Vibra-Tech

April 5, 2016

4818 E. Ben White Blvd.
Suite 202
Austin, TX 78741

Phone 512.442.6464
Fax 512.442.6552

Mr. Mike Shands
Garden Ridge Quarry Commission
9400 Municipal Parkway
Garden Ridge, Texas 78266

Dear Mr. Shands,

Enclosed is the analysis for the blasting conducted during the month of March 2016 at the Hanson Aggregates Quarry in Garden Ridge, Texas. Please place this information in your 2016 Blast Data Management Book.

At the request of the Garden Ridge Quarry Commission, Vibra-Tech, Inc. personnel used seismographs each day of blasting at various locations.

The attached report contains the original seismograph records obtained from the blasting along with a comparison of the recorded vibrations to the latest recommended U.S. Bureau of Mines (USBM) Variable Partic le Velocity vs. Frequency Limits Report of Investigations (RI)-8507 (Nov. 1980).

The recorded ground vibrations **satisfy** the Variable Particle Velocity vs. Frequency Limits recommended by the USBM RI-8507 (Nov. 1980), and the levels set forth in Garden Ridge City Ordinance 34.

The recorded air-borne effects **satisfy** the recommended levels set forth in the USBM RI-8485 (Nov. 1980), and the levels set forth in Garden Ridge City Ordinance 34.

If there are any additional questions, please contact the Quarry Commission, Mike Shands at 210-257-0868, or attend the Quarry Commission meeting held the 2nd Monday of each month at 7:00 p.m.

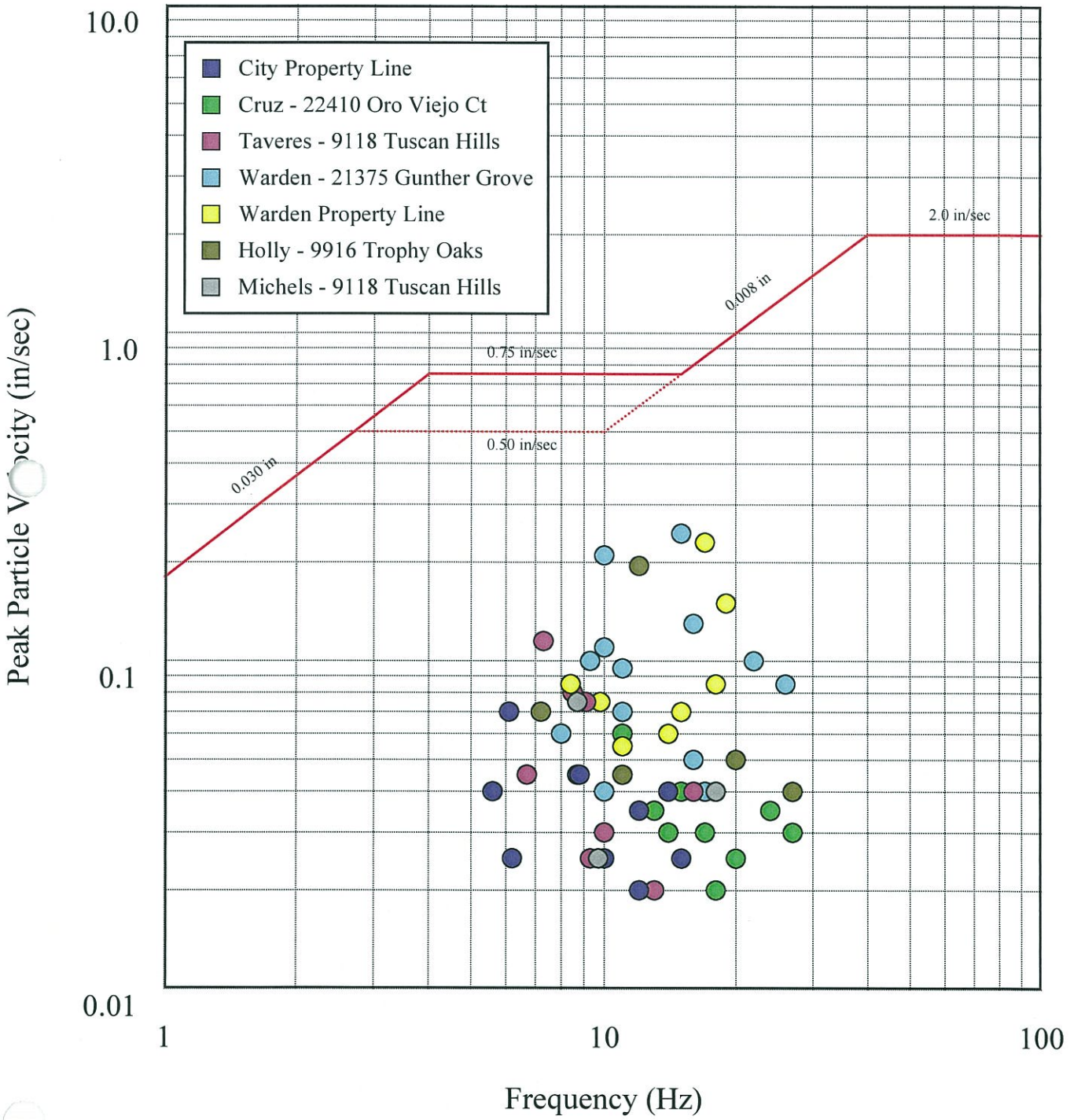
Respectfully submitted,

VIBRA-TECH, INC.

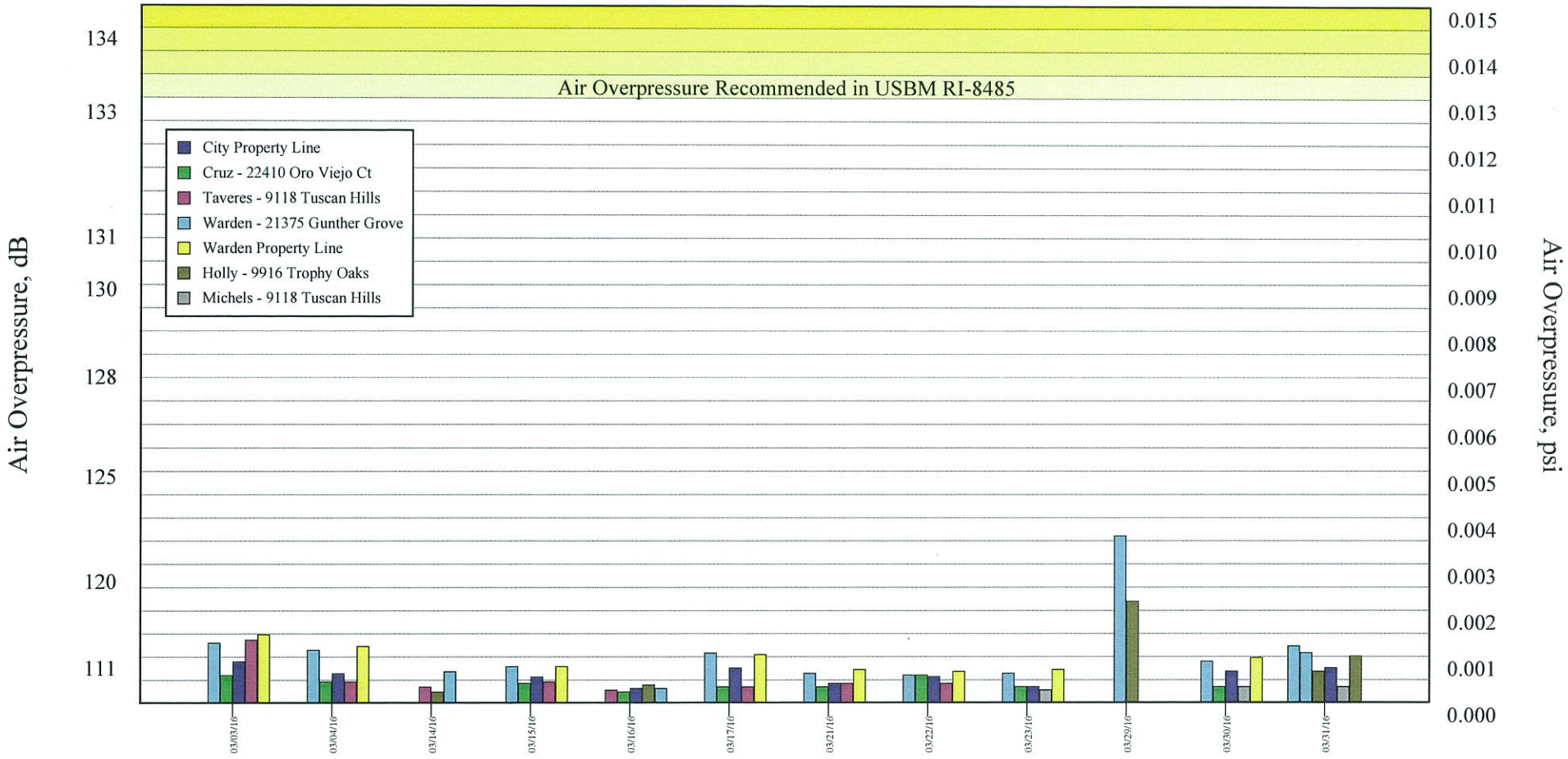
Geoffrey Rigsby
Southwest Regional Manager

cc: Jacob Scherer, Hanson – Servtex

Comparison of Measured Blast Vibrations to Current U.S. Bureau of Mines Recommendations
Quarry Commission
Garden Ridge
March 2016



Air Overpressure Levels from
Quarry Commission
Garden Ridge
March 2016



Cruz
Taveres/Michels
03-22-16 4B
03-15-16 5B
03-21-16 3E
03-23-16 3D
03-30-16 Lower 6
03-04-16 3B
03-17-16 Upper 3A
Warden Property Line
Warden
City Property Line
03-16-16 Base Pit 2B
03-31-16 South Wall 0
03-14-16 S Wall 0
Holly
03-29-16 South Wall C
03-31-16 Signature Hole
Google earth
3000 ft
N

GARDEN RIDGE QUARRY COMMISSION
GARDEN RIDGE, TEXAS
MONTH OF MARCH 2016

DATE	SHOT # LOCATION	SHOT LOCATION GPS READING	WEATHER	TIME	PPV (in/sec)	FREQ (Hz)	AIR (dB)	SHOT DURATION (MS)	MAX LBS/ DELAY	DISTANCE FROM BLAST	SEISMOGRAPH LOCATION
03/03/16	03-03-16 3D	N 29° 38' 51.8" W 098° 17' 36.7"	CLEAR 80° N 16	12:14	0.045	8.7	109.9	600	910.00	3,324	City Property Line
03/03/16	03-03-16 3D	N 29° 38' 51.8" W 098° 17' 36.7"	CLEAR 80° N 16	12:14	0.040	15.0	106.5	600	910.00	3,663	Cruz - 22410 Oro Viejo Ct
03/03/16	03-03-16 3D	N 29° 38' 51.8" W 098° 17' 36.7"	CLEAR 80° N 16	12:14	0.080	8.5	113.5	600	910.00	3,762	Taveres - 9118 Tuscan Hills
03/03/16	03-03-16 3D	N 29° 38' 51.8" W 098° 17' 36.7"	CLEAR 80° N 16	12:14	0.095	11.0	113.1	600	910.00	2,933	Warden - 21375 Gunther Grove
03/03/16	03-03-16 3D	N 29° 38' 51.8" W 098° 17' 36.7"	CLEAR 80° N 16	12:14	0.075	9.8	114.2	600	910.00	2,723	Warden Property Line
03/04/16	03-04-16 3B	N 29° 38' 41.5" W 098° 17' 35.2"	CLEAR 70° SE 8	11:55	0.070	6.1	107.0	1148	663.00	2,528	City Property Line
03/04/16	03-04-16 3B	N 29° 38' 41.5" W 098° 17' 35.2"	CLEAR 70° SE 8	11:55	0.060	11.0	104.2	1148	663.00	4,117	Cruz - 22410 Oro Viejo Ct
03/04/16	03-04-16 3B	N 29° 38' 41.5" W 098° 17' 35.2"	CLEAR 70° SE 8	11:55	0.115	7.3	104.2	1148	663.00	4,037	Taveres - 9118 Tuscan Hills
03/04/16	03-04-16 3B	N 29° 38' 41.5" W 098° 17' 35.2"	CLEAR 70° SE 8	11:55	0.245	15.0	112.0	1148	663.00	1,922	Warden - 21375 Gunther Grove
03/04/16	03-04-16 3B	N 29° 38' 41.5" W 098° 17' 35.2"	CLEAR 70° SE 8	11:55	0.230	17.0	112.6	1148	663.00	1,705	Warden Property Line
03/14/16	03-14-16 S Wall 0	N 29° 38' 18.4" W 098° 16' 38.5"	CLEAR 83° SW 15	14:25	NT	NT	NT	784	1027.00	6,661	City Property Line
03/14/16	03-14-16 S Wall 0	N 29° 38' 18.4" W 098° 16' 38.5"	CLEAR 83° SW 15	14:25	NT	NT	NT	784	1027.00	9,633	Cruz - 22410 Oro Viejo Ct
03/14/16	03-14-16 S Wall 0	N 29° 38' 18.4" W 098° 16' 38.5"	CLEAR 83° SW 15	14:25	0.040	27.0	98.8	784	1027.00	4,198	Holly - 9916 Trophy Oaks
03/14/16	03-14-16 S Wall 0	N 29° 38' 18.4" W 098° 16' 38.5"	CLEAR 83° SW 15	14:25	0.020	13.0	101.9	784	1027.00	9,518	Taveres - 9118 Tuscan Hills
03/14/16	03-14-16 S Wall 0	N 29° 38' 18.4" W 098° 16' 38.5"	CLEAR 83° SW 15	14:25	0.040	17.0	107.5	784	1027.00	5,437	Warden - 21375 Gunther Grove
03/15/16	03-15-16 5B	N 29° 39' 01.8" W 098° 17' 16.8"	PT CLOUDY 75° SW 8	11:54	0.025	10.0	106.0	744	663.00	5,145	City Property Line

NT = No Trigger, <0.020 ips.
NT = No Trigger, <122dB

GARDEN RIDGE QUARRY COMMISSION
GARDEN RIDGE, TEXAS
MONTH OF MARCH 2016

DATE	SHOT # LOCATION	SHOT LOCATION GPS READING	WEATHER	TIME	PPV (in/sec)	FREQ (Hz)	AIR (dB)	SHOT DURATION (MS)	MAX LBS/ DELAY	DISTANCE FROM BLAST	SEISMOGRAPH LOCATION
03/15/16	03-15-16 5B	N 29° 39' 01.8" W 098° 17' 16.8"	PT CLOUDY 75° SW 8	11:54	0.025	20.0	103.5	744	663.00	5,354	Cruz - 22410 Oro Viejo Ct
03/15/16	03-15-16 5B	N 29° 39' 01.8" W 098° 17' 16.8"	PT CLOUDY 75° SW 8	11:54	0.025	9.3	104.2	744	663.00	5,604	Taveres - 9118 Tuscan Hills
03/15/16	03-15-16 5B	N 29° 39' 01.8" W 098° 17' 16.8"	PT CLOUDY 75° SW 8	11:54	0.085	26.0	108.8	744	663.00	4,431	Warden - 21375 Gunther Grove
03/15/16	03-15-16 5B	N 29° 39' 01.8" W 098° 17' 16.8"	PT CLOUDY 75° SW 8	11:54	0.055	11.0	108.8	744	663.00	4,211	Warden Property Line
03/16/16	03-16-16 Base Pit 2B	N 29° 38' 19.0" W 098° 17' 04.8"	PT CLOUDY 72° E 9	11:30	0.025	6.2	101.0	756	897.00	4,346	City Property Line
03/16/16	03-16-16 Base Pit 2B	N 29° 38' 19.0" W 098° 17' 04.8"	PT CLOUDY 72° E 9	11:30	0.030	17.0	98.8	756	897.00	7,567	Cruz - 22410 Oro Viejo Ct
03/16/16	03-16-16 Base Pit 2B	N 29° 38' 19.0" W 098° 17' 04.8"	PT CLOUDY 72° E 9	11:30	0.195	12.0	102.8	756	897.00	1,911	Holly - 9916 Trophy Oaks
03/16/16	03-16-16 Base Pit 2B	N 29° 38' 19.0" W 098° 17' 04.8"	PT CLOUDY 72° E 9	11:30	0.030	10.0	100.0	756	897.00	7,374	Taveres - 9118 Tuscan Hills
03/16/16	03-16-16 Base Pit 2B	N 29° 38' 19.0" W 098° 17' 04.8"	PT CLOUDY 72° E 9	11:30	0.130	16.0	101.0	756	897.00	3,127	Warden - 21375 Gunther Grove
03/17/16	03-17-16 Upper 3A	N 29° 38' 36.7" W 098° 17' 35.2"	CLOUDY 70° NE 1	11:35	0.040	14.0	108.4	360	275.00	2,183	City Property Line
03/17/16	03-17-16 Upper 3A	N 29° 38' 36.7" W 098° 17' 35.2"	CLOUDY 70° NE 1	11:35	0.020	18.0	101.9	360	275.00	4,347	Cruz - 22410 Oro Viejo Ct
03/17/16	03-17-16 Upper 3A	N 29° 38' 36.7" W 098° 17' 35.2"	CLOUDY 70° NE 1	11:35	0.045	6.7	101.9	360	275.00	4,192	Taveres - 9118 Tuscan Hills
03/17/16	03-17-16 Upper 3A	N 29° 38' 36.7" W 098° 17' 35.2"	CLOUDY 70° NE 1	11:35	0.210	10.0	111.5	360	275.00	1,451	Warden - 21375 Gunther Grove
03/17/16	03-17-16 Upper 3A	N 29° 38' 36.7" W 098° 17' 35.2"	CLOUDY 70° NE 1	11:35	0.150	19.0	111.2	360	275.00	1,232	Warden Property Line
03/21/16	03-21-16 3E	N 29° 38' 54.9" W 098° 17' 37.2"	CLEAR 58° SE 10	11:52	0.025	15.0	103.5	440	845.00	3,588	City Property Line
03/21/16	03-21-16 3E	N 29° 38' 54.9" W 098° 17' 37.2"	CLEAR 58° SE 10	11:52	0.035	13.0	101.9	440	845.00	3,571	Cruz - 22410 Oro Viejo Ct

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GARDEN RIDGE QUARRY COMMISSION
GARDEN RIDGE, TEXAS
MONTH OF MARCH 2016

DATE	SHOT # LOCATION	SHOT LOCATION GPS READING	WEATHER	TIME	PPV (in/sec)	FREQ (Hz)	AIR (dB)	SHOT DURATION (MS)	MAX LBS/ DELAY	DISTANCE FROM BLAST	SEISMOGRAPH LOCATION
03/21/16	03-21-16 3E	N 29° 38' 54.9" W 098° 17' 37.2"	CLEAR 58° SE 10	11:52	0.040	16.0	103.5	440	845.00	3,730	Taveres - 9118 Tuscan Hills
03/21/16	03-21-16 3E	N 29° 38' 54.9" W 098° 17' 37.2"	CLEAR 58° SE 10	11:52	0.070	11.0	107.0	440	845.00	3,242	Warden - 21375 Gunther Grove
03/21/16	03-21-16 3E	N 29° 38' 54.9" W 098° 17' 37.2"	CLEAR 58° SE 10	11:52	0.060	14.0	108.0	440	845.00	3,034	Warden Property Line
03/22/16	03-22-16 4B	N 29° 39' 01.1" W 098° 17' 35.5"	CLEAR 64° S 20	11:52	0.035	12.0	106.0	632	767.00	4,224	City Property Line
03/22/16	03-22-16 4B	N 29° 39' 01.1" W 098° 17' 35.5"	CLEAR 64° S 20	11:52	0.035	24.0	106.5	632	767.00	3,706	Cruz - 22410 Oro Viejo Ct
03/22/16	03-22-16 4B	N 29° 39' 01.1" W 098° 17' 35.5"	CLEAR 64° S 20	11:52	0.075	9.1	103.5	632	767.00	3,976	Taveres - 9118 Tuscan Hills
03/22/16	03-22-16 4B	N 29° 39' 01.1" W 098° 17' 35.5"	CLEAR 64° S 20	11:52	0.110	10.0	106.5	632	767.00	3,881	Warden - 21375 Gunther Grove
03/22/16	03-22-16 4B	N 29° 39' 01.1" W 098° 17' 35.5"	CLEAR 64° S 20	11:52	0.070	15.0	107.5	632	767.00	3,671	Warden Property Line
03/23/16	03-23-16 3D	N 29° 38' 51" W 098° 17' 36.9"	CLOUDY 70° S 20	12:04	0.045	8.8	101.9	660	962.00	3,244	City Property Line
03/23/16	03-23-16 3D	N 29° 38' 51" W 098° 17' 36.9"	CLOUDY 70° S 20	12:04	0.030	14.0	101.9	660	962.00	3,662	Cruz - 22410 Oro Viejo Ct
03/23/16	03-23-16 3D	N 29° 38' 51" W 098° 17' 36.9"	CLOUDY 70° S 20	12:04	0.075	8.7	100.0	660	962.00	3,746	Michels - 9118 Tuscan Hills
03/23/16	03-23-16 3D	N 29° 38' 51" W 098° 17' 36.9"	CLOUDY 70° S 20	12:04	0.100	9.3	107.0	660	962.00	2,851	Warden - 21375 Gunther Grove
03/23/16	03-23-16 3D	N 29° 38' 51" W 098° 17' 36.9"	CLOUDY 70° S 20	12:04	0.085	8.4	108.0	660	962.00	2,641	Warden Property Line
03/29/16	03-29-16 South Wall C	N 29° 38' 12.9" W 098° 16' 48.4"	CLOUDY 67° SE 10	12:43	NT	NT	NT	744	1105.00	5,859	City Property Line
03/29/16	03-29-16 South Wall C	N 29° 38' 12.9" W 098° 16' 48.4"	CLOUDY 67° SE 10	12:43	NT	NT	NT	744	1105.00	9,122	Cruz - 22410 Oro Viejo Ct
03/29/16	03-29-16 South Wall C	N 29° 38' 12.9" W 098° 16' 48.4"	CLOUDY 67° SE 10	12:43	0.045	11.0	117.6	744	1105.00	3,319	Holly - 9916 Trophy Oaks

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GARDEN RIDGE QUARRY COMMISSION
GARDEN RIDGE, TEXAS
MONTH OF MARCH 2016

DATE	SHOT # LOCATION	SHOT LOCATION GPS READING	WEATHER	TIME	PPV (in/sec)	FREQ (Hz)	AIR (dB)	SHOT DURATION (MS)	MAX LBS/ DELAY	DISTANCE FROM BLAST	SEISMOGRAPH LOCATION
03/29/16	03-29-16 South Wall C	N 29° 38' 12.9" W 098° 16' 48.4"	CLOUDY 67° SE 10	12:43	NT	NT	NT	744	1105.00	8,942	Michels - 9118 Tuscan Hills
03/29/16	03-29-16 South Wall C	N 29° 38' 12.9" W 098° 16' 48.4"	CLOUDY 67° SE 10	12:43	0.050	16.0	121.9	744	1105.00	4,659	Warden - 21375 Gunther Grove
03/30/16	03-30-16 Lower 6	N 29° 38' 49.8" W 098° 17' 08.9"	CLOUDY 70° S 14	11:47	0.020	12.0	107.5	590	500.00	4,831	City Property Line
03/30/16	03-30-16 Lower 6	N 29° 38' 49.8" W 098° 17' 08.9"	CLOUDY 70° S 14	11:47	0.030	27.0	101.9	590	500.00	6,110	Cruz - 22410 Oro Viejo Ct
03/30/16	03-30-16 Lower 6	N 29° 38' 49.8" W 098° 17' 08.9"	CLOUDY 70° S 14	11:47	0.040	18.0	101.9	590	500.00	6,215	Michels - 9118 Tuscan Hills
03/30/16	03-30-16 Lower 6	N 29° 38' 49.8" W 098° 17' 08.9"	CLOUDY 70° S 14	11:47	0.100	22.0	109.9	590	500.00	3,857	Warden - 21375 Gunther Grove
03/30/16	03-30-16 Lower 6	N 29° 38' 49.8" W 098° 17' 08.9"	CLOUDY 70° S 14	11:47	0.085	18.0	110.6	590	500.00	3,653	Warden Property Line
03/31/16	03-31-16 South Wall 0	N 29° 38' 18.9" W 098° 16' 38"	CLEAR 78° NW 12	12:16	0.040	5.6	108.4	856	1027.00	6,702	City Property Line
03/31/16	03-31-16 South Wall 0	N 29° 38' 18.9" W 098° 16' 38"	CLEAR 78° NW 12	12:16	NT	NT	NT	856	1027.00	8,651	Cruz - 22410 Oro Viejo Ct
03/31/16	03-31-16 South Wall 0	N 29° 38' 18.9" W 098° 16' 38"	CLEAR 78° NW 12	12:16	0.070	7.2	107.5	856	1027.00	4,246	Holly - 9916 Trophy Oaks
03/31/16	03-31-16 South Wall 0	N 29° 38' 18.9" W 098° 16' 38"	CLEAR 78° NW 12	12:16	0.025	9.7	101.9	856	1027.00	9,541	Michels - 9118 Tuscan Hills
03/31/16	03-31-16 South Wall 0	N 29° 38' 18.9" W 098° 16' 38"	CLEAR 78° NW 12	12:16	0.060	8.0	111.5	856	1027.00	5,477	Warden - 21375 Gunther Grove
03/31/16	03-31-16 Signature Hole	N 29° 38' 09.8" W 098° 16' 54.9"	CLEAR 78° NW 12	12:24	NT	NT	NT	0	880.00	5,363	City Property Line
03/31/16	03-31-16 Signature Hole	N 29° 38' 09.8" W 098° 16' 54.9"	CLEAR 78° NW 12	12:24	NT	NT	NT	0	880.00	8,808	Cruz - 22410 Oro Viejo Ct
03/31/16	03-31-16 Signature Hole	N 29° 38' 09.8" W 098° 16' 54.9"	CLEAR 78° NW 12	12:24	0.050	20.0	110.9	0	880.00	2,790	Holly - 9916 Trophy Oaks
03/31/16	03-31-16 Signature Hole	N 29° 38' 09.8" W 098° 16' 54.9"	CLEAR 78° NW 12	12:24	NT	NT	NT	0	880.00	8,585	Michels - 9118 Tuscan Hills

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GARDEN RIDGE QUARRY COMMISSION
GARDEN RIDGE, TEXAS
MONTH OF MARCH 2016

DATE	SHOT # LOCATION	SHOT LOCATION GPS READING	WEATHER	TIME	PPV (in/sec)	FREQ (Hz)	AIR (dB)	SHOT DURATION (MS)	MAX LBS/ DELAY	DISTANCE FROM BLAST	SEISMOGRAPH LOCATION
03/31/16	03-31-16 Signature Hole	N 29° 38' 09.8" W 098° 16' 54.9"	CLEAR 78° NW 12	12:24	0.040	10.0	112.6	0	880.00	4,192	Warden - 21375 Gunther Grove

NT = No Trigger, <0.020 ips.
NT = No Trigger, <122dB

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-03-16 Blast No. 03-03-16 3D Time 12:14

Exact Blast Location BENCH 3D

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 51.8"
W 98° 17' 36.7"

MONITOR GPS

N 29 38' 22.63
W 98 18' 53.97

SEISMOGRAPH DATA

Seismograph No. 6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location City Property Line: outside city water tower gate

30' from gate at the property line

Seismograph Distance from Blast 3,324'

Peak Overpressure 109.9 dB Scaled Distance ------

Peak Particle Velocity .045 ips Operator L. LUMBERS

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 03-03-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 12:14:45 March 3, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

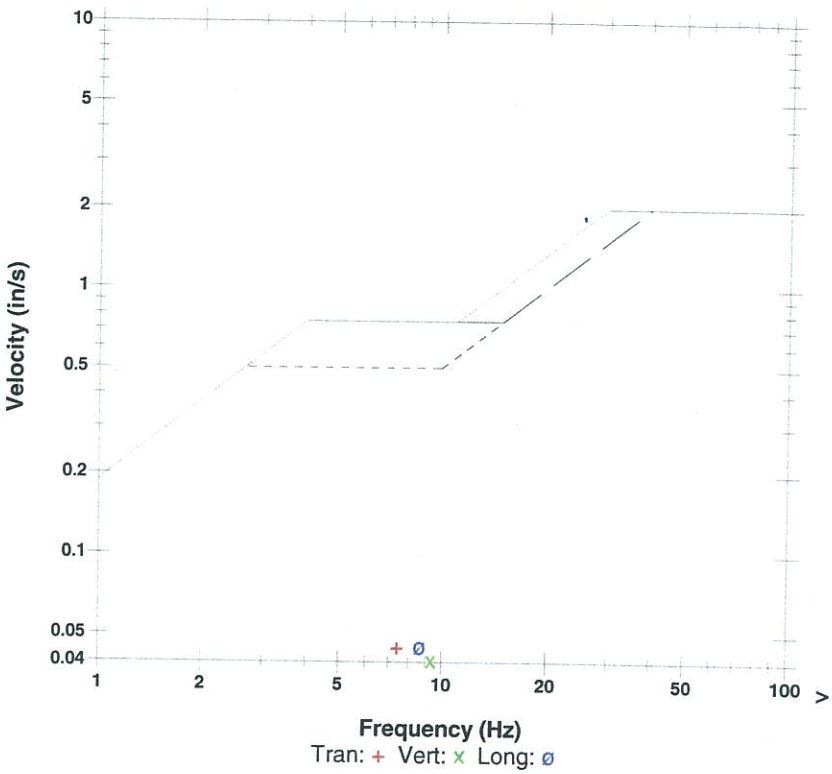
Serial Number	BD6191 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	H191G9MF.CL1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Extended Notes

Post Event Notes
City Prop Line Dist: 3,324'

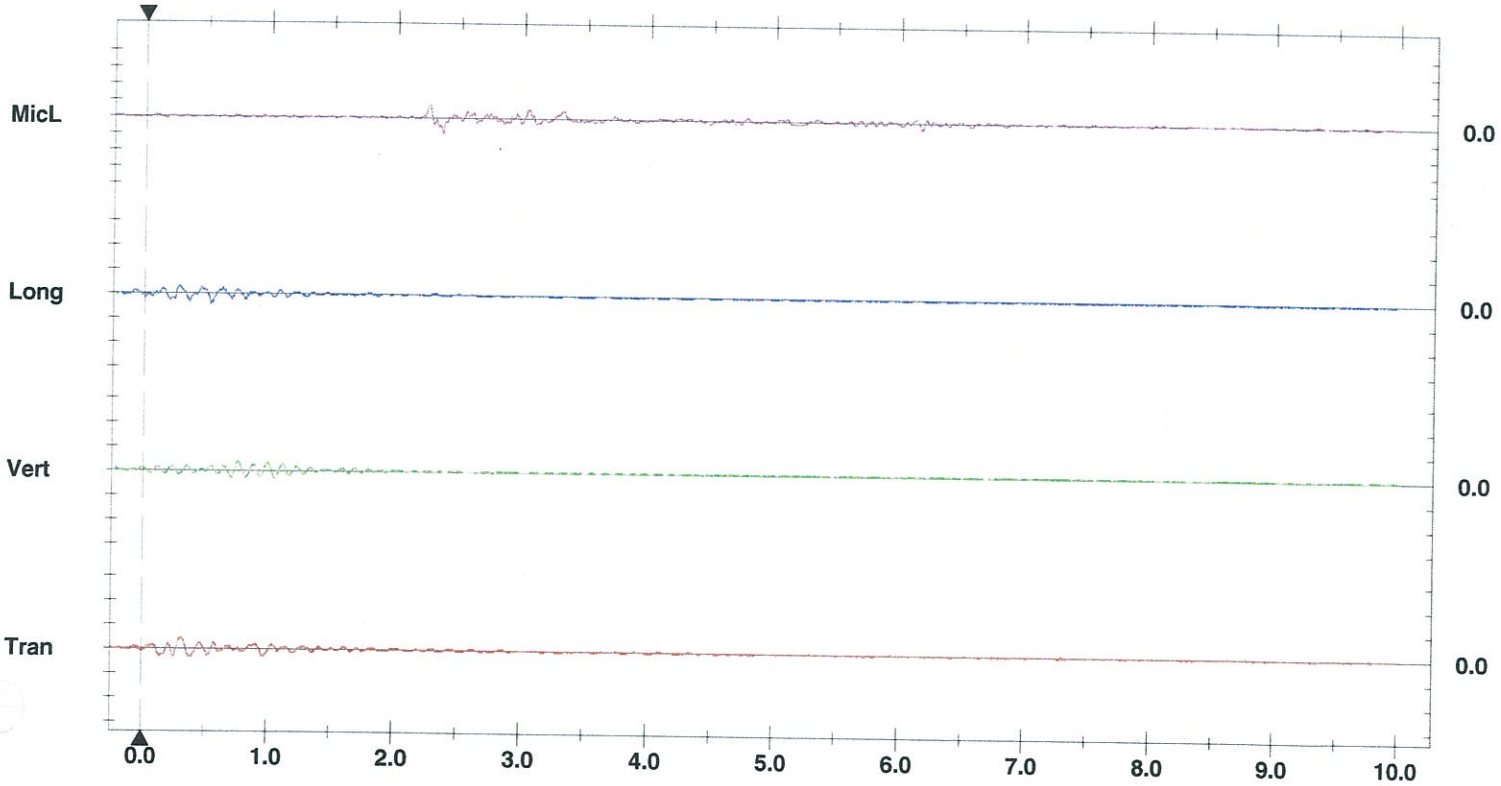
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	109.9 dB(L) at 2.354 sec
ZC Freq	5.4 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 566 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0400	0.0450	in/s
ZC Freq	7.4	9.3	8.7	Hz
Time (Rel. to Trig)	0.307	0.754	0.524	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00109	0.00071	0.00075	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0550 in/s at 0.525 sec



Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-03-16 Blast No. 03-03-16 3D Time 12:14

Exact Blast Location BENCH 3D

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29 38' 51.8"
W 98 17' 36.7"

MONITOR GPS

N 29 38 58.8
W 98 18 17.5

SEISMOGRAPH DATA

Seismograph No. 8949 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location Cruz Residence – 22410 Oro Viejo Ct – George Ranch Subdivision

15' E off SE corner of garage at fence

Seismograph Distance from Blast 3,663'

Peak Overpressure 106.5 dB Scaled Distance ------

Peak Particle Velocity .040 ips Operator L. Lumbers

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 03-03-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 12:14:45 March 3, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

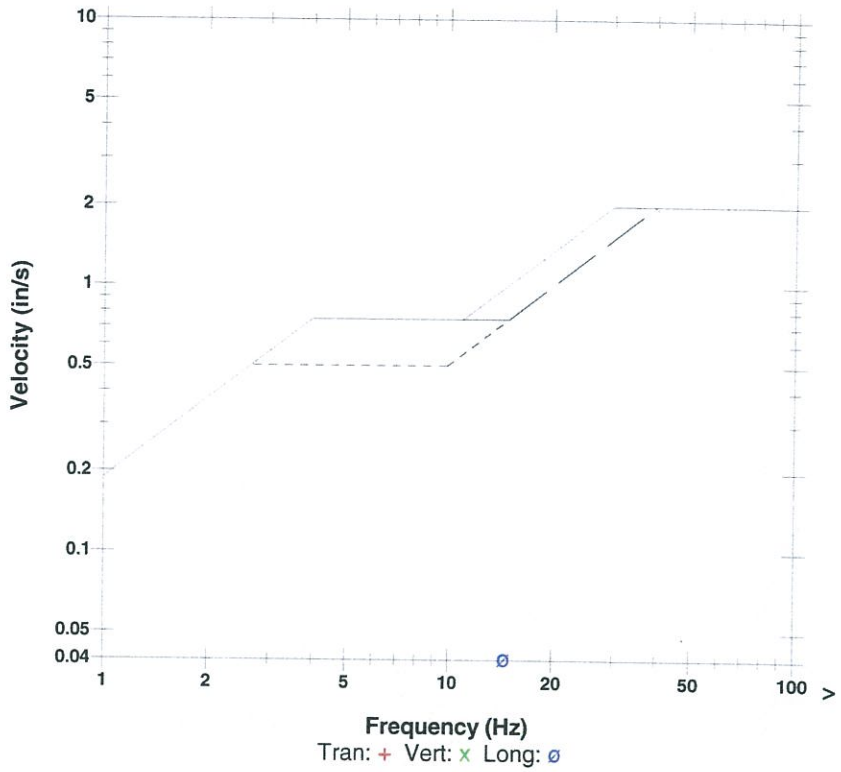
Serial Number	BF8949 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	J949G9MF.CL1

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra-Tech
General:

Extended Notes

Post Event Notes
Cruz Res. Dist: 3,663'

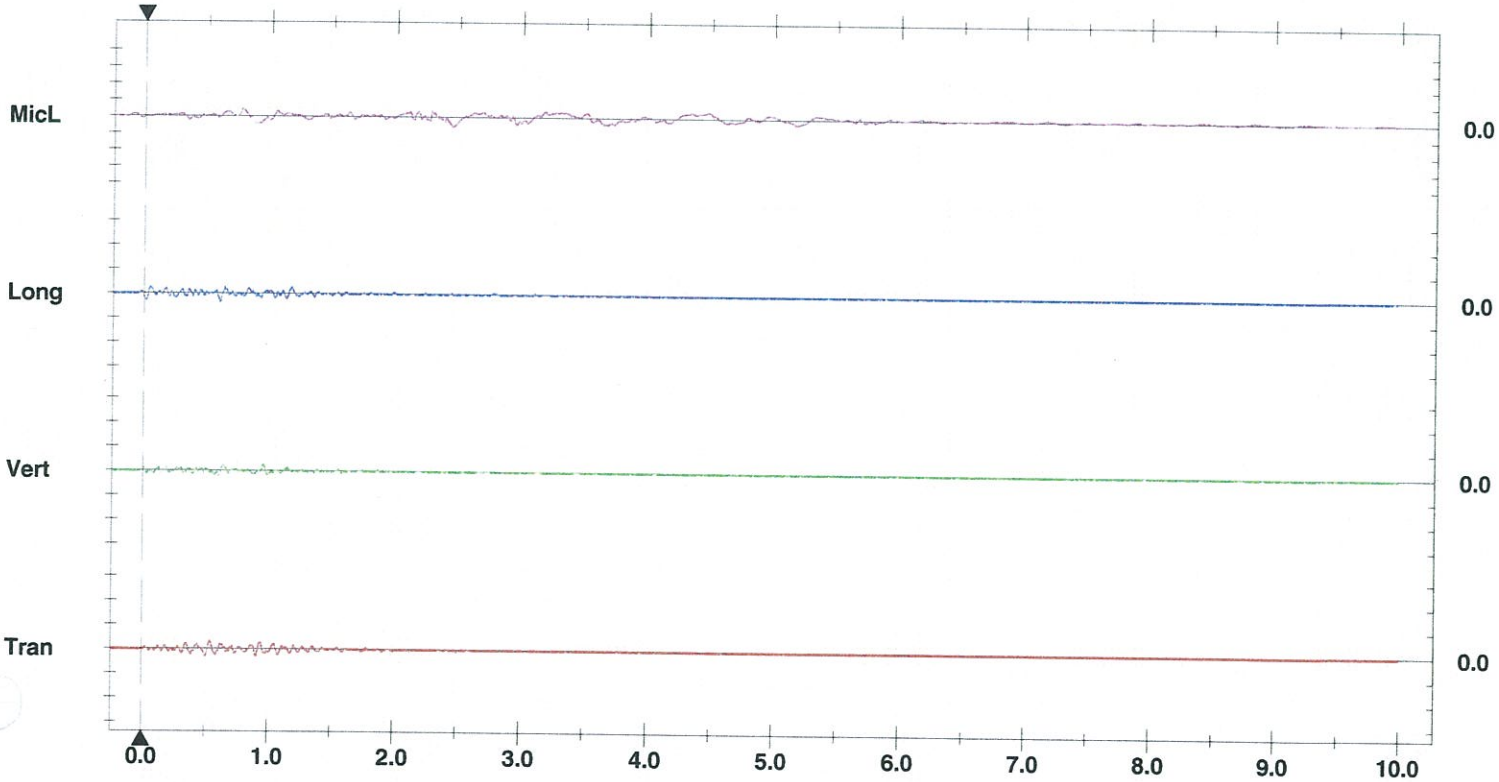
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	106.5 dB(L) at 2.442 sec
ZC Freq	4.0 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 528 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0250	0.0400	in/s
ZC Freq	11	20	15	Hz
Time (Rel. to Trig)	0.504	0.601	0.602	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00045	0.00026	0.00039	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0472 in/s at 0.602 sec



Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-03-16 Blast No. 03-03-16 3D Time 12:14

Exact Blast Location BENCH 3D

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 51.8"
W 98° 17' 36.7"

MONITOR GPS

N 29 38' 52"
W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 10626 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-21-15 Microphone Calibration 07-21-15

Exact Seismograph Location Taveres Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 3,762'

Peak Overpressure 113.5 dB Scaled Distance ------

Peak Particle Velocity .080 ips Operator L. LUMBERS

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 03-03-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 12:14:44 March 3, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps
Job Number:	1

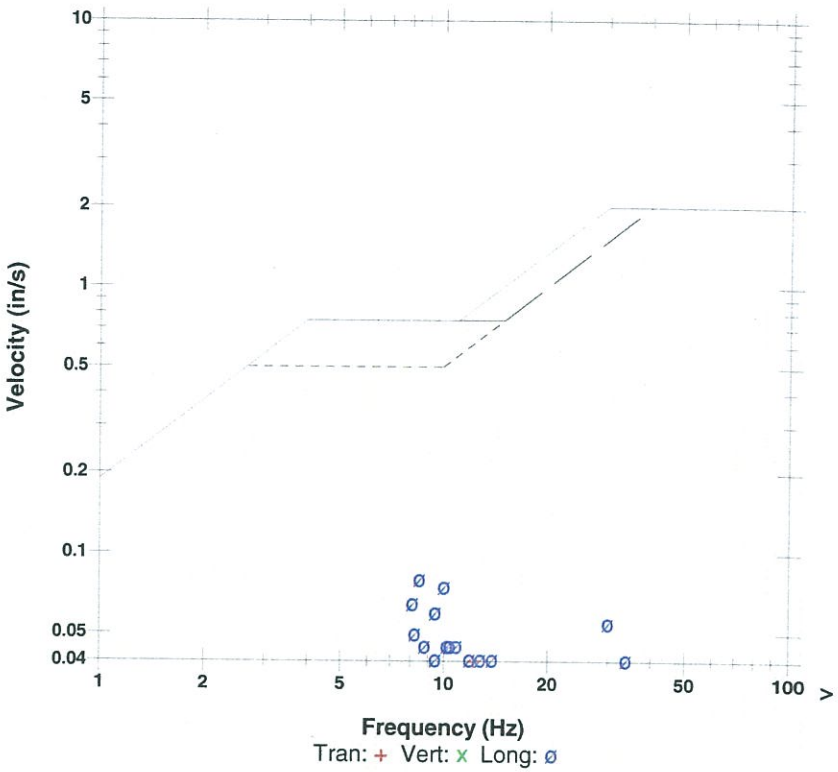
Serial Number	BB10626 V 7.04-8.0 EVERLERT III
Battery Level	6.4 Volts
Calibration	July 21, 2015 by Vibra-Tech Inc.
File Name	L626G9MF.CK1

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra Tech
General:

Extended Notes

Post Event Notes
Taveres Res. Dist: 3,762'

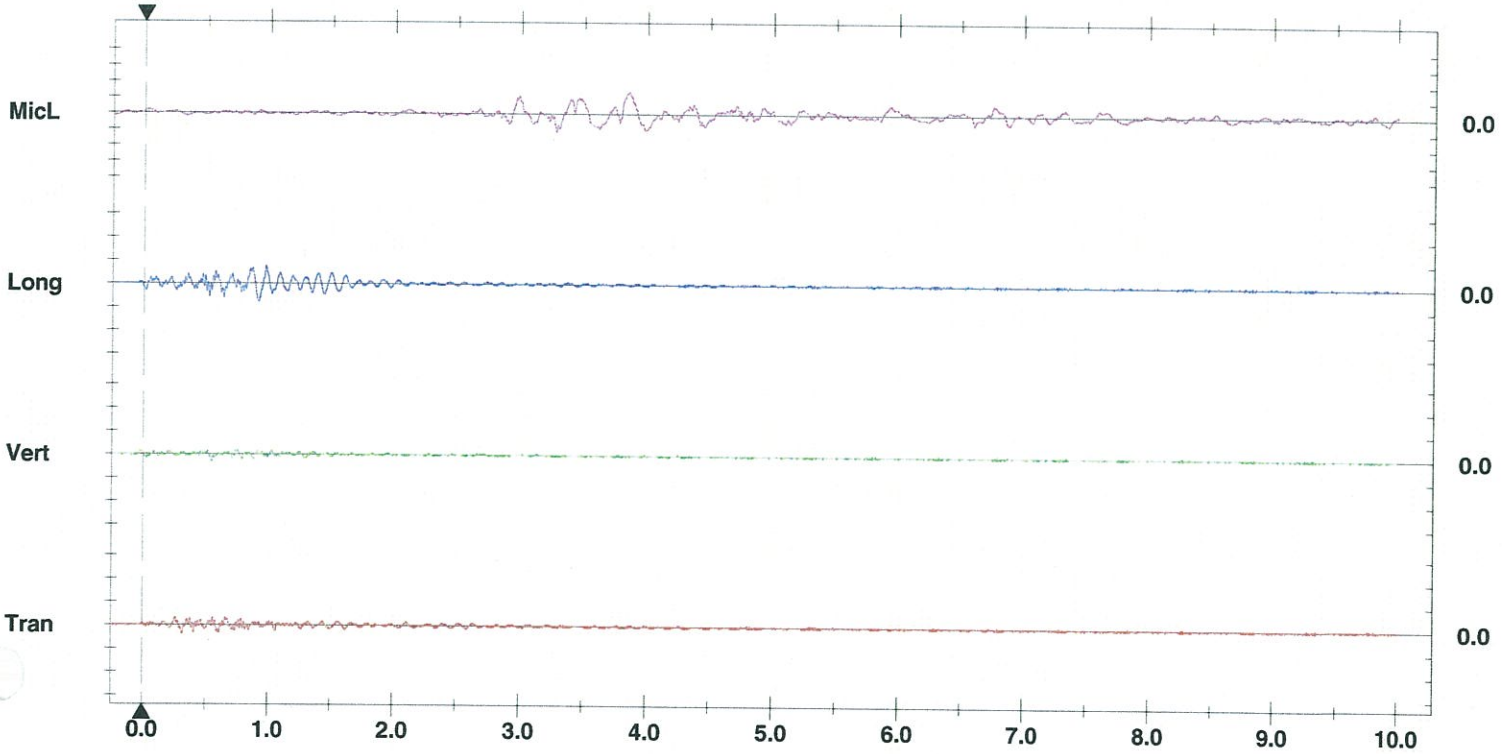
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	113.5 dB(L) at 3.851 sec
ZC Freq	4.1 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 697 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0300	0.0800	in/s
ZC Freq	12	24	8.5	Hz
Time (Rel. to Trig)	0.314	0.537	0.909	sec
Peak Acceleration	0.0265	0.0265	0.0398	g
Peak Displacement	0.00042	0.00022	0.00140	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0808 in/s at 0.909 sec



Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-03-16 Blast No. 03-03-16 3D Time 12:14

Exact Blast Location BENCH 3D

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS
N 29 38' 51.8"
W 98 17' 36.7

MONITOR GPS
N 29 38' 23"
W 98 17' 40"

SEISMOGRAPH DATA

Seismograph No. 13270 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 03-12-15 Microphone Calibration 03-12-15

Exact Seismograph Location Warden Residence: 21375 Gunther Grove Drive, Trophy Oaks Subdivision
10' N of NE corner of pool at the rock wall

Seismograph Distance from Blast 2,933'

Peak Overpressure 113.1 dB Scaled Distance ------

Peak Particle Velocity .095 ips Operator L. LUMBERS

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 03-02-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:14:46 March 3, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

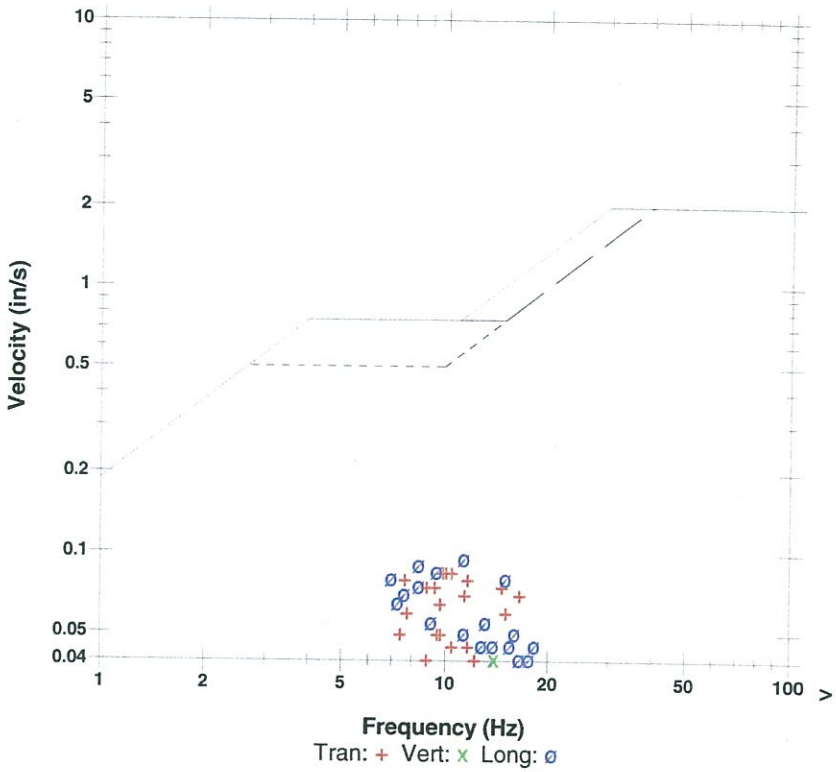
Serial Number	BF13270 V 7.04-8.0 MultiSeis Plus
Battery Level	6.5 Volts
Calibration	March 12, 2015 by Vibra-Tech Inc.
File Name	O270G9MF.CM1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Extended Notes

Post Event Notes
Warden Res. Dist: 2,933'

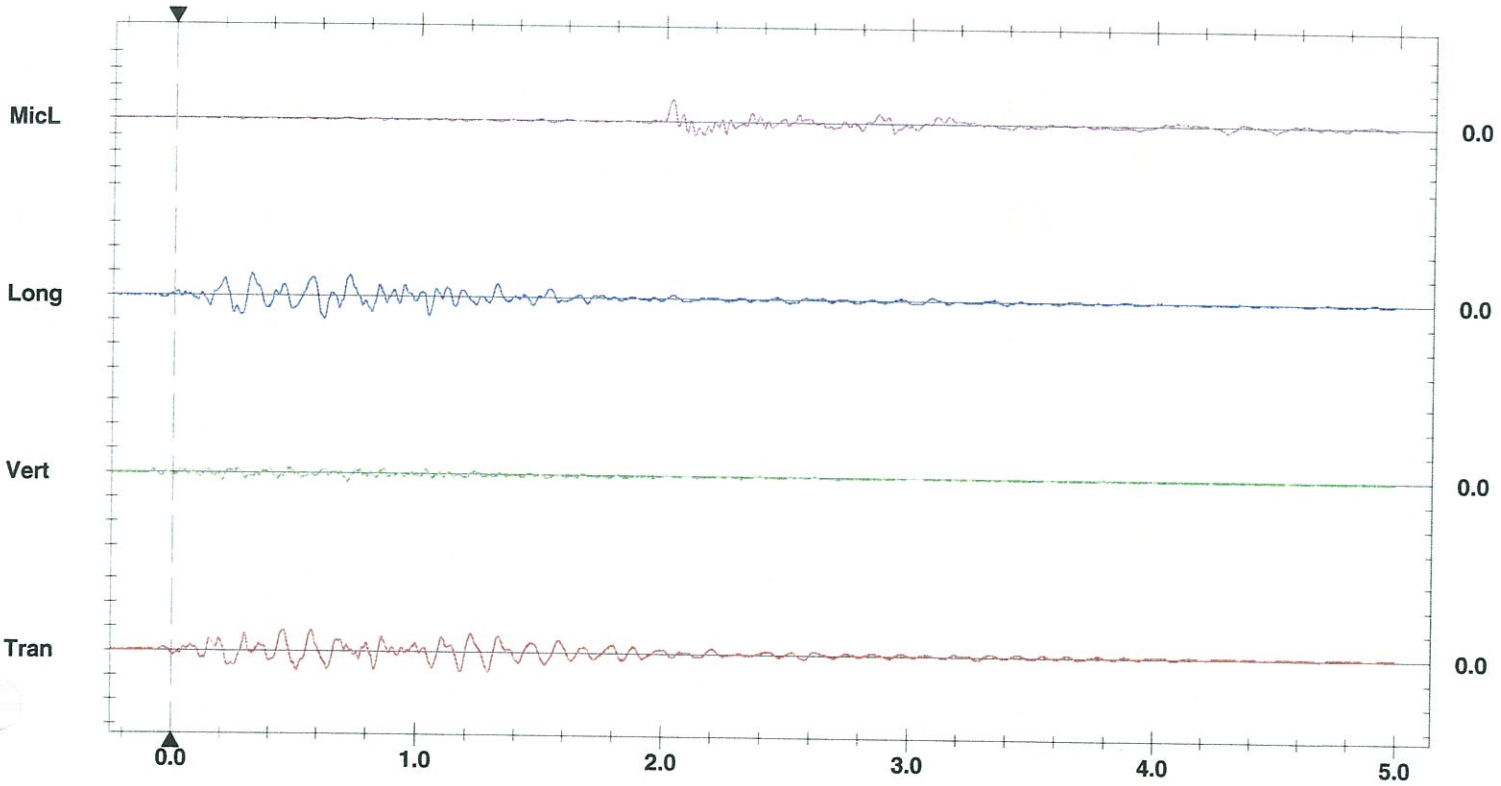
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	113.1 dB(L) at 2.025 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.0850	0.0400	0.0950	in/s
ZC Freq	9.8	14	11	Hz
Time (Rel. to Trig)	0.457	0.719	0.614	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00148	0.00040	0.00199	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.113 in/s at 0.572 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— ——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-03-16 Blast No. 03-03-16 3D Time 12:14

