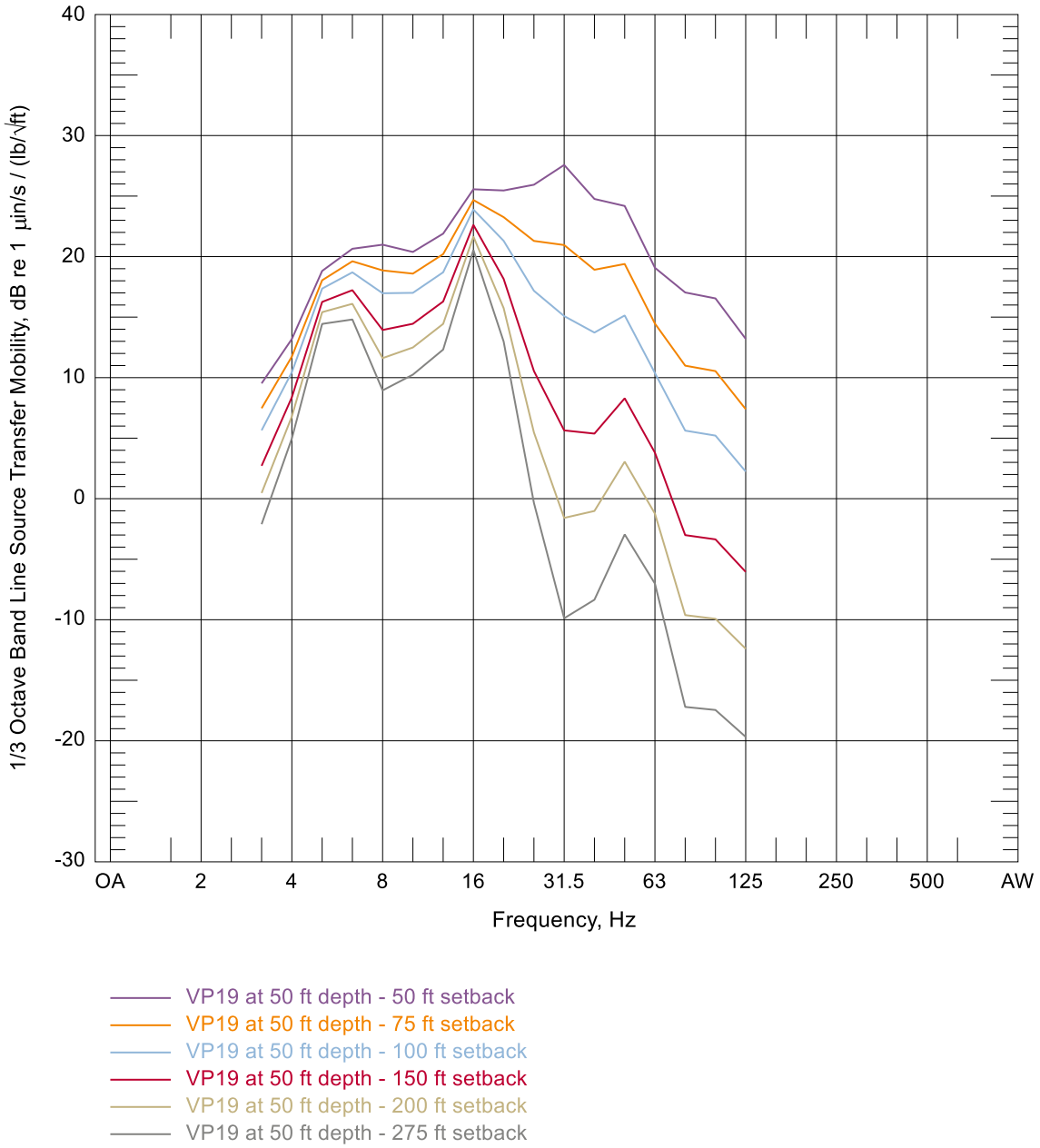
APPENDIX C: VIBRATION PROPAGATION MEASUREMENT DATA

Table C-1 Line Source Response Coefficients for Borehole Impact Site VP19 – 50 ft Depth

Frequency (Hz)	A	B	C
3.15	45.6	-19.5	0
4	38.7	-13.8	0
5	32.4	-7.3	0
6.3	38.7	-9.8	0
8	58.3	-20.2	0
10	51.8	-17.0	0
12.5	51.6	-16.0	0
16	41.1	-8.4	0
20	64.1	-20.9	0
25	107.4	-44.0	0
31.5	143.6	-62.7	0
40	127.3	-55.5	0
50	108.3	-45.5	0
63	99.9	-43.7	0
80	123.1	-57.4	0
100	121.9	-57.0	0
125	115.1	-55.1	0

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$
Where: A, B, C = Polynomial coefficients
d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-1 Line Source Response for Borehole Impact Site VP19 – 50 ft Depth

Table C-2 Line Source Response Coefficients for Borehole Impact Site VP19 – 60 ft Depth

