Vibra-Tech

February 3, 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 January 2016 at the Hanson Aggregates Quarry in Garden Ridge, Texas. Please place this information in your 2015 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

GARDEN RIDGE QUARRY COMMISSION
GARDEN RIDGE, TEXAS
MONTH OF JANUARY 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
01/07/16	01-07-16 4A	N 29° 38' 57.2" W 098° 17' 36.1"	CLEAR 62° NW 4	11:45	0.045	20.0	108.8	880	871.00	3,841	City Property Line
01/07/16	01-07-16 4A	N 29° 38' 57.2" W 098° 17' 36.1"	CLEAR 62° NW 4	11:45	0.050	10.0	97.5	880	871.00	4,897	McCormick - 21403 Liguria Drive
01/07/16	01-07-16 4A	N 29° 38' 57.2" W 098° 17' 36.1"	CLEAR 62° NW 4	11:45	0.070	7.9	101.0	880	871.00	3,851	Taveres - 9118 Tuscan Hills
01/07/16	01-07-16 4A	N 29° 38' 57.2" W 098° 17' 36.1"	CLEAR 62° NW 4	11:45	0.120	11.0	109.9	880	871.00	3,483	Warden - 21375 Gunther Grove
01/07/16	01-07-16 4A	N 29° 38' 57.2" W 098° 17' 36.1"	CLEAR 62° NW 4	11:45	0.085	17.0	109.5	880	871.00	3,273	Warden Property Line
01/08/16	01-08-16 Base Pit 2B	N 29° 38' 19" W 098° 17' 04"	CLOUDY 58° S 7	11:34	0.030	6.3	101.9	1008	897.00	4,417	City Property Line
01/08/16	01-08-16 Base Pit 2B	N 29° 38' 19" W 098° 17' 04"	CLOUDY 58° S 7	11:34	0.210	16.0	100.0	1008	897.00	1,980	Holly - 9916 Trophy Oaks
01/08/16	01-08-16 Base Pit 2B	N 29° 38' 19" W 098° 17' 04"	CLOUDY 58° S 7	11:34	0.040	6.9	94.0	1008	897.00	7,116	McCormick - 21403 Liguria Drive
01/08/16	01-08-16 Base Pit 2B	N 29° 38' 19" W 098° 17' 04"	CLOUDY 58° S 7	11:34	0.030	9.7	95.9	1008	897.00	7,437	Taveres - 9118 Tuscan Hills
01/08/16	01-08-16 Base Pit 2B	N 29° 38' 19" W 098° 17' 04"	CLOUDY 58° S 7	11:34	0.120	12.0	101.9	1008	897.00	3,197	Warden - 21375 Gunther Grove
01/12/16	01-12-16 3C	N 29° 38' 47.0" W 098° 17' 35.5"	CLEAR 64° NW 2	14:13	0.060	6.6	103.5	1078	518.00	2,891	City Property Line
01/12/16	01-12-16 3C	N 29° 38' 47.0" W 098° 17' 35.5"	CLEAR 64° NW 2	14:13	0.060	10.0	101.0	1078	518.00	4,434	McCormick - 21403 Liguria Drive
01/12/16	01-12-16 3C	N 29° 38' 47.0" W 098° 17' 35.5"	CLEAR 64° NW 2	14:13	0.085	6.7	107.0	1078	518.00	3,908	Taveres - 9118 Tuscan Hills
01/12/16	01-12-16 3C	N 29° 38' 47.0" W 098° 17' 35.5"	CLEAR 64° NW 2	14:13	0.145	10.0	109.5	1078	518.00	2,407	Warden - 21375 Gunther Grove
01/12/16	01-12-16 3C	N 29° 38' 47.0" W 098° 17' 35.5"	CLEAR 64° NW 2	14:13	0.105	7.8	109.2	1078	518.00	2,200	Warden Property Line
01/13/16	01-13-16 Lower 6	N 29° 38' 47.7" W 098° 17' 09.3"	CLEAR 64° S 7	11:02	0.025	13.0	102.8	450	470.00	4,683	City Property Line

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

GARDEN RIDGE QUARRY COMMISSION
GARDEN RIDGE, TEXAS
MONTH OF JANUARY 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
01/13/16	01-13-16 Lower 6	N 29° 38' 47.7" W 098° 17' 09.3"	CLEAR 64° S 7	11:02	0.035	10.0	100.0	450	470.00	6,724	McCormick - 21403 Liguria Drive
01/13/16	01-13-16 Lower 6	N 29° 38' 47.7" W 098° 17' 09.3"	CLEAR 64° S 7	11:02	0.055	12.0	100.0	450	470.00	6,191	Taveres - 9118 Tuscan Hills
01/13/16	01-13-16 Lower 6	N 29° 38' 47.7" W 098° 17' 09.3"	CLEAR 64° S 7	11:02	0.130	8.7	105.5	450	470.00	3,685	Warden - 21375 Gunther Grove
01/13/16	01-13-16 Lower 6	N 29° 38' 47.7" W 098° 17' 09.3"	CLEAR 64° S 7	11:02	0.090	16.0	103.5	450	470.00	3,483	Warden Property Line
01/14/16	01-14-16 4B	N 29° 39' 00" W 098° 17' 34.5"	PT CLOUDY 61° S 6	11:59	0.030	12.0	108.0	945	767.00	4,157	City Property Line
01/14/16	01-14-16 4B	N 29° 39' 00" W 098° 17' 34.5"	PT CLOUDY 61° S 6	11:59	0.060	20.0	97.5	945	767.00	5,169	McCormick - 21403 Liguria Drive
01/14/16	01-14-16 4B	N 29° 39' 00" W 098° 17' 34.5"	PT CLOUDY 61° S 6	11:59	0.060	9.3	98.8	945	767.00	4,038	Taveres - 9118 Tuscan Hills
01/14/16	01-14-16 4B	N 29° 39' 00" W 098° 17' 34.5"	PT CLOUDY 61° S 6	11:59	0.110	20.0	110.6	945	767.00	3,781	Warden - 21375 Gunther Grove
01/14/16	01-14-16 4B	N 29° 39' 00" W 098° 17' 34.5"	PT CLOUDY 61° S 6	11:59	0.065	10.0	110.9	945	767.00	3,569	Warden Property Line
01/15/16	01-15-16 3D	N 29° 38' 52.6" W 098° 17' 36.2"	CLEAR 68° W 4	13:48	0.045	12.0	104.2	1108	500.00	3,417	City Property Line
01/15/16	01-15-16 3D	N 29° 38' 52.6" W 098° 17' 36.2"	CLEAR 68° W 4	13:48	0.030	8.5	95.9	1108	500.00	4,661	McCormick - 21403 Liguria Drive
01/15/16	01-15-16 3D	N 29° 38' 52.6" W 098° 17' 36.2"	CLEAR 68° W 4	13:48	0.055	10.0	98.8	1108	500.00	3,807	Taveres - 9118 Tuscan Hills
01/15/16	01-15-16 3D	N 29° 38' 52.6" W 098° 17' 36.2"	CLEAR 68° W 4	13:48	0.050	14.0	107.5	1108	500.00	3,018	Warden - 21375 Gunther Grove
01/15/16	01-15-16 3D	N 29° 38' 52.6" W 098° 17' 36.2"	CLEAR 68° W 4	13:48	0.080	21.0	106.0	1108	500.00	2,808	Warden Property Line
01/19/16	01-19-16 South Wall A	N 29° 38' 17.5" W 098° 16' 39"	CLOUDY 65° S 12	12:27	0.020	6.2	110.9	400	475.00	6,620	City Property Line
01/19/16	01-19-16 South Wall A	N 29° 38' 17.5" W 098° 16' 39"	CLOUDY 65° S 12	12:27	0.045	10.0	106.0	400	475.00	4,151	Holly - 9916 Trophy Oaks

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GARDEN RIDGE QUARRY COMMISSION
GARDEN RIDGE, TEXAS
MONTH OF JANUARY 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
01/19/16	01-19-16 South Wall A	N 29° 38' 17.5" W 098° 16' 39"	CLOUDY 65° S 12	12:27	NT	NT	NT	400	475.00	9,304	McCormick - 21403 Liguria Drive
01/19/16	01-19-16 South Wall A	N 29° 38' 17.5" W 098° 16' 39"	CLOUDY 65° S 12	12:27	NT	NT	NT	400	475.00	9,492	Taveres - 9118 Tuscan Hills
01/19/16	01-19-16 South Wall A	N 29° 38' 17.5" W 098° 16' 39"	CLOUDY 65° S 12	12:27	0.035	11.0	112.6	400	475.00	5,397	Warden - 21375 Gunther Grove
01/19/16	01-19-16 Lower 3A	N 29° 38' 38.2" W 098° 17' 32.7"	CLOUDY 65° S 12	12:44	0.020	9.3	95.9	600	242.00	2,416	City Property Line
01/19/16	01-19-16 Lower 3A	N 29° 38' 38.2" W 098° 17' 32.7"	CLOUDY 65° S 12	12:44	0.020	15.0	97.5	600	242.00	4,485	McCormick - 21403 Liguria Drive
01/19/16	01-19-16 Lower 3A	N 29° 38' 38.2" W 098° 17' 32.7"	CLOUDY 65° S 12	12:44	0.025	18.0	108.4	600	242.00	4,327	Taveres - 9118 Tuscan Hills
01/19/16	01-19-16 Lower 3A	N 29° 38' 38.2" W 098° 17' 32.7"	CLOUDY 65° S 12	12:44	0.160	19.0	102.8	600	242.00	1,640	Warden - 21375 Gunther Grove
01/19/16	01-19-16 Lower 3A	N 29° 38' 38.2" W 098° 17' 32.7"	CLOUDY 65° S 12	12:44	0.110	26.0	101.0	600	242.00	1,448	Warden Property Line
01/22/16	01-22-16 S Wall C	N 29° 38' 13.7" W 098° 16' 48.1"	CLEAR 60° NW 16	12:08	NT	NT	NT	999	1105.00	5,872	City Property Line
01/22/16	01-22-16 S Wall C	N 29° 38' 13.7" W 098° 16' 48.1"	CLEAR 60° NW 16	12:08	0.050	11.0	108.4	999	1105.00	3,341	Holly - 9916 Trophy Oaks
01/22/16	01-22-16 S Wall C	N 29° 38' 13.7" W 098° 16' 48.1"	CLEAR 60° NW 16	12:08	0.025	12.0	100.0	999	1105.00	8,595	McCormick - 21403 Liguria Drive
01/22/16	01-22-16 S Wall C	N 29° 38' 13.7" W 098° 16' 48.1"	CLEAR 60° NW 16	12:08	0.020	11.0	97.5	999	1105.00	8,930	Taveres - 9118 Tuscan Hills
01/22/16	01-22-16 S Wall C	N 29° 38' 13.7" W 098° 16' 48.1"	CLEAR 60° NW 16	12:08	0.060	8.7	108.0	999	1105.00	4,667	Warden - 21375 Gunther Grove
01/25/16	01-25-16 4A	N 29° 38' 57.7" W 098° 17' 36.4"	PT CLOUDY 68° NW 1	12:15	0.035	11.0	109.9	825	845.00	3,876	City Property Line
01/25/16	01-25-16 4A	N 29° 38' 57.7" W 098° 17' 36.4"	PT CLOUDY 68° NW 1	12:15	0.060	17.0	100.0	825	845.00	4,901	McCormick - 21403 Liguria Drive
01/25/16	01-25-16 4A	N 29° 38' 57.7" W 098° 17' 36.4"	PT CLOUDY 68° NW 1	12:15	0.085	8.4	98.8	825	845.00	3,833	Taveres - 9118 Tuscan Hills

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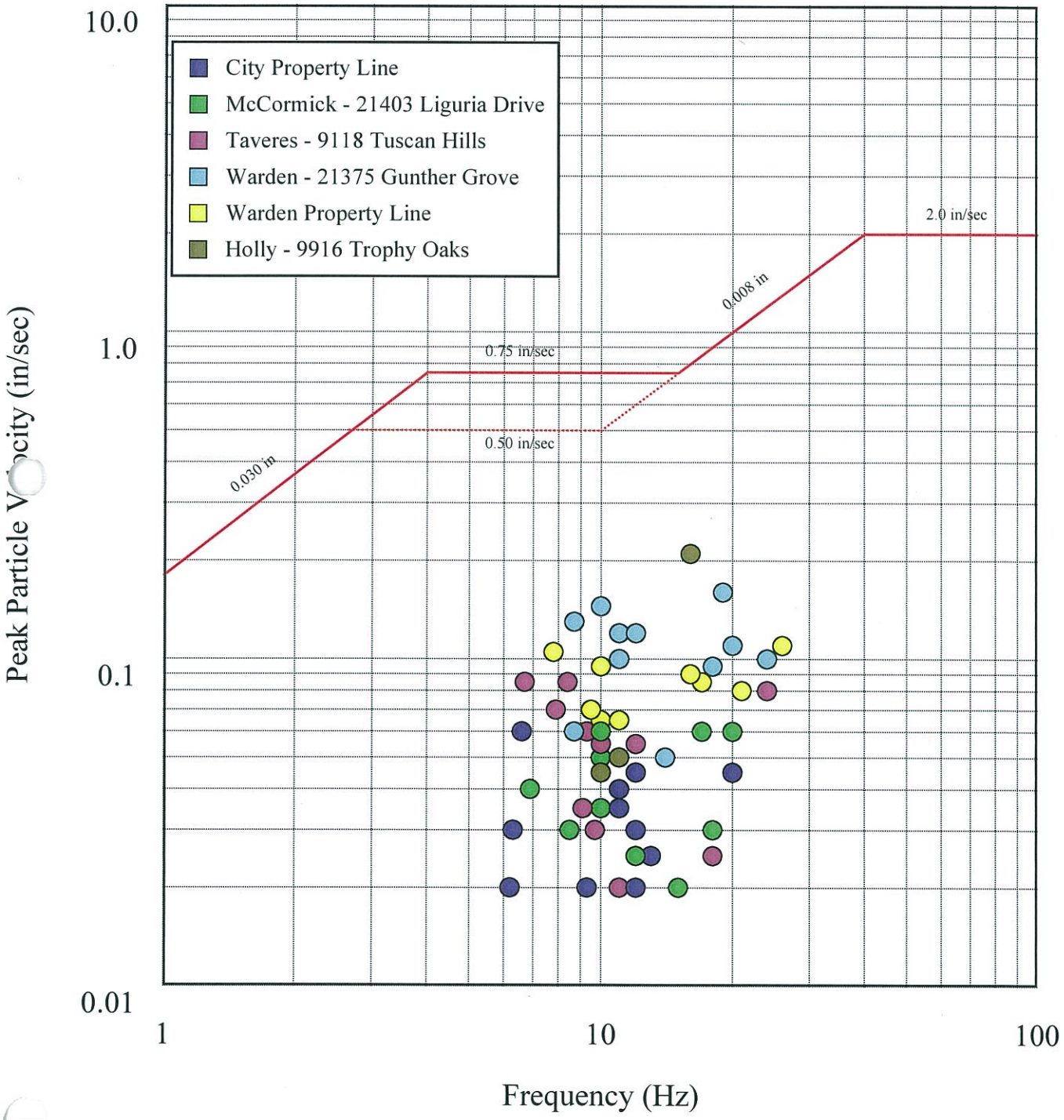
GARDEN RIDGE QUARRY COMMISSION
GARDEN RIDGE, TEXAS
MONTH OF JANUARY 2016

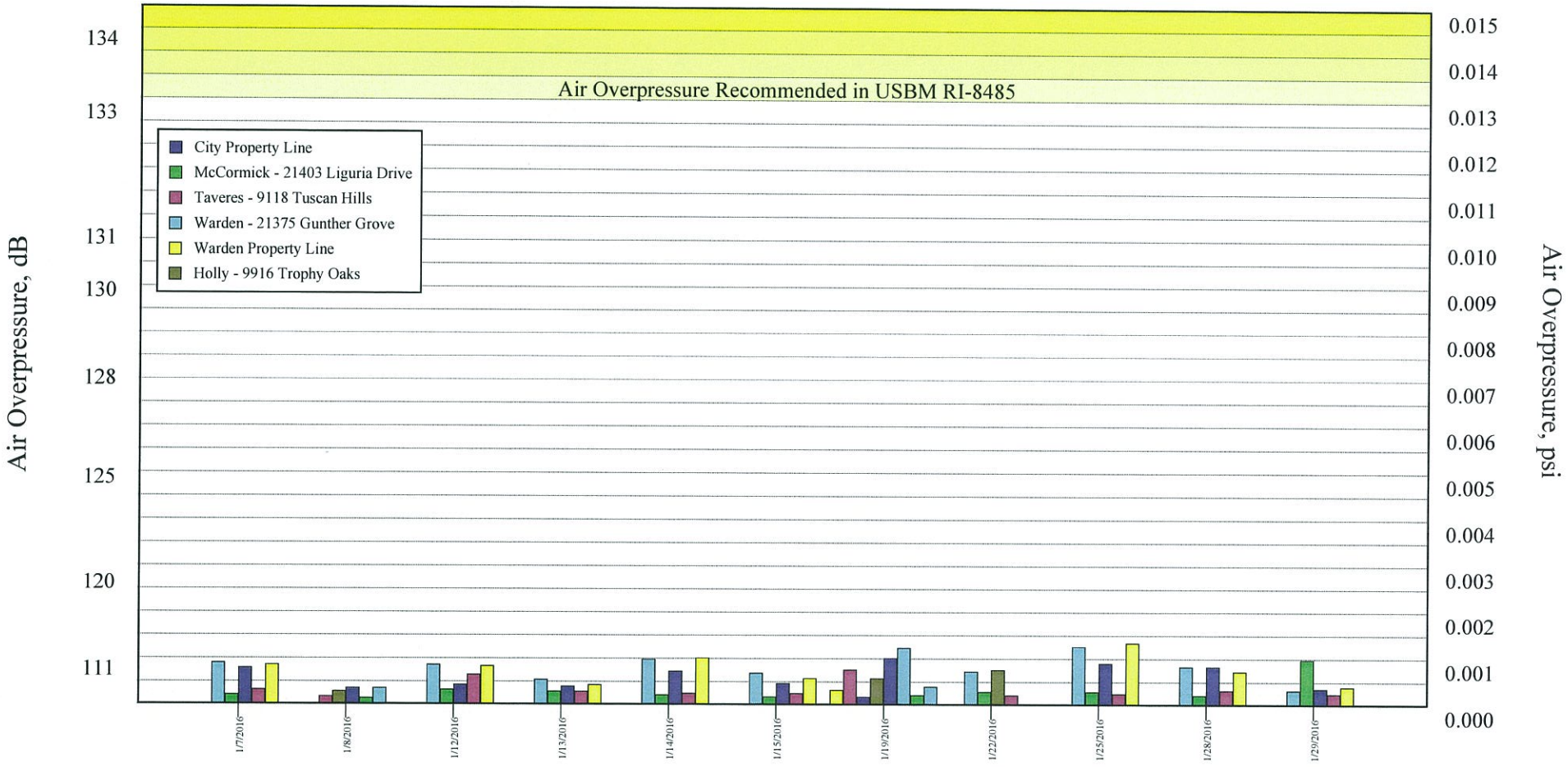
DATE	SHOT # LOCATION	SHOT LOCATION GPS READING	WEATHER	TIME	PPV (in/sec)	FREQ (Hz)	AIR (dB)	SHOT DURATION (MS)	MAX LBS/ DELAY	DISTANCE FROM BLAST	SEISMOGRAPH LOCATION
01/25/16	01-25-16 4A	N 29° 38' 57.7" W 098° 17' 36.4"	PT CLOUDY 68° NW 1	12:15	0.100	11.0	112.8	825	845.00	3,531	Warden - 21375 Gunther Grove
01/25/16	01-25-16 4A	N 29° 38' 57.7" W 098° 17' 36.4"	PT CLOUDY 68° NW 1	12:15	0.095	10.0	113.3	825	845.00	3,322	Warden Property Line
01/28/16	01-28-16 4B	N 29° 39' 00.3" W 098° 17' 34.9"	CLEAR 59° SW 15	11:53	0.040	11.0	109.2	728	767.00	4,171	City Property Line
01/28/16	01-28-16 4B	N 29° 39' 00.3" W 098° 17' 34.9"	CLEAR 59° SW 15	11:53	0.060	10.0	97.5	728	767.00	5,156	McCormick - 21403 Liguria Drive
01/28/16	01-28-16 4B	N 29° 39' 00.3" W 098° 17' 34.9"	CLEAR 59° SW 15	11:53	0.080	24.0	101.0	728	767.00	4,010	Taveres - 9118 Tuscan Hills
01/28/16	01-28-16 4B	N 29° 39' 00.3" W 098° 17' 34.9"	CLEAR 59° SW 15	11:53	0.095	18.0	109.2	728	767.00	3,806	Warden - 21375 Gunther Grove
01/28/16	01-28-16 4B	N 29° 39' 00.3" W 098° 17' 34.9"	CLEAR 59° SW 15	11:53	0.065	11.0	108.0	728	767.00	3,595	Warden Property Line
01/29/16	01-29-16 5B	N 29° 39' 01.5" W 098° 17' 17.1"	CLEAR 70° SW 14	11:42	0.020	12.0	101.9	912	702.00	5,105	City Property Line
01/29/16	01-29-16 5B	N 29° 39' 01.5" W 098° 17' 17.1"	CLEAR 70° SW 14	11:42	0.030	18.0	110.6	912	702.00	6,570	McCormick - 21403 Liguria Drive
01/29/16	01-29-16 5B	N 29° 39' 01.5" W 098° 17' 17.1"	CLEAR 70° SW 14	11:42	0.035	9.1	98.8	912	702.00	5,572	Taveres - 9118 Tuscan Hills
01/29/16	01-29-16 5B	N 29° 39' 01.5" W 098° 17' 17.1"	CLEAR 70° SW 14	11:42	0.100	24.0	101.0	912	702.00	4,392	Warden - 21375 Gunther Grove
01/29/16	01-29-16 5B	N 29° 39' 01.5" W 098° 17' 17.1"	CLEAR 70° SW 14	11:42	0.070	9.5	102.8	912	702.00	4,171	Warden Property Line

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

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



Air Overpressure Levels from
Quarry Commission
Garden Ridge
January 2016



Miller Ln
Cinnabar Ct
Taveres
Quiet Moon Dr
01-28-16 4B
01-07-16 4A
01-25-16 4A
01-15-16 3D
01-29-16 5B
01-12-16 3C
01-13-16 Lower 6
01-19-16 Lower 3A
McCormick
Fair View Cir
Warden
City Property Line
01-08-16 Base Pit 2B
01-19-16 South Wall A
01-22-16 South Wall C
Holly
Goldenrod Ln
Sumac Ln
Klein Cir
Kurre Way
Bluebell Dr
Timber Rose
Wahl Ln
Grass Creek Rd
Cinchona Trail

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-7-16 Blast No. 1-7-16 4A: Time 11:45

Exact Blast Location FACE 4A:

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 57.2
W 98° 17 36.1

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 3,841'

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

Peak Particle Velocity .045 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-7-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:45:22 January 7, 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	H191G6QO.NM1

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

Extended Notes

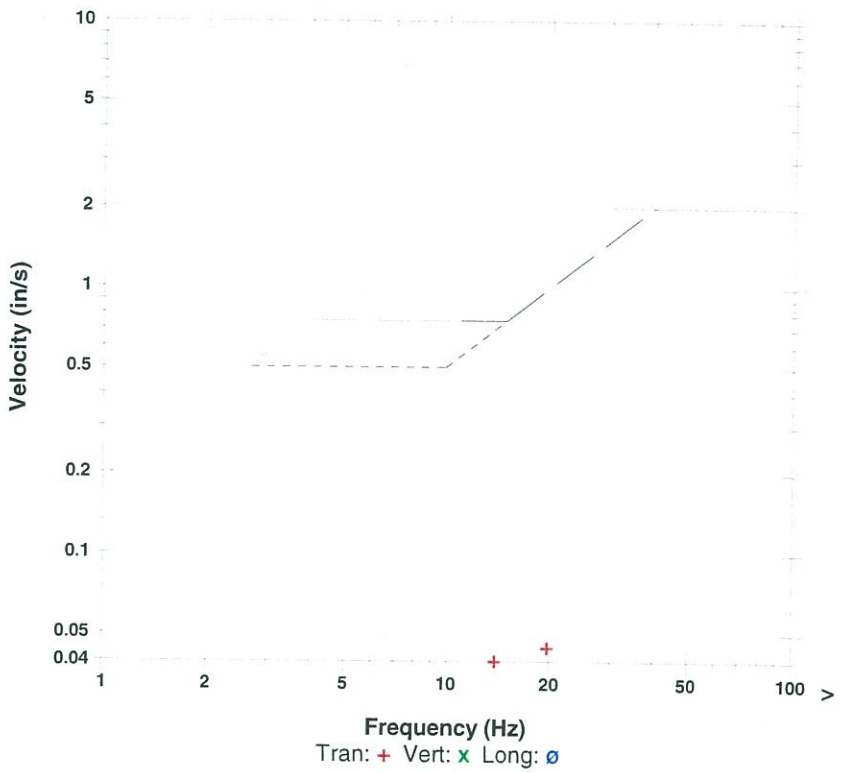
Post Event Notes
City Prop Line: 3,841'

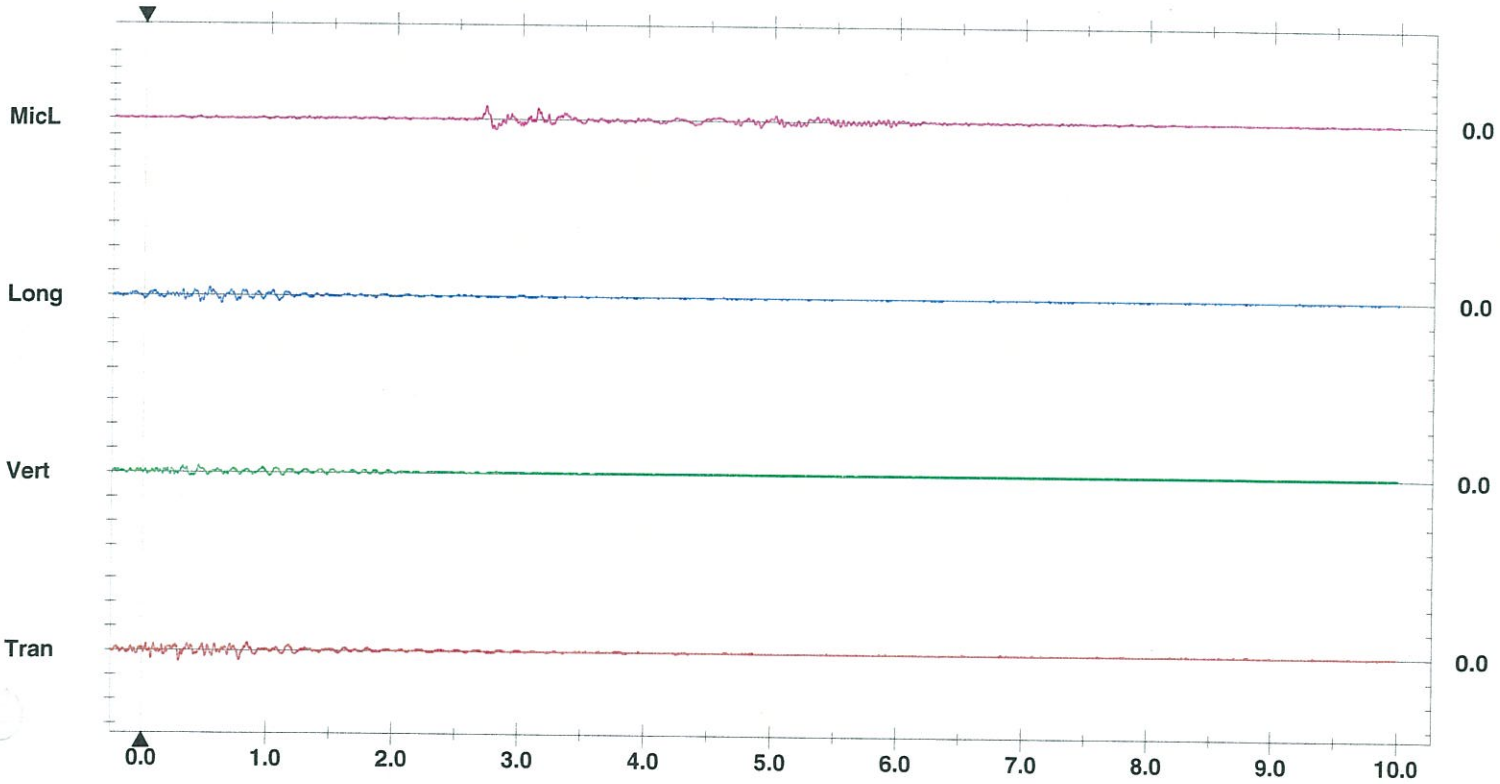
Microphone	Linear Weighting
PSPL	108.8 dB(L) at 2.711 sec
ZC Freq	7.1 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 598 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0300	0.0350	in/s
ZC Freq	20	8.8	10	Hz
Time (Rel. to Trig)	0.294	0.450	0.619	sec
Peak Acceleration	0.0265	0.0265	0.0133	g
Peak Displacement	0.00045	0.00040	0.00046	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0453 in/s at 0.294 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 1-7-16 Blast No. 1-7-16 4A Time 11:45

Exact Blast Location FACE 4A:

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 57.2
W 98° 17 36.1

MONITOR GPS

N 29 38 31.84
W 98 18 23.43

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 McCormick Residence: 21403 Liguria Drive, George Ranch Subdivision

15' E off NE corner of garage

Seismograph Distance from Blast 4,897'

Peak Overpressure 97.5 dB Scaled Distance ------

Peak Particle Velocity .050 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-7-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:45:12 January 7, 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	J949G6QO.NC1

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

Extended Notes

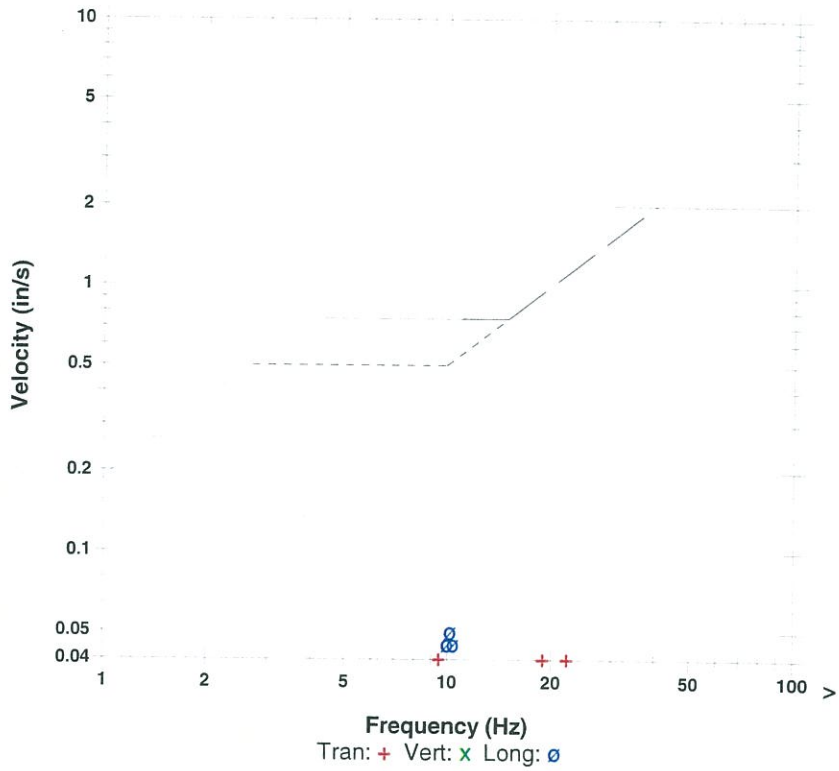
Post Event Notes
McCormick Res: 4,897'

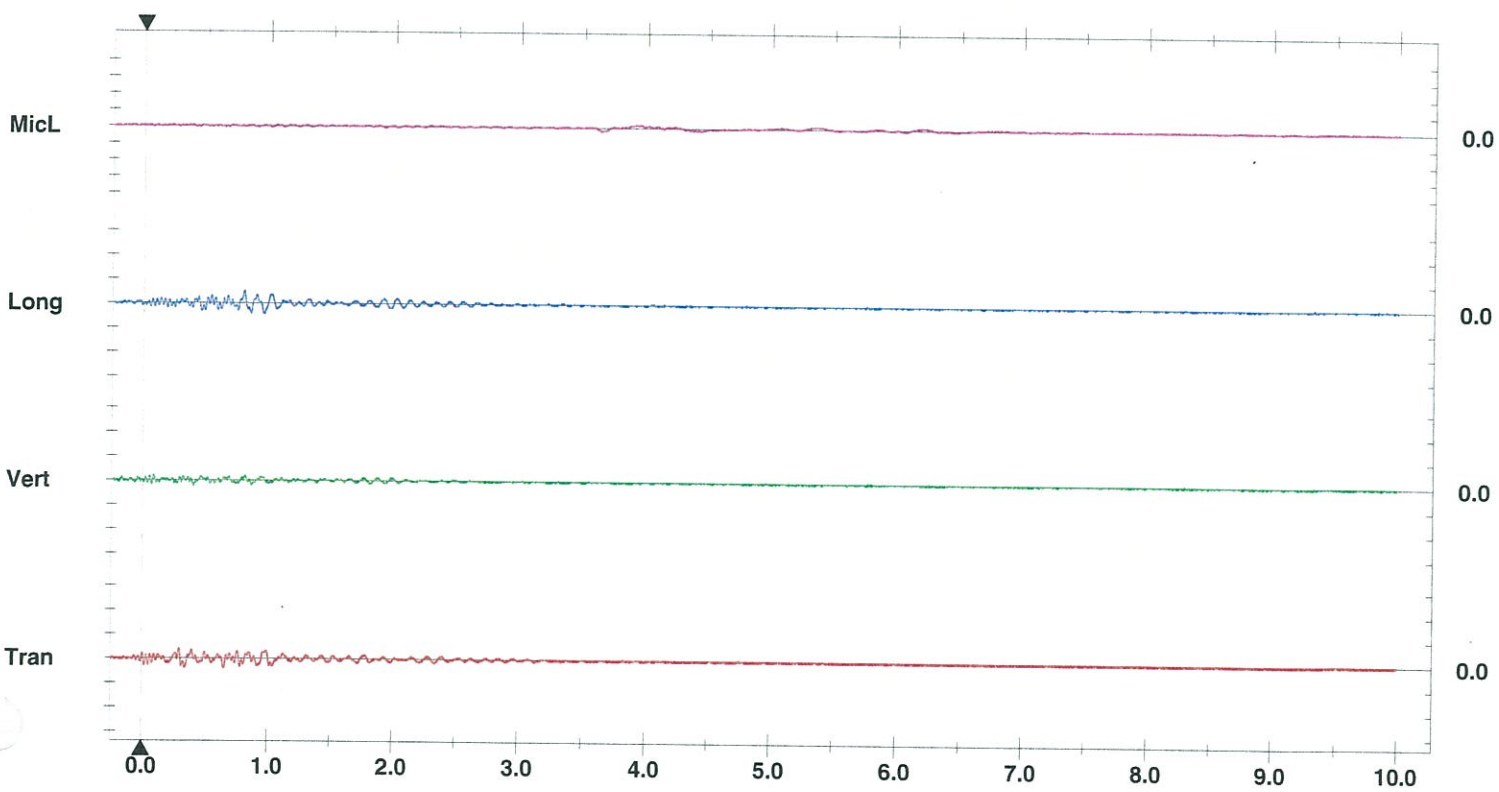
Microphone	Linear Weighting
PSPL	97.5 dB(L) at 3.627 sec
ZC Freq	5.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 511 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0250	0.0500	in/s
ZC Freq	22	18	10	Hz
Time (Rel. to Trig)	0.300	0.399	0.792	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00065	0.00025	0.00063	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0524 in/s at 0.792 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 = ▶——◀

Printed: January 7, 2016 (V 7.03 - 7.01)

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-7-16 Blast No. 1-7-16 4A Time 11:45

Exact Blast Location FACE 4A:

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 57.2

W 98° 17 36.1

MONITOR GPS

N 29 38' 52"

W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 14420 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 01-28-15 Microphone Calibration 01-28-15

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

10' E of NE corner of house

Seismograph Distance from Blast 3,851'

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

Peak Particle Velocity .070 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-7-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:45:26 January 7, 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

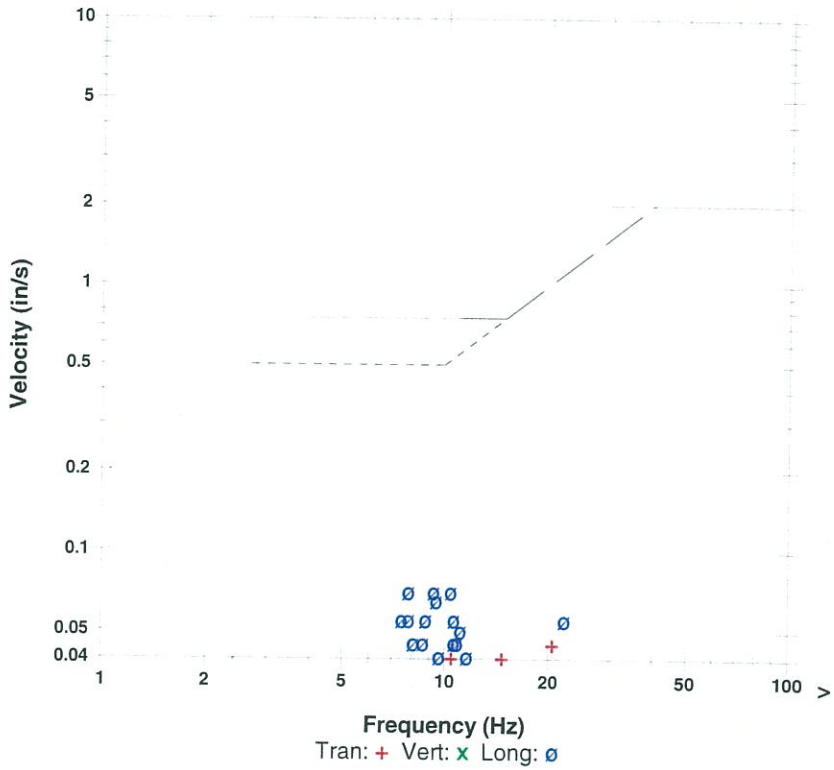
Serial Number	BF14420 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	January 28, 2015 by Vibra-Tech Inc.
File Name	P420G6QO.NQ1

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

Extended Notes

Post Event Notes
Taveres Res: 3,851'

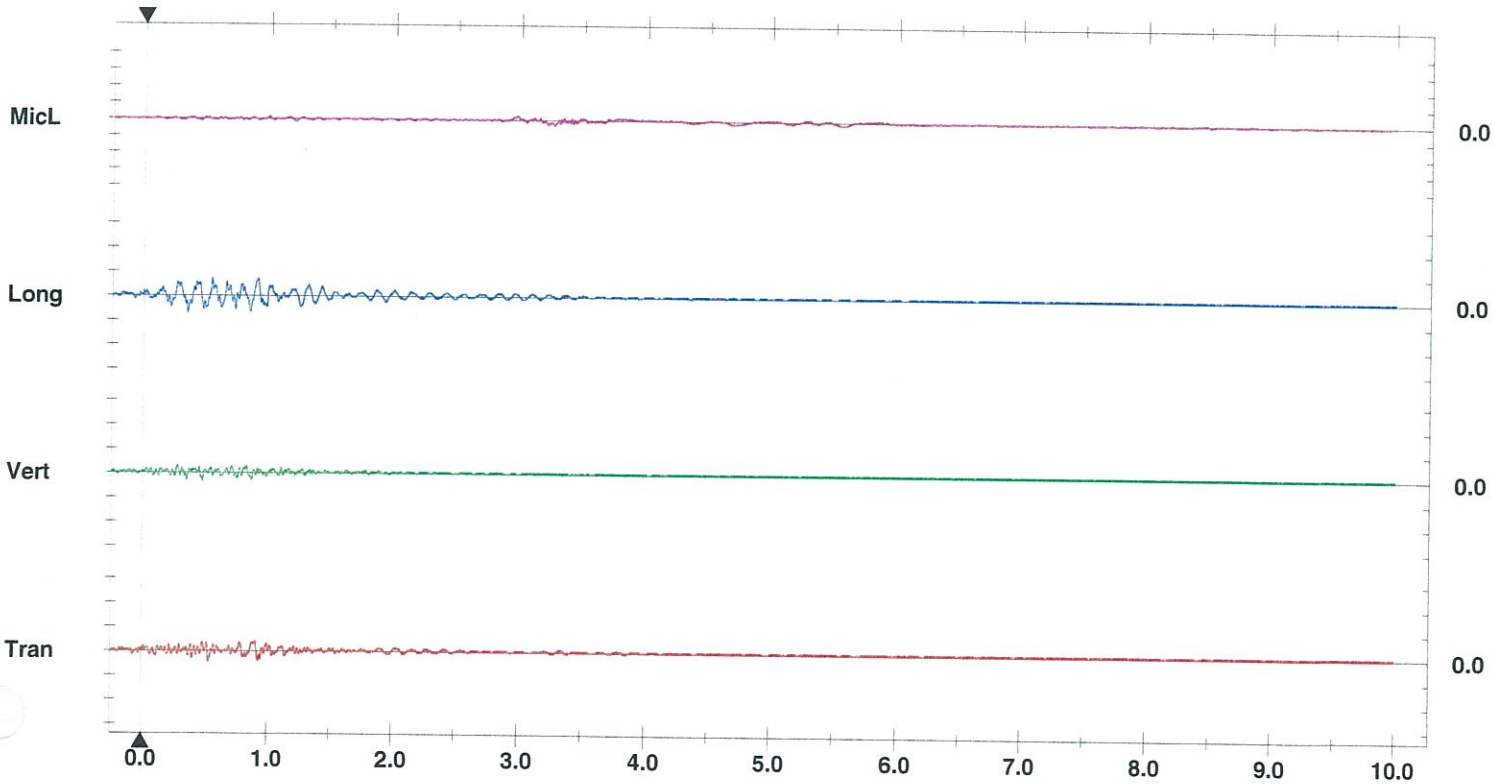
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	101.0 dB(L) at 3.257 sec
ZC Freq	4.7 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 537 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0350	0.0700	in/s
ZC Freq	20	20	7.9	Hz
Time (Rel. to Trig)	0.530	0.471	0.344	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00068	0.00035	0.00121	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0808 in/s at 0.902 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 1-7-16 Blast No. 1-7164A Time 11:45

Exact Blast Location FACE 4A.