Exact Blast Location BENCH 3D

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N29° 38' 51.8"
W98° 17' 36.7"

MONITOR GPS

N 29 38' 25"
W 98 17' 39"

SEISMOGRAPH DATA

Seismograph No. 13922 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 11-22-15 Microphone Calibration 11-22-15

Exact Seismograph Location Warden Property Line: 21375 Gunther Grove Drive, Trophy Oaks Subdivision North East corner of the property, at the pink pin flag

Seismograph Distance from Blast 2,723'

Peak Overpressure 114.2 dB Scaled Distance ------

Peak Particle Velocity .075 ips Operator L. LUMBERS

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 03-03-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

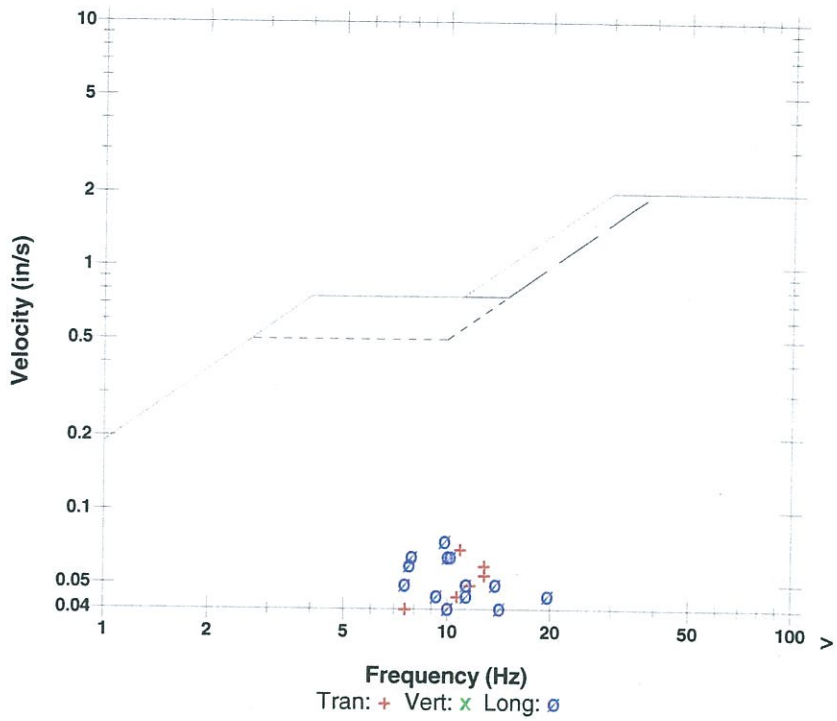
Date/Time	Long at 12:14:46 March 3, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

Serial Number	BF13922 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	November 22, 2015 by Vibra-Tech Inc.
File Name	O922G9MF.CM1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Post Event Notes
Warden Prop. Ln Dist: 2,723'

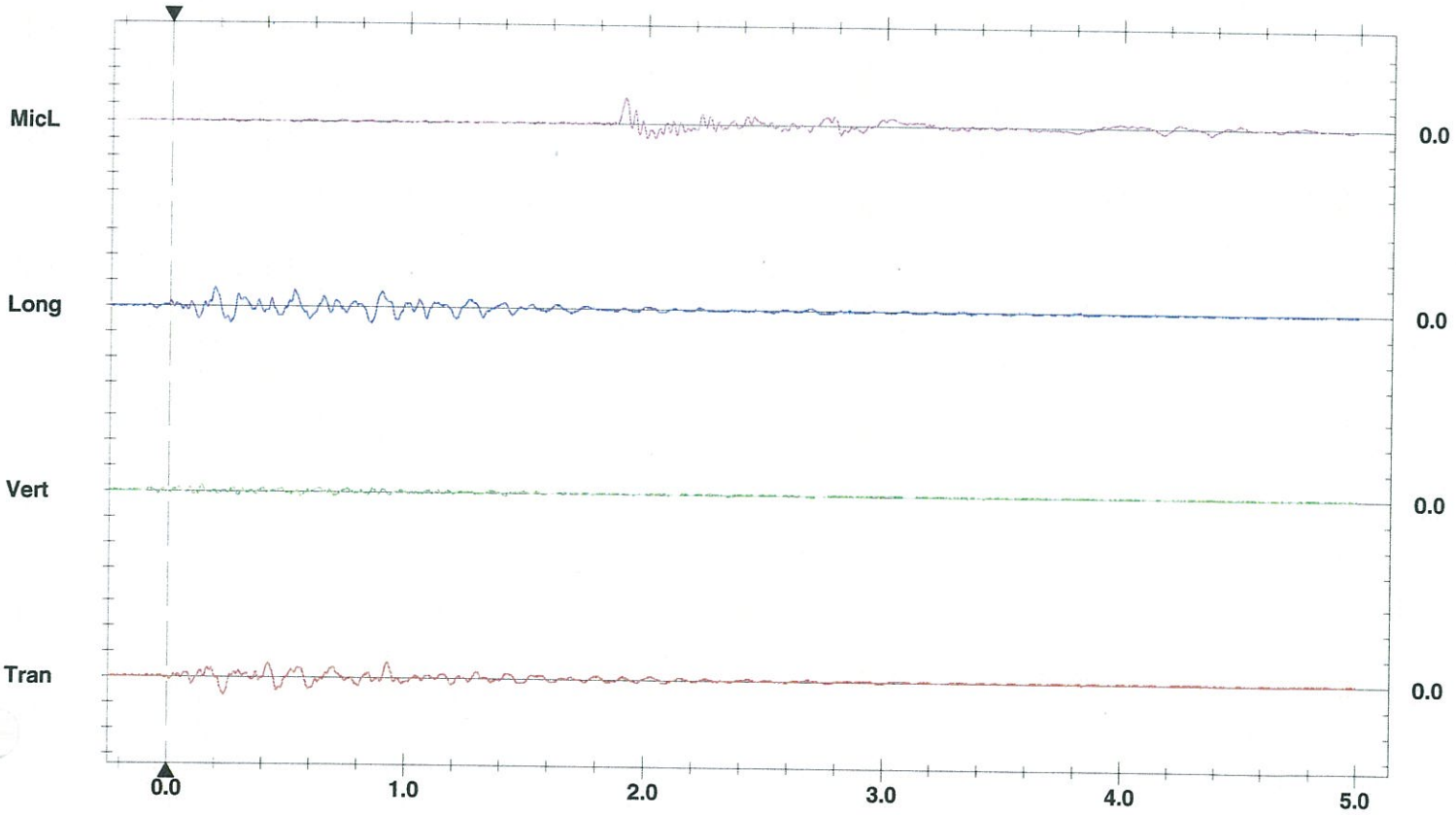
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	114.2 dB(L) at 1.902 sec
ZC Freq	9.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 535 mv)

	Tran	Vert	Long	
PPV	0.0700	0.0250	0.0750	in/s
ZC Freq	11	26	9.8	Hz
Time (Rel. to Trig)	0.236	0.137	0.187	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00103	0.00020	0.00138	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0832 in/s at 0.236 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— ——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-04-16 Blast No. 03-04-16 3B Time 11:55

Exact Blast Location 3B

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS
N 29° 38' 41.5"
W 98° 17' 35.2"

MONITOR GPS
N 29 38' 22.63
W 98 18' 53.97

SEISMOGRAPH DATA

Seismograph No. 6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location City Property Line: outside city water tower gate
30' from gate at the property line

Seismograph Distance from Blast 2528'

Peak Overpressure 107.0 dB Scaled Distance ------

Peak Particle Velocity 0.070 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-04-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:55:55 March 4, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

Serial Number	BD6191 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	H191G9O9.571

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

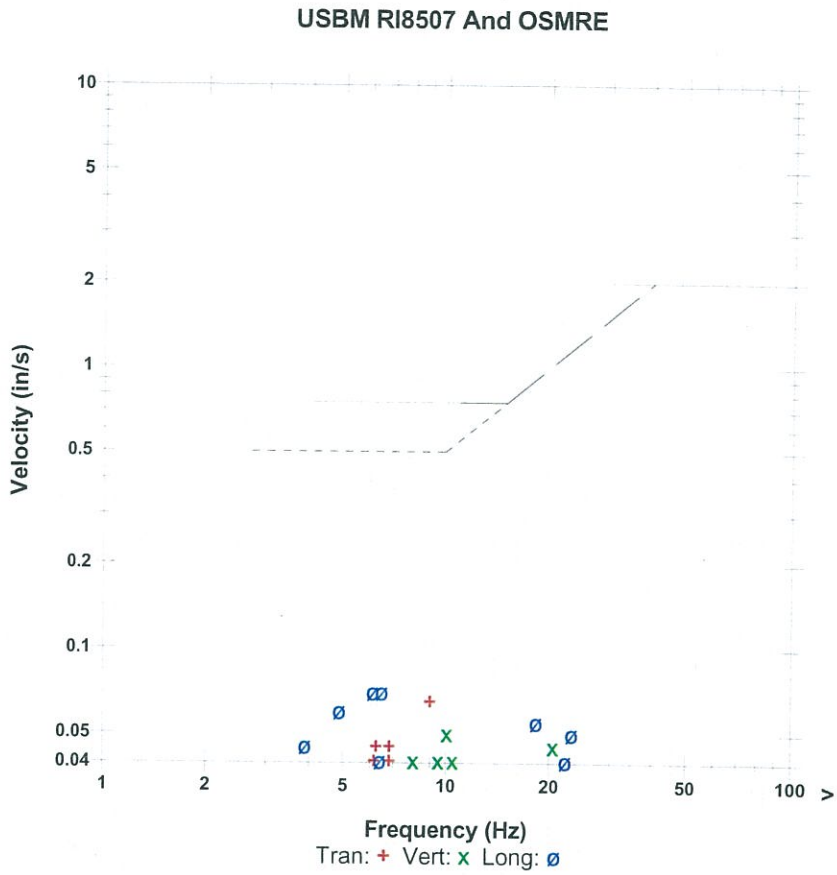
Extended Notes

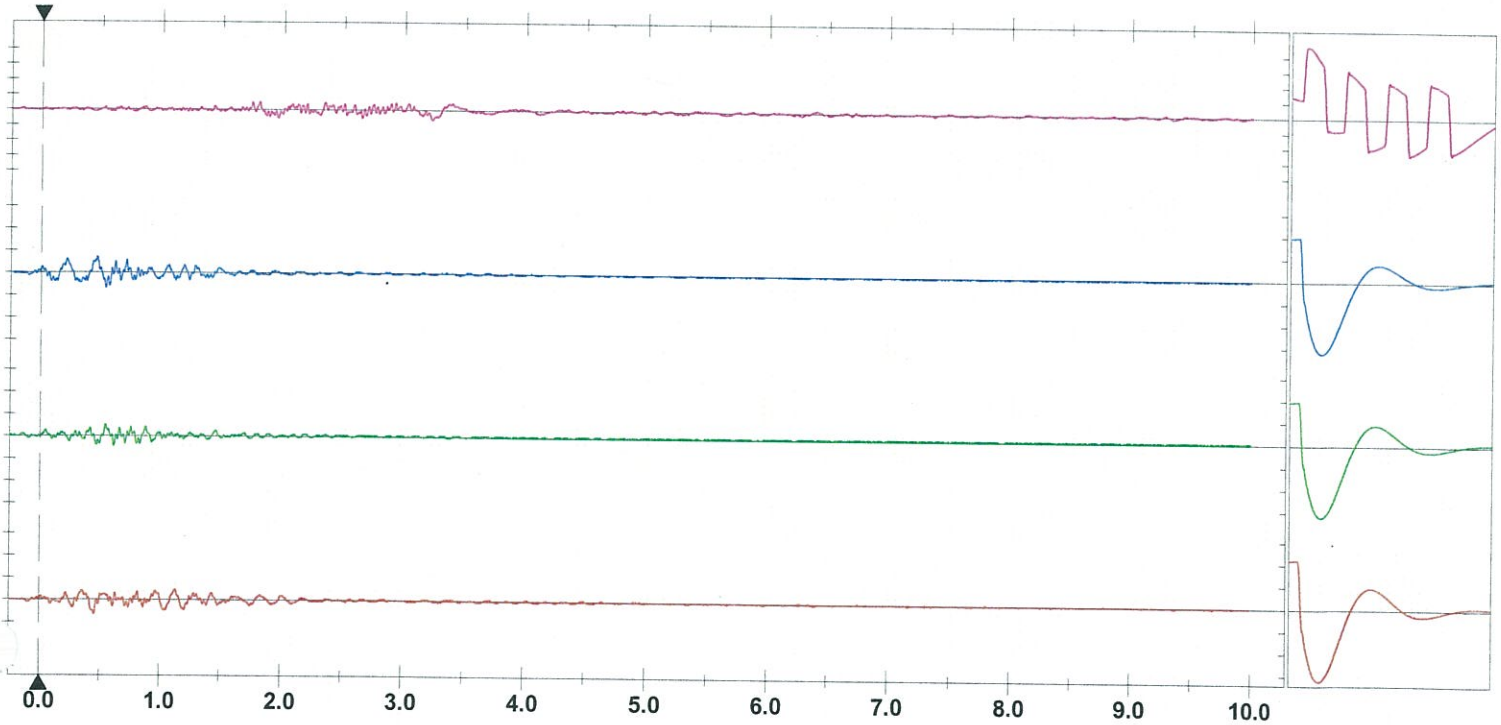
Post Event Notes
City Property Line
2528 ft.

Microphone	Linear Weighting
PSPL	107.0 dB(L) at 3.221 sec
ZC Freq	3.8 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 584 mv)

	Tran	Vert	Long	
PPV	0.0650	0.0500	0.0700	in/s
ZC Freq	9.0	10	6.1	Hz
Time (Rel. to Trig)	0.454	0.536	0.462	sec
Peak Acceleration	0.0133	0.0265	0.0265	g
Peak Displacement	0.00125	0.00075	0.00207	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	8.1	7.6	7.3	Hz
Overswing Ratio	3.3	3.4	4.0	

Peak Vector Sum 0.100 in/s at 0.462 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-04-16 Blast No. 03-04-16 3B Time 11:55

Exact Blast Location 3B

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 41.5"
W98° 17' 35.2"

MONITOR GPS

N 29 38 58.8
W 98 18 17.5

SEISMOGRAPH DATA

Seismograph No. 8949 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location Cruz Residence – 22410 Oro Viejo Ct – George Ranch Subdivision

15' E off SE corner of garage at fence

Seismograph Distance from Blast 4117'

Peak Overpressure 104.2 dB Scaled Distance ------

Peak Particle Velocity 0.060 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-04-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:55:56 March 4, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

Serial Number	BF8949 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	J949G9O9.581

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra-Tech
General:

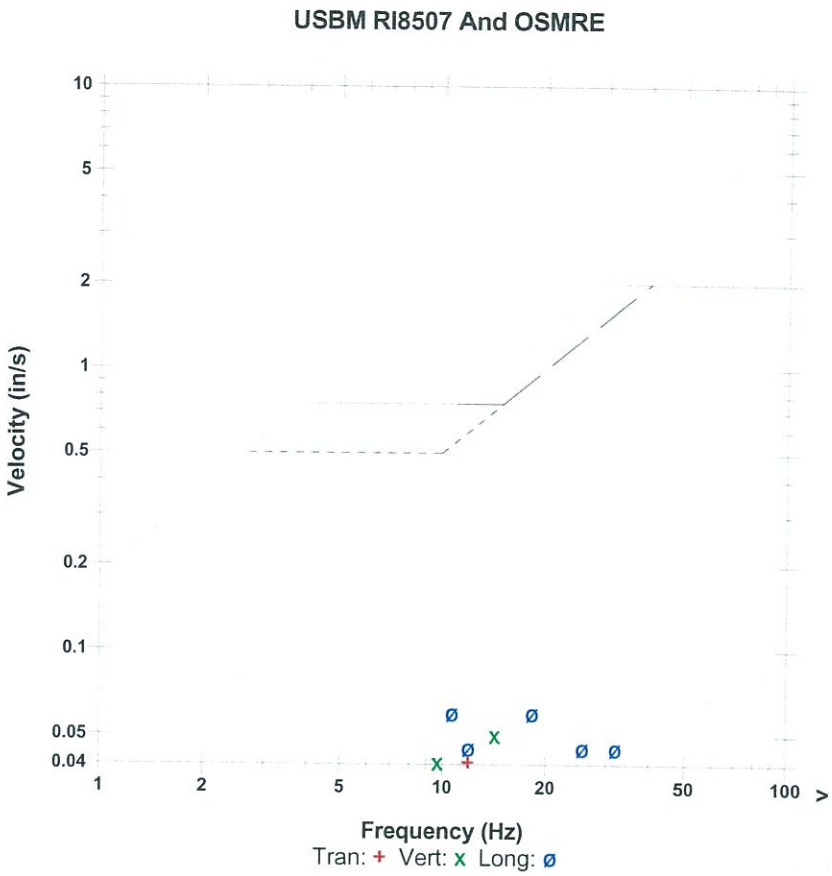
Extended Notes

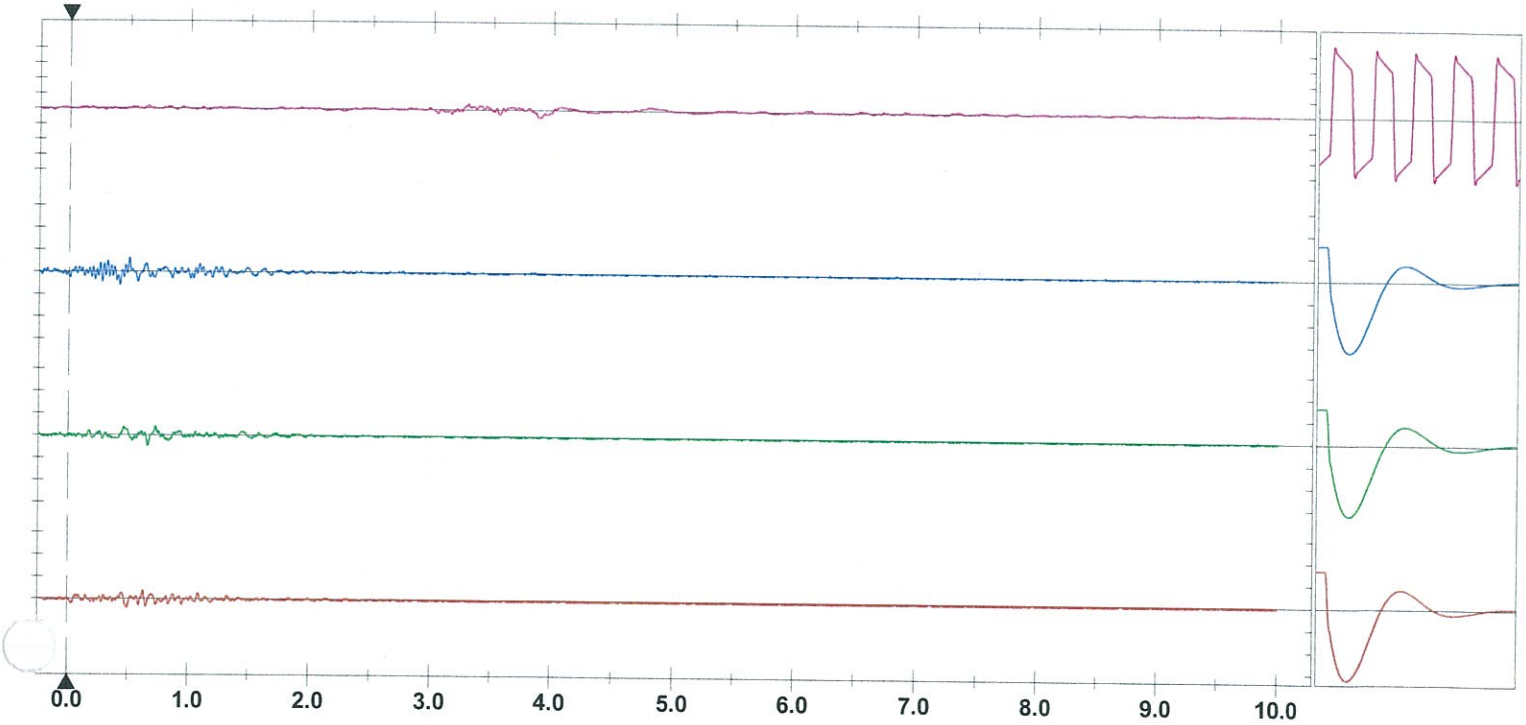
Post Event Notes
Cruz Residence
4117 ft.

Microphone	Linear Weighting
PSPL	104.2 dB(L) at 3.876 sec
ZC Freq	3.1 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 556 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0500	0.0600	in/s
ZC Freq	12	14	11	Hz
Time (Rel. to Trig)	0.489	0.660	0.422	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00057	0.00067	0.00075	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.7	7.4	7.3	Hz
Overswing Ratio	3.7	3.8	4.3	

Peak Vector Sum 0.0696 in/s at 0.499 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-04-16 Blast No. 03-04-16 3B Time 11:55

Exact Blast Location 3B

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 41.5"
W 98° 17' 35.2"

MONITOR GPS

N 29 38' 52"
W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 10626 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-21-15 Microphone Calibration 07-21-15

Exact Seismograph Location Taveres Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 4037'

Peak Overpressure 104.2 dB Scaled Distance ------

Peak Particle Velocity 0.11 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-04-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:55:56 March 4, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps
Job Number:	1

Serial Number	BB10626 V 7.04-8.0 EVERLERT III
Battery Level	6.3 Volts
Calibration	July 21, 2015 by Vibra-Tech Inc.
File Name	L626G9O9.581

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra Tech
General:

Extended Notes

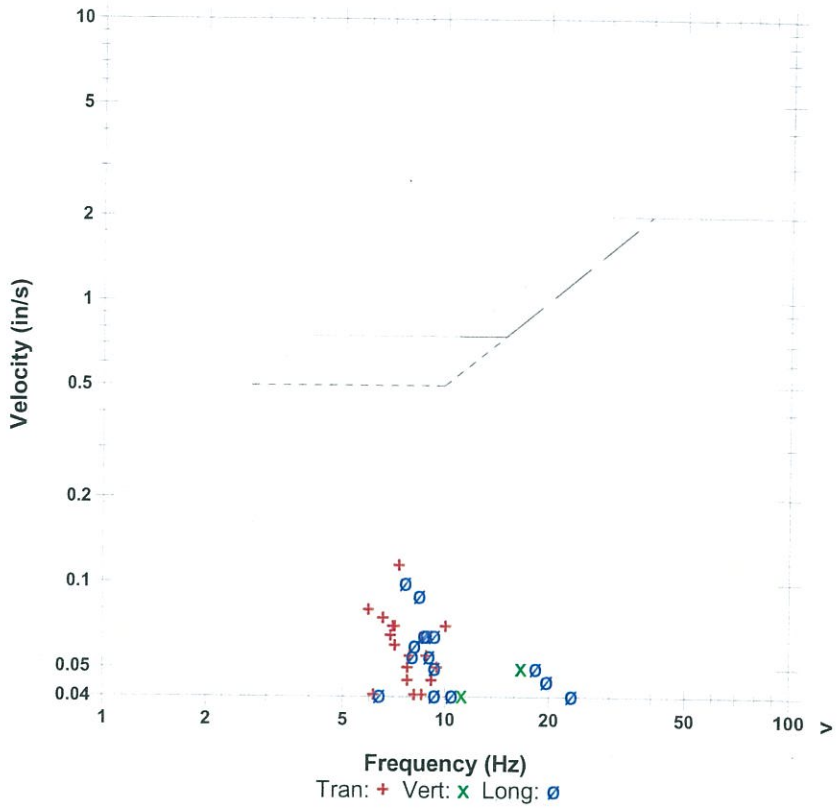
Post Event Notes
Taveres Residence
4037 ft.

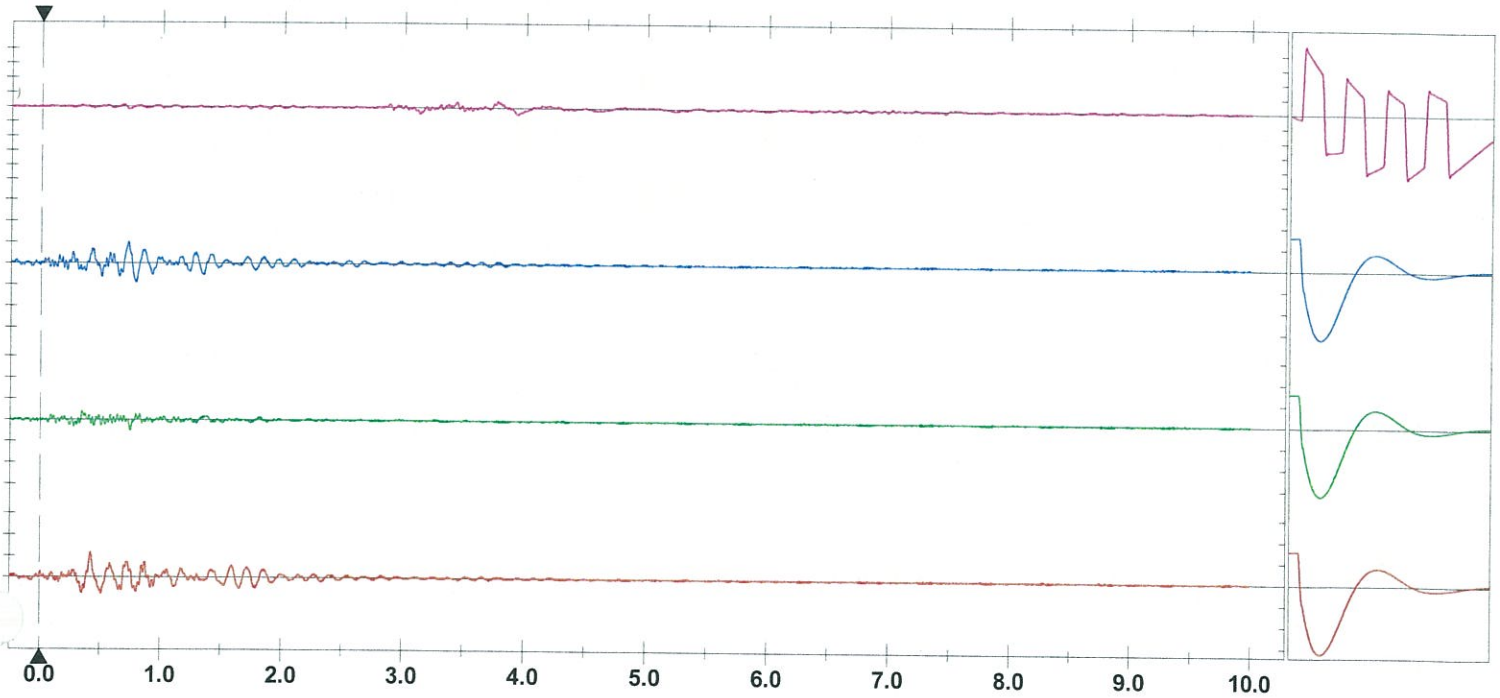
Microphone	Linear Weighting
PSPL	104.2 dB(L) at 3.927 sec
ZC Freq	3.6 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 699 mv)

	Tran	Vert	Long	
PPV	0.115	0.0500	0.1000	in/s
ZC Freq	7.3	17	7.6	Hz
Time (Rel. to Trig)	0.425	0.744	0.724	sec
Peak Acceleration	0.0265	0.0265	0.0398	g
Peak Displacement	0.00184	0.00054	0.00183	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.2	7.5	7.5	Hz
Overswing Ratio	3.9	3.7	3.9	

Peak Vector Sum 0.130 in/s at 0.425 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-04-16 Blast No. 03-04-16 3B Time 11:55

Exact Blast Location 3B

No. of Holes _____ Diameter _____in. Avg. Depth _____ Subgrade _____ft.

Spacing _____ft. Burden _____ft. Avg. Stemming _____ft.

Make & Type of Explosives:

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ms.

Max. lbs/delay period _____lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 41.5"
W 98° 17' 35.2"

MONITOR GPS

N 29 38' 23"
W 98 17' 40"

SEISMOGRAPH DATA

Seismograph No. 13270 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 03-12-15 Microphone Calibration 03-12-15

Exact Seismograph Location Warden Residence: 21375 Gunther Grove Drive, Trophy Oaks Subdivision

10' N of NE corner of pool at the rock wall

Seismograph Distance from Blast 1922'

Peak Overpressure 112.0 dB Scaled Distance ------

Peak Particle Velocity 0.24 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-04-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 11:55:56 March 4, 2016	**Serial Number**	BF13270 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s	**Battery Level**	6.4 Volts
	Mic: 122 dB(L)	**Calibration**	March 12, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	O270G9O9.581
Record Time	5.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Extended Notes

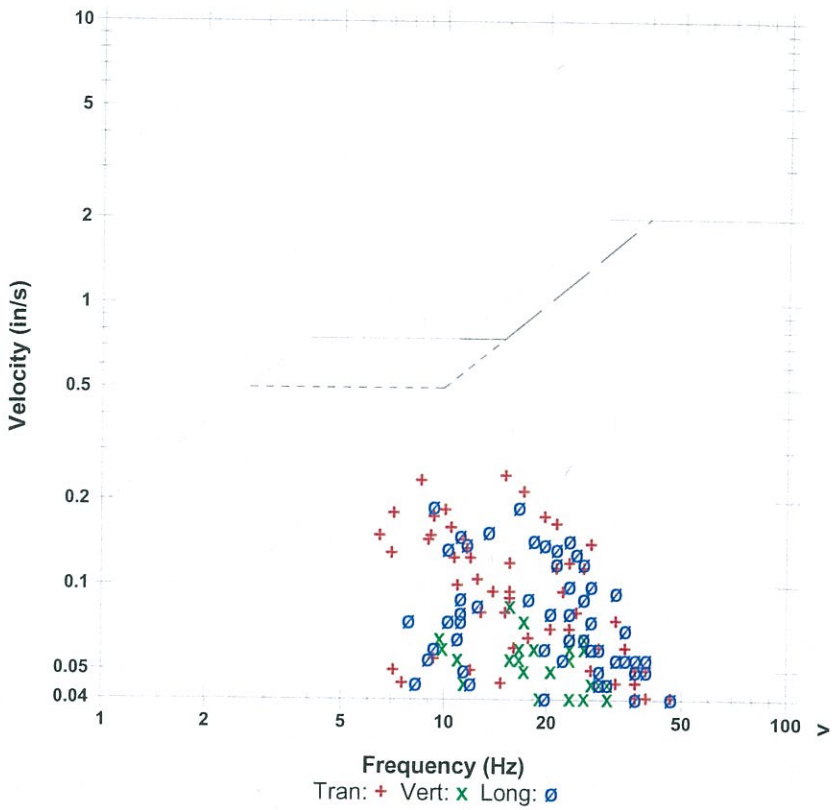
Post Event Notes
Warden Residence
1922 ft.

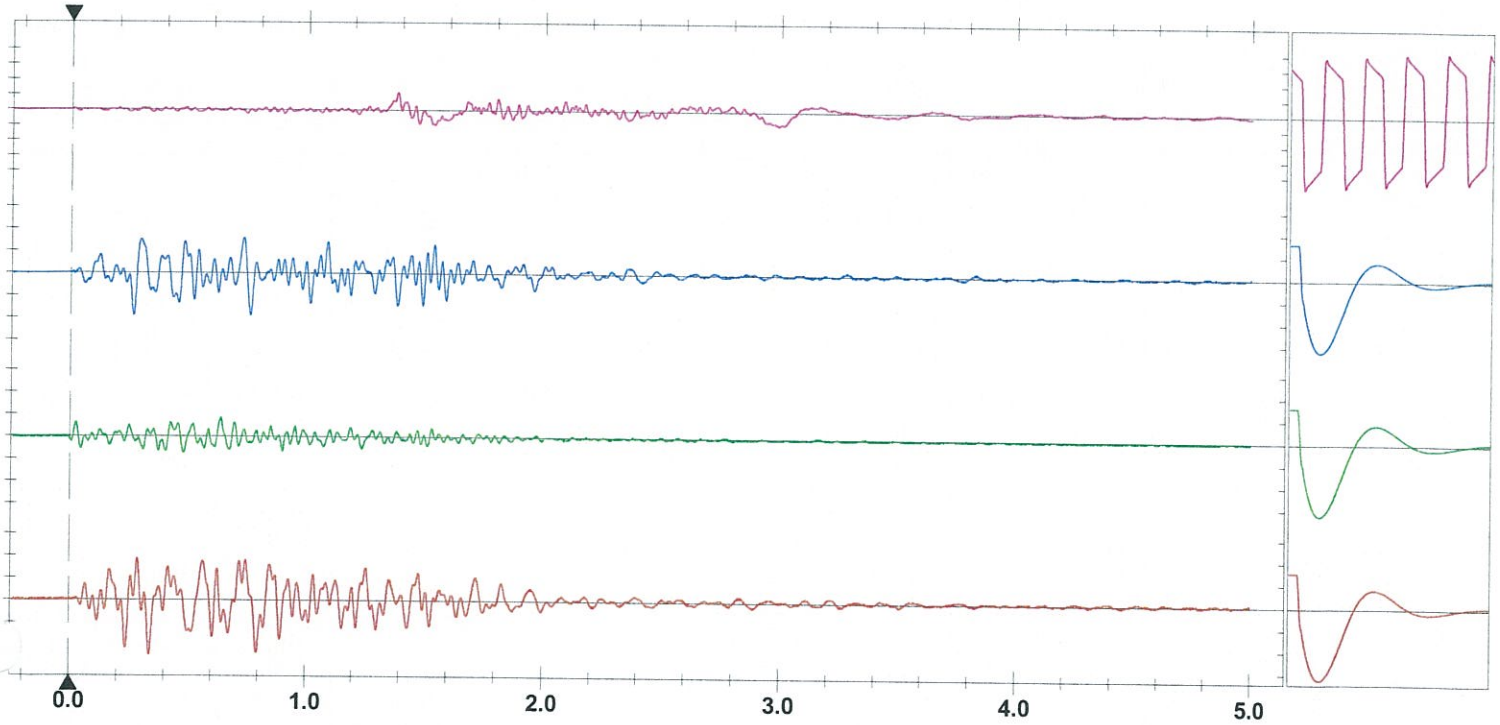
Microphone Linear Weighting
PSPL 112.0 dB(L) at 1.379 sec
ZC Freq 8.7 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 569 mv)

	Tran	Vert	Long	
PPV	0.245	0.0850	0.190	in/s
ZC Freq	15	16	9.3	Hz
Time (Rel. to Trig)	0.337	0.637	0.263	sec
Peak Acceleration	0.0663	0.0398	0.0663	g
Peak Displacement	0.00350	0.00105	0.00241	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.4	7.4	7.3	Hz
Overswing Ratio	3.8	3.6	3.9	

Peak Vector Sum 0.256 in/s at 0.337 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-04-16 Blast No. 03-04-16 3B Time 11:55

Exact Blast Location 3B

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 41.5"
W 98° 17' 35.2"

MONITOR GPS

N 29 38' 25"
W 98 17' 39"

SEISMOGRAPH DATA

Seismograph No. 13922 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 11-22-15 Microphone Calibration 11-22-15

Exact Seismograph Location Warden Property Line: 21375 Gunther Grove Drive, Trophy Oaks Subdivision North East corner of the property, at the pink pin flag

Seismograph Distance from Blast 1705'

Peak Overpressure 112.6 dB Scaled Distance ------

Peak Particle Velocity 0.23 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-04-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 11:55:55 March 4, 2016	**Serial Number**	BF13922 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s	**Battery Level**	6.4 Volts
	Mic: 122 dB(L)	**Calibration**	November 22, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	O922G9O9.571
Record Time	5.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

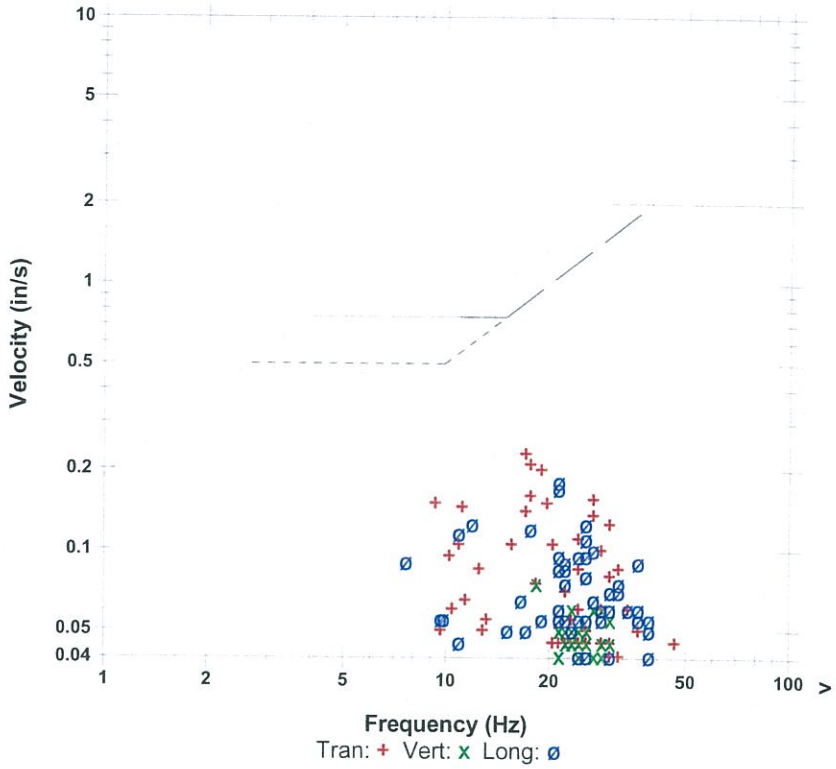
Post Event Notes
Warden Property Line
1705 ft.

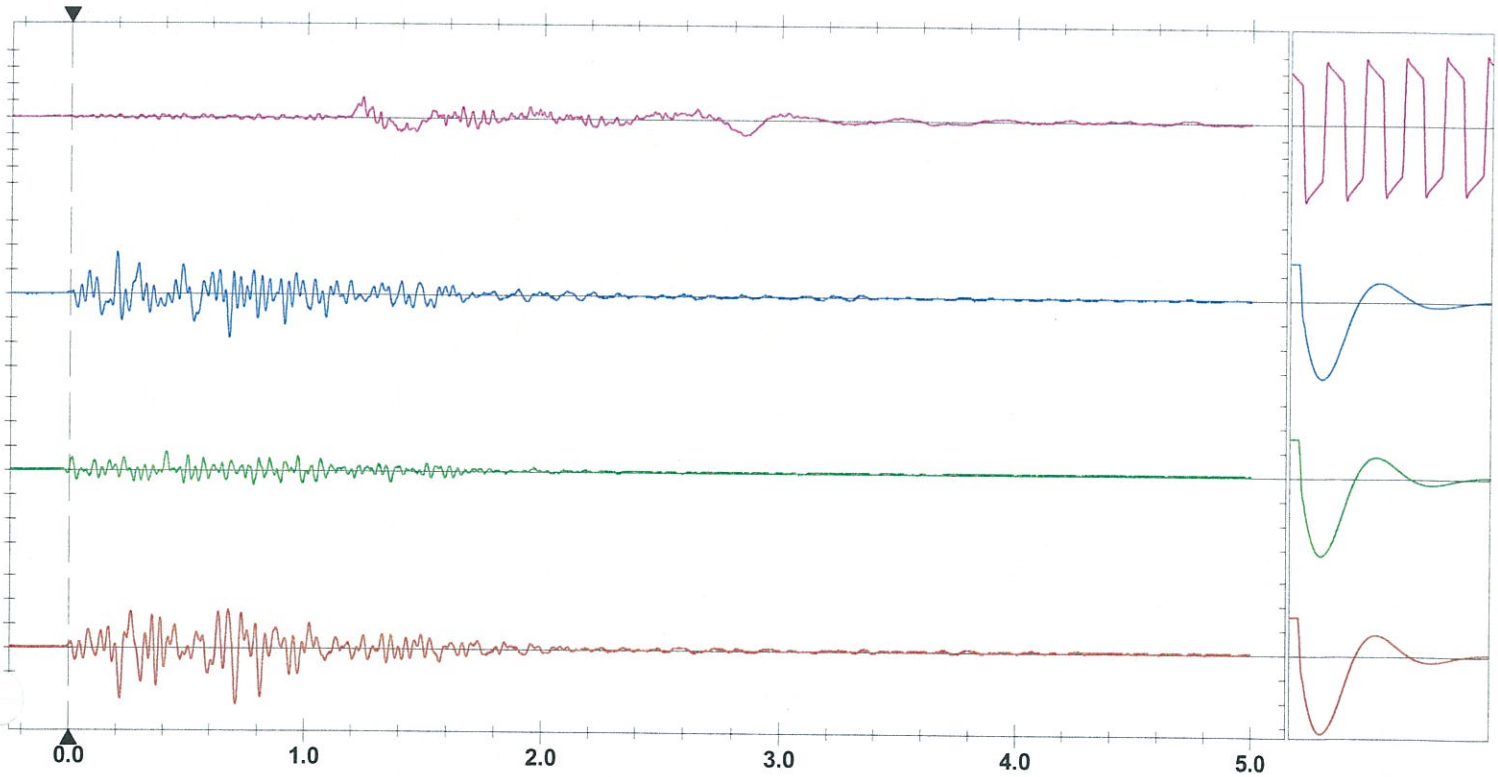
Microphone Linear Weighting
PSPL 112.6 dB(L) at 1.234 sec
ZC Freq 5.0 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 537 mv)

	Tran	Vert	Long	
PPV	0.230	0.0750	0.180	in/s
ZC Freq	17	18	21	Hz
Time (Rel. to Trig)	0.708	0.409	0.674	sec
Peak Acceleration	0.0795	0.0398	0.0795	g
Peak Displacement	0.00211	0.00063	0.00169	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.5	7.5	7.2	Hz
Overswing Ratio	3.6	3.6	4.0	

Peak Vector Sum 0.238 in/s at 0.708 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— ——◀

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 14, 2016 Blast No. 03-14-16 South Wall O Time 14:25

Exact Blast Location South Wall O

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N: 29° 38' 18.4"
W: 98° 16' 38.5"

MONITOR GPS

N 29 38' 22.63
W 98 18' 53.97

SEISMOGRAPH DATA

Seismograph No. 6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location City Property Line: outside city water tower gate

30' from gate at the property line

Seismograph Distance from Blast 6661 ft.

Peak Overpressure NT dB Scaled Distance ------

Peak Particle Velocity NT ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3/14/16

Event Report: Monitor Log

Start Time	End Time	Status
---	---	SERIAL NUMBER: BD6191
Mar 11 '16 14:13:05	Mar 11 '16 14:14:32	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)
Mar 14 '16 10:38:00		Start Monitoring Trigger Level: Geo: 0.0200 in/s Mic: 122.0 dB(L)
Mar 14 '16 10:38:01	Mar 14 '16 10:38:11	Event recorded. Trigger Tran: 0.0200 in/s
Mar 14 '16 10:38:11	Mar 14 '16 14:49:32	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)

City Property Line - 6661 ft. to Blast

No - Trigger

Shot at 14:25

3/14/16

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 14, 2016 Blast No. 03-14-16 South Wall 0 Time 14:25

Exact Blast Location South Wall 0

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 13.4"
W 98° 16' 38.5"

MONITOR GPS

N 29 38 58.8
W 98 18 17.5

SEISMOGRAPH DATA

Seismograph No. 8949 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location Cruz Residence – 22410 Oro Viejo Ct – George Ranch Subdivision

15' E off SE corner of garage at fence

Seismograph Distance from Blast 9633 ft.

Peak Overpressure NT dB Scaled Distance ------

Peak Particle Velocity NT ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3/14/16

Event Report: Monitor Log - MultiSeis Plus # BF8949 comp mode

Start Time	End Time	Status
---	---	SERIAL NUMBER: BF8949
Mar 14 '16 10:54:01		Start Monitoring Trigger Level: Geo: 0.0200 in/s Mic: 122.0 dB(L)
Mar 14 '16 10:54:02	Mar 14 '16 10:54:12	Event recorded. Trigger Long: 0.0200 in/s
Mar 14 '16 10:54:12		Start Monitoring Trigger Level: Geo: 0.0200 in/s Mic: 122.0 dB(L)
Mar 14 '16 12:44:14	Mar 14 '16 12:44:24	Event recorded. Trigger Long: 0.0200 in/s
Mar 14 '16 12:44:24		Start Monitoring Trigger Level: Geo: 0.0200 in/s Mic: 122.0 dB(L)
Mar 14 '16 12:45:04	Mar 14 '16 12:45:14	Event recorded. Trigger Tran: 0.0200 in/s
Mar 14 '16 12:45:14	Mar 14 '16 13:21:02	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)
Mar 14 '16 13:23:21	Mar 14 '16 14:55:52	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)

Cruz Residence - 9633 ft. to Blast
No Trigger
Shot at 14:25
3/14/16

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 14, 2016 Blast No. 03-14-16 South Wall 0 Time 14:25

Exact Blast Location South Wall 0

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N: 29° 38' 18.4"
W: 98° 16' 38.5"

MONITOR GPS

N 29 38' 15"
W 98 17' 26"

SEISMOGRAPH DATA

Seismograph No. 10562 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 09-13-15 Microphone Calibration 09-13-15

Exact Seismograph Location Holly Residence: 9916 Trophy Oaks Drive, Trophy Oaks Subdivision backyard along the quarry property line at the barbed wire fence

Seismograph Distance from Blast 4198 ft.

Peak Overpressure 98.8 dB Scaled Distance ------

Peak Particle Velocity 0.040 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 3/14/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 14:25:50 March 14, 2016	**Serial Number**	BF10562 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)	**Battery Level**	6.3 Volts
		Calibration	September 13, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	L562GA6Y.R21
Record Time	5.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Extended Notes

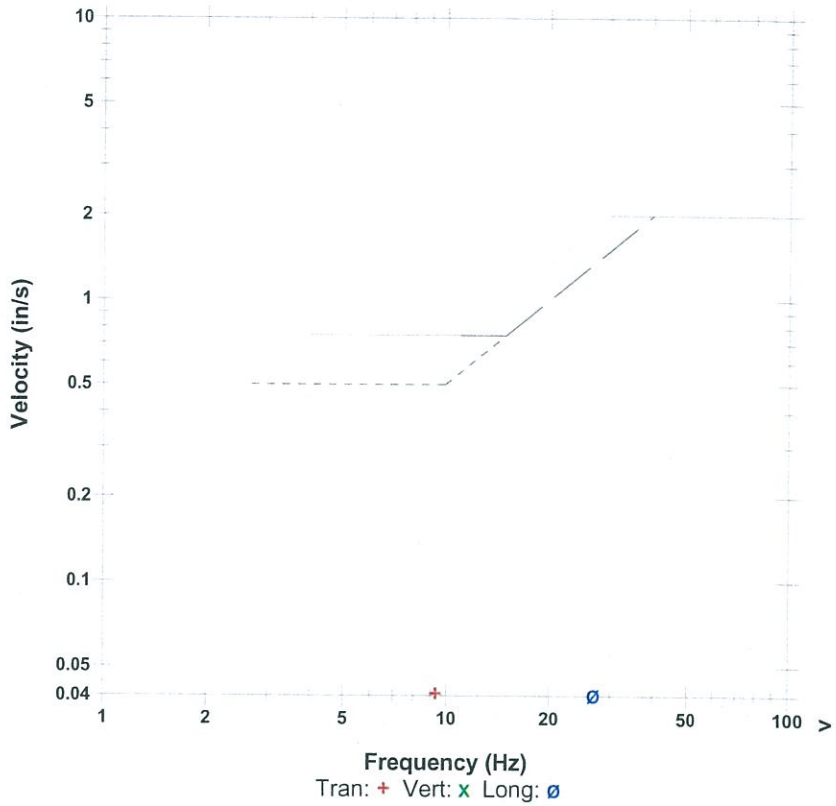
Post Event Notes
Holly Residence
4198 ft to Blast

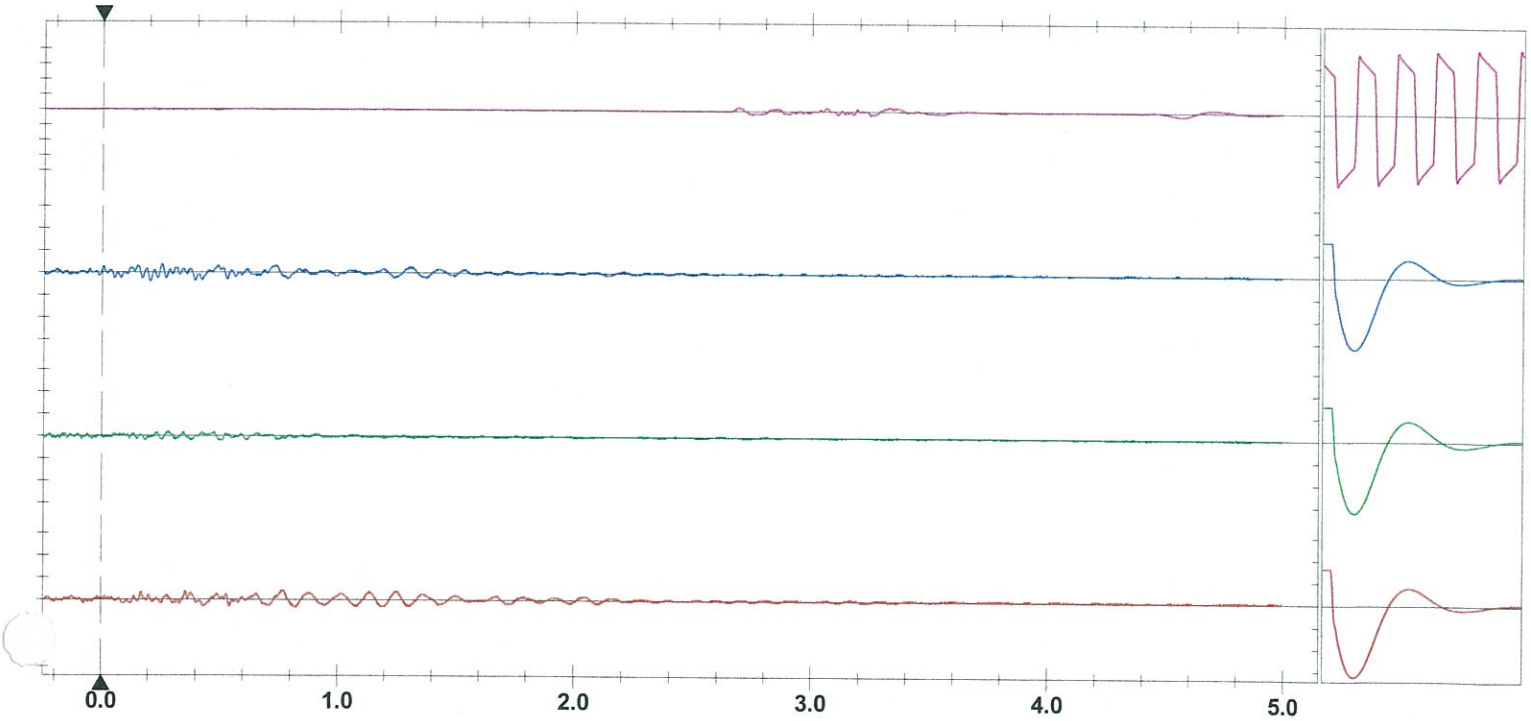
Microphone Linear Weighting
PSPL 98.8 dB(L) at 3.243 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 554 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0200	0.0400	in/s
ZC Freq	9.3	30	27	Hz
Time (Rel. to Trig)	0.761	0.182	0.201	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00064	0.00024	0.00058	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	4.1	3.5	3.9	

Peak Vector Sum 0.0458 in/s at 0.201 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— ——◀

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 14, 2016 Blast No. 03-14-16 South Wall 0 Time 14:25

Exact Blast Location South Wall 0

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N: 29° 38' 18.4"

W: 98° 16' 38.5"

MONITOR GPS

N 29 38' 52"

W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 10626 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-21-15 Microphone Calibration 07-21-15

Exact Seismograph Location Taveres Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 9518 ft.