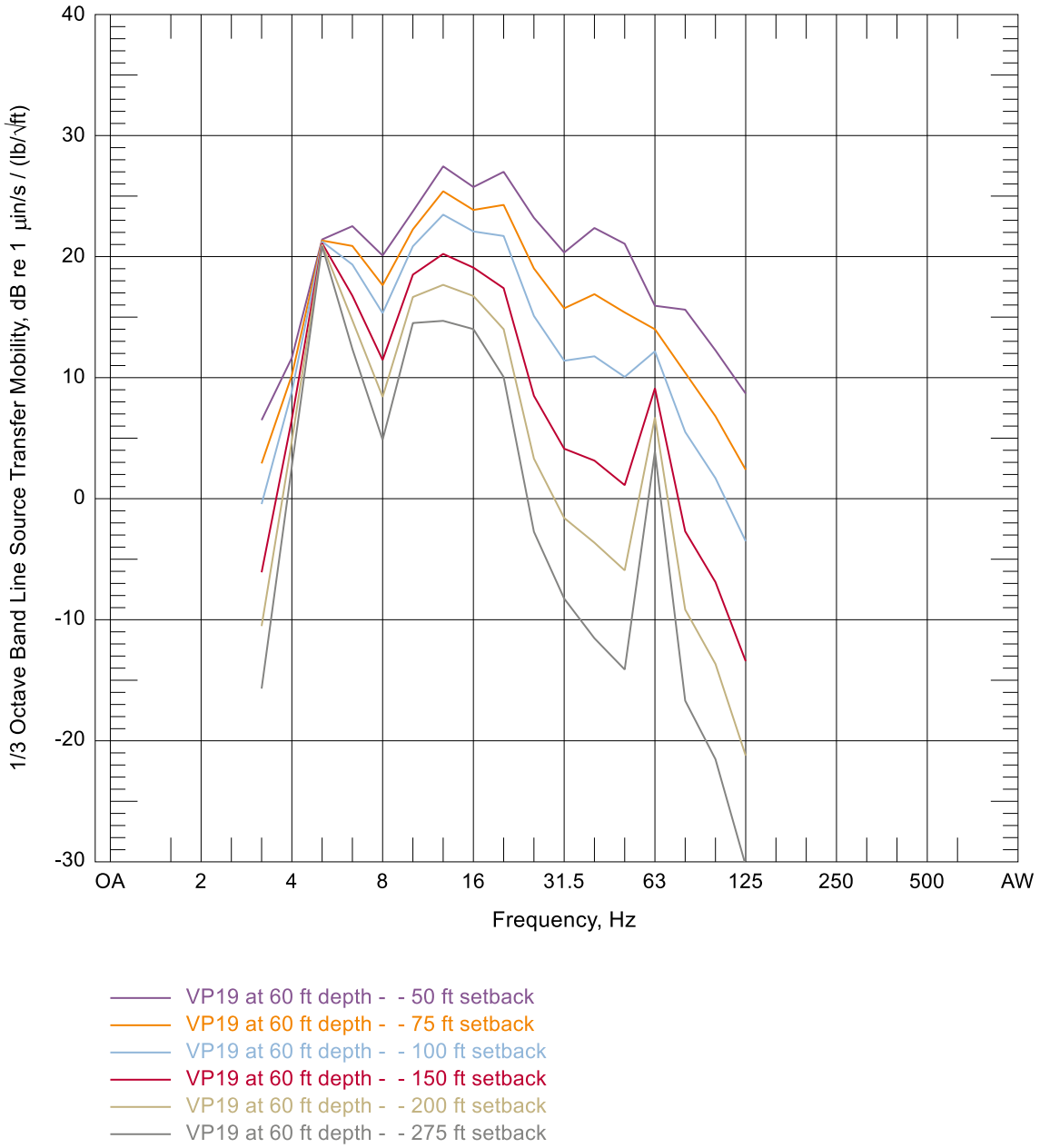
Frequency (Hz)	A	B	C
3.15	81.9	-39.8	0
4	42.1	-16.1	0
5	23.3	-1.0	0
6.3	57.0	-18.2	0
8	71.8	-27.3	0
10	55.1	-16.6	0
12.5	70.8	-22.9	0
16	65.7	-21.1	0
20	84.6	-30.5	0
25	111.4	-46.6	0
31.5	117.5	-51.3	0
40	137.6	-60.9	0
50	140.6	-63.2	0
63	56.8	-21.6	0
80	125.4	-58.0	0
100	127.1	-60.7	0
125	141.2	-70.0	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-2 Line Source Response for Borehole Impact Site VP19 – 60 ft Depth

Table C-3 Line Source Response Coefficients for Borehole Impact Site VP19 – 71 ft Depth

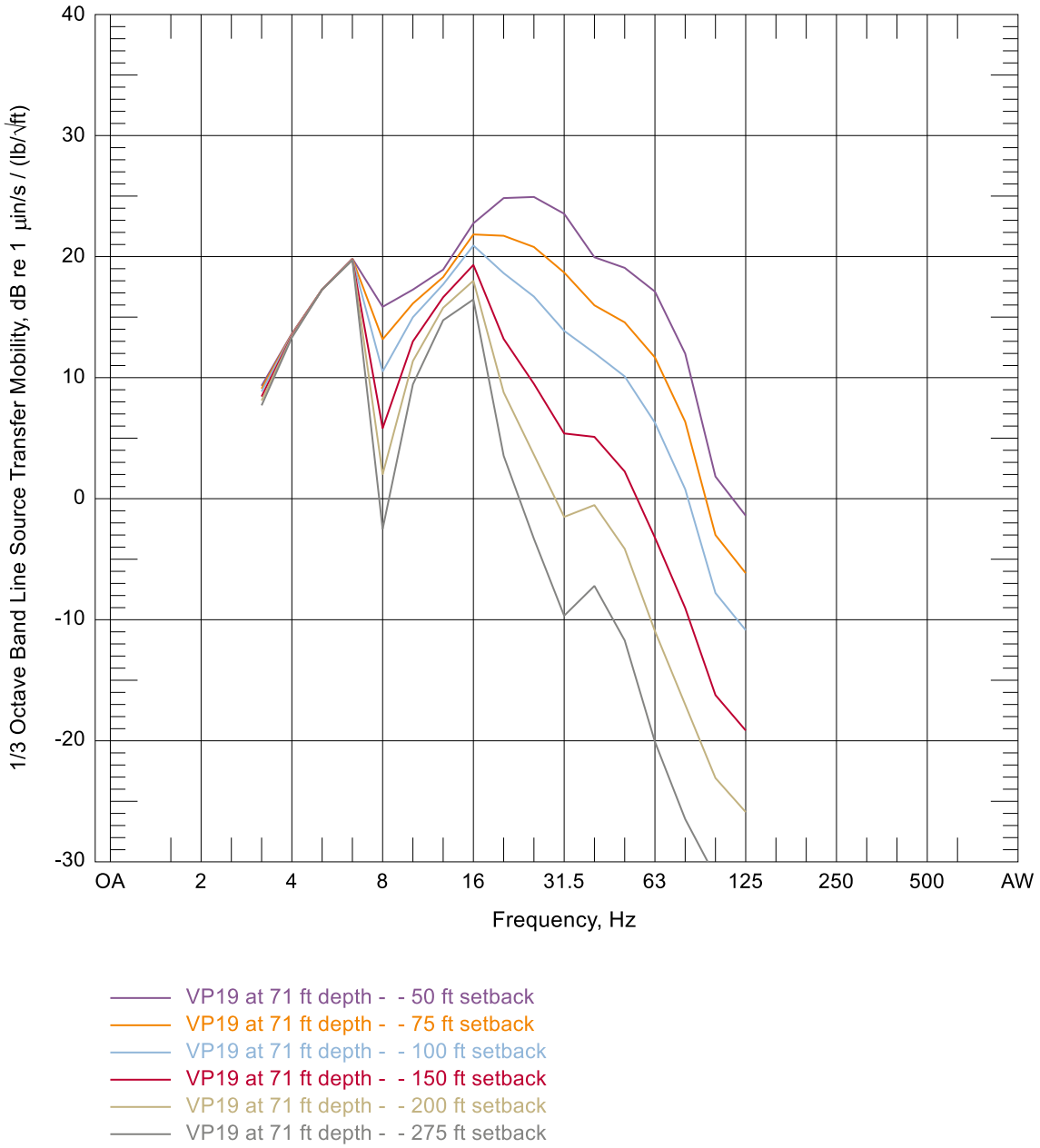
Frequency (Hz)	A	B	C
3.15	15.3	-4.2	0
4	12.6	-0.9	0
5	14.5	-0.1	0
6.3	17.6	-0.4	0
8	85.0	-35.8	0
10	51.1	-17.8	0
12.5	37.3	-10.2	0
16	50.3	-14.7	0
20	104.9	-41.4	0
25	134.3	-56.4	0
31.5	151.3	-65.9	0
40	125.6	-54.5	0
50	135.2	-59.9	0
63	157.5	-72.4	0
80	157.5	-75.1	0
100	127.1	-64.6	0
125	123.7	-64.5	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-3 Line Source Response for Borehole Impact Site VP19 – 71 ft Depth