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 57.2
W 98° 17 36.1

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 3,483'

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

Peak Particle Velocity .12 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-7-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:45:30 January 7, 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

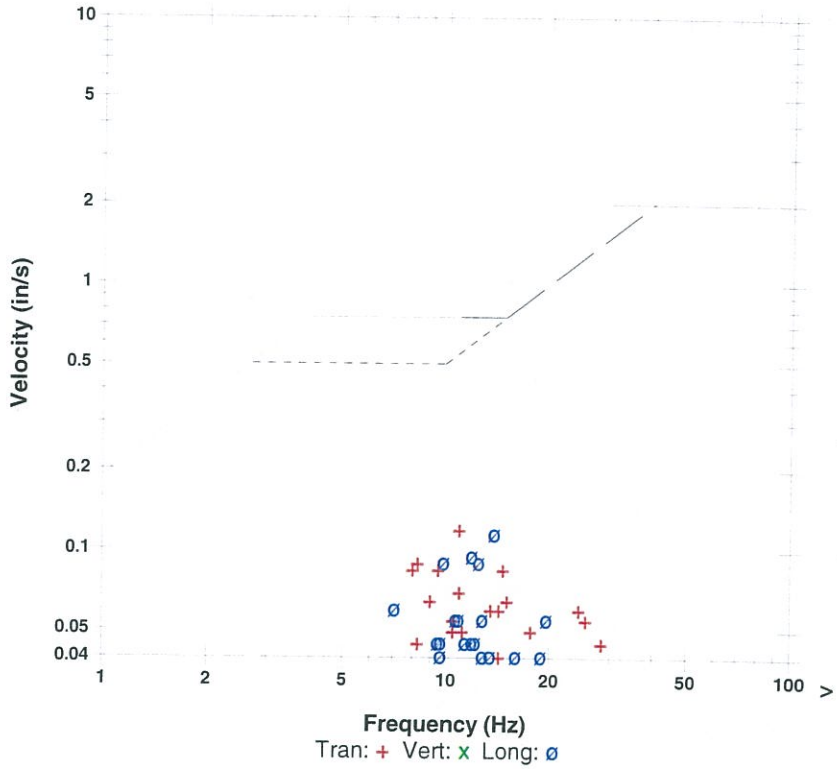
Serial Number	BF13270 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	March 12, 2015 by Vibra-Tech Inc.
File Name	O270G6QO.NU1

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

Extended Notes

Post Event Notes
Warden Res: 3,483'

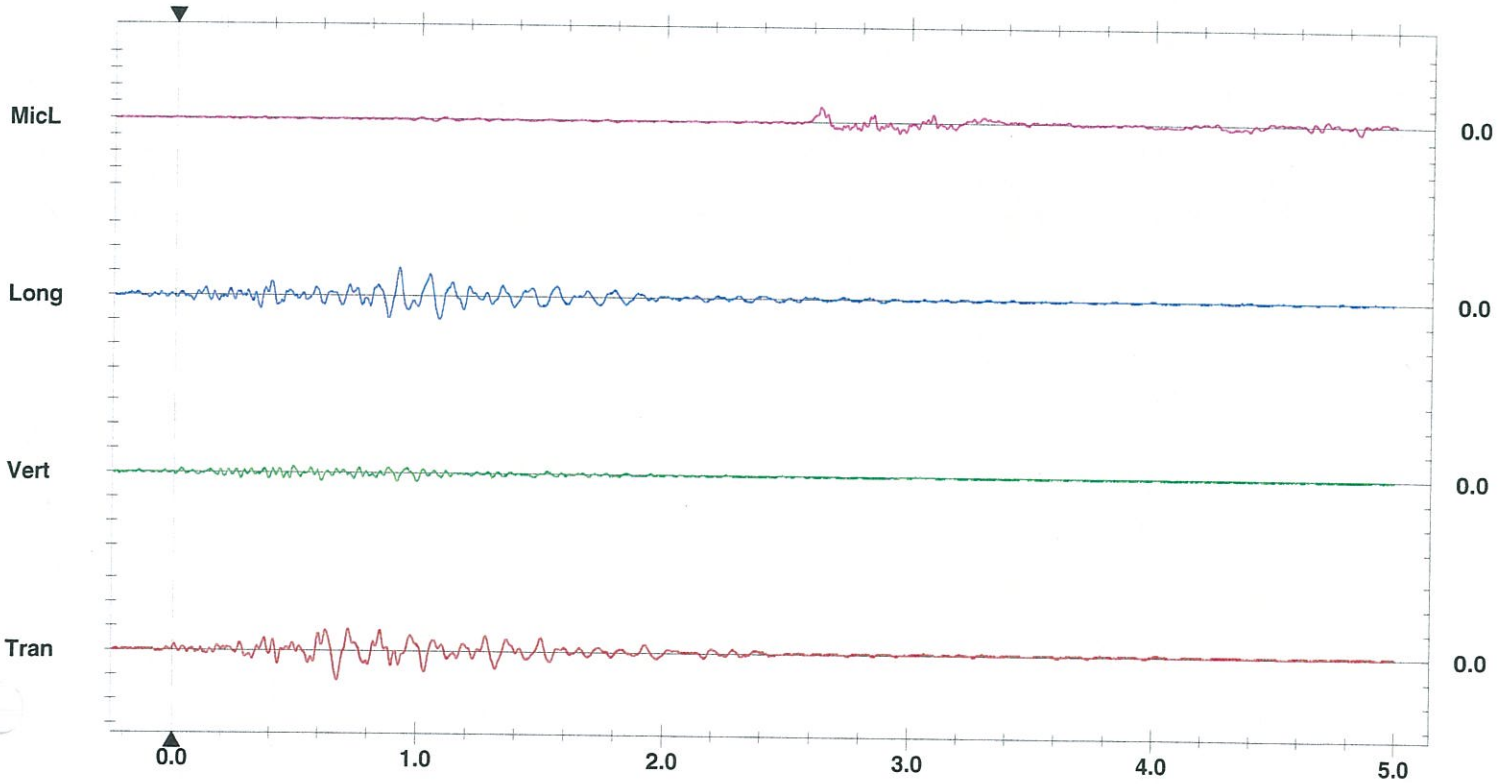
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	109.9 dB(L) at 2.627 sec
ZC Freq	6.4 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 542 mv)

	Tran	Vert	Long	
PPV	0.120	0.0350	0.115	in/s
ZC Freq	11	21	14	Hz
Time (Rel. to Trig)	0.674	0.603	0.915	sec
Peak Acceleration	0.0398	0.0265	0.0398	g
Peak Displacement	0.00167	0.00033	0.00133	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.125 in/s at 0.679 sec



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

Printed: January 7, 2016 (V 7.03 - 7.01)

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-7-16 Blast No. 1-7-16 4A Time 11:45

Exact Blast Location FACE 4A:

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 57.2

W 98° 17 36.1

MONITOR GPS

N 29 38' 25"

W 98 17' 39"

SEISMOGRAPH DATA

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

Date of last: Geophone Calibration 6-9-15 Microphone Calibration 6-9-15

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 3,275'

Peak Overpressure 109.5 dB Scaled Distance ------

Peak Particle Velocity .085 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 1-7-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:45:24 January 7, 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	June 9, 2015 by Vibra-Tech Inc.
File Name	O138G6QO.NO1

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

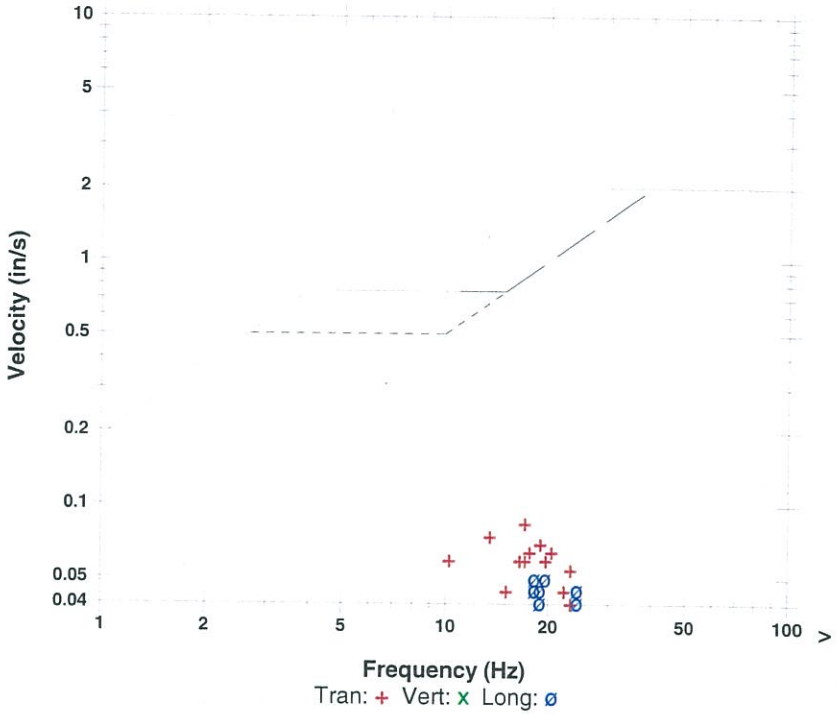
Post Event Notes
Warden Prop Line: 3,273'

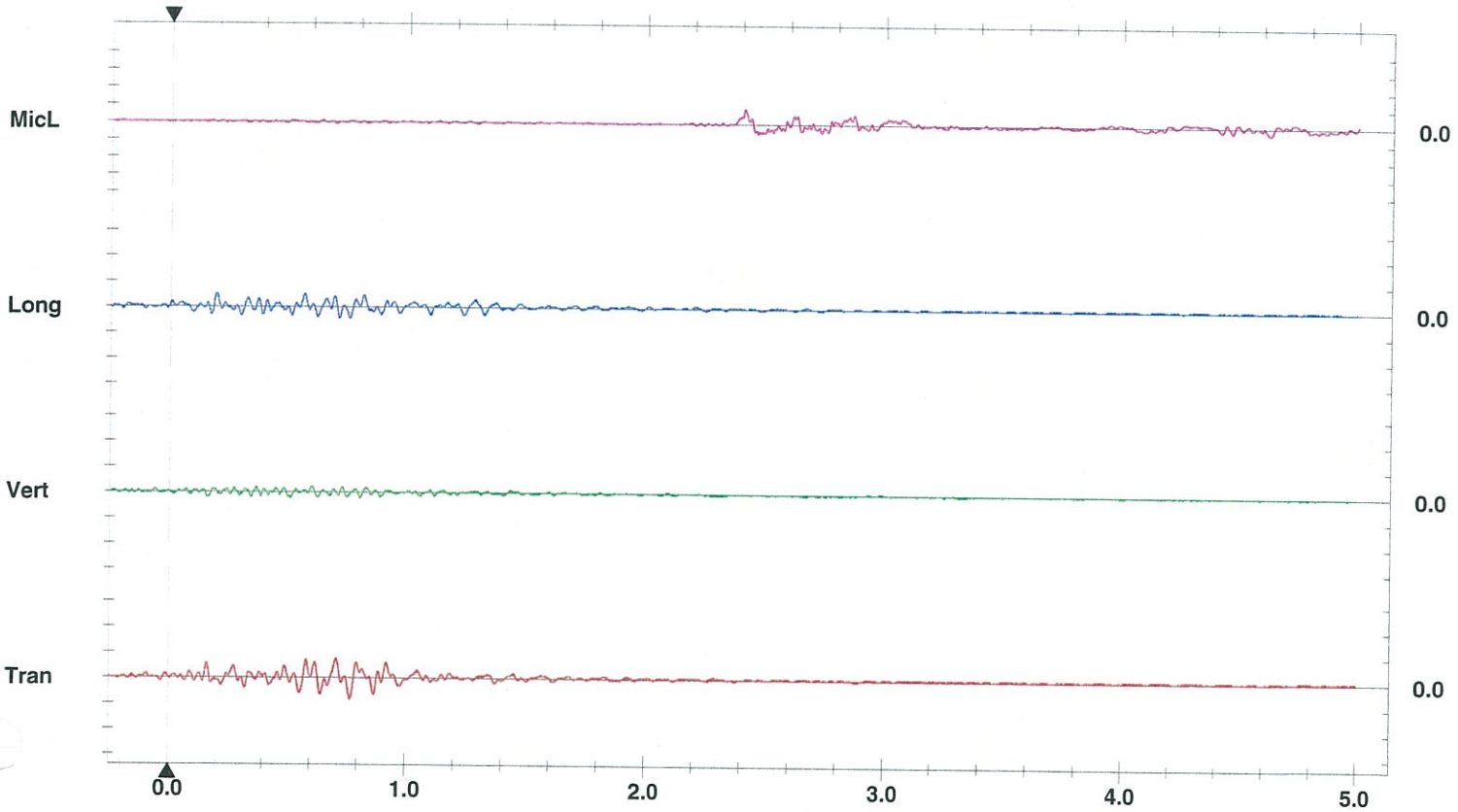
Microphone	Linear Weighting
PSPL	109.5 dB(L) at 2.405 sec
ZC Freq	6.9 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 810 mv)

	Tran	Vert	Long	
PPV	0.0850	0.0250	0.0500	in/s
ZC Freq	17	18	20	Hz
Time (Rel. to Trig)	0.771	0.511	0.190	sec
Peak Acceleration	0.0398	0.0265	0.0265	g
Peak Displacement	0.00080	0.00024	0.00043	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0887 in/s at 0.713 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 01-08-16 Blast No. 01-08-16 Base Pit 2B Time 11:34

Exact Blast Location Base Pit

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
29° 38' 19"
-98° 17' 04"

MONITOR GPS
29° 38' 22.63"
-98° 17' 53.97"

SEISMOGRAPH DATA

Seismograph No. C191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 7-16-15 Microphone Calibration 7-16-15

Exact Seismograph Location City Property Line - outside city water tower gate - 30' frm gate at prop line

Seismograph Distance & Direction from Blast ~~BRG.~~ Distance: 441'

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

Peak Particle Velocity .030 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 01-08-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:34:11 January 8, 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

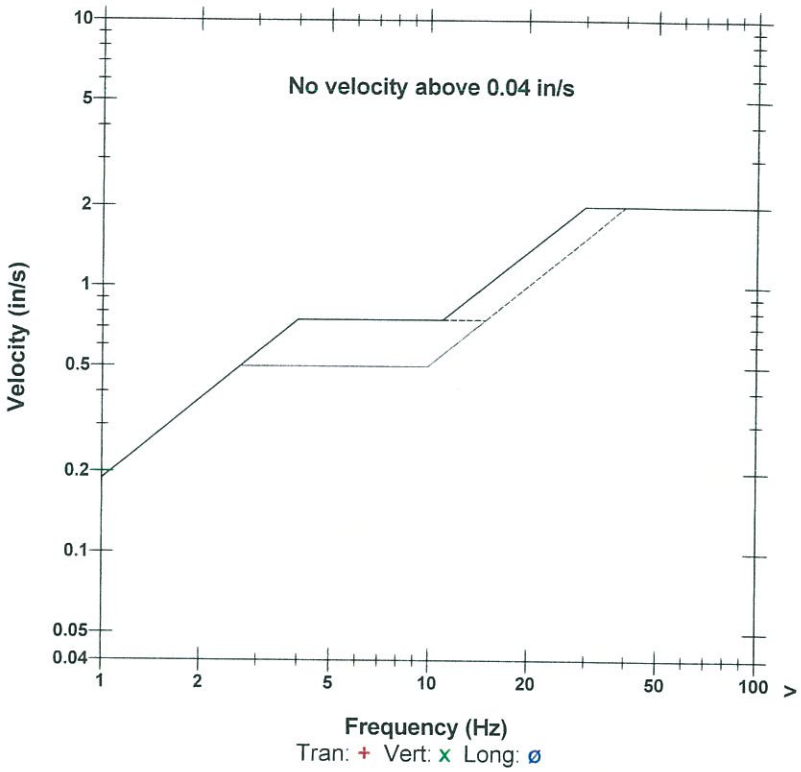
Serial Number	BD6191 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	H191G6SI.SZ1

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

Extended Notes

Post Event Notes
City Property Line - Distance: 4,417 ft

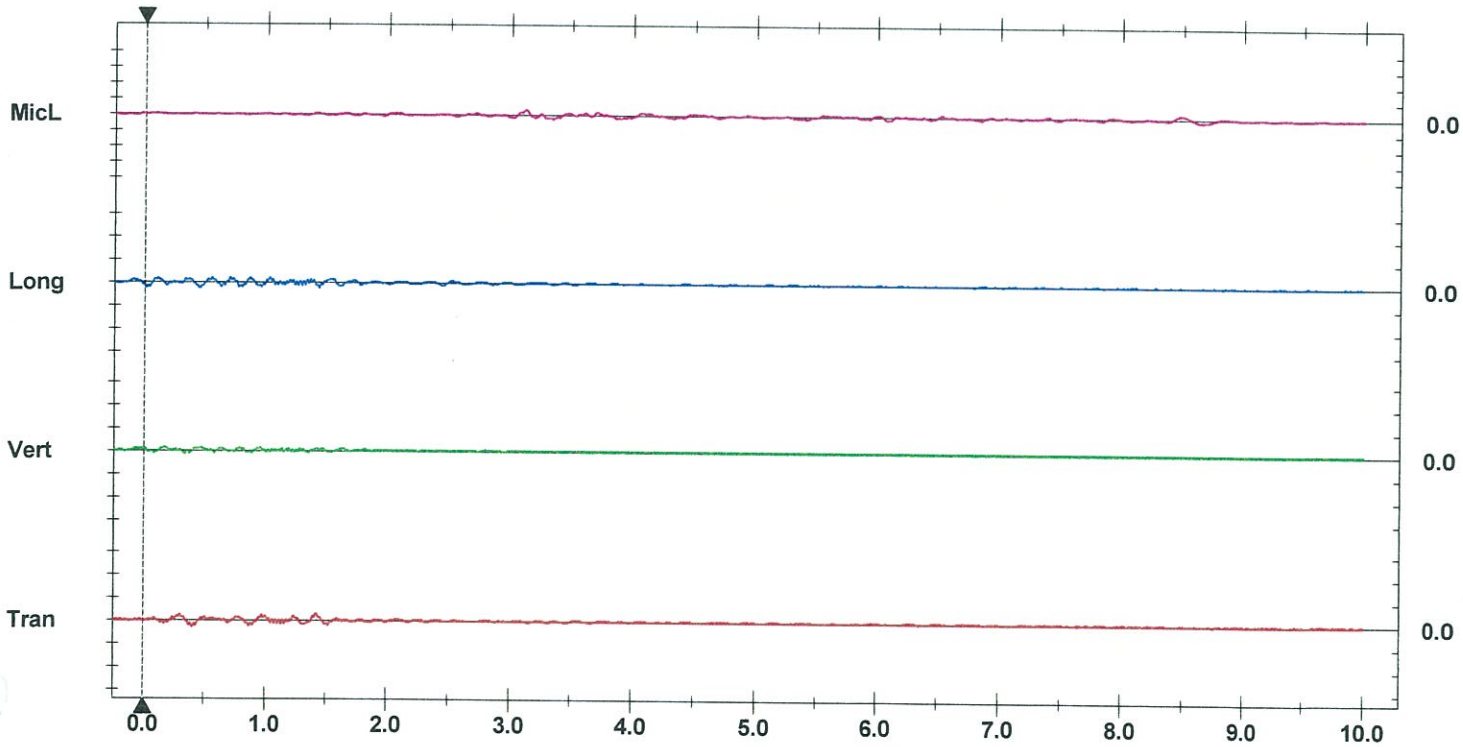
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	101.9 dB(L) at 3.117 sec
ZC Freq	5.3 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 579 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0150	0.0250	in/s
ZC Freq	6.3	9.1	8.7	Hz
Time (Rel. to Trig)	0.400	0.149	0.007	sec
Peak Acceleration	0.0133	0.0133	0.0133	g
Peak Displacement	0.00073	0.00039	0.00059	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0374 in/s at 1.425 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 01-08-16 Blast No. 01-08-16 Base Pit 2B Time 11:34

Exact Blast Location Base Pit

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
29° 38' 19"
-98° 17' 04"

MONITOR GPS
29° 38' 15"
-98° 17' 26"

SEISMOGRAPH DATA

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

Date of last: Geophone Calibration 9-13-15 Microphone Calibration 9-13-15

Exact Seismograph Location Holly Residence - 9916 Trophy Oaks dr - backyard allong quarry prop line at fence

Seismograph Distance & Direction from Blast ~~BRG.~~ Distance: 1980

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

Peak Particle Velocity .21 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 01-08-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 11:34:10 January 8, 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

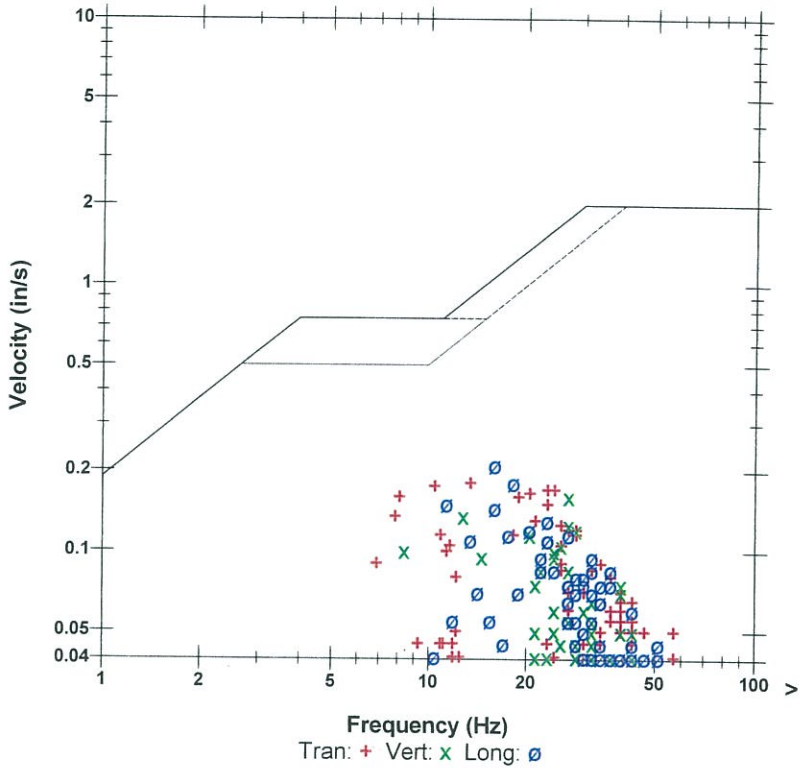
Serial Number	BF10562 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	September 13, 2015 by Vibra-Tech Inc.
File Name	L562G6SI.SY1

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

Extended Notes

Post Event Notes
Holly Residence - Distance: 1,980

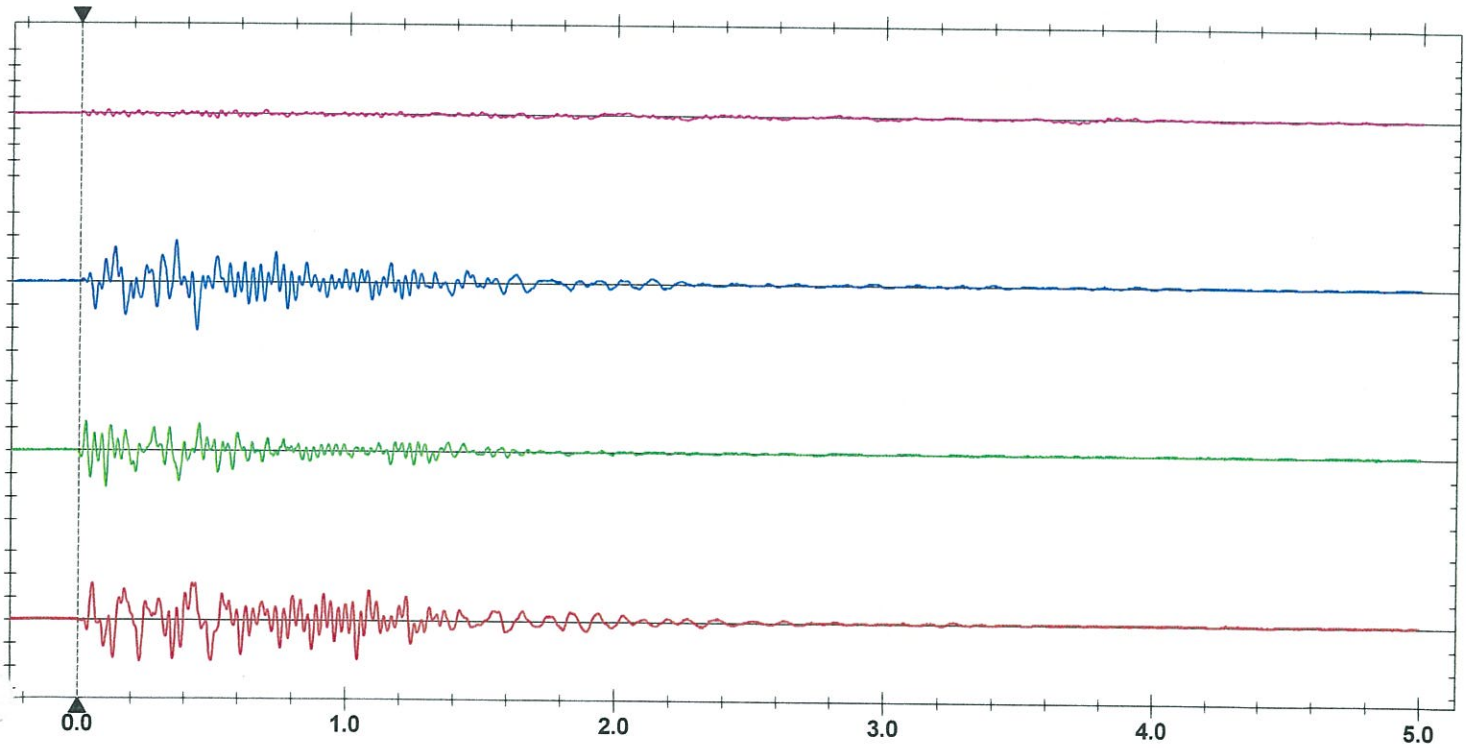
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	100.0 dB(L) at 0.508 sec
ZC Freq	28 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 562 mv)

	Tran	Vert	Long	
PPV	0.180	0.160	0.210	in/s
ZC Freq	13	27	16	Hz
Time (Rel. to Trig)	0.232	0.101	0.438	sec
Peak Acceleration	0.0663	0.0663	0.0663	g
Peak Displacement	0.00291	0.00146	0.00183	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.263 in/s at 0.441 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 01-08-16 Blast No. 01-08-16 Base Pit 2B Time 11:34

Exact Blast Location Base Pit

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
29° 38' 19"
-98° 17' 04"

MONITOR GPS
29° 38' 31.84"
-98° 18' 23.43"

SEISMOGRAPH DATA

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

Date of last: Geophone Calibration 7-16-15 Microphone Calibration _____

Exact Seismograph Location McCormick Res - 21403 liguria dr - 15' off NE cnr of garage

Seismograph Distance & Direction from Blast ~~BRG.~~ Distance: 711 G

Peak Overpressure 94 dB Scaled Distance ------

Peak Particle Velocity .040 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 01-08-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:34:12 January 8, 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

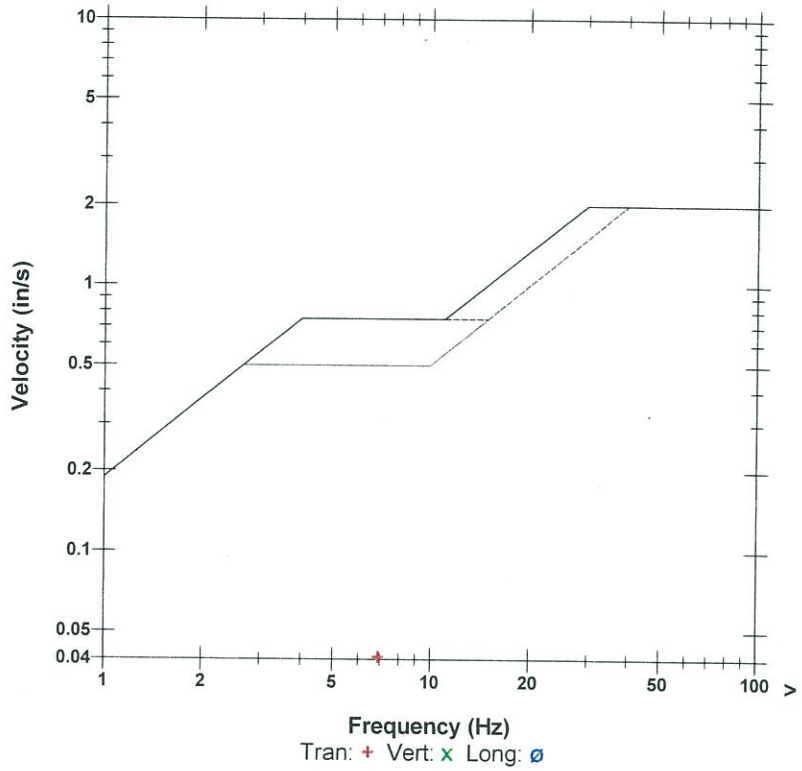
Serial Number	BF8949 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	J949G6SI.T01

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

Extended Notes

Post Event Notes
McCormick Residence - Distance: 7,116

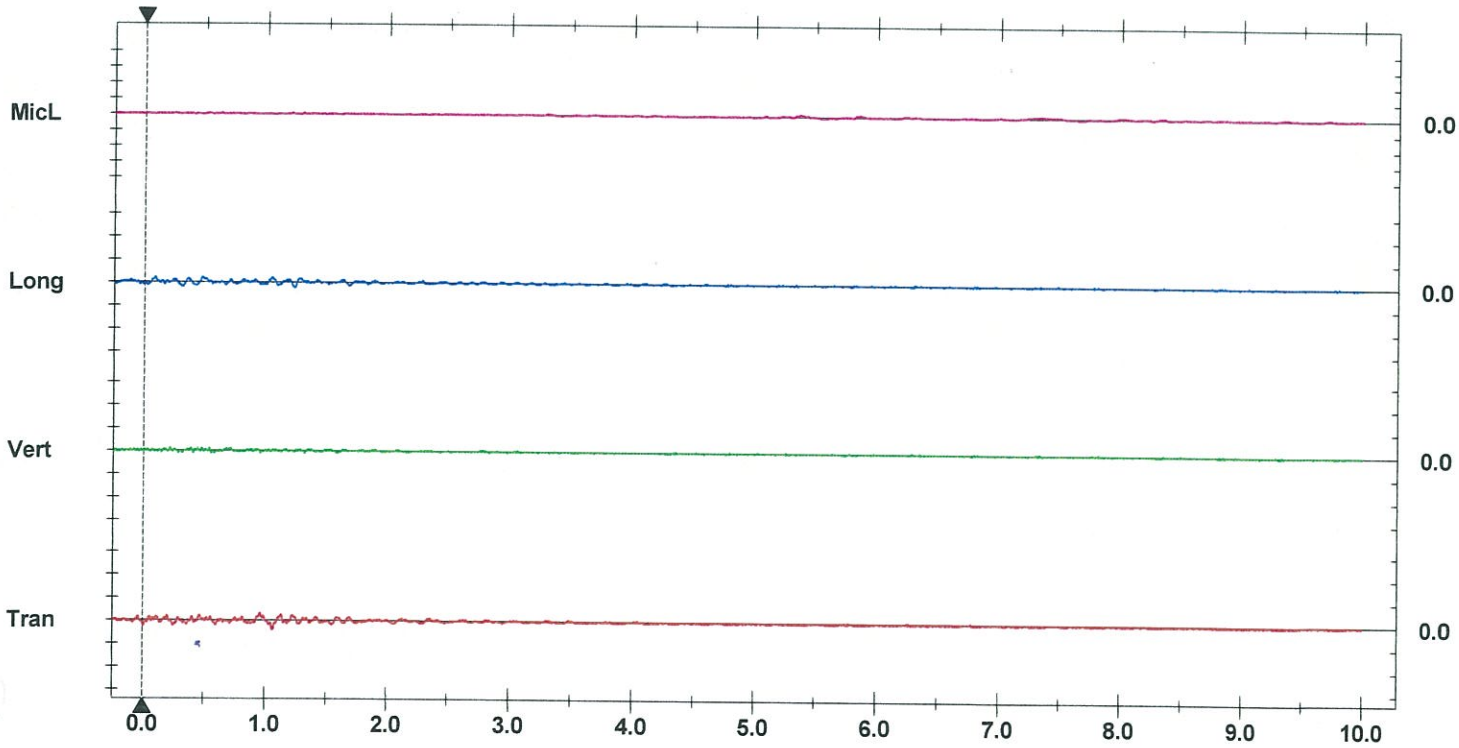
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	94.0 dB(L) at 5.358 sec
ZC Freq	5.2 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 582 mv)

	Tran	Vert	Long	
PPV	0.0400	0.01000	0.0250	in/s
ZC Freq	6.9	>100	13	Hz
Time (Rel. to Trig)	1.058	0.144	1.225	sec
Peak Acceleration	0.0265	0.0133	0.0265	g
Peak Displacement	0.00068	0.00004	0.00037	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0415 in/s at 1.061 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 01-08-16 Blast No. 01-08-16 Base Pit 2B Time 11:34

Exact Blast Location Base Pit

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
29° 38' 19"
-98° 17' 04"

MONITOR GPS
29° 38' 52"
-98° 18' 19"

SEISMOGRAPH DATA

Seismograph No. 12499 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 7-22-15 Microphone Calibration 7-22-15

Exact Seismograph Location Taveres Residence - 9118 Tuscan Hills - 10' E of NE cnr of house

Seismograph Distance & Direction from Blast ~~BRG.~~ Distance: 7437

Peak Overpressure 95.9 dB Scaled Distance ------

Peak Particle Velocity .030 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 01-08-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:33:49 January 8, 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	BF12499 V 7.05-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 22, 2015 by Vibra-Tech Inc.
File Name	N499G6SI.SD1

Notes
Client: SGS
Project: Fire Rock
Location: Clubhouse
Notes: Fountain Hills, AZ

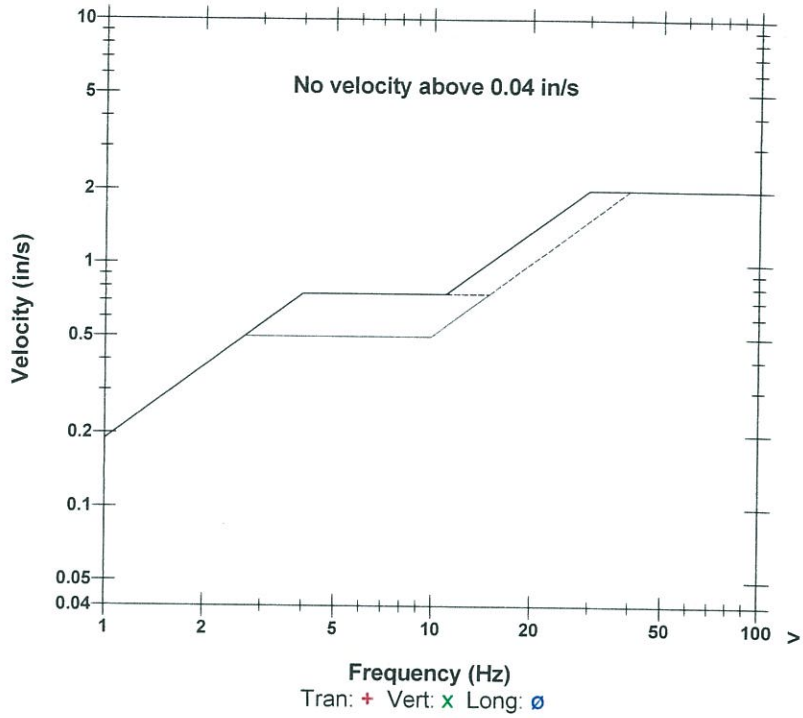
Post Event Notes
Taveres Residence - Distance: 7,437 ft