Peak Overpressure 101.9 dB Scaled Distance ------

Peak Particle Velocity 0.020 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3/14/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 14:25:51 March 14, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps
Job Number:	1

Serial Number	BB10626 V 7.04-8.0 EVERLERT III
Battery Level	6.3 Volts
Calibration	July 21, 2015 by Vibra-Tech Inc.
File Name	L626GA6Y.R31

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra Tech
General:

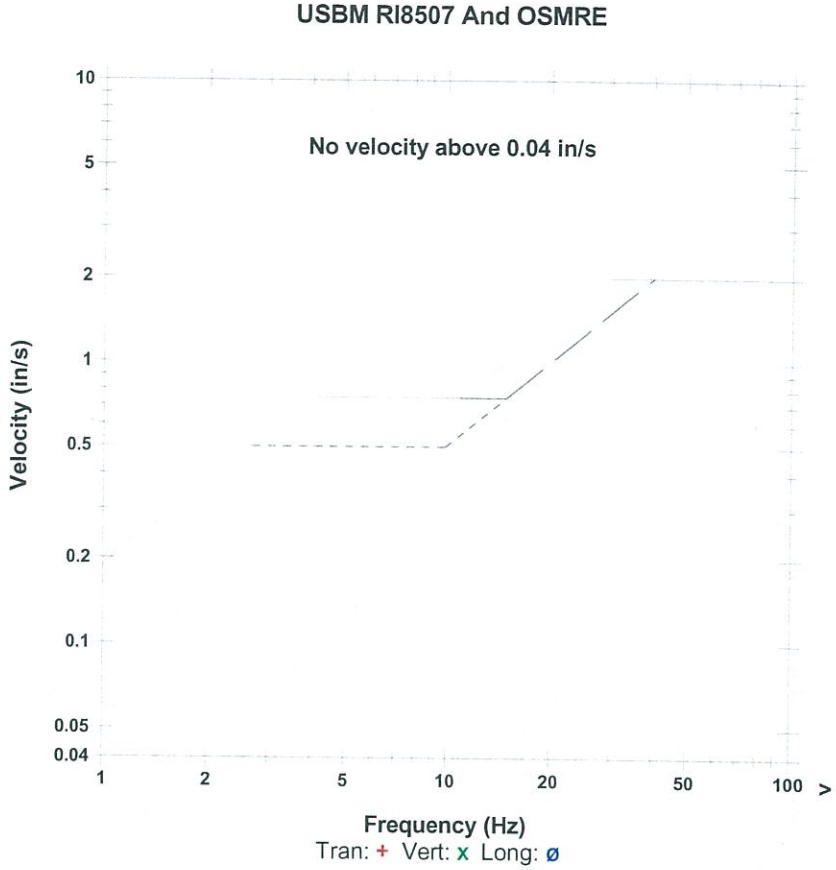
Extended Notes

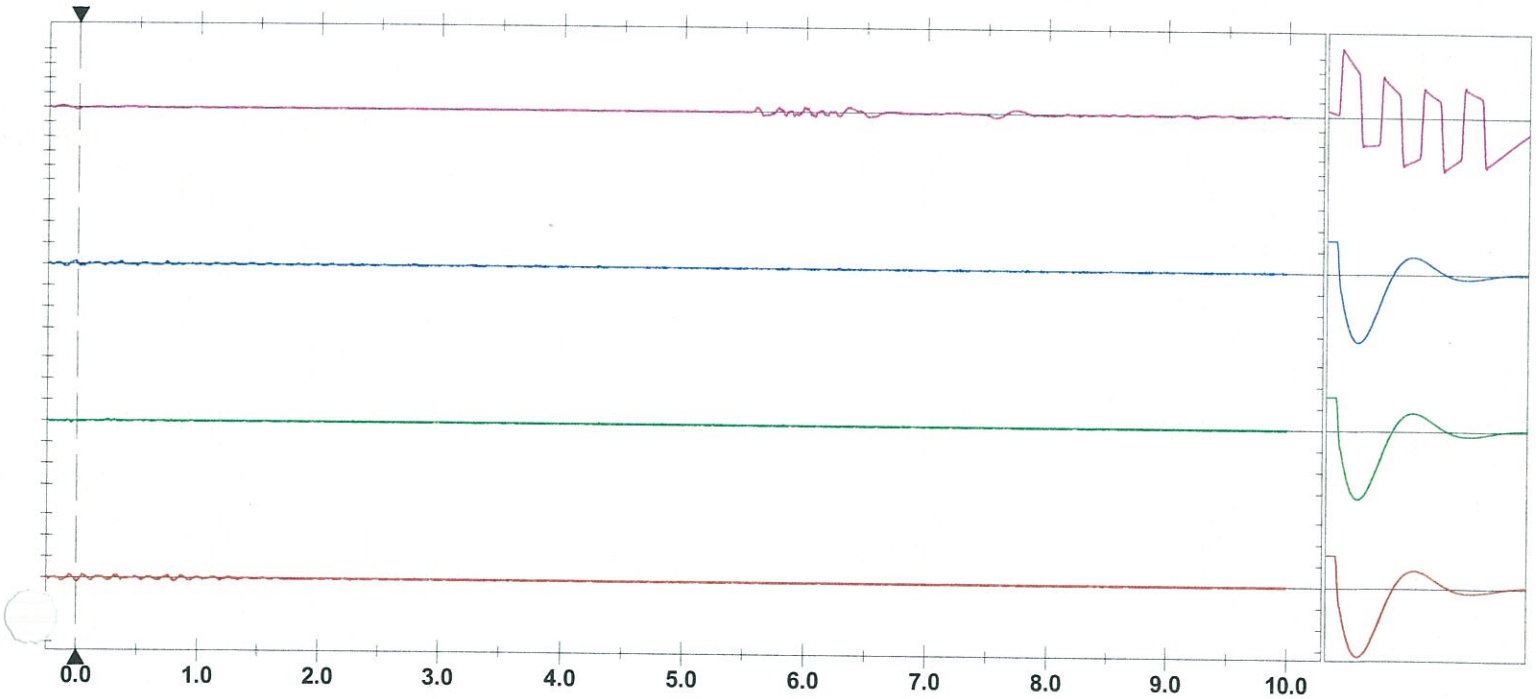
Post Event Notes
Taveres Residence
9518 ft to Blast

Microphone	Linear Weighting
PSPL	101.9 dB(L) at 5.984 sec
ZC Freq	8.7 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 704 mv)

	Tran	Vert	Long	
PPV	0.0200	0.01000	0.0150	in/s
ZC Freq	13	>100	18	Hz
Time (Rel. to Trig)	0.000	-0.056	-0.017	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00027	0.00000	0.00013	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.2	7.4	7.4	Hz
Overswing Ratio	3.9	3.7	3.9	

Peak Vector Sum 0.0224 in/s at 0.003 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 14, 2016 Blast No. 03-14-16 South Wall O Time 14:25

Exact Blast Location South Wall O

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N: 29° 38' 18.4"

W: 98° 16' 38.5"

MONITOR GPS

N 29 38' 23"

W 98 17' 40"

SEISMOGRAPH DATA

Seismograph No. 13138 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 02-23-16 Microphone Calibration 02-23-16

Exact Seismograph Location Warden Residence: 21375 Gunther Grove Drive, Trophy Oaks Subdivision

10' N of NE corner of pool at the rock wall

Seismograph Distance from Blast 5437 ft

Peak Overpressure 107.5 dB Scaled Distance ------

Peak Particle Velocity 0.040 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3/14/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 14:25:50 March 14, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

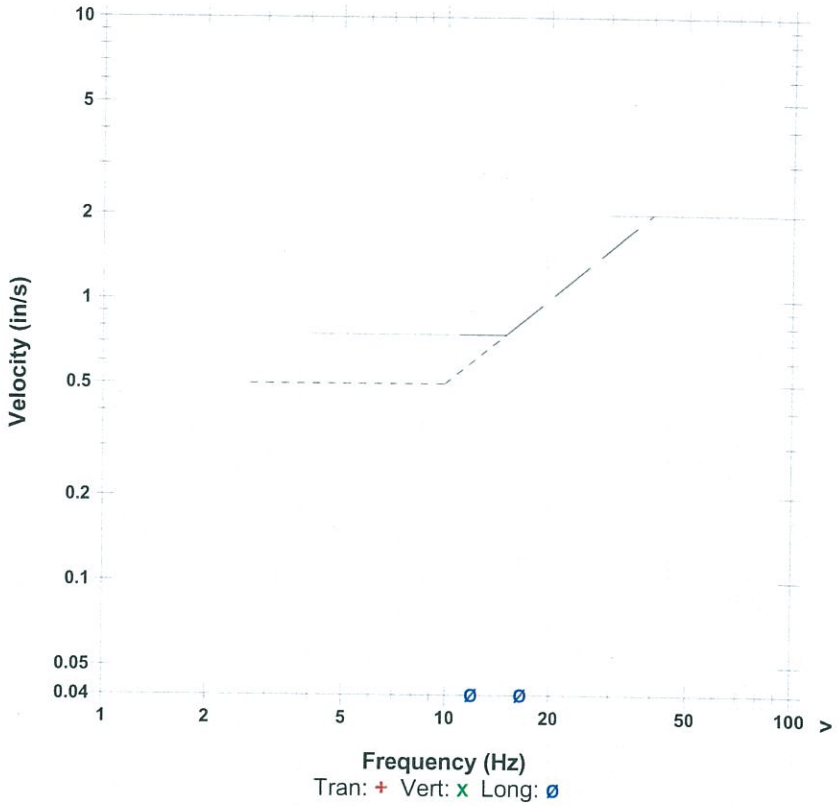
Serial Number	BF13138 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	February 23, 2016 by Vibra-Tech Inc.
File Name	O138GA6Y.R21

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra-Tech
General:

Extended Notes

Post Event Notes
Warden Residence
5437 ft to Blast

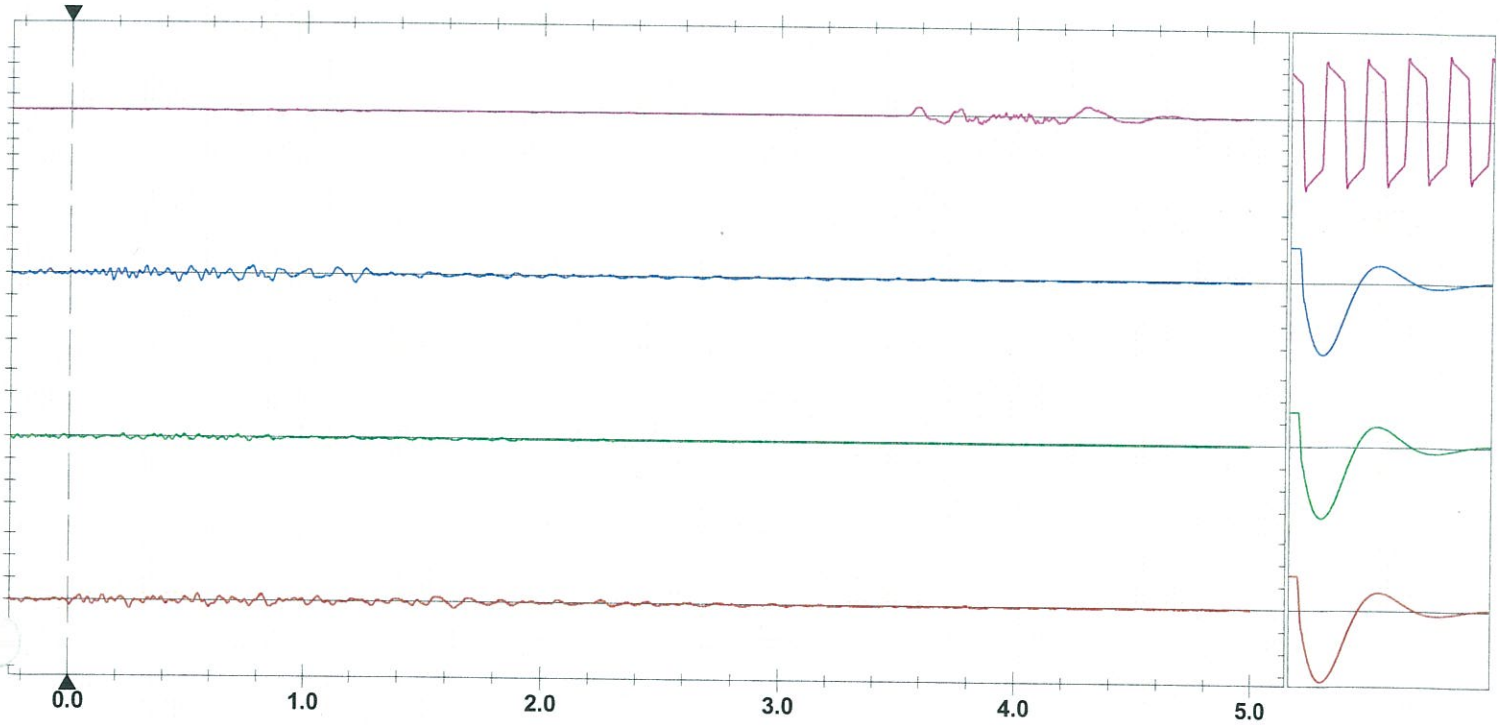
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	107.5 dB(L) at 4.288 sec
ZC Freq	3.2 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 556 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0200	0.0400	in/s
ZC Freq	17	20	17	Hz
Time (Rel. to Trig)	0.253	0.756	0.457	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00056	0.00026	0.00056	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.1	7.5	7.3	Hz
Overswing Ratio	4.0	3.5	4.0	

Peak Vector Sum 0.0472 in/s at 0.550 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-15-16 Blast No. 3-15-16 5B Time 11:54

Exact Blast Location FACE 5B : N 29° 39' 01.8" W 98° 17' 16.8"

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 39' 01.8"
W 98° 17' 16.8"

MONITOR GPS

N 29 38' 22.63
W 98 18' 53.97

SEISMOGRAPH DATA

Seismograph No. 6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location City Property Line: outside city water tower gate

30' from gate at the property line

Seismograph Distance from Blast 5,145'

Peak Overpressure 106.0 dB Scaled Distance ------

Peak Particle Velocity .025 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3-15-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:54:09 March 15, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

Serial Number	BD6191 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	H191GA8M.E91

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

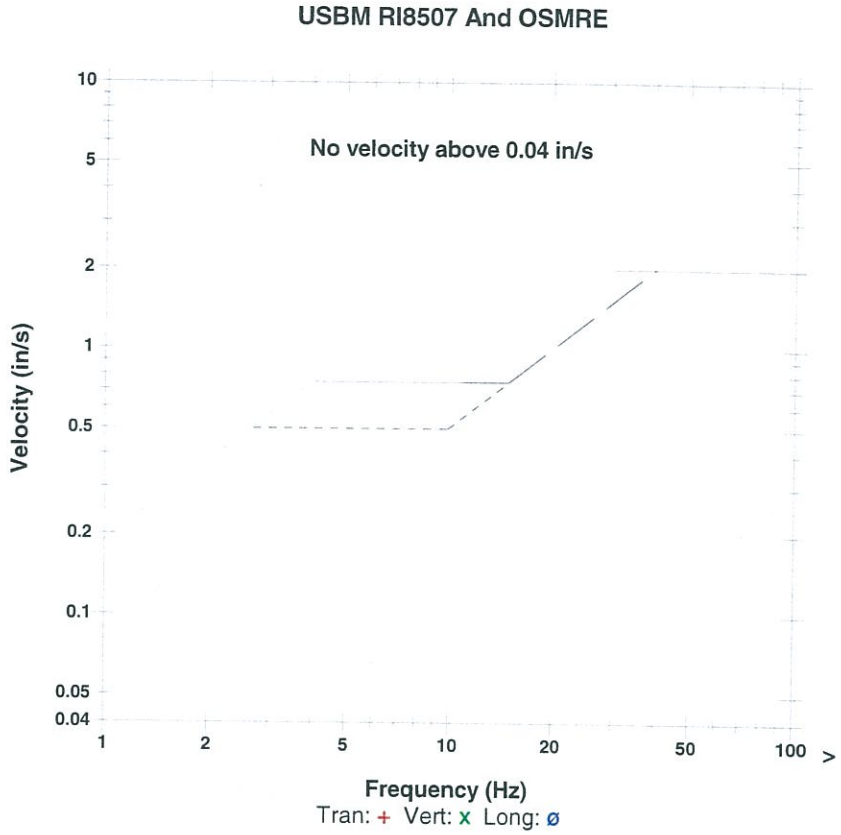
Extended Notes

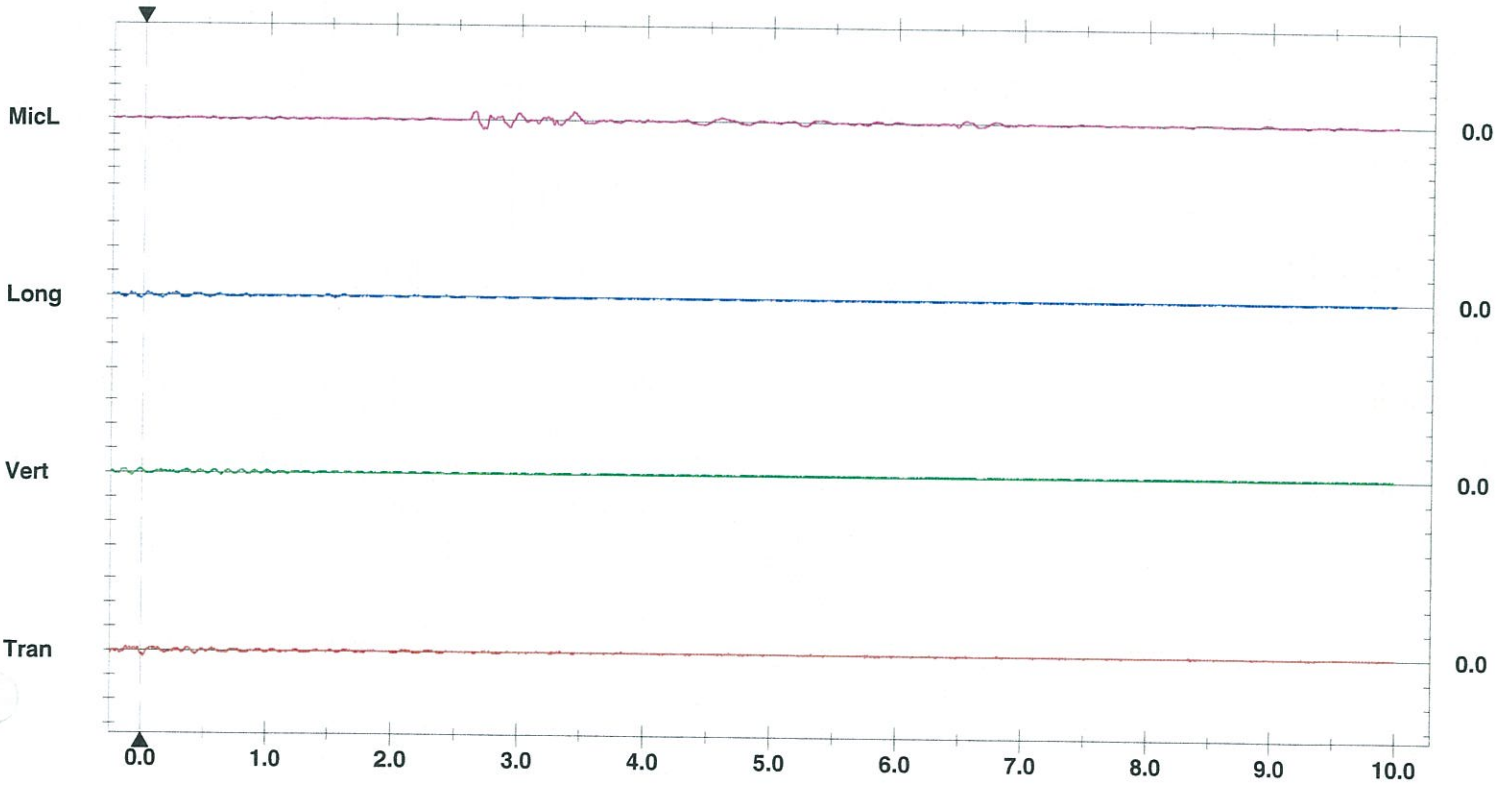
Post Event Notes
City Property Line: 5,145'

Microphone	Linear Weighting
PSPL	106.0 dB(L) at 2.689 sec
ZC Freq	6.2 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 612 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0150	0.0150	in/s
ZC Freq	10	28	18	Hz
Time (Rel. to Trig)	0.014	-0.089	-0.029	sec
Peak Acceleration	0.0133	0.0133	0.0133	g
Peak Displacement	0.00039	0.00021	0.00016	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0255 in/s at 0.016 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— ——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-15-16 Blast No. 3-15-16 5B Time 11:54

Exact Blast Location FACE 5B: N 29° 39' 01.8" W 98° 17' 16.8"

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 39' 01.8"
W 98° 17' 16.8"

MONITOR GPS

N 29 38 58.8
W 98 18 17.5

SEISMOGRAPH DATA

Seismograph No. 8949 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location Cruz Residence – 22410 Oro Viejo Ct – George Ranch Subdivision

15' E off SE corner of garage at fence

Seismograph Distance from Blast 5,354'

Peak Overpressure 103.5 dB Scaled Distance ------

Peak Particle Velocity .025 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 3-15-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:54:07 March 15, 2016	**Serial Number**	BF8949 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)	**Battery Level**	6.3 Volts
		Calibration	July 16, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	J949GA8M.E71
Record Time	10.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra-Tech
General:

Extended Notes

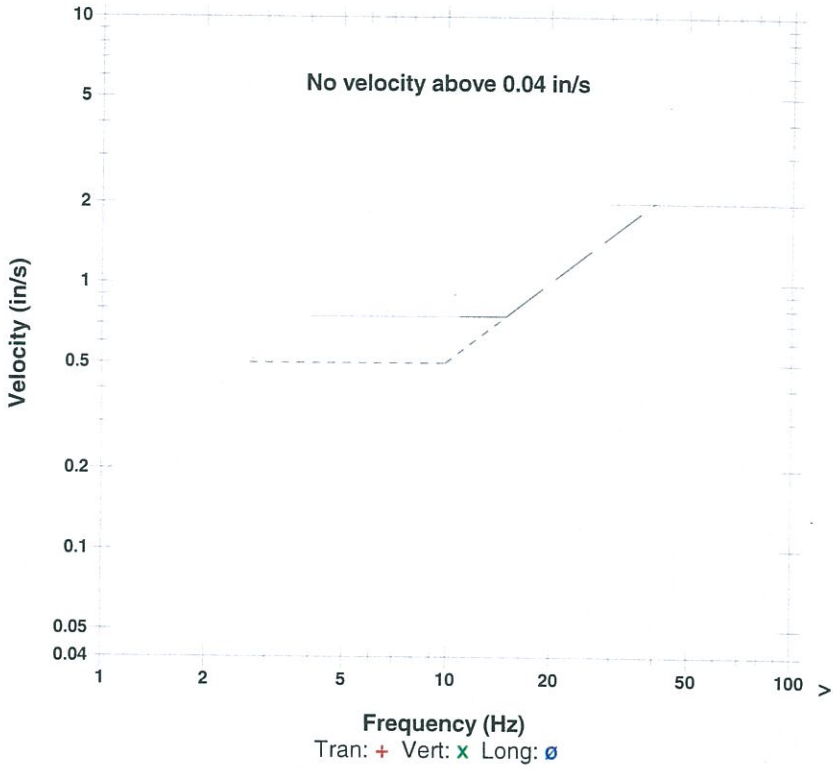
Post Event Notes
Cruz Residence: 5,354'

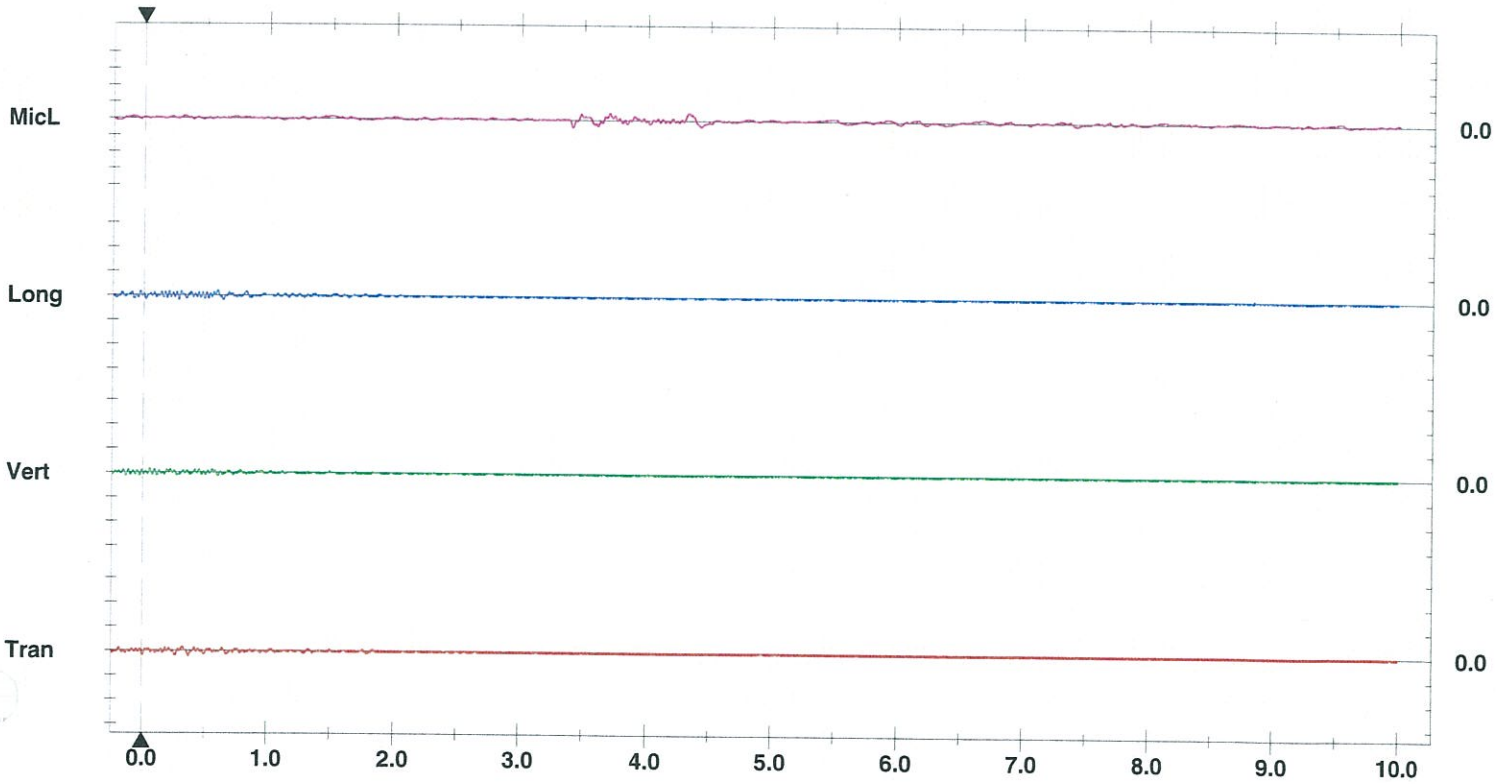
Microphone Linear Weighting
PSPL 103.5 dB(L) at 3.404 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 558 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0150	0.0200	in/s
ZC Freq	20	39	28	Hz
Time (Rel. to Trig)	0.372	-0.145	0.010	sec
Peak Acceleration	0.0133	0.0133	0.0265	g
Peak Displacement	0.00019	0.00012	0.00017	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0274 in/s at 0.372 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-15-16 Blast No. 3-15-16 5B Time 11:54

Exact Blast Location FACE 5B : N 29° 39' 01.8" W 98° 17' 16.8"

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 39' 01.8"
W 98° 17' 16.8"

MONITOR GPS

N 29 38' 52"
W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 10626 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-21-15 Microphone Calibration 07-21-15

Exact Seismograph Location Taveres Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 5,604'

Peak Overpressure 104.2 dB Scaled Distance ------

Peak Particle Velocity .025 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 3-15-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:54:08 March 15, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps
Job Number:	1

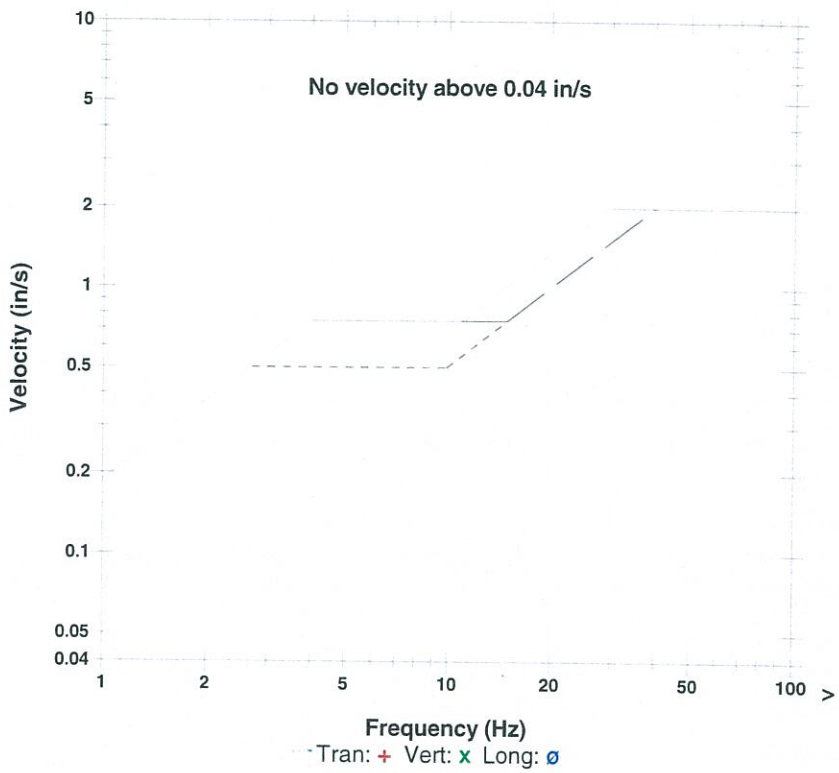
Serial Number	BB10626 V 7.04-8.0 EVERLERT III
Battery Level	6.4 Volts
Calibration	July 21, 2015 by Vibra-Tech Inc.
File Name	L626GA8M.E81

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra Tech
General:

Extended Notes

Post Event Notes
Taveres Residence: 5,604'

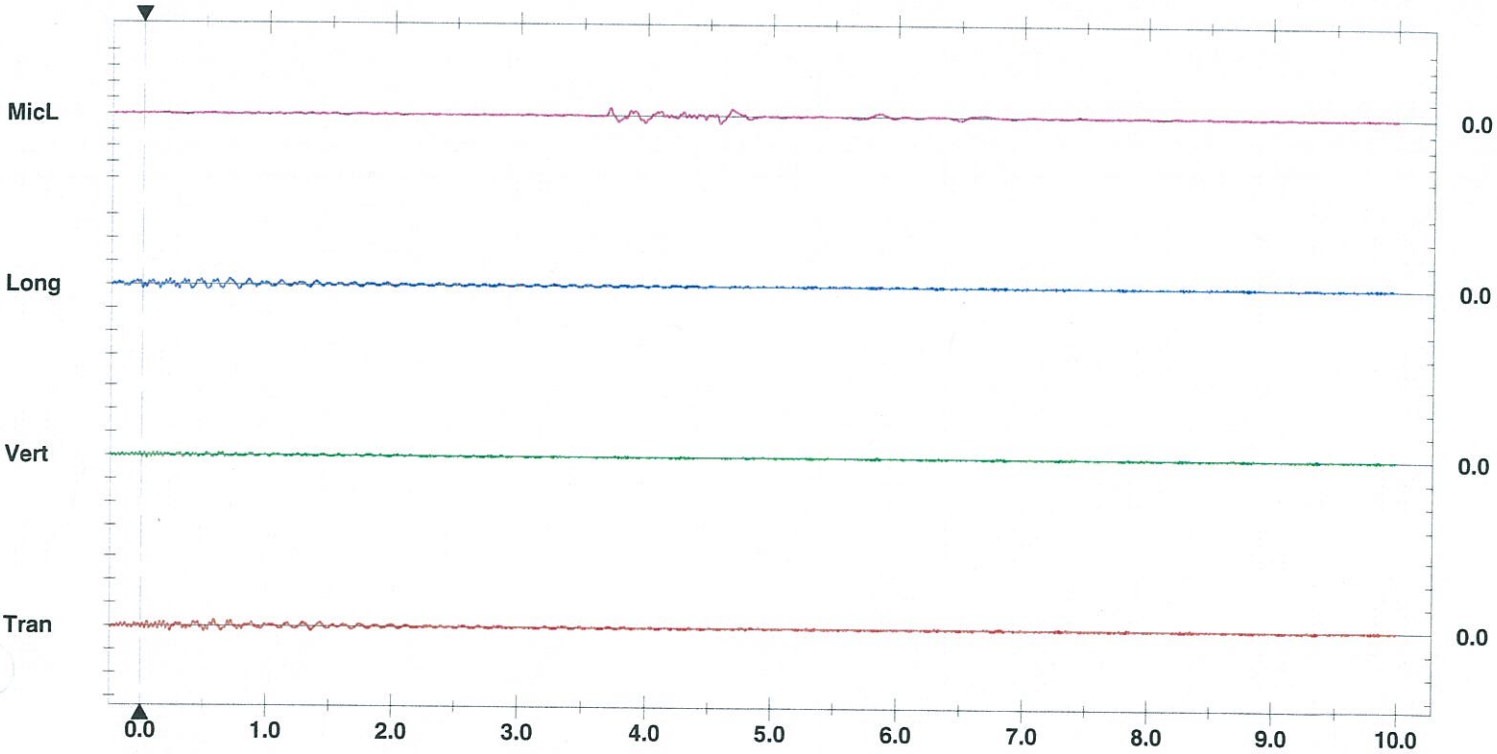
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	104.2 dB(L) at 3.698 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 697 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0150	0.0250	in/s
ZC Freq	27	43	9.3	Hz
Time (Rel. to Trig)	0.230	0.041	0.690	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00034	0.00008	0.00041	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0335 in/s at 0.691 sec



Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-15-16 Blast No. 3-15-16 5D Time 11:54

Exact Blast Location FACE 5D: N 29° 39' 01.8" W 98° 17' 16.8"

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 39' 01.8"
W 98° 17' 16.8"

MONITOR GPS

N 29 38' 23"
W 98 17' 40"

SEISMOGRAPH DATA

Seismograph No. 13138 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 02-23-16 Microphone Calibration 02-23-16

Exact Seismograph Location Warden Residence: 21375 Gunther Grove Drive, Trophy Oaks Subdivision
10' N of NE corner of pool at the rock wall

Seismograph Distance from Blast 4,431'

Peak Overpressure 108.8 dB Scaled Distance ------

Peak Particle Velocity .085 ips Operator DAVID LARMER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 3-15-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:54:11 March 15, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

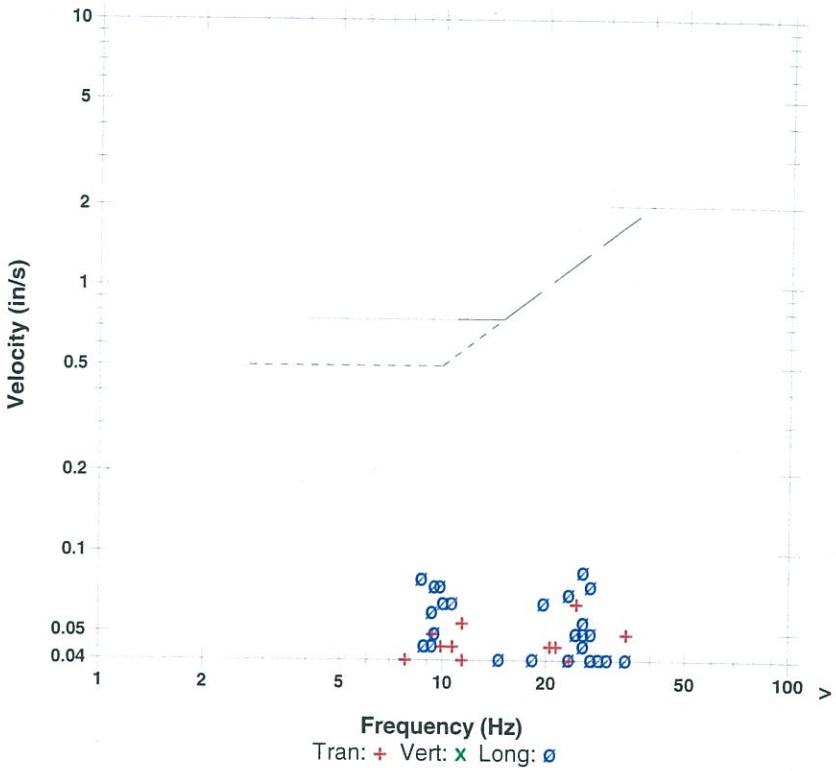
Serial Number	BF13138 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	February 23, 2016 by Vibra-Tech Inc.
File Name	O138GA8M.EB1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra-Tech
General:

Extended Notes

Post Event Notes
Warden Residence: 4,431'

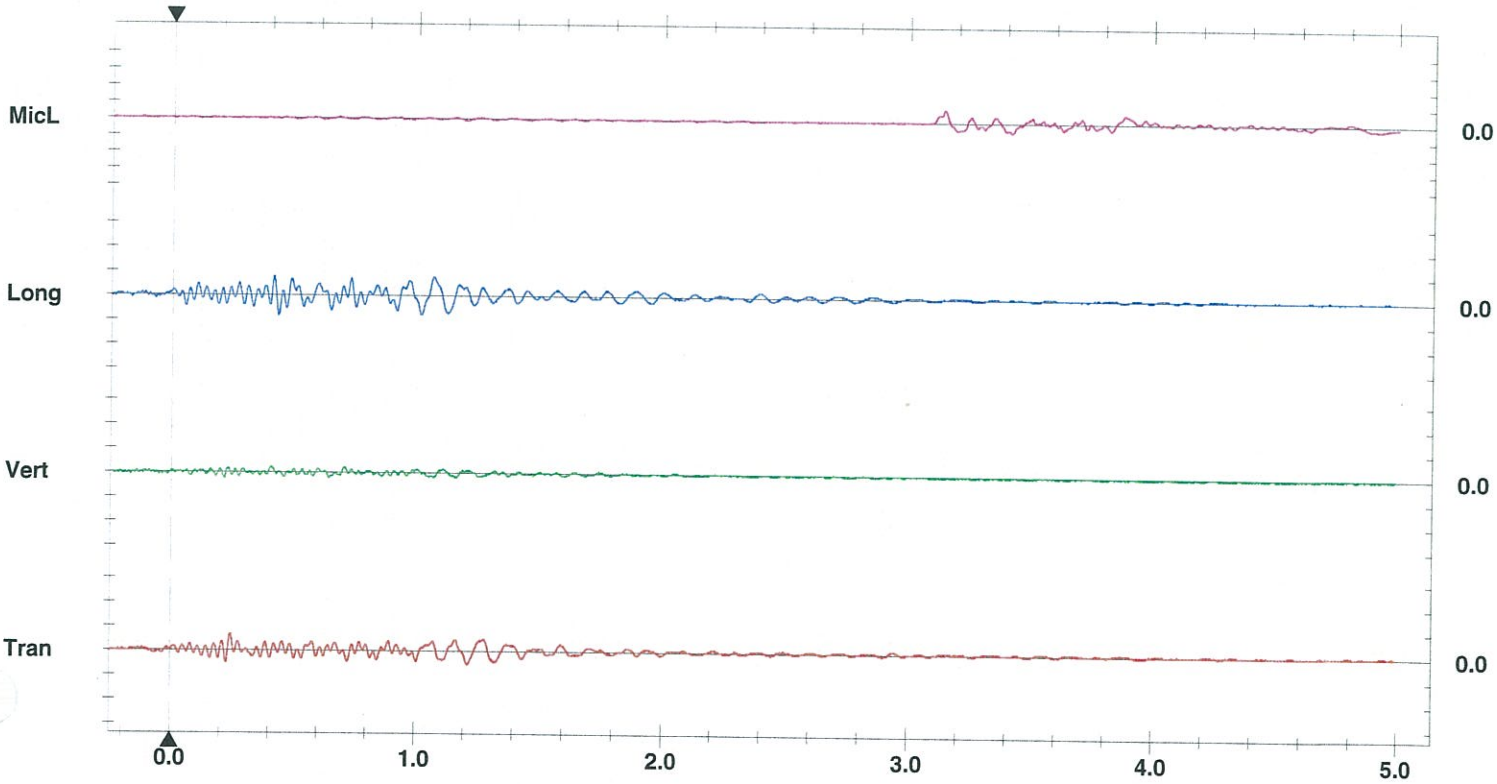
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	108.8 dB(L) at 3.139 sec
ZC Freq	8.1 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 525 mv)

	Tran	Vert	Long	
PPV	0.0650	0.0250	0.0850	in/s
ZC Freq	24	34	26	Hz
Time (Rel. to Trig)	0.242	0.213	0.430	sec
Peak Acceleration	0.0265	0.0265	0.0398	g
Peak Displacement	0.00093	0.00035	0.00126	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0857 in/s at 0.430 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-15-16 Blast No. 3-15-16 5D Time 11:54

Exact Blast Location FACE 5D: N 29° 39' 01.8" W 98° 17' 16.8"

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 39' 01.8"
W 98° 17' 16.8"

MONITOR GPS

N 29 38' 25"
W 98 17' 39"

SEISMOGRAPH DATA

Seismograph No. 13922 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 11-22-15 Microphone Calibration 11-22-15

Exact Seismograph Location Warden Property Line: 21375 Gunther Grove Drive, Trophy Oaks Subdivision North East corner of the property, at the pink pin flag

Seismograph Distance from Blast 4,211'

Peak Overpressure 108.8 dB Scaled Distance ------

Peak Particle Velocity .055 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 3-15-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

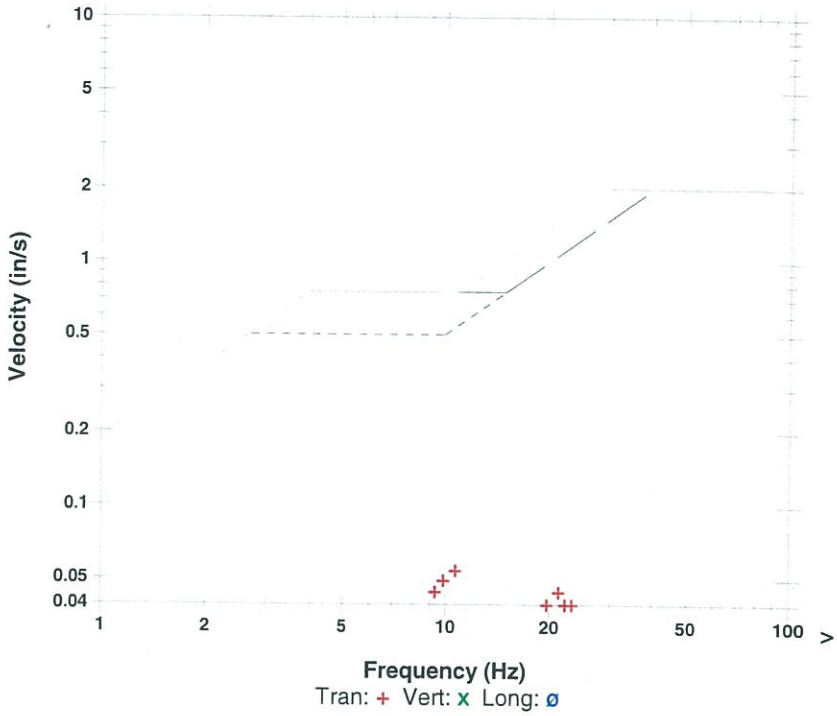
Date/Time	Tran at 11:53:18 March 15, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

Serial Number	BF13922 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	November 22, 2015 by Vibra-Tech Inc.
File Name	O922GA8M.CU1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Post Event Notes
Warden Prop Line: 4,211'

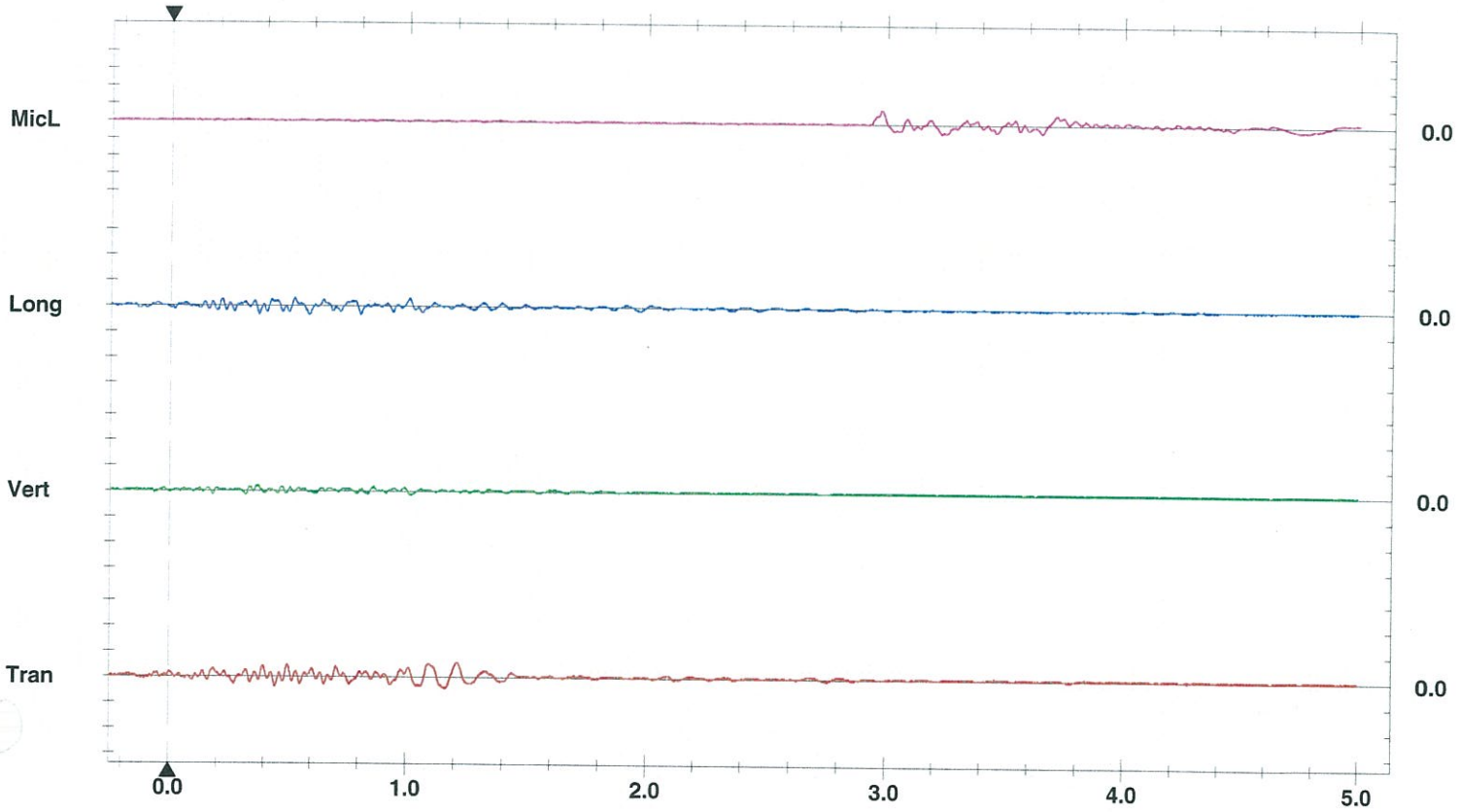
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	108.8 dB(L) at 2.971 sec
ZC Freq	7.9 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 546 mv)

	Tran	Vert	Long	
PPV	0.0550	0.0200	0.0350	in/s
ZC Freq	11	22	23	Hz
Time (Rel. to Trig)	1.208	0.363	0.370	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00093	0.00017	0.00038	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0555 in/s at 1.218 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 16, 2016 Blast No. 63-16-16 Base Pit 213 Time 11:30

Exact Blast Location Base Pit 213

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N: 29° 38' 19"

W: 98° 17' 04.8"

MONITOR GPS

N 29 38' 22.63

W 98 18' 53.97

SEISMOGRAPH DATA

Seismograph No. 6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location City Property Line: outside city water tower gate

30' from gate at the property line

Seismograph Distance from Blast 4346 Ft.