Table C-4 Line Source Response Coefficients for Surface Impact Site VP20

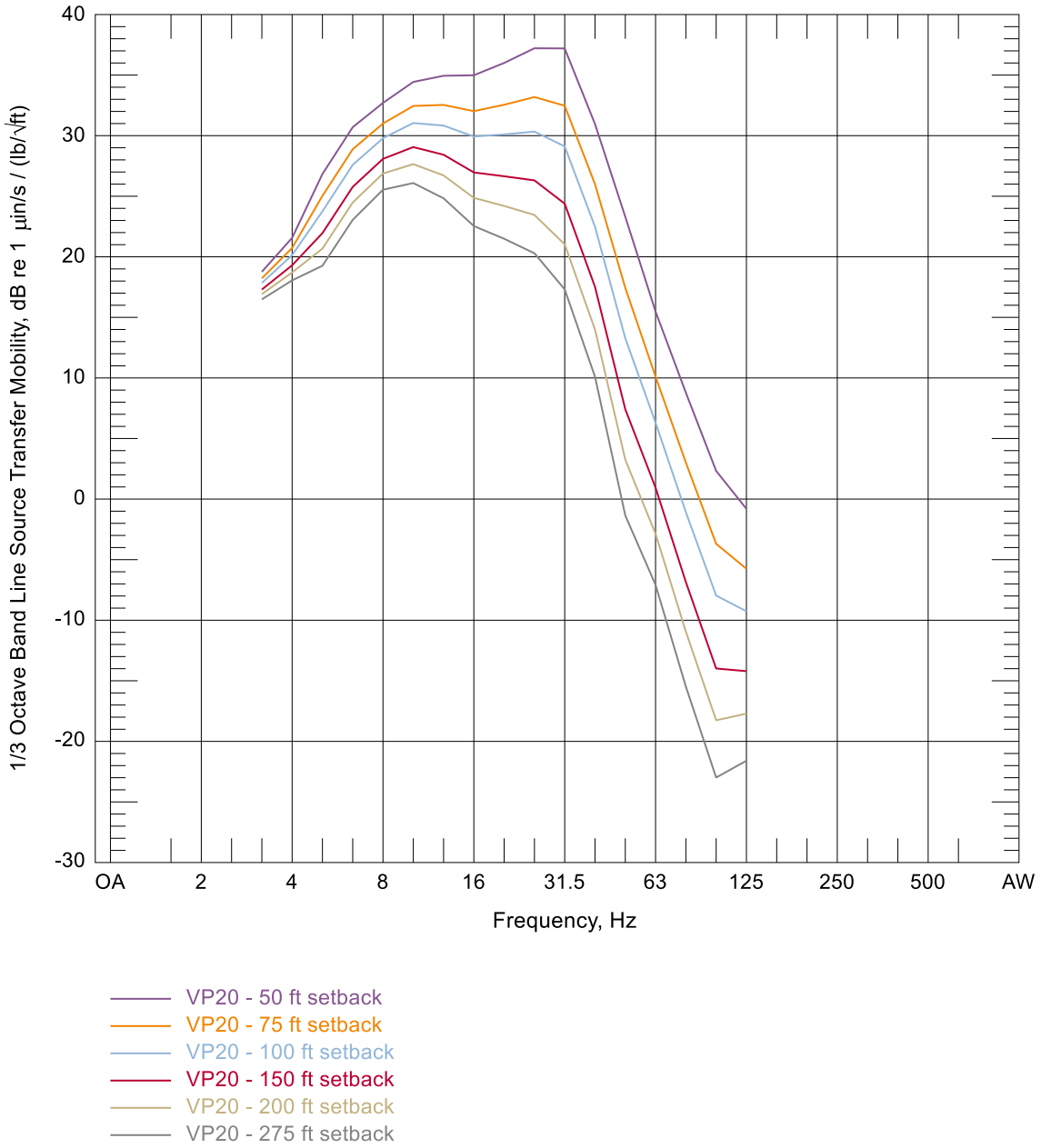
Frequency (Hz)	A	B	C
3.15	24.0	-3.1	0
4	29.6	-4.7	0
5	44.2	-10.2	0
6.3	48.2	-10.3	0
8	49.2	-9.7	0
10	53.6	-11.3	0
12.5	58.2	-13.7	0
16	63.5	-16.8	0
20	69.3	-19.6	0
25	76.0	-22.9	0
31.5	82.8	-26.9	0
40	78.8	-28.2	0
50	79.9	-33.3	0
63	67.3	-30.5	0
80	64.4	-32.8	0
100	60.4	-34.2	0
125	46.9	-28.1	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-4 Line Source Response for Surface Impact Site VP20

