	107
9/29/2023 11:27	EAST 54	Marquette	1,038	0.135	21.7	117
9/29/2023 11:27	EAST 54	Berkeley	1,584	0.045	21.7	119
9/29/2023 11:12	EAST 53	Ellis	1,134	0.153	14.7	106
9/29/2023 11:12	EAST 53	St. Rita	942	0.113	15.6	118
9/29/2023 11:12	EAST 53	Marquette	1,198	0.15	15.2	118
9/29/2023 11:12	EAST 53	Berkeley	1,693	0.048	11.4	116
9/21/2023 13:12	EAST 52	Ellis	930	0.165	41.7	111
9/21/2023 13:12	EAST 52	St. Rita	1,029	0.128	31.3	116
9/21/2023 13:12	EAST 52	Marquette	1,214	0.148	38.5	114
9/21/2023 13:12	EAST 52	Berkeley	1,883	0.04	29.4	116
9/21/2023 12:15	EAST 51	Ellis	1,609	0.045	55.6	106
9/21/2023 12:15	EAST 51	St. Rita	1,539	0.035	38.5	106
9/21/2023 12:15	EAST 51	Marquette	603	0.173	29.4	112
9/21/2023 12:15	EAST 51	Berkeley	1,226	0.045	23.8	106
9/18/2023 12:02	EAST 50	Ellis	1,261	0.105	35.7	109
9/18/2023 12:02	EAST 50	St. Rita	1,163	0.11	20.8	111
9/18/2023 12:02	EAST 50	Marquette	979	0.248	13.5	120
9/18/2023 12:02	EAST 50	Berkeley	1,546	0.075	14.7	119
9/18/2023 9:31	EAST 49	Ellis	950	0.205	38.5	109
9/18/2023 9:31	EAST 49	St. Rita	1,037	0.163	27.8	115
9/18/2023 9:31	EAST 49	Marquette	1,197	0.125	18.5	112
9/18/2023 9:31	EAST 49	Berkeley	1,863	0.033	20.8	114
9/13/2023 11:55	EAST 48	Ellis	909	0.198	41.7	107
9/13/2023 11:55	EAST 48	St. Rita	977	0.183	31.3	118
9/13/2023 11:55	EAST 48	Marquette	1,252	0.08	17.2	117
9/13/2023 11:55	EAST 48	Berkeley	1,899	0.053	33.3	118
9/13/2023 10:45	EAST 47	Ellis	1,730	0.033	41.7	104
9/13/2023 10:45	EAST 47	St. Rita	1,631	N/T	N/T	N/A
9/13/2023 10:45	EAST 47	Marquette	529	0.253	31.3	116
9/13/2023 10:45	EAST 47	Berkeley	1,104	0.063	29.4	111
9/8/2023 10:35	EAST 46	Ellis	1,300	0.12	12.2	108
9/8/2023 10:35	EAST 46	St. Rita	1,182	0.088	31.3	111
9/8/2023 10:35	EAST 46	Marquette	958	0.193	16.7	116
9/8/2023 10:35	EAST 46	Berkeley	1,507	0.053	31.3	121
9/8/2023 9:15	EAST 45	Ellis	1,859	N/T	N/T	N/A
9/8/2023 9:15	EAST 45	St. Rita	1,730	N/T	N/T	N/A
9/8/2023 9:15	EAST 45	Marquette	479	0.095	50	106

9/8/2023 9:15	EAST 45	Berkeley	973	0.04	21.7	106
9/8/2023 9:02	EAST 44	Ellis	1,966	N/T	N/T	N/A
9/8/2023 9:02	EAST 44	St. Rita	1,808	N/T	N/T	N/A
9/8/2023 9:02	EAST 44	Marquette	478	0.13	45.5	109
9/8/2023 9:02	EAST 44	Berkeley	861	0.063	27.8	108

N/T - seismograph did not trigger

Ground Vibration (PPV) Limit - The Village of Caledonia explosives use ordinance states that “The maximum ground vibration at the location of any dwelling, public building, place of employment, school, church or community or institutional building outside or beyond the permitted explosives use area shall have a maximum peak-particle-velocity limit as provided by the Department, the scaled-distance equation of paragraph (ii), or the blasting level chart of paragraph (iii), whichever is applicable hereunder. Notwithstanding this general requirement, an annual permit holder who is subject to the limitations of paragraph (iii)a (Figure A, incorporated by herein reference), below, may exceed the limitation of Figure A on up to five percent (5%) of the blasts it initiates during the six (6) month period from July 1 to December 31 and during the six (6) month period from January 1 to June 30 without violating this Section, provided that the ground vibration produced by such blasts does not exceed 0.65 inches per second or the limitations imposed by the Wisconsin Department of Industry, Labor and Human Relations in Section ILHR 7.64(4), Wis. Adm. Code, as amended from time to time, whichever is more stringent”.

Airblast (AO) Limit - The Village of Caledonia explosives use ordinance states that “Airblast shall not exceed the maximum limits listed in Table A-1 at the location of any dwelling, public building, place of employment, school, church or community or institutional building outside and beyond the permitted explosives use area. Notwithstanding this general requirement, an annual permit holder subject to this limitation may exceed the limitation on up to five percent (5%) of the blasts it initiates during the six (6) month period from July 1 to December 31, and during the six (6) month period from January 1 to June 30, without violating this ordinance, provided that the airblast produced by such blasts does not exceed the limitations on airblast imposed by Wisconsin Department of Industry, Labor and Human Relations in Subsection ILHR 7.64(2), Wis. Adm. Code, as amended from time to time.”

TABLE A-1 AIRBLAST  
LIMITS

<u>Lower Frequency Limit of Measuring System in Hz</u>	<u>Maximum Level in db</u>
2 Hz or lower -- Flat response	123 peak
6 Hz or lower -- Flat response	129 peak

# PPV vs. Frequency

USBM Blasting Level Criteria  
(RI 8507, 1980)