Peak Overpressure 101.0 dB Scaled Distance ------

Peak Particle Velocity 0.025 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3/16/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:30:56 March 16, 2016	**Serial Number**	BD6191 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s	**Battery Level**	6.3 Volts
	Mic: 122 dB(L)	**Calibration**	July 16, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	H191GAAF.ZK1
Record Time	10.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

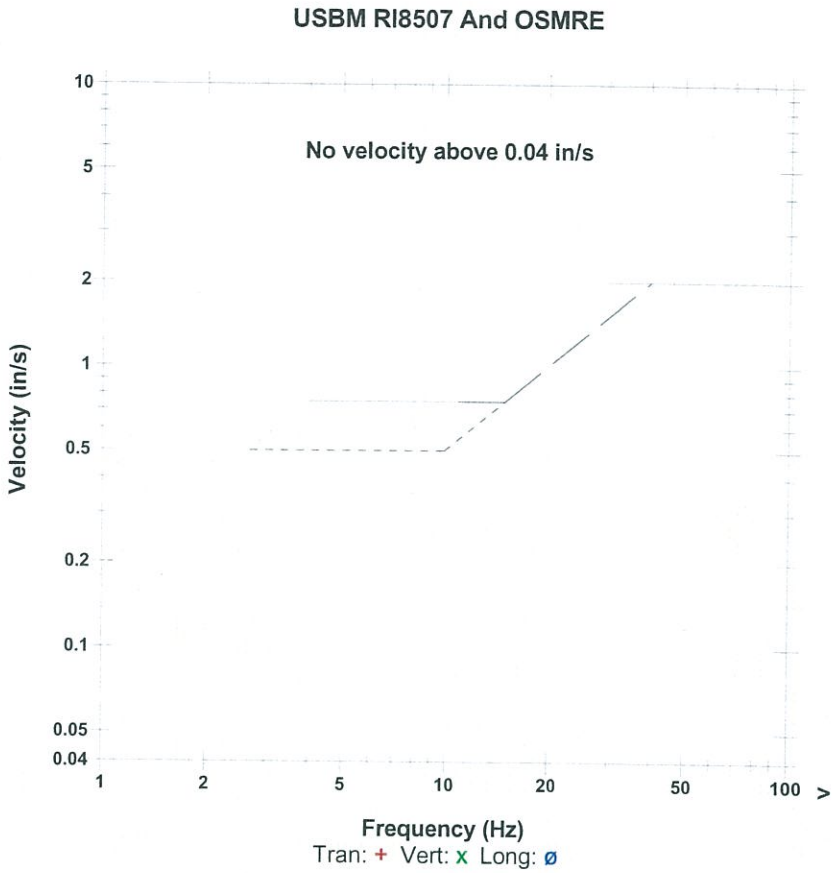
Extended Notes

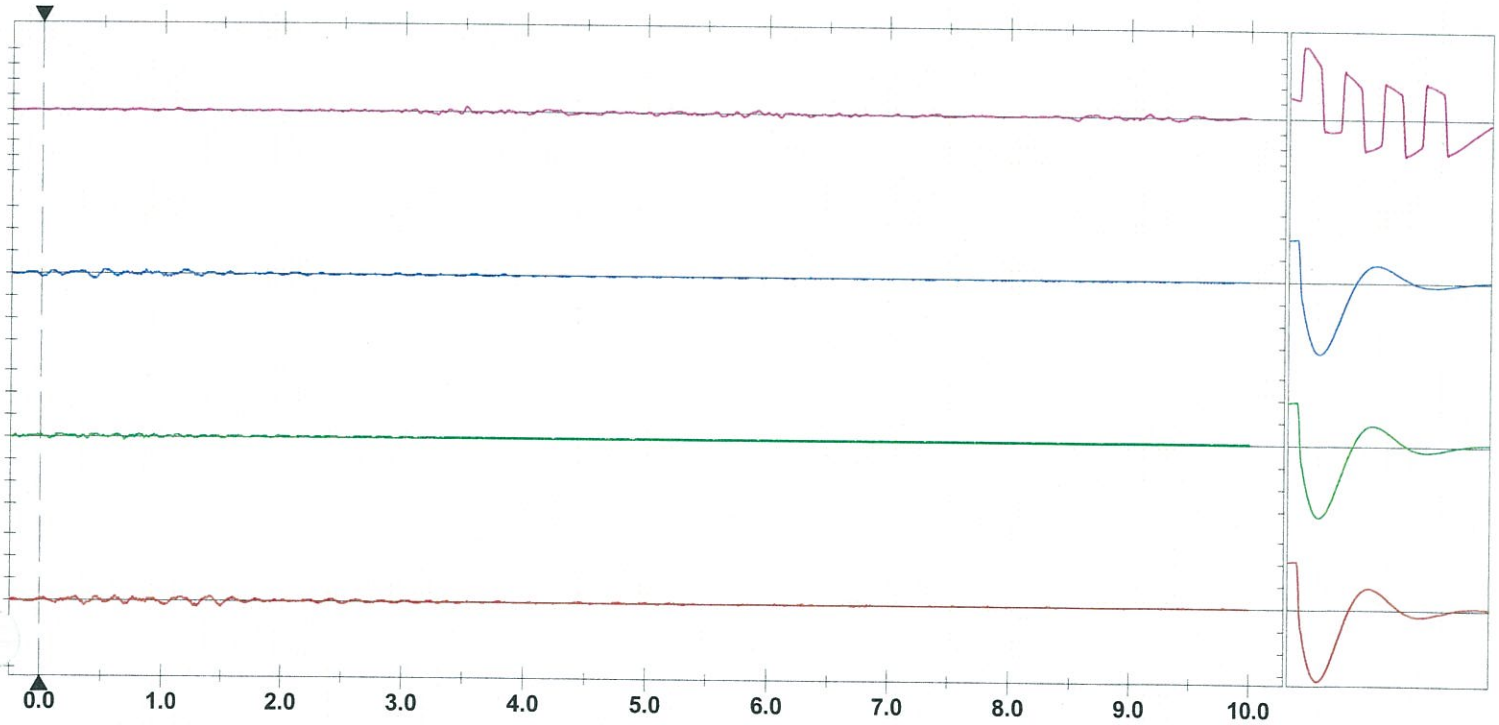
Post Event Notes
City Property Line
4346 ft. to Blast

Microphone Linear Weighting
PSPL 101.0 dB(L) at 3.502 sec
ZC Freq 9.3 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 596 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0150	0.0250	in/s
ZC Freq	8.0	30	6.2	Hz
Time (Rel. to Trig)	0.362	0.686	0.416	sec
Peak Acceleration	0.0265	0.0133	0.0133	g
Peak Displacement	0.00066	0.00021	0.00074	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.9	7.6	7.2	Hz
Overswing Ratio	3.3	3.5	4.1	

Peak Vector Sum 0.0287 in/s at 0.439 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— ——◀

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 16, 2016 Blast No. 03-16-16 Base Pit 2B Time 11:30

Exact Blast Location Base Pit 2B

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 19"
W 98° 17' 04.8"

MONITOR GPS

N 29 38 58.8
W 98 18 17.5

SEISMOGRAPH DATA

Seismograph No. 8949 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location Cruz Residence – 22410 Oro Viejo Ct – George Ranch Subdivision

15' E off SE corner of garage at fence

Seismograph Distance from Blast 7567ft.

Peak Overpressure 98.8 dB Scaled Distance ------

Peak Particle Velocity 0.030 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 3/16/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:30:56 March 16, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

Serial Number	BF8949 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	J949GAAF.ZK1

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra-Tech
General:

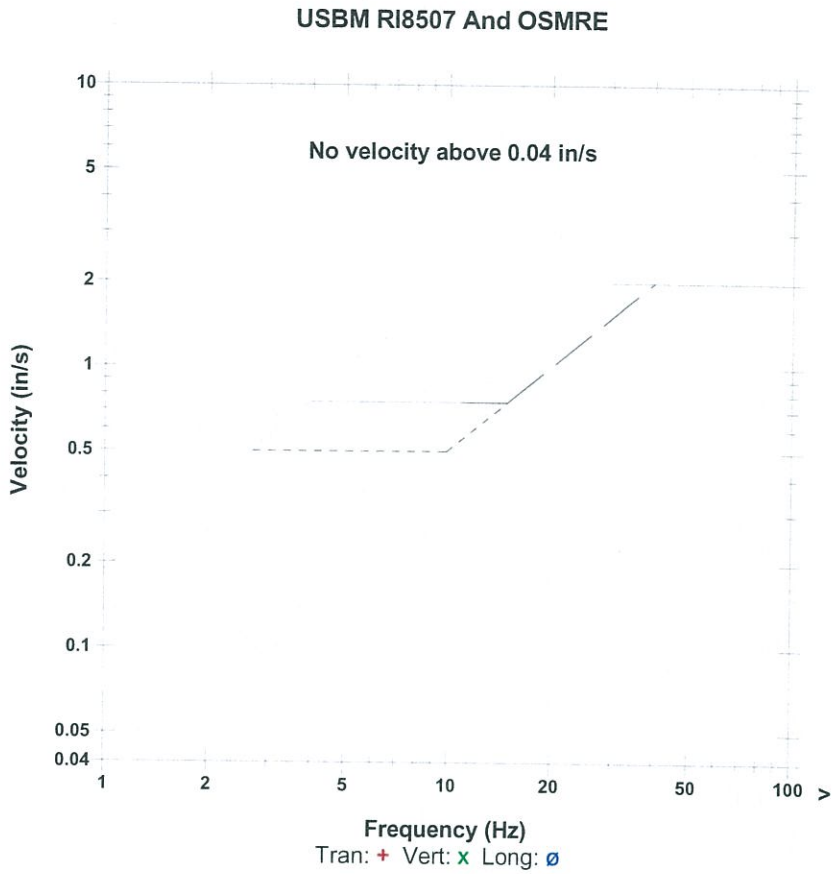
Extended Notes

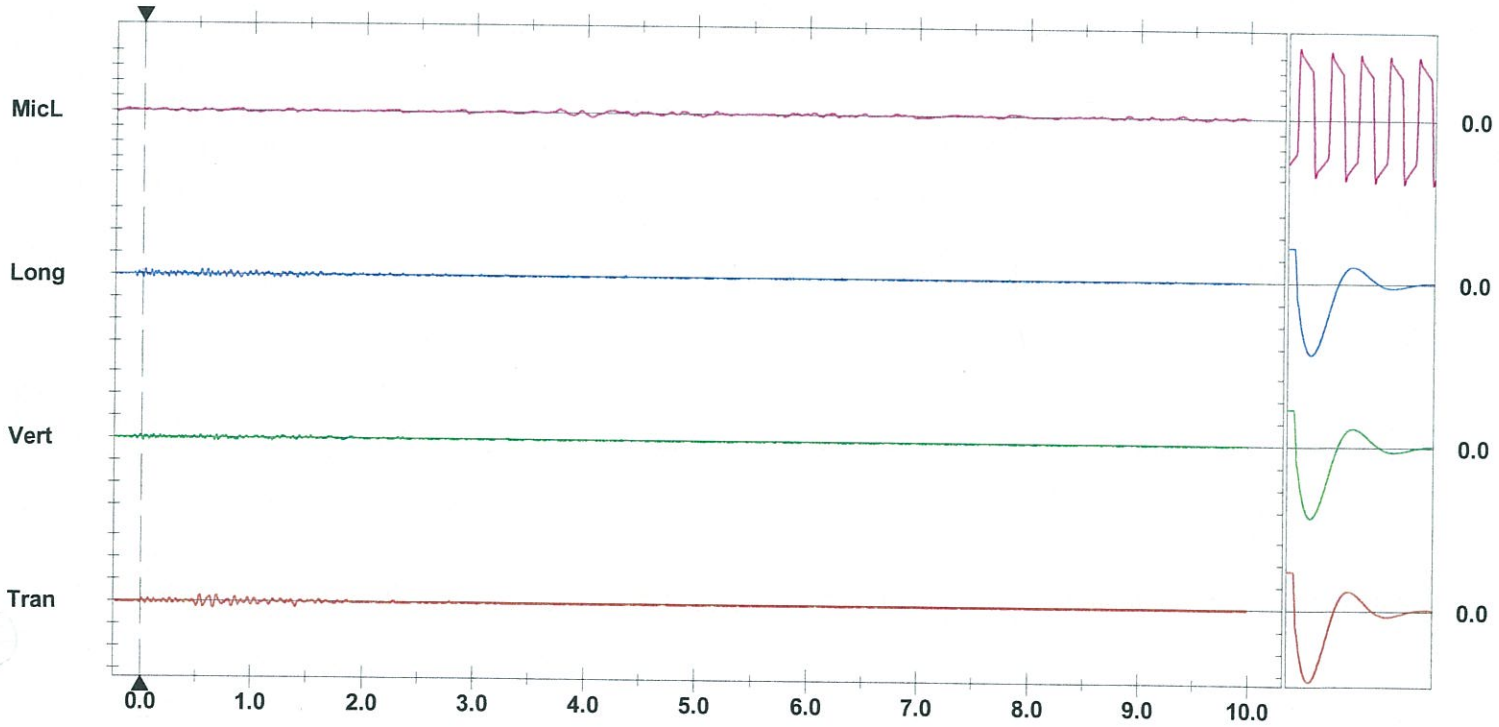
Post Event Notes
Cruz Residence
7567 ft. to Blast

Microphone	Linear Weighting
PSPL	98.8 dB(L) at 3.750 sec
ZC Freq	5.3 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 603 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0150	0.0200	in/s
ZC Freq	17	32	30	Hz
Time (Rel. to Trig)	0.654	0.005	0.000	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00032	0.00009	0.00014	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.8	7.3	7.3	Hz
Overswing Ratio	3.6	3.9	4.3	

Peak Vector Sum 0.0350 in/s at 0.662 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 16, 2016 Blast No. 03-16-16 Base Pit 2B Time 11:30

Exact Blast Location Base Pit 2B

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N: 29° 38' 19"
W: 98° 17' 04.8"

MONITOR GPS

N 29 38' 15"
W 98 17' 26"

SEISMOGRAPH DATA

Seismograph No. 10562 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 09-13-15 Microphone Calibration 09-13-15

Exact Seismograph Location Holly Residence: 9916 Trophy Oaks Drive, Trophy Oaks Subdivision backyard along the quarry property line at the barbed wire fence

Seismograph Distance from Blast 1911 ft.

Peak Overpressure 102.8 dB Scaled Distance ------

Peak Particle Velocity 0.19 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3/16/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 11:30:54 March 16, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

Serial Number	BF10562 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	September 13, 2015 by Vibra-Tech Inc.
File Name	L562GAAF.ZI1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Extended Notes

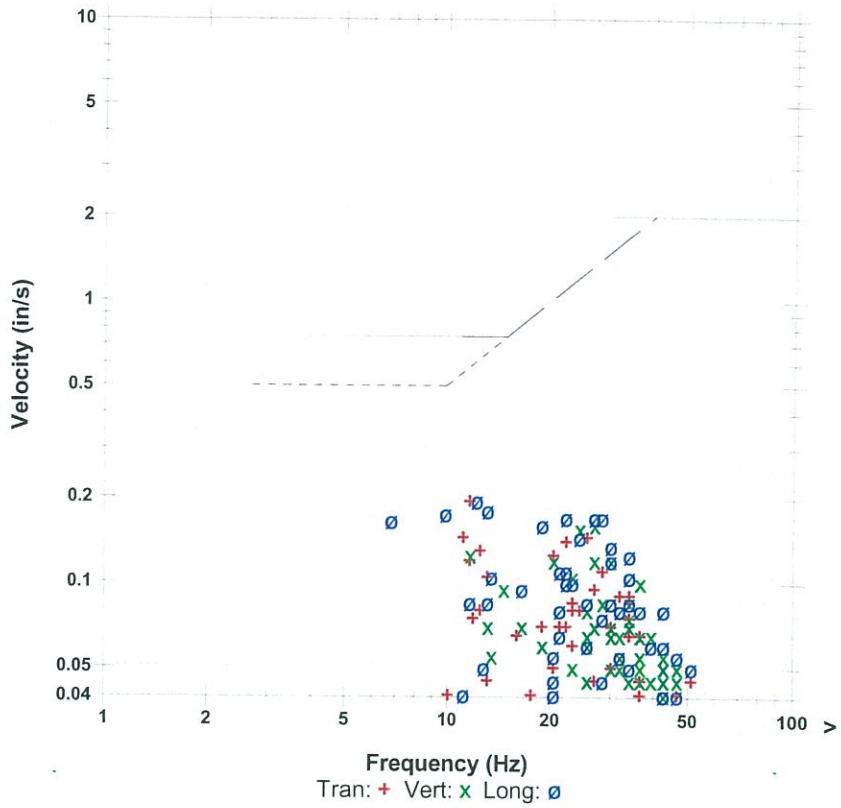
Post Event Notes
Holly Residence
1911 ft. to Blast

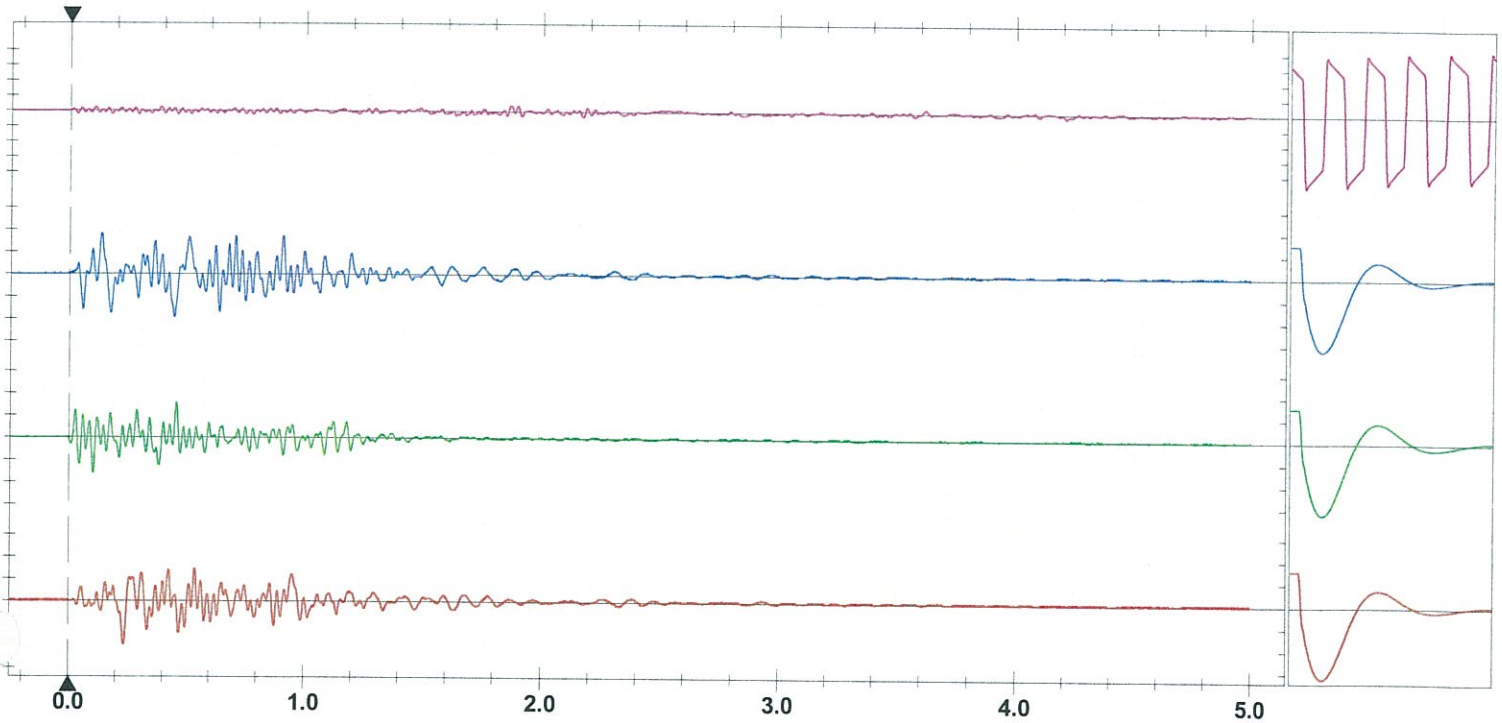
Microphone	Linear Weighting
PSPL	102.8 dB(L) at 1.862 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 554 mv)

	Tran	Vert	Long	
PPV	0.195	0.160	0.195	in/s
ZC Freq	12	27	12	Hz
Time (Rel. to Trig)	0.235	0.100	0.445	sec
Peak Acceleration	0.0663	0.0663	0.0795	g
Peak Displacement	0.00197	0.00155	0.00246	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.2	7.5	7.4	Hz
Overswing Ratio	4.1	3.5	4.0	

Peak Vector Sum 0.207 in/s at 0.174 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— ——◀

Dynamic Geo Cal.

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 16, 2016 Blast No. 03-16-16 Base Pit 2B Time 11:30

Exact Blast Location Base Pit 2B

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N: 29° 38' 19"
W: 98° 17' 04.8"

MONITOR GPS

N 29 38' 52"
W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 10626 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-21-15 Microphone Calibration 07-21-15

Exact Seismograph Location Taveres Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 7374 ft.

Peak Overpressure 100.0 dB Scaled Distance ------

Peak Particle Velocity 0.030 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3/16/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:30:55 March 16, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps
Job Number:	1

Serial Number	BB10626 V 7.04-8.0 EVERLERT III
Battery Level	6.3 Volts
Calibration	July 21, 2015 by Vibra-Tech Inc.
File Name	L626GAAF.ZJ1

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra Tech
General:

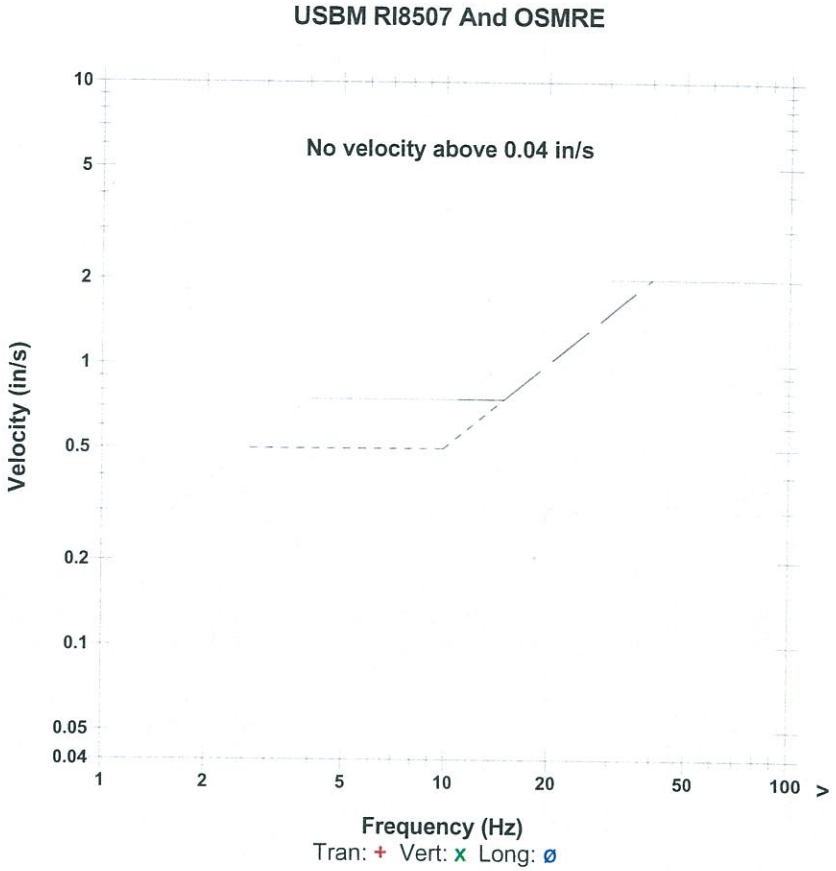
Extended Notes

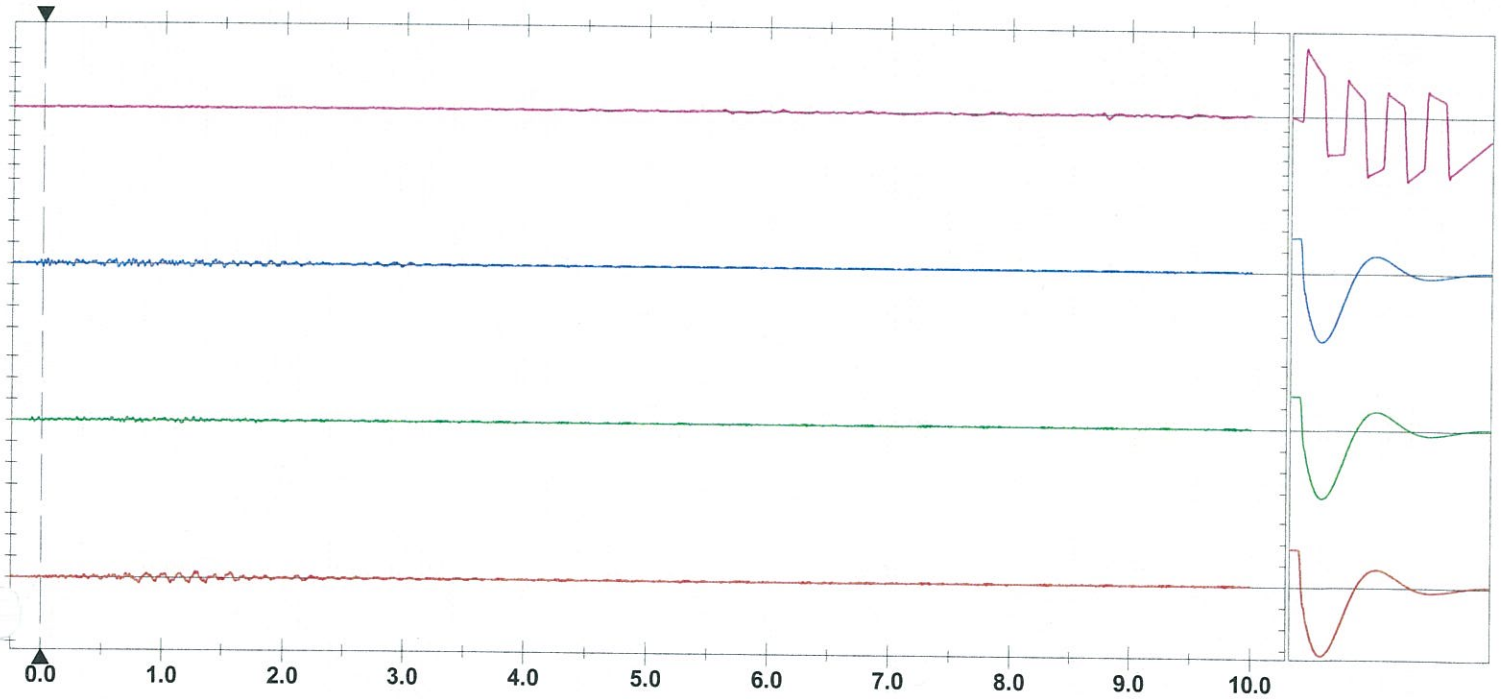
Post Event Notes
Taveres Residence
7374 ft. to Blast

Microphone	Linear Weighting
PSPL	100.0 dB(L) at 8.806 sec
ZC Freq	8.4 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 703 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0150	0.0200	in/s
ZC Freq	10	27	47	Hz
Time (Rel. to Trig)	1.284	0.703	0.000	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00050	0.00014	0.00018	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.8	3.7	3.9	

Peak Vector Sum 0.0308 in/s at 1.284 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 16, 2016 Blast No. 03-16-16 Base Pit 2D Time 11:30

Exact Blast Location Base Pit 2B

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N: 29° 38' 19"

W: 98° 17' 04.8"

MONITOR GPS

N 29 38' 23"

W 98 17' 40"

SEISMOGRAPH DATA

Seismograph No. 13138 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 02-23-16 Microphone Calibration 02-23-16

Exact Seismograph Location Warden Residence: 21375 Gunther Grove Drive, Trophy Oaks Subdivision

10' N of NE corner of pool at the rock wall

Seismograph Distance from Blast 3127 ft.

Peak Overpressure 101.0 dB Scaled Distance ------

Peak Particle Velocity 0.13 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3/16/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 11:30:55 March 16, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

Serial Number	BF13138 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	February 23, 2016 by Vibra-Tech Inc.
File Name	O138GAAF.ZJ1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra-Tech
General:

Extended Notes

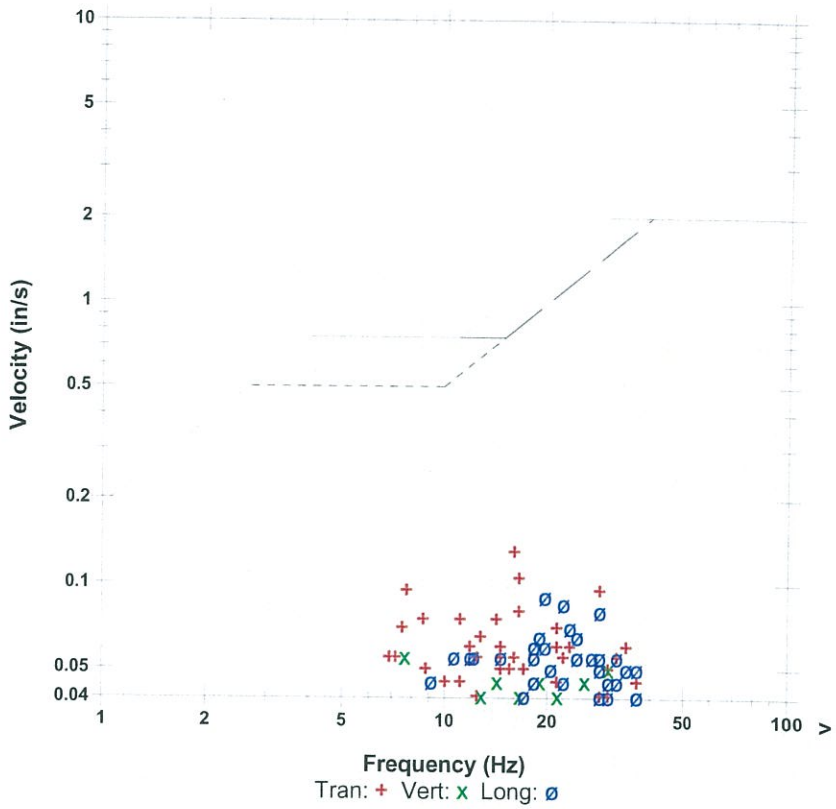
Post Event Notes
Warden Residence
3127 ft. to Blast

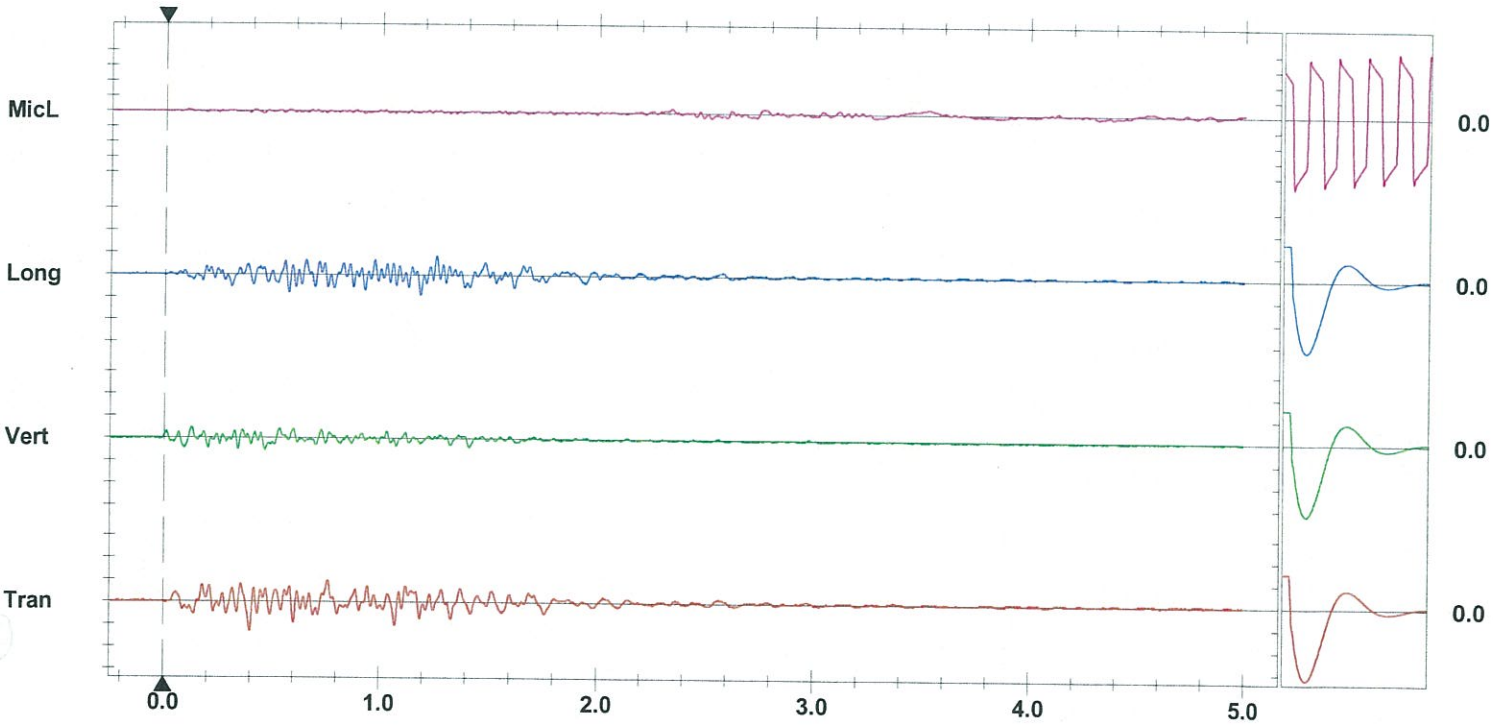
Microphone	Linear Weighting
PSPL	101.0 dB(L) at 2.519 sec
ZC Freq	5.1 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 558 mv)

	Tran	Vert	Long	
PPV	0.130	0.0550	0.0900	in/s
ZC Freq	16	7.6	20	Hz
Time (Rel. to Trig)	0.399	0.465	1.181	sec
Peak Acceleration	0.0398	0.0265	0.0398	g
Peak Displacement	0.00142	0.00097	0.00094	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.1	7.3	7.3	Hz
Overswing Ratio	3.9	3.5	3.9	

Peak Vector Sum 0.138 in/s at 0.402 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Dynamic Geo Cal.

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-17-16 Blast No. 03-17-16 Upper 3A Time 11:35

Exact Blast Location Upper 3A

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS
N 29° 38' 36.7"
W 98° 17' 35.2"

MONITOR GPS
N 29 38' 22.63
W 98 18' 53.97

SEISMOGRAPH DATA

Seismograph No. 6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location City Property Line: outside city water tower gate
30' from gate at the property line

Seismograph Distance from Blast 2183'

Peak Overpressure 108.4 dB Scaled Distance ------

Peak Particle Velocity .040 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-17-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:35:29 March 17, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

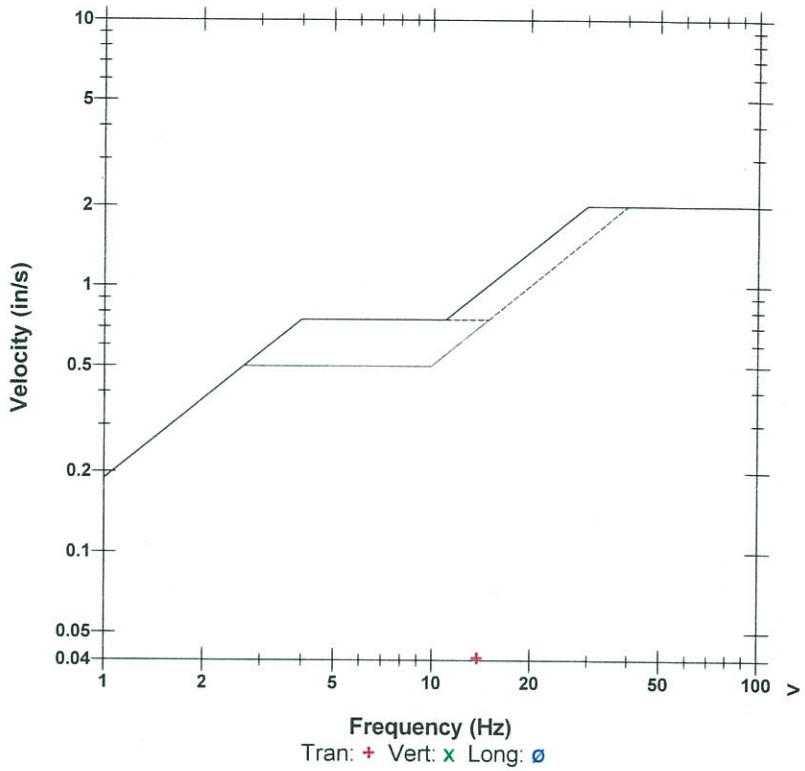
Serial Number	BD6191 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	H191GACA.V51

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Extended Notes

Post Event Notes
City Property Line
Distance - 2183 ft

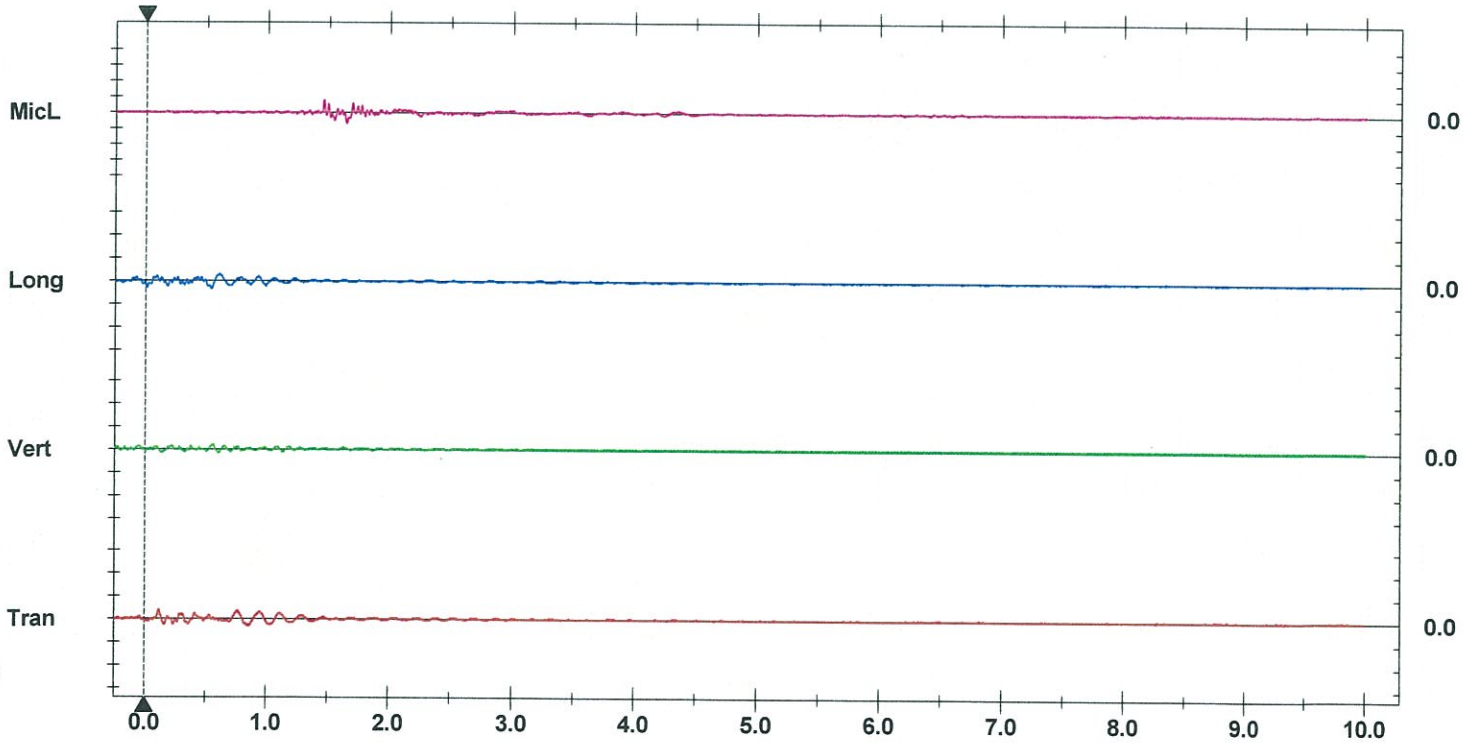
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	108.4 dB(L) at 1.454 sec
ZC Freq	22 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 557 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0200	0.0350	in/s
ZC Freq	14	12	7.9	Hz
Time (Rel. to Trig)	0.116	0.544	0.532	sec
Peak Acceleration	0.0133	0.0133	0.0133	g
Peak Displacement	0.00086	0.00031	0.00073	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0403 in/s at 0.116 sec



Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶----------◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-17-16 Blast No. 03-17-16 Upper 3A Time 11:35

Exact Blast Location Upper 3A

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 36.7"
W 98° 17' 35.2"

MONITOR GPS

N 29 38 58.8
W 98 18 17.5

SEISMOGRAPH DATA

Seismograph No. 8949 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location Cruz Residence – 22410 Oro Viejo Ct – George Ranch Subdivision

15' E off SE corner of garage at fence

Seismograph Distance from Blast 4347'

Peak Overpressure 101.9 dB Scaled Distance ------

Peak Particle Velocity 0.020 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-17-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:35:29 March 17, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

Serial Number	BF8949 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	J949GACA.V51

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra-Tech
General:

Extended Notes

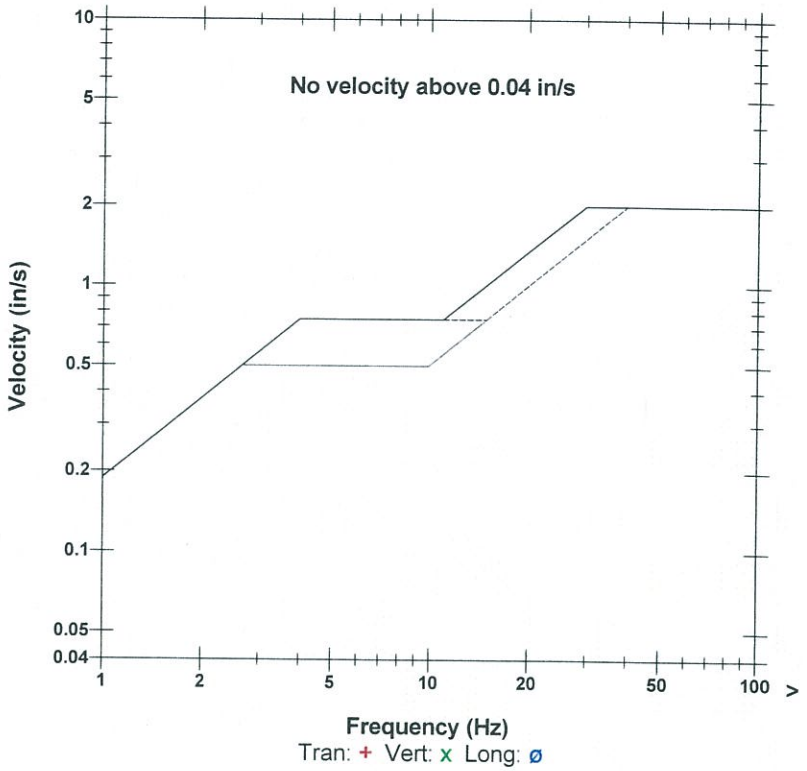
Post Event Notes
Cruz Residence
Distance - 4347 ft

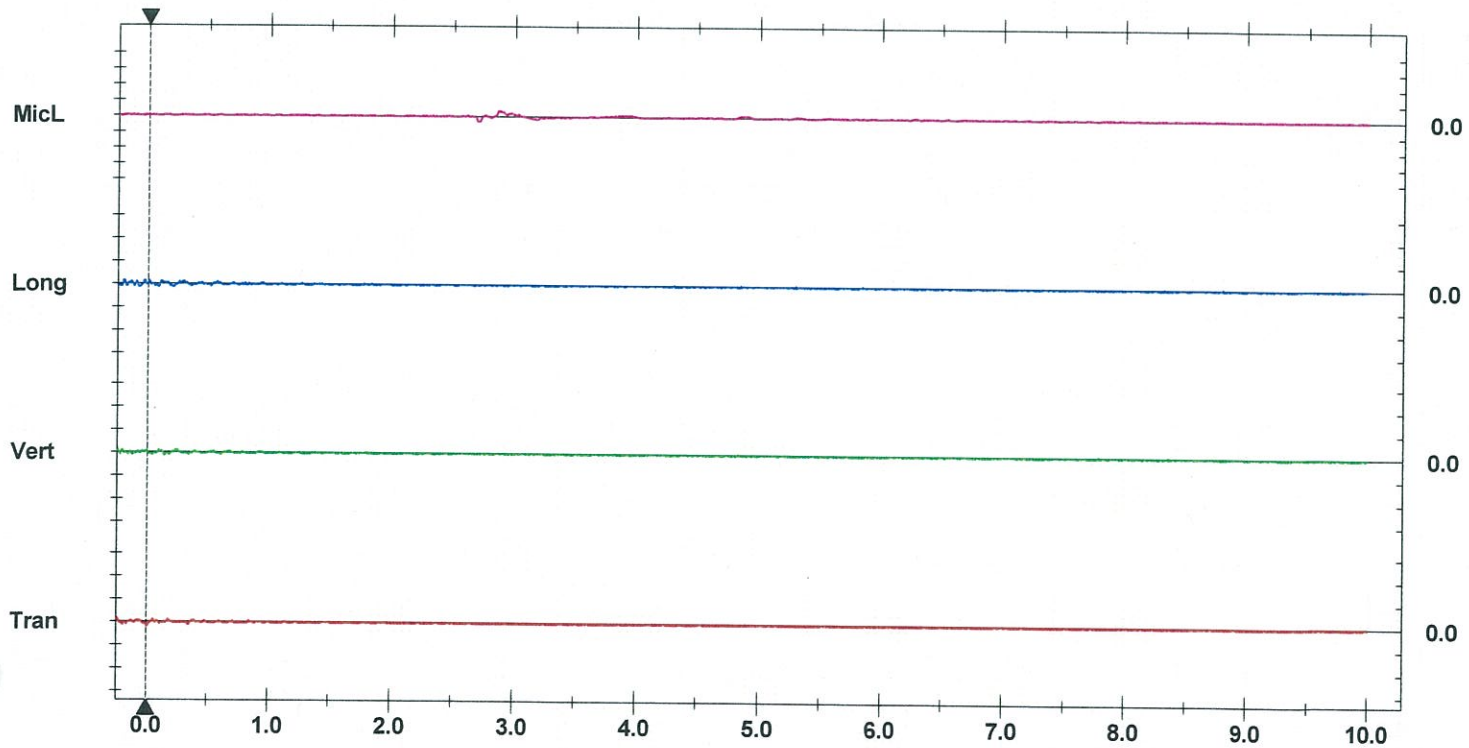
Microphone	Linear Weighting
PSPL	101.9 dB(L) at 2.863 sec
ZC Freq	2.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 516 mv)

	Tran	Vert	Long	
PPV	0.0200	0.0150	0.0150	in/s
ZC Freq	18	32	28	Hz
Time (Rel. to Trig)	0.000	0.143	-0.203	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00020	0.00010	0.00018	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0255 in/s at 0.008 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶----------◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-17-16 Blast No. 03-17-16 Upper 3A Time 11:35

Exact Blast Location Upper 3A

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 36.7"
W 98° 17' 35.2"

MONITOR GPS

N 29 38' 52"
W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 10626 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-21-15 Microphone Calibration 07-21-15

Exact Seismograph Location Taveres Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 4192'

Peak Overpressure 101.9 dB Scaled Distance ------

Peak Particle Velocity 0.045 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-17-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:35:29 March 17, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps
Job Number:	1

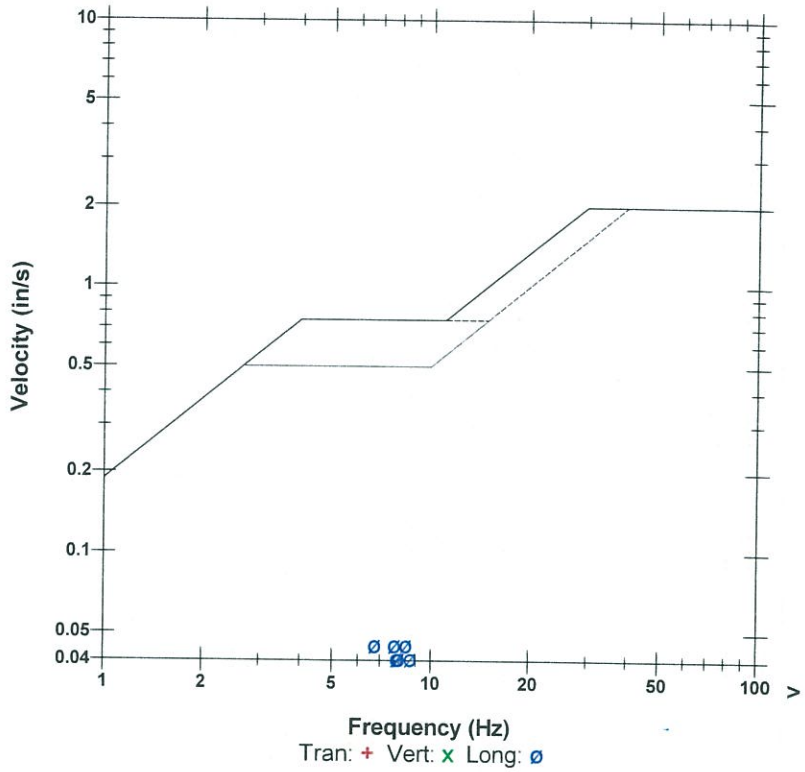
Serial Number	BB10626 V 7.04-8.0 EVERLERT III
Battery Level	6.3 Volts
Calibration	July 21, 2015 by Vibra-Tech Inc.
File Name	L626GACA.V51

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra Tech
General:

Extended Notes

Post Event Notes
Taveres Residence
Distance - 4192 ft

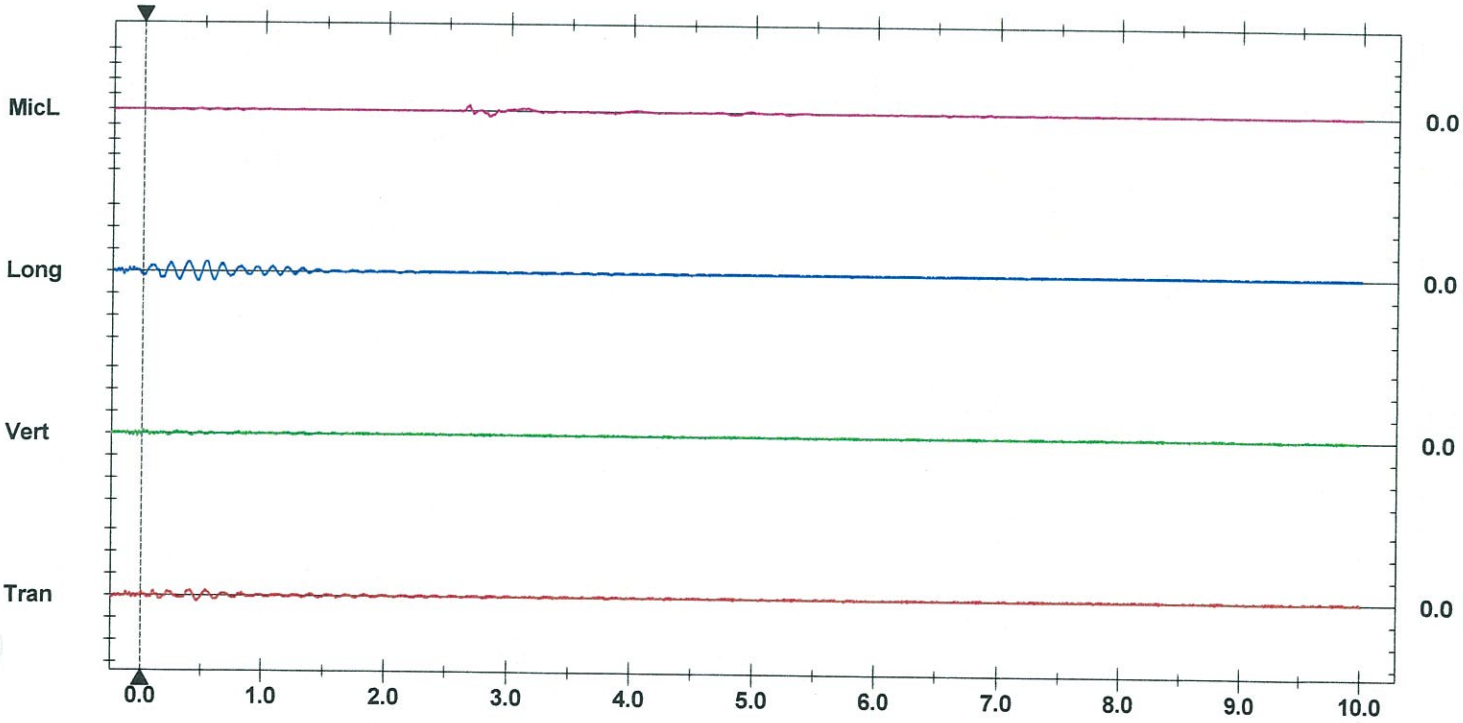
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	101.9 dB(L) at 2.660 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 683 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0150	0.0450	in/s
ZC Freq	9.0	51	6.7	Hz
Time (Rel. to Trig)	0.409	-0.041	0.375	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00047	0.00008	0.00104	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0517 in/s at 0.458 sec



Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶----------◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-17-16 Blast No. 03-17-16 Upper 3A Time 11:35

Exact Blast Location Upper 3A

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 36.7"
W 98° 17' 35.2"

MONITOR GPS

N 29 38' 23"
W 98 17' 40"

SEISMOGRAPH DATA

Seismograph No. 13138 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 02-23-16 Microphone Calibration 02-23-16

Exact Seismograph Location Warden Residence: 21375 Gunther Grove Drive, Trophy Oaks Subdivision

10' N of NE corner of pool at the rock wall

Seismograph Distance from Blast 1451

Peak Overpressure 111.5 dB Scaled Distance ------

Peak Particle Velocity 0.210 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-17-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 11:35:30 March 17, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

Serial Number	BF13138 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	February 23, 2016 by Vibra-Tech Inc.
File Name	O138GACA.V61

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra-Tech
General:

Extended Notes

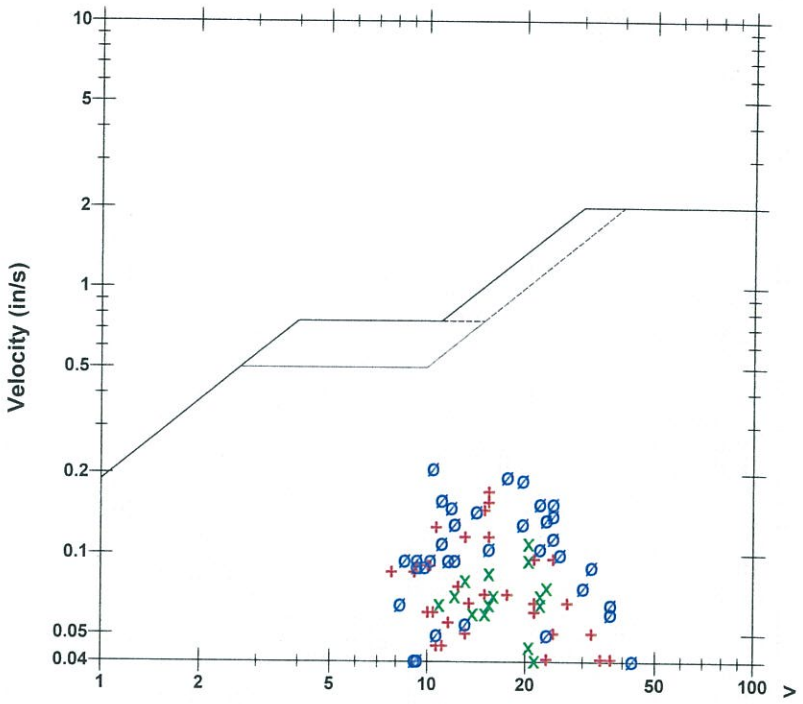
Post Event Notes
Warden Residence
Distance - 1451 ft