Table C-5 Line Source Response Coefficients for Surface Impact Site VP21

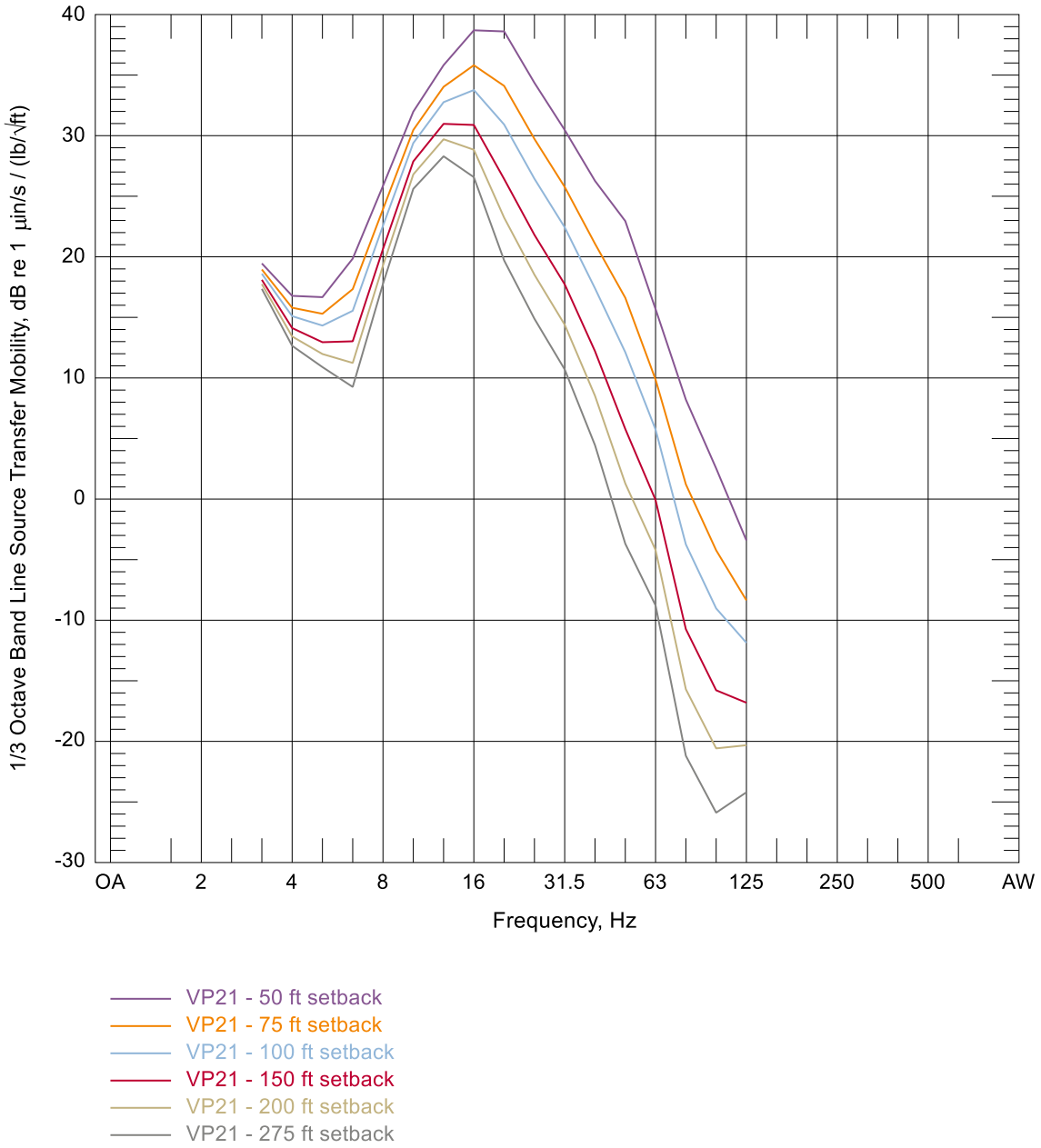
Frequency (Hz)	A	B	C
3.15	24.3	-2.8	0
4	26.2	-5.6	0
5	29.9	-7.8	0
6.3	44.2	-14.3	0
8	44.4	-10.9	0
10	46.6	-8.6	0
12.5	53.1	-10.2	0
16	66.5	-16.4	0
20	82.0	-25.5	0
25	79.1	-26.3	0
31.5	75.8	-26.7	0
40	76.3	-29.5	0
50	84.1	-36.0	0
63	71.8	-33.0	0
80	75.7	-39.7	0
100	67.8	-38.4	0
125	44.3	-28.1	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-5 Line Source Response for Surface Impact Site VP21

Table C-6 Line Source Response Coefficients for Surface Impact Site VP22

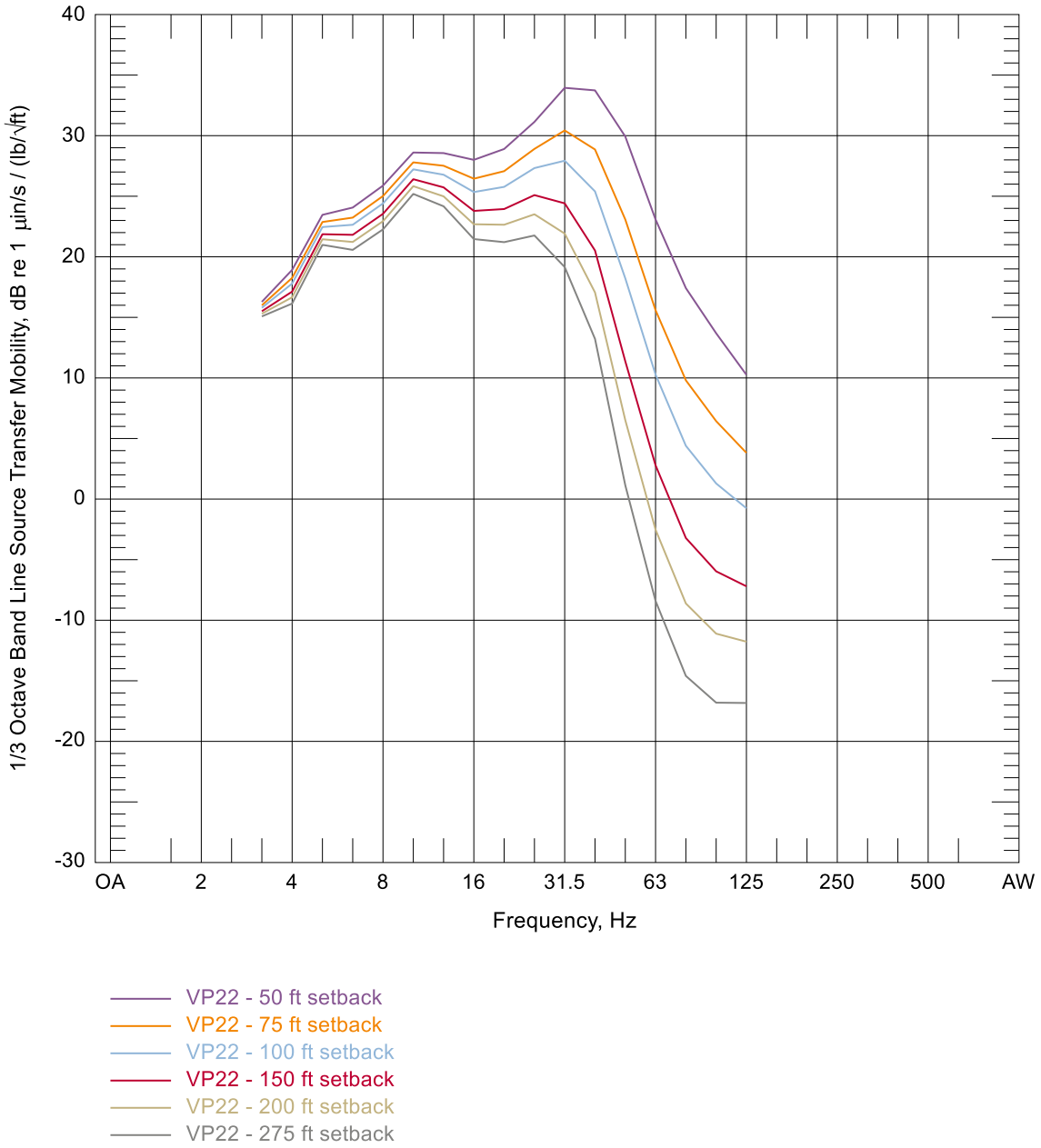
Frequency (Hz)	A	B	C
3.15	19.0	-1.6	0
4	25.3	-3.8	0
5	29.1	-3.3	0
6.3	32.1	-4.7	0
8	34.2	-4.9	0
10	36.4	-4.6	0
12.5	38.6	-5.9	0
16	43.0	-8.8	0
20	46.5	-10.4	0
25	52.7	-12.7	0
31.5	67.9	-20.0	0
40	80.8	-27.7	0
50	96.0	-38.9	0
63	95.3	-42.5	0
80	90.9	-43.2	0
100	83.7	-41.2	0
125	72.4	-36.6	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-6 Line Source Response for Surface Impact Site VP22