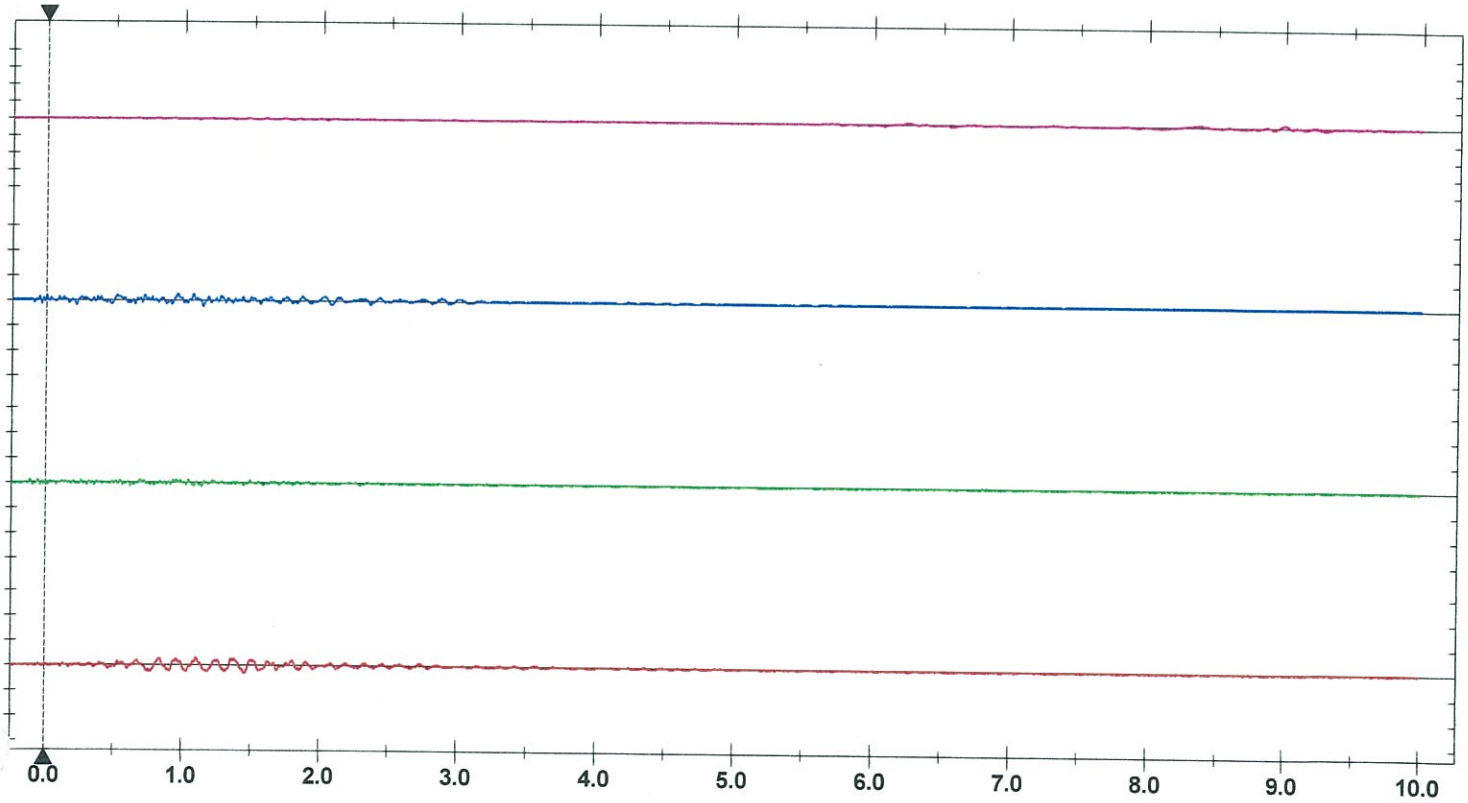
Microphone	Linear Weighting
PSPL	95.9 dB(L) at 8.993 sec
ZC Freq	9.0 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 563 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0150	0.0250	in/s
ZC Freq	9.7	39	8.4	Hz
Time (Rel. to Trig)	1.105	0.615	0.947	sec
Peak Acceleration	0.0133	0.0265	0.0133	g
Peak Displacement	0.00064	0.00012	0.00043	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0335 in/s at 0.953 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 = ▶----------◀

Printed: January 8, 2016 (V 7.05 - 7.04)

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 01-08-16 Blast No. 01-08-16 Base Pit 2B Time 11:34

Exact Blast Location Base Pit

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
29° 38' 19"
-98° 17' 04"

MONITOR GPS
29° 38' 23"
-98° 17' 43"

SEISMOGRAPH DATA

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

Date of last: Geophone Calibration 3-12-15 Microphone Calibration 3-12-15

Exact Seismograph Location Warden Residence - 21375 Gunther Grove - 10' N of NE cnr of pool at rock wall

Seismograph Distance & Direction from Blast ~~BRG.~~ Distance: 3197

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

Peak Particle Velocity .12 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 01-08-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 11:34:11 January 8, 2016	**Serial Number**	BF13270 V 7.04-8.0 MultiSeis Plus
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)	**Battery Level**	6.5 Volts
		Calibration	March 12, 2015 by Vibra-Tech Inc.
Range	Geo :10.00 in/s	**File Name**	O270G6SI.SZ1
Record Time	5.0 sec at 1024 sps		

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

Extended Notes

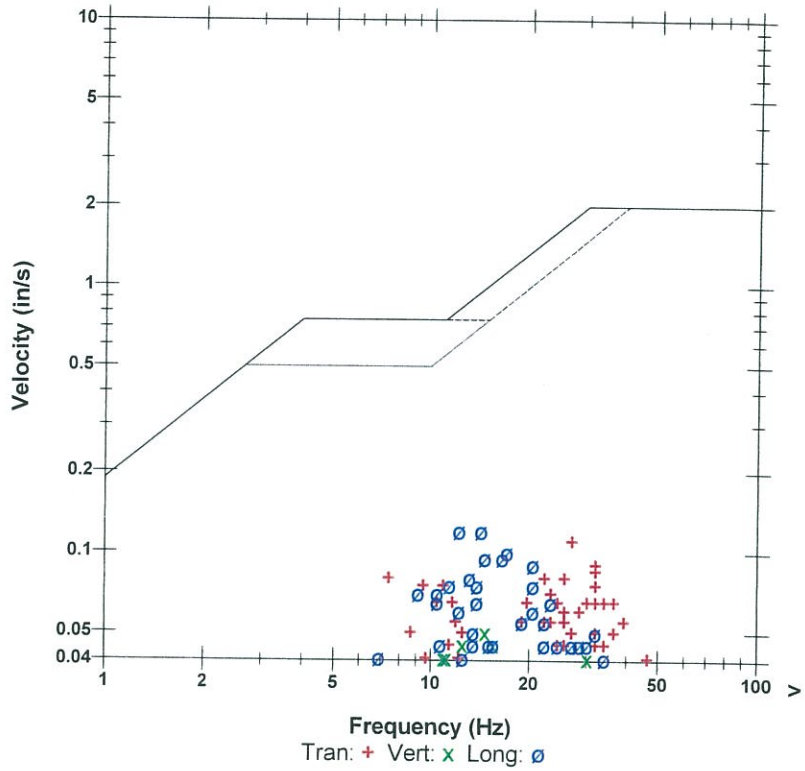
Post Event Notes
Warden Residence - Distance: 3,197 ft

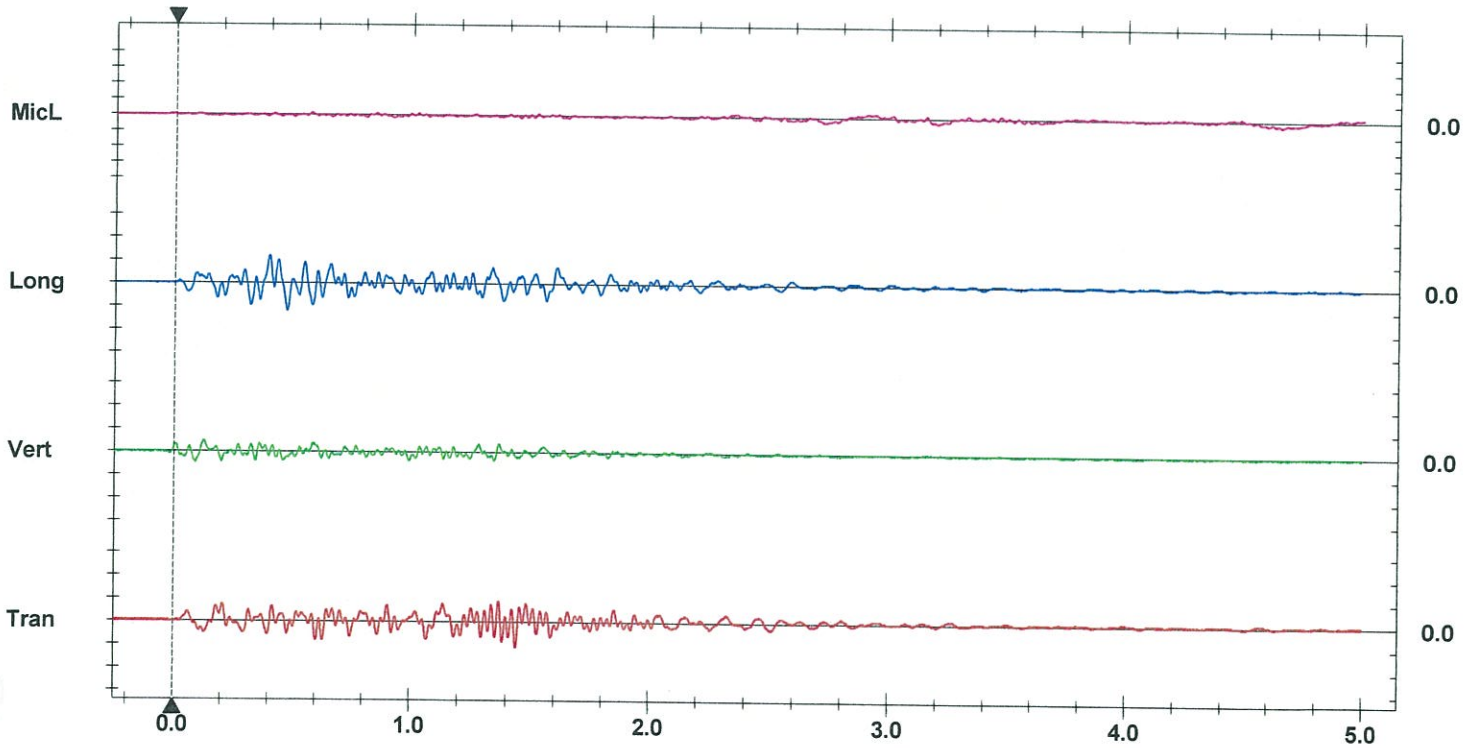
Microphone Linear Weighting
PSPL 101.9 dB(L) at 4.650 sec
ZC Freq 2.3 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 556 mv)

	Tran	Vert	Long	
PPV	0.110	0.0500	0.120	in/s
ZC Freq	27	15	12	Hz
Time (Rel. to Trig)	1.439	0.090	0.396	sec
Peak Acceleration	0.0530	0.0398	0.0398	g
Peak Displacement	0.00135	0.00056	0.00122	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.133 in/s at 0.396 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 1-12-16 Blast No. 1-12-16 3C Time 14:13

Exact Blast Location FACE 3C:

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' 47"
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 2,891'

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

Peak Particle Velocity .060 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-12-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 14:13:44 January 12, 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	H191G704.UW1

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

Extended Notes

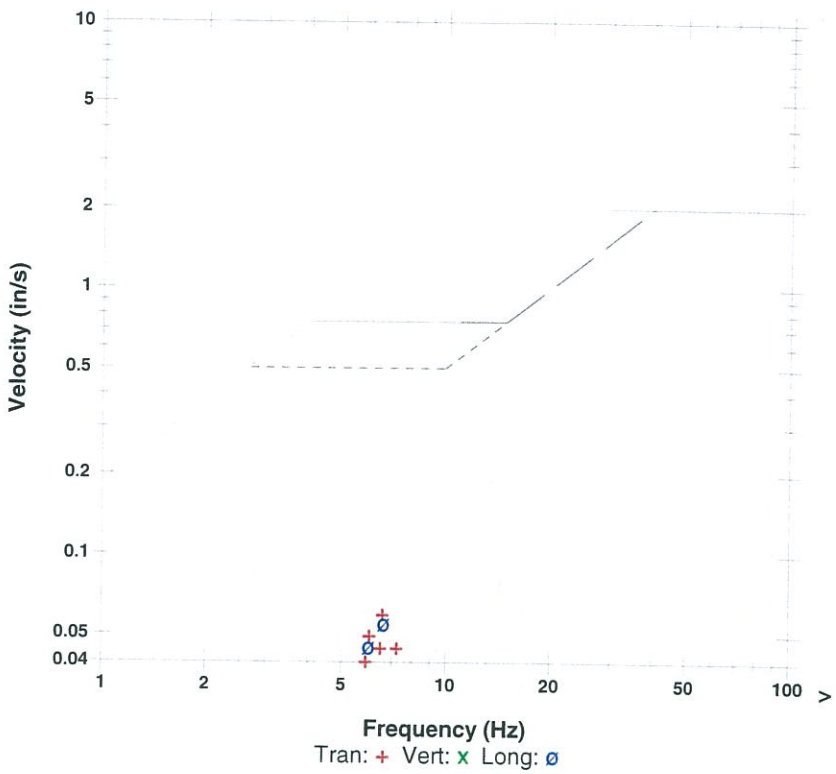
Post Event Notes
City Prop Line: 2,891'

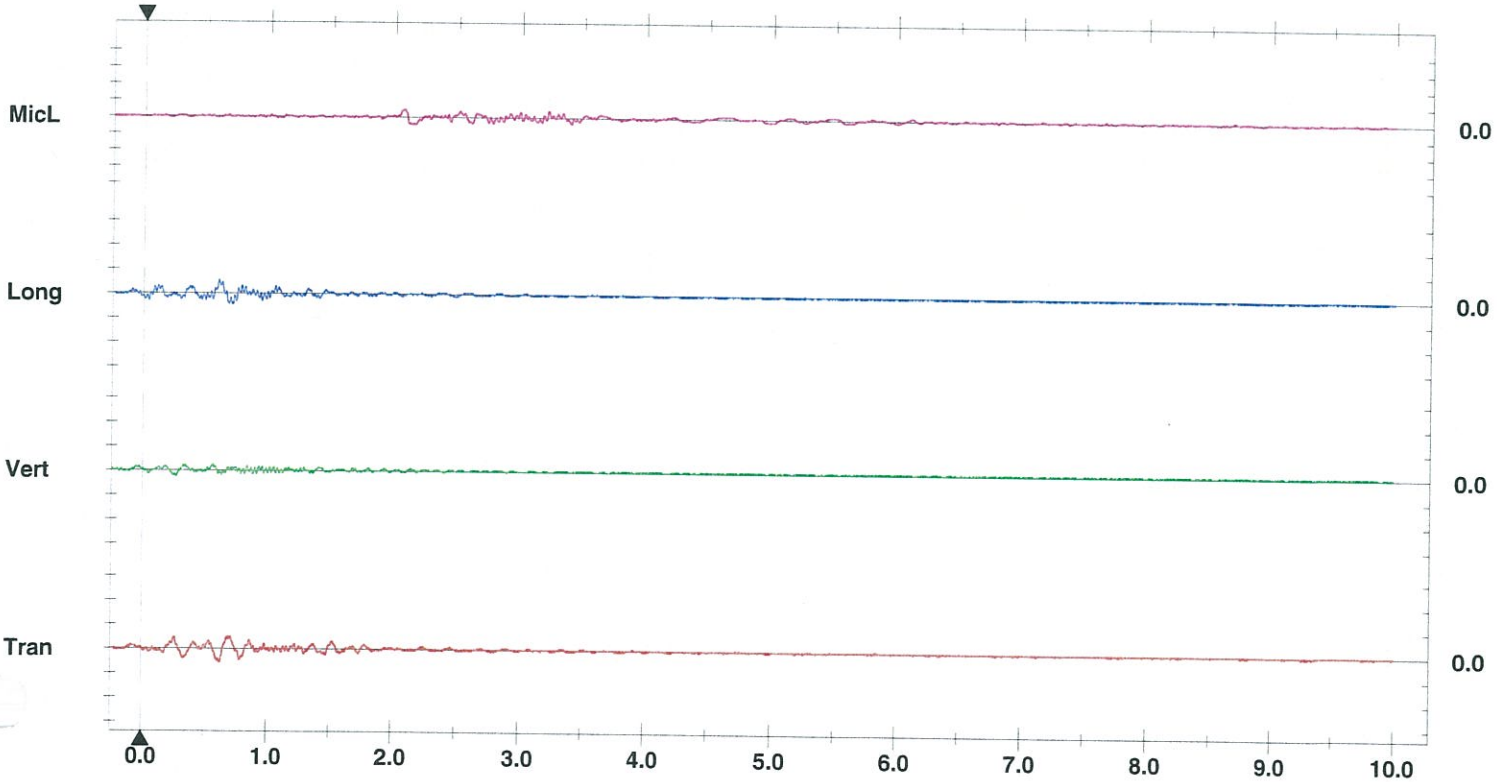
Microphone	Linear Weighting
PSPL	103.5 dB(L) at 2.067 sec
ZC Freq	7.4 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 564 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0250	0.0550	in/s
ZC Freq	6.6	8.4	6.6	Hz
Time (Rel. to Trig)	0.627	0.261	0.599	sec
Peak Acceleration	0.0133	0.0265	0.0265	g
Peak Displacement	0.00138	0.00053	0.00125	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0776 in/s at 0.627 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 1-12-16 Blast No. 1-12-16 3C Time 14:13

Exact Blast Location FACE 3C

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' 47"
W 98° 17' 35.5"

MONITOR GPS

N 29 38 31.84
W 98 18 23.43

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 McCormick Residence: 21403 Liguria Drive, George Ranch Subdivision

15' E off NE corner of garage

Seismograph Distance from Blast 4,434'

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

Peak Particle Velocity .060 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-12-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 14:13:39 January 12, 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

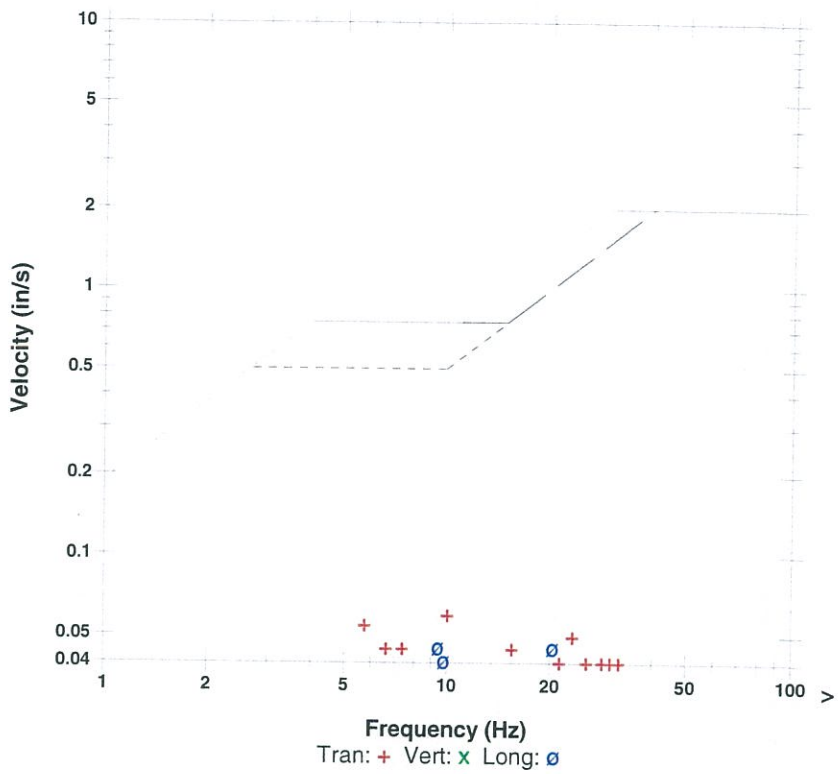
Serial Number	BF8949 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	J949G704.UR1

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

Extended Notes

Post Event Notes
McCormick Res: 4,434'

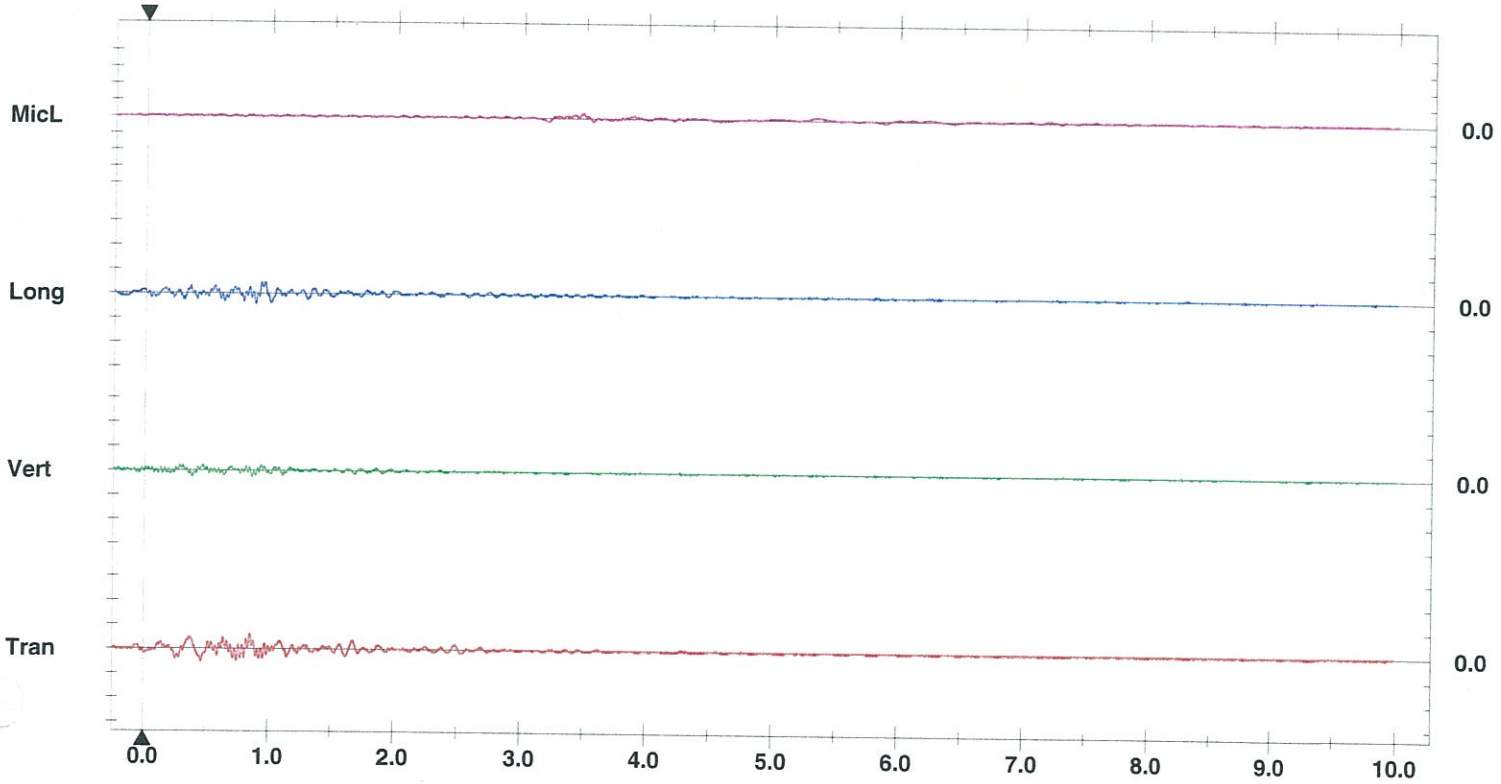
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	101.0 dB(L) at 3.476 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 571 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0250	0.0450	in/s
ZC Freq	10	17	20	Hz
Time (Rel. to Trig)	0.854	0.379	0.877	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00122	0.00030	0.00085	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0652 in/s at 0.858 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 1-12-16 Blast No. 1-12-16 3C Time 14:13

Exact Blast Location FACE 3C

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' 47"
W 98° 17' 35.5

MONITOR GPS

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

SEISMOGRAPH DATA

Seismograph No. 14420 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 01-28-15 Microphone Calibration 01-28-15

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

10' E of NE corner of house

Seismograph Distance from Blast 3,908'

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

Peak Particle Velocity .085 ips Operator DAVID LATENER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-12-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 14:13:45 January 12, 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	BF14420 V 7.04-8.0 MultiSeis Plus
Battery Level	6.2 Volts
Calibration	January 28, 2015 by Vibra-Tech Inc.
File Name	P420G704.UX1

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

Extended Notes

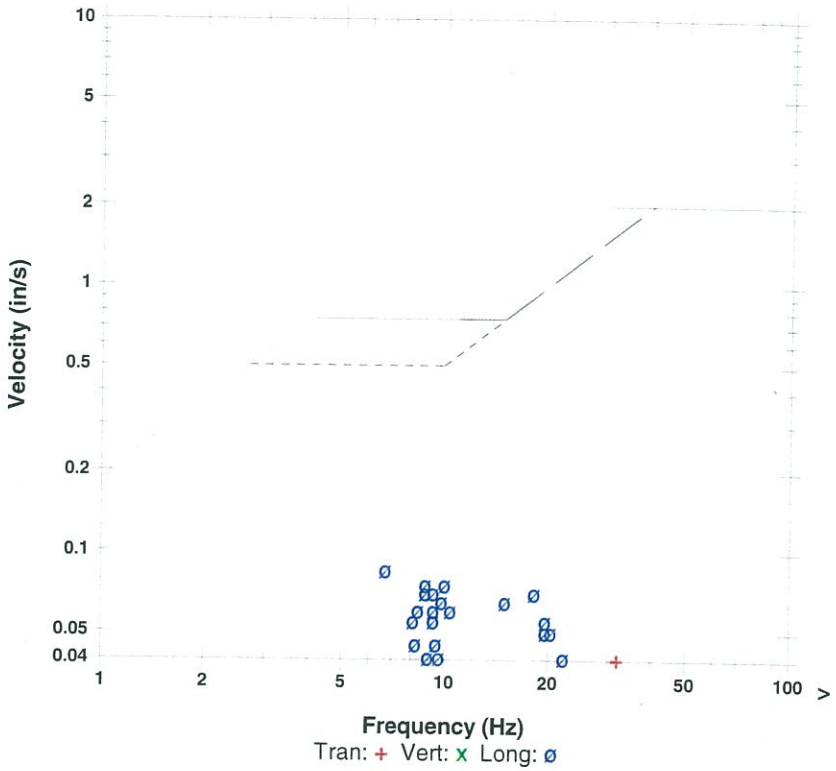
Post Event Notes
Taveres Res: 3,908'

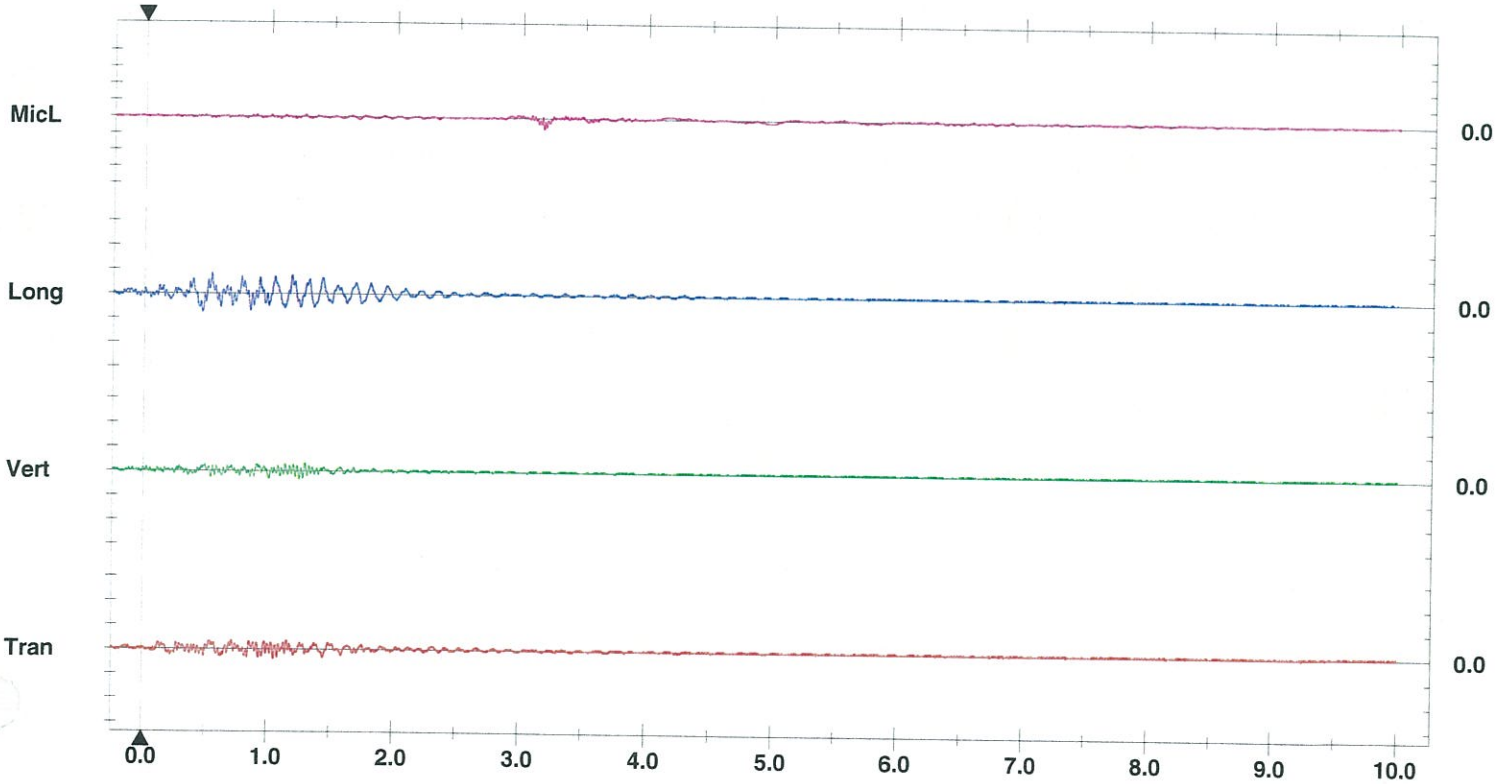
Microphone	Linear Weighting
PSPL	107.0 dB(L) at 3.171 sec
ZC Freq	7.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 536 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0350	0.0850	in/s
ZC Freq	32	30	6.7	Hz
Time (Rel. to Trig)	1.055	1.243	0.535	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00058	0.00036	0.00136	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0935 in/s at 0.535 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 1-12-16 Blast No. 1-12-16 3C Time 14:17

Exact Blast Location FACE 3C:

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' 47"
W 98° 17' 35.5"

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 2,407'

Peak Overpressure 109.5 dB Scaled Distance ------

Peak Particle Velocity .14 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 1-12-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 14:13:47 January 12, 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

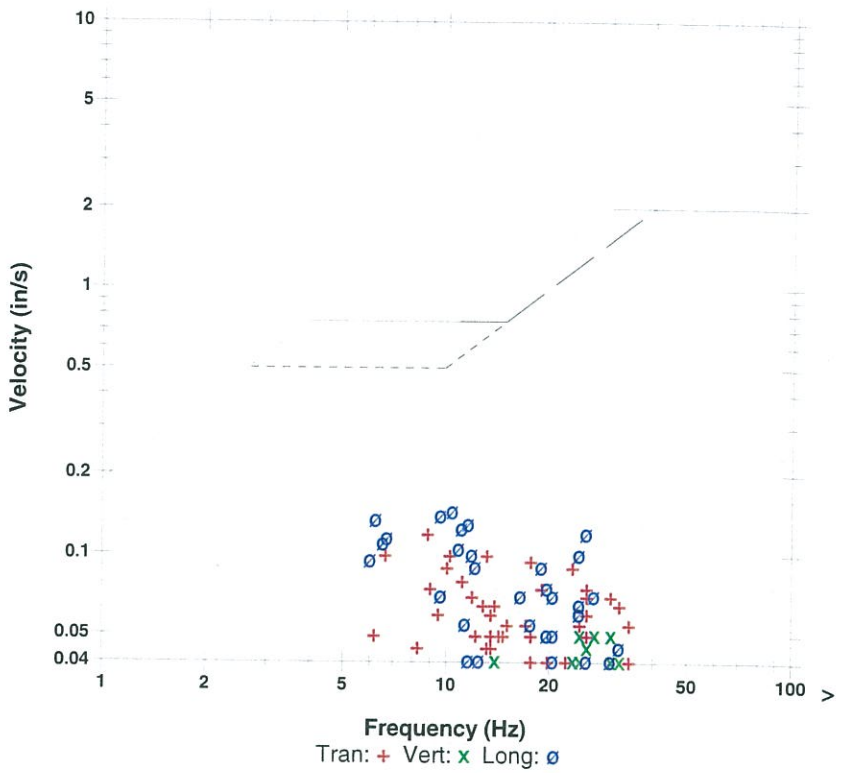
Serial Number	BF13270 V 7.04-8.0 MultiSeis Plus
Battery Level	6.5 Volts
Calibration	March 12, 2015 by Vibra-Tech Inc.
File Name	O270G704.UZ1

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

Extended Notes

Post Event Notes
Warden Res: 2,407'

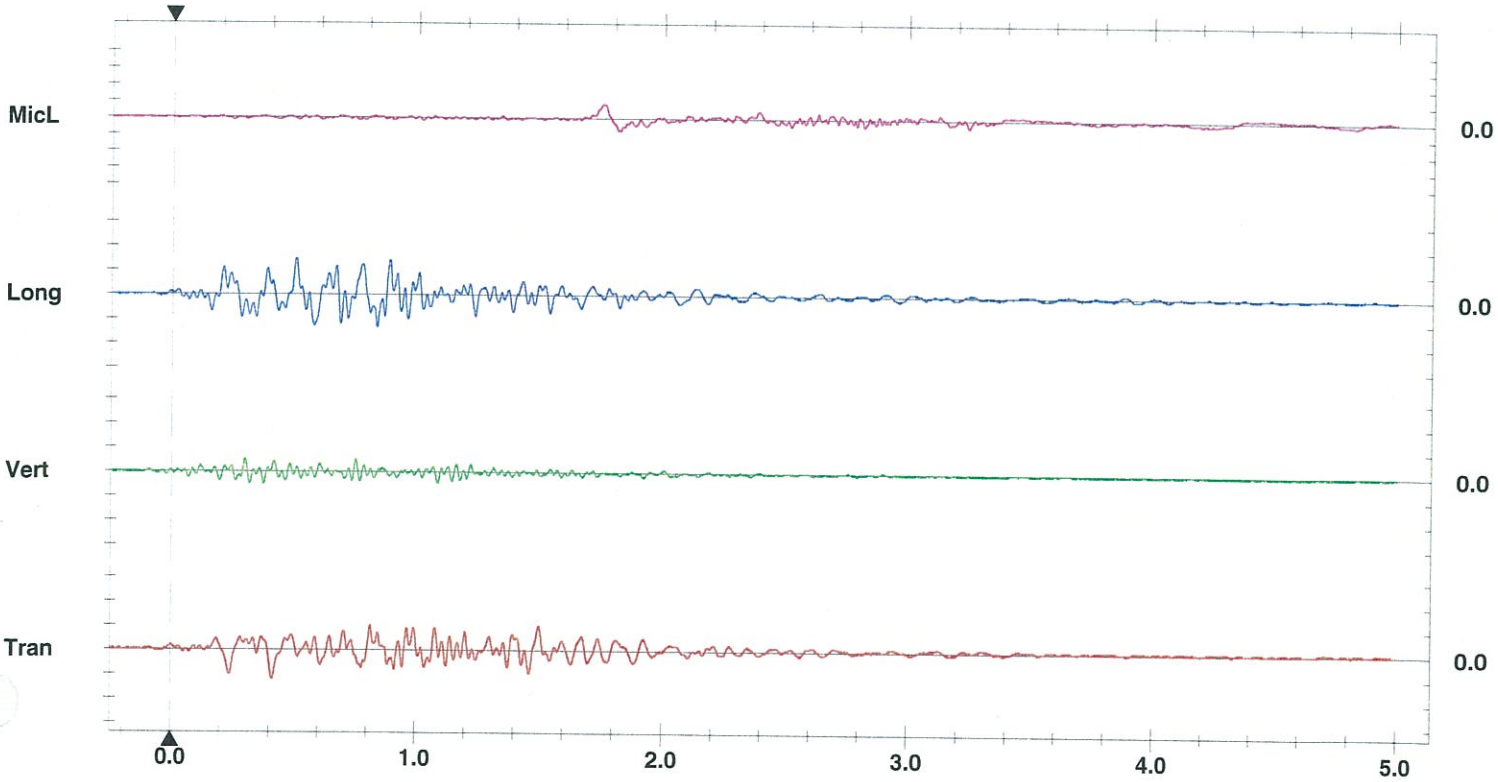
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	109.5 dB(L) at 1.753 sec
ZC Freq	6.0 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.120	0.0500	0.145	in/s
ZC Freq	8.8	27	10	Hz
Time (Rel. to Trig)	0.410	0.298	0.499	sec
Peak Acceleration	0.0398	0.0398	0.0663	g
Peak Displacement	0.00164	0.00043	0.00244	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.153 in/s at 0.884 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 1-12-16 Blast No. 1-12-16 3C Time 14:13

Exact Blast Location FACE 3C:

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' 47"
W 98° 17' 35.5"

MONITOR GPS

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

SEISMOGRAPH DATA

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

Date of last: Geophone Calibration 6-9-15 Microphone Calibration 6-9-15

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 2,200'

Peak Overpressure 109.2 dB Scaled Distance ------

Peak Particle Velocity .10 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 1-12-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 14:13:59 January 12, 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	June 9, 2015 by Vibra-Tech Inc.
File Name	O138G704.VB1

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

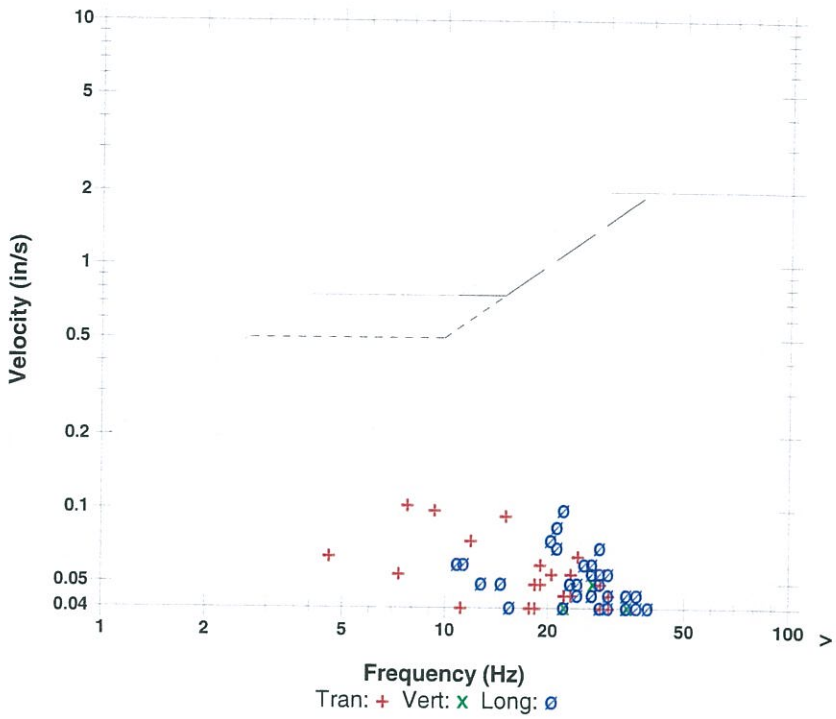
Post Event Notes
Warden Prop Line: 2,200'

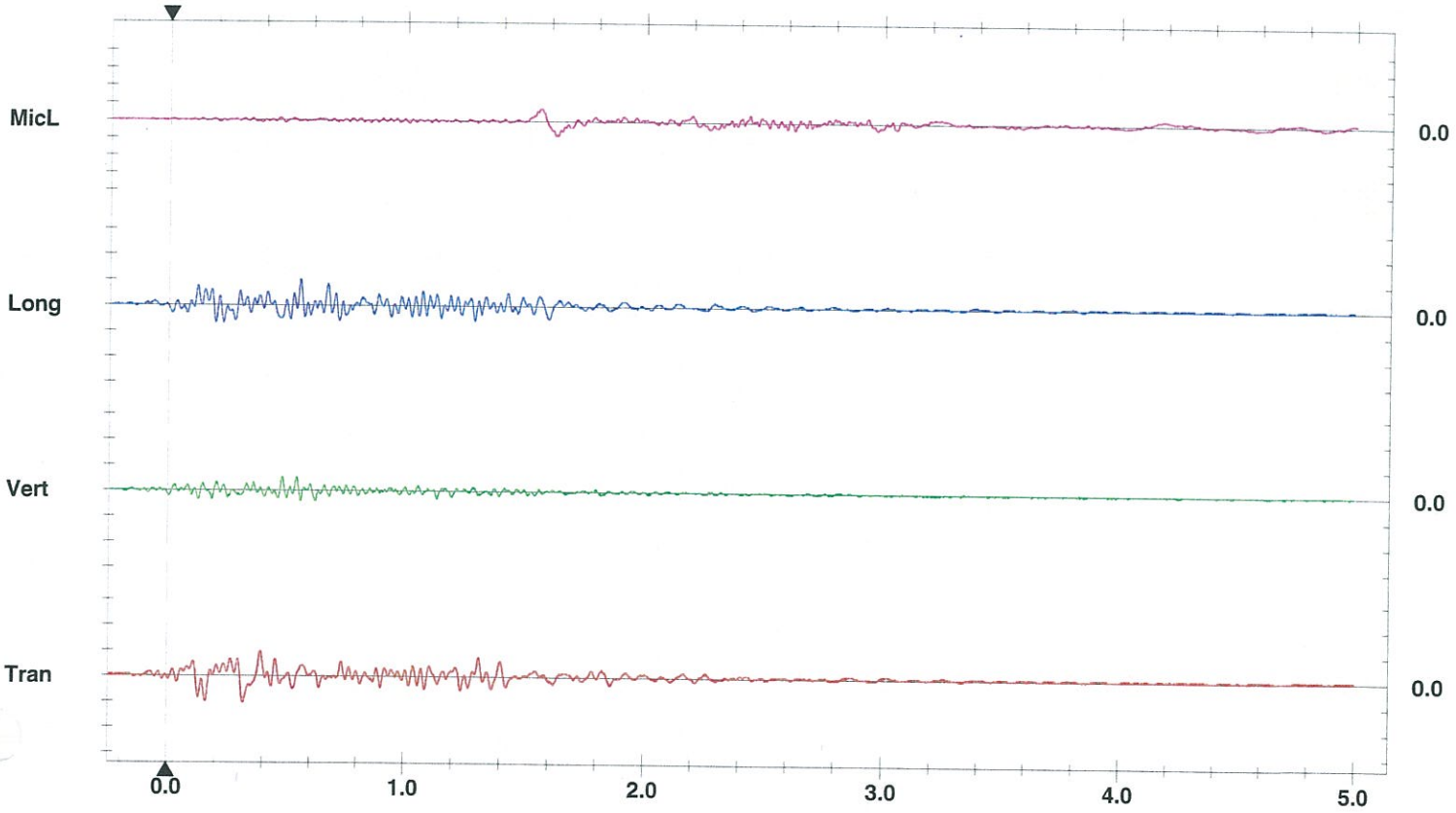
Microphone	Linear Weighting
PSPL	109.2 dB(L) at 1.615 sec
ZC Freq	4.2 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 765 mv)