Microphone	Linear Weighting
PSPL	111.5 dB(L) at 1.079 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 583 mv)

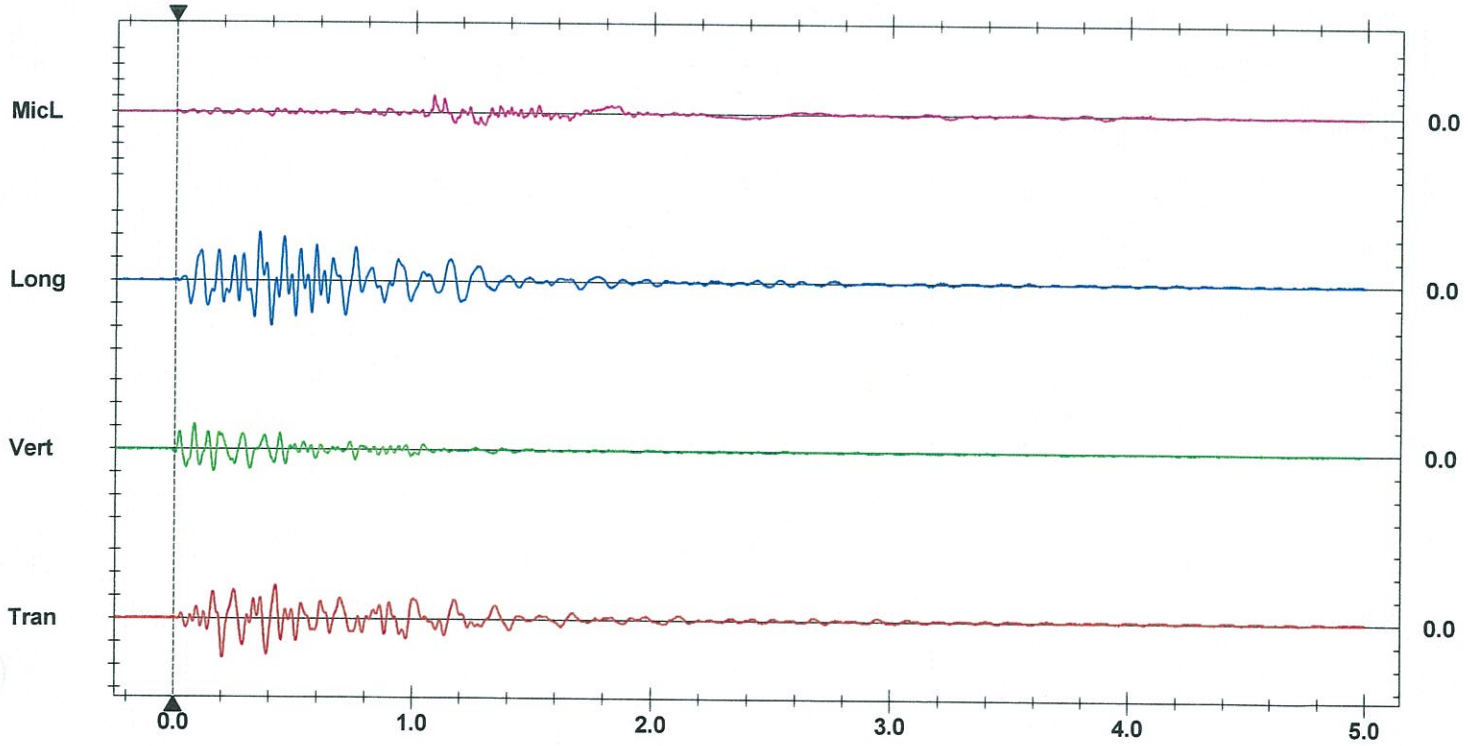
	Tran	Vert	Long	
PPV	0.170	0.110	0.210	in/s
ZC Freq	16	20	10	Hz
Time (Rel. to Trig)	0.202	0.081	0.351	sec
Peak Acceleration	0.0530	0.0398	0.0795	g
Peak Displacement	0.00158	0.00097	0.00222	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.211 in/s at 0.353 sec

USBM RI8507 And OSMRE



Tran: + Vert: x Long: ø



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶----------◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-17-16 Blast No. 03-17-16 Upper 3A Time 11:35

Exact Blast Location Upper 3A

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS
N29° 38' 36.7"
W98° 17' 35.2"

MONITOR GPS
N 29 38' 25"
W 98 17' 39"

SEISMOGRAPH DATA

Seismograph No. 13922 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 11-22-15 Microphone Calibration 11-22-15

Exact Seismograph Location Warden Property Line: 21375 Gunther Grove Drive, Trophy Oaks Subdivision North East corner of the property, at the pink pin flag

Seismograph Distance from Blast 1232'

Peak Overpressure 111.2 dB Scaled Distance ------

Peak Particle Velocity 0.150 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-17-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 11:35:29 March 17, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

Serial Number	BF13922 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	November 22, 2015 by Vibra-Tech Inc.
File Name	O922GACA.V51

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

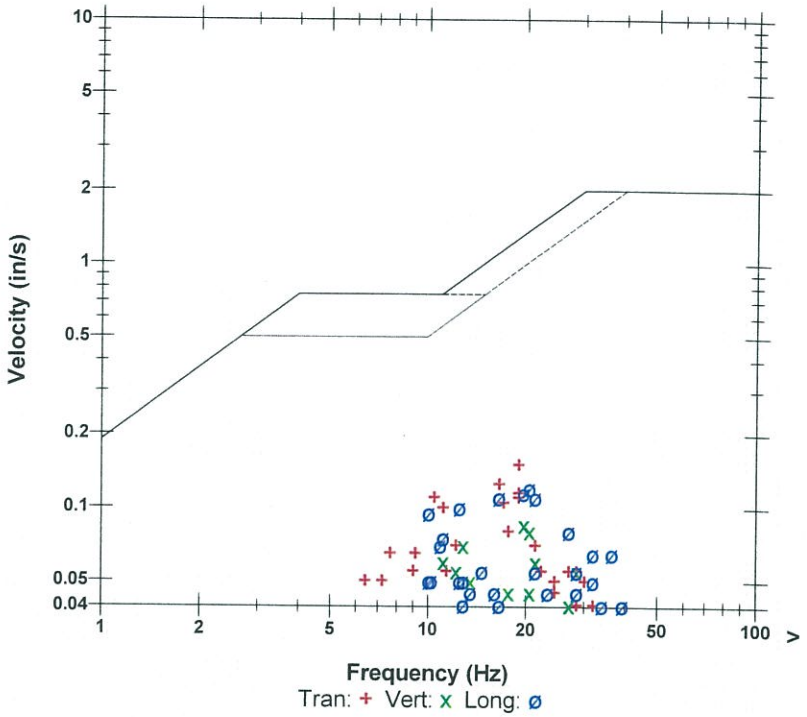
Post Event Notes
Warden Property Line
Distance - 1232 ft

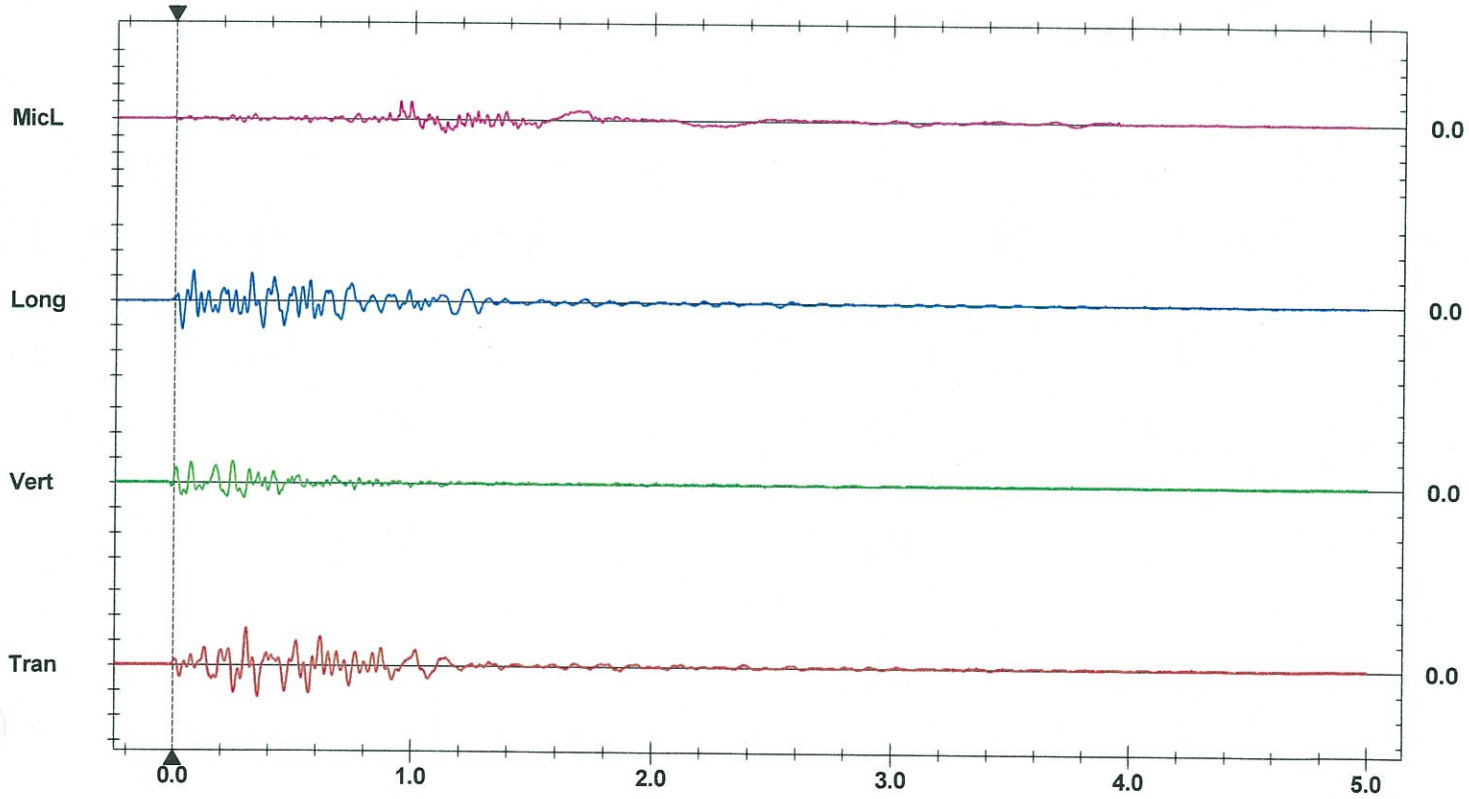
Microphone	Linear Weighting
PSPL	111.2 dB(L) at 0.938 sec
ZC Freq	6.7 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 520 mv)

	Tran	Vert	Long	
PPV	0.150	0.0850	0.120	in/s
ZC Freq	19	20	20	Hz
Time (Rel. to Trig)	0.305	0.242	0.076	sec
Peak Acceleration	0.0530	0.0398	0.0530	g
Peak Displacement	0.00125	0.00082	0.00117	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.153 in/s at 0.305 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶----------◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-21-16 Blast No. 3-21-16 3E Time 11:52

Exact Blast Location FACE 3E

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29 38 54.9
W 98 17 37.2

MONITOR GPS

N 29 38' 22.63
W 98 18' 53.97

SEISMOGRAPH DATA

Seismograph No. 6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location City Property Line: outside city water tower gate

30' from gate at the property line

Seismograph Distance from Blast 3,588'

Peak Overpressure 103.5 dB Scaled Distance ------

Peak Particle Velocity .025 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: D. Larner Date: 3-21-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:52:13 March 21, 2016	**Serial Number**	BD6191 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s	**Battery Level**	6.3 Volts
	Mic: 122 dB(L)	**Calibration**	July 16, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	H191GAJQ.B11
Record Time	10.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

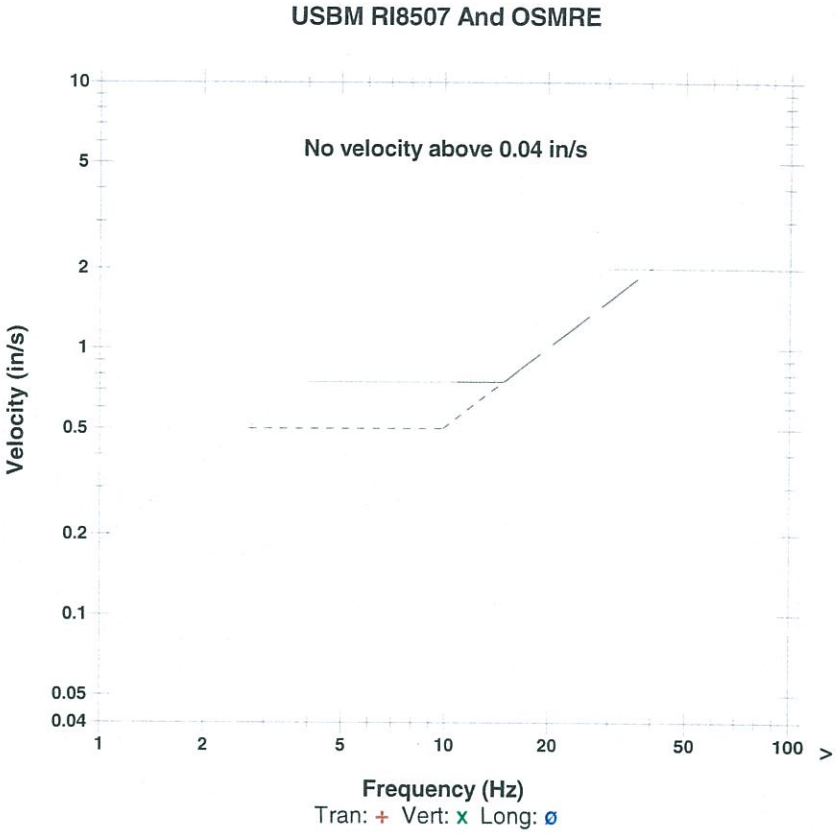
Extended Notes

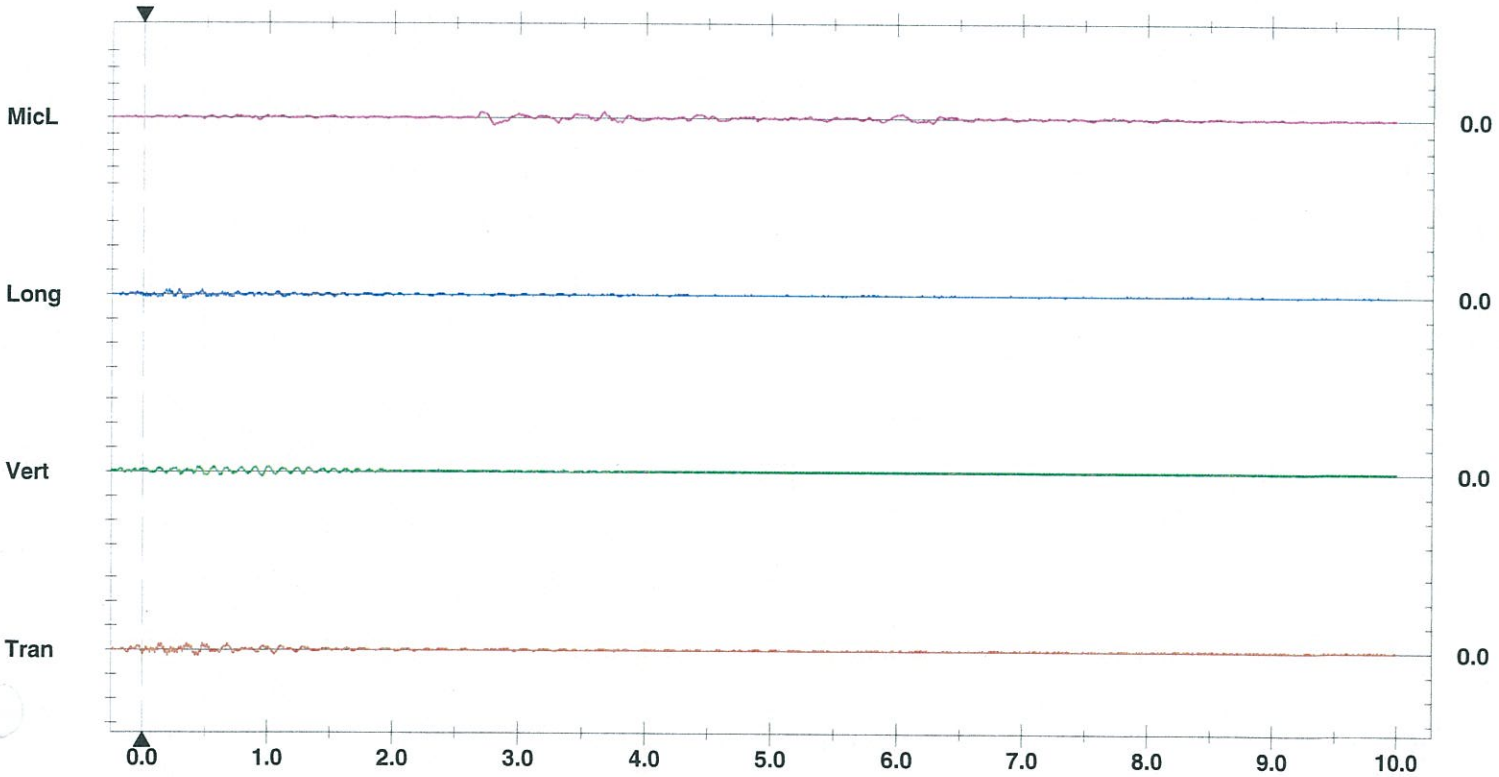
Post Event Notes
City Prop Line: 3,588'

Microphone Linear Weighting
PSPL 103.5 dB(L) at 2.793 sec
ZC Freq 3.2 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 586 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0200	0.0200	in/s
ZC Freq	15	12	28	Hz
Time (Rel. to Trig)	0.128	0.434	0.184	sec
Peak Acceleration	0.0133	0.0133	0.0133	g
Peak Displacement	0.00045	0.00039	0.00012	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0324 in/s at 0.438 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——— ———◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-21-16 Blast No. 3-21-16 3E Time 11:52

Exact Blast Location FACE 3E

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29 38 54.9
W 98 17 37.2

MONITOR GPS

N 29 38 58.8
W 98 18 17.5

SEISMOGRAPH DATA

Seismograph No. 8949 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location Cruz Residence – 22410 Oro Viejo Ct – George Ranch Subdivision

15' E off SE corner of garage at fence

Seismograph Distance from Blast 3,571'

Peak Overpressure 101.9 dB Scaled Distance ------

Peak Particle Velocity .035 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3-21-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:52:08 March 21, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

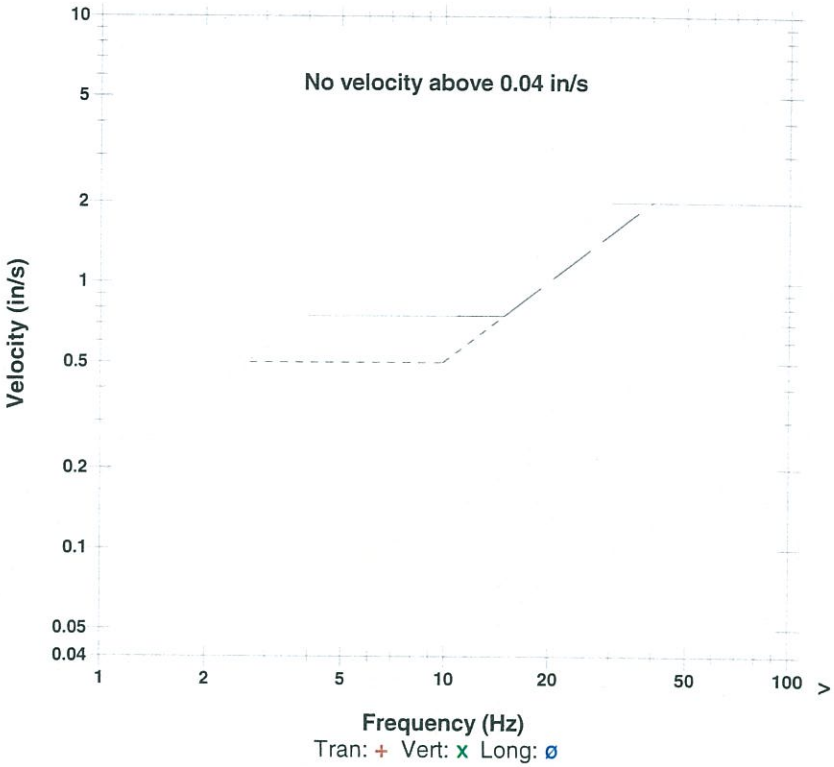
Serial Number	BF8949 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	J949GAJQ.AW1

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra-Tech
General:

Extended Notes

Post Event Notes
Cruz Res: 3,571'

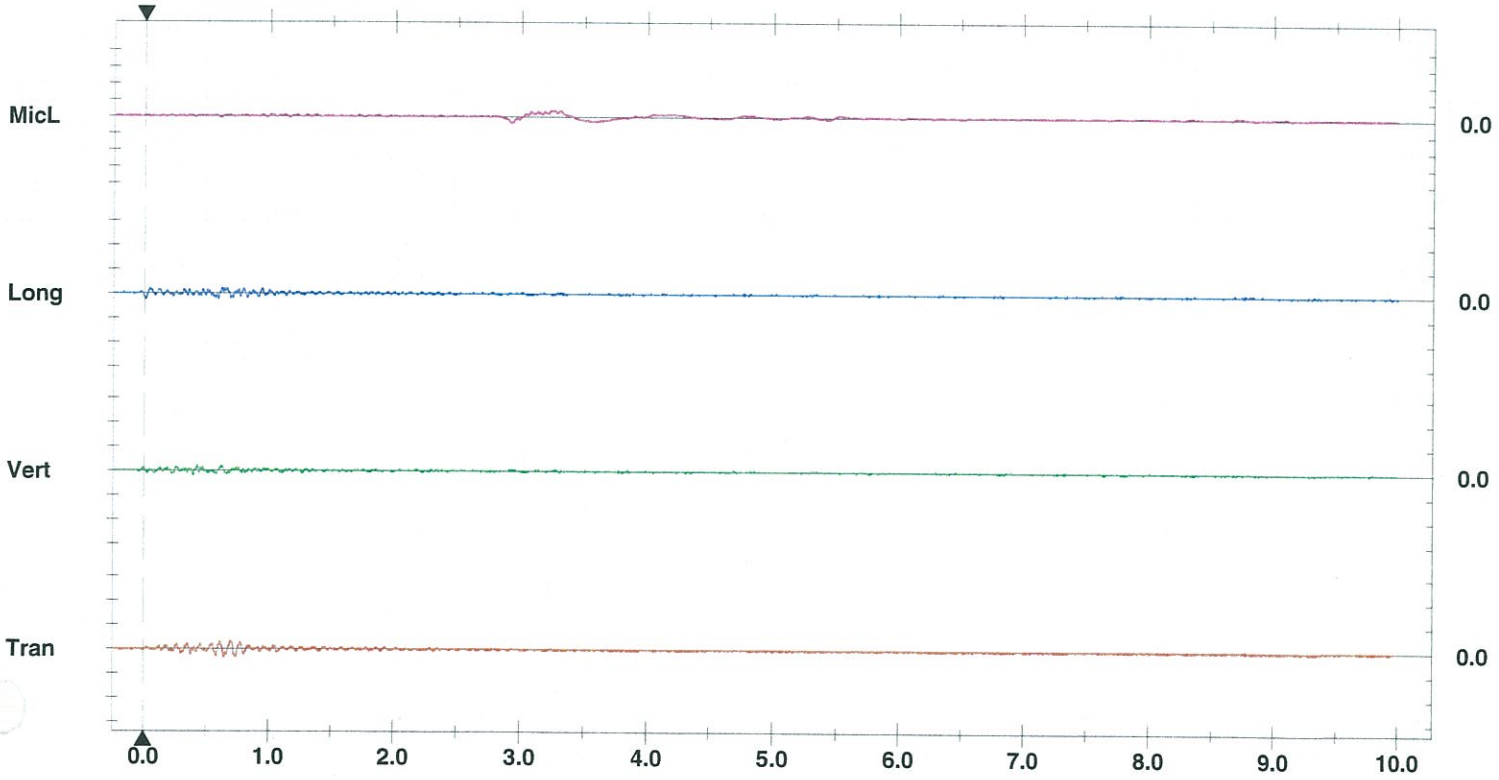
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	101.9 dB(L) at 2.912 sec
ZC Freq	3.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 580 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0200	0.0250	in/s
ZC Freq	13	32	16	Hz
Time (Rel. to Trig)	0.639	0.388	0.005	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00042	0.00020	0.00025	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0394 in/s at 0.639 sec



Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-21-16 Blast No. 3-21-16 3E Time 11:52

Exact Blast Location FACE 3E

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29 38 54.9

W 98 17 37.2

MONITOR GPS

N 29 38' 52"

W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 10626 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-21-15 Microphone Calibration 07-21-15

Exact Seismograph Location Taveres Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 3,730'

Peak Overpressure 107.5 dB Scaled Distance ------

Peak Particle Velocity .040 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3-21-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:52:12 March 21, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps
Job Number:	1

Serial Number	BB10626 V 7.04-8.0 EVERLERT III
Battery Level	6.3 Volts
Calibration	July 21, 2015 by Vibra-Tech Inc.
File Name	L626GAJQ.B01

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra Tech
General:

Extended Notes

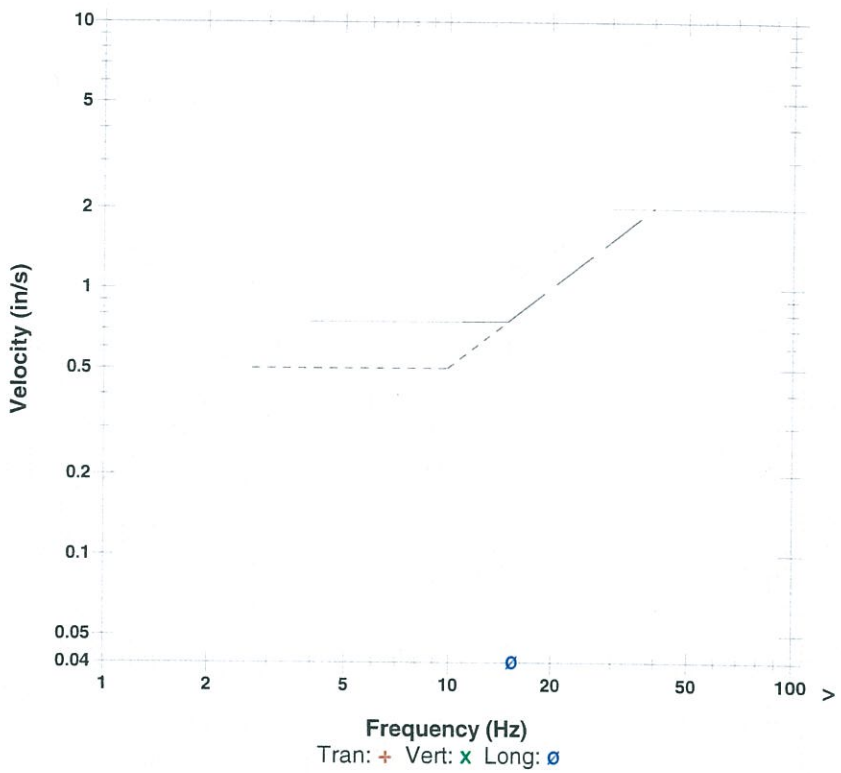
Post Event Notes
Taveres Res: 3,730'

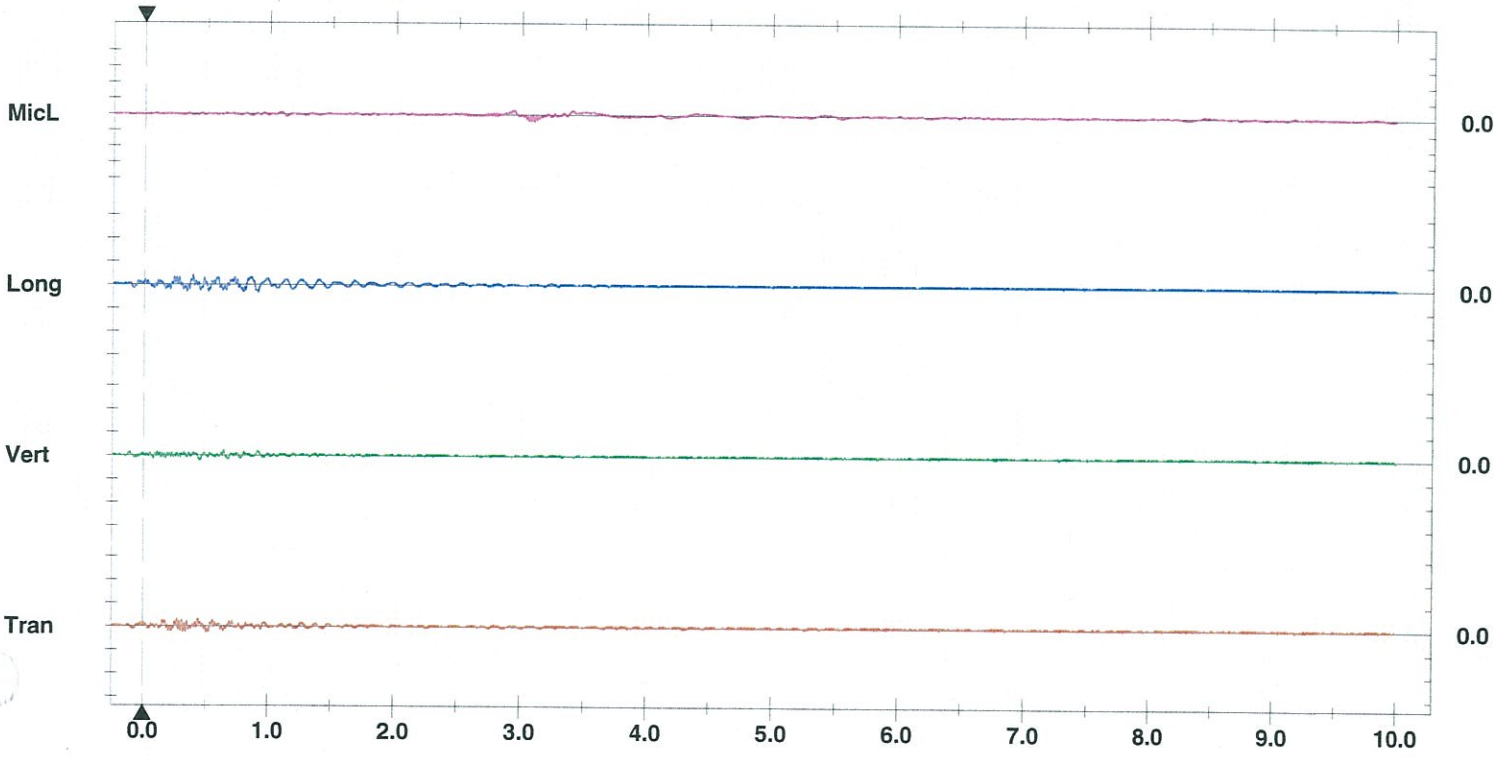
Microphone	Linear Weighting
PSPL	103.5 dB(L) at 3.097 sec
ZC Freq	8.3 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 674 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0200	0.0400	in/s
ZC Freq	39	17	16	Hz
Time (Rel. to Trig)	0.271	0.438	0.387	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00027	0.00022	0.00067	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0418 in/s at 0.442 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-21-16 Blast No. 3-21-16 3E Time 11:52

Exact Blast Location FACE 3E

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29 38 54.9
W 98 17 37.2

MONITOR GPS

N 29 38' 23"
W 98 17' 40"

SEISMOGRAPH DATA

Seismograph No. 13138 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 02-23-16 Microphone Calibration 02-23-16

Exact Seismograph Location Warden Residence: 21375 Gunther Grove Drive, Trophy Oaks Subdivision

10' N of NE corner of pool at the rock wall

Seismograph Distance from Blast 3,742'

Peak Overpressure 107.0 dB Scaled Distance ------

Peak Particle Velocity .070 ips Operator DAVID WARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3-21-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:52:22 March 21, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

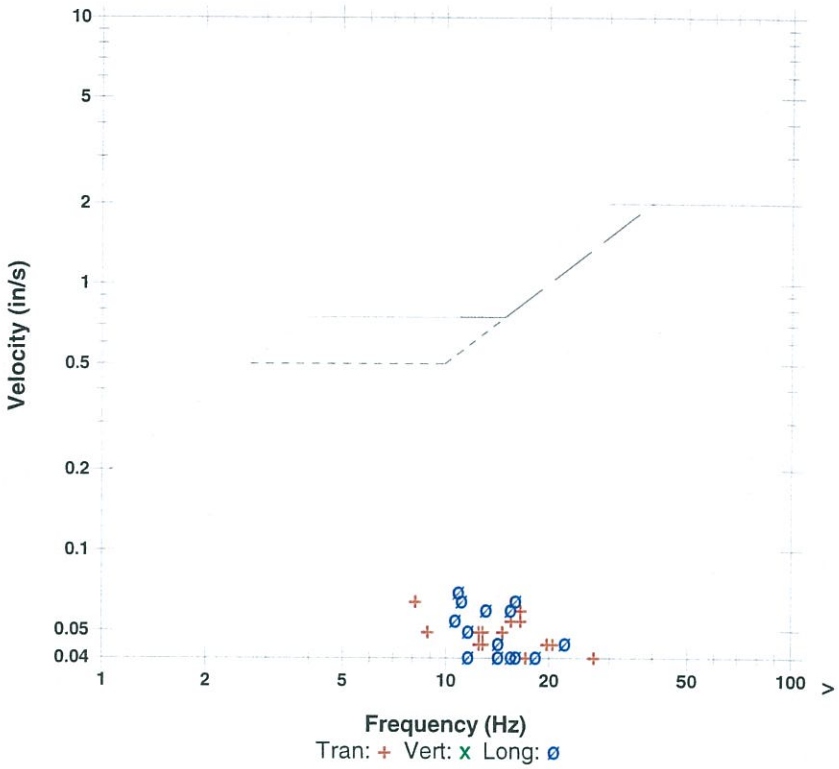
Serial Number	BF13138 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	February 23, 2016 by Vibra-Tech Inc.
File Name	O138GAJQ.BA1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra-Tech
General:

Extended Notes

Post Event Notes
Warden Res: 3,242'

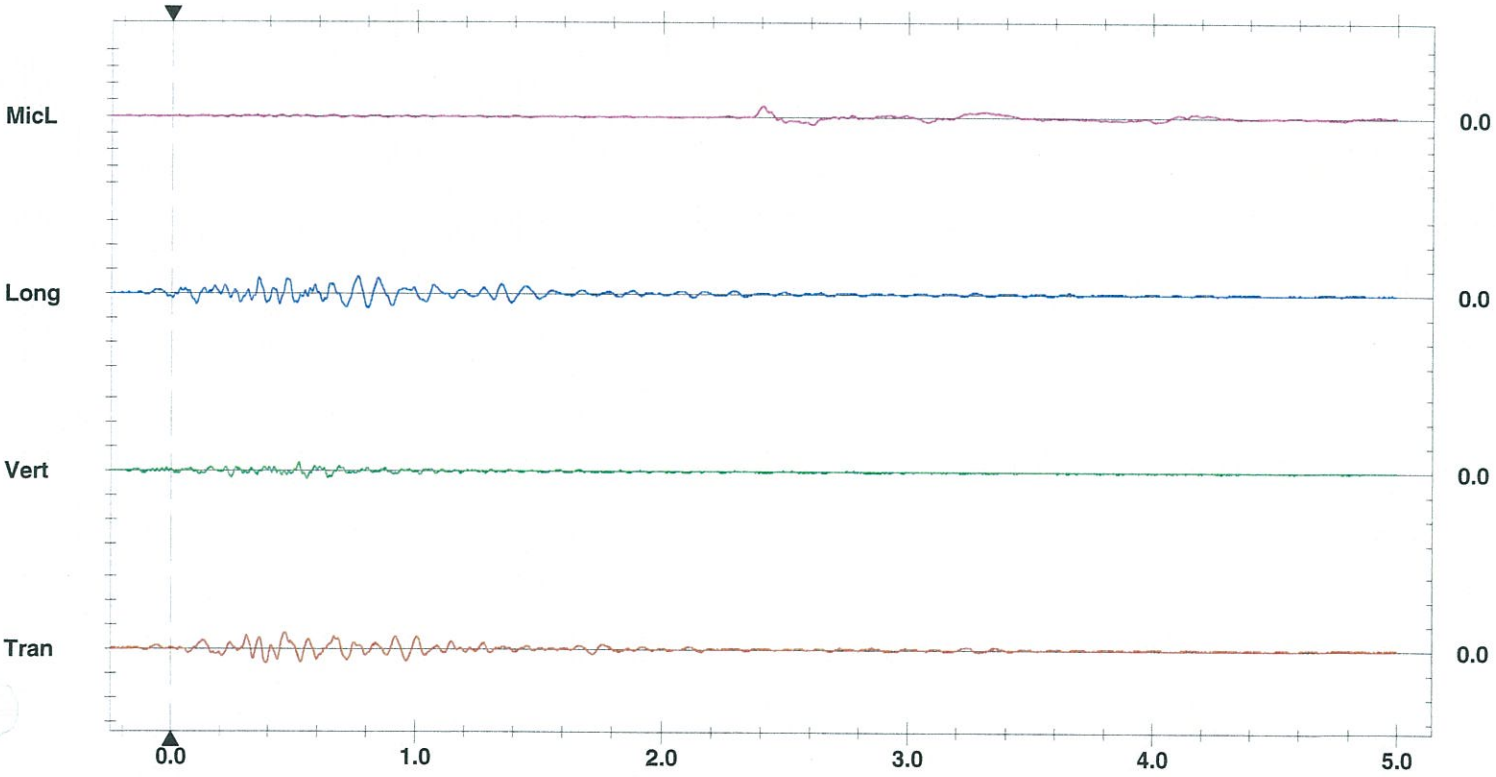
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	107.0 dB(L) at 2.399 sec
ZC Freq	6.2 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 579 mv)

	Tran	Vert	Long	
PPV	0.0650	0.0350	0.0700	in/s
ZC Freq	8.1	28	11	Hz
Time (Rel. to Trig)	0.465	0.522	0.757	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00111	0.00032	0.00099	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0897 in/s at 0.471 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— ——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-21-16 Blast No. 3-21-16 3E Time 11:52

Exact Blast Location FACE 3E

No. of Holes _____ Diameter _____in. Avg. Depth _____ Subgrade _____ft.

Spacing _____ft. Burden _____ft. Avg. Stemming _____ft.

Make & Type of Explosives:

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ms.

Max. lbs/delay period _____lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29 38 54.9
W 98 17 37.2

MONITOR GPS

N 29 38' 25"
W 98 17' 39"

SEISMOGRAPH DATA

Seismograph No. 13922 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 11-22-15 Microphone Calibration 11-22-15

Exact Seismograph Location Warden Property Line: 21375 Gunther Grove Drive, Trophy Oaks Subdivision

North East corner of the property, at the pink pin flag

Seismograph Distance from Blast 3,034'

Peak Overpressure 108.0 dB Scaled Distance ------

Peak Particle Velocity .060 ips Operator DAVID CARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: D. [signature] Date: 3-21-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

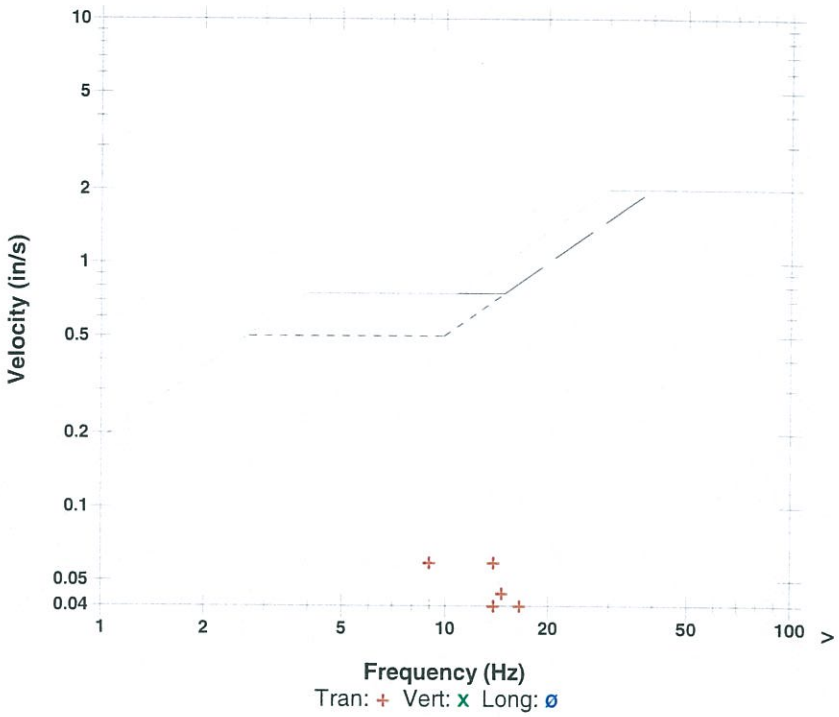
Date/Time	Tran at 11:52:17 March 21, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

Serial Number	BF13922 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	November 22, 2015 by Vibra-Tech Inc.
File Name	O922GAJQ.B51

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Post Event Notes
Warden Prop Line: 3,034'

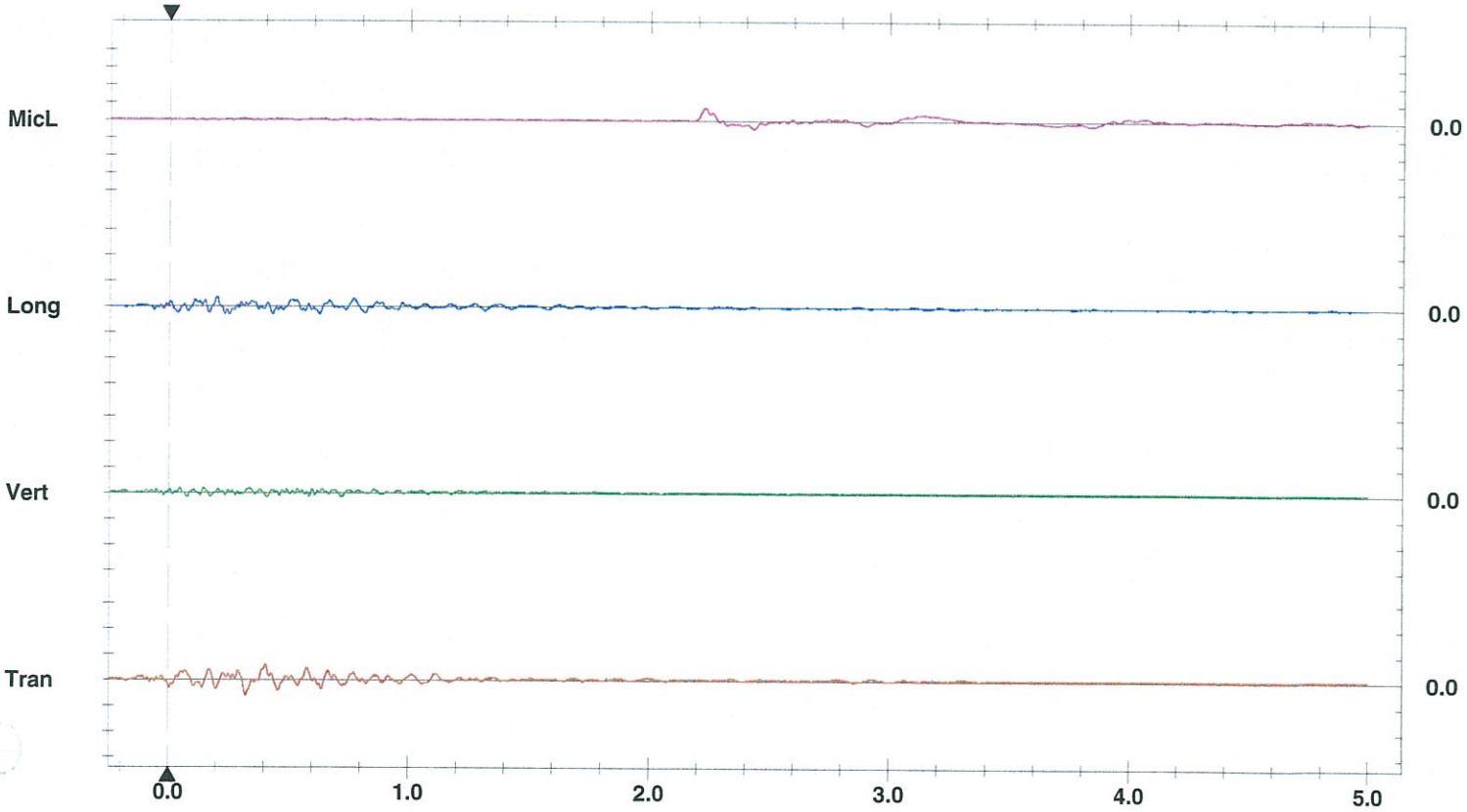
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	108.0 dB(L) at 2.224 sec
ZC Freq	5.8 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 598 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0200	0.0350	in/s
ZC Freq	14	37	22	Hz
Time (Rel. to Trig)	0.325	0.042	0.196	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00091	0.00019	0.00051	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0636 in/s at 0.409 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 22, 2016 Blast No. 03-22-16 4B Time 11:42

Exact Blast Location 4B

No. of Holes _____ Diameter _____in. Avg. Depth _____ Subgrade _____ft.

Spacing _____ft. Burden _____ft. Avg. Stemming _____ft.

Make & Type of Explosives:

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ms.

Max. lbs/delay period _____lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N: 29° 39' 01.1"
W: 98° 17' 35.5"

MONITOR GPS

N 29 38' 22.63
W 98 18' 53.97

SEISMOGRAPH DATA

Seismograph No. 6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location City Property Line: outside city water tower gate
30' from gate at the property line

Seismograph Distance from Blast 4224 ft.