Table C-7 Line Source Response Coefficients for Surface Impact Site VP23

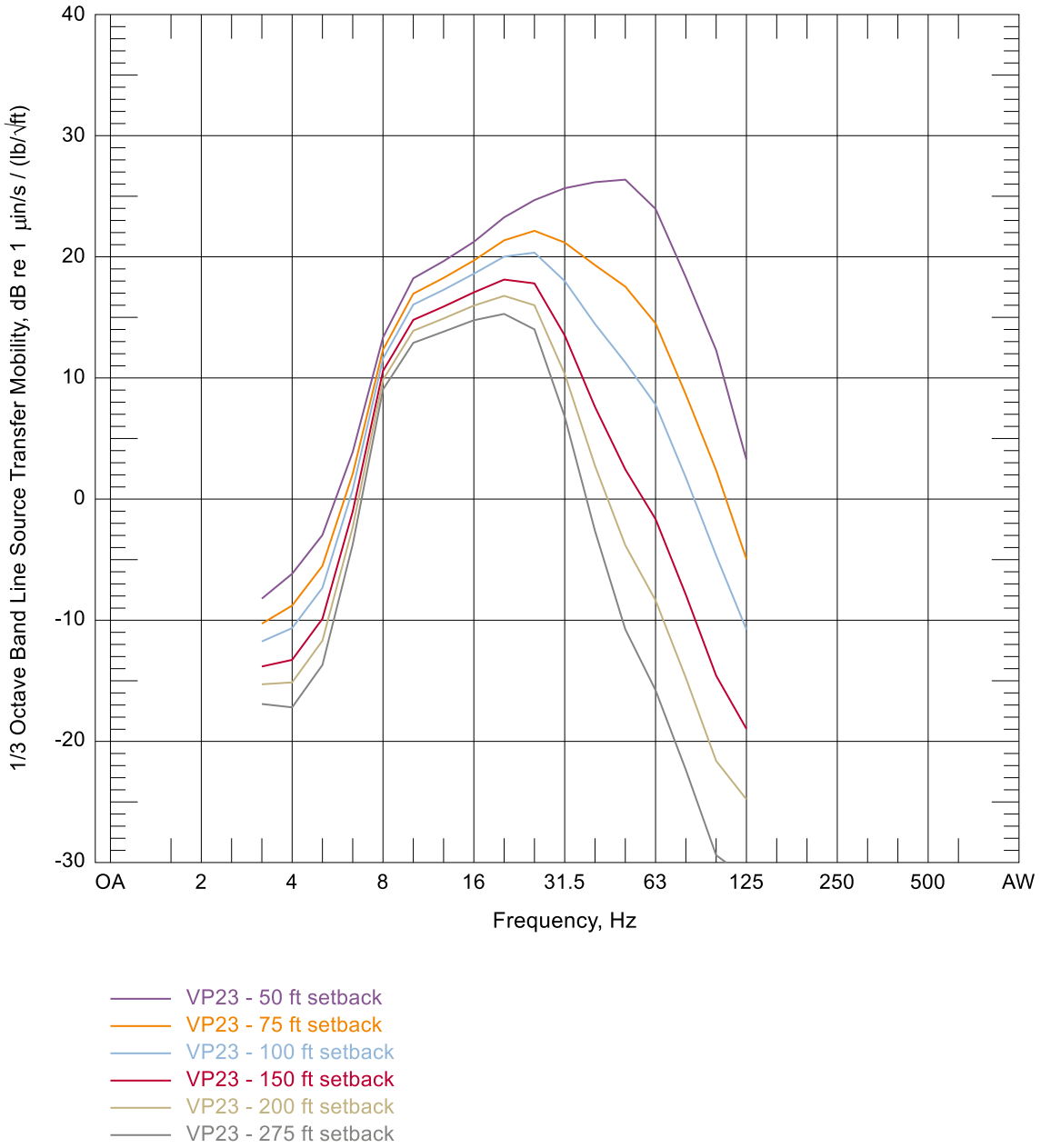
Frequency (Hz)	A	B	C
3.15	11.7	-11.7	0
4	19.1	-14.9	0
5	21.6	-14.5	0
6.3	21.4	-10.3	0
8	23.2	-5.8	0
10	30.4	-7.2	0
12.5	33.0	-7.9	0
16	36.1	-8.7	0
20	41.5	-10.8	0
25	49.2	-14.4	0
31.5	68.9	-25.5	0
40	92.2	-38.9	0
50	111.6	-50.1	0
63	115.1	-53.7	0
80	111.6	-54.9	0
100	108.0	-56.3	0
125	82.4	-46.6	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-7 Line Source Response for Surface Impact Site VP23