	Tran	Vert	Long	
PPV	0.105	0.0500	0.1000	in/s
ZC Freq	7.8	27	22	Hz
Time (Rel. to Trig)	0.317	0.475	0.548	sec
Peak Acceleration	0.0398	0.0265	0.0398	g
Peak Displacement	0.00182	0.00030	0.00087	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.108 in/s at 0.319 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 1-13-16 Blast No. 1-13-16 lower C6 Time 11:02

Exact Blast Location lower C6

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
29° 38' 47.7"
-98° 17' 9.3"

MONITOR GPS
29° 38' 22.63"
-98° 17' 53.97"

SEISMOGRAPH DATA

Seismograph No. C6191 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 7-16-15 Microphone Calibration 7-16-15

Exact Seismograph Location City Property Line - outside city water tower - 30' frm gate at property line

Seismograph Distance & Direction from Blast ~~BRG.~~ Distance: 4683

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

Peak Particle Velocity .025 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 1-13-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:02:24 January 13, 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	H191G71Q.O01

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

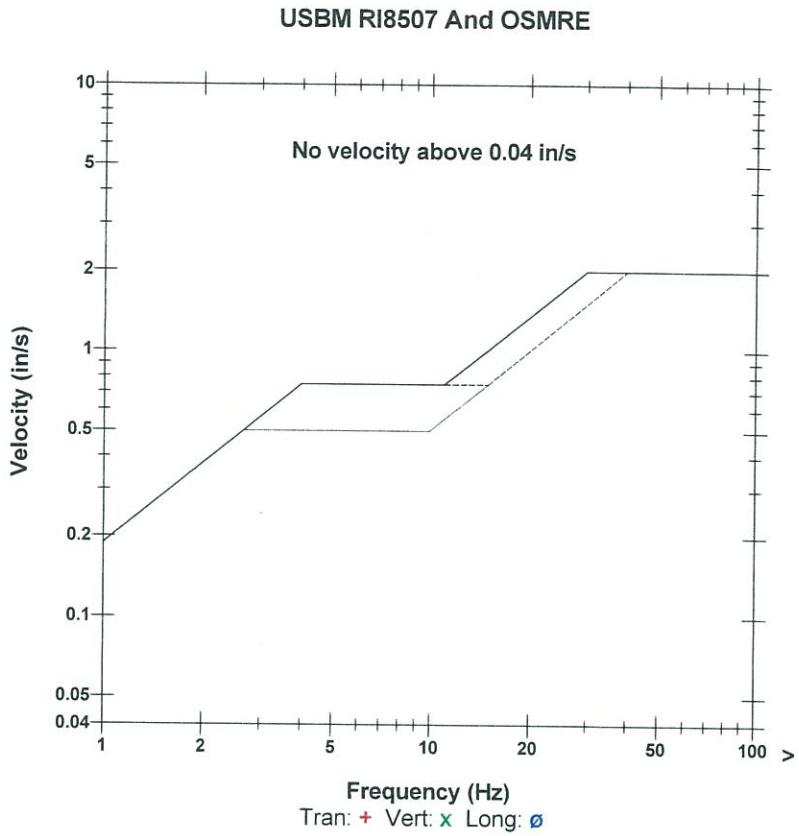
Extended Notes

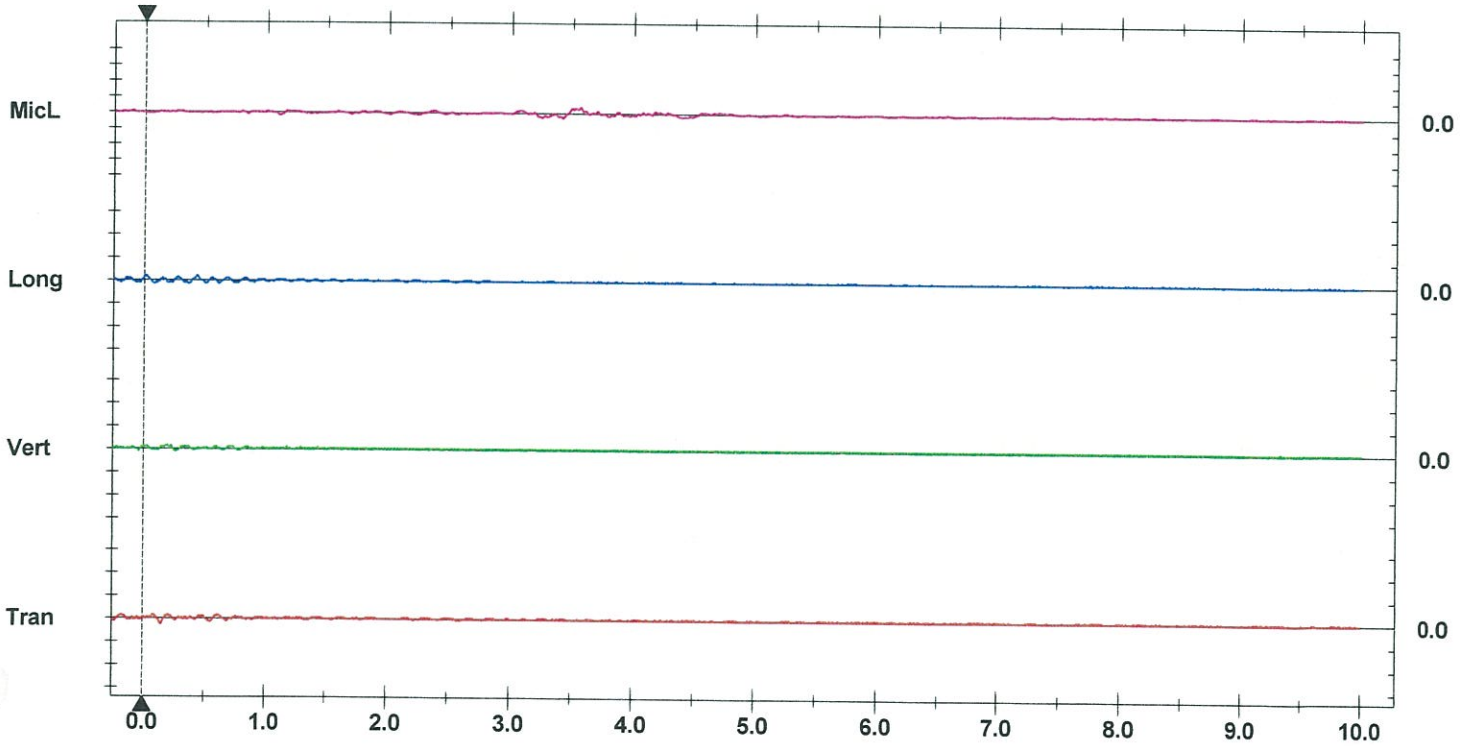
Post Event Notes
City Property Line - Distance: 4,683 ft

Microphone	Linear Weighting
PSPL	102.8 dB(L) at 3.556 sec
ZC Freq	3.3 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 606 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0150	0.0200	in/s
ZC Freq	13	15	13	Hz
Time (Rel. to Trig)	0.146	0.177	0.000	sec
Peak Acceleration	0.0133	0.0133	0.0133	g
Peak Displacement	0.00031	0.00020	0.00030	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0274 in/s at 0.146 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 1-13-16 Blast No. 1-13-16 lower C6 Time 11:02

Exact Blast Location lower C6

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
29° 38' 47.7"
-98° 17' 9.3"

MONITOR GPS
29° 38' 31.84"
-98° 16' 23.43"

SEISMOGRAPH DATA

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

Date of last: Geophone Calibration 7-16-15 Microphone Calibration 7-16-15

Exact Seismograph Location McCormick Residence - 21403 Liguria dr - 15' off NE cnr of garage

Seismograph Distance & Direction from Blast ~~BRG.~~ Distance: 6 724'

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

Peak Particle Velocity .035 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 1-13-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:02:24 January 13, 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	J949G71Q.O01

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

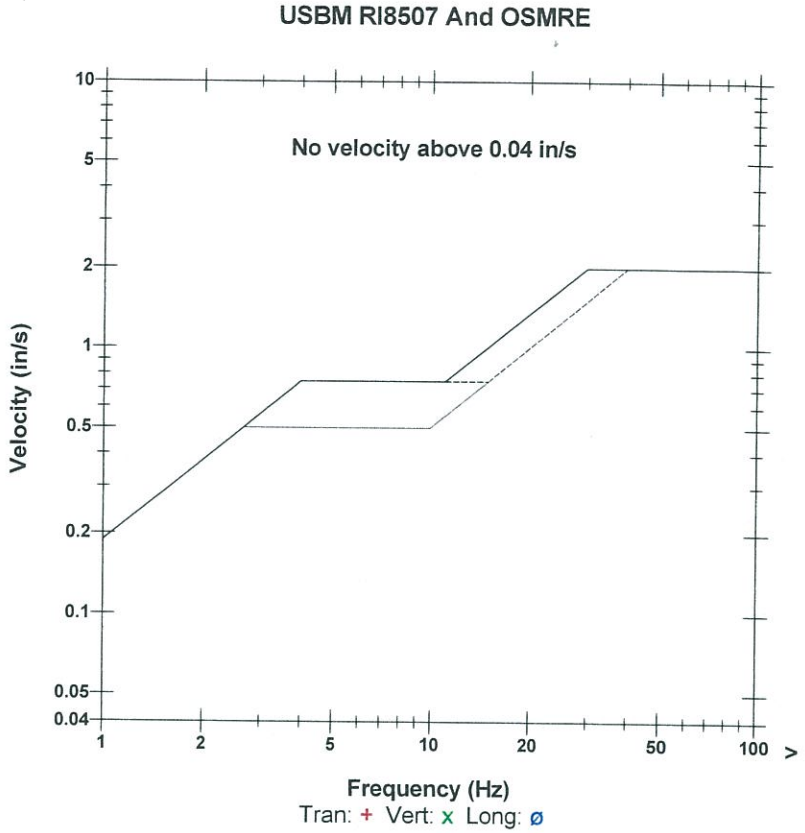
Extended Notes

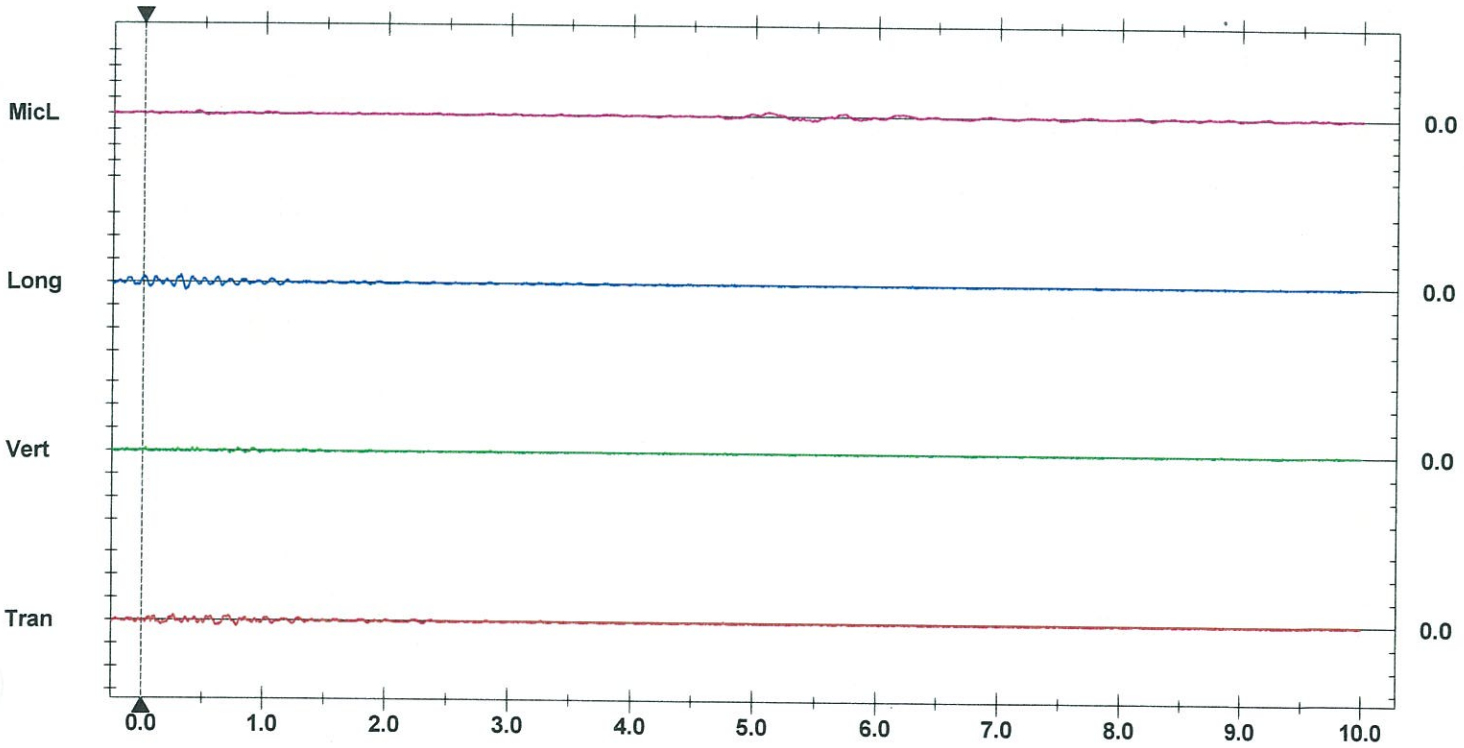
Post Event Notes
McCormick Residence - Distance: 3,685 ft

Microphone	Linear Weighting
PSPL	100.0 dB(L) at 5.105 sec
ZC Freq	1.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 551 mv)

	Tran	Vert	Long	
PPV	0.0250	0.01000	0.0350	in/s
ZC Freq	15	>100	10	Hz
Time (Rel. to Trig)	0.776	0.021	0.348	sec
Peak Acceleration	0.0133	0.0133	0.0265	g
Peak Displacement	0.00053	0.00006	0.00056	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0354 in/s at 0.348 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 1-13-16 Blast No. 1-13-16 lower C6 Time 11:02

Exact Blast Location lower C6

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
29° 38' 47.7"
-98° 17' 9.3"

MONITOR GPS
29° 38' 52"
-98° 18' 19"

SEISMOGRAPH DATA

Seismograph No. 14420 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 1-28-15 Microphone Calibration 1-28-15

Exact Seismograph Location Taveres Residence - 9118 Tuscan Hills dr - 10' E of NE cnr of home

Seismograph Distance & Direction from Blast ~~BRG.~~ Distance: 6191'

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

Peak Particle Velocity .055 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 1-13-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:02:23 January 13, 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	BF14420 V 7.04-8.0 MultiSeis Plus
Battery Level	6.2 Volts
Calibration	January 28, 2015 by Vibra-Tech Inc.
File Name	P420G71Q.NZ1

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

Extended Notes

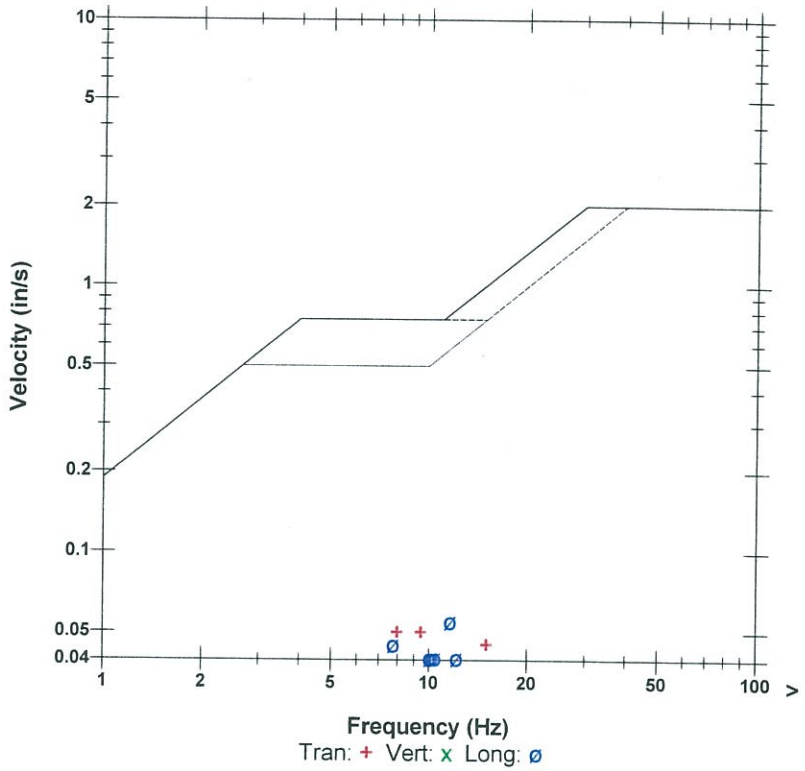
Post Event Notes
Taveres Residence - Distance: 6,191 ft

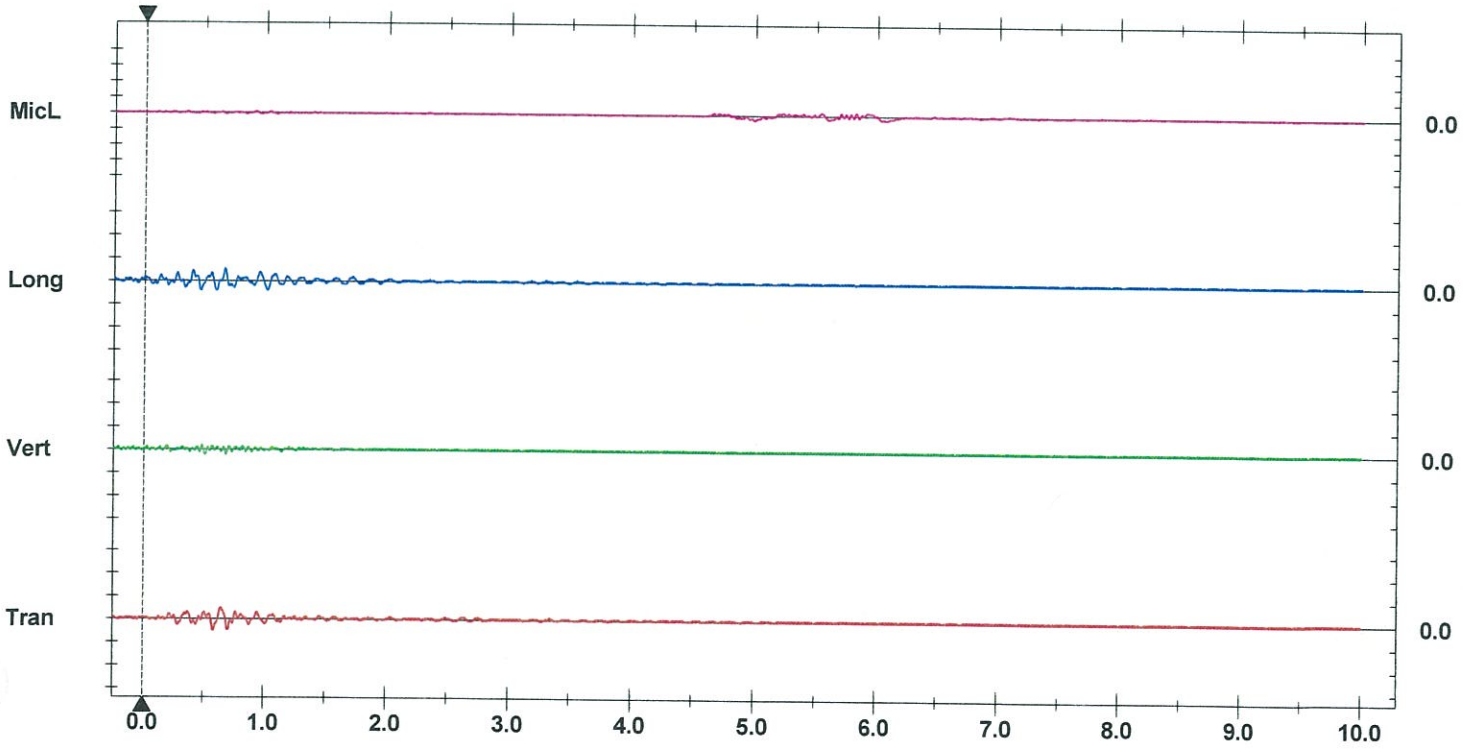
Microphone	Linear Weighting
PSPL	100.0 dB(L) at 4.979 sec
ZC Freq	4.1 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 522 mv)

	Tran	Vert	Long	
PPV	0.0500	0.0200	0.0550	in/s
ZC Freq	9.5	30	12	Hz
Time (Rel. to Trig)	0.579	0.479	0.662	sec
Peak Acceleration	0.0133	0.0265	0.0133	g
Peak Displacement	0.00097	0.00017	0.00079	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0660 in/s at 0.662 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 1-13-16 Blast No. 1-13-16 lower C6 Time 11:02

Exact Blast Location lower C6

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
29° 38' 47.7"
-98° 17' 9.3"

MONITOR GPS
29° 38' 23"
-98° 17' 40"

SEISMOGRAPH DATA

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

Date of last: Geophone Calibration 3-12-15 Microphone Calibration 3-12-15

Exact Seismograph Location Warden Residence - 21375 Gunther Grove - 10' N of NE cnr of pool at rock wall

Seismograph Distance & Direction from Blast ~~BRG:~~ Distance: 3685

Peak Overpressure 105.5 dB Scaled Distance ------

Peak Particle Velocity .0130 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 1-13-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:02:23 January 13, 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

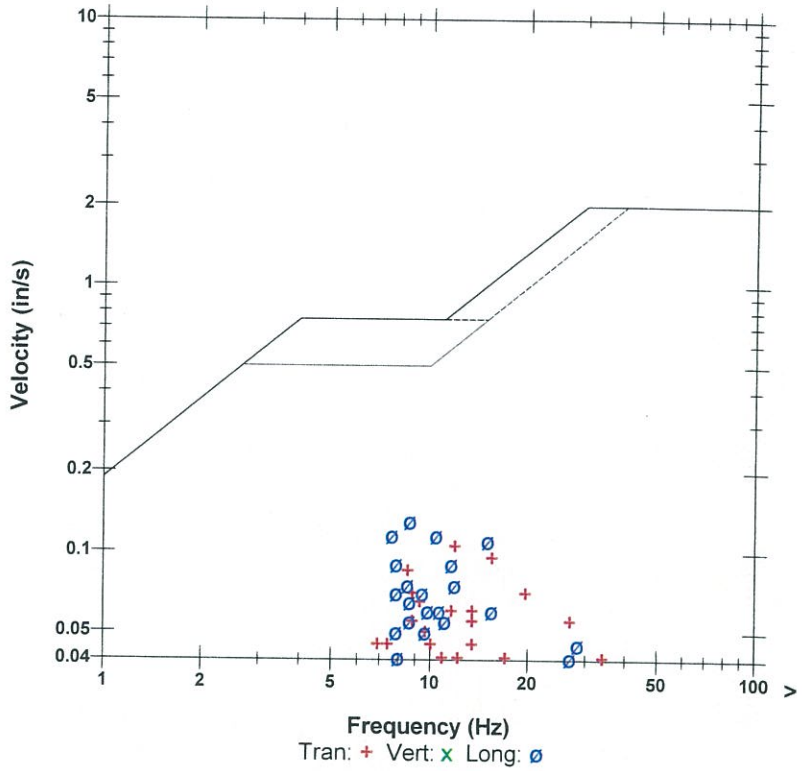
Serial Number	BF13270 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	March 12, 2015 by Vibra-Tech Inc.
File Name	O270G71Q.NZ1

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

Extended Notes

Post Event Notes
Warden Residence - Distance: 3,685 ft

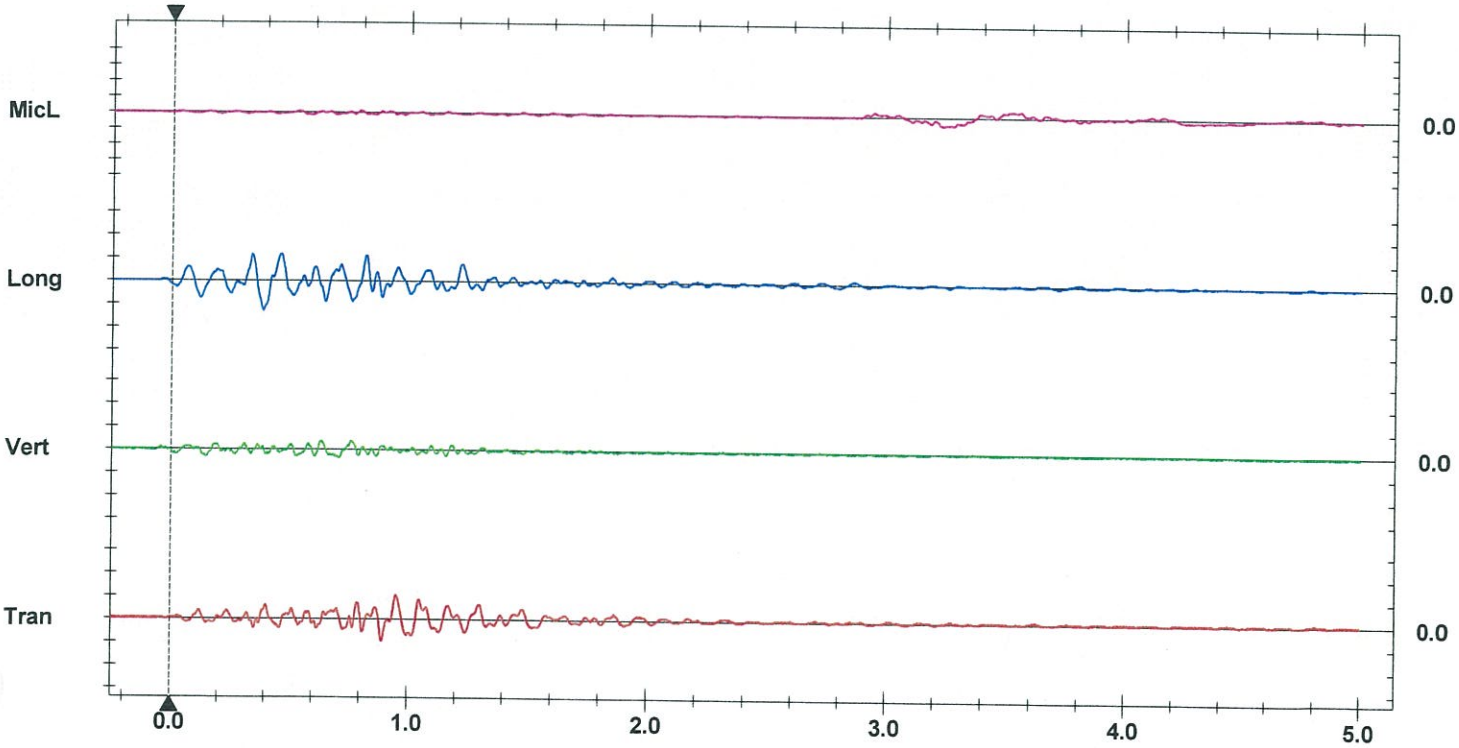
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	105.5 dB(L) at 3.226 sec
ZC Freq	1.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 594 mv)

	Tran	Vert	Long	
PPV	0.105	0.0350	0.130	in/s
ZC Freq	12	18	8.7	Hz
Time (Rel. to Trig)	0.951	0.630	0.388	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00150	0.00083	0.00236	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.134 in/s at 0.388 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 1-13-16 Blast No. 1-13-16 lower C6 Time 11:02

Exact Blast Location lower C6

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
29° 38' 47.7"
-98° 17' 9.3"

MONITOR GPS
29° 38' 25"
-98° 17' 39"

SEISMOGRAPH DATA

Seismograph No. 12499 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 7-22-15 Microphone Calibration 7-22-15

Exact Seismograph Location Warden Property Line - 21375 Gunther Grove - NE cnr of property at pin flag

Seismograph Distance & Direction from Blast ~~BRG.~~ Distance: 3483

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

Peak Particle Velocity .090 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 1-13-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:01:34 January 13, 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	BF12499 V 7.05-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	July 22, 2015 by Vibra-Tech Inc.
File Name	N499G71Q.MM1

Notes
Client:
Project:
Location:
Notes:

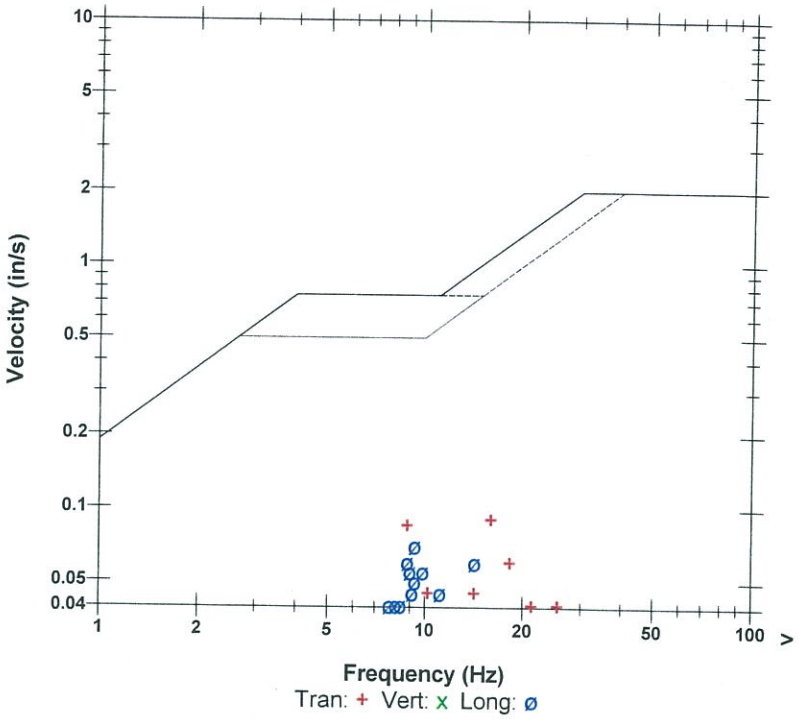
Post Event Notes
Warden Property Line - Distance: 3,483 ft

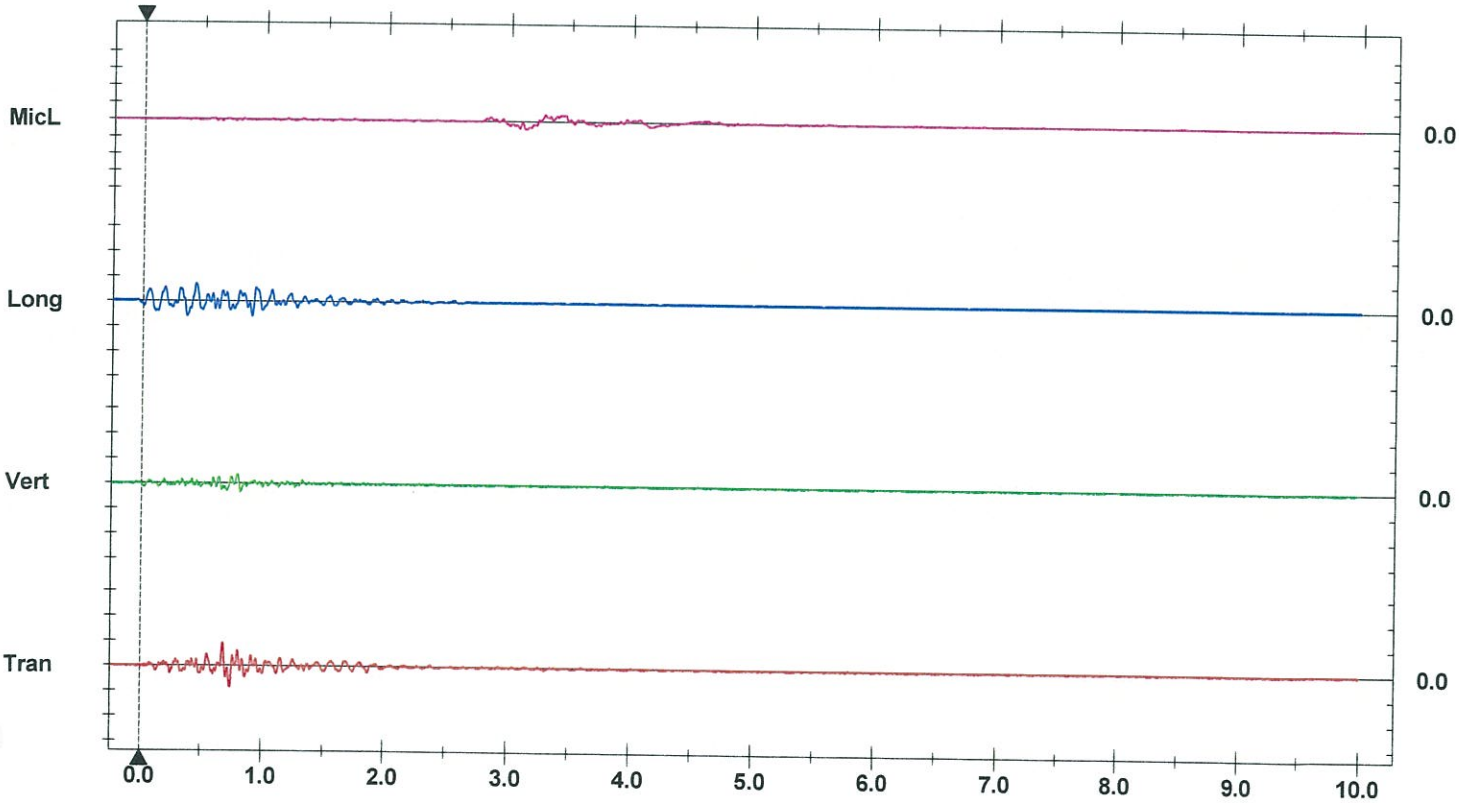
Microphone	Linear Weighting
PSPL	103.5 dB(L) at 3.111 sec
ZC Freq	4.0 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 609 mv)

	Tran	Vert	Long	
PPV	0.0900	0.0350	0.0700	in/s
ZC Freq	16	18	9.3	Hz
Time (Rel. to Trig)	0.684	0.783	0.434	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00120	0.00070	0.00112	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0946 in/s at 0.684 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 1-14-16 Blast No. 01-14-16 4B Time 11:59

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 00
W 98 17 34.5

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 DIST: 4,157'

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

Peak Particle Velocity .030 ips Operator L. LUMBERS

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-14-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 11:59:38 January 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

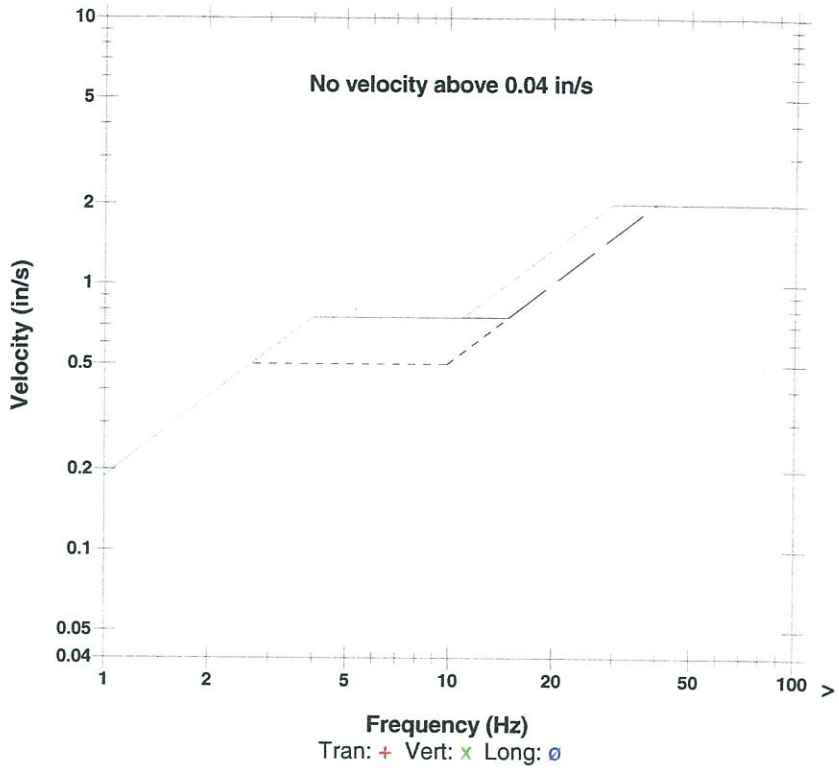
Serial Number	BD6191 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	H191G73N.ZE1

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

Extended Notes

Post Event Notes
City Property Line Dist: 4,157'