Peak Overpressure 106.0 dB Scaled Distance ------

Peak Particle Velocity 0.035 ips Operator Clayford Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 3/22/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:42:12 March 22, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

Serial Number	BD6191 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	H191GALK.IC1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

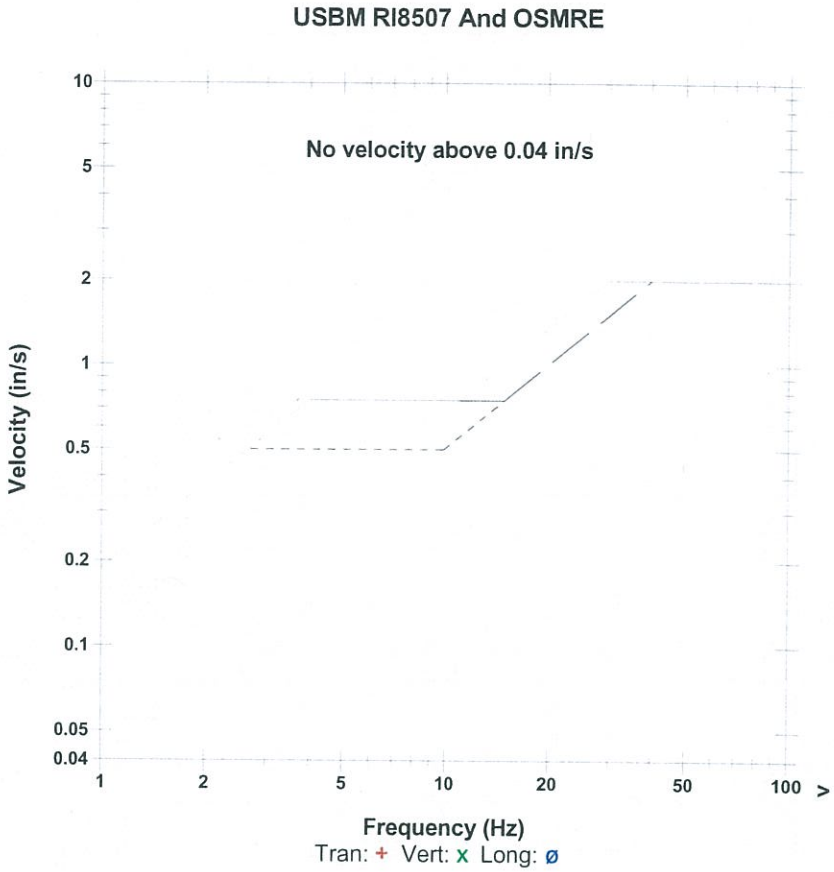
Extended Notes

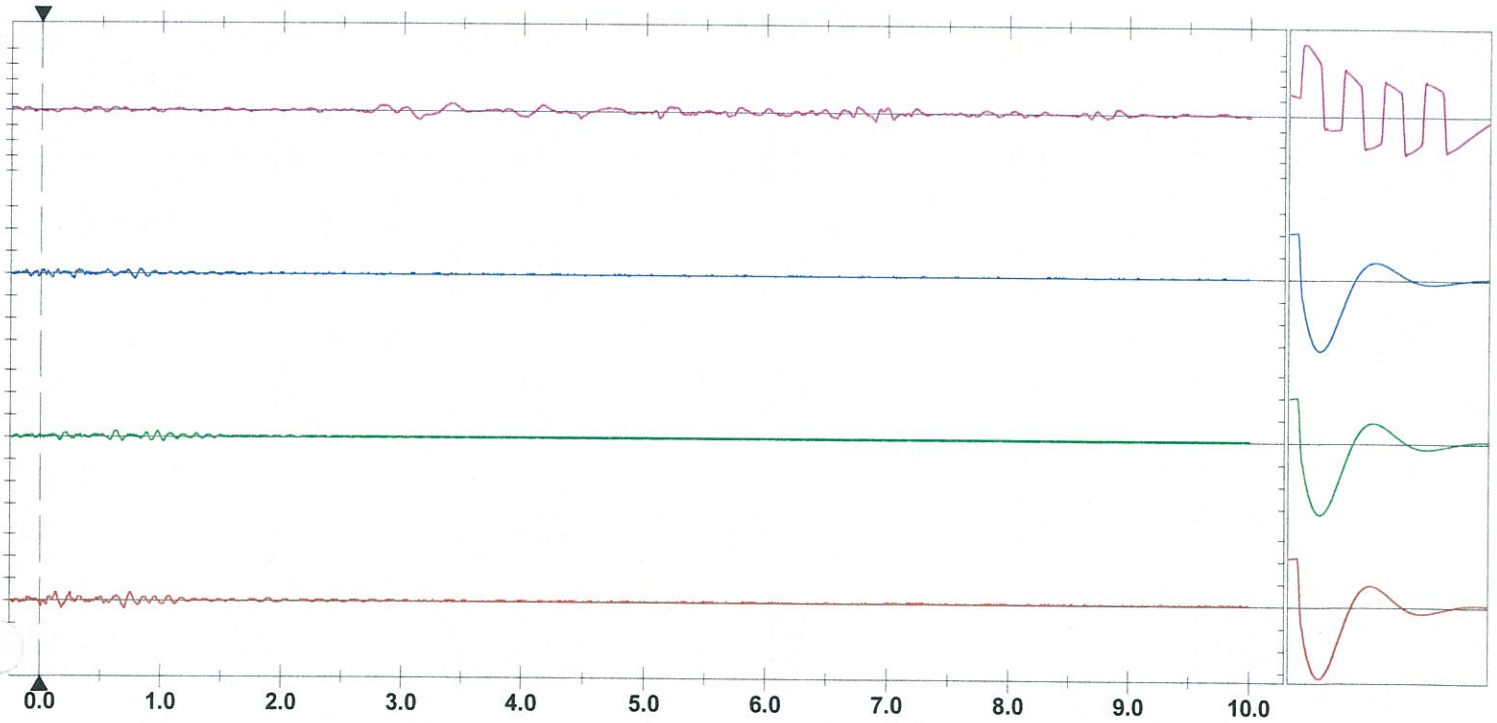
Post Event Notes
City Property Line
6191 ft to Blast

Microphone	Linear Weighting
PSPL	106.0 dB(L) at 3.127 sec
ZC Freq	2.1 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 567 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0250	0.0250	in/s
ZC Freq	12	11	14	Hz
Time (Rel. to Trig)	0.127	0.614	0.275	sec
Peak Acceleration	0.0265	0.0265	0.0133	g
Peak Displacement	0.00060	0.00046	0.00036	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.9	7.6	7.4	Hz
Overswing Ratio	3.3	3.5	4.1	

Peak Vector Sum 0.0377 in/s at 0.748 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶—— ——◀

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 22, 2016 Blast No. 03-22-16 4B Time 11:42

Exact Blast Location 4B

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 39' 01.1"
W 98° 17' 35.5"

MONITOR GPS

N 29 38 58.8
W 98 18 17.5

SEISMOGRAPH DATA

Seismograph No. 8949 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location Cruz Residence – 22410 Oro Viejo Ct – George Ranch Subdivision

15' E off SE corner of garage at fence

Seismograph Distance from Blast 3706

Peak Overpressure 106.5 dB Scaled Distance ------

Peak Particle Velocity 0.035 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3/22/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:42:12 March 22, 2016	**Serial Number**	BF8949 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)	**Battery Level**	6.3 Volts
		Calibration	July 16, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	J949GALK.IC1
Record Time	10.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra-Tech
General:

Extended Notes

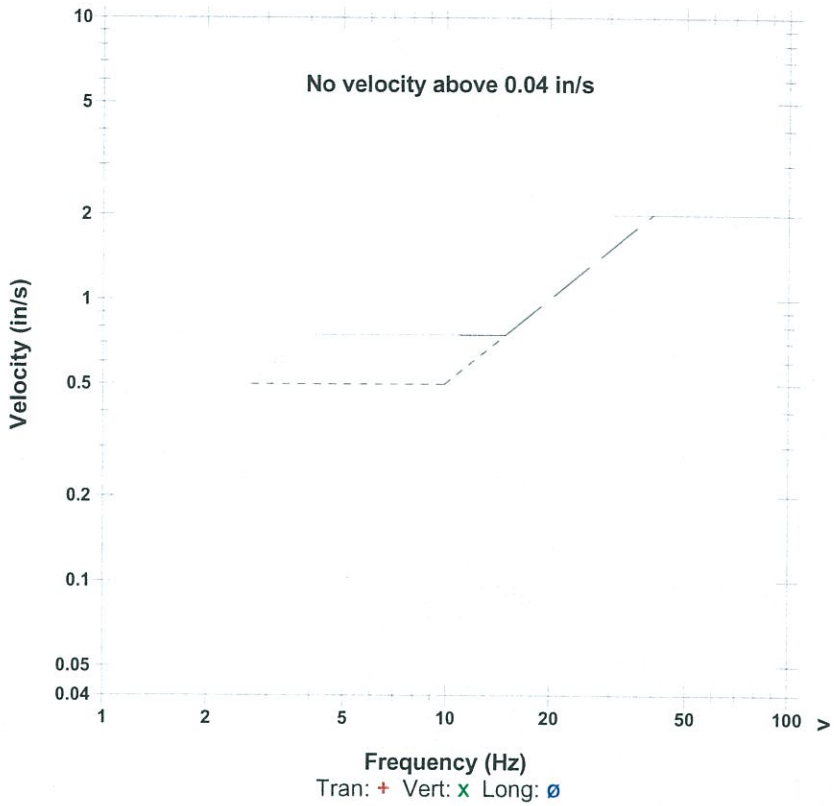
Post Event Notes
Cruz Residence
8949 ft to Blast

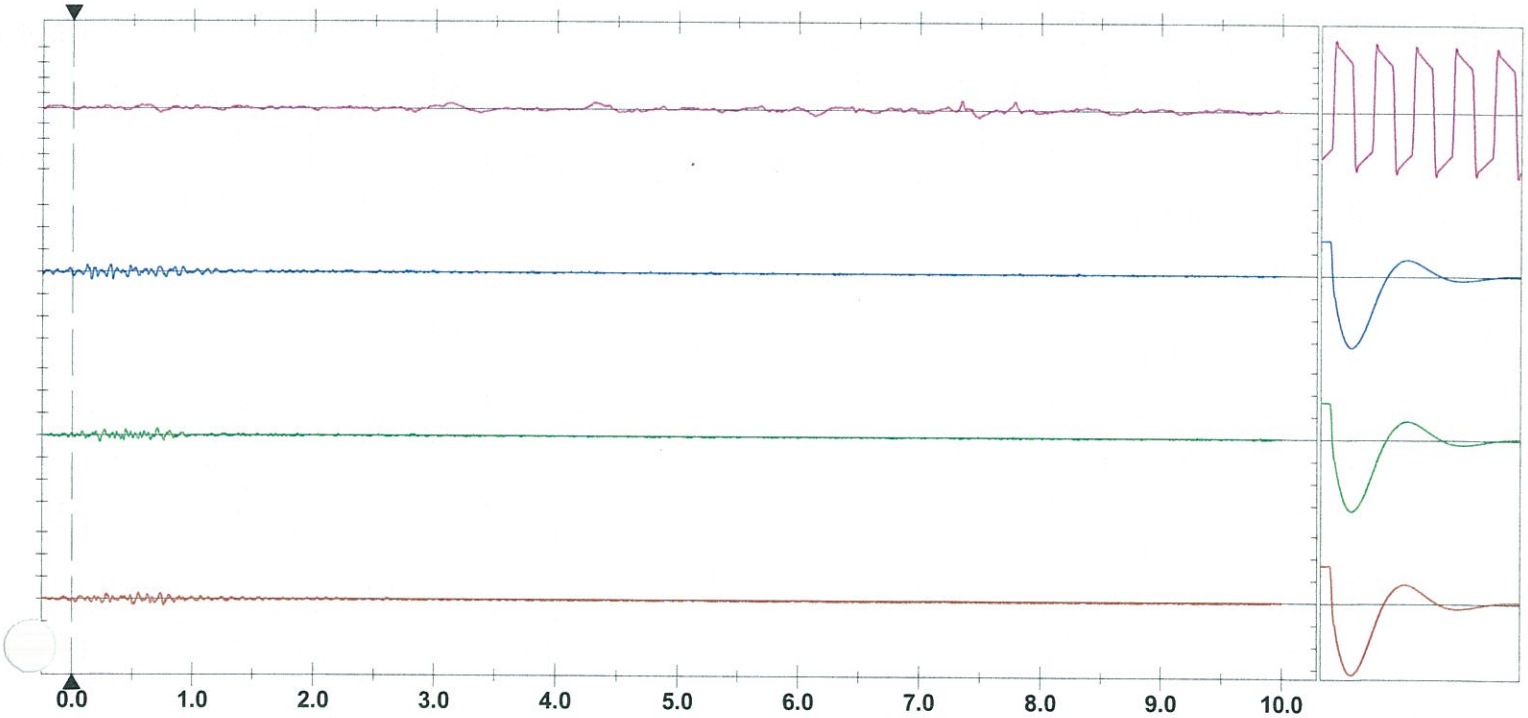
Microphone Linear Weighting
PSPL 106.5 dB(L) at 7.337 sec
ZC Freq 5.0 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 579 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0300	0.0350	in/s
ZC Freq	15	19	24	Hz
Time (Rel. to Trig)	0.757	0.224	0.150	sec
Peak Acceleration	0.0133	0.0133	0.0265	g
Peak Displacement	0.00034	0.00027	0.00035	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.7	7.4	7.3	Hz
Overswing Ratio	3.8	3.9	4.3	

Peak Vector Sum 0.0391 in/s at 0.757 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 22, 2016 Blast No. 03-22-16 4B Time 11:42

Exact Blast Location 4B

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N: 29° 39' 01.1"
W: 98° 17' 35.5"

MONITOR GPS

N 29 38' 52"
W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 10626 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-21-15 Microphone Calibration 07-21-15

Exact Seismograph Location Taveres Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 3976 ft.

Peak Overpressure 103.5 dB Scaled Distance ------

Peak Particle Velocity 0.075 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3/22/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

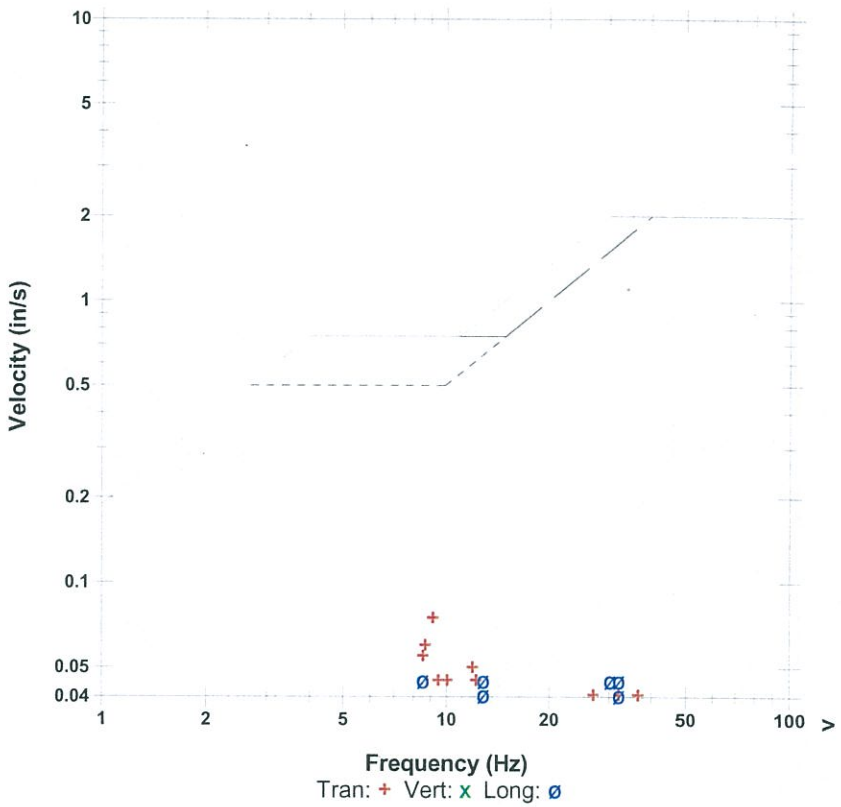
Date/Time	Tran at 11:42:12 March 22, 2016	**Serial Number**	BB10626 V 7.04-8.0 EVERLERT III
Trigger Source	Geo: 0.0200 in/s	**Battery Level**	6.3 Volts
	Mic: 122 dB(L)	**Calibration**	July 21, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	L626GALK.IC1
Record Time	10.0 sec at 1024 sps		
Job Number:	1		

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra Tech
General:

Extended Notes

Post Event Notes
Taveres Residence
3976 ft to Blast

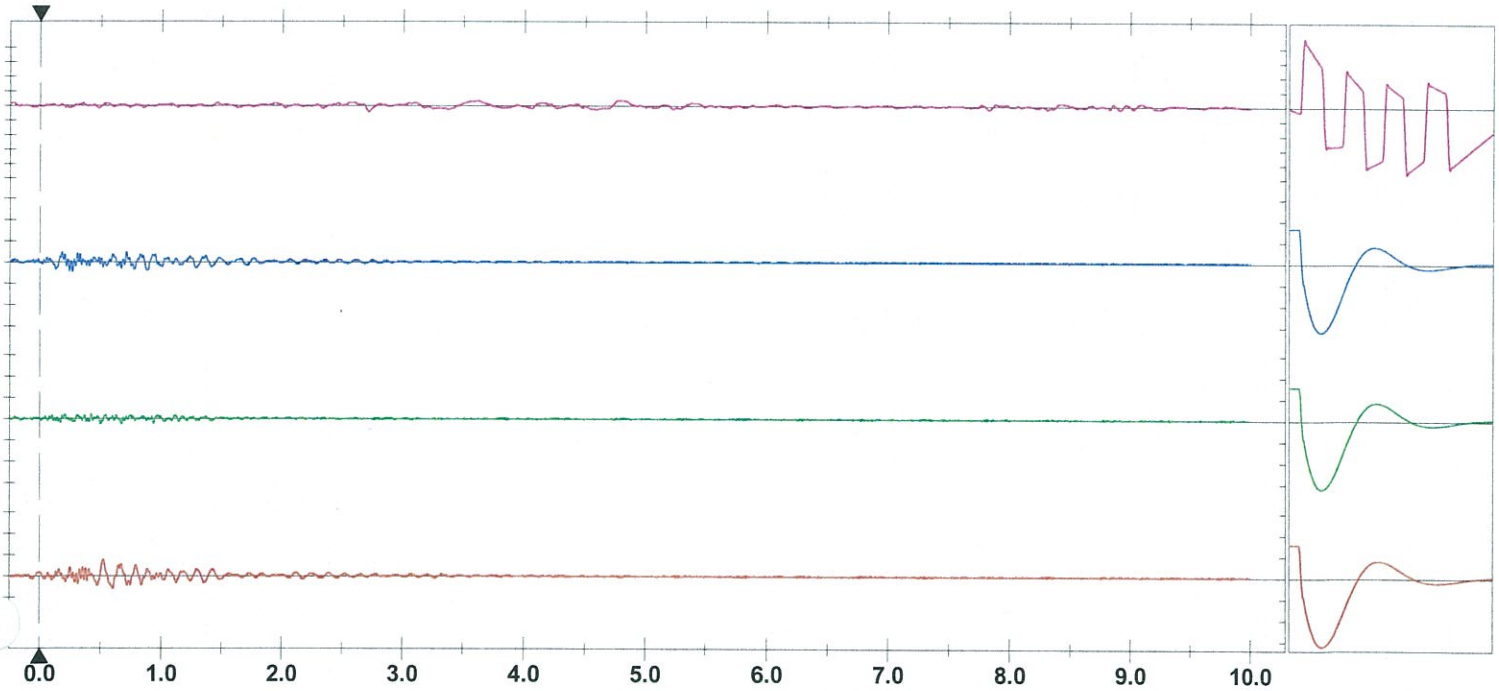
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	103.5 dB(L) at 2.708 sec
ZC Freq	5.8 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 725 mv)

	Tran	Vert	Long	
PPV	0.0750	0.0250	0.0450	in/s
ZC Freq	9.1	16	8.5	Hz
Time (Rel. to Trig)	0.520	0.496	0.182	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00118	0.00024	0.00073	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.2	7.4	7.6	Hz
Overswing Ratio	3.9	3.8	3.9	

Peak Vector Sum 0.0783 in/s at 0.520 sec



Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——— ———◀

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 22, 2016 Blast No. 03-22-16 43 Time 11:42

Exact Blast Location 43

No. of Holes _____ Diameter _____in. Avg. Depth _____ Subgrade _____ft.

Spacing _____ft. Burden _____ft. Avg. Stemming _____ft.

Make & Type of Explosives:

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ms.

Max. lbs/delay period _____lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N: 29° 39' 01.1"
W: 98° 17' 35.5"

MONITOR GPS

N 29 38' 23"
W 98 17' 40"

SEISMOGRAPH DATA

Seismograph No. 13138 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 02-23-16 Microphone Calibration 02-23-16

Exact Seismograph Location Warden Residence: 21375 Gunther Grove Drive, Trophy Oaks Subdivision

10' N of NE corner of pool at the rock wall

Seismograph Distance from Blast 3881 ft.

Peak Overpressure 106.5 dB Scaled Distance ------

Peak Particle Velocity 0.11 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3/22/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:42:11 March 22, 2016	**Serial Number**	BF13138 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)	**Battery Level**	6.4 Volts
		Calibration	February 23, 2016 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	O138GALK.IB1
Record Time	5.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra-Tech
General:

Extended Notes

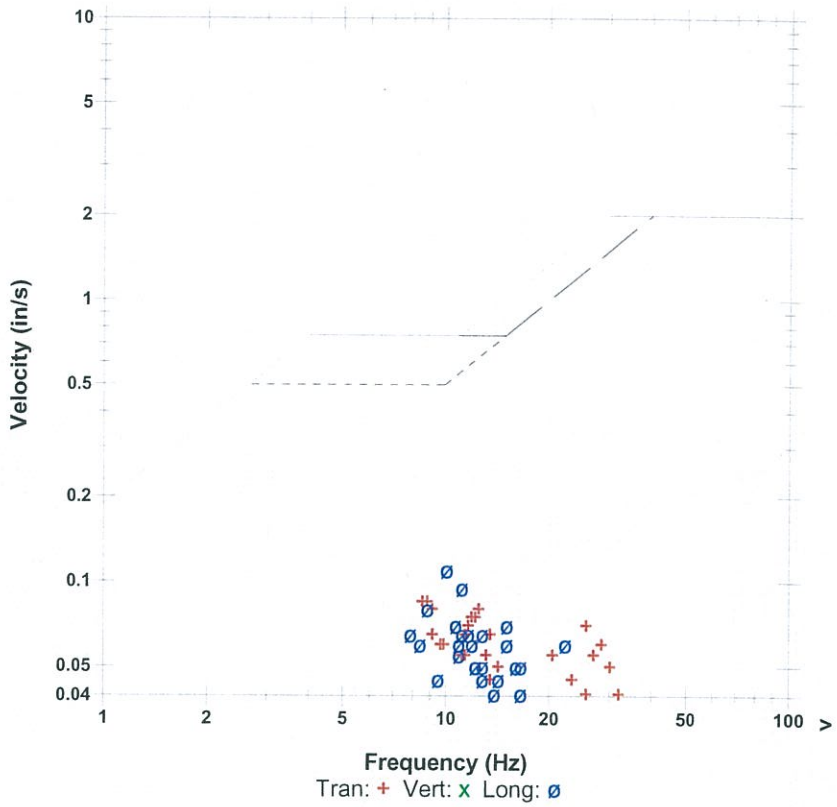
Post Event Notes
Warden Residence
3881 ft. to Blast

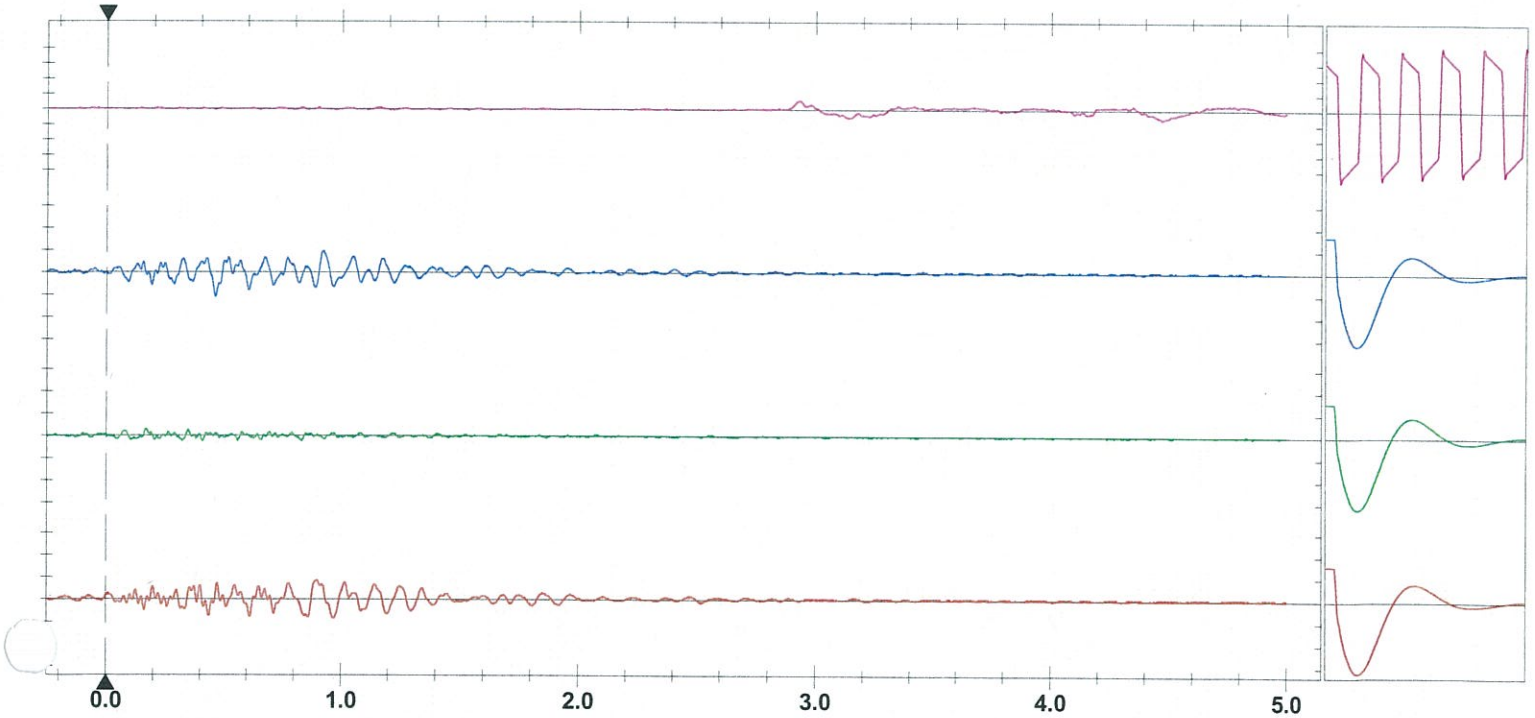
Microphone Linear Weighting
PSPL 106.5 dB(L) at 4.467 sec
ZC Freq 2.3 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 557 mv)

	Tran	Vert	Long	
PPV	0.0850	0.0300	0.110	in/s
ZC Freq	8.5	22	10	Hz
Time (Rel. to Trig)	0.893	0.164	0.459	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00178	0.00031	0.00145	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.2	7.4	7.5	Hz
Overswing Ratio	4.0	3.5	3.9	

Peak Vector Sum 0.116 in/s at 0.920 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date March 22, 2016 Blast No. 03-22-16 413 Time 11:42

Exact Blast Location 413

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N: 29° 39' 01.1"
W: 98° 17' 35.5"

MONITOR GPS

N 29 38' 25"
W 98 17' 39"

SEISMOGRAPH DATA

Seismograph No. 13922 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 11-22-15 Microphone Calibration 11-22-15

Exact Seismograph Location Warden Property Line: 21375 Gunther Grove Drive, Trophy Oaks Subdivision

North East corner of the property, at the pink pin flag

Seismograph Distance from Blast 3671 ft.

Peak Overpressure 107.5 dB Scaled Distance _____

Peak Particle Velocity 0.070 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 3/22/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

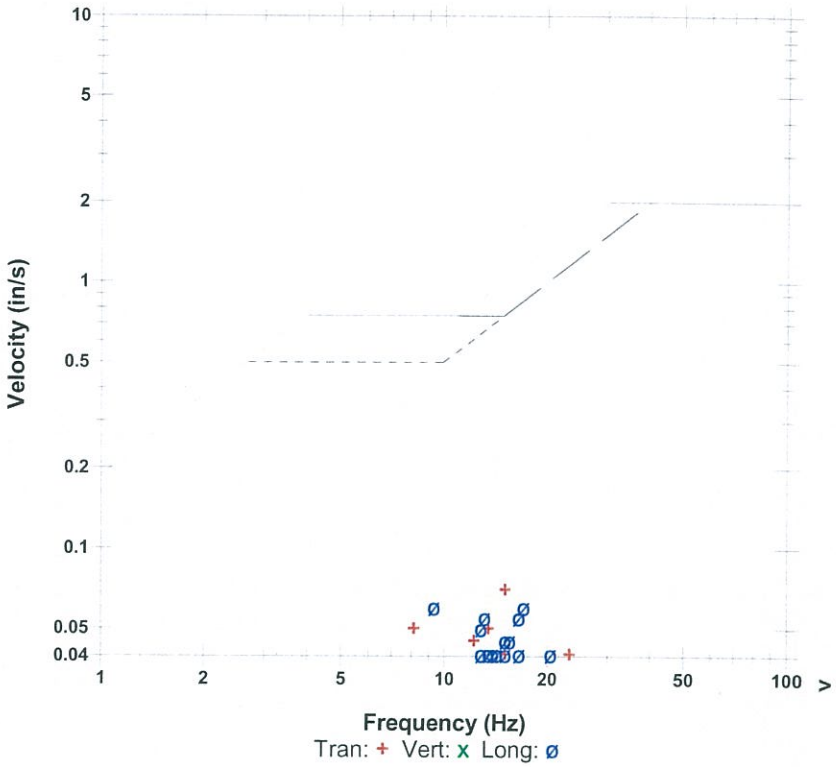
Date/Time	Long at 11:42:12 March 22, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

Serial Number	BF13922 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	November 22, 2015 by Vibra-Tech Inc.
File Name	O922GALK.IC1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Post Event Notes
Warden Property Line
3671 ft to Blast

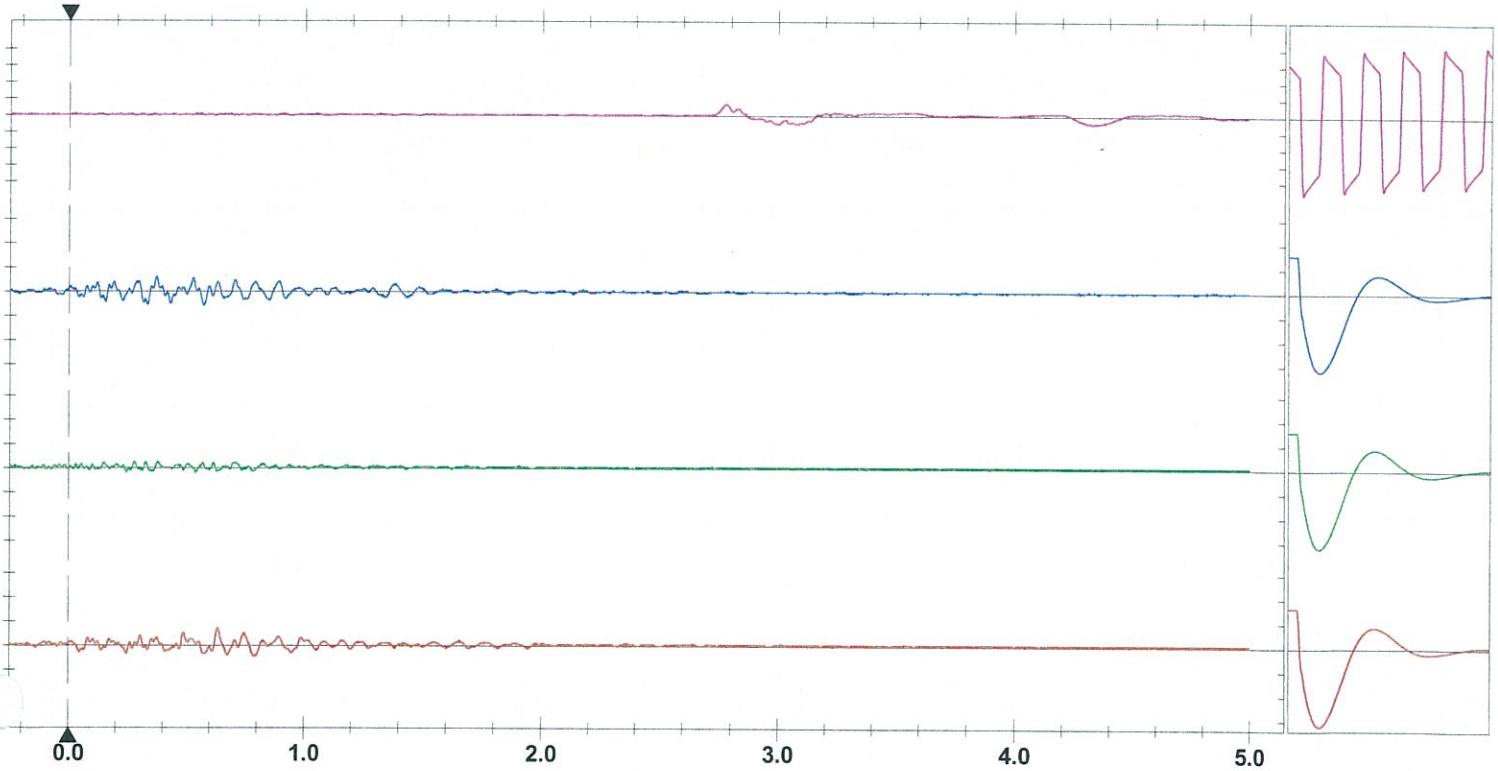
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	107.5 dB(L) at 2.776 sec
ZC Freq	3.7 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 570 mv)

	Tran	Vert	Long	
PPV	0.0700	0.0250	0.0600	in/s
ZC Freq	15	30	9.3	Hz
Time (Rel. to Trig)	0.631	0.272	0.368	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00076	0.00028	0.00072	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.5	7.5	7.1	Hz
Overswing Ratio	3.7	3.7	4.1	

Peak Vector Sum 0.0797 in/s at 0.632 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

Dynamic Geo Cal.

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-23-16 Blast No. 3-23-16 3D Time 12:04

Exact Blast Location FACE 3D

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 51.00"
W 98° 17' 36.90"

MONITOR GPS

N 29 38' 22.63
W 98 18' 53.97

SEISMOGRAPH DATA

Seismograph No. 6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location City Property Line: outside city water tower gate

30' from gate at the property line

Seismograph Distance from Blast 3,244'

Peak Overpressure 101.9 dB Scaled Distance ------

Peak Particle Velocity .045 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3-23-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 12:04:53 March 23, 2016	**Serial Number**	BD6191 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)	**Battery Level**	6.3 Volts
		Calibration	July 16, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	H191GANG.851
Record Time	10.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Extended Notes

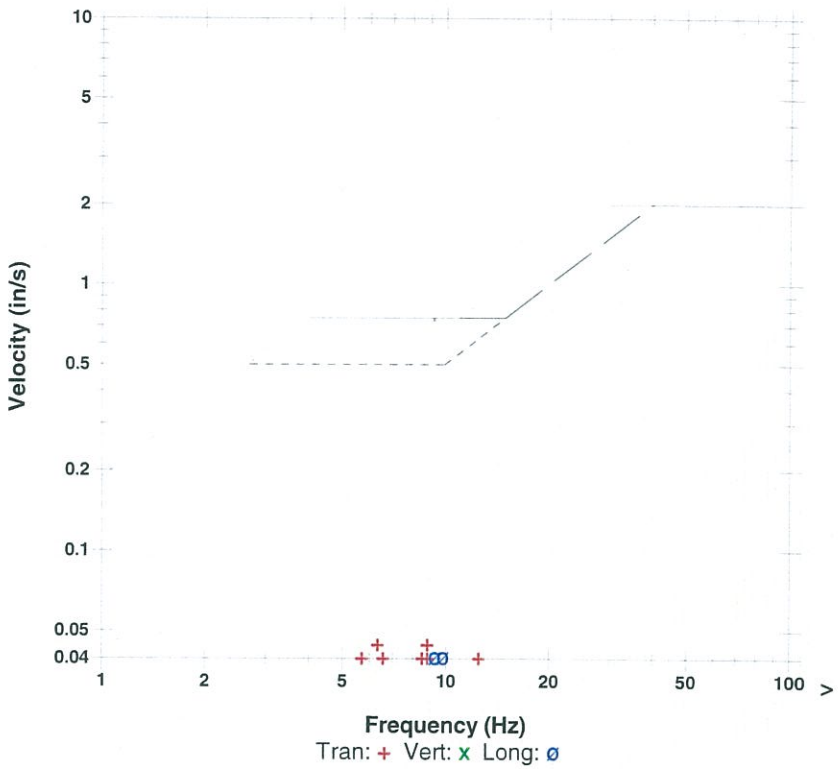
Post Event Notes
City Prop Line: 3,244'

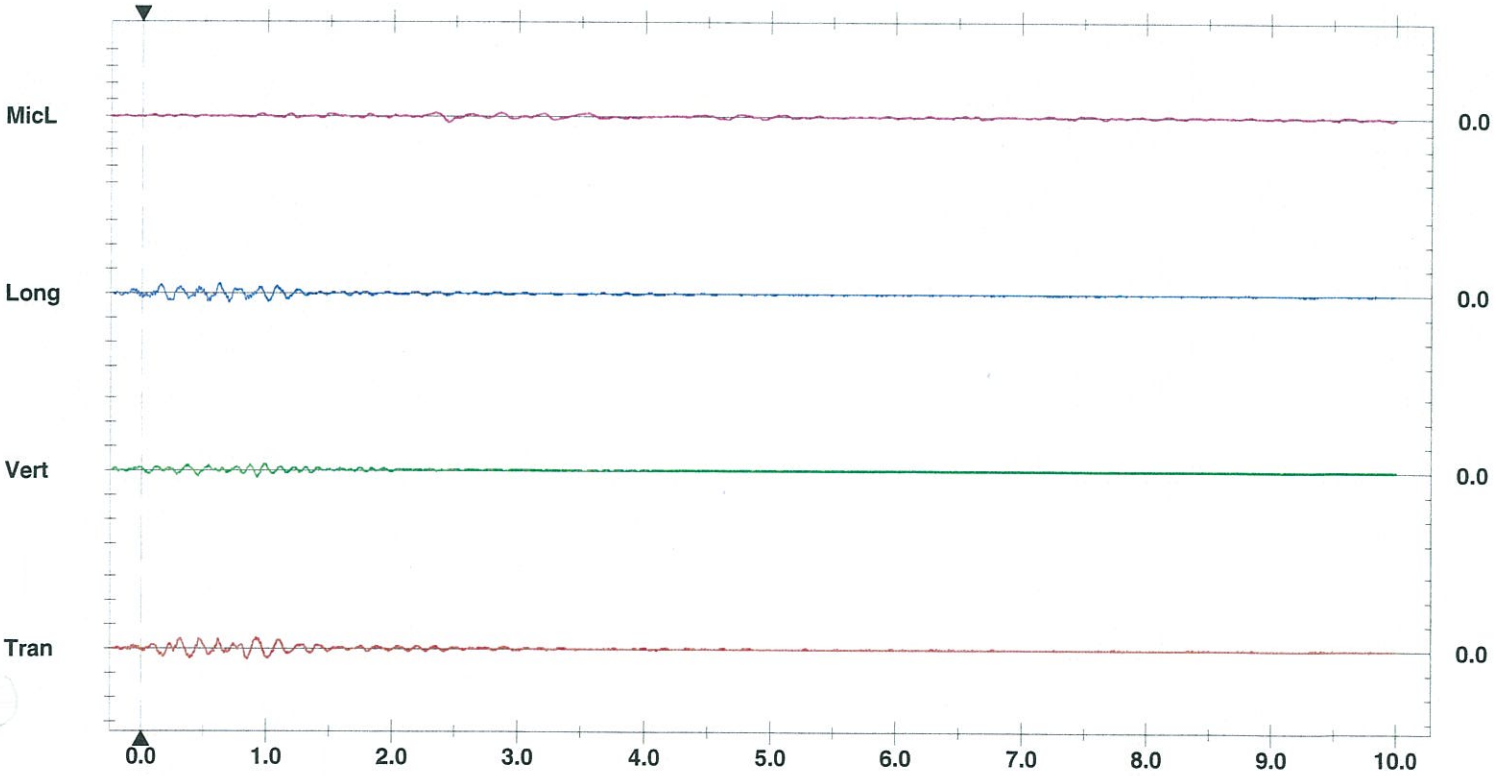
Microphone Linear Weighting
PSPL 101.9 dB(L) at 2.436 sec
ZC Freq 3.5 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 554 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0300	0.0400	in/s
ZC Freq	8.8	10	9.8	Hz
Time (Rel. to Trig)	0.850	0.922	0.618	sec
Peak Acceleration	0.0133	0.0133	0.0265	g
Peak Displacement	0.00118	0.00047	0.00086	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0568 in/s at 0.618 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-23-16 Blast No. 3-23-16 3D Time 12:04

Exact Blast Location FALE 3D

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38 51.00
W 98° 17 36.40

MONITOR GPS

N 29 38 58.8
W 98 18 17.5

SEISMOGRAPH DATA

Seismograph No. 8949 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location Cruz Residence – 22410 Oro Viejo Ct – George Ranch Subdivision

15' E off SE corner of garage at fence

Seismograph Distance from Blast 3,662'

Peak Overpressure 101.9 dB Scaled Distance ------

Peak Particle Velocity .030 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 3-23-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 12:04:52 March 23, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

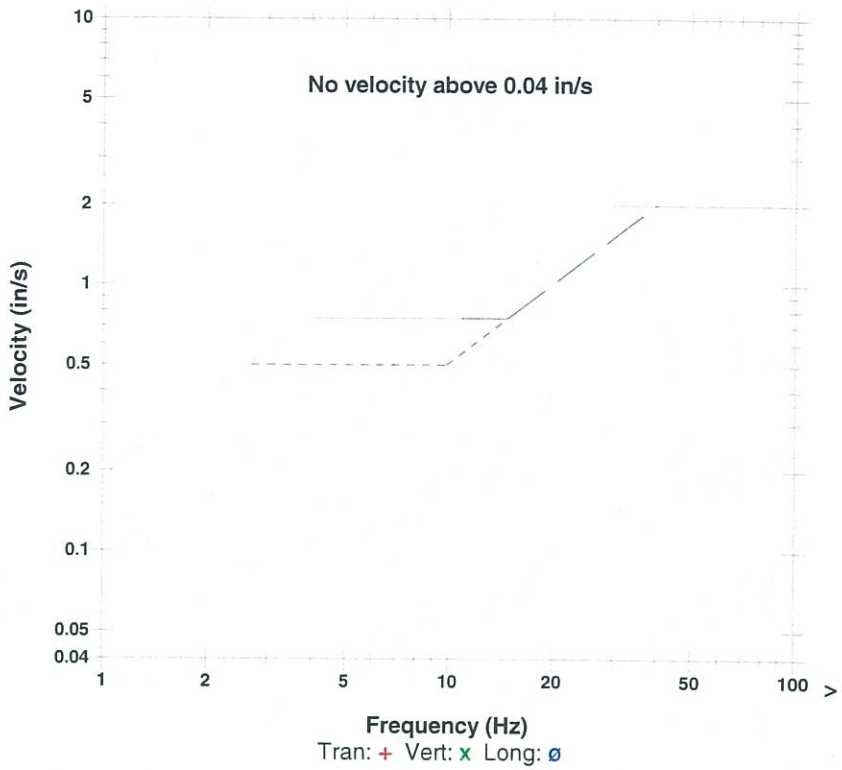
Serial Number	BF8949 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	J949GANG.841

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra-Tech
General:

Extended Notes

Post Event Notes
Cruz Res: 3,662'

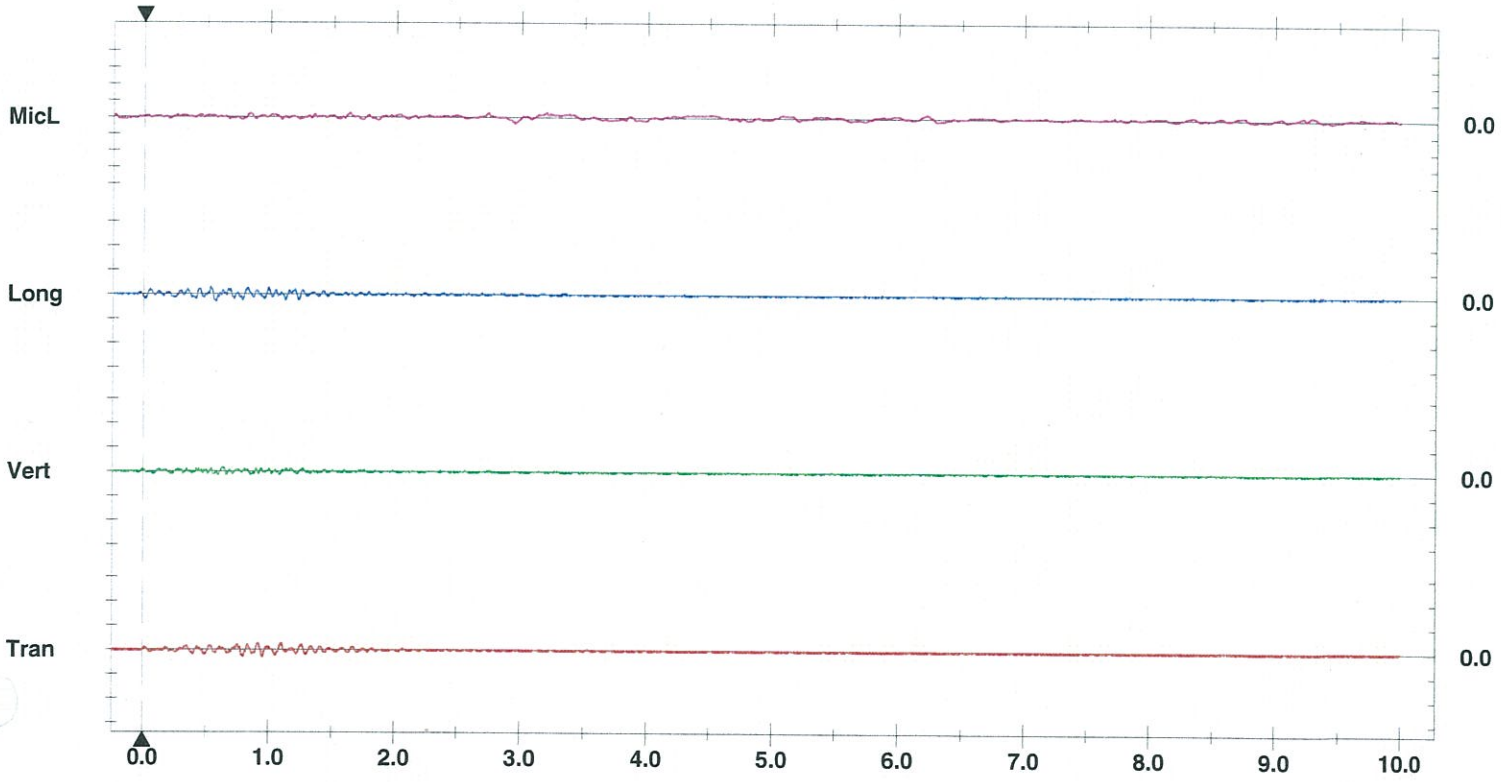
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	101.9 dB(L) at 2.945 sec
ZC Freq	4.5 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 553 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0150	0.0300	in/s
ZC Freq	14	27	18	Hz
Time (Rel. to Trig)	0.795	0.587	0.527	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00036	0.00018	0.00041	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0364 in/s at 0.950 sec



Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-23-16 Blast No. 3-23-16 3D Time 12:04

Exact Blast Location FACE 3D

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38 51
W 98° 17 36.90

MONITOR GPS

N 29 38' 52"
W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 10626 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-21-15 Microphone Calibration 07-21-15

Exact Seismograph Location Michels Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 3,746'

Peak Overpressure 100.0 dB Scaled Distance ------

Peak Particle Velocity .075 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3-23-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:04:54 March 23, 2016	**Serial Number**	BB10626 V 7.04-8.0 EVERLERT III
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	July 21, 2015 by Vibra-Tech Inc.
Record Time	10.0 sec at 1024 sps	**File Name**	L626GANG.861
Job Number:	1		

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra Tech
General:

Extended Notes

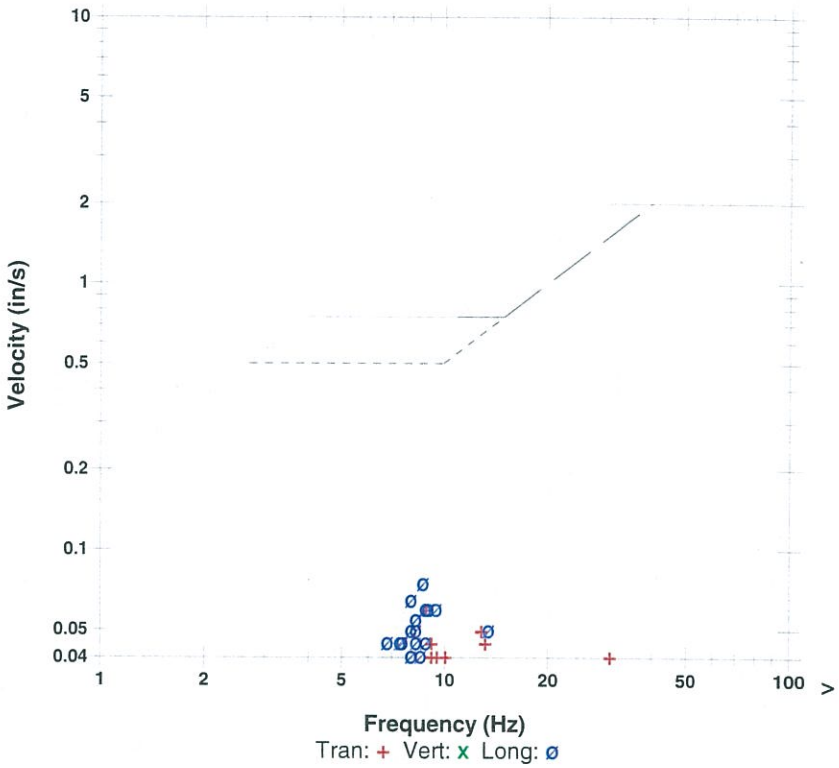
Post Event Notes
Michels Res: 3,746'

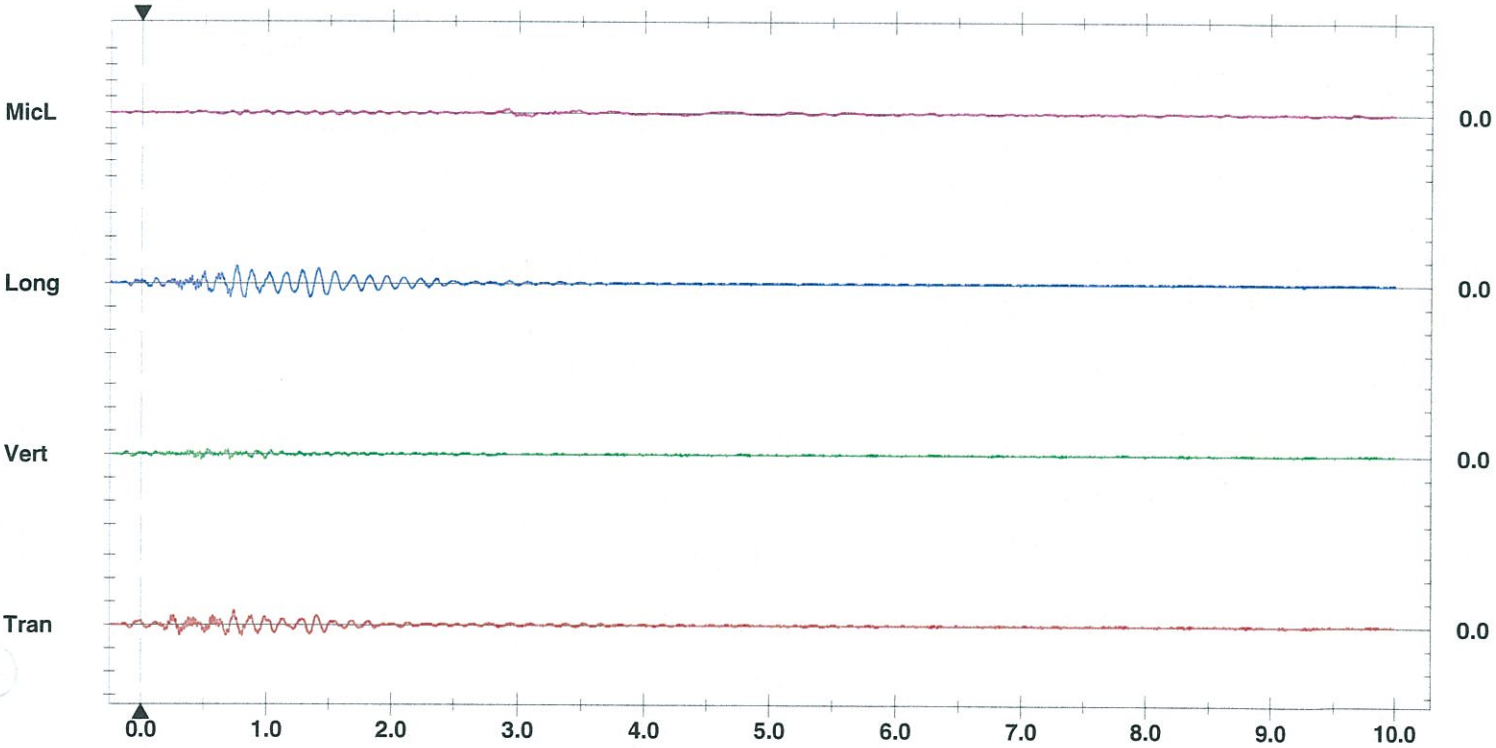
Microphone Linear Weighting
PSPL 100.0 dB(L) at 3.094 sec
ZC Freq 6.4 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 728 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0250	0.0750	in/s
ZC Freq	8.8	39	8.7	Hz
Time (Rel. to Trig)	0.739	0.474	0.752	sec
Peak Acceleration	0.0398	0.0265	0.0398	g
Peak Displacement	0.00092	0.00022	0.00132	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0815 in/s at 0.744 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-23-16 Blast No. 3-23-16 30 Time 12:04

Exact Blast Location _____

No. of Holes _____ Diameter _____in. Avg. Depth _____ Subgrade _____ft.

Spacing _____ft. Burden _____ft. Avg. Stemming _____ft.