Table C-8 Line Source Response Coefficients for Surface Impact Site VP24

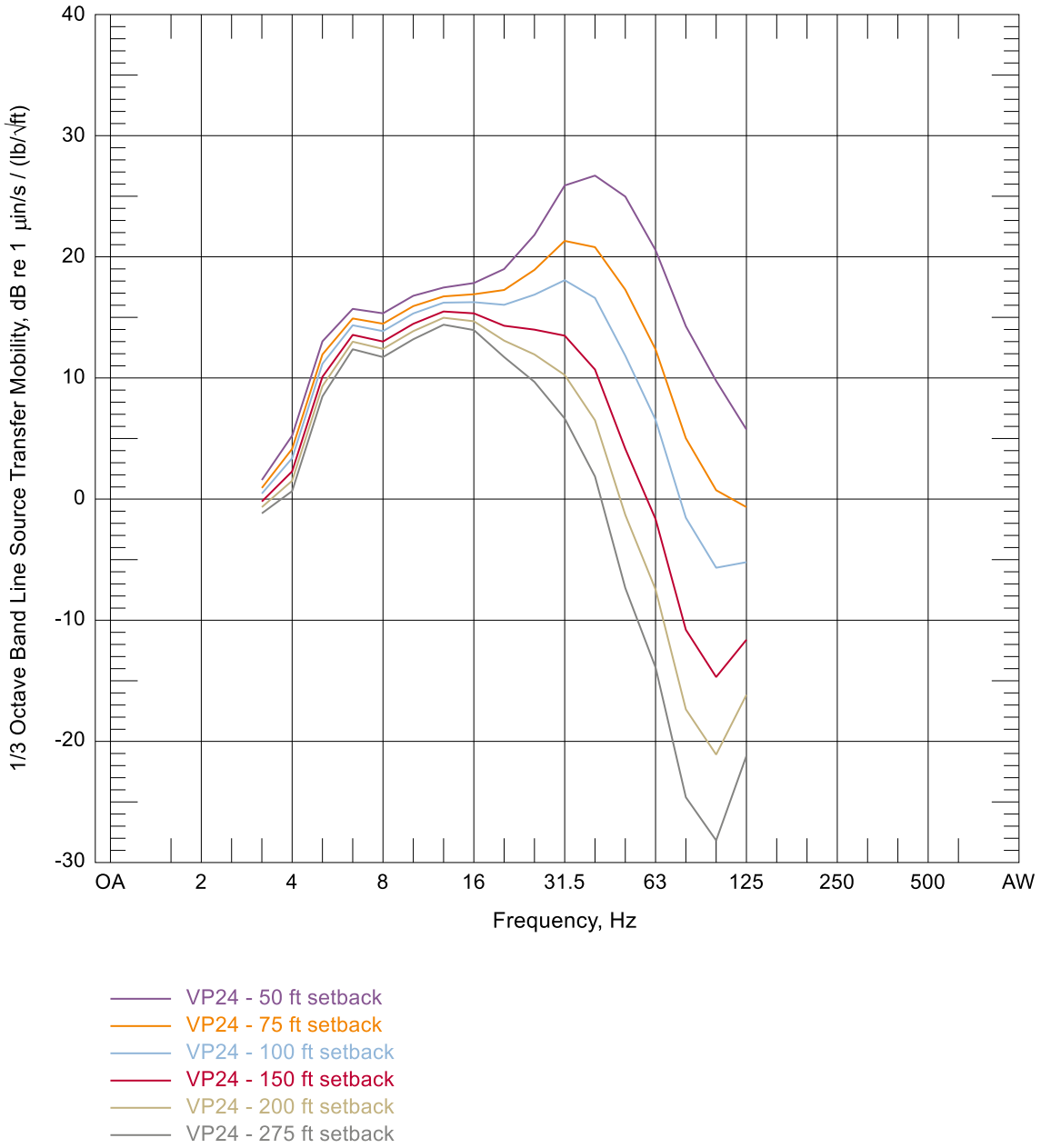
Frequency (Hz)	A	B	C
3.15	7.9	-3.7	0
4	15.7	-6.2	0
5	23.5	-6.1	0
6.3	23.4	-4.5	0
8	23.6	-4.9	0
10	25.0	-4.8	0
12.5	24.5	-4.1	0
16	26.7	-5.2	0
20	35.7	-9.8	0
25	49.6	-16.4	0
31.5	70.0	-26.0	0
40	83.7	-33.6	0
50	99.1	-43.6	0
63	99.6	-46.5	0
80	103.5	-52.5	0
100	96.8	-51.2	0
125	67.6	-36.4	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-8 Line Source Response for Surface Impact Site VP24

Table C-9 Line Source Response Coefficients for Surface Impact Site VP25

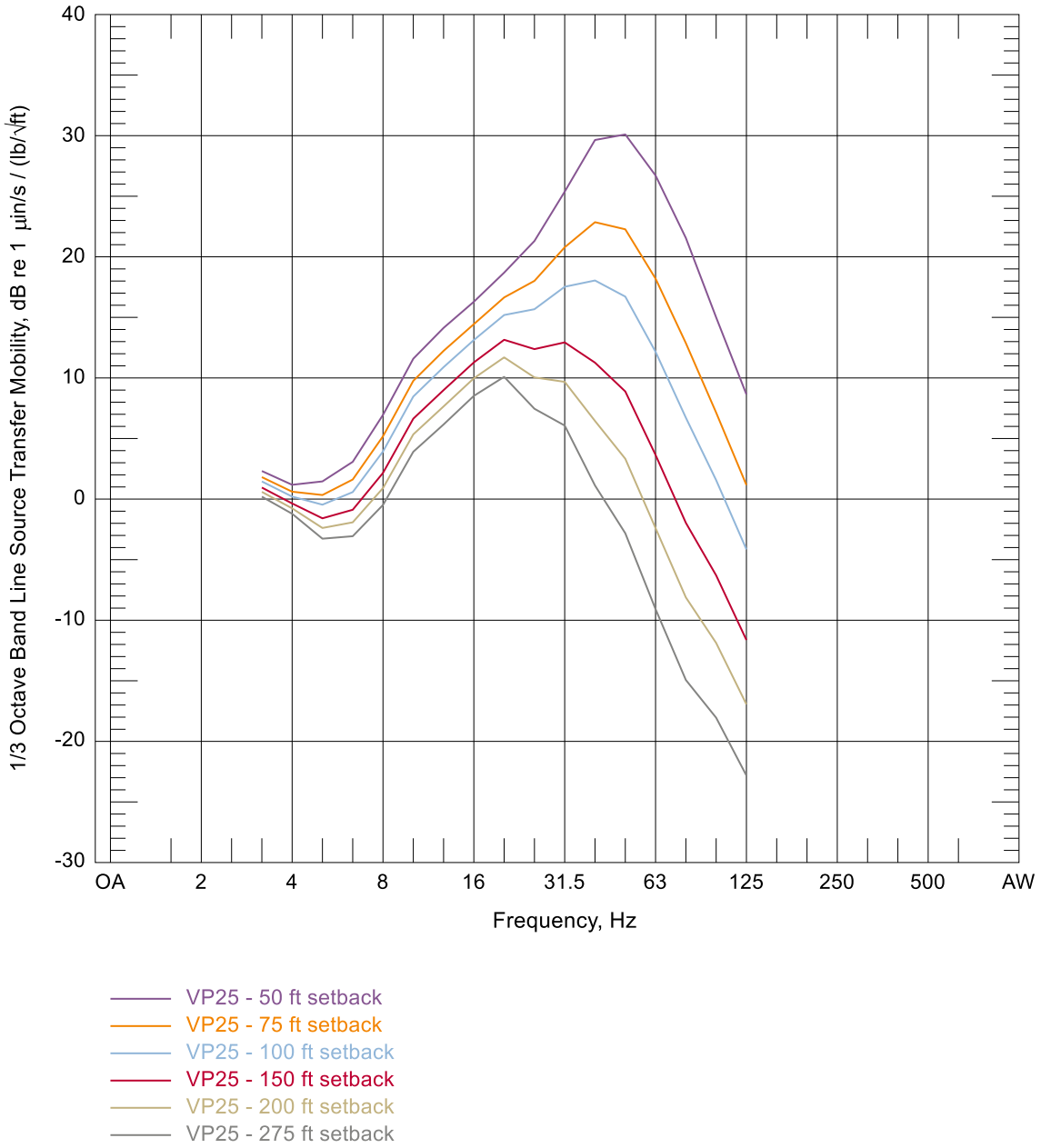
Frequency (Hz)	A	B	C
3.15	7.2	-2.9	0
4	6.7	-3.2	0
5	12.3	-6.4	0
6.3	17.2	-8.3	0
8	24.0	-10.0	0
10	29.2	-10.4	0
12.5	32.4	-10.8	0
16	34.1	-10.5	0
20	38.4	-11.6	0
25	53.1	-18.7	0
31.5	69.7	-26.1	0
40	95.1	-38.5	0
50	105.6	-44.5	0
63	108.9	-48.4	0
80	105.3	-49.3	0
100	90.8	-44.6	0
125	80.8	-42.5	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-9 Line Source Response for Surface Impact Site VP25