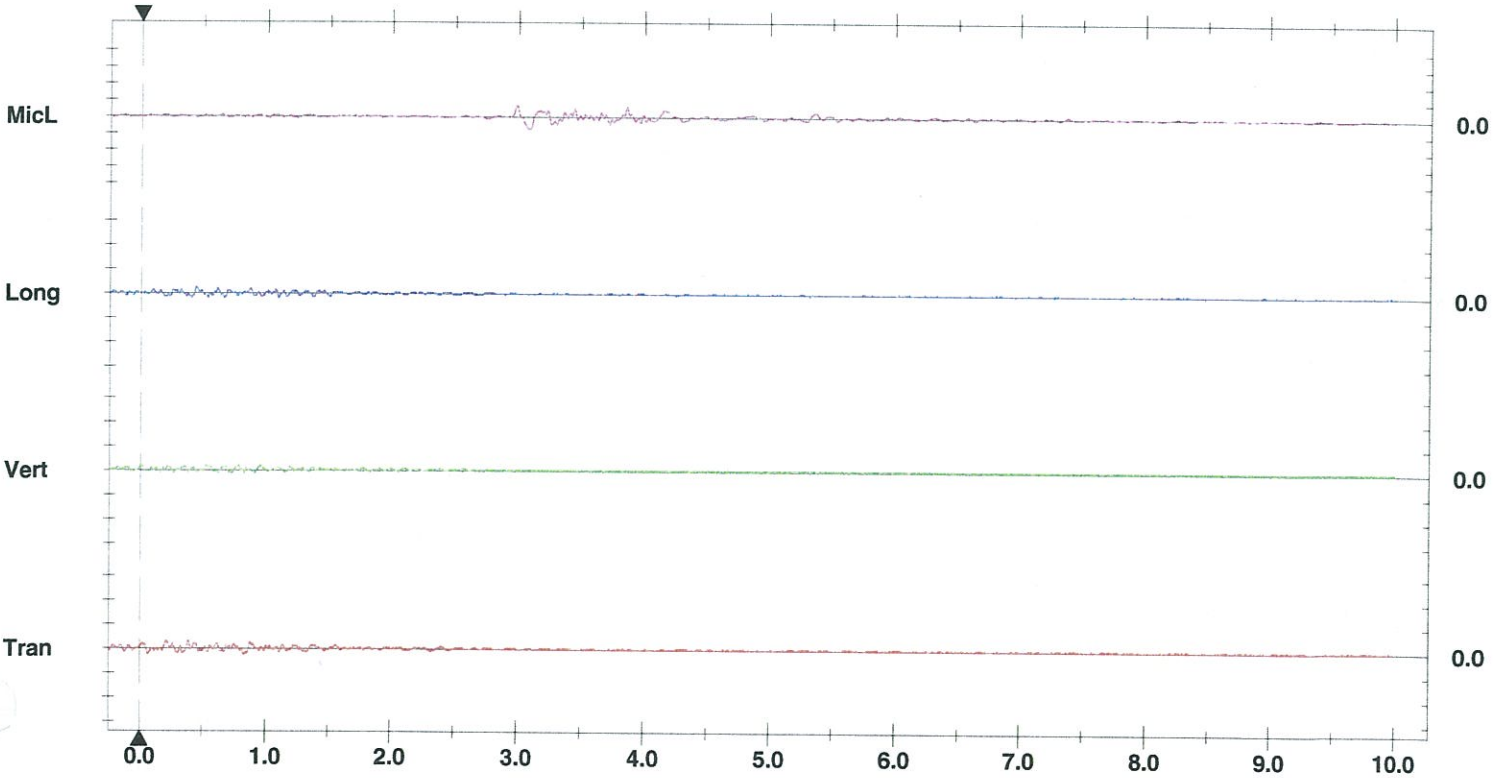
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	108.0 dB(L) at 3.081 sec
ZC Freq	5.7 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 610 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0200	0.0250	in/s
ZC Freq	12	13	16	Hz
Time (Rel. to Trig)	0.205	0.000	0.438	sec
Peak Acceleration	0.0133	0.0133	0.0133	g
Peak Displacement	0.00041	0.00037	0.00027	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0350 in/s at 0.207 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 1-14-16 Blast No. 01-14-16 4B Time 11:59

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 00
W 98 17 34.5

MONITOR GPS

N 29 38 31.84
W 98 18 23.43

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 McCormick Residence: 21403 Liguria Drive, George Ranch Subdivision

15' E off NE corner of garage

Seismograph Distance from Blast DIST: 5,169'

Peak Overpressure 97.5 dB Scaled Distance ------

Peak Particle Velocity .060 ips Operator L. Lumbers

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-14-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:59:36 January 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

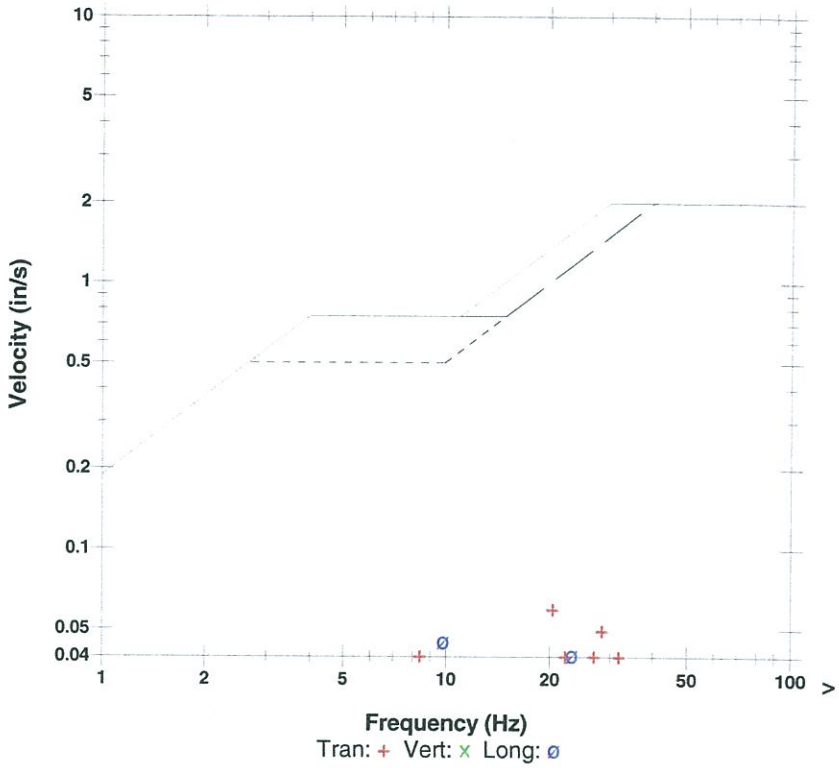
Serial Number	BF8949 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	J949G73N.ZC1

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

Extended Notes

Post Event Notes
McCormick Residence Dist: 5,169'

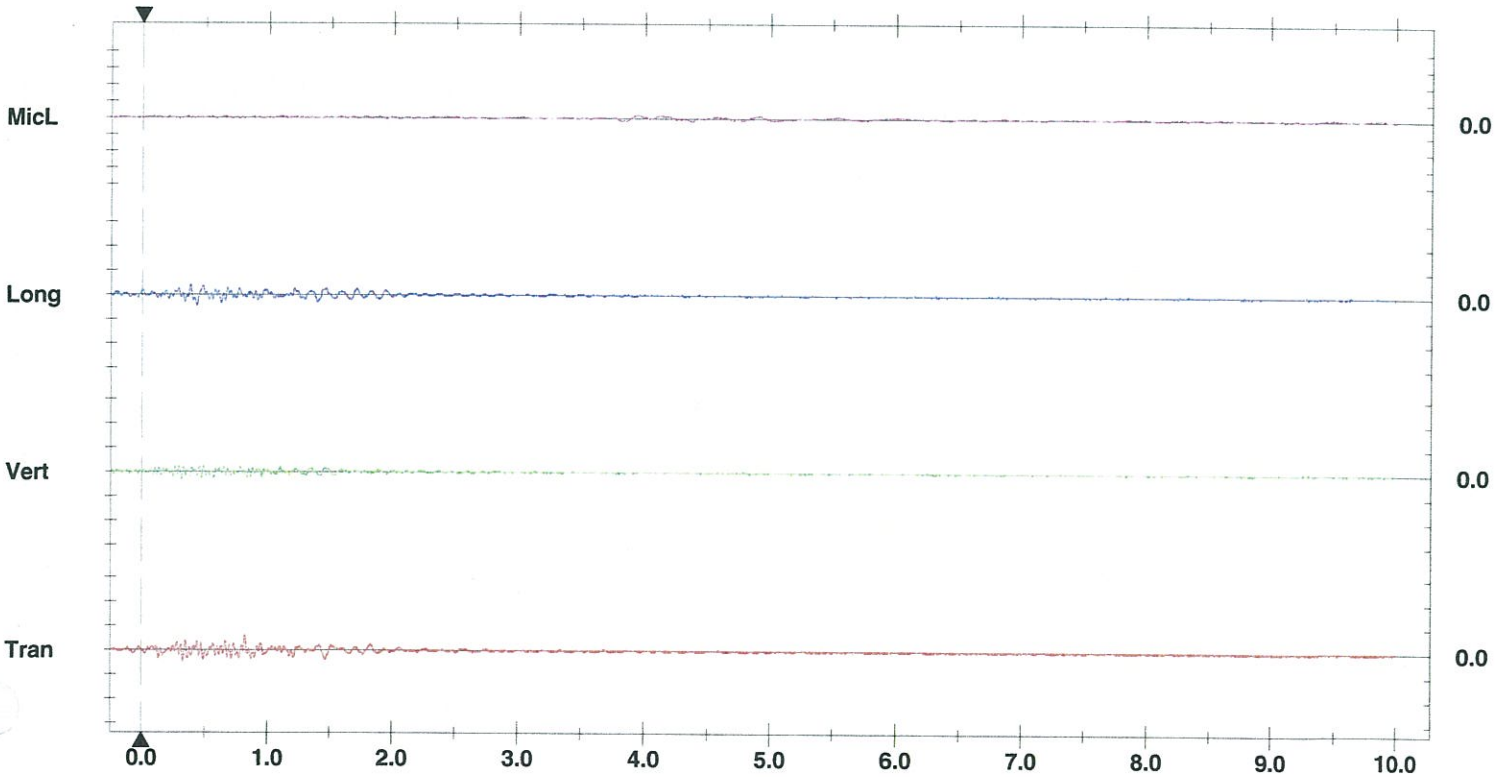
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	97.5 dB(L) at 3.948 sec
ZC Freq	5.6 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 575 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0300	0.0450	in/s
ZC Freq	20	32	9.8	Hz
Time (Rel. to Trig)	0.816	0.309	0.425	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00070	0.00033	0.00064	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0658 in/s at 0.819 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 1-14-16 Blast No. 01-14-16 4B Time 11:59

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

N29 39 00

W98 17 34.5

MONITOR GPS

N 29 38' 52"

W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 14420 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 01-28-15 Microphone Calibration 01-28-15

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

10' E of NE corner of house

Seismograph Distance from Blast DIST: 4,038'

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

Peak Particle Velocity .060 ips Operator L. Lymbers

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-14-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:59:37 January 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

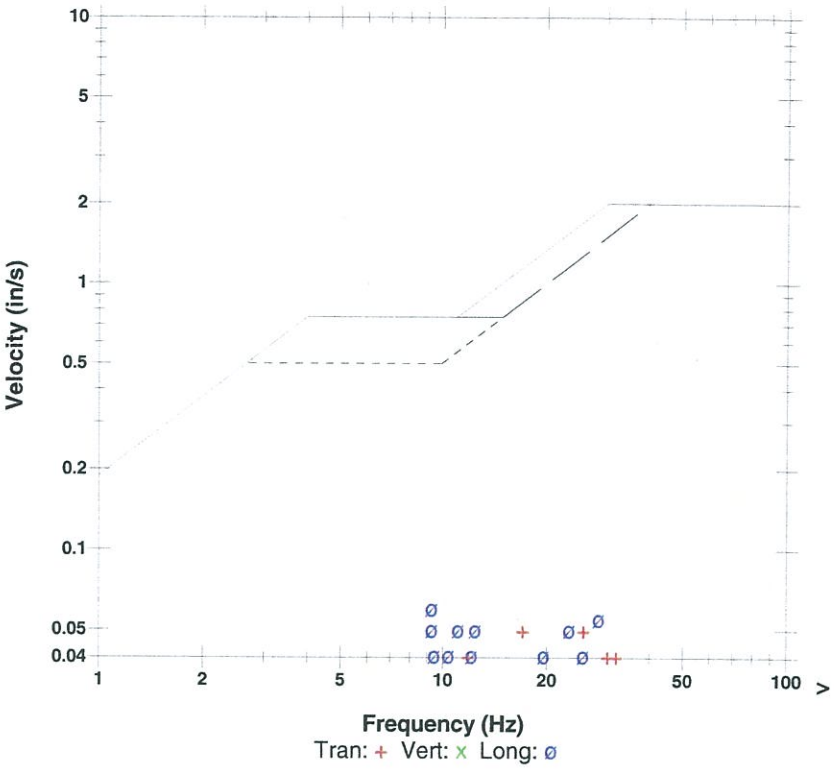
Serial Number	BF14420 V 7.04-8.0 MultiSeis Plus
Battery Level	6.2 Volts
Calibration	January 28, 2015 by Vibra-Tech Inc.
File Name	P420G73N.ZD1

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

Extended Notes

Post Event Notes
Taveres Residence Dist: 4,038'

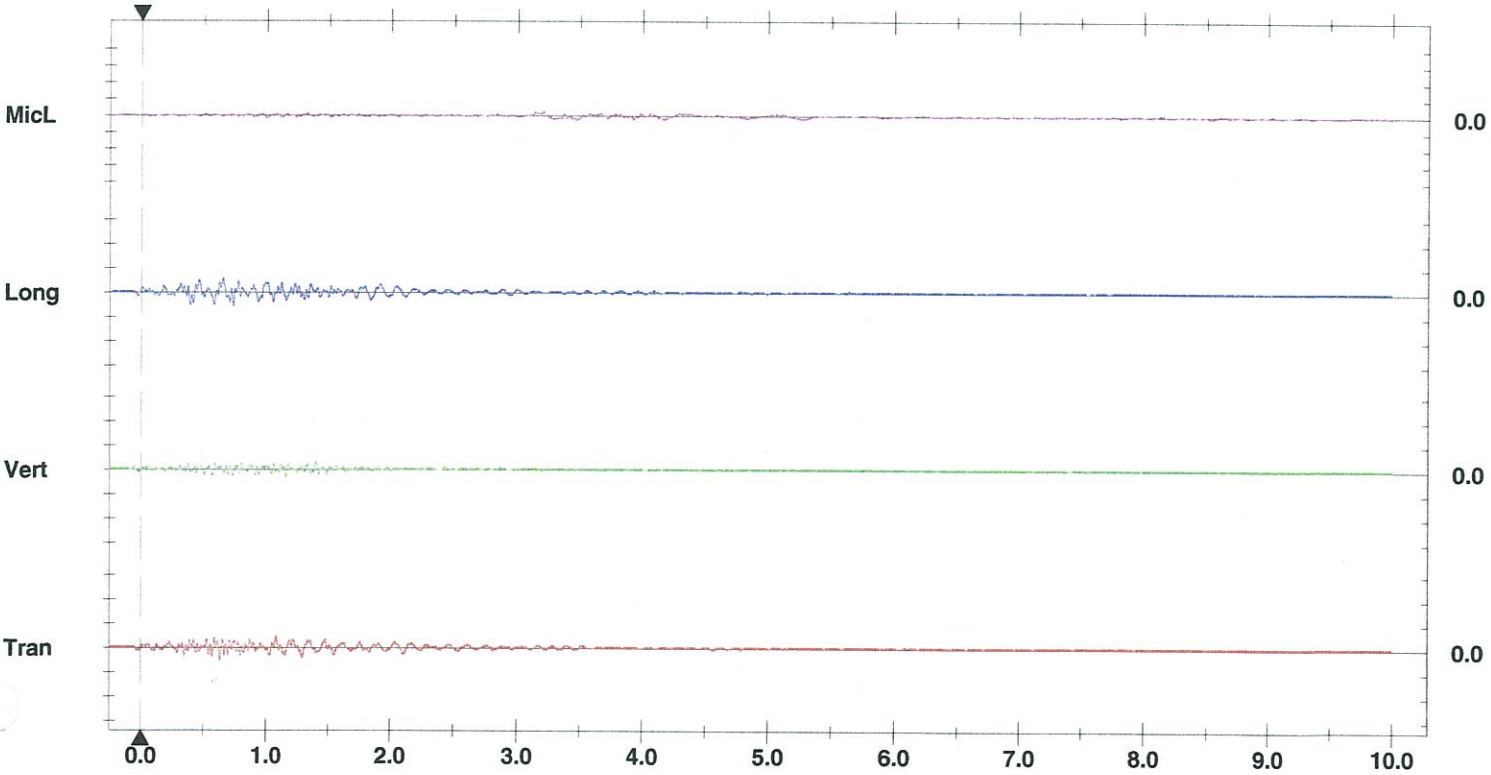
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	98.8 dB(L) at 3.199 sec
ZC Freq	4.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 538 mv)

	Tran	Vert	Long	
PPV	0.0500	0.0350	0.0600	in/s
ZC Freq	26	27	9.3	Hz
Time (Rel. to Trig)	0.632	1.157	0.648	sec
Peak Acceleration	0.0265	0.0265	0.0398	g
Peak Displacement	0.00056	0.00026	0.00088	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0671 in/s at 0.650 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 1-14-16 Blast No. 01-14-16 4B Time 11:59

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

N29 39 00

W98 ~~57~~ 34.5

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 DIST.: 3,781'

Peak Overpressure 110.6 dB Scaled Distance ------

Peak Particle Velocity .110 ips Operator L. Lumbers

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-14-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:59:45 January 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

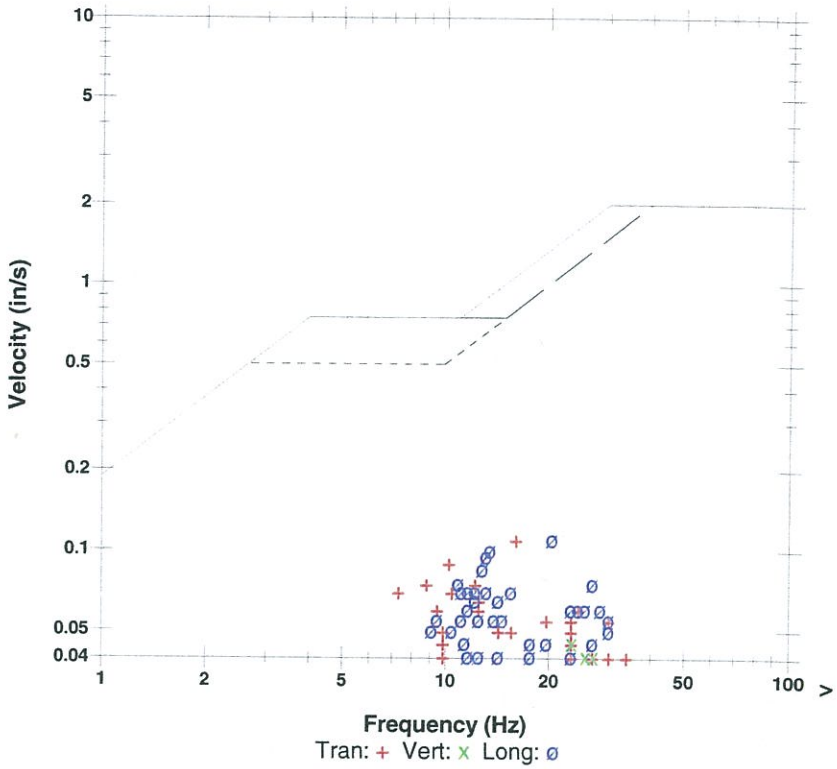
Serial Number	BF13270 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	March 12, 2015 by Vibra-Tech Inc.
File Name	O270G73N.ZL1

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

Extended Notes

Post Event Notes
Warden Residence Dist: 3,781'

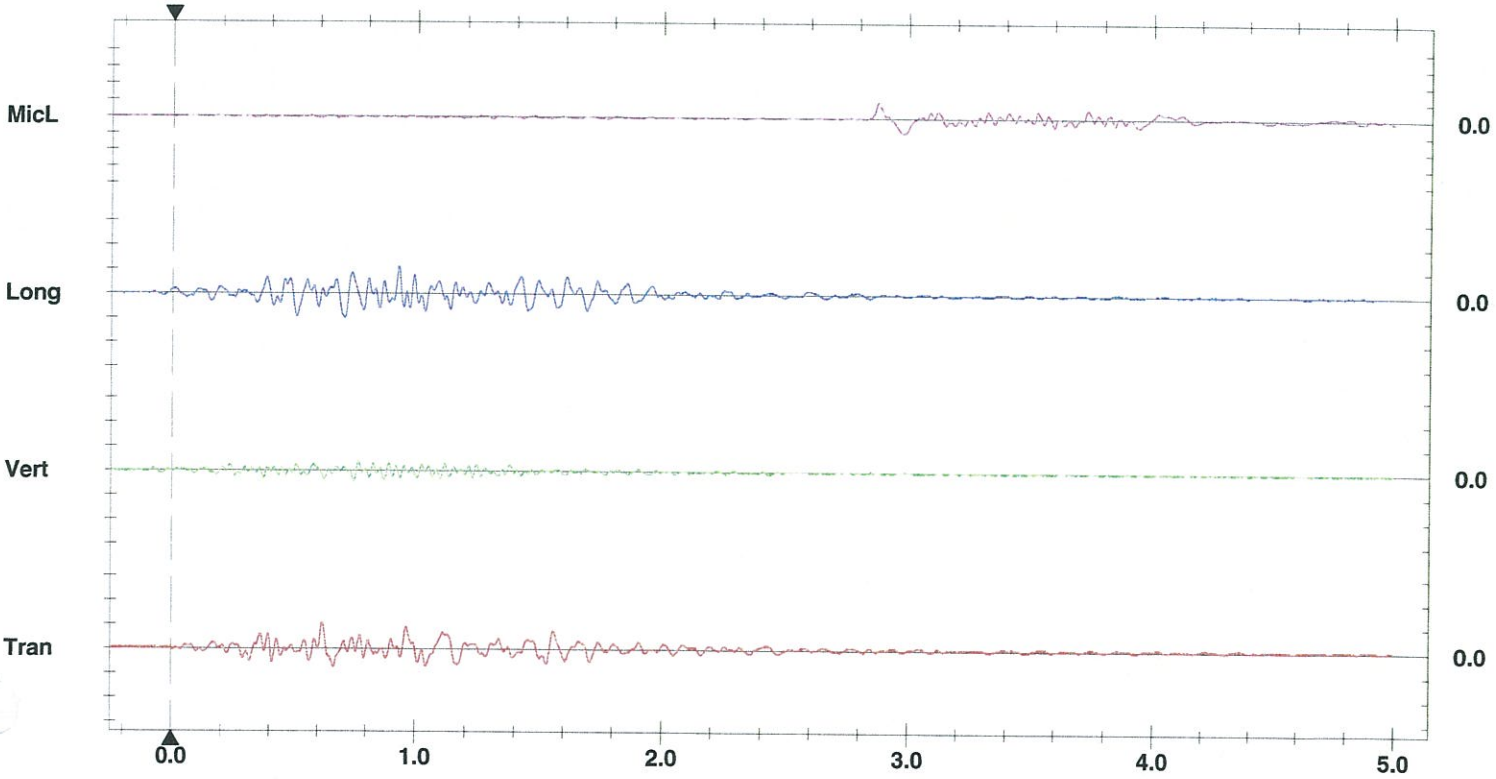
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	110.6 dB(L) at 2.874 sec
ZC Freq	6.9 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 504 mv)

	Tran	Vert	Long	
PPV	0.110	0.0450	0.110	in/s
ZC Freq	16	23	20	Hz
Time (Rel. to Trig)	0.618	0.742	0.924	sec
Peak Acceleration	0.0398	0.0265	0.0398	g
Peak Displacement	0.00152	0.00031	0.00127	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.115 in/s at 0.619 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 1-14-16 Blast No. 01-14-16 4B Time 11:59

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
N29 39 00
W98 17 34.5

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 DIST: 3,569'

Peak Overpressure 110.9 dB Scaled Distance ------

Peak Particle Velocity .065 ips Operator L. Lumbers

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-14-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:59:46 January 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	BF13922 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	November 22, 2015 by Vibra-Tech Inc.
File Name	O922G73N.ZM1

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

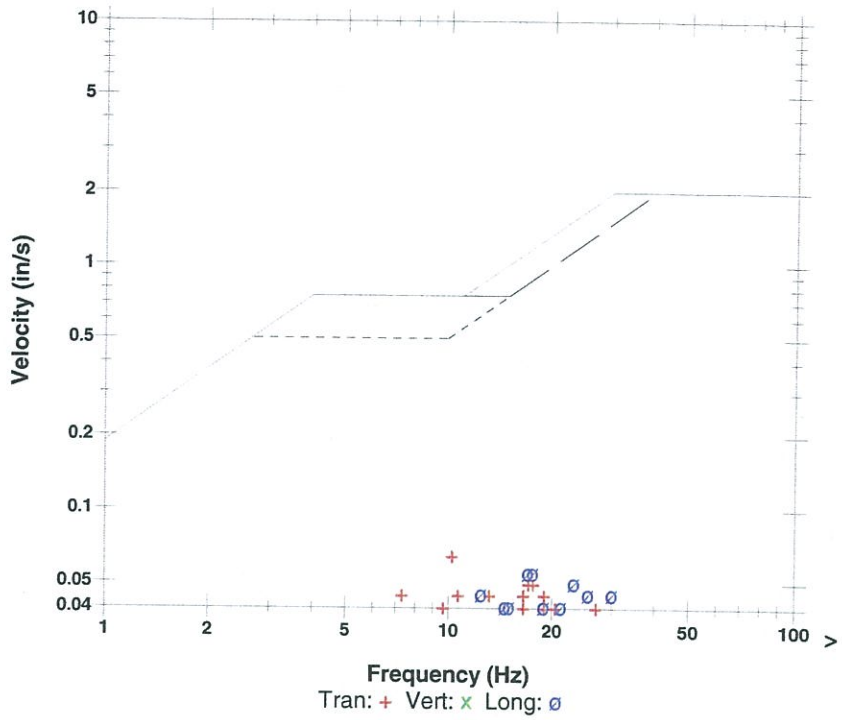
Post Event Notes
Warden Property Line Dist: 3,569'

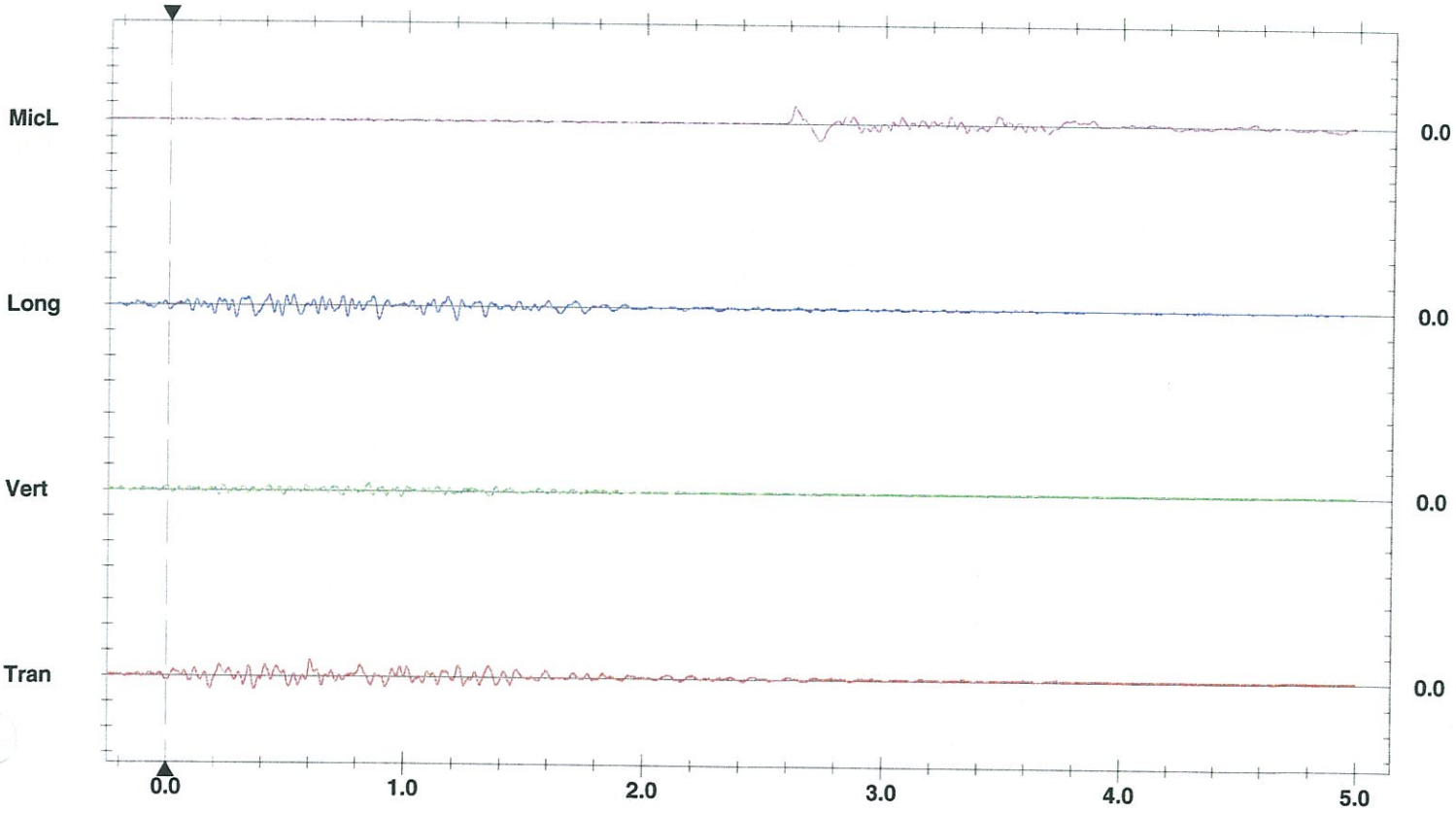
Microphone	Linear Weighting
PSPL	110.9 dB(L) at 2.620 sec
ZC Freq	5.7 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 599 mv)

	Tran	Vert	Long	
PPV	0.0650	0.0300	0.0550	in/s
ZC Freq	10	22	18	Hz
Time (Rel. to Trig)	0.604	0.846	0.883	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00082	0.00023	0.00057	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0682 in/s at 0.604 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 01-15-16 Blast No. 01-15-16 3D Time 13:48

Exact Blast Location 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' 52.6
W 98° 17' 36.2

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 3417'

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

Peak Particle Velocity .045 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 01-15-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 13:48:06 January 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	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	H191G75N.O61

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

Extended Notes

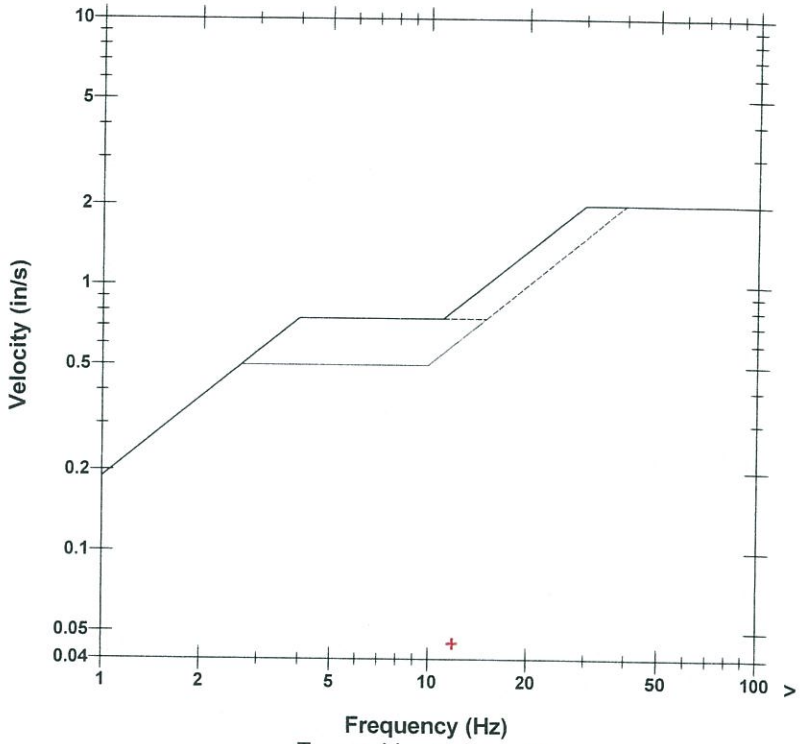
Post Event Notes
City Property Line - Distance: 3,417 ft

Microphone	Linear Weighting
PSPL	104.2 dB(L) at 2.429 sec
ZC Freq	5.0 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 583 mv)

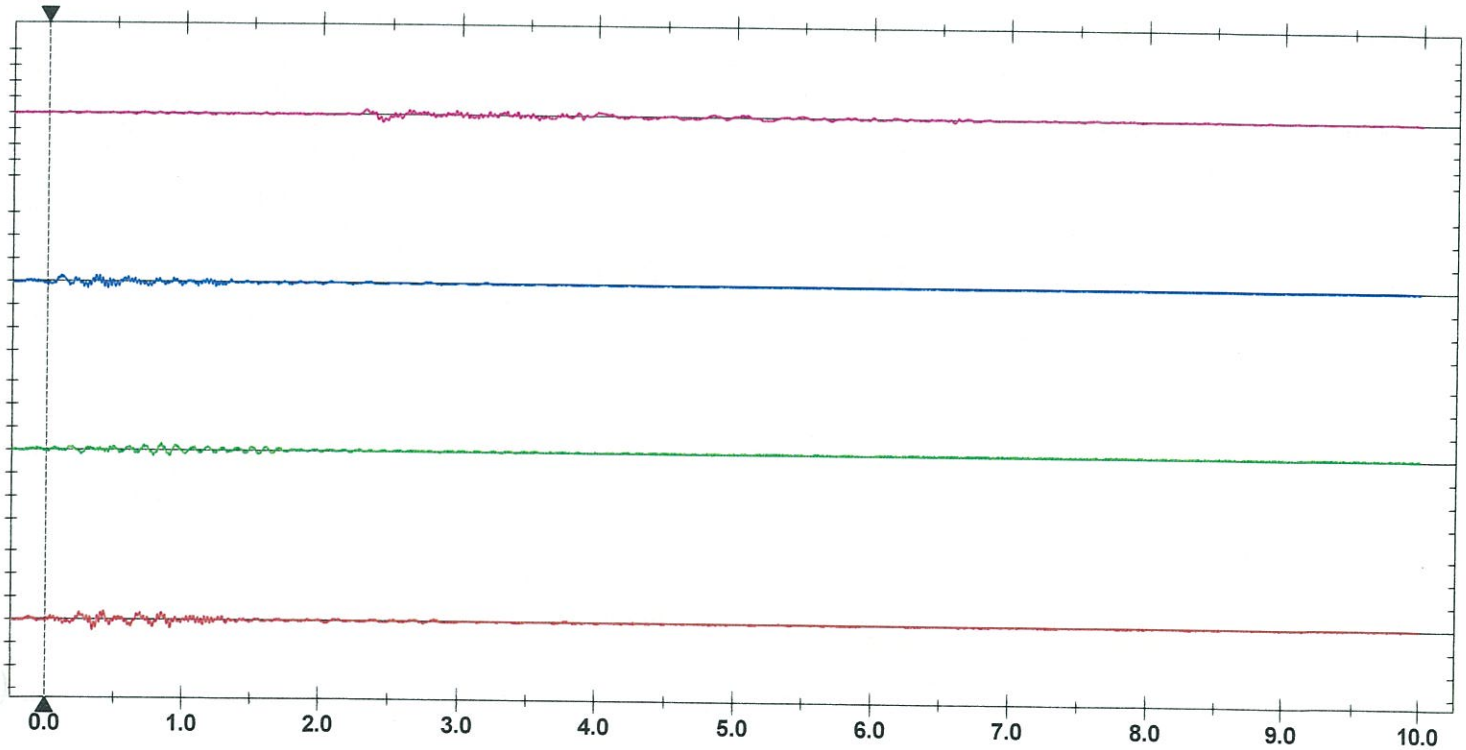
	Tran	Vert	Long	
PPV	0.0450	0.0300	0.0300	in/s
ZC Freq	12	12	23	Hz
Time (Rel. to Trig)	0.339	0.837	0.289	sec
Peak Acceleration	0.0265	0.0133	0.0265	g
Peak Displacement	0.00053	0.00033	0.00043	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0456 in/s at 0.339 sec

USBM RI8507 And OSMRE



Tran: + Vert: x Long: ø



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 01-15-16 Blast No. 01-15-16 3D Time 13:48

Exact Blast Location 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' 52.6"
W 98° 17' 36.2"

MONITOR GPS

N 29 38 31.84
W 98 18 23.43

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 McCormick Residence: 21403 Liguria Drive, George Ranch Subdivision

15' E off NE corner of garage

Seismograph Distance from Blast 4661'

Peak Overpressure 95.9 dB Scaled Distance ------

Peak Particle Velocity .030 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 01-15-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 13:48:05 January 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	BF8949 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	J949G75N.O51

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

Extended Notes

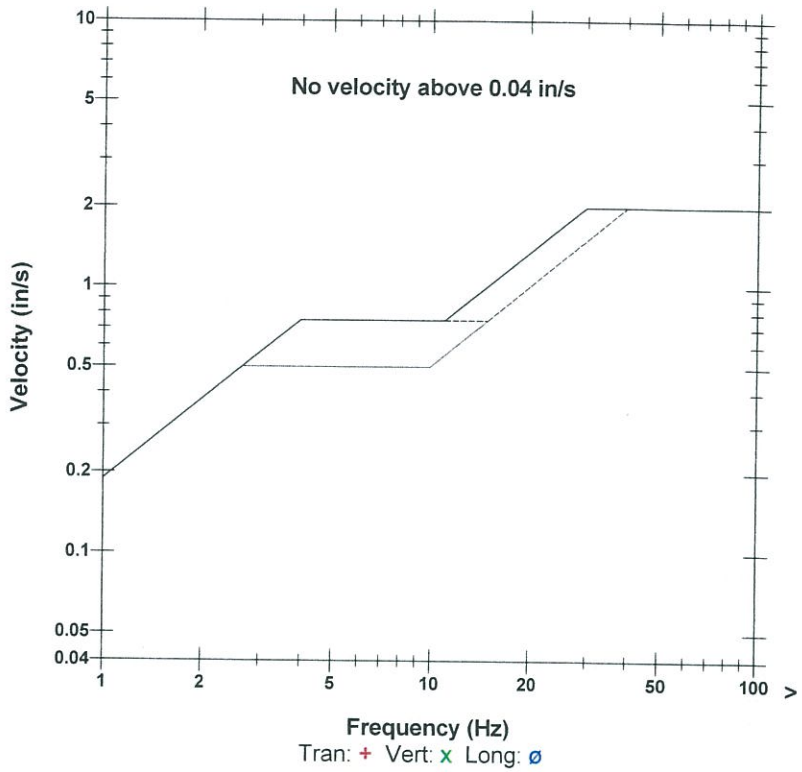
Post Event Notes
McCormick Residence - Distance: 4,661 ft

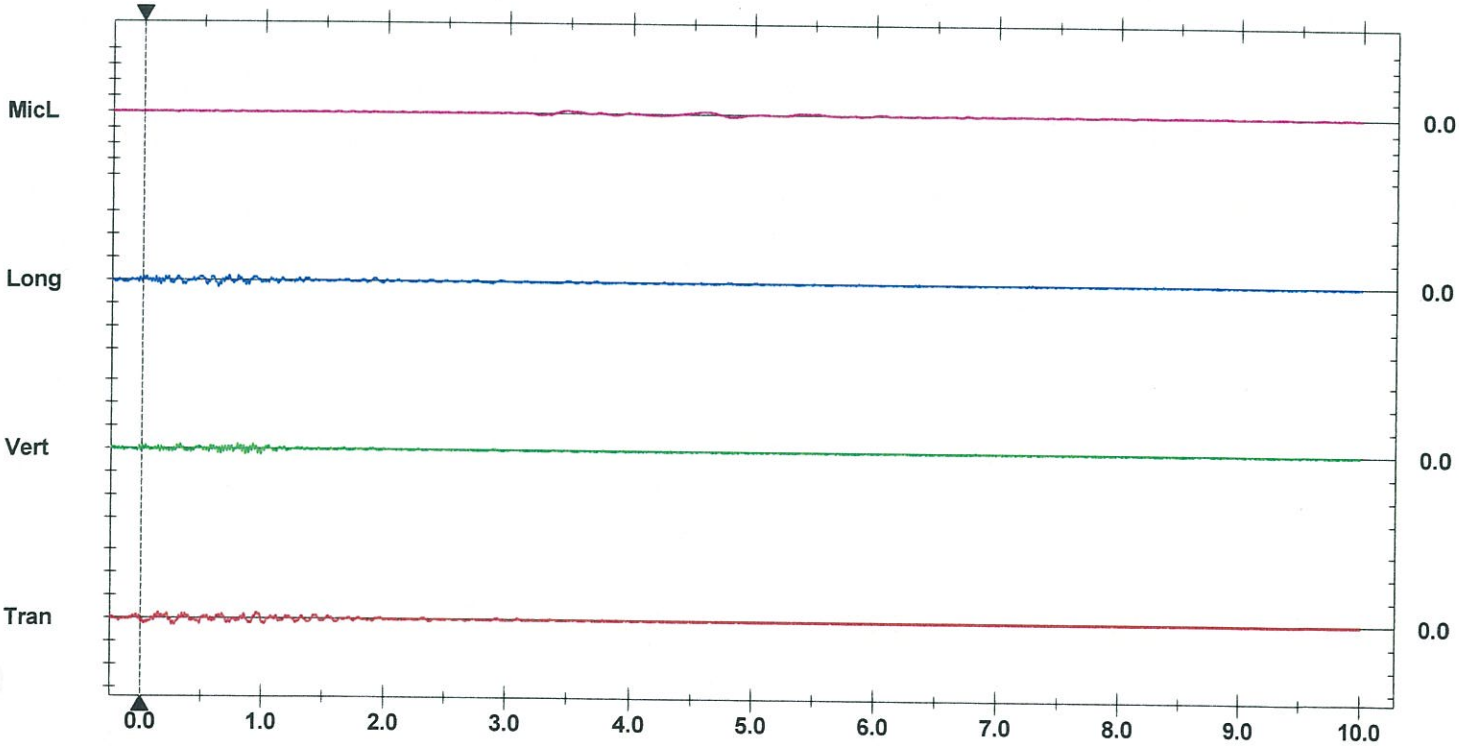
Microphone	Linear Weighting
PSPL	95.9 dB(L) at 3.455 sec
ZC Freq	2.4 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 578 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0250	0.0300	in/s
ZC Freq	8.5	37	12	Hz
Time (Rel. to Trig)	0.254	0.853	0.617	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00055	0.00014	0.00033	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0354 in/s at 0.140 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 01-15-16 Blast No. 01-15-16 3D Time 13:46