Make & Type of Explosives:

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

_____ _____lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ms.

Max. lbs/delay period _____lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38 51.00
W 98° 17 36.40

MONITOR GPS

N 29 38' 23"
W 98 17' 40"

SEISMOGRAPH DATA

Seismograph No. 13138 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 02-23-16 Microphone Calibration 02-23-16

Exact Seismograph Location Warden Residence: 21375 Gunther Grove Drive, Trophy Oaks Subdivision

10' N of NE corner of pool at the rock wall

Seismograph Distance from Blast 2,851'

Peak Overpressure 107.0 dB Scaled Distance ------

Peak Particle Velocity .100 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3.23.16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 12:04:55 March 23, 2016	**Serial Number**	BF13138 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	February 23, 2016 by Vibra-Tech Inc.
Record Time	5.0 sec at 1024 sps	**File Name**	O138GANG.871

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra-Tech
General:

Extended Notes

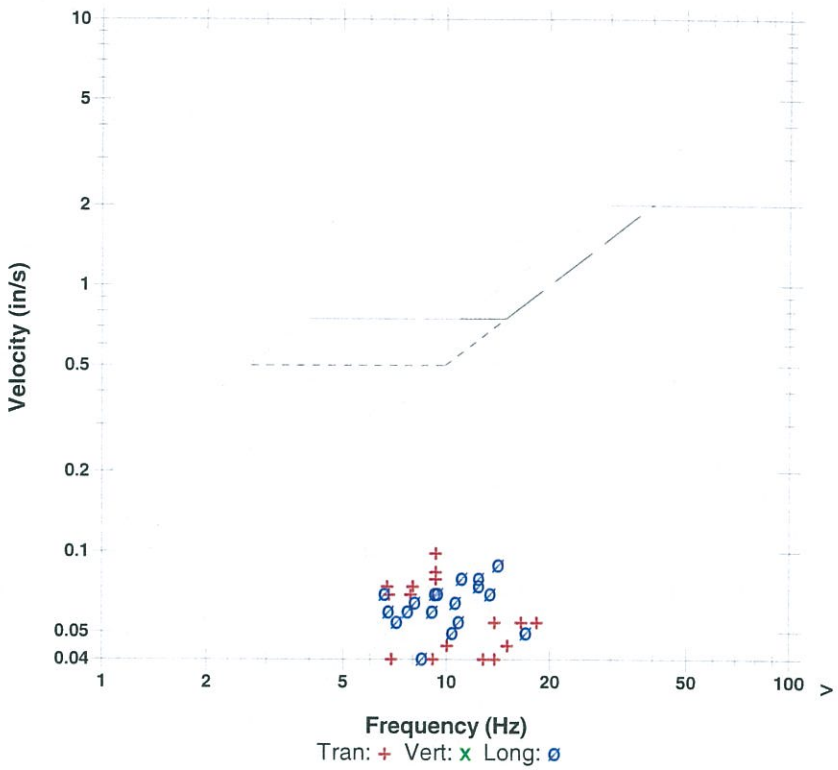
Post Event Notes
Warden Res: 2,851'

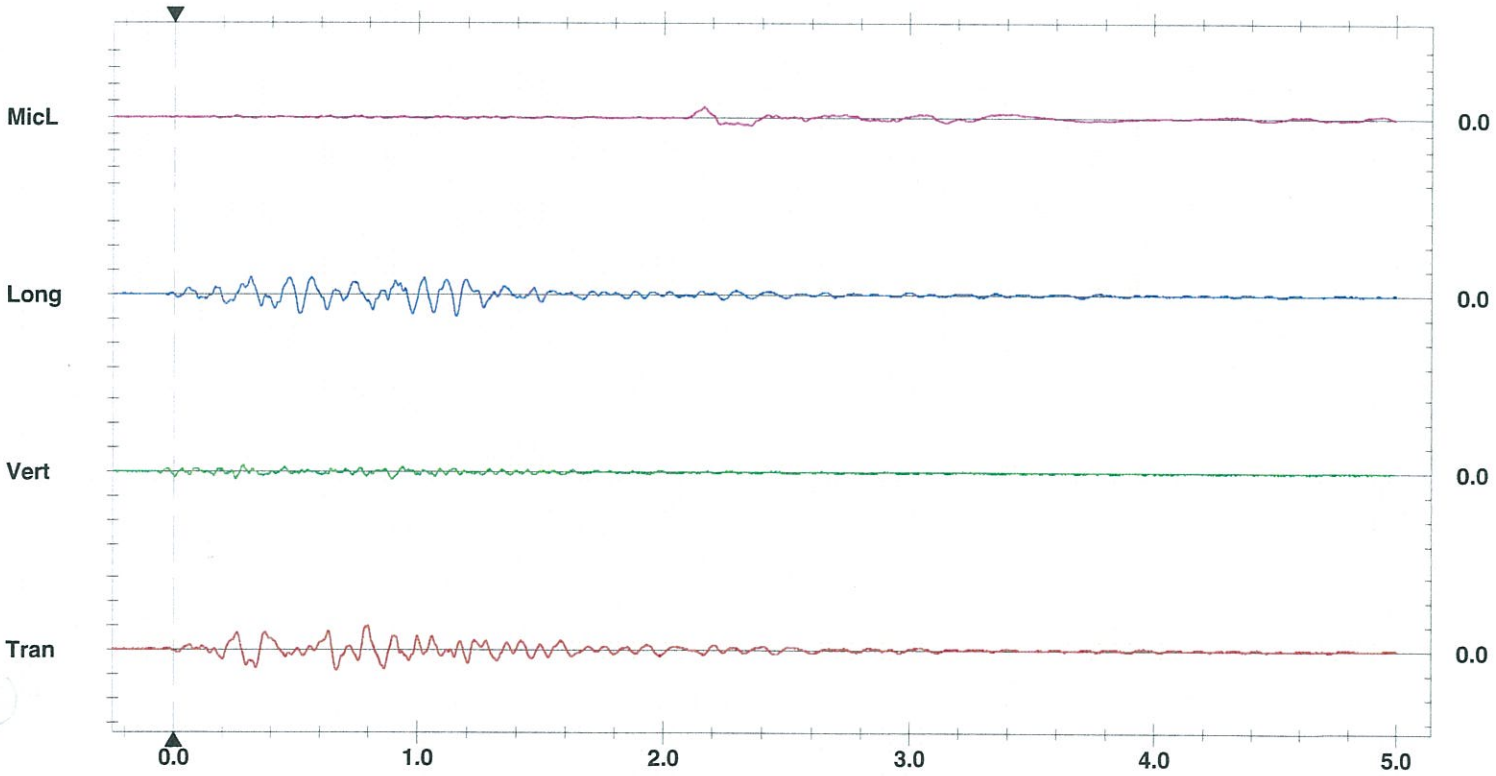
Microphone Linear Weighting
PSPL 107.0 dB(L) at 2.163 sec
ZC Freq 4.9 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 543 mv)

	Tran	Vert	Long	
PPV	0.1000	0.0300	0.0900	in/s
ZC Freq	9.3	20	14	Hz
Time (Rel. to Trig)	0.799	0.252	1.150	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00181	0.00038	0.00140	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.105 in/s at 0.799 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-23-16 Blast No. 3-23-16 3D Time 12:04

Exact Blast Location FACE 3D

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38 51.00
W 98° 17 36.90

MONITOR GPS

N 29 38' 25"
W 98 17' 39"

SEISMOGRAPH DATA

Seismograph No. 13922 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 11-22-15 Microphone Calibration 11-22-15

Exact Seismograph Location Warden Property Line: 21375 Gunther Grove Drive, Trophy Oaks Subdivision North East corner of the property, at the pink pin flag

Seismograph Distance from Blast 2,641'

Peak Overpressure 108.0 dB Scaled Distance ------

Peak Particle Velocity .085 ips Operator DAVID WARMER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: D. [illegible] Date: 3-23-16

VIBRA-TECH
The Vibration Monitoring Experts

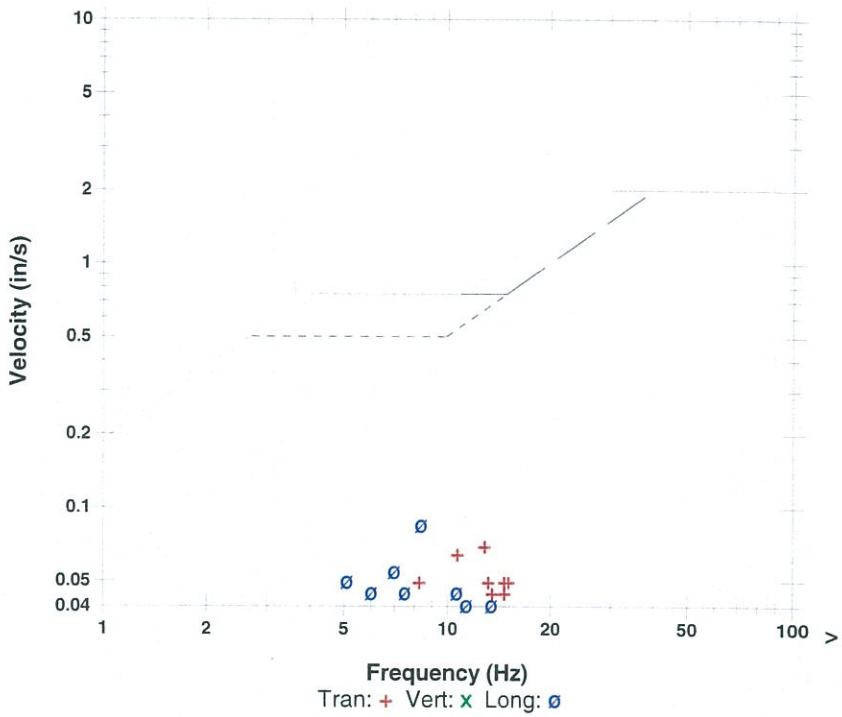
Event Report

Date/Time	Tran at 12:04:55 March 23, 2016	**Serial Number**	BF13922 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s	**Battery Level**	6.4 Volts
	Mic: 122 dB(L)	**Calibration**	November 22, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	O922GANG.871
Record Time	5.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Post Event Notes
Warden Prop Line: 2,641'

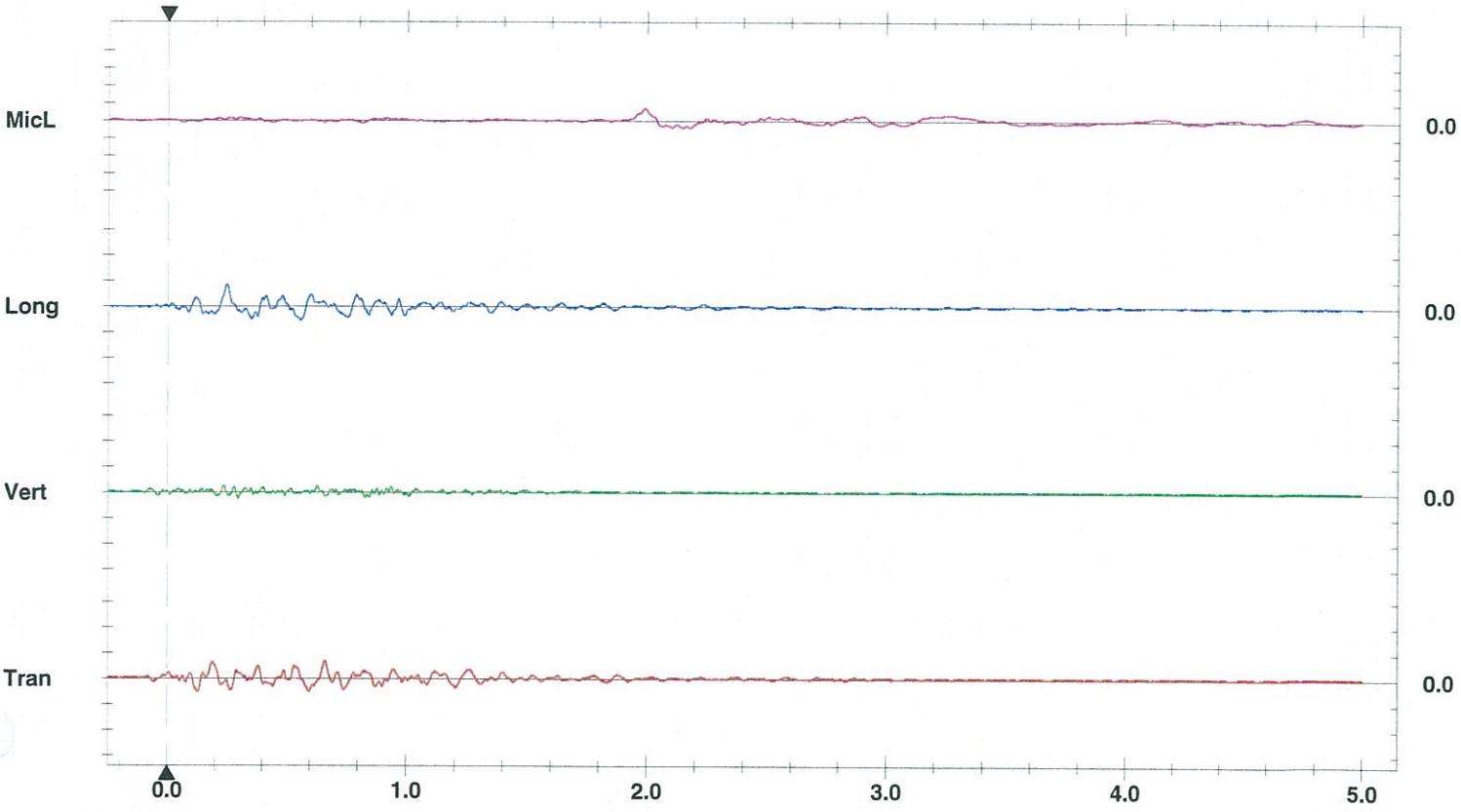
USBM RI8507 And OSMRE



Microphone	Linear Weighting		
PSPL	108.0 dB(L) at 1.987 sec		
ZC Freq	4.0 Hz		
Channel Test	Passed (Freq = 20.1 Hz Amp = 546 mv)		

	Tran	Vert	Long	
PPV	0.0700	0.0250	0.0850	in/s
ZC Freq	13	28	8.4	Hz
Time (Rel. to Trig)	0.661	0.231	0.244	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00090	0.00020	0.00128	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0857 in/s at 0.244 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger =

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-29-16 Blast No. 03-29-16 South Wall C Time 12:43

Exact Blast Location South Wall C

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 12.9"
W 98° 16' 48.4"

MONITOR GPS

N 29 38' 22.63
W 98 18' 53.97

SEISMOGRAPH DATA

Seismograph No. 6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location City Property Line: outside city water tower gate

30' from gate at the property line

Seismograph Distance from Blast 5859'

Peak Overpressure NT dB Scaled Distance ------

Peak Particle Velocity NT ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-29-16

City Property Line
Distance - 5859 ft
No Trigger

Event Report: Monitor Log - MultiSeis Plus # BD6191 comp mode

Start Time	End Time	Status
---	---	SERIAL NUMBER: BD6191
Mar 29 '16 11:11:46	Mar 29 '16 13:49:50	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-29-16 Blast No. 03-29-16 South Wall C Time 12:43

Exact Blast Location South Wall C

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 12.9"
W 98° 16' 48.4"

MONITOR GPS

N 29 38 58.8
W 98 18 17.5

SEISMOGRAPH DATA

Seismograph No. 8949 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location Cruz Residence – 22410 Oro Viejo Ct – George Ranch Subdivision

15' E off SE corner of garage at fence

Seismograph Distance from Blast 9122

Peak Overpressure NT dB Scaled Distance ------

Peak Particle Velocity NT ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-29-16

Cruz Residence
Distance - 9122 ft
No Trigger

Event Report: Monitor Log - MultiSeis Plus # BF8949 comp mode

Start Time	End Time	Status
---	---	SERIAL NUMBER: BF8949
Mar 29 '16 11:25:34	Mar 29 '16 13:59:21	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-29-16 Blast No. 03-29-16 South Wall C Time 12:43

Exact Blast Location South Wall C

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 12.9"
W 98° 16' 48.4"

MONITOR GPS

N 29 38' 15"
W 98 17' 26"

SEISMOGRAPH DATA

Seismograph No. 10562 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 09-13-15 Microphone Calibration 09-13-15

Exact Seismograph Location Holly Residence: 9916 Trophy Oaks Drive, Trophy Oaks Subdivision backyard along the quarry property line at the barbed wire fence

Seismograph Distance from Blast 3319

Peak Overpressure 117.6 dB Scaled Distance ------

Peak Particle Velocity 0.045 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-29-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:43:35 March 29, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

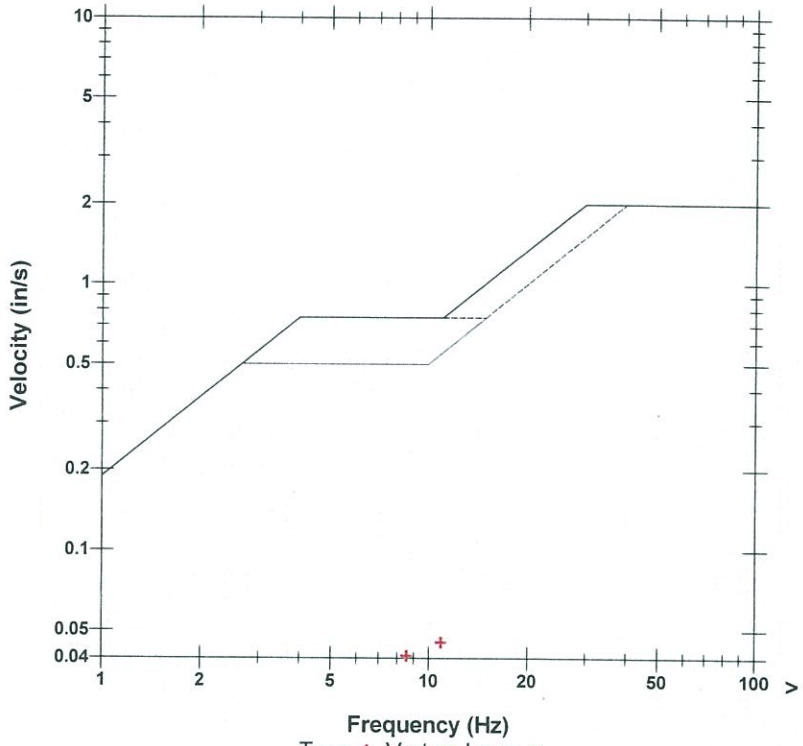
Serial Number	BF10562 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	September 13, 2015 by Vibra-Tech Inc.
File Name	L562GAYM.0N1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Extended Notes

Post Event Notes
Holly Residence
Distance: 3319 ft

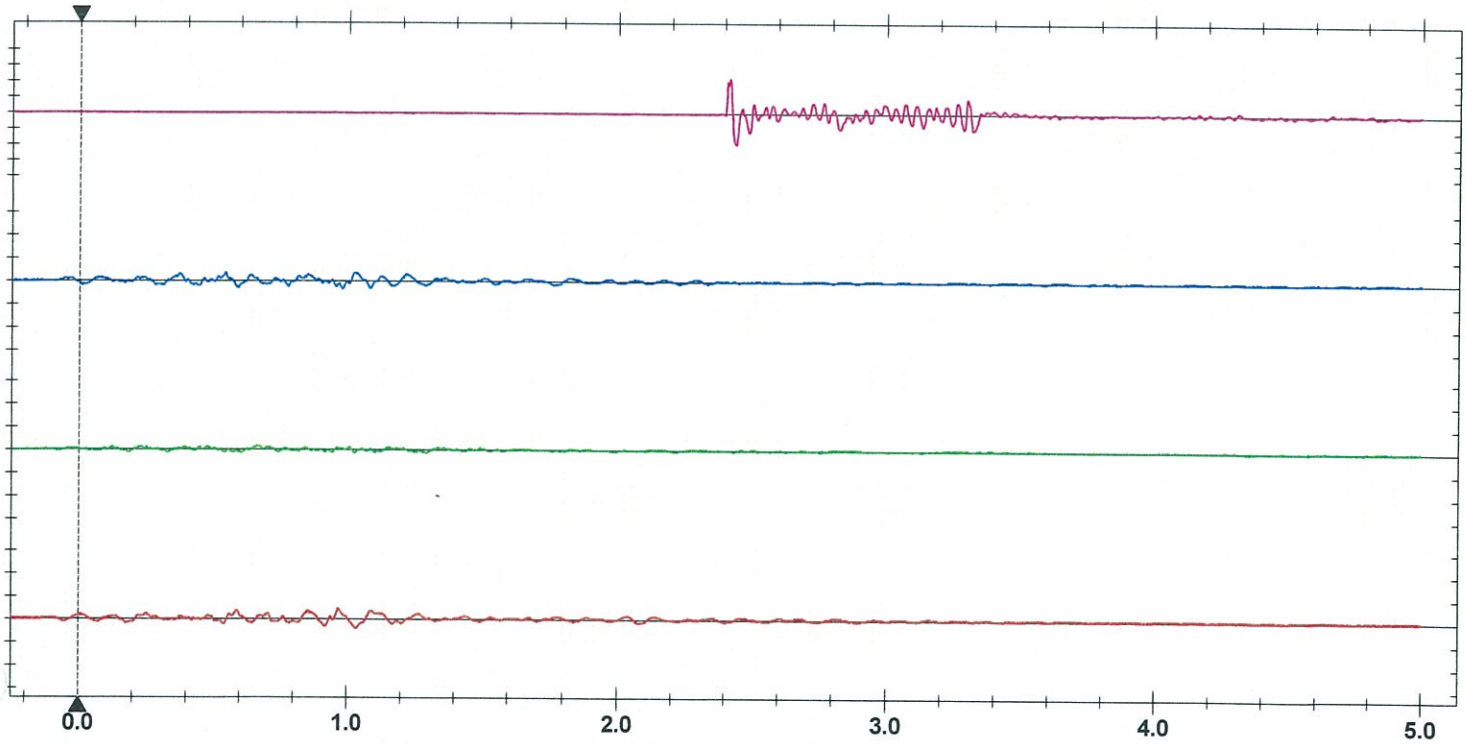
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	117.6 dB(L) at 2.417 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 539 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0150	0.0350	in/s
ZC Freq	11	30	11	Hz
Time (Rel. to Trig)	0.966	0.329	0.540	sec
Peak Acceleration	0.0133	0.0265	0.0265	g
Peak Displacement	0.00089	0.00016	0.00055	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0534 in/s at 1.034 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶----------◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-29-16 Blast No. 03-29-16 South Wall C Time 12:43

Exact Blast Location South Wall C

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 12.9"
W 98° 16' 48.4"

MONITOR GPS

N 29 38' 52"
W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 10626 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-21-15 Microphone Calibration 07-21-15

Exact Seismograph Location Michels Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 8942'

Peak Overpressure NT dB Scaled Distance ------

Peak Particle Velocity NT ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-29-16

Michels Residence
Distance - 8942 ft
No Trigger

Event Report: Monitor Log - EVERLERT III # BB10626 comp mode

Start Time	End Time	Status
---	---	SERIAL NUMBER: BB10626
Mar 29 '16 11:19:18	Mar 29 '16 13:54:36	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-29-16 Blast No. 03-29-16 South Wall C Time 12:43

Exact Blast Location South Wall C

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 12.9"
W 98° 16' 48.4"

MONITOR GPS

N 29 38' 23"
W 98 17' 40"

SEISMOGRAPH DATA

Seismograph No. 13138 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 02-23-16 Microphone Calibration 02-23-16

Exact Seismograph Location Warden Residence: 21375 Gunther Grove Drive, Trophy Oaks Subdivision

10' N of NE corner of pool at the rock wall

Seismograph Distance from Blast 4659

Peak Overpressure 121.9 dB Scaled Distance ------

Peak Particle Velocity 0.050 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-29-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 12:43:36 March 29, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

Serial Number	BF13138 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	February 23, 2016 by Vibra-Tech Inc.
File Name	O138GAYM.0O1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra-Tech
General:

Extended Notes

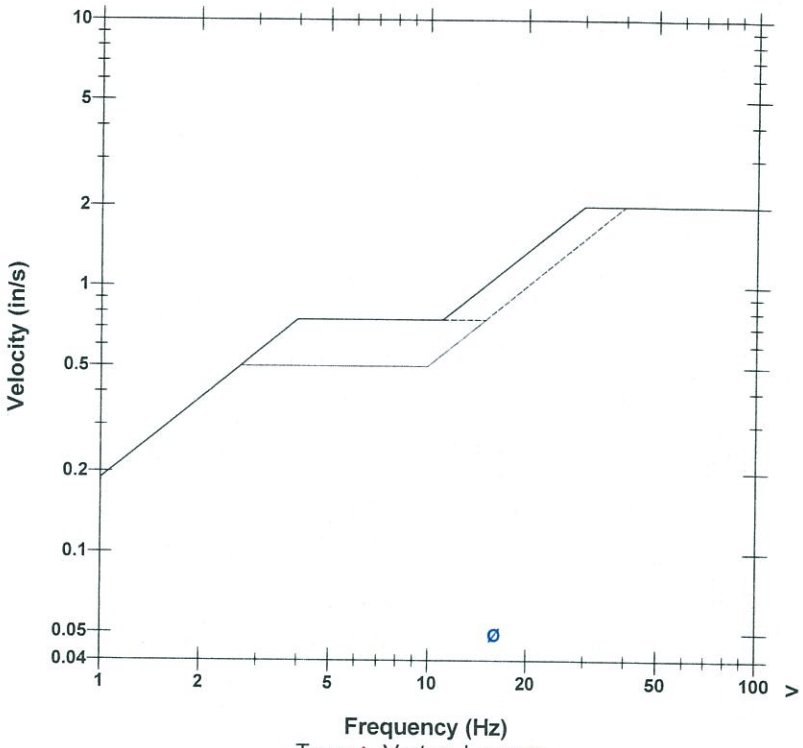
Post Event Notes
Warden Residence
Distance: 4659 ft

Microphone	Linear Weighting
PSPL	121.9 dB(L) at 3.006 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 574 mv)

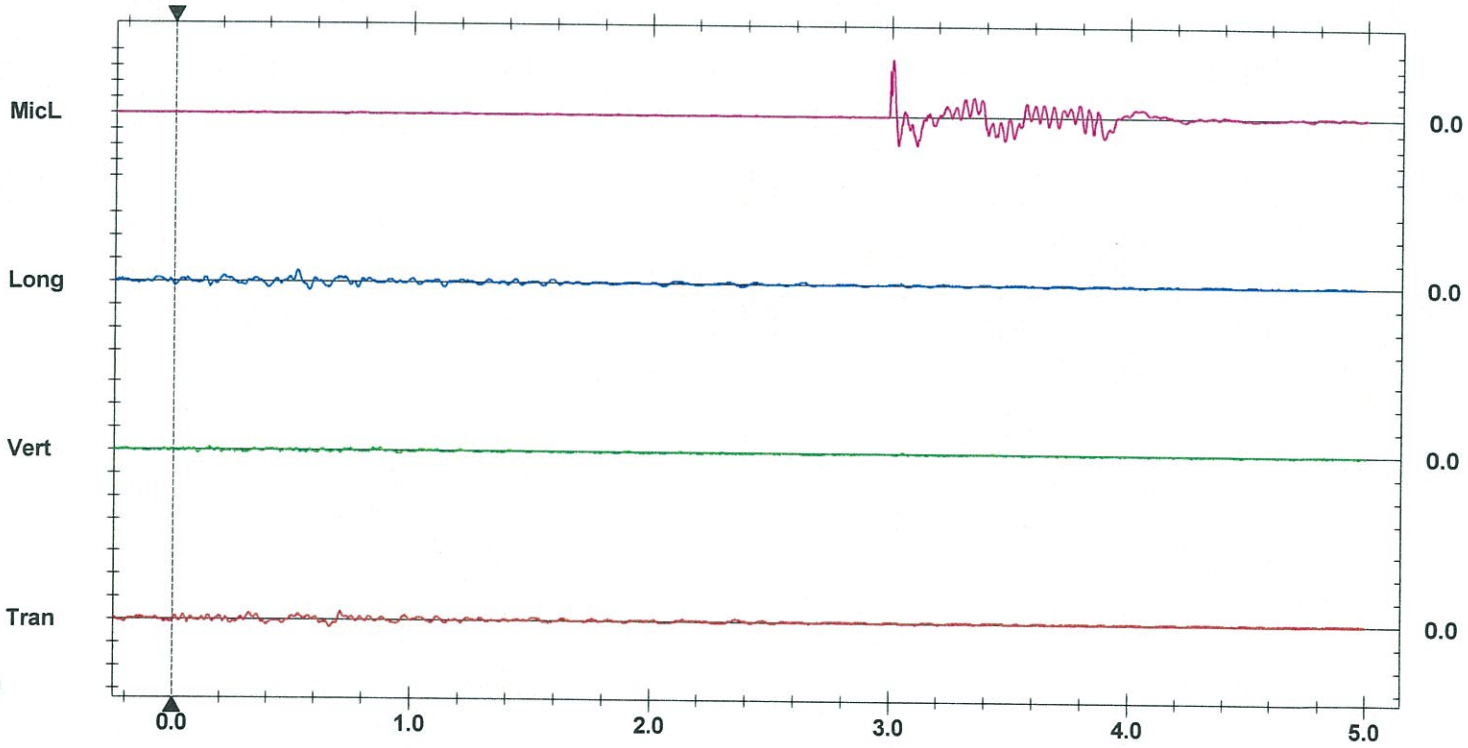
	Tran	Vert	Long	
PPV	0.0350	0.0150	0.0500	in/s
ZC Freq	11	37	16	Hz
Time (Rel. to Trig)	0.708	0.103	0.521	sec
Peak Acceleration	0.0133	0.0133	0.0265	g
Peak Displacement	0.00043	0.00010	0.00046	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0512 in/s at 0.521 sec

USBM RI8507 And OSMRE



Tran: + Vert: x Long: ø



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶----------◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-30-16 Blast No. 3.30.16 Lower 6 Time 11:47

Exact Blast Location N 29° 38' 49.8 W 98° 17' 08.9"

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 49.8"
W 98° 17' 08.9"

MONITOR GPS

N 29 38' 22.63
W 98 18' 53.97

SEISMOGRAPH DATA

Seismograph No. 6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location City Property Line: outside city water tower gate

30' from gate at the property line

Seismograph Distance from Blast 4,831'

Peak Overpressure 107.5 dB Scaled Distance ------

Peak Particle Velocity .020 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 3-30-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:47:38 March 30, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

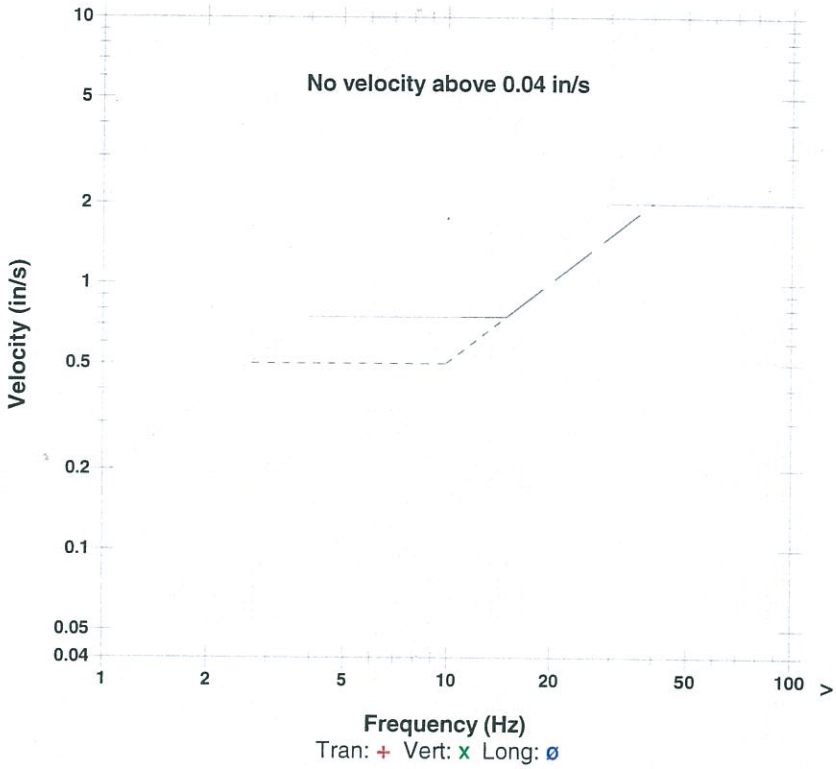
Serial Number	BD6191 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	H191GB0E.3E1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Extended Notes

Post Event Notes
City Property Line: 4,831'

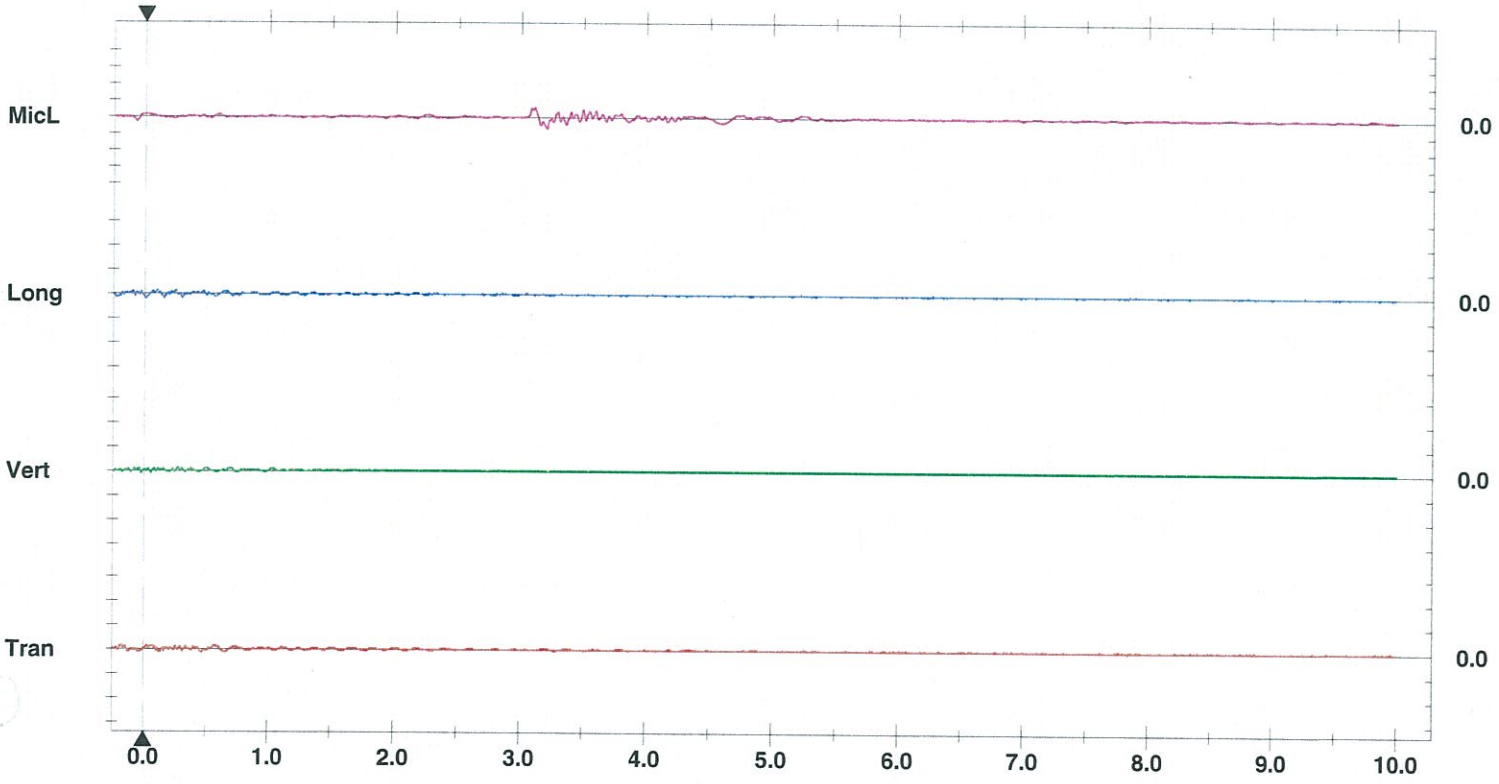
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	107.5 dB(L) at 3.199 sec
ZC Freq	3.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 570 mv)

	Tran	Vert	Long	
PPV	0.0150	0.0150	0.0200	in/s
ZC Freq	20	28	12	Hz
Time (Rel. to Trig)	-0.186	0.270	0.000	sec
Peak Acceleration	0.0133	0.0265	0.0265	g
Peak Displacement	0.00025	0.00018	0.00029	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0245 in/s at 0.301 sec



Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-30.16 Blast No. 3-30-16 Lower 6 Time 11:47

Exact Blast Location N 29° 38' 49.8" W 98° 17' 08.9"

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 49.8"
W 98° 17' 08.9"

MONITOR GPS

N 29 38 58.8
W 98 18 17.5

SEISMOGRAPH DATA

Seismograph No. 8949 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location Cruz Residence – 22410 Oro Viejo Ct – George Ranch Subdivision

15' E off SE corner of garage at fence

Seismograph Distance from Blast 6,110'

Peak Overpressure 101.9 dB Scaled Distance ------

Peak Particle Velocity .030 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3-30-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:47:36 March 30, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

Serial Number	BF8949 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	J949GB0E.3C1

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra-Tech
General:

Extended Notes

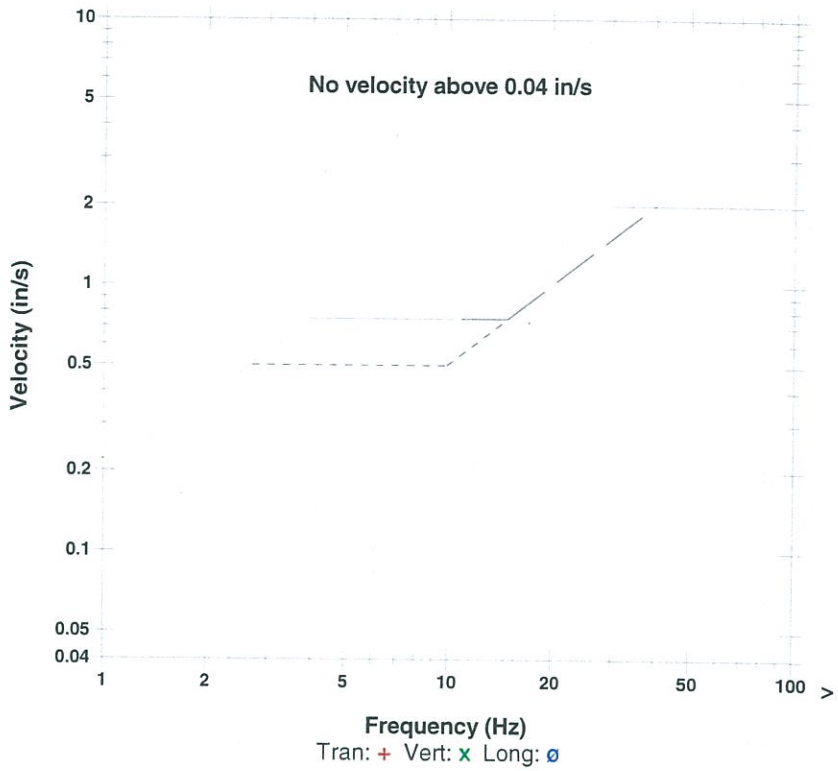
Post Event Notes
Cruz Residence: 6,110'

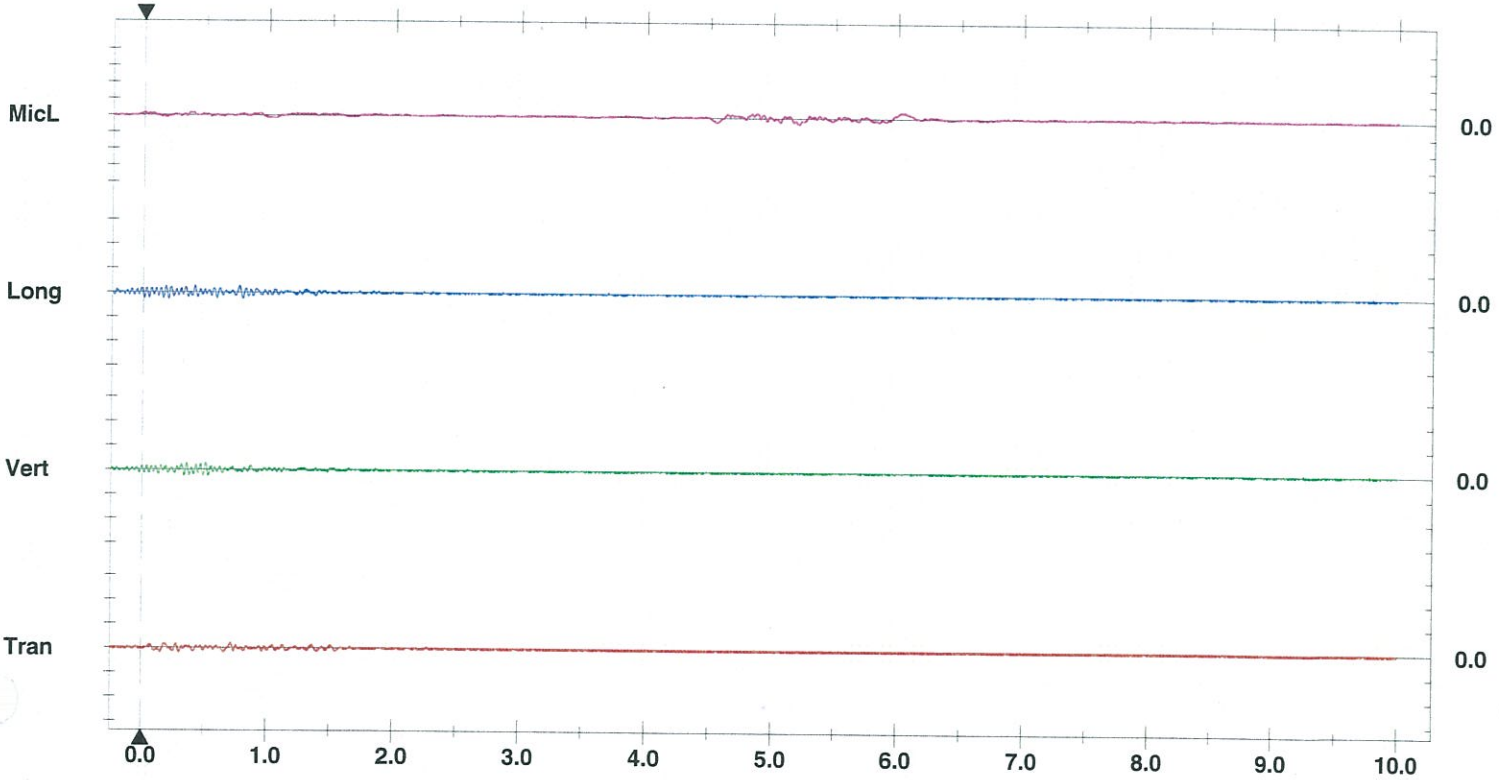
Microphone	Linear Weighting
PSPL	101.9 dB(L) at 5.209 sec
ZC Freq	4.2 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 596 mv)

	Tran	Vert	Long	
PPV	0.0200	0.0250	0.0300	in/s
ZC Freq	18	28	27	Hz
Time (Rel. to Trig)	0.146	0.331	0.201	sec
Peak Acceleration	0.0133	0.0265	0.0265	g
Peak Displacement	0.00020	0.00016	0.00020	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0354 in/s at 0.409 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-30-16 Blast No. 3-30-16 Lower 6 Time 11:47

Exact Blast Location N29° 38' 49.8" W 98° 17' 08.9"

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 49.8"
W 98° 17' 08.9"

MONITOR GPS

N 29 38' 52"
W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 10626 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-21-15 Microphone Calibration 07-21-15

Exact Seismograph Location Michels Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 6,215'

Peak Overpressure 101.9 dB Scaled Distance ------

Peak Particle Velocity .040 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3-30-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:47:38 March 30, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps
Job Number:	1

Serial Number	BB10626 V 7.04-8.0 EVERLERT III
Battery Level	6.3 Volts
Calibration	July 21, 2015 by Vibra-Tech Inc.
File Name	L626GB0E.3E1

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra Tech
General:

Extended Notes

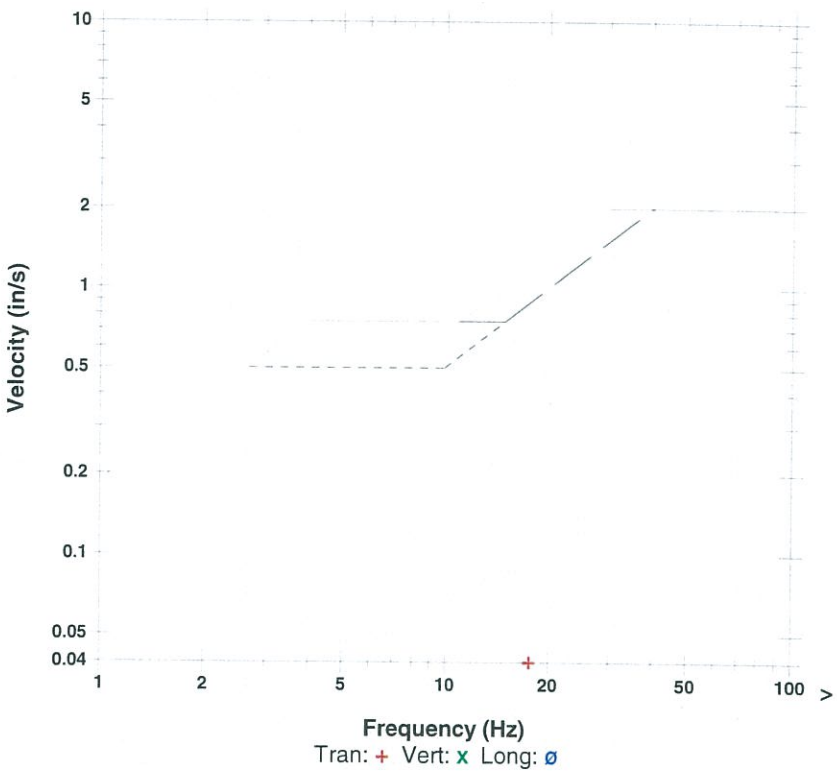
Post Event Notes
Michels Residence: 6,215'

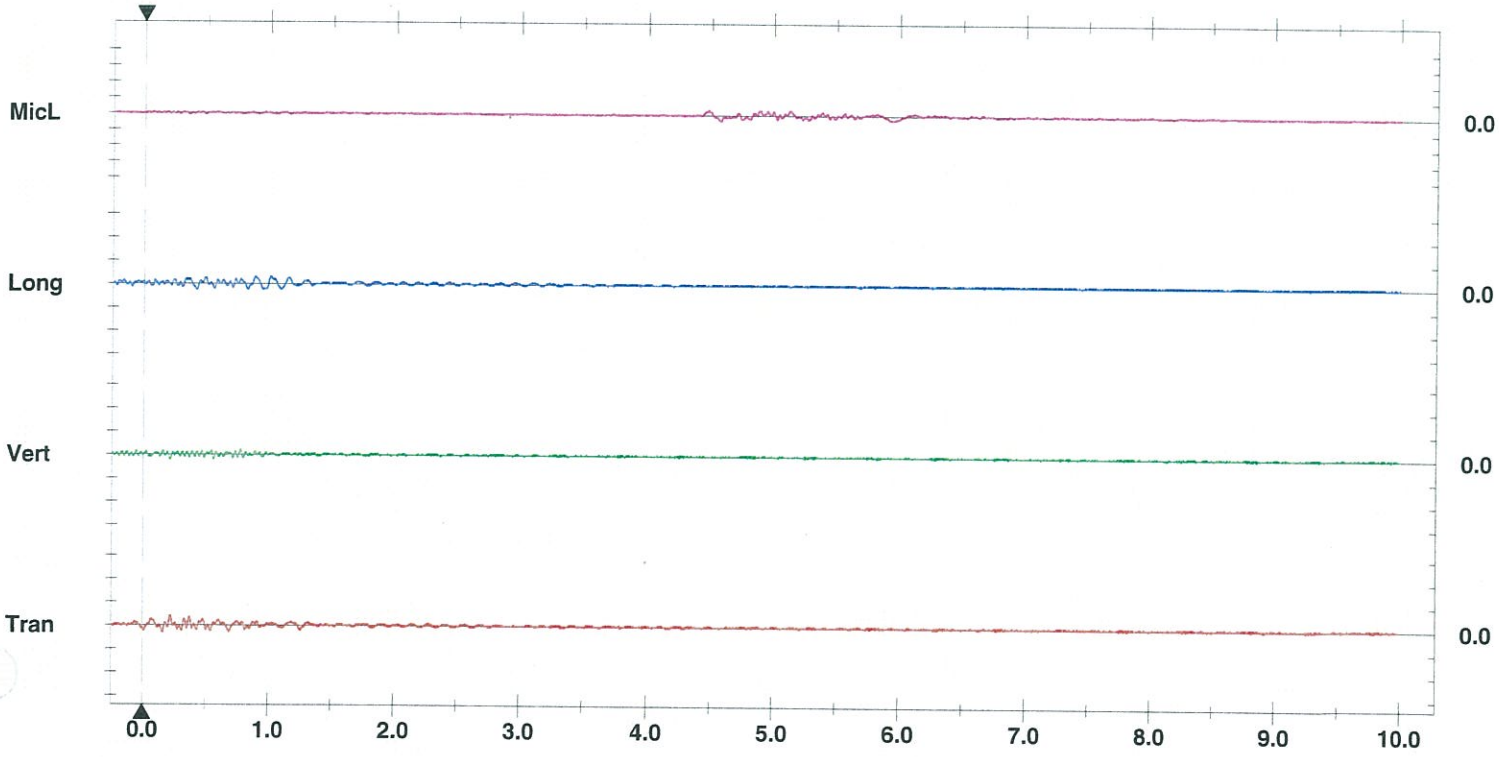
Microphone	Linear Weighting
PSPL	101.9 dB(L) at 4.564 sec
ZC Freq	2.9 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 702 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0200	0.0300	in/s
ZC Freq	18	24	11	Hz
Time (Rel. to Trig)	0.214	0.208	0.417	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00040	0.00014	0.00063	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0439 in/s at 0.214 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-30-16 Blast No. 3-30.16 Lower 6 Time 11:47

Exact Blast Location N 29° 38' 49.8" W 98° 17' 08.9"

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 49.8"
W 98° 17' 08.9"

MONITOR GPS

N 29 38' 23"
W 98 17' 40"

SEISMOGRAPH DATA

Seismograph No. 13138 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 02-23-16 Microphone Calibration 02-23-16

Exact Seismograph Location Warden Residence: 21375 Gunther Grove Drive, Trophy Oaks Subdivision
10' N of NE corner of pool at the rock wall

Seismograph Distance from Blast 3,857'

Peak Overpressure 109.9 dB Scaled Distance ------

Peak Particle Velocity .100 ips 22Hz Operator DAVID LATENEIR

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 3-30-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:47:38 March 30, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

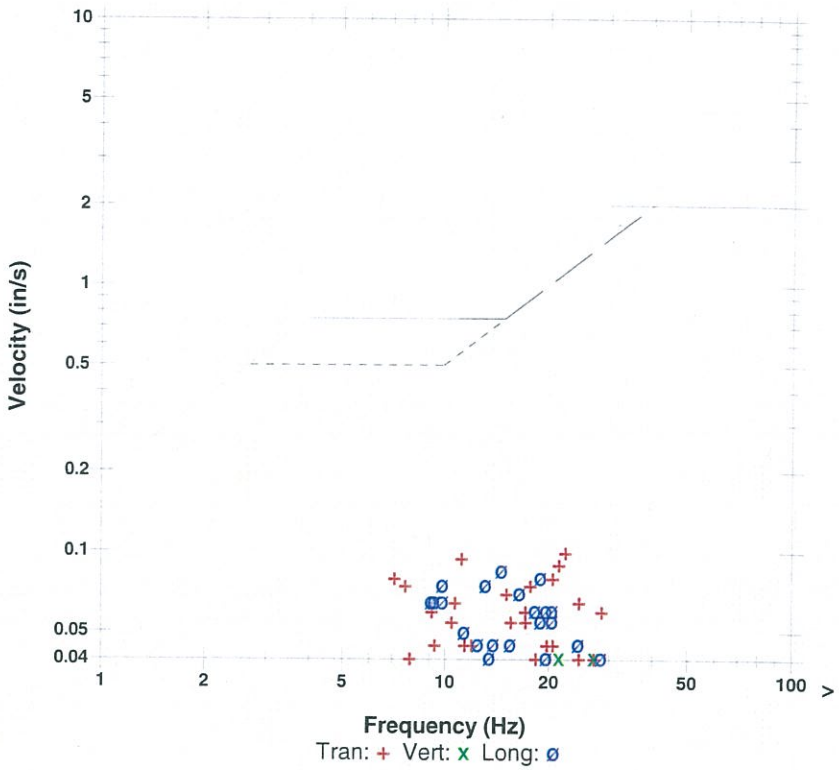
Serial Number	BF13138 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	February 23, 2016 by Vibra-Tech Inc.
File Name	O138GB0E.3E1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra-Tech
General:

Extended Notes

Post Event Notes
Warden Residence: 3,857'

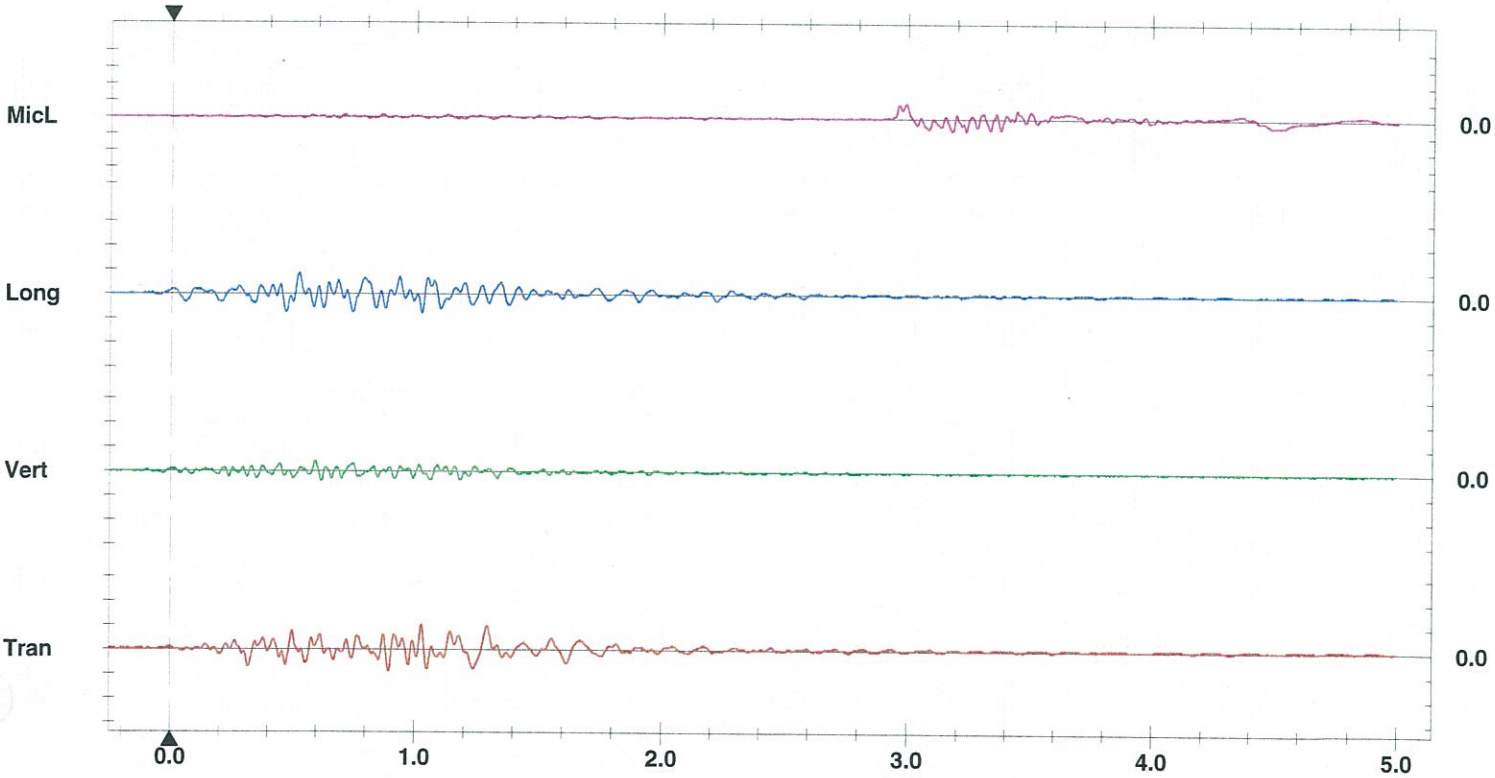
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	109.9 dB(L) at 2.991 sec
ZC Freq	6.2 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 579 mv)