Table C-10 Line Source Response Coefficients for Surface Impact Site VP26

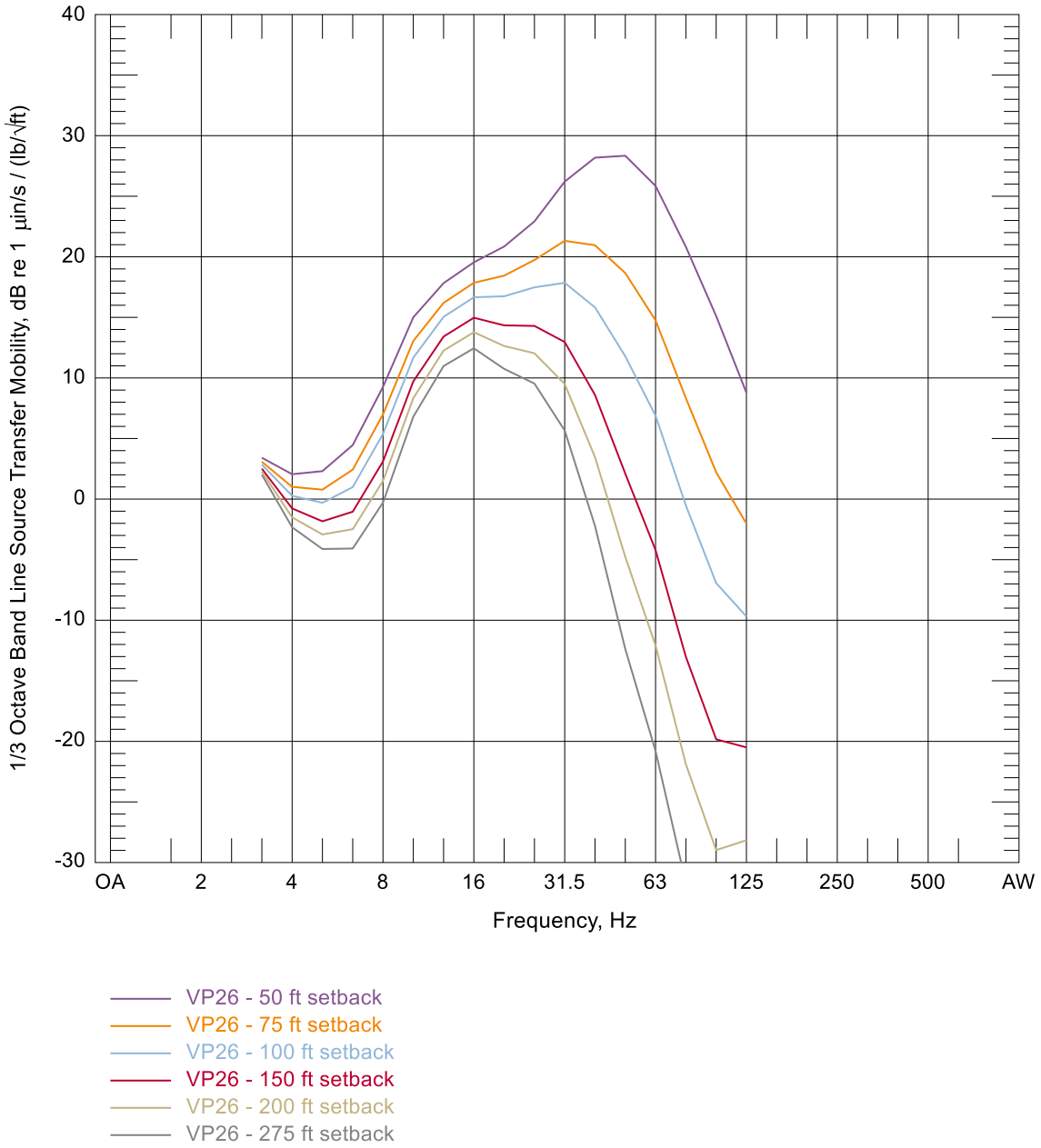
Frequency (Hz)	A	B	C
3.15	6.6	-1.9	0
4	12.1	-5.9	0
5	17.1	-8.7	0
6.3	24.1	-11.5	0
8	31.2	-12.9	0
10	33.8	-11.1	0
12.5	33.5	-9.2	0
16	35.8	-9.6	0
20	44.0	-13.6	0
25	53.6	-18.1	0
31.5	73.4	-27.8	0
40	97.9	-41.1	0
50	121.8	-55.0	0
63	132.9	-63.0	0
80	141.3	-70.9	0
100	139.5	-73.2	0
125	113.0	-61.4	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-10 Line Source Response for Surface Impact Site VP26