Exact Blast Location 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' 52.6"
W 98° 17' 36.2

MONITOR GPS

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

SEISMOGRAPH DATA

Seismograph No. 14420 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 01-28-15 Microphone Calibration 01-28-15

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

10' E of NE corner of house

Seismograph Distance from Blast 3807'

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

Peak Particle Velocity .055 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 01-15-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 13:48:05 January 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	BF14420 V 7.04-8.0 MultiSeis Plus
Battery Level	6.2 Volts
Calibration	January 28, 2015 by Vibra-Tech Inc.
File Name	P420G75N.O51

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

Extended Notes

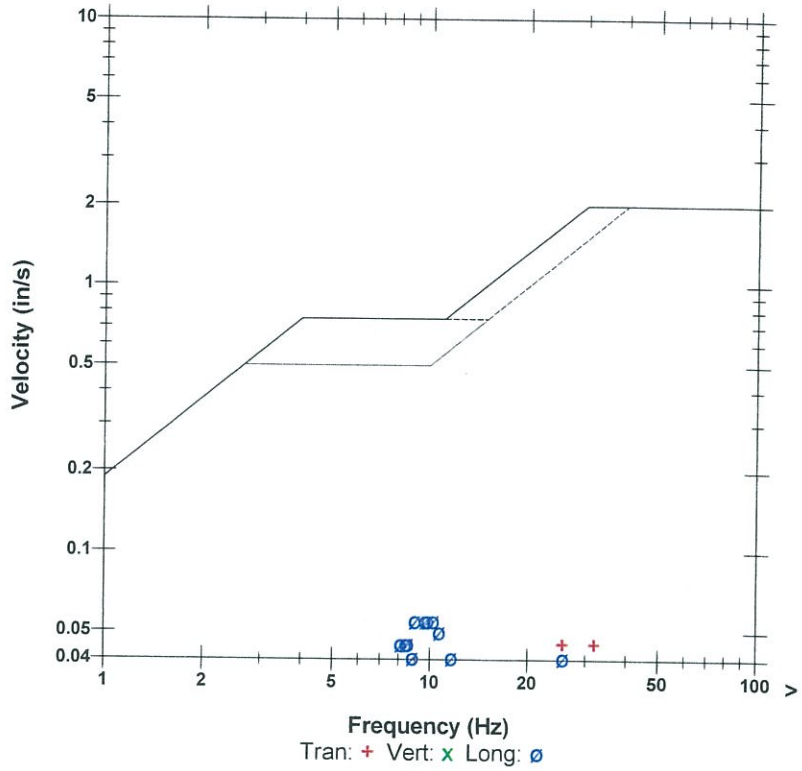
Post Event Notes
Taveres Residence - Distance: 3,807 ft

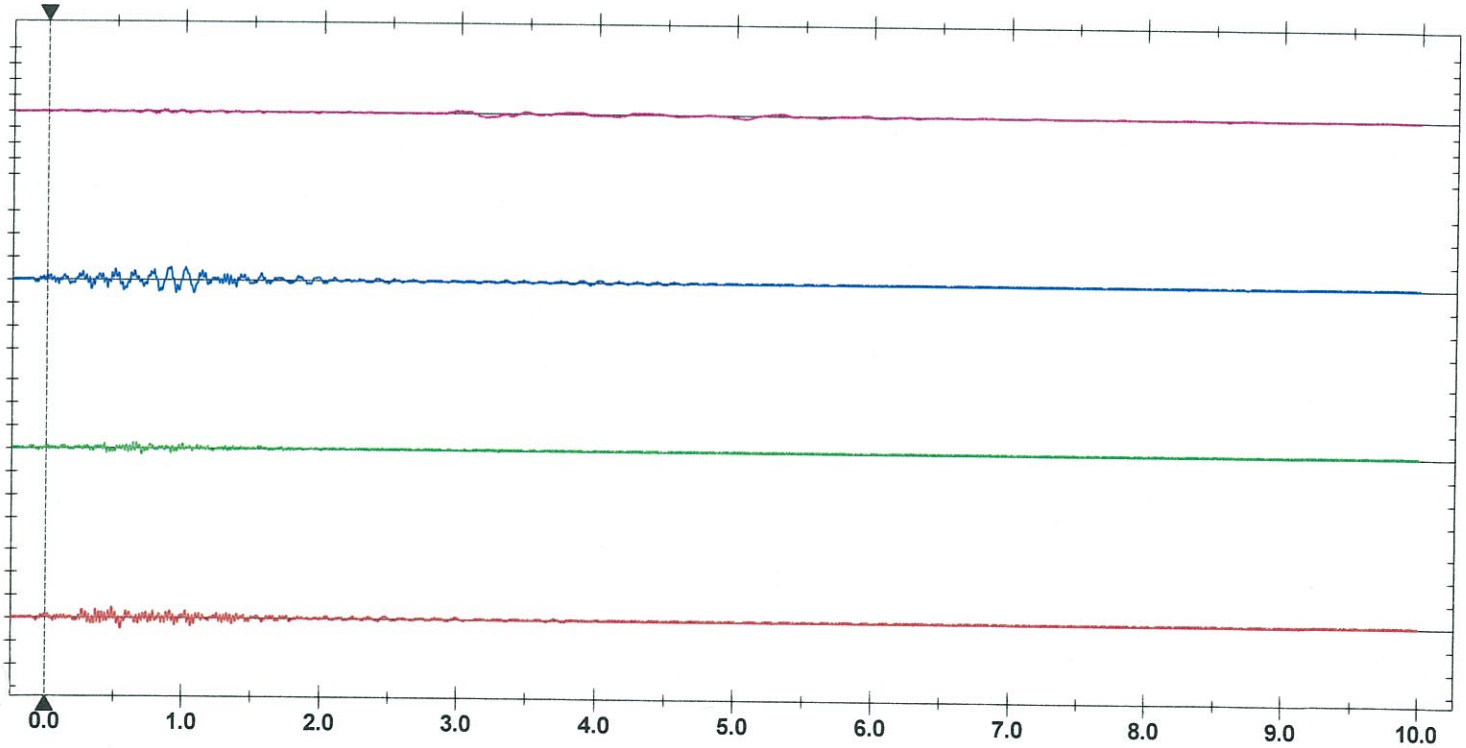
Microphone	Linear Weighting
PSPL	98.8 dB(L) at 3.180 sec
ZC Freq	2.9 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 553 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0250	0.0550	in/s
ZC Freq	32	37	10	Hz
Time (Rel. to Trig)	0.485	0.634	0.899	sec
Peak Acceleration	0.0398	0.0265	0.0265	g
Peak Displacement	0.00029	0.00013	0.00095	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0594 in/s at 1.069 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 01-15-16 Blast No. 01-15-16 3D Time 13:48

Exact Blast Location 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' 52.6"
W 98° 17' 36.2"

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 3018

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

Peak Particle Velocity .050 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 01-15-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 13:48:05 January 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	O922G75N.O51

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

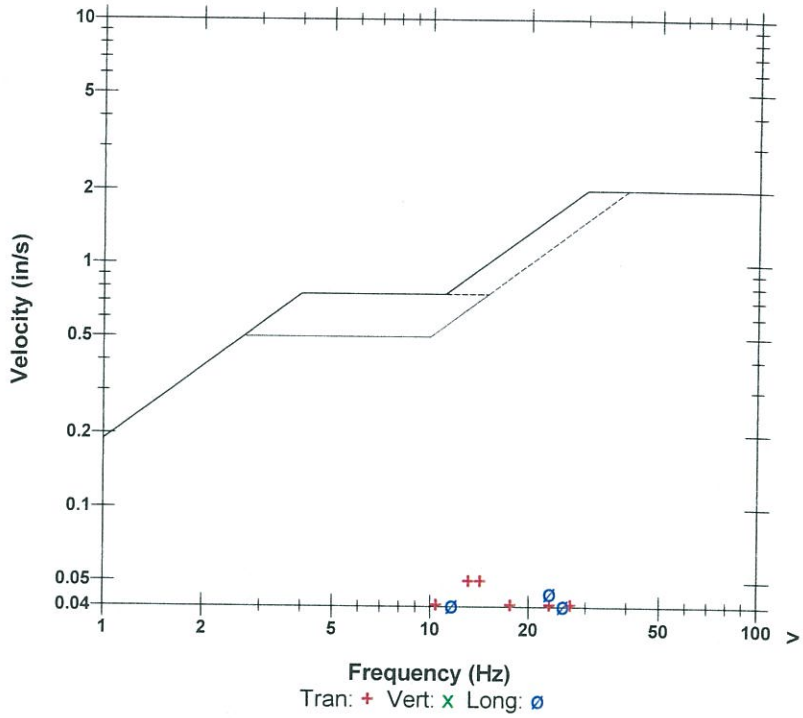
Post Event Notes
Warden Property Line - Distance: 2,808 ft

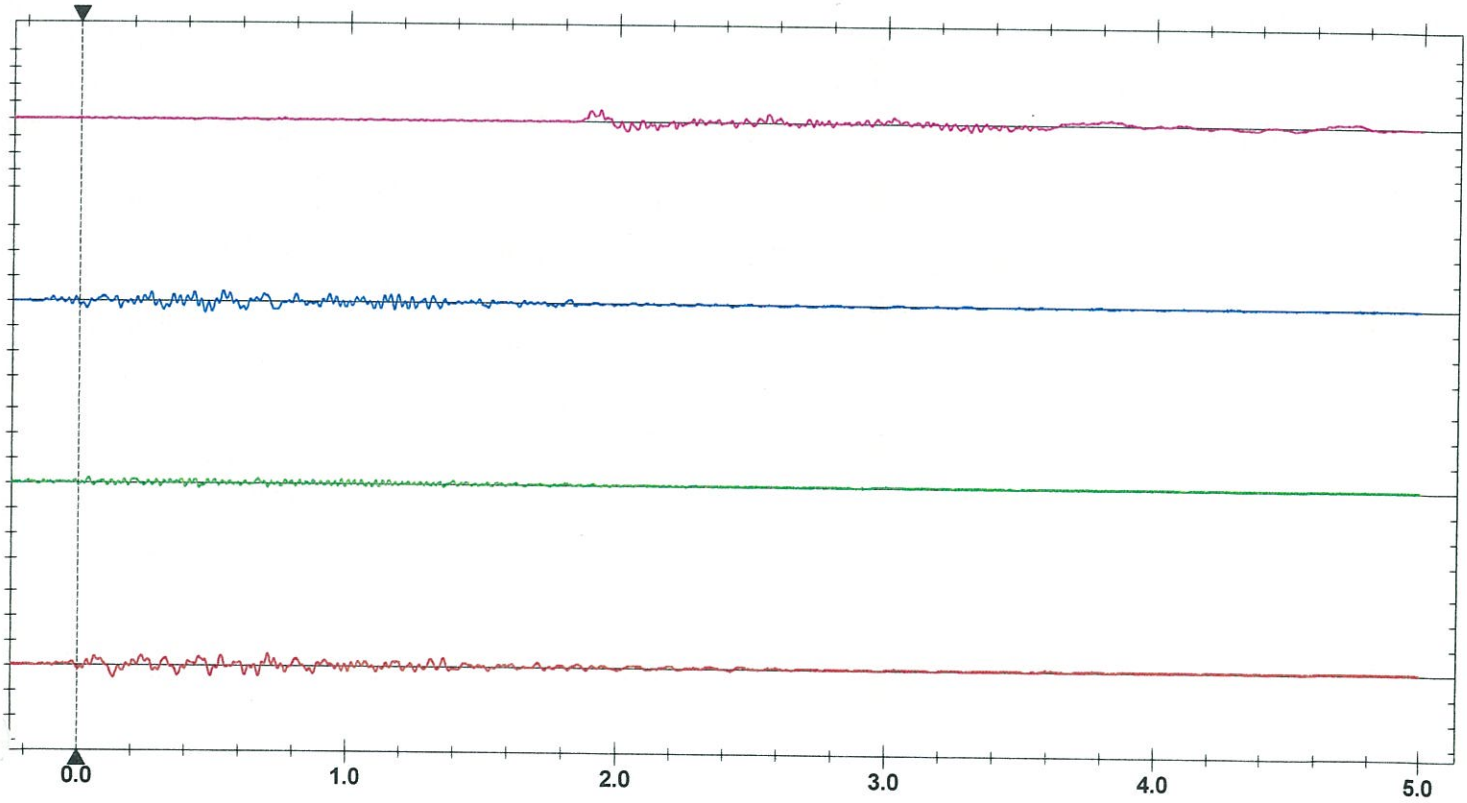
Microphone	Linear Weighting
PSPL	107.5 dB(L) at 1.930 sec
ZC Freq	4.5 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 540 mv)

	Tran	Vert	Long	
PPV	0.0500	0.0200	0.0450	in/s
ZC Freq	14	30	23	Hz
Time (Rel. to Trig)	0.132	0.033	0.466	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00056	0.00018	0.00051	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0574 in/s at 0.531 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 01-15-16 Blast No. 01-15-16 3D Time 13:48

Exact Blast Location 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' 52.6"
W 98° 17' 36.2"

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 2808'

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

Peak Particle Velocity .080 ips Operator M. Marks

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: M. Marks Date: 01-15-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 13:48:05 January 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

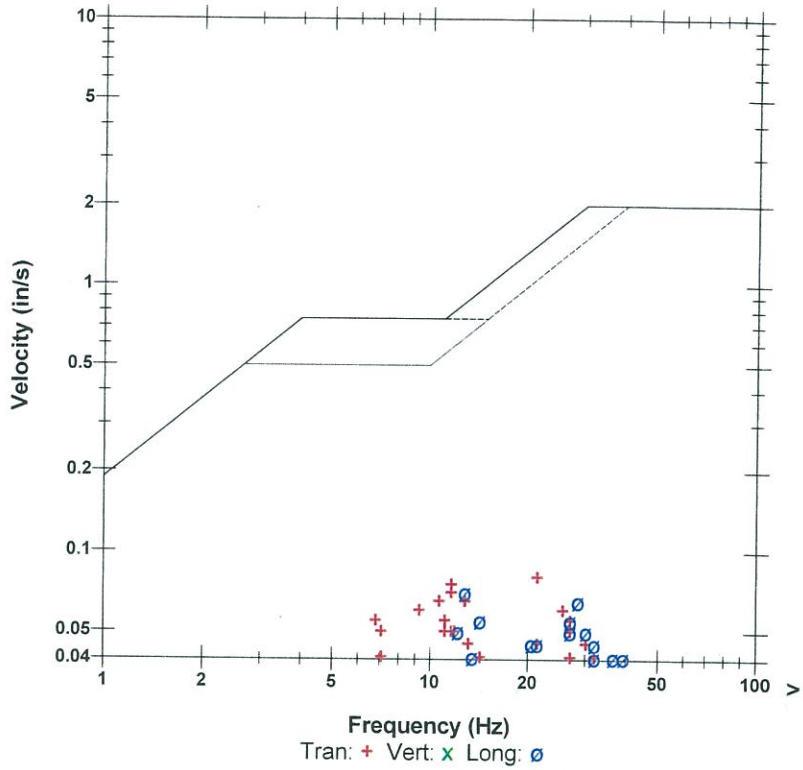
Serial Number	BF13270 V 7.04-8.0 MultiSeis Plus
Battery Level	6.5 Volts
Calibration	March 12, 2015 by Vibra-Tech Inc.
File Name	O270G75N.O51

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

Extended Notes

Post Event Notes
Warden Residence - Distance: 3,018 ft

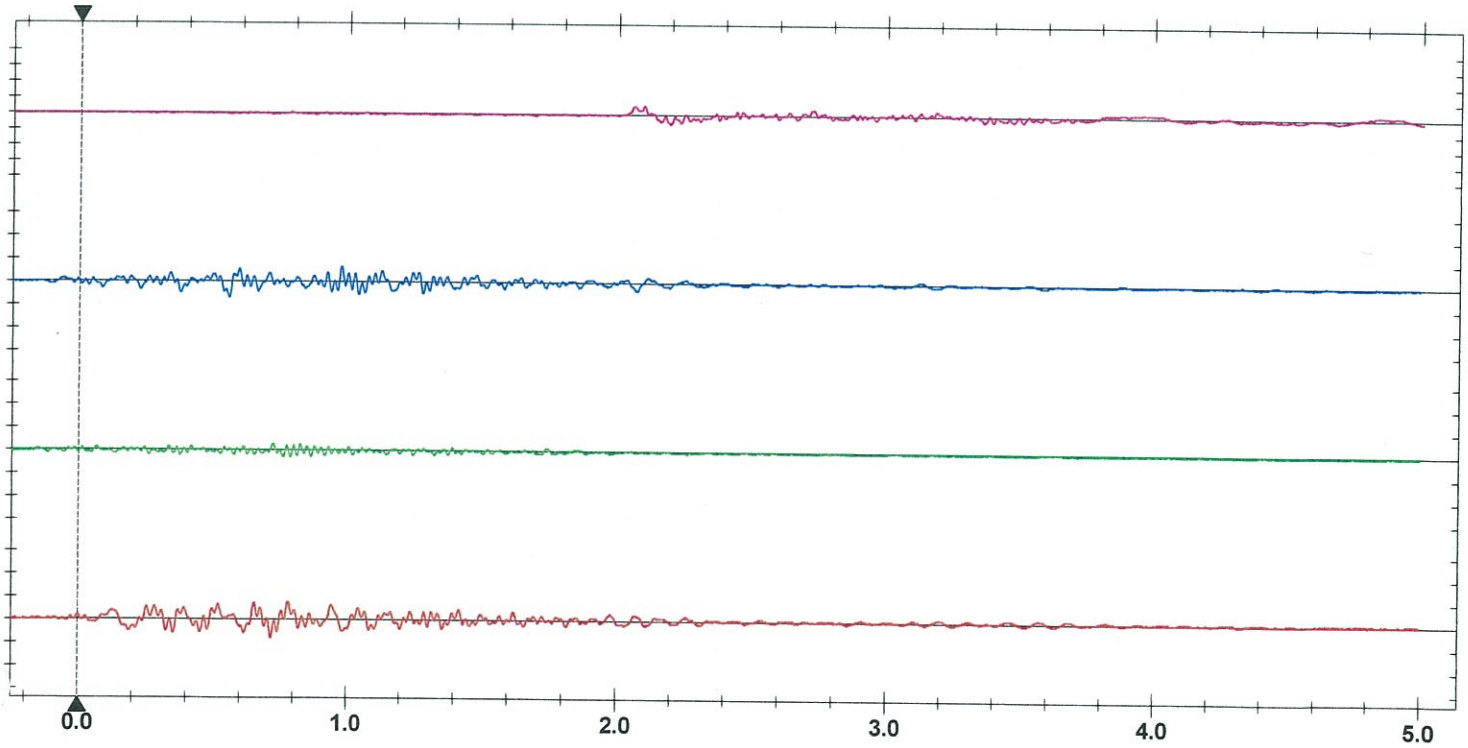
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	106.0 dB(L) at 2.094 sec
ZC Freq	6.4 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 554 mv)

	Tran	Vert	Long	
PPV	0.0800	0.0300	0.0700	in/s
ZC Freq	21	32	13	Hz
Time (Rel. to Trig)	0.717	0.758	0.552	sec
Peak Acceleration	0.0398	0.0265	0.0398	g
Peak Displacement	0.00114	0.00017	0.00085	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0838 in/s at 0.719 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 1-19-16 Blast No. 1-19-16 S.Wall A Time 12:27

Exact Blast Location South Wall A

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' 17.5"
W 98° 18' 39"

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 6,620'

Peak Overpressure 110.9 dB Scaled Distance ------

Peak Particle Velocity .020 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: D. L. Date: 1-19-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:27:36 January 19, 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	H191G7CY.M01

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

Extended Notes

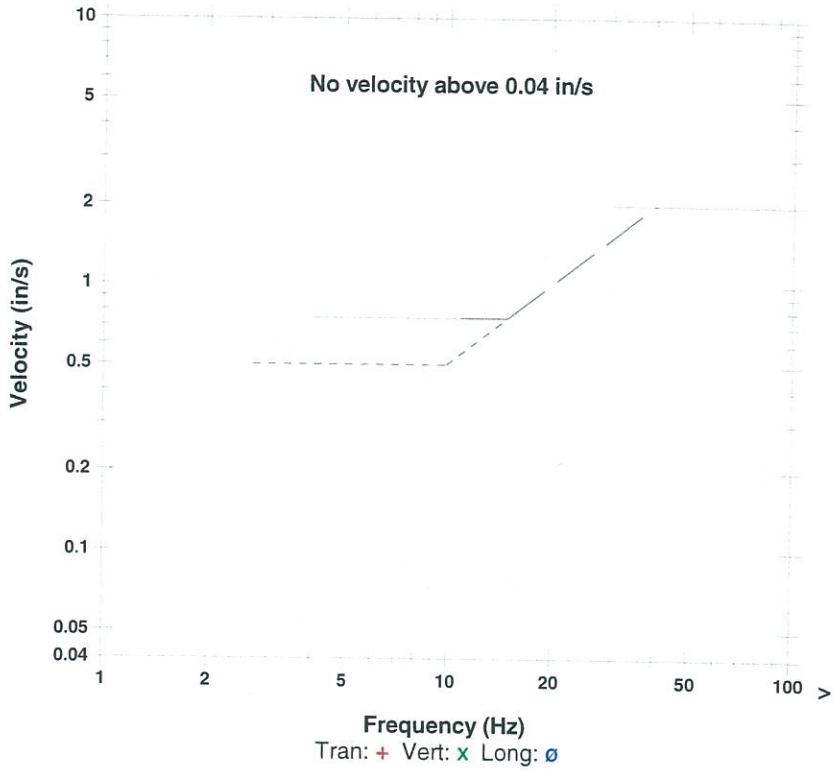
Post Event Notes
City Prop Line: 6,620'

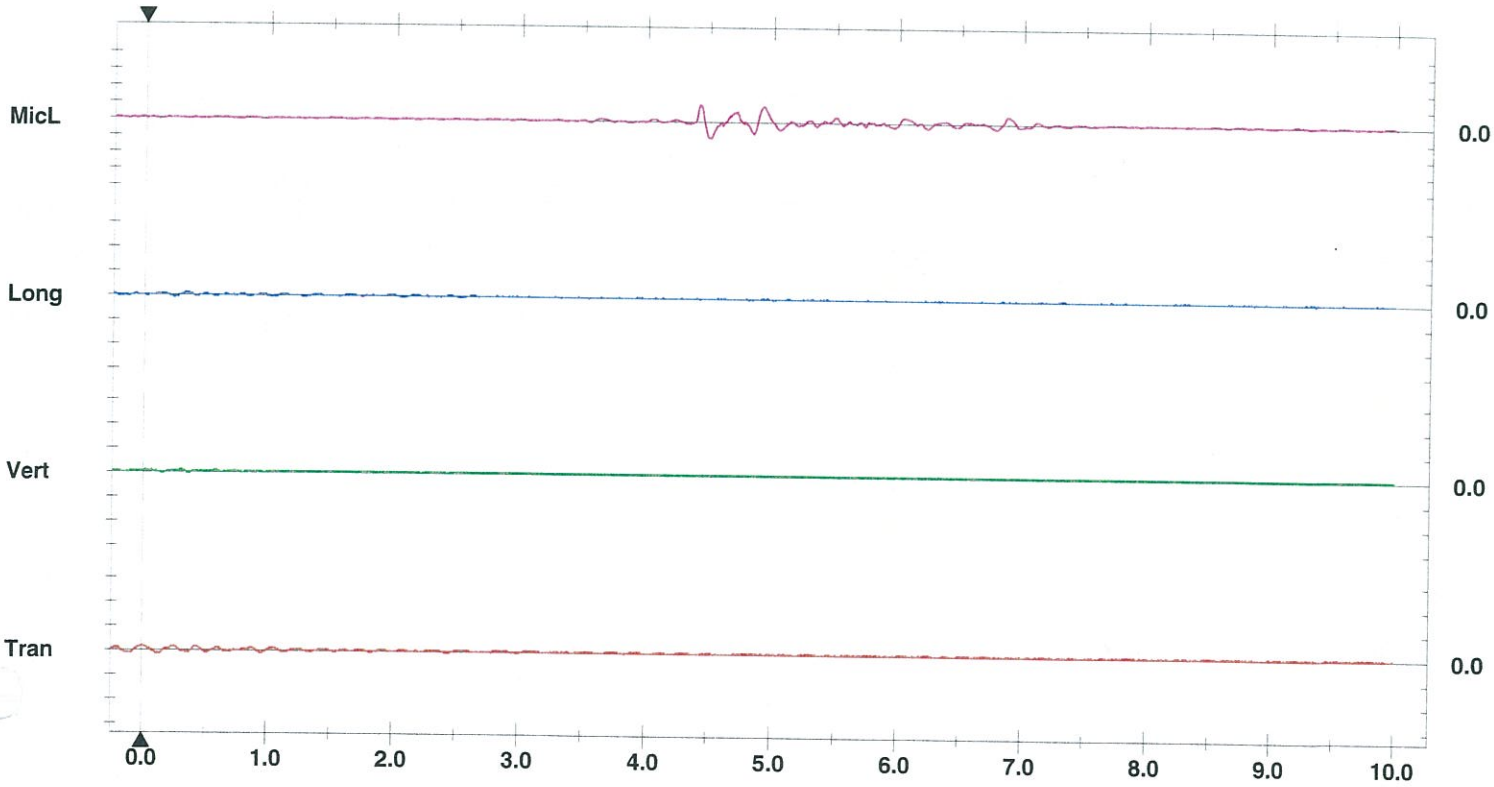
Microphone	Linear Weighting
PSPL	110.9 dB(L) at 4.417 sec
ZC Freq	7.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 594 mv)

	Tran	Vert	Long	
PPV	0.0200	0.01000	0.01000	in/s
ZC Freq	6.2	>100	>100	Hz
Time (Rel. to Trig)	0.000	0.007	0.226	sec
Peak Acceleration	0.0133	0.0133	0.0133	g
Peak Displacement	0.00054	0.00005	0.00003	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0206 in/s at 0.000 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 =

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-19-16 Blast No. 1-19-16 S.Wall A Time 12:27

Exact Blast Location South Wall A

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' 17.5"
W 98° 16' 39"

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 4,151'

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

Peak Particle Velocity .045 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-19-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:27:35 January 19, 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	L562G7CY.LZ1

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

Extended Notes

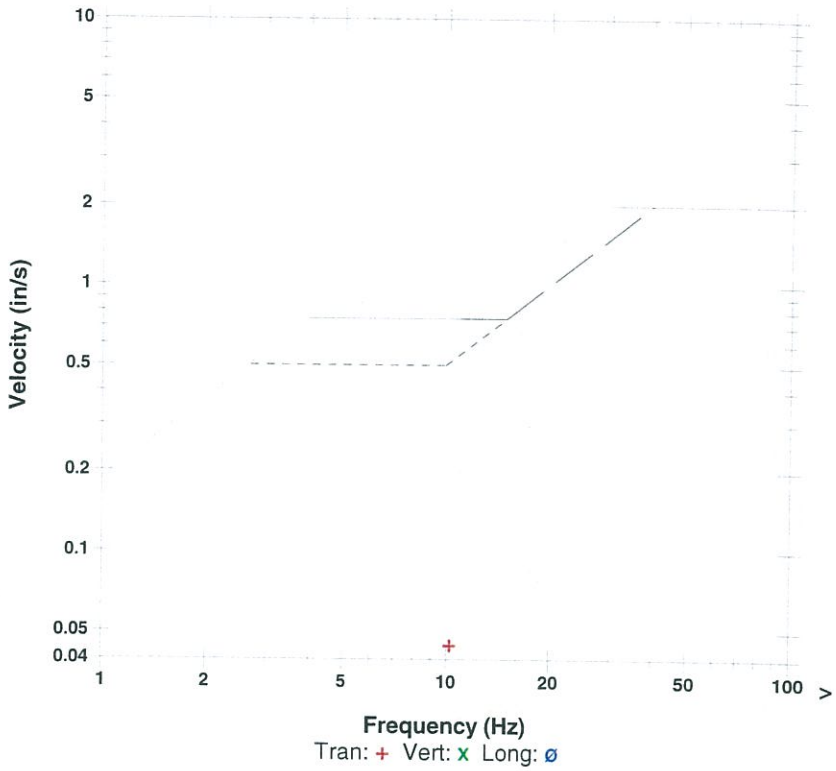
Post Event Notes
Holly Res: 4,151'

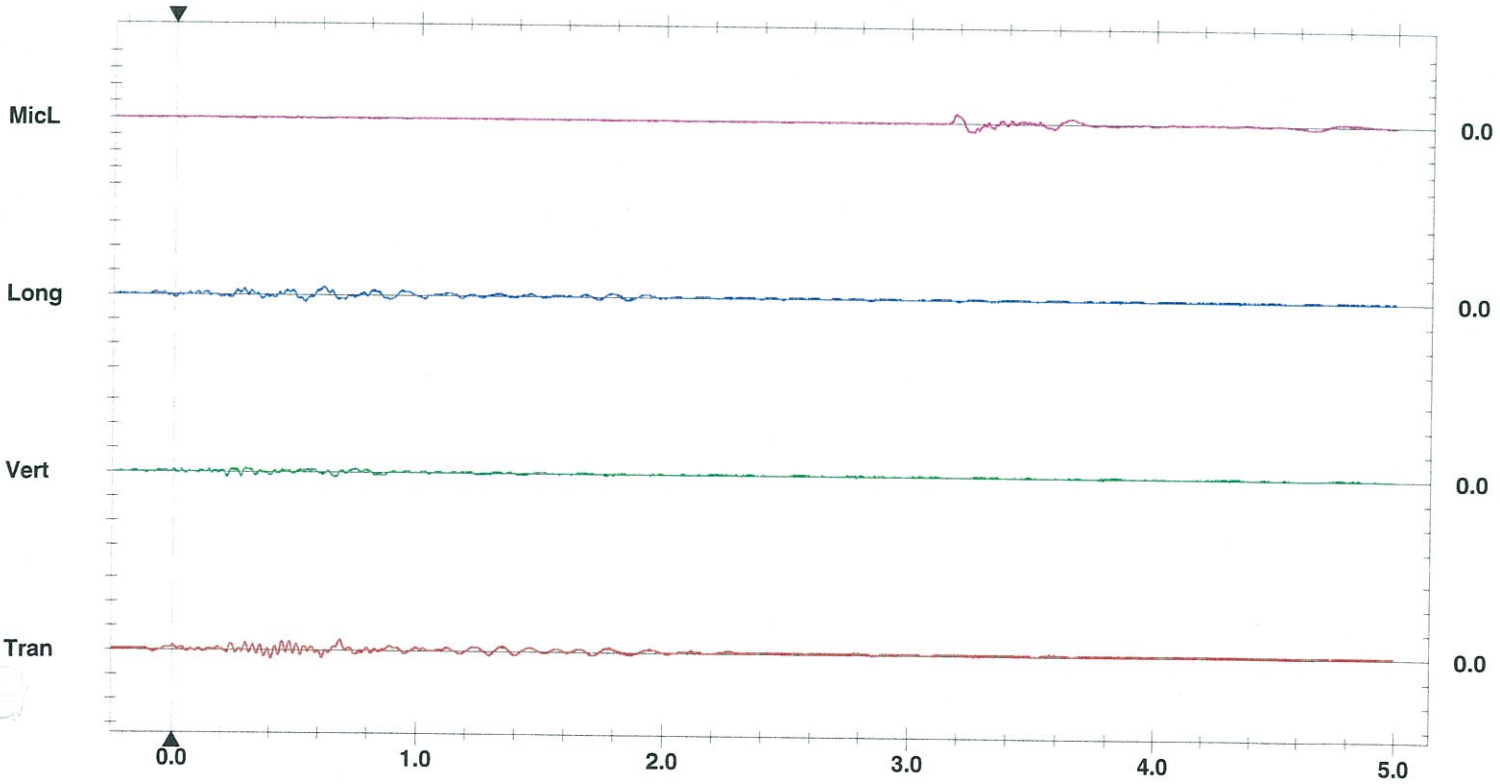
Microphone	Linear Weighting
PSPL	106.0 dB(L) at 3.186 sec
ZC Freq	9.3 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 587 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0200	0.0350	in/s
ZC Freq	10	30	9.3	Hz
Time (Rel. to Trig)	0.689	0.217	0.612	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00055	0.00024	0.00056	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0477 in/s at 0.689 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 =

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-19-16 Blast No. 1-19-16 S. Wall A Time 12:27

Exact Blast Location South Wall A

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' 17.5"
W 98° 16' 39"

MONITOR GPS

N 29 38 31.84
W 98 18 23.43

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 McCormick Residence: 21403 Liguria Drive, George Ranch Subdivision

15' E off NE corner of garage

Seismograph Distance from Blast 9,304'

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

Peak Particle Velocity NT ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-19-16

Event Report: Monitor Log

Start Time	End Time	Status
---	---	SERIAL NUMBER: BF8949
Jan 19 '16 11:43:30		Start Monitoring Trigger Level: Geo: 0.0200 in/s Mic: 122.0 dB(L)
Jan 19 '16 11:43:32	Jan 19 '16 11:43:42	Event recorded. Trigger Vert: 0.0200 in/s
Jan 19 '16 11:43:42		Start Monitoring Trigger Level: Geo: 0.0200 in/s Mic: 122.0 dB(L)
Jan 19 '16 11:43:46	Jan 19 '16 11:43:56	Event recorded. Trigger Vert: 0.0200 in/s
Jan 19 '16 11:43:56		Start Monitoring Trigger Level: Geo: 0.0200 in/s Mic: 122.0 dB(L)
Jan 19 '16 12:44:21	Jan 19 '16 12:44:31	Event recorded. Trigger Tran: 0.0200 in/s
Jan 19 '16 12:44:31	Jan 19 '16 13:05:24	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)

Mc Cormick Res.

South WALL A. @ 12:27

1-19-16

No TRIGGER

@ 9:30 -

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-19-16 Blast No. 1-19-16 S. Wall A Time 12:27

Exact Blast Location South Wall A

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' 17.5"

W 98° 16' 39"

MONITOR GPS

N 29 38' 52"

W 98 18' 19"

SEISMOGRAPH DATA

Seismograph No. 14420 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 01-28-15 Microphone Calibration 01-28-15

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

10' E of NE corner of house

Seismograph Distance from Blast 9,492'

Peak Overpressure N/T dB Scaled Distance ------

Peak Particle Velocity N/T ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-19-16

Event Report: Monitor Log

Start Time	End Time	Status
---	---	SERIAL NUMBER: BF14420
Jan 19 '16 11:51:31		Start Monitoring Trigger Level: Geo: 0.0200 in/s Mic: 122.0 dB(L)
Jan 19 '16 11:51:33	Jan 19 '16 11:51:43	Event recorded. Trigger Tran: 0.0200 in/s
Jan 19 '16 11:51:43		Start Monitoring Trigger Level: Geo: 0.0200 in/s Mic: 122.0 dB(L)
Jan 19 '16 12:44:21	Jan 19 '16 12:44:32	Event recorded. Trigger Tran: 0.0200 in/s
Jan 19 '16 12:44:32	Jan 19 '16 12:56:28	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)

TAVERES RES

SOUTH WALL A @ 12:27

1-19-16

NO TRIGGER

@ 9,492'

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-19-16 Blast No. 1-19-16 S. WALL A Time 12:27

Exact Blast Location South Wall A

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' 17.5"
W 98° 16' 39"

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 5,357'

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

Peak Particle Velocity .035 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-19-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

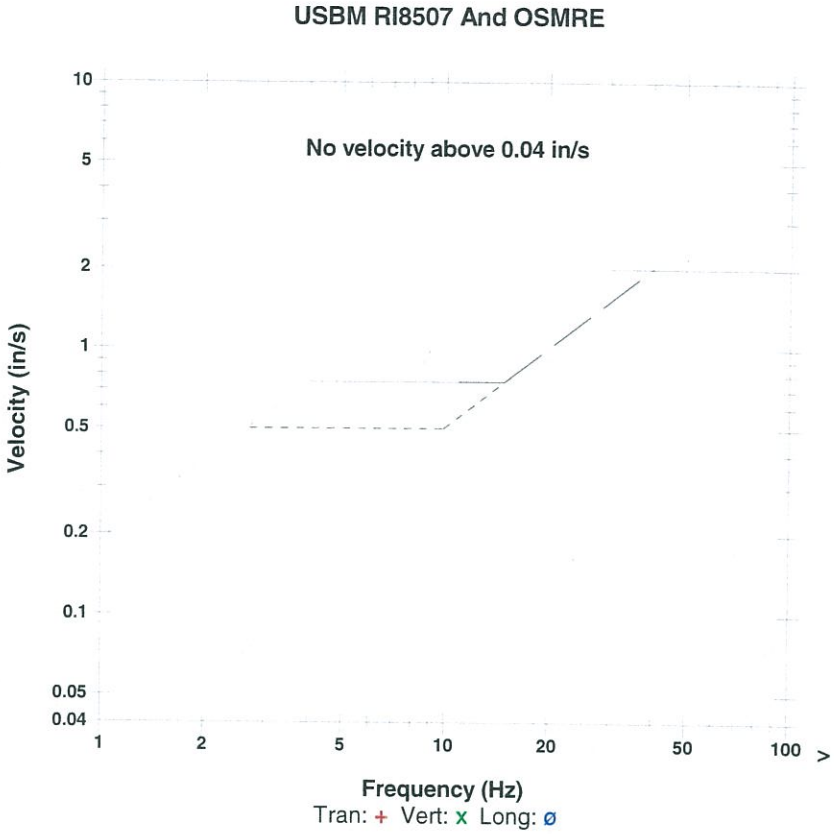
Date/Time	Tran at 12:27:36 January 19, 2016
Trigger Source	Geo: 0.0200 in/s
	Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	5.0 sec at 1024 sps

Serial Number	BF13270 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	March 12, 2015 by Vibra-Tech Inc.
File Name	O270G7CY.M01

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

Extended Notes

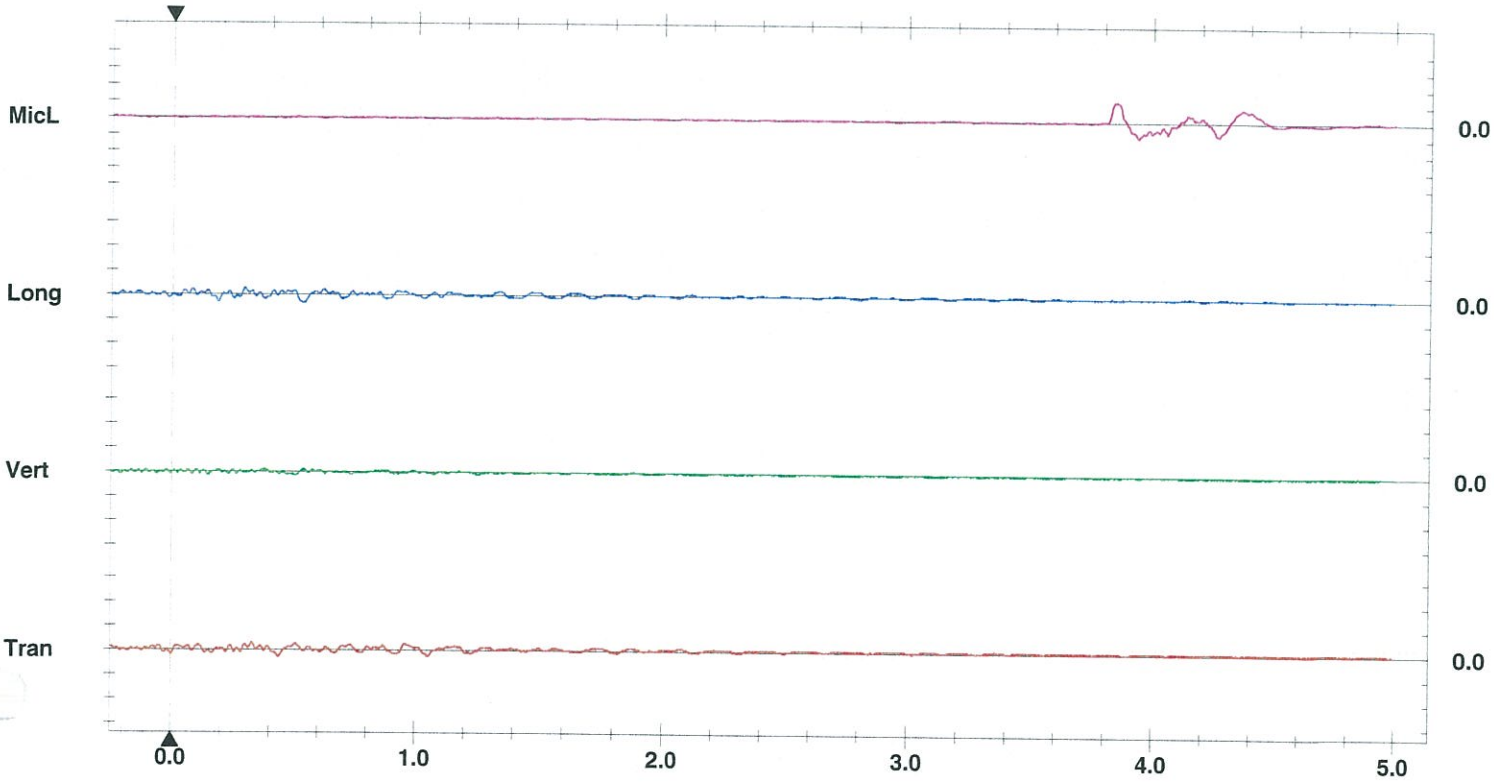
Post Event Notes
Warden Res: 5,397'



Microphone	Linear Weighting
PSPL	112.6 dB(L) at 3.839 sec
ZC Freq	6.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 522 mv)

	Tran	Vert	Long	
PPV	0.0300	0.0150	0.0350	in/s
ZC Freq	20	37	11	Hz
Time (Rel. to Trig)	0.330	0.144	0.526	sec
Peak Acceleration	0.0265	0.0265	0.0133	g
Peak Displacement	0.00044	0.00016	0.00059	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0367 in/s at 0.526 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 1-19-16 Blast No. 1-19-16 Lower 3A Time 12:44

Exact Blast Location Lower 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' 38.2"

W 98° 17' 32.7"

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 2,416'

Peak Overpressure 95.9 dB Scaled Distance ------

Peak Particle Velocity .020 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-19-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

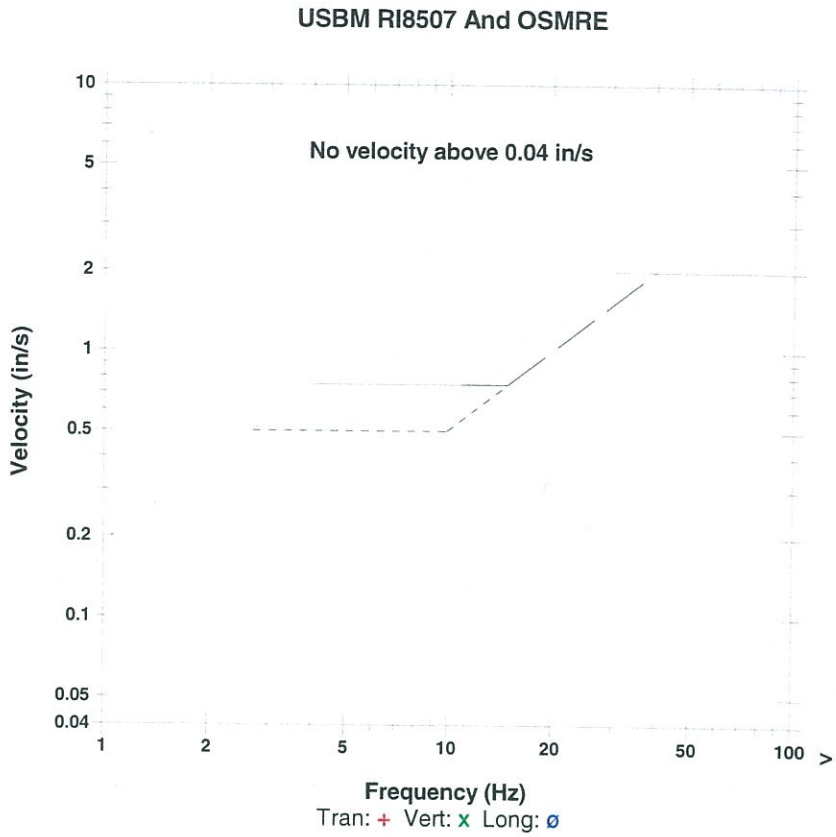
Date/Time	Long at 12:44:20 January 19, 2016
Trigger Source	Geo: 0.0200 in/s Mic: 122 dB(L)
Range	Geo :10.00 in/s
Record Time	10.0 sec at 1024 sps

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	H191G7CZ.DW1

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

Extended Notes

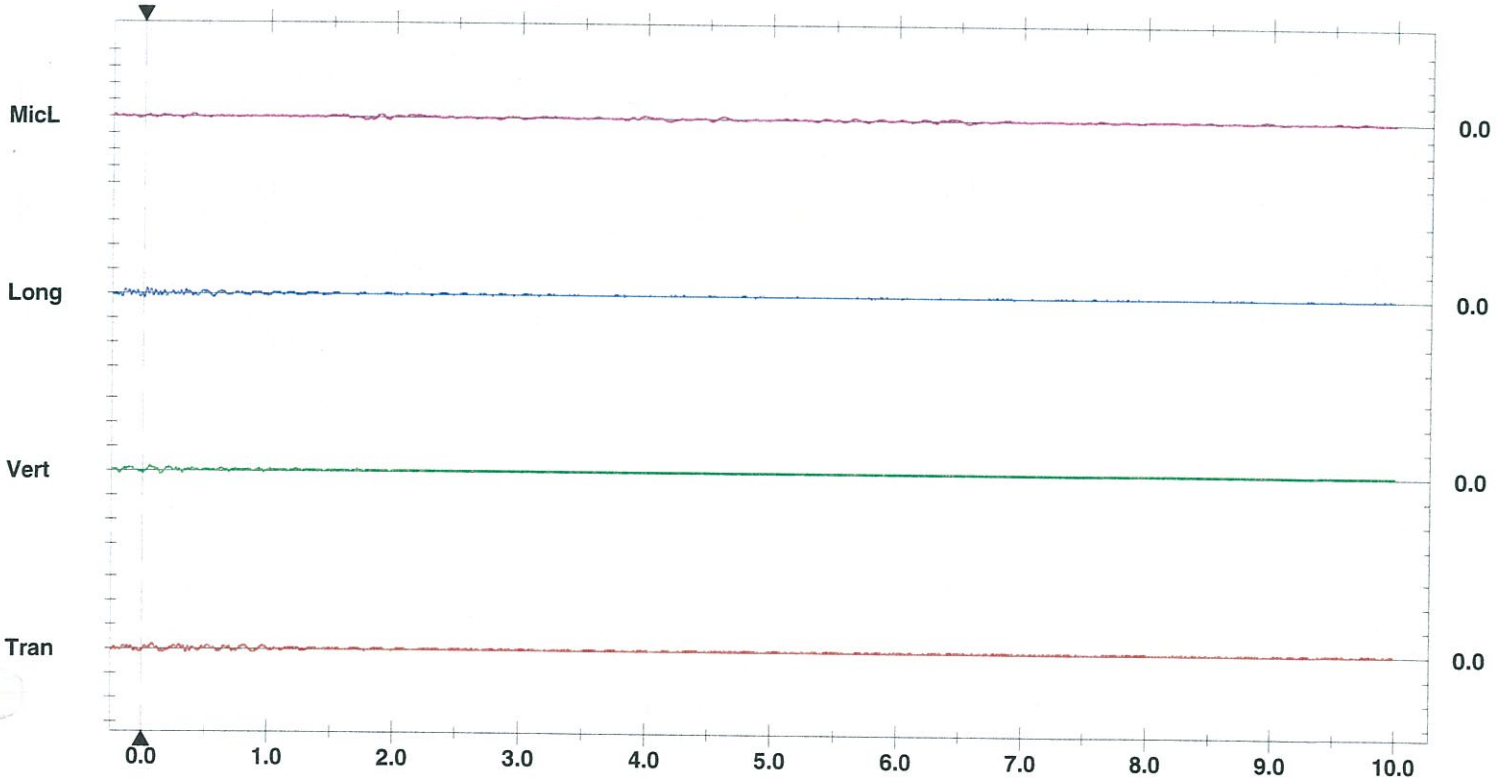
Post Event Notes
City Prop Line: 2,416'



Microphone	Linear Weighting
PSPL	95.9 dB(L) at 1.744 sec
ZC Freq	7.2 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 594 mv)

	Tran	Vert	Long	
PPV	0.0200	0.0200	0.0200	in/s
ZC Freq	14	9.3	28	Hz
Time (Rel. to Trig)	0.074	0.049	0.000	sec
Peak Acceleration	0.0133	0.0133	0.0133	g
Peak Displacement	0.00028	0.00034	0.00016	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0269 in/s at 0.053 sec



Time Scale: 0.50 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 1-19-16 Blast No. 1-19-16 Lower 3A Time 12:44

Exact Blast Location Lower 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' 38.2"
W 98° 17' 32.7"

MONITOR GPS

N 29 38 31.84
W 98 18 23.43

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 McCormick Residence: 21403 Liguria Drive, George Ranch Subdivision

15' E off NE corner of garage

Seismograph Distance from Blast 4,485'

Peak Overpressure 97.5 dB Scaled Distance ------

Peak Particle Velocity .020 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 1-19-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:44:21 January 19, 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	J949G7CZ.DX1

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

Extended Notes

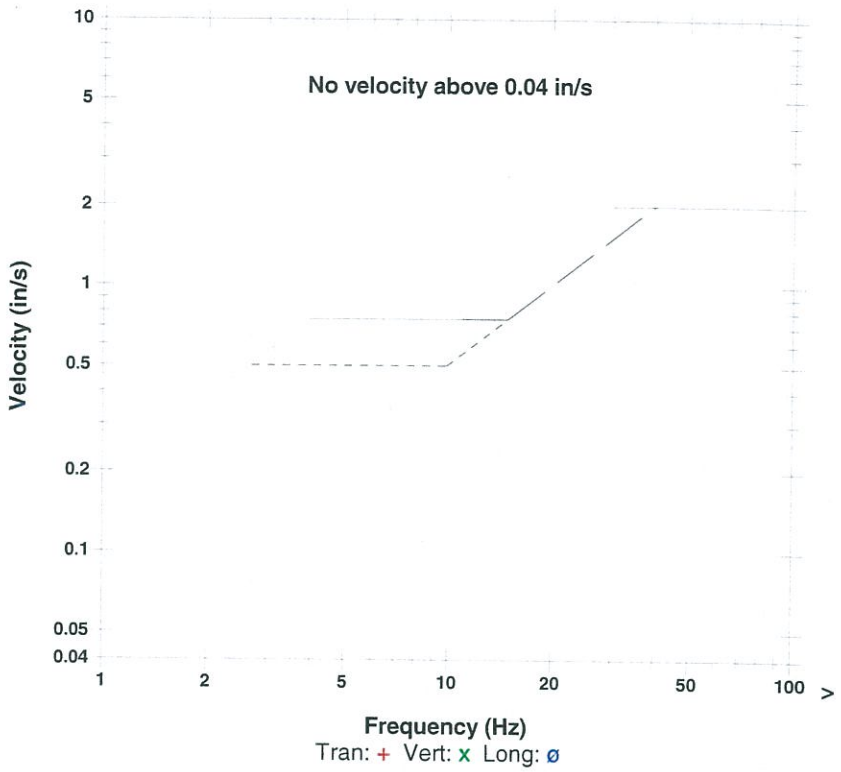
Post Event Notes
McCormick Res: 4,485'

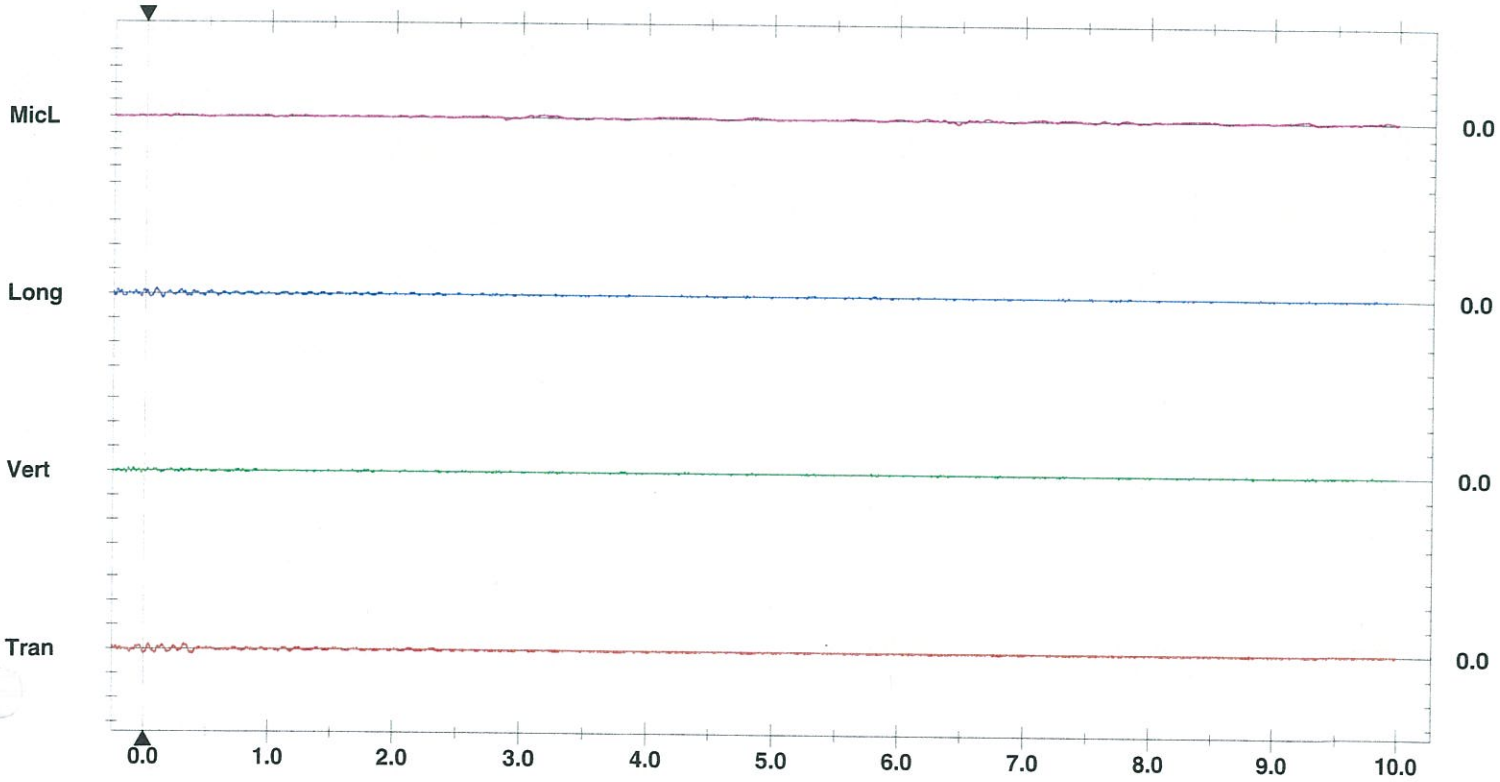
Microphone	Linear Weighting
PSPL	97.5 dB(L) at 6.464 sec
ZC Freq	8.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 535 mv)

	Tran	Vert	Long	
PPV	0.0200	0.01000	0.0200	in/s
ZC Freq	15	85	17	Hz
Time (Rel. to Trig)	0.000	-0.150	0.085	sec
Peak Acceleration	0.0133	0.0265	0.0265	g
Peak Displacement	0.00032	0.00003	0.00021	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0255 in/s at 0.085 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 =

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-19-16 Blast No. 1-19-16 Lower 3A Time 12:44

Exact Blast Location Lower 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' 38.2"
W 98° 17' 32.7"

MONITOR GPS

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

SEISMOGRAPH DATA

Seismograph No. 14420 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 01-28-15 Microphone Calibration 01-28-15

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

10' E of NE corner of house

Seismograph Distance from Blast 4,327'

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

Peak Particle Velocity .025 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-19-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:44:21 January 19, 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

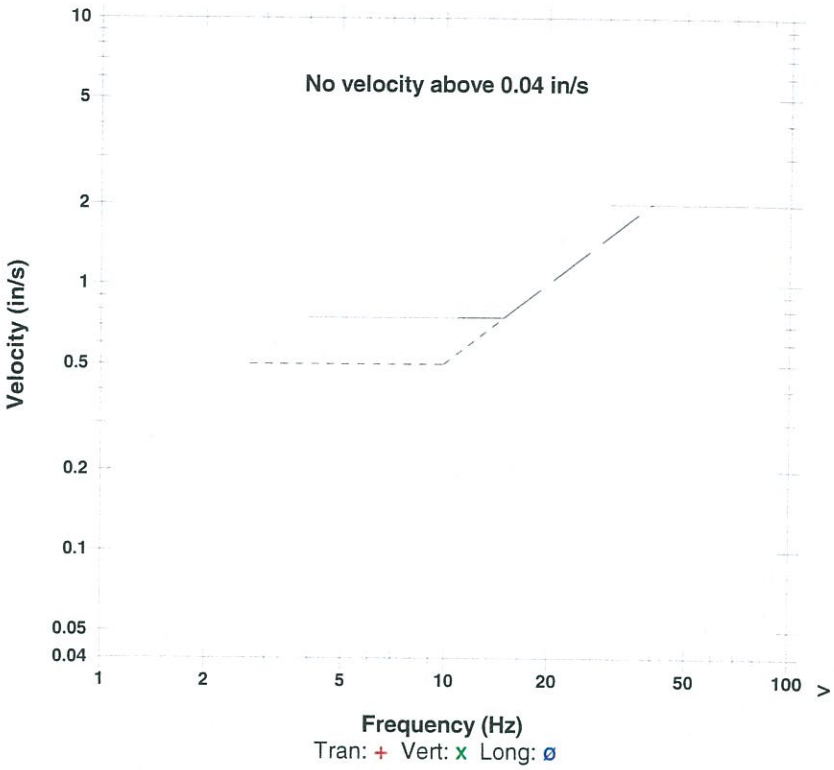
Serial Number	BF14420 V 7.04-8.0 MultiSeis Plus
Battery Level	6.2 Volts
Calibration	January 28, 2015 by Vibra-Tech Inc.
File Name	P420G7CZ.DX1

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

Extended Notes

Post Event Notes
Taveres Res: 4,327'

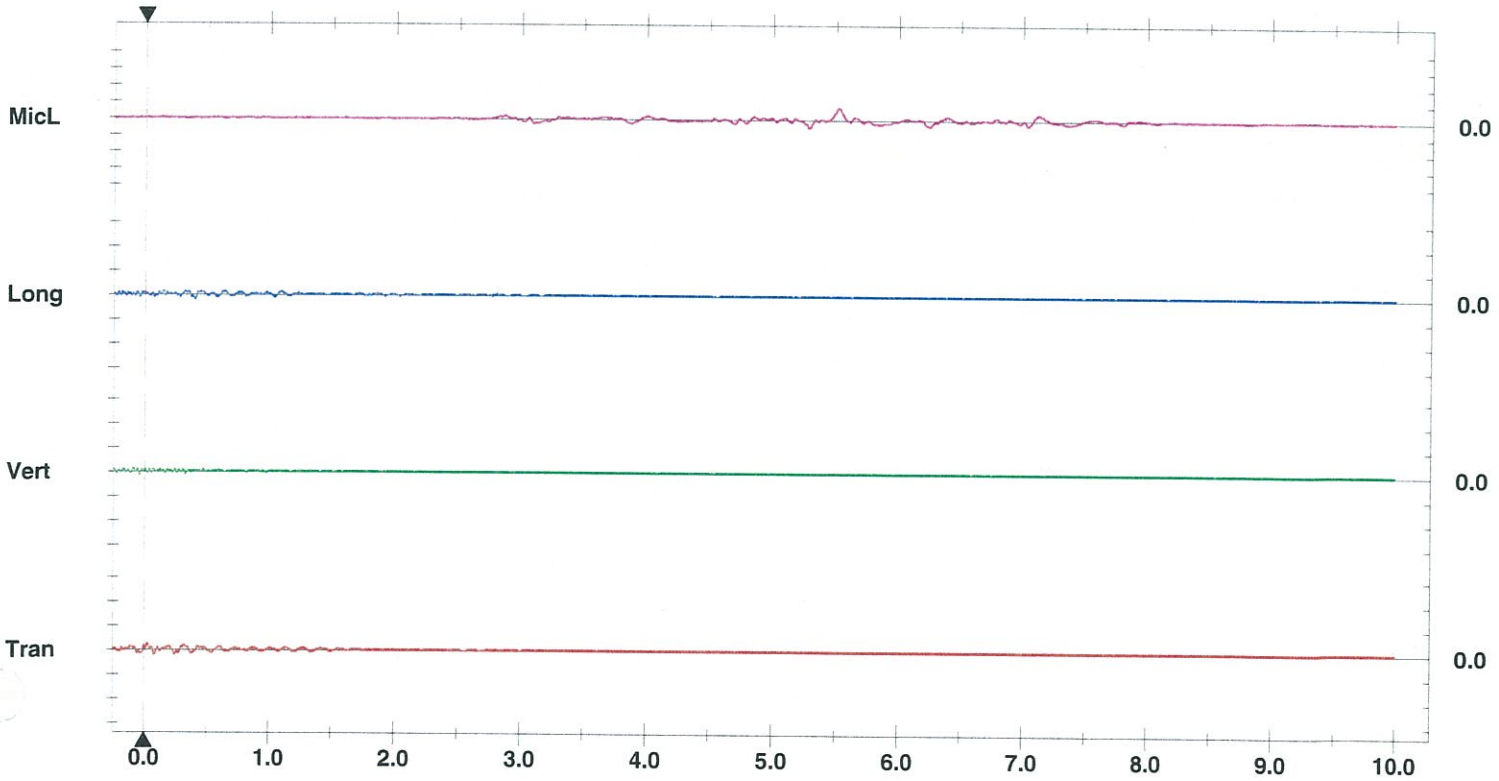
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	108.4 dB(L) at 5.516 sec
ZC Freq	3.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 561 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0150	0.0200	in/s
ZC Freq	18	34	19	Hz
Time (Rel. to Trig)	0.023	-0.099	0.395	sec
Peak Acceleration	0.0133	0.0133	0.0265	g
Peak Displacement	0.00043	0.00009	0.00026	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0255 in/s at 0.023 sec



Time Scale: 0.50 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 1-19-16 Blast No. 1-19-16 Lower 3A Time 12:44

Exact Blast Location Lower 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' 38.2"
W 98° 17' 32.7"

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 1,640'

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

Peak Particle Velocity .16 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-19-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 12:44:21 January 19, 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	6.4 Volts
Calibration	March 12, 2015 by Vibra-Tech Inc.
File Name	O270G7CZ.DX1

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

Extended Notes

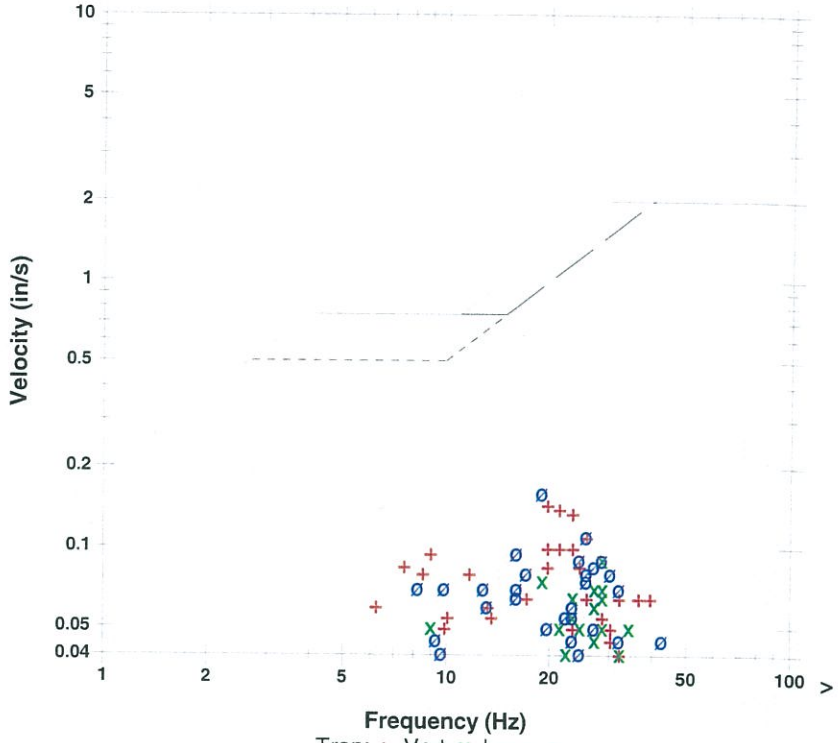
Post Event Notes
Warden Res: 1,640'

Microphone	Linear Weighting
PSPL	102.8 dB(L) at 1.563 sec
ZC Freq	4.1 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 522 mv)

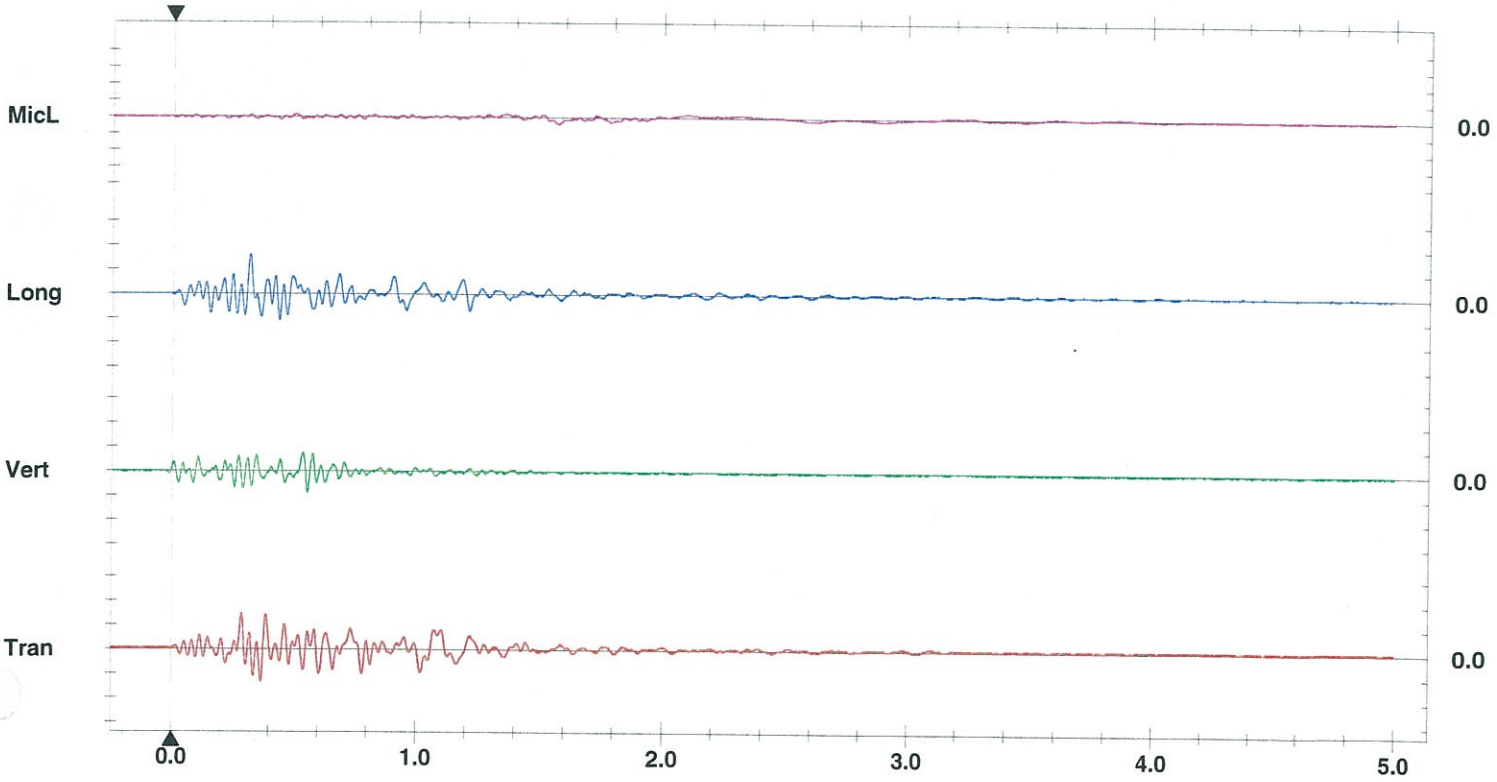
	Tran	Vert	Long	
PPV	0.145	0.0900	0.160	in/s
ZC Freq	20	28	19	Hz
Time (Rel. to Trig)	0.289	0.557	0.317	sec
Peak Acceleration	0.0663	0.0398	0.0530	g
Peak Displacement	0.00175	0.00068	0.00126	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.169 in/s at 0.319 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 =

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-19-16 Blast No. 1-19-16 Lower 3A Time 12:44

Exact Blast Location Lower 3 A

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' 38.2"
W 98° 17' 32.7"

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 1,448'

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

Peak Particle Velocity .11 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-19-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 12:44:21 January 19, 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	6.3 Volts
Calibration	November 22, 2015 by Vibra-Tech Inc.
File Name	O922G7CZ.DX1

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

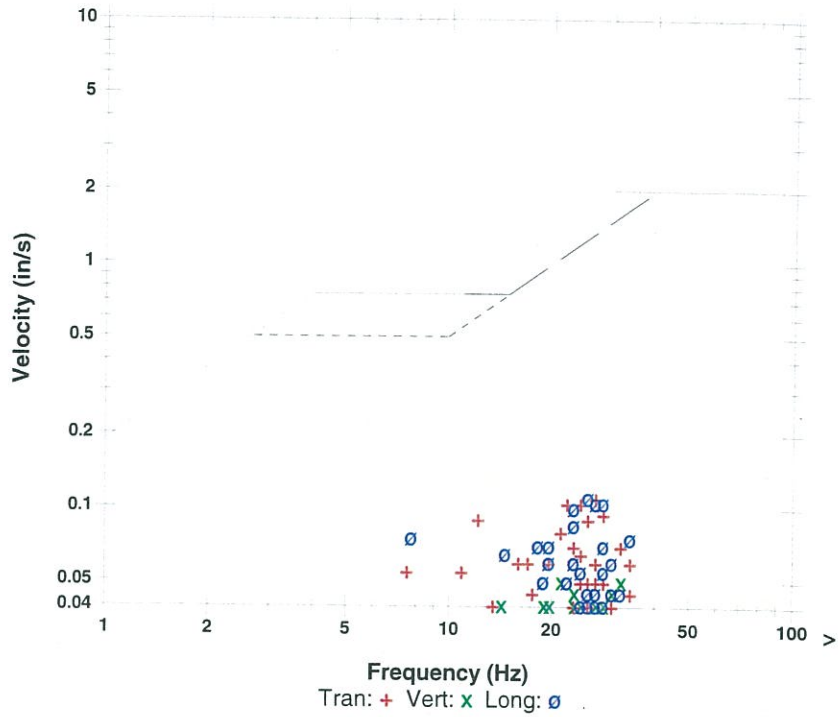
Post Event Notes
Warden Prop Line: 1,448'

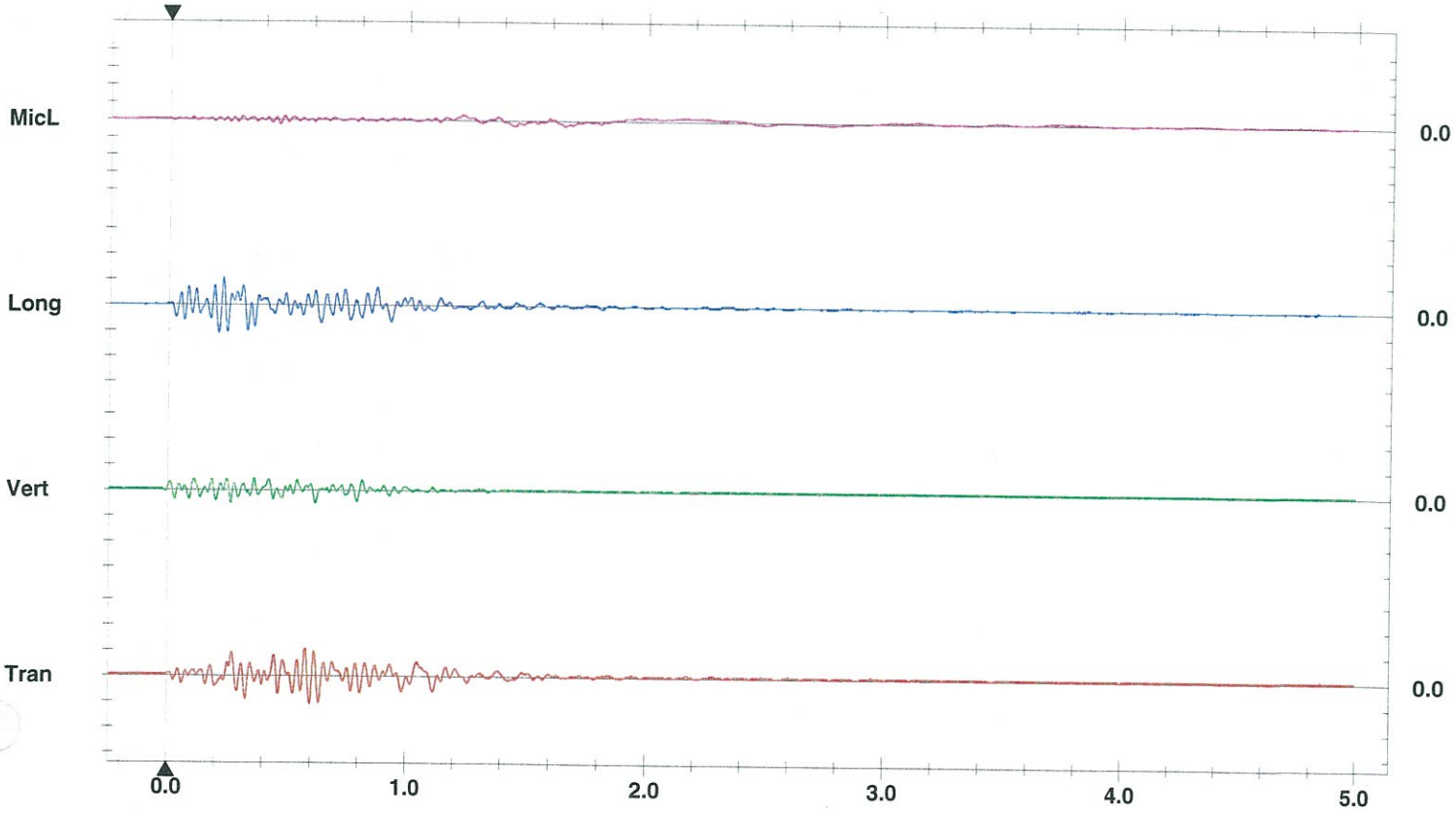
Microphone	Linear Weighting
PSPL	101.0 dB(L) at 1.224 sec
ZC Freq	5.6 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 585 mv)

	Tran	Vert	Long	
PPV	0.110	0.0500	0.110	in/s
ZC Freq	27	32	26	Hz
Time (Rel. to Trig)	0.598	0.261	0.205	sec
Peak Acceleration	0.0530	0.0398	0.0530	g
Peak Displacement	0.00105	0.00039	0.00114	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.135 in/s at 0.329 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 =

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-22-16 Blast No. 1-22-16 S. WALL C Time 12:08

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' 13.7"
W 98° 16' 48.1"

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 5,872'

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

Peak Particle Velocity NT ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-22-16

Event Report: Monitor Log

Start Time	End Time	Status
---	---	SERIAL NUMBER: BD6191
Jan 22 '16 10:26:05		Start Monitoring Trigger Level: Geo: 0.0200 in/s Mic: 122.0 dB(L)
Jan 22 '16 10:26:09	Jan 22 '16 10:26:19	Event recorded. Trigger Vert: 0.0200 in/s
Jan 22 '16 10:26:19	Jan 22 '16 12:57:22	No events recorded. (Keyboard Exit) Trigger Geo: 0.0200 in/s Mic: 122.0 dB(L)

CITY PROP LINE

SOUTH WALL C

1-22-16 at 12:08

NO TRIGGER

at 5,872'

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-22-16 Blast No. 1-22.16 S. Wall Time 12:08

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' 13.7"
W 98° 16' 48.1"

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 3,341'

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

Peak Particle Velocity .050 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 1-22-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 12:07:59 January 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

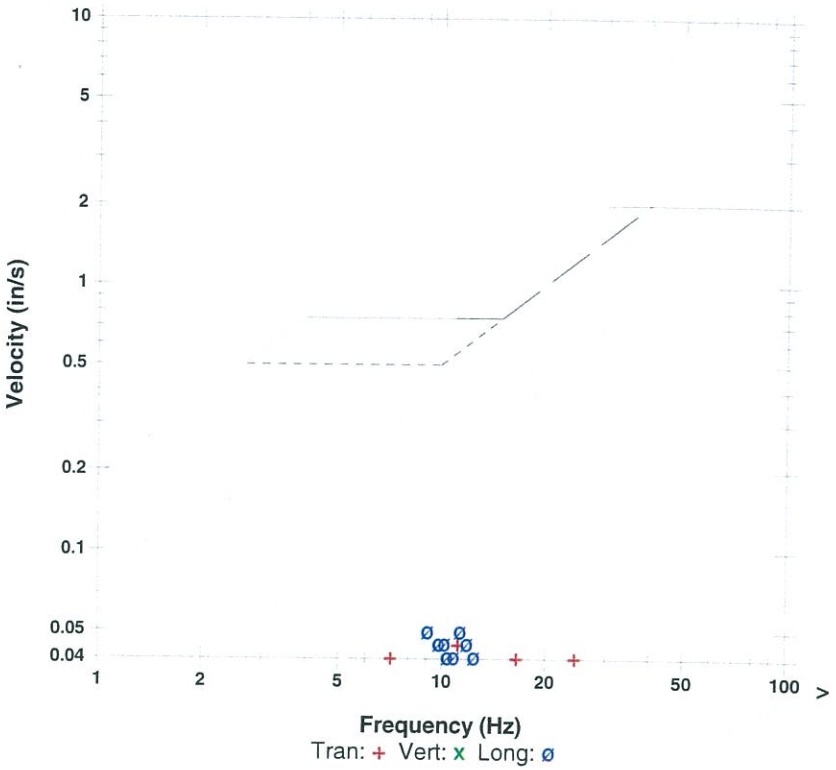
Serial Number	BF10562 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	September 13, 2015 by Vibra-Tech Inc.
File Name	L562G7IH.PB1

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

Extended Notes

Post Event Notes
Holly Res: 3,341'

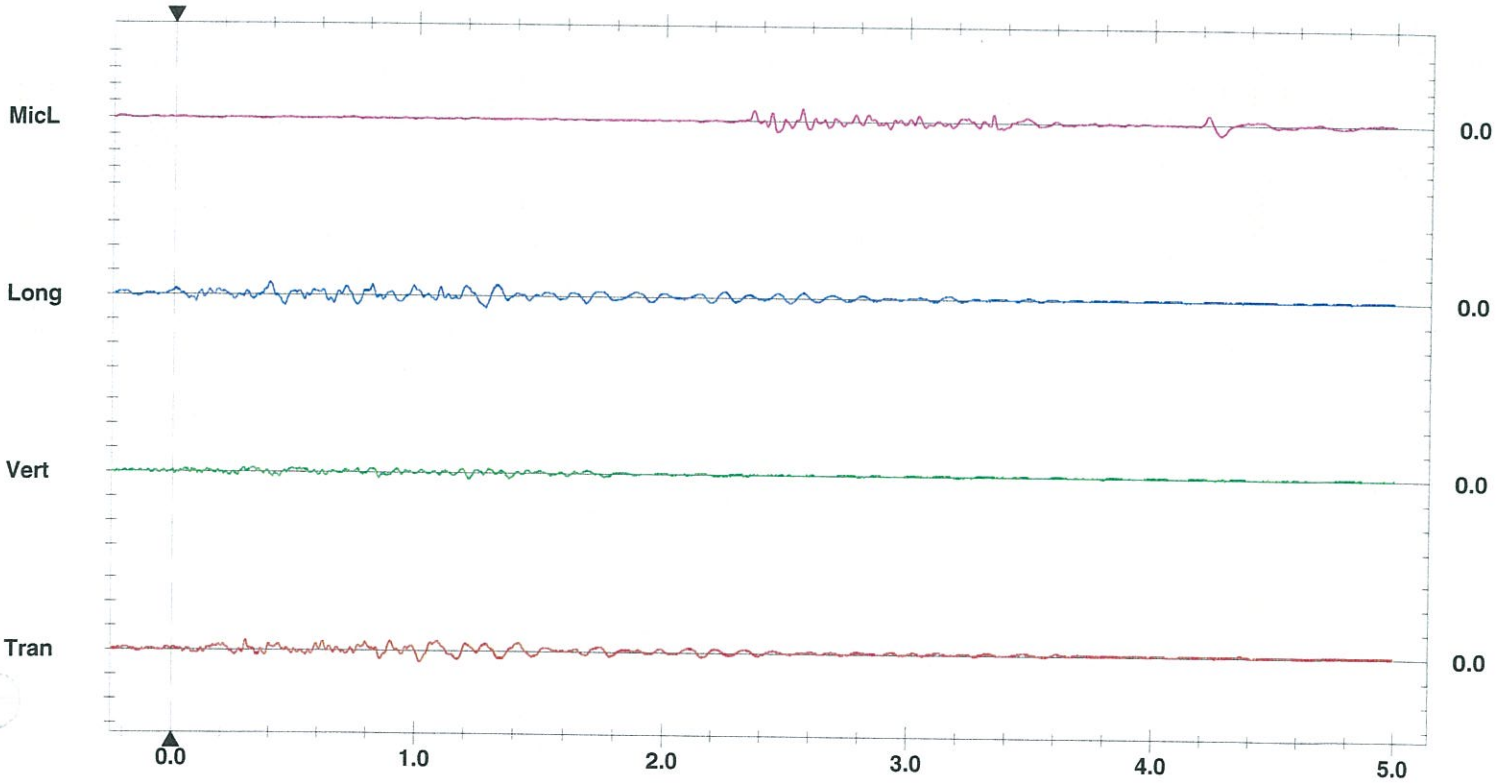
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	108.4 dB(L) at 2.560 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 565 mv)

	Tran	Vert	Long	
PPV	0.0450	0.0250	0.0500	in/s
ZC Freq	11	30	11	Hz
Time (Rel. to Trig)	1.015	0.844	0.392	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00093	0.00025	0.00086	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0561 in/s at 1.275 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 1-22-16 Blast No. 1-22-16 S. WALL C Time 12:08

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' 13.7"
W 98° 16' 48.1"

MONITOR GPS

N 29 38 31.84
W 98 18 23.43

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 McCormick Residence: 21403 Liguria Drive, George Ranch Subdivision

15' E off NE corner of garage

Seismograph Distance from Blast 8,595'

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

Peak Particle Velocity .025 ips Operator DAVID WARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-22-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:08:01 January 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

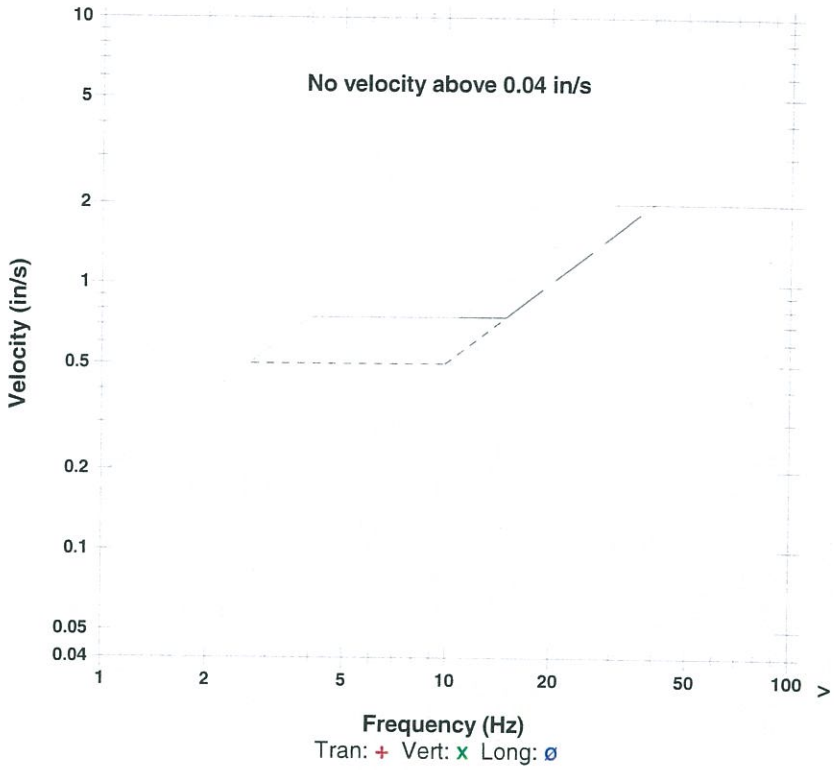
Serial Number	BF8949 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	J949G7IH.PD1

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

Extended Notes

Post Event Notes
McCormick Res: 8,595'

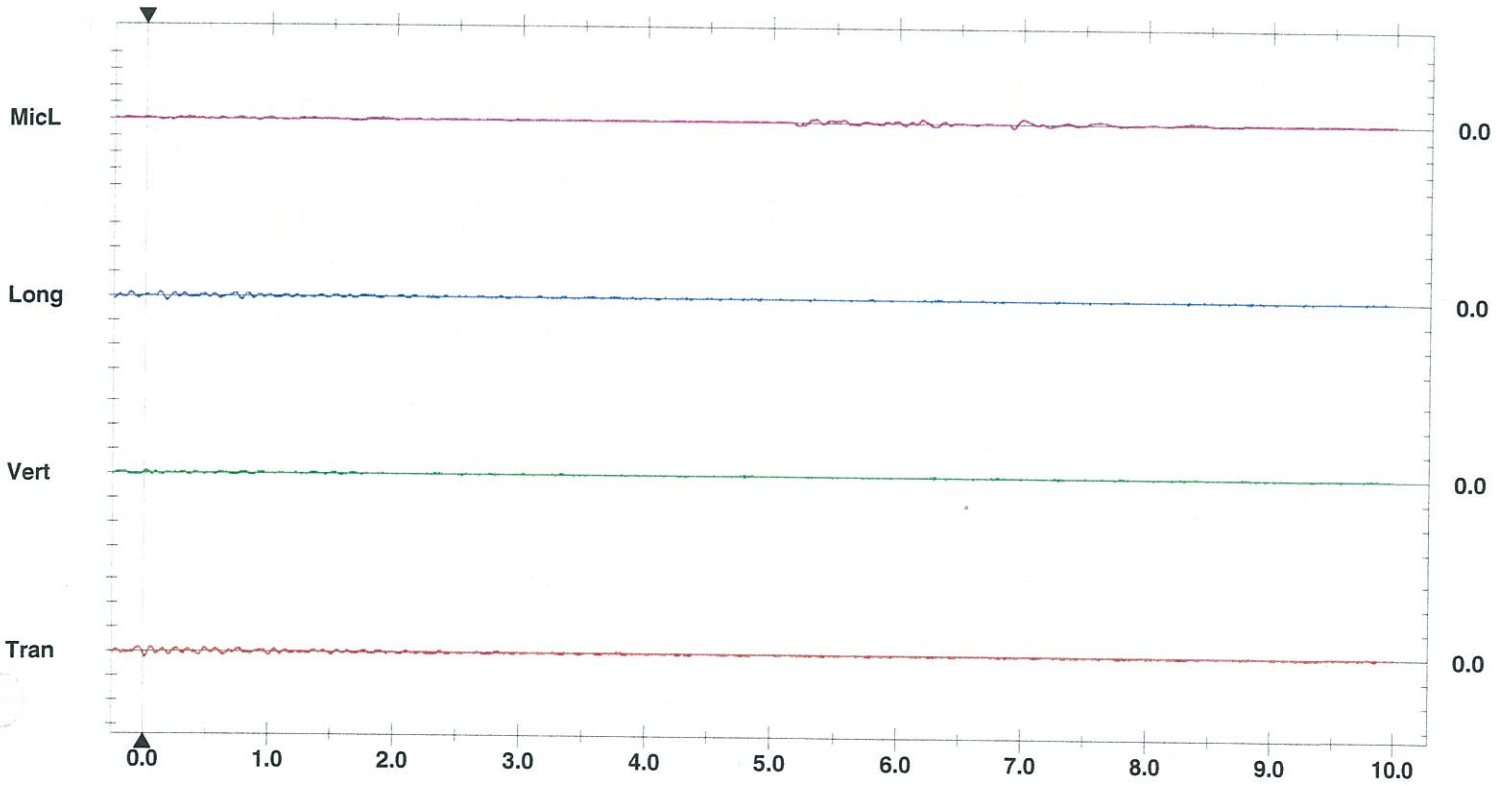
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	100.0 dB(L) at 6.982 sec
ZC Freq	4.2 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 569 mv)

	Tran	Vert	Long	
PPV	0.0250	0.01000	0.0200	in/s
ZC Freq	12	>100	12	Hz
Time (Rel. to Trig)	0.003	0.002	0.163	sec
Peak Acceleration	0.0265	0.0265	0.0133	g
Peak Displacement	0.00035	0.00000	0.00029	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0274 in/s at 0.013 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 1-22-16 Blast No. 1-22-16 S. WALL C Time 12:08

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' 13.7"
W 98° 16' 48.1"

MONITOR GPS

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

SEISMOGRAPH DATA

Seismograph No. 14420 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 01-28-15 Microphone Calibration 01-28-15

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

10' E of NE corner of house

Seismograph Distance from Blast 8,930'

Peak Overpressure 97.5 dB Scaled Distance ------

Peak Particle Velocity .020 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: D. [signature] Date: 1-22-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:08:05 January 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

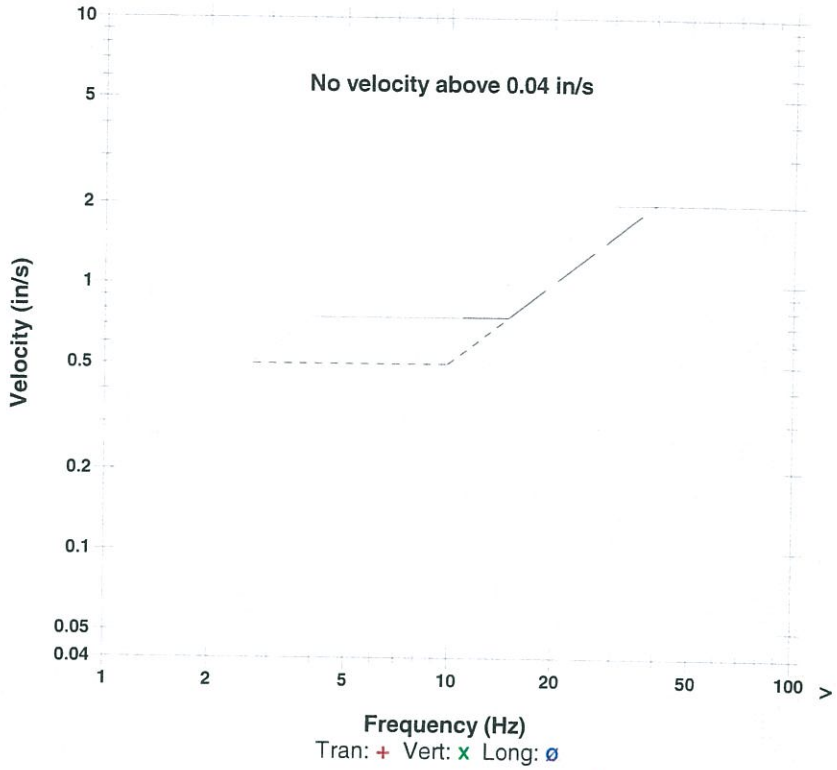
Serial Number	BF14420 V 7.04-8.0 MultiSeis Plus
Battery Level	6.2 Volts
Calibration	January 28, 2015 by Vibra-Tech Inc.
File Name	P420G7IH.PH1

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

Extended Notes

Post Event Notes
Taveres Res: 8,930'

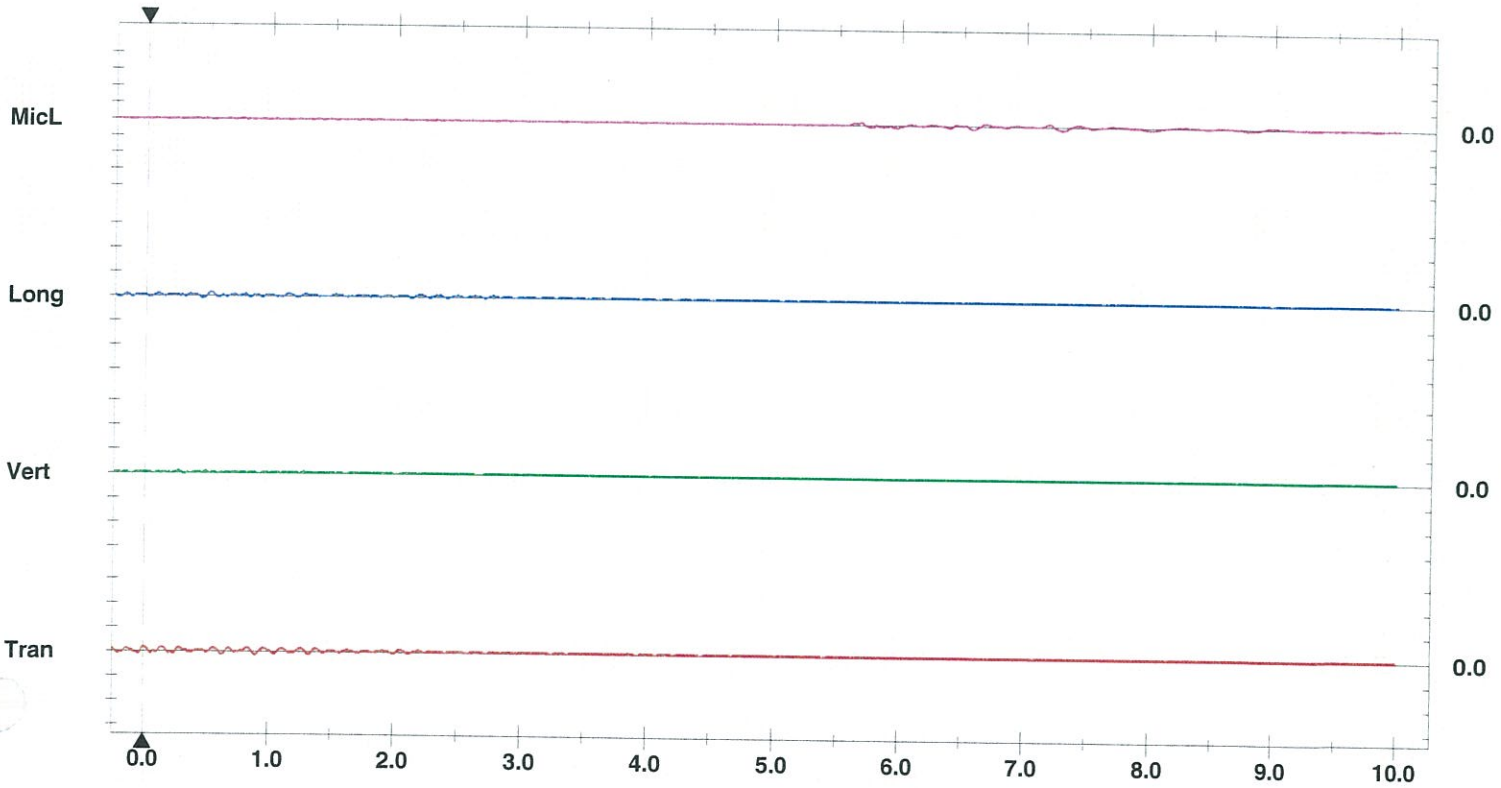
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	97.5 dB(L) at 7.274 sec
ZC Freq	4.7 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 550 mv)

	Tran	Vert	Long	
PPV	0.0200	0.01000	0.0150	in/s
ZC Freq	11	>100	11	Hz
Time (Rel. to Trig)	0.000	0.259	0.507	sec
Peak Acceleration	0.0133	0.0133	0.0265	g
Peak Displacement	0.00031	0.00000	0.00028	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0206 in/s at 0.000 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 1-22-16 Blast No. 1-22.16 S. WALL C Time 12:08

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' 13.7"
W 98° 16' 48.1"

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 4,667'

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

Peak Particle Velocity .060 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: D. L. Date: 1-22-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:08:06 January 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

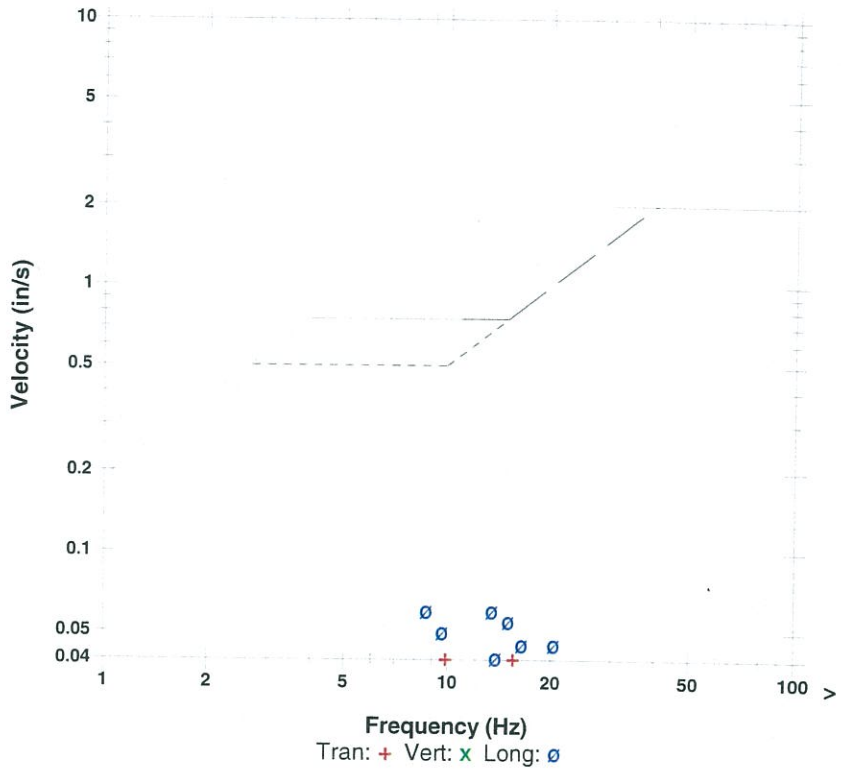
Serial Number	BF13270 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	March 12, 2015 by Vibra-Tech Inc.
File Name	O270G7IH.PI1

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

Extended Notes

Post Event Notes
Warden Res: 4,667'

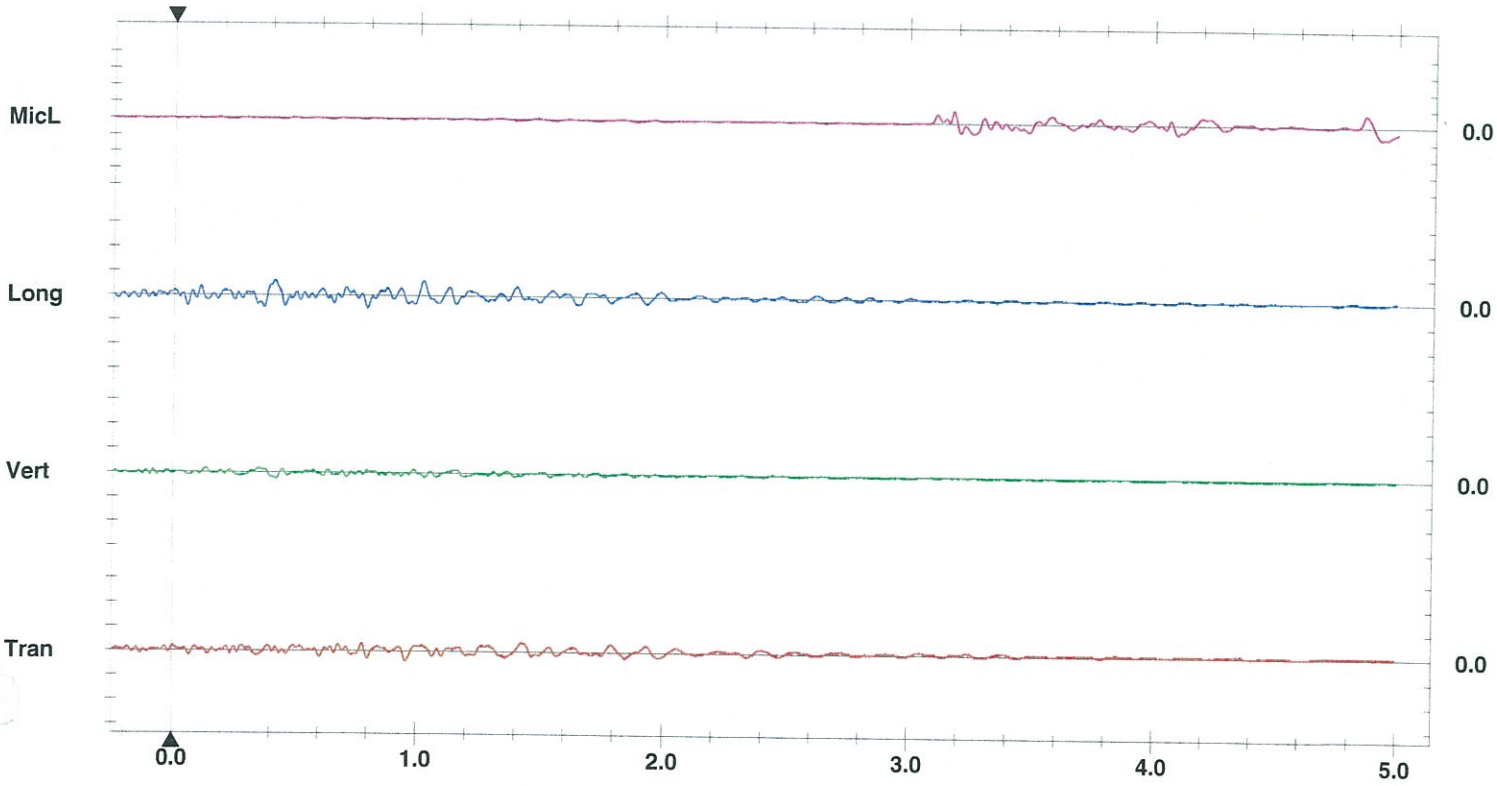
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	108.0 dB(L) at 3.175 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 560 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0250	0.0600	in/s
ZC Freq	16	11	8.7	Hz
Time (Rel. to Trig)	0.954	0.416	0.410	sec
Peak Acceleration	0.0265	0.0133	0.0265	g
Peak Displacement	0.00067	0.00043	0.00107	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0667 in/s at 1.021 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 1/25/16 Blast No. 1-25-2016 4A Time 12:15 pm

Exact Blast Location 4A

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' 57.7"
W: 98° 17' 36.4"

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 3876 ft.

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

Peak Particle Velocity 0.035 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 1/25/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:15:58 January 25, 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	H191G7O2.2M1

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

Extended Notes

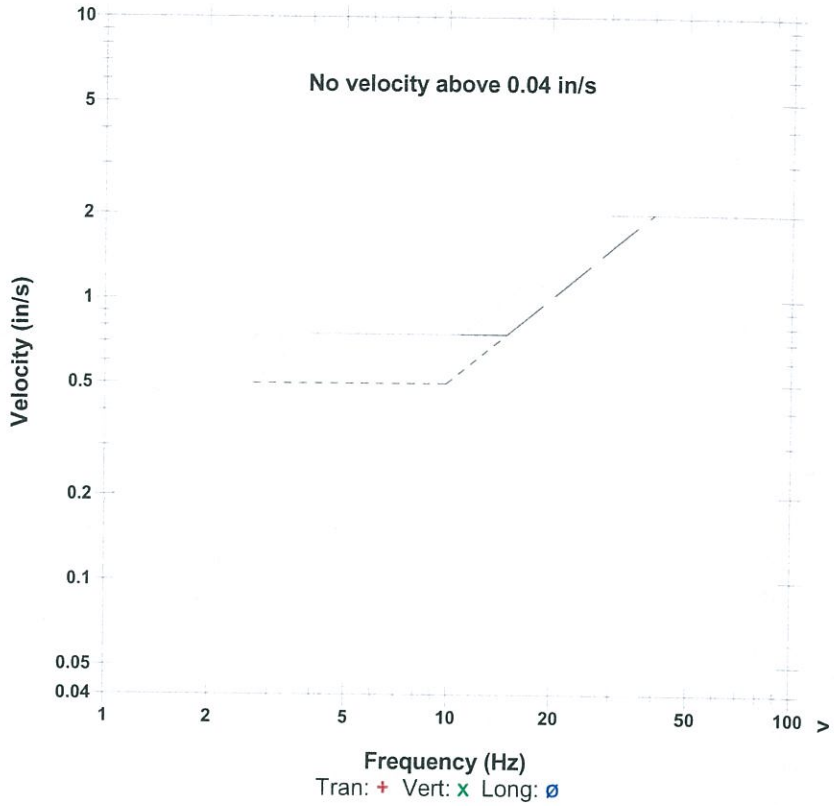
Post Event Notes
City Property Line
3876 feet to Blast

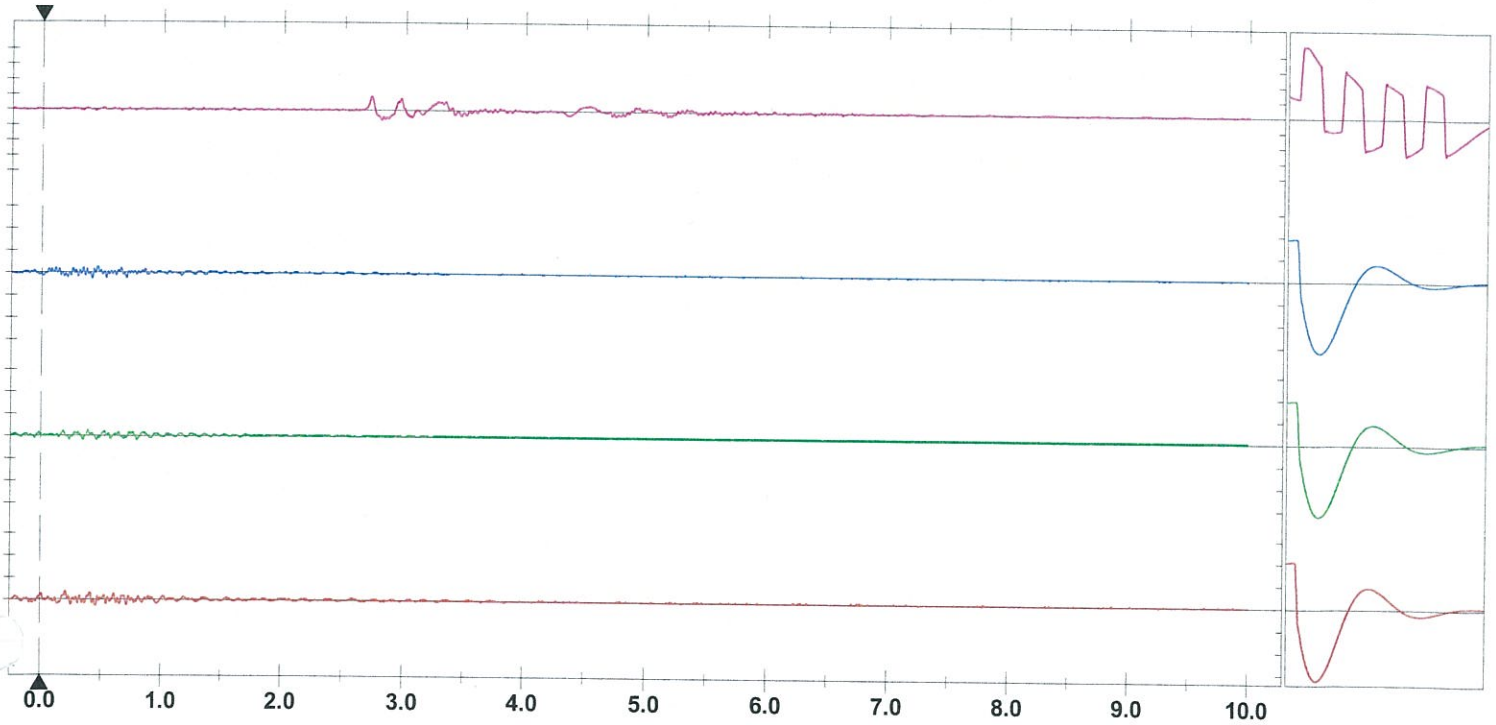
Microphone	Linear Weighting
PSPL	109.9 dB(L) at 2.718 sec
ZC Freq	6.3 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 550 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0250	0.0300	in/s
ZC Freq	11	20	23	Hz
Time (Rel. to Trig)	0.208	0.387	0.415	sec
Peak Acceleration	0.0133	0.0265	0.0133	g
Peak Displacement	0.00047	0.00031	0.00021	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 0.0439 in/s at 0.460 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 1/25/16 Blast No. 1-25-2016 4A Time 12:15 pm

Exact Blast Location 4A

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' 57.7"
W 98° 17' 36.4"

MONITOR GPS

N 29 38 31.84
W 98 18 23.43

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 McCormick Residence: 21403 Liguria Drive, George Ranch Subdivision

15' E off NE corner of garage

Seismograph Distance from Blast 4901 ft.

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

Peak Particle Velocity 0.065 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1/25/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:15:59 January 25, 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	J949G7O2.2N1

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

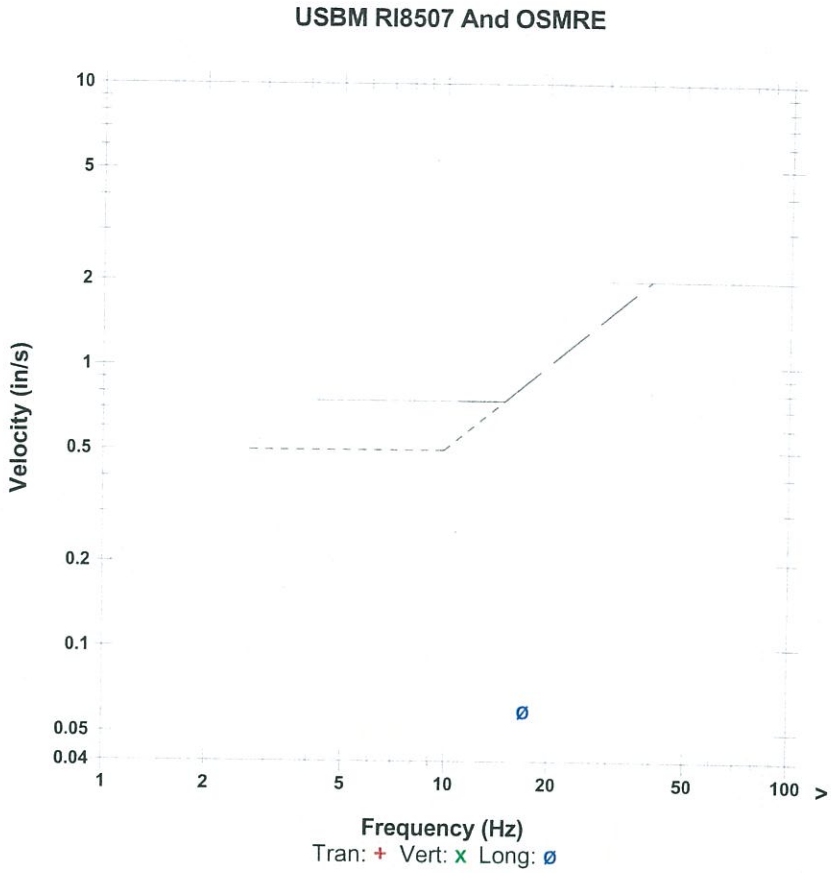
Extended Notes

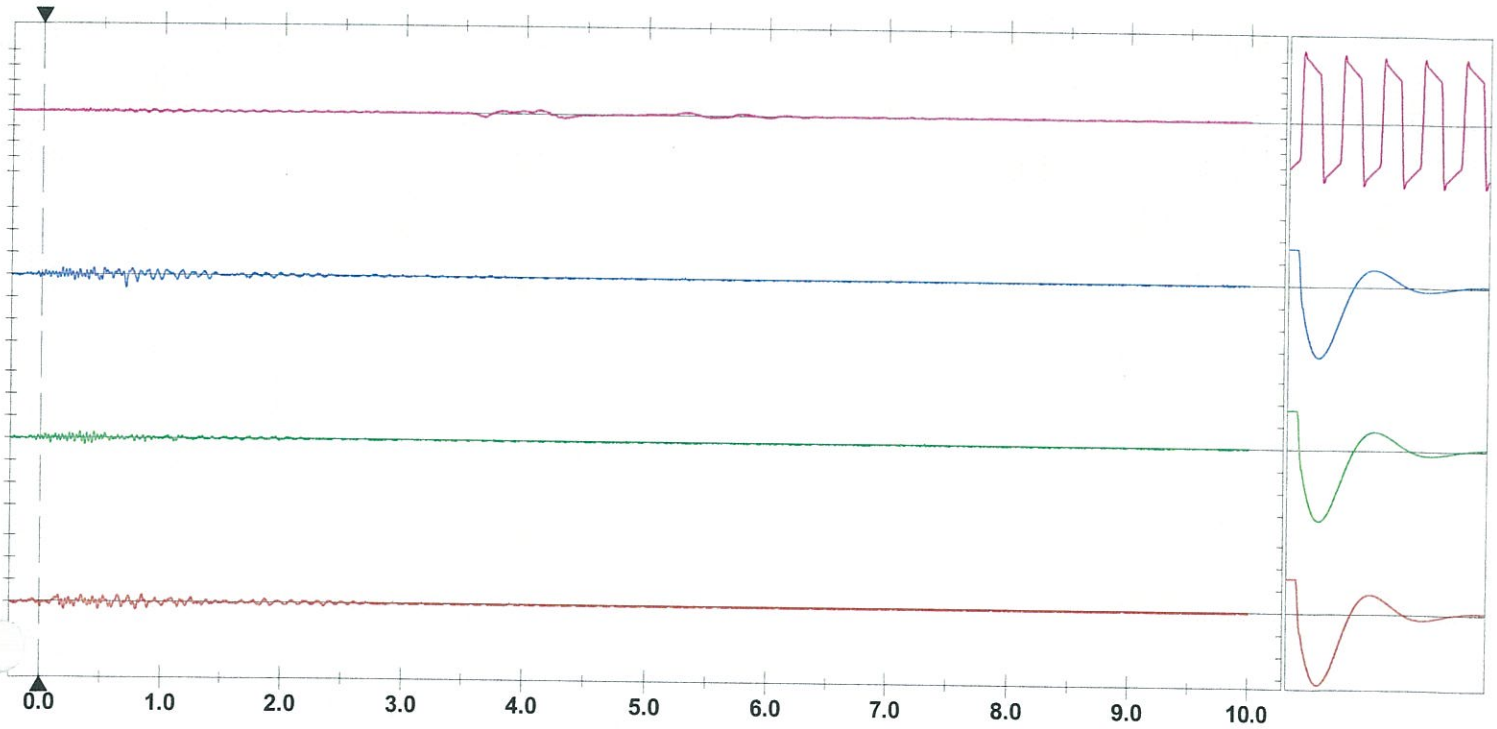
Post Event Notes
McCormick Residence
4901 feet to Blast

Microphone	Linear Weighting
PSPL	100.0 dB(L) at 4.100 sec
ZC Freq	3.2 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 561 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0300	0.0600	in/s
ZC Freq	26	32	17	Hz
Time (Rel. to Trig)	0.199	0.363	0.696	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00033	0.00019	0.00052	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.6	7.3	7.5	Hz
Overswing Ratio	3.7	3.9	4.2	

Peak Vector Sum 0.0610 in/s at 0.696 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 1/25/16 Blast No. 01-25-2016 4A Time 12:15 pm

Exact Blast Location 4A

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' 57.7"
W: 98° 17' 36.4"

MONITOR GPS

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

SEISMOGRAPH DATA

Seismograph No. 14420 Range Setting 10.00 ips Trigger Level 0.020 ips

Date of last: Geophone Calibration 01-28-15 Microphone Calibration 01-28-15

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

10' E of NE corner of house

Seismograph Distance from Blast 3833 ft.

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

Peak Particle Velocity 0.085 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1/25/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 12:15:59 January 25, 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	BF14420 V 7.04-8.0 MultiSeis Plus
Battery Level	6.2 Volts
Calibration	January 28, 2015 by Vibra-Tech Inc.
File Name	P420G7O2.2N1

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

Extended Notes

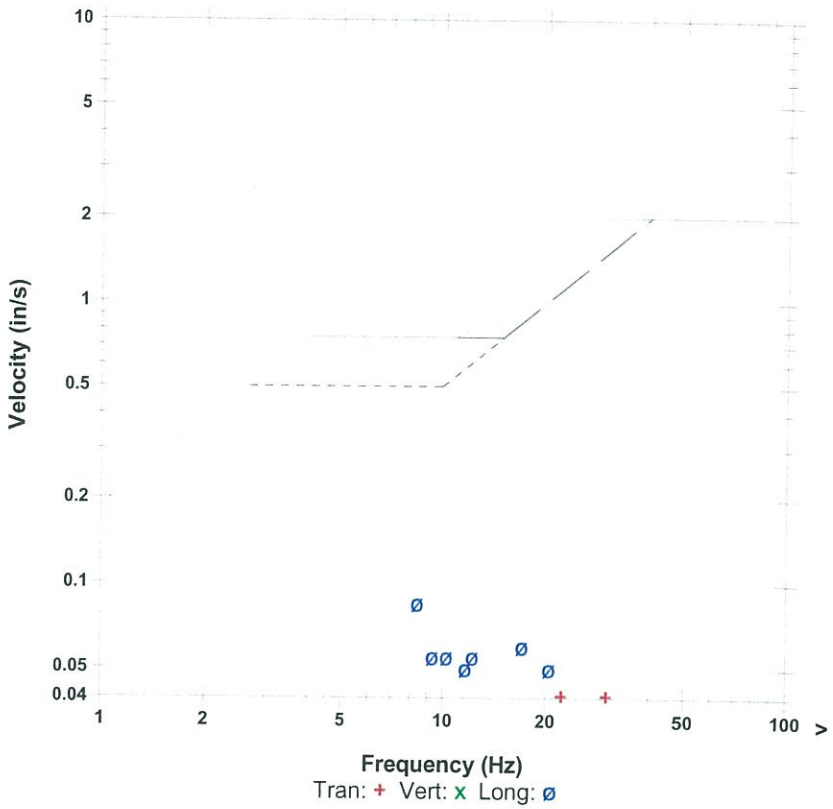
Post Event Notes
Taveres Residence
3833 feet to Blast