	Tran	Vert	Long	
PPV	0.1000	0.0400	0.0850	in/s
ZC Freq	22	21	15	Hz
Time (Rel. to Trig)	1.025	0.589	0.521	sec
Peak Acceleration	0.0398	0.0265	0.0265	g
Peak Displacement	0.00145	0.00045	0.00116	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.125 in/s at 1.025 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 3-30-16 Blast No. 3-30-16 Lower 6 Time 11:47

Exact Blast Location N 29° 38 49.8 W 98°17 08.9

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 49.8"

W 98° 17' 08.9"

MONITOR GPS

N 29 38' 25"

W 98 17' 39"

SEISMOGRAPH DATA

Seismograph No. 13922 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 11-22-15 Microphone Calibration 11-22-15

Exact Seismograph Location Warden Property Line: 21375 Gunther Grove Drive, Trophy Oaks Subdivision

North East corner of the property, at the pink pin flag

Seismograph Distance from Blast 3,653'

Peak Overpressure 110.6 dB Scaled Distance ------

Peak Particle Velocity .085 ips Operator DAVID LARMER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 3-30-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:47:09 March 30, 2016	**Serial Number**	BF13922 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)	**Battery Level**	6.4 Volts
Range	Geo :10.00 in/s	**Calibration**	November 22, 2015 by Vibra-Tech Inc.
Record Time	5.0 sec at 1024 sps	**File Name**	O922GB0E.2L1

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

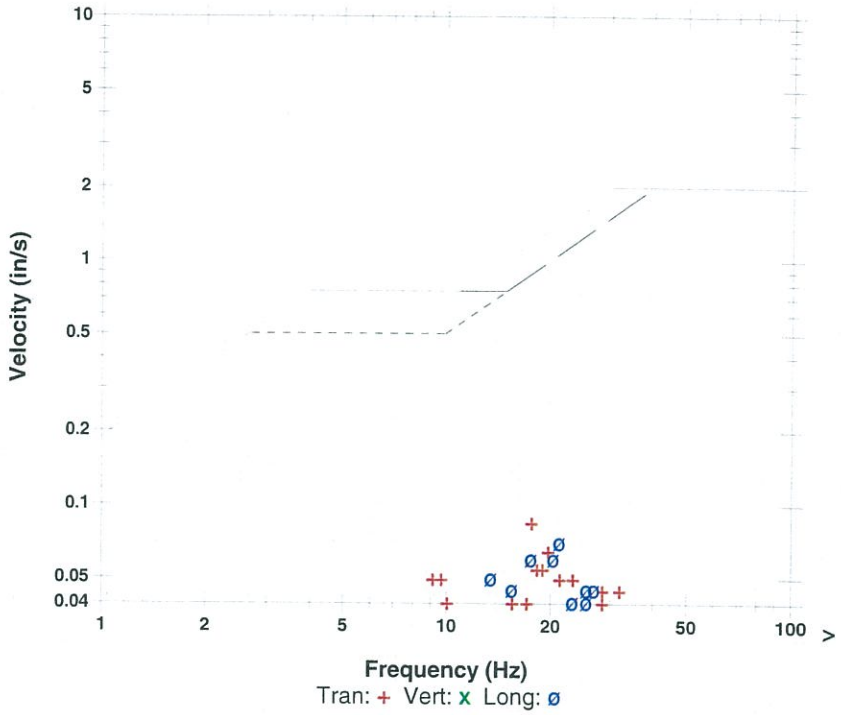
Post Event Notes
Warden Property Line: 3,653'

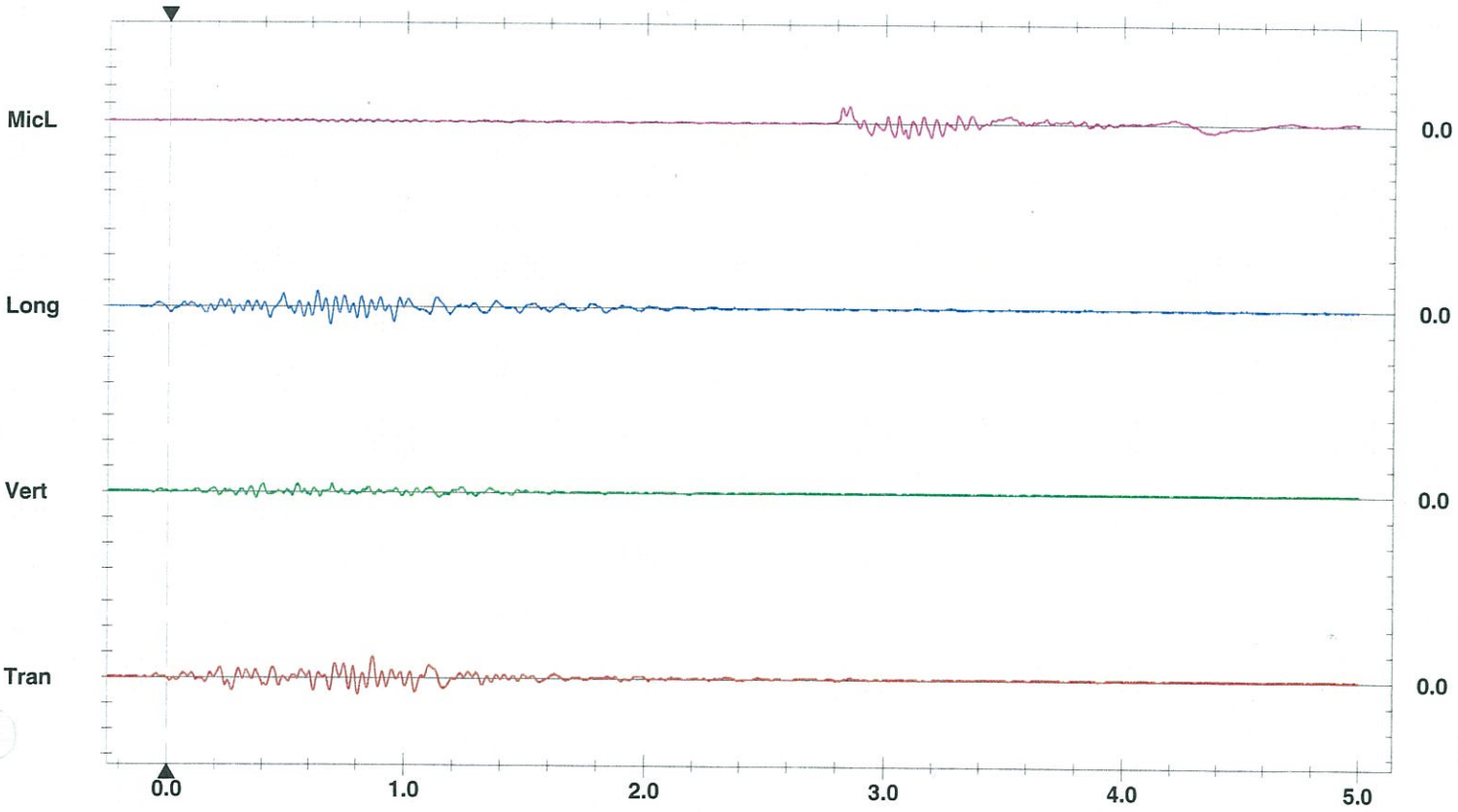
Microphone Linear Weighting
PSPL 110.6 dB(L) at 2.849 sec
ZC Freq 5.6 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 534 mv)

	Tran	Vert	Long	
PPV	0.0850	0.0300	0.0700	in/s
ZC Freq	18	19	21	Hz
Time (Rel. to Trig)	0.868	0.395	0.683	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00091	0.00028	0.00055	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0865 in/s at 0.868 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶——◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-31-16 Blast No. 03-31-16 South Wall O Time 12:16

Exact Blast Location South Wall O

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS
N 29° 38' 18.9"
W 98° 16' 38.0"

MONITOR GPS

N 29 38' 22.63
W 98 18' 53.97

SEISMOGRAPH DATA

Seismograph No. 6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location City Property Line: outside city water tower gate

30' from gate at the property line

Seismograph Distance from Blast 6702

Peak Overpressure 108.4 dB Scaled Distance ------

Peak Particle Velocity 0.040 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-31-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

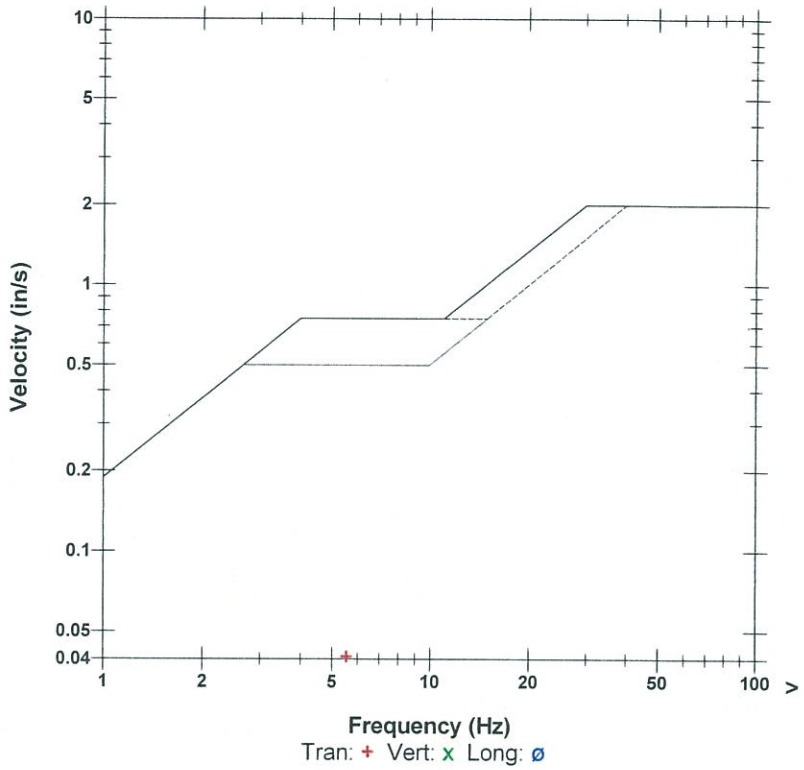
Date/Time	Tran at 12:16:45 March 31, 2016	**Serial Number**	BD6191 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)	**Battery Level**	6.3 Volts
		Calibration	July 16, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	H191GB2A.3X1
Record Time	10.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Extended Notes

Post Event Notes
City Property Line
Distance: 6702 ft

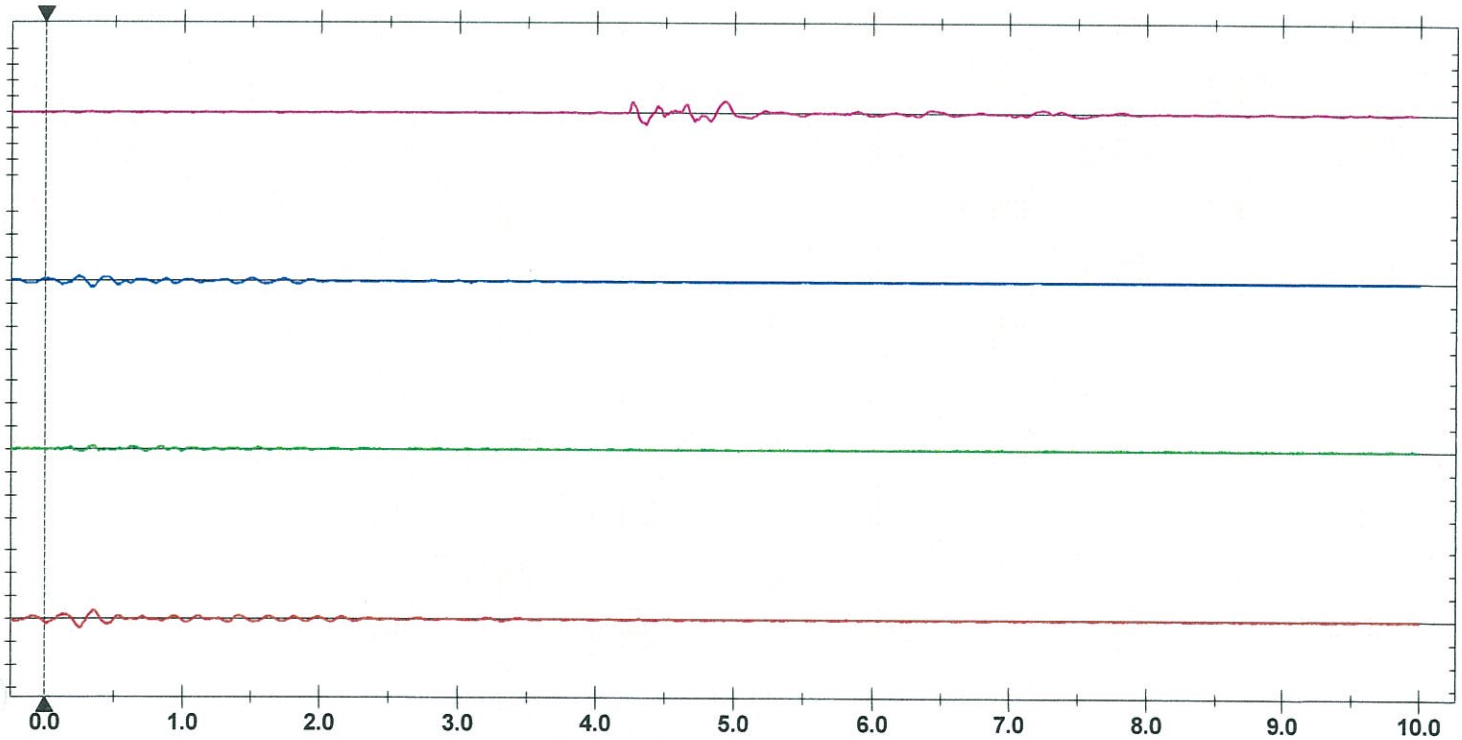
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	108.4 dB(L) at 4.357 sec
ZC Freq	4.7 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 599 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0150	0.0300	in/s
ZC Freq	5.6	12	6.2	Hz
Time (Rel. to Trig)	0.246	0.338	0.323	sec
Peak Acceleration	0.0133	0.0265	0.0133	g
Peak Displacement	0.00116	0.00023	0.00084	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0485 in/s at 0.349 sec



Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶----------◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-31-16 Blast No. 03-31-16 South Wall O Time 12:16

Exact Blast Location South Wall O

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 18.9"
W 98° 16' 38.0"

MONITOR GPS

N 29 38 58.8
W 98 18 17.5

SEISMOGRAPH DATA

Seismograph No. 8949 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location Cruz Residence – 22410 Oro Viejo Ct – George Ranch Subdivision

15' E off SE corner of garage at fence

Seismograph Distance from Blast 6651

Peak Overpressure NT dB Scaled Distance ------

Peak Particle Velocity NT ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-31-16

Cruz Residence
Distance - 9651 ft
No Trigger

Event Report: Monitor Log - MultiSeis Plus # BF8949 comp mode

Start Time	End Time	Status
---	---	SERIAL NUMBER: BF8949
Mar 31 '16 10:36:26	Mar 31 '16 13:47:25	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-31-16 Blast No. 03-31-16 South Wall O Time 12:16

Exact Blast Location South Wall O

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 18.9"
W 98° 16' 38.0"

MONITOR GPS

N 29 38' 15"
W 98 17' 26"

SEISMOGRAPH DATA

Seismograph No. 10562 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 09-13-15 Microphone Calibration 09-13-15

Exact Seismograph Location Holly Residence: 9916 Trophy Oaks Drive, Trophy Oaks Subdivision backyard along the quarry property line at the barbed wire fence

Seismograph Distance from Blast 4246

Peak Overpressure 107.5 dB Scaled Distance ------

Peak Particle Velocity 0.070 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-31-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 12:16:45 March 31, 2016	**Serial Number**	BF10562 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s	**Battery Level**	6.4 Volts
	Mic: 122 dB(L)	**Calibration**	September 13, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	L562GB2A.3X1
Record Time	5.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Extended Notes

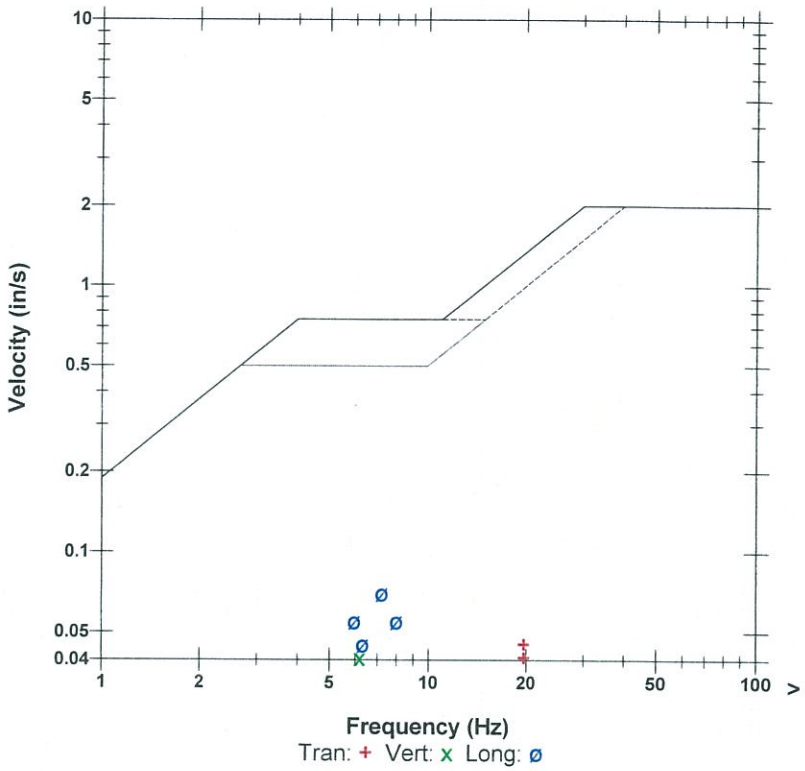
Post Event Notes
Holly Residence
Distance: 4264 ft

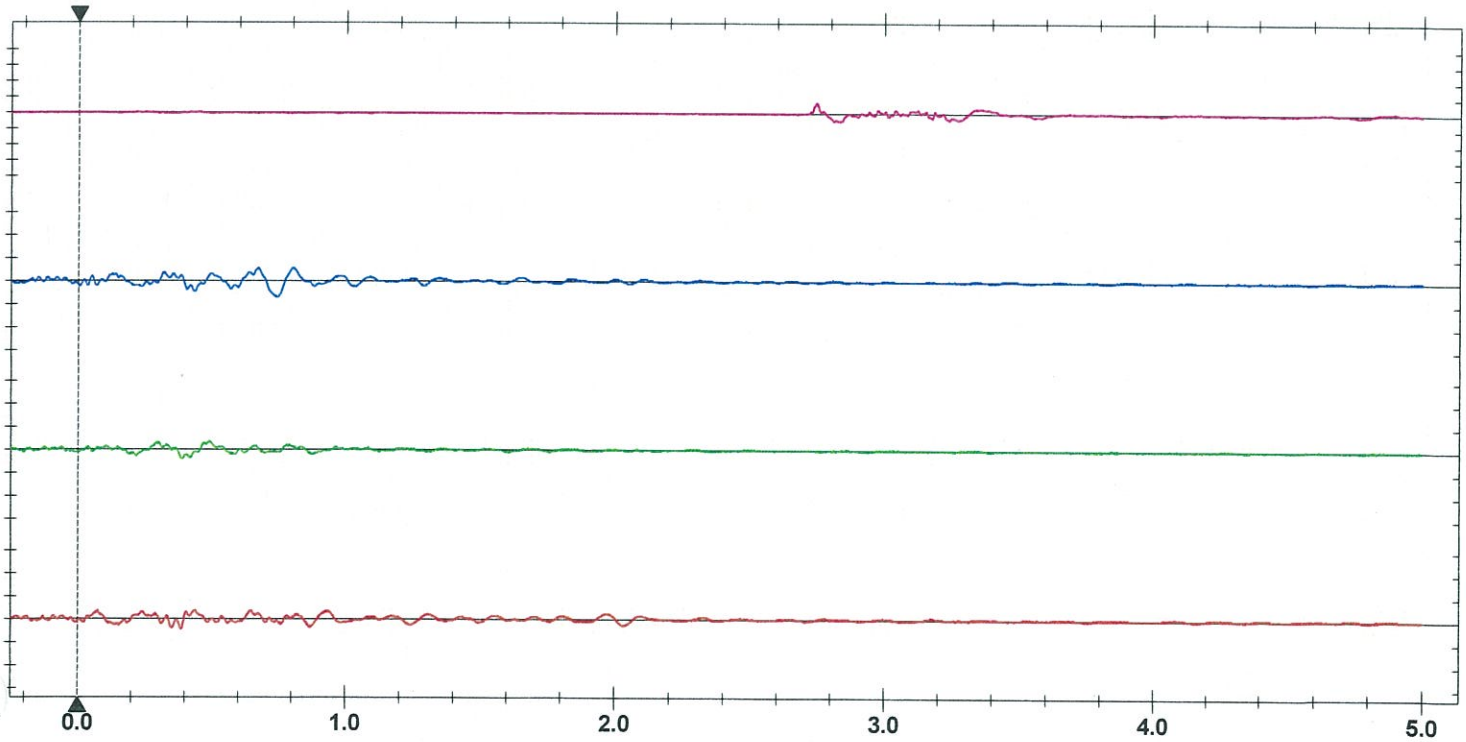
Microphone Linear Weighting
PSPL 107.5 dB(L) at 2.746 sec
ZC Freq 8.7 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 488 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0400	0.0700	in/s
ZC Freq	20	6.2	7.2	Hz
Time (Rel. to Trig)	0.387	0.384	0.735	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00076	0.00095	0.00168	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0723 in/s at 0.739 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶----------◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-31-16 Blast No. 03-31-16 South Wall O Time 12:16

Exact Blast Location South Wall O

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 18.9"
W 98° 16' 38.0"

MONITOR GPS

N 29 38' 52"
W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 10626 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-21-15 Microphone Calibration 07-21-15

Exact Seismograph Location Michels Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 9541

Peak Overpressure 101.9 dB Scaled Distance ------

Peak Particle Velocity 0.025 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-31-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:16:46 March 31, 2016	**Serial Number**	BB10626 V 7.04-8.0 EVERLERT III
Trigger Source	Geo: 0.0200 in/s	**Battery Level**	6.3 Volts
	Mic: 122 dB(L)	**Calibration**	July 21, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	L626GB2A.3Y1
Record Time	10.0 sec at 1024 sps		
Job Number:	1		

Notes
Location: Garden Ridge, Texas
Client: Hanson ServTex
User Name: Vibra Tech
General:

Extended Notes

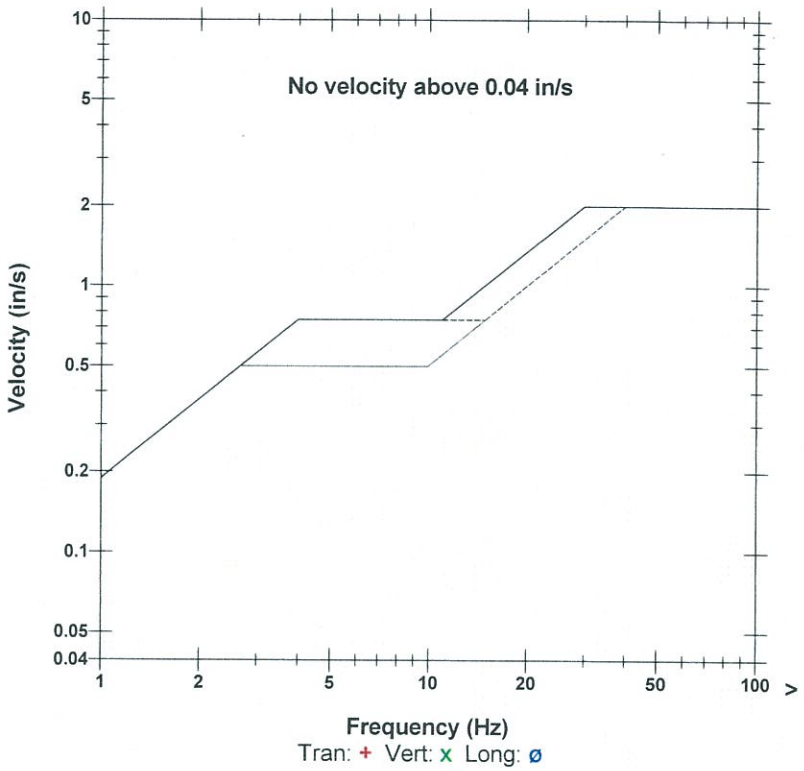
Post Event Notes
Michels Residence
Distance: 9541 ft

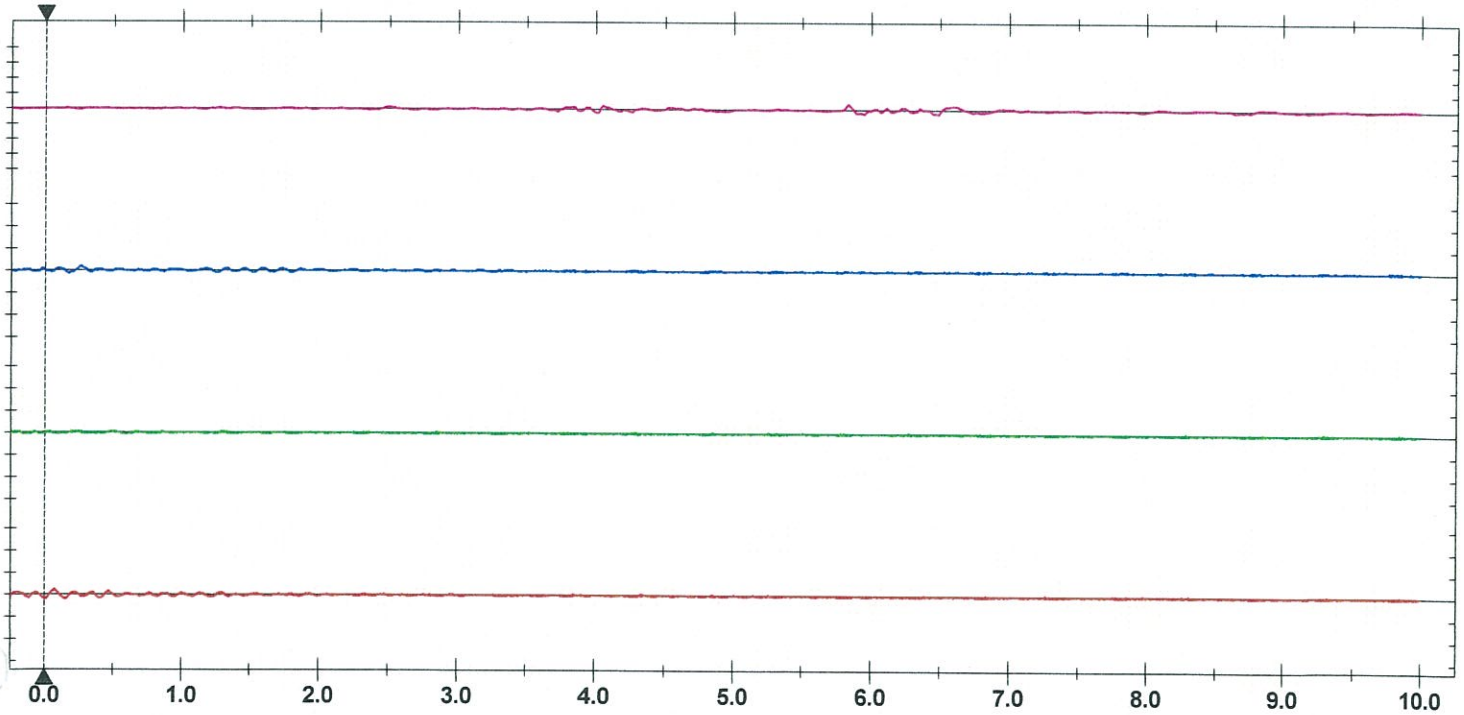
Microphone Linear Weighting
PSPL 101.9 dB(L) at 5.829 sec
ZC Freq 8.0 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 697 mv)

	Tran	Vert	Long	
PPV	0.0250	0.01000	0.0200	in/s
ZC Freq	9.7	>100	11	Hz
Time (Rel. to Trig)	0.076	0.099	0.252	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00039	0.00000	0.00031	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0260 in/s at 0.076 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶----------◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-31-16 Blast No. 03-31-16 South Wall ① Time 12:16

Exact Blast Location South Wall ①

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 18.9"
W 98° 16' 38.0"

MONITOR GPS

N 29 38' 23"
W 98 17' 40"

SEISMOGRAPH DATA

Seismograph No. 13138 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 02-23-16 Microphone Calibration 02-23-16

Exact Seismograph Location Warden Residence: 21375 Gunther Grove Drive, Trophy Oaks Subdivision

10' N of NE corner of pool at the rock wall

Seismograph Distance from Blast 5477

Peak Overpressure 111.5 dB Scaled Distance ------

Peak Particle Velocity 0.060 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-31-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:16:45 March 31, 2016	**Serial Number**	BF13138 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s	**Battery Level**	6.4 Volts
	Mic: 122 dB(L)	**Calibration**	February 23, 2016 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	O138GB2A.3X1
Record Time	5.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra-Tech
General:

Extended Notes

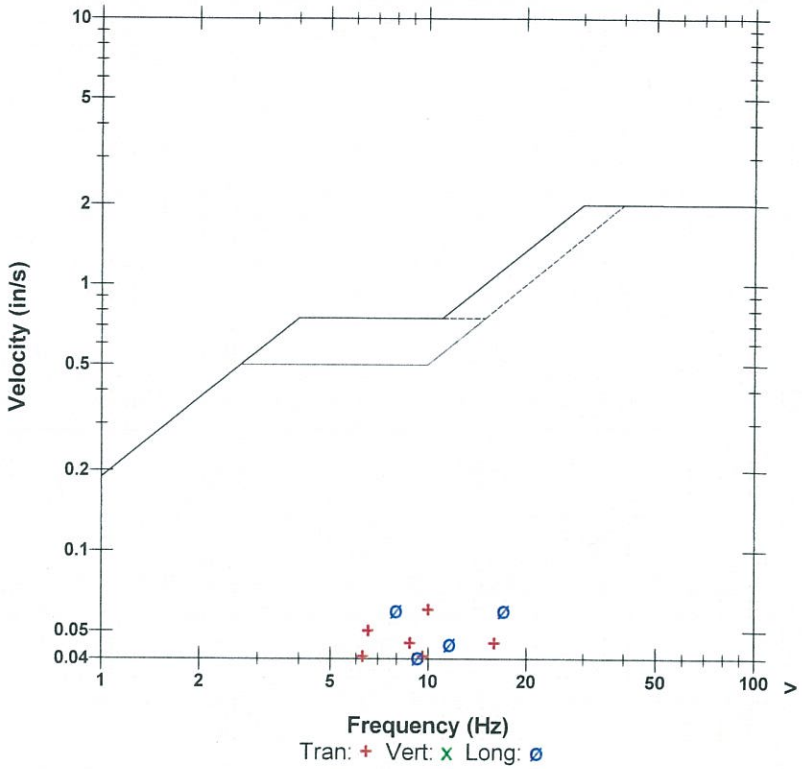
Post Event Notes
Warden Residence
Distance: 5477 ft

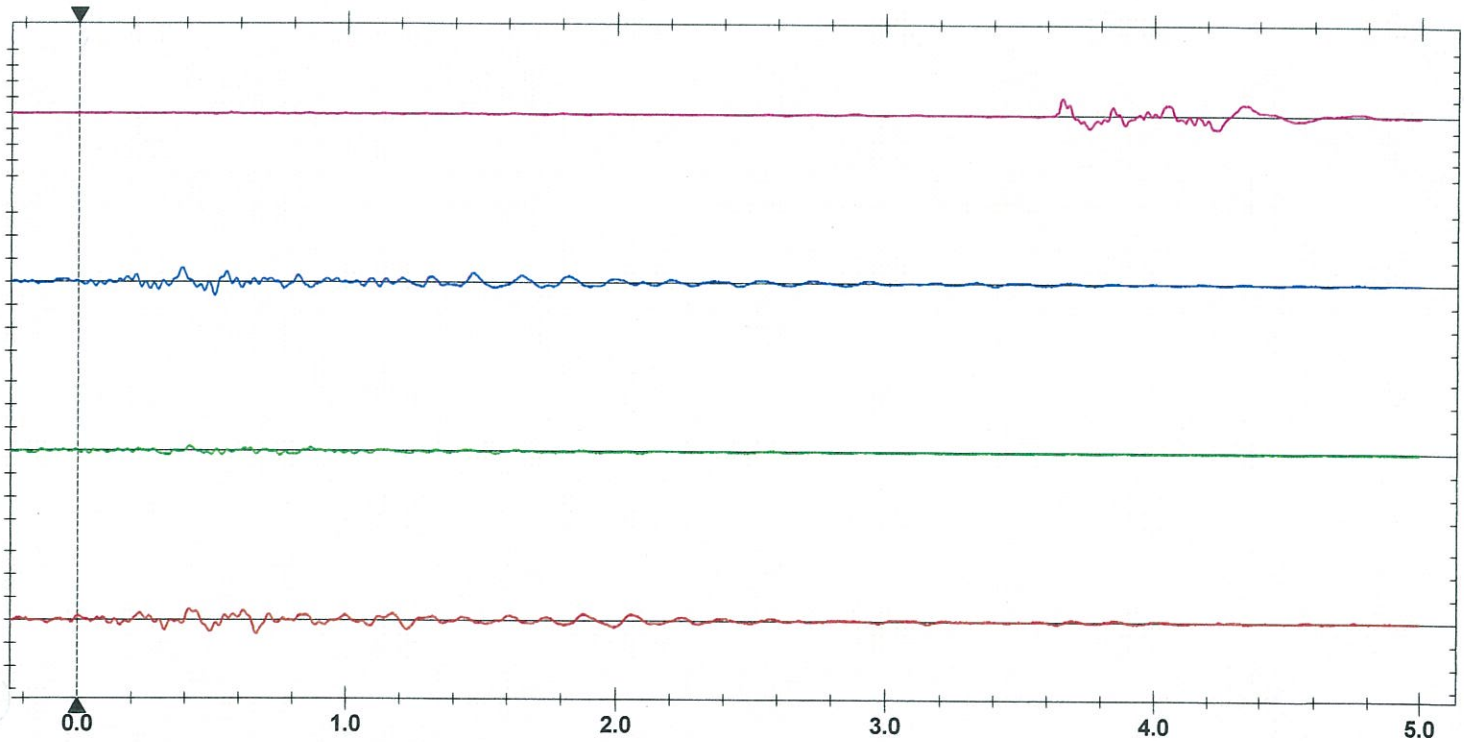
Microphone Linear Weighting
PSPL 111.5 dB(L) at 3.655 sec
ZC Freq 7.6 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 572 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0200	0.0600	in/s
ZC Freq	10	9.5	8.0	Hz
Time (Rel. to Trig)	0.664	0.324	0.384	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00101	0.00038	0.00093	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0673 in/s at 0.505 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶----------◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-31-16 Blast No. 03-31-16 Signature Hole Time 12:24

Exact Blast Location _____

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 09.8"
W 98° 16' 54.9"

MONITOR GPS

N 29 38' 22.63
W 98 18' 53.97

SEISMOGRAPH DATA

Seismograph No. 6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location City Property Line: outside city water tower gate

30' from gate at the property line

Seismograph Distance from Blast 5363

Peak Overpressure NT dB Scaled Distance ------

Peak Particle Velocity NT ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-31-16

City Property Line
Distance - 5363 ft
No Trigger

Event Report: Monitor Log - MultiSeis Plus # BD6191 comp mode

Start Time	End Time	Status
---	---	SERIAL NUMBER: BD6191
Mar 31 '16 10:23:11		Start Monitoring Trigger Level: Geo: 0.0200 in/s Mic: 122.0 dB(L)
Mar 31 '16 12:16:45	Mar 31 '16 12:16:55	Event recorded. Trigger Tran: 0.0200 in/s
Mar 31 '16 12:16:55	Mar 31 '16 13:34:45	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-31-16 Blast No. 03-31-16 Signature Hole Time 12:24

Exact Blast Location _____

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 09.8"
W 98° 16' 54.9"

MONITOR GPS

N 29 38 58.8
W 98 18 17.5

SEISMOGRAPH DATA

Seismograph No. 8949 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-16-15 Microphone Calibration 07-16-15

Exact Seismograph Location Cruz Residence – 22410 Oro Viejo Ct – George Ranch Subdivision

15' E off SE corner of garage at fence

Seismograph Distance from Blast 8808

Peak Overpressure NT dB Scaled Distance ------

Peak Particle Velocity NT ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-31-16

Cruz Residence
Distance - 8808 ft
No Trigger

Event Report: Monitor Log - MultiSeis Plus # BF8949 comp mode

Start Time	End Time	Status
---	---	SERIAL NUMBER: BF8949
Mar 31 '16 10:36:26	Mar 31 '16 13:47:25	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-31-16 Blast No. 03-31-16 Signature Hole Time 12:24

Exact Blast Location _____

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 09.8"
W 98° 16' 54.9"

MONITOR GPS

N 29 38' 15"
W 98 17' 26"

SEISMOGRAPH DATA

Seismograph No. 10562 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 09-13-15 Microphone Calibration 09-13-15

Exact Seismograph Location Holly Residence: 9916 Trophy Oaks Drive, Trophy Oaks Subdivision backyard along the quarry property line at the barbed wire fence

Seismograph Distance from Blast 2790

Peak Overpressure 110.9 dB Scaled Distance ------

Peak Particle Velocity 0.050 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-31-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 12:24:06 March 31, 2016	**Serial Number**	BF10562 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)	**Battery Level**	6.4 Volts
		Calibration	September 13, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	L562GB2A.G61
Record Time	5.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra Tech
General:

Extended Notes

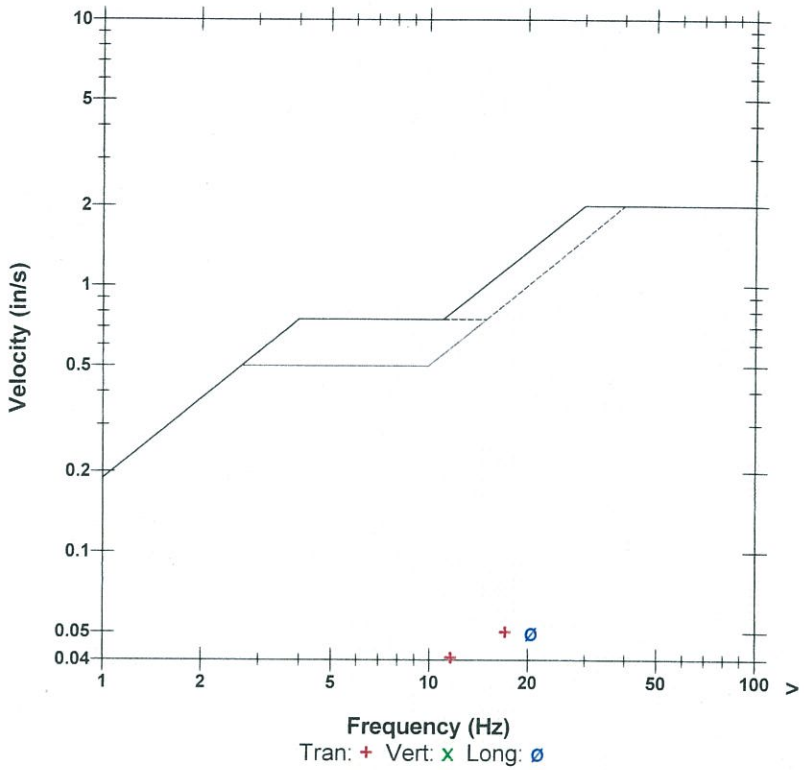
Post Event Notes
Holly Residence
Distance: 2790 ft

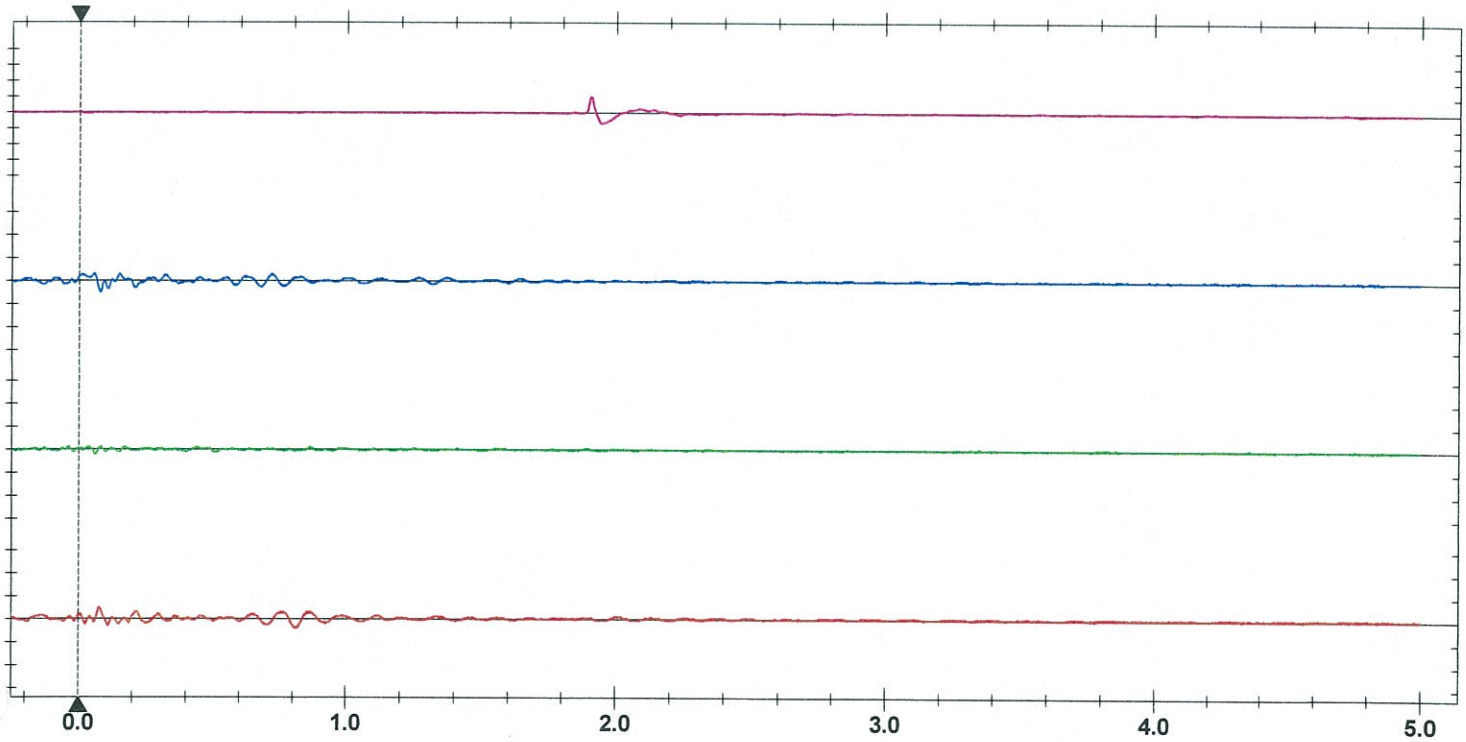
Microphone Linear Weighting
PSPL 110.9 dB(L) at 1.902 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 488 mv)

	Tran	Vert	Long	
PPV	0.0500	0.0200	0.0500	in/s
ZC Freq	17	28	20	Hz
Time (Rel. to Trig)	0.078	0.057	0.076	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00059	0.00013	0.00069	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0714 in/s at 0.078 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶----------◀

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-31-16 Blast No. 03-31-16 Sig Hole Time 12:24

Exact Blast Location _____

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 09.8"

MONITOR GPS

N 29 38' 52"
W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 10626 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 07-21-15 Microphone Calibration 07-21-15

Exact Seismograph Location Michels Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 858S

Peak Overpressure NT dB Scaled Distance ------

Peak Particle Velocity NT ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-31-16

Michels Residence
Distance - 8585 ft
No Trigger

Event Report: Monitor Log - EVERLERT III # BB10626 comp mode

Start Time	End Time	Status
---	---	SERIAL NUMBER: BB10626
Mar 31 '16 10:30:46		Start Monitoring Trigger Level: Geo: 0.0200 in/s Mic: 122.0 dB(L)
Mar 31 '16 12:11:02	Mar 31 '16 12:11:12	Event recorded. Trigger Tran: 0.0200 in/s
Mar 31 '16 12:11:12		Start Monitoring Trigger Level: Geo: 0.0200 in/s Mic: 122.0 dB(L)
Mar 31 '16 12:16:46	Mar 31 '16 12:16:56	Event recorded. Trigger Tran: 0.0200 in/s
Mar 31 '16 12:16:56	Mar 31 '16 13:42:26	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 03-31-16 Blast No. 03-31-16 Signature Hole Time 12:24

Exact Blast Location _____

No. of Holes _____ Diameter _____ in. Avg. Depth _____ Subgrade _____ ft.

Spacing _____ ft. Burden _____ ft. Avg. Stemming _____ ft.

Make & Type of Explosives:

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

_____ _____ lbs.

Total Explosives _____ lbs.

Delay Make _____

Delay Type & Nos. _____

Min. delay period _____ ms.

Max. lbs/delay period _____ lbs.

Blaster: Adam Nichols, ORICA

Weather _____

Wind Direction & Speed _____

BLAST LAYOUT

Detail or Diagram Blast Layout: Number of rows; Number of holes in each row; Number of decks per hole; amount of stemming between powder columns; nominal delay time between decks, holes and rows. (Use reverse side if necessary.)

See attached for blast diagram and above Information

FACE GPS

N 29° 38' 09.8"
W 98° 16' 54.9"

MONITOR GPS

N 29 38' 23"
W 98 17' 40"

SEISMOGRAPH DATA

Seismograph No. 13138 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 02-23-16 Microphone Calibration 02-23-16

Exact Seismograph Location Warden Residence: 21375 Gunther Grove Drive, Trophy Oaks Subdivision

10' N of NE corner of pool at the rock wall

Seismograph Distance from Blast 4192

Peak Overpressure 112.6 dB Scaled Distance ------

Peak Particle Velocity 0.040 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 03-31-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 12:24:07 March 31, 2016	**Serial Number**	BF13138 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s	**Battery Level**	6.3 Volts
	Mic: 122 dB(L)	**Calibration**	February 23, 2016 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	O138GB2A.G71
Record Time	5.0 sec at 1024 sps		

Notes
Location: Garden Ridge, Texas
Client: Hanson Servtex
User Name: Vibra-Tech
General:

Extended Notes

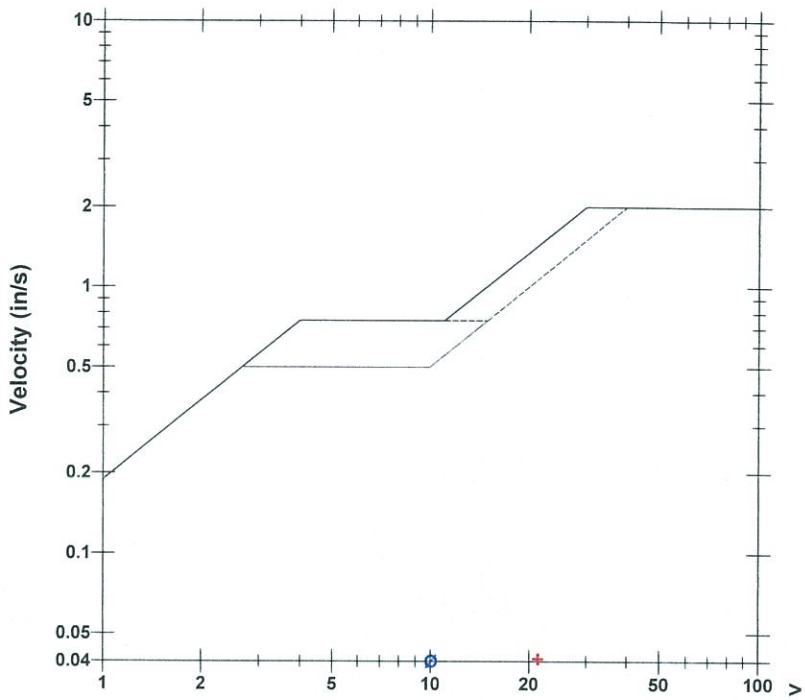
Post Event Notes
Warden Residence
Distance: 4192 ft

Microphone Linear Weighting
PSPL 112.6 dB(L) at 2.913 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 572 mv)

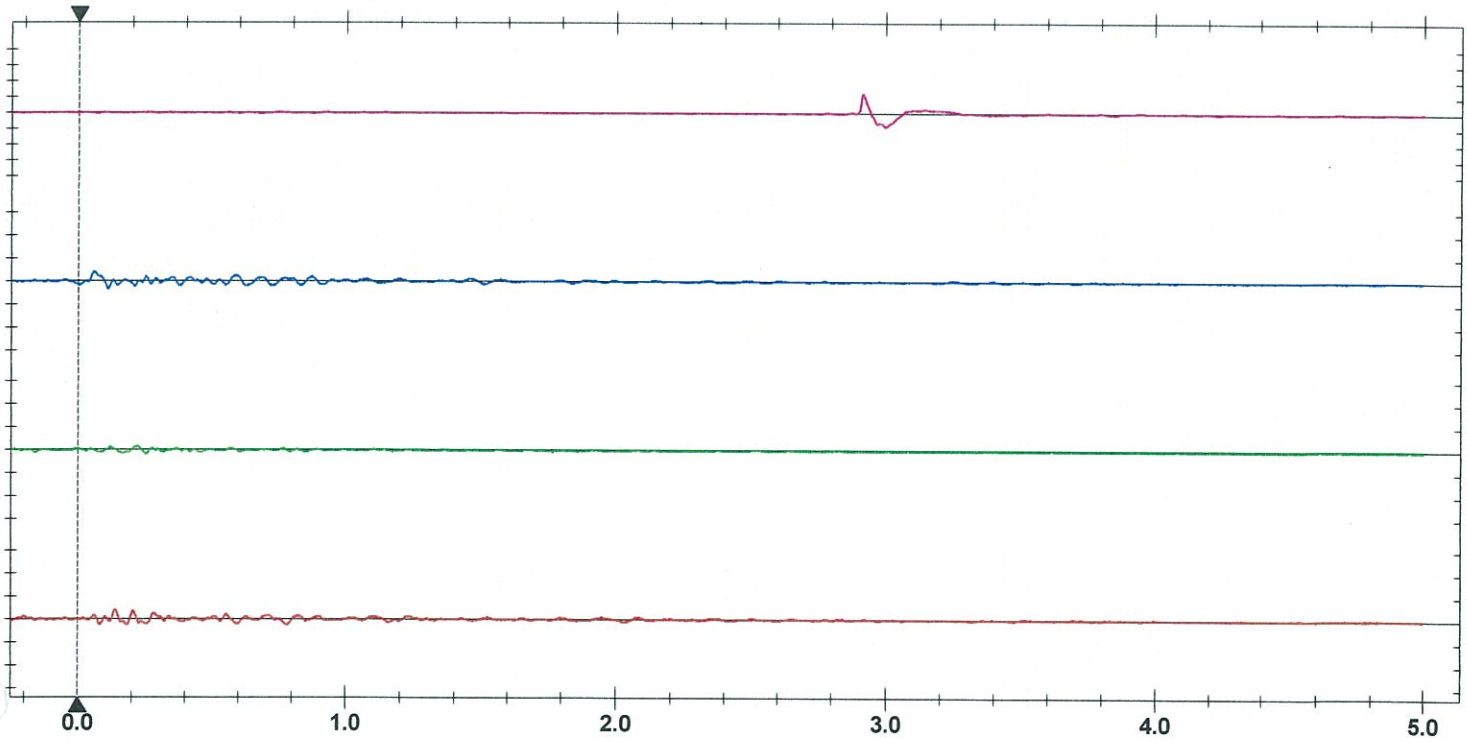
	Tran	Vert	Long	
PPV	0.0400	0.0200	0.0400	in/s
ZC Freq	21	23	10	Hz
Time (Rel. to Trig)	0.139	0.251	0.055	sec
Peak Acceleration	0.0133	0.0133	0.0265	g
Peak Displacement	0.00036	0.00027	0.00059	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0450 in/s at 0.143 sec

USBM RI8507 And OSMRE



Tran: + Vert: x Long: ø



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div
Trigger = ▶----------◀

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