Table C-11 Line Source Response Coefficients for Surface Impact Site VP27

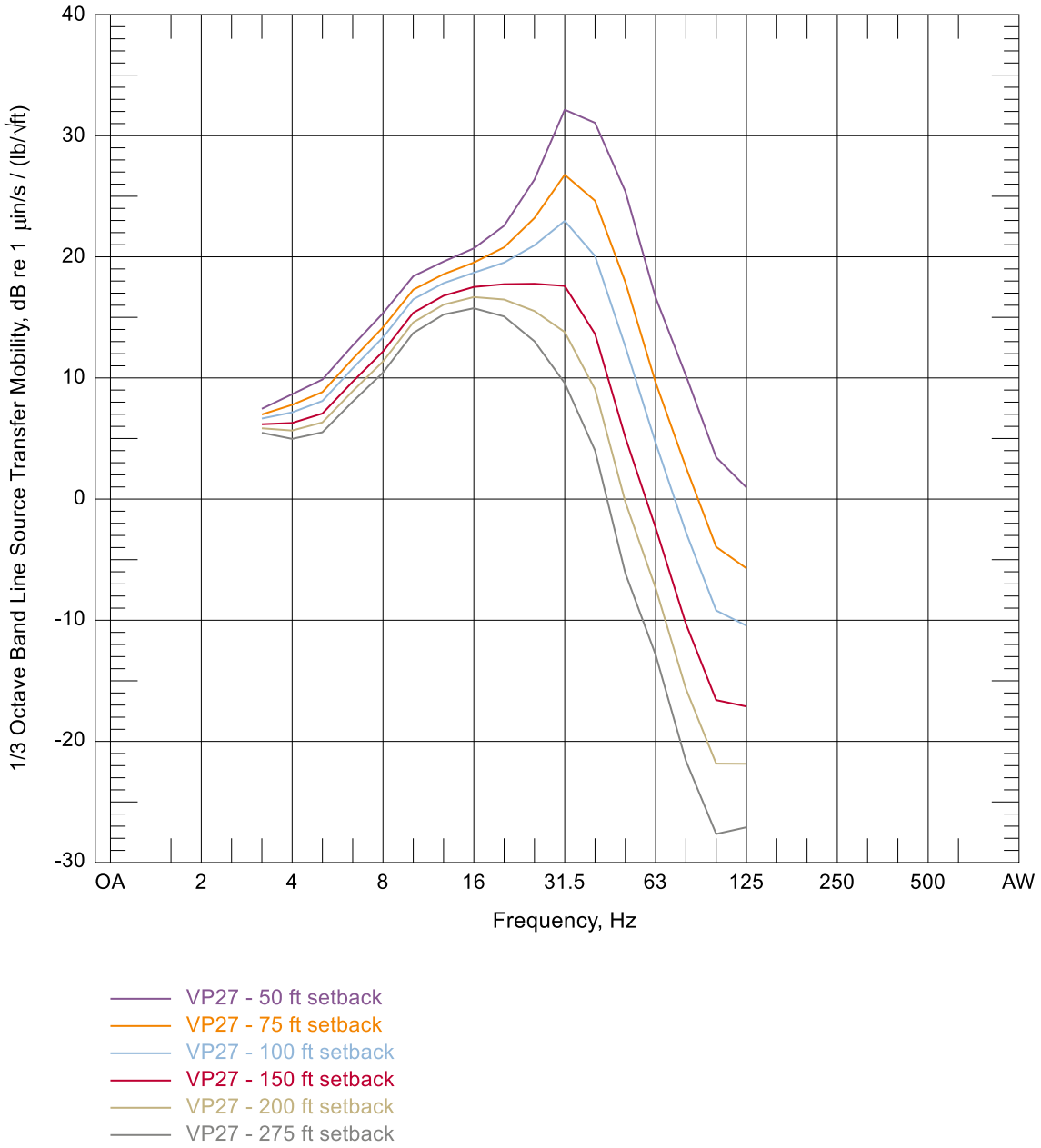
Frequency (Hz)	A	B	C
3.15	12.0	-2.7	0
4	17.1	-5.0	0
5	19.9	-5.9	0
6.3	23.3	-6.3	0
8	26.6	-6.6	0
10	29.2	-6.3	0
12.5	29.6	-5.9	0
16	32.0	-6.7	0
20	39.8	-10.1	0
25	57.0	-18.0	0
31.5	83.9	-30.5	0
40	93.1	-36.5	0
50	97.7	-42.6	0
63	84.3	-39.8	0
80	83.2	-43.0	0
100	74.8	-42.0	0
125	65.3	-37.9	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-11 Line Source Response for Surface Impact Site VP27

Table C-12 Line Source Response Coefficients for Surface Impact Site VP28

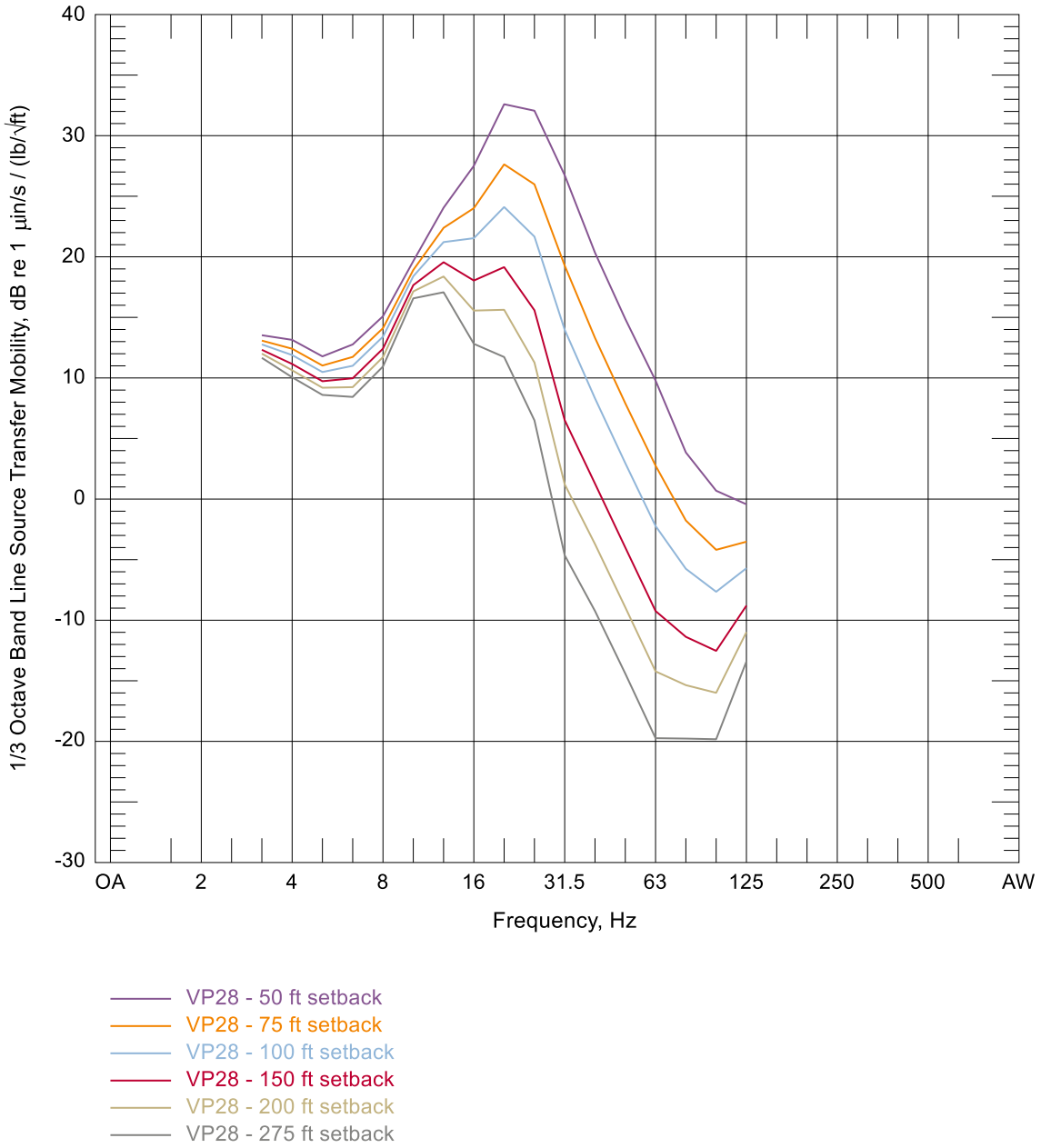
Frequency (Hz)	A	B	C
3.15	17.8	-2.5	0
4	20.2	-4.2	0
5	19.1	-4.3	0
6.3	22.7	-5.9	0
8	24.6	-5.6	0
10	26.7	-4.2	0
12.5	40.1	-9.4	0
16	61.2	-19.8	0
20	80.5	-28.2	0
25	90.7	-34.5	0
31.5	98.7	-42.4	0
40	88.2	-40.0	0
50	82.1	-39.5	0
63	77.5	-39.9	0
80	58.1	-31.9	0
100	47.8	-27.7	0
125	29.3	-17.5	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-12 Line Source Response for Surface Impact Site VP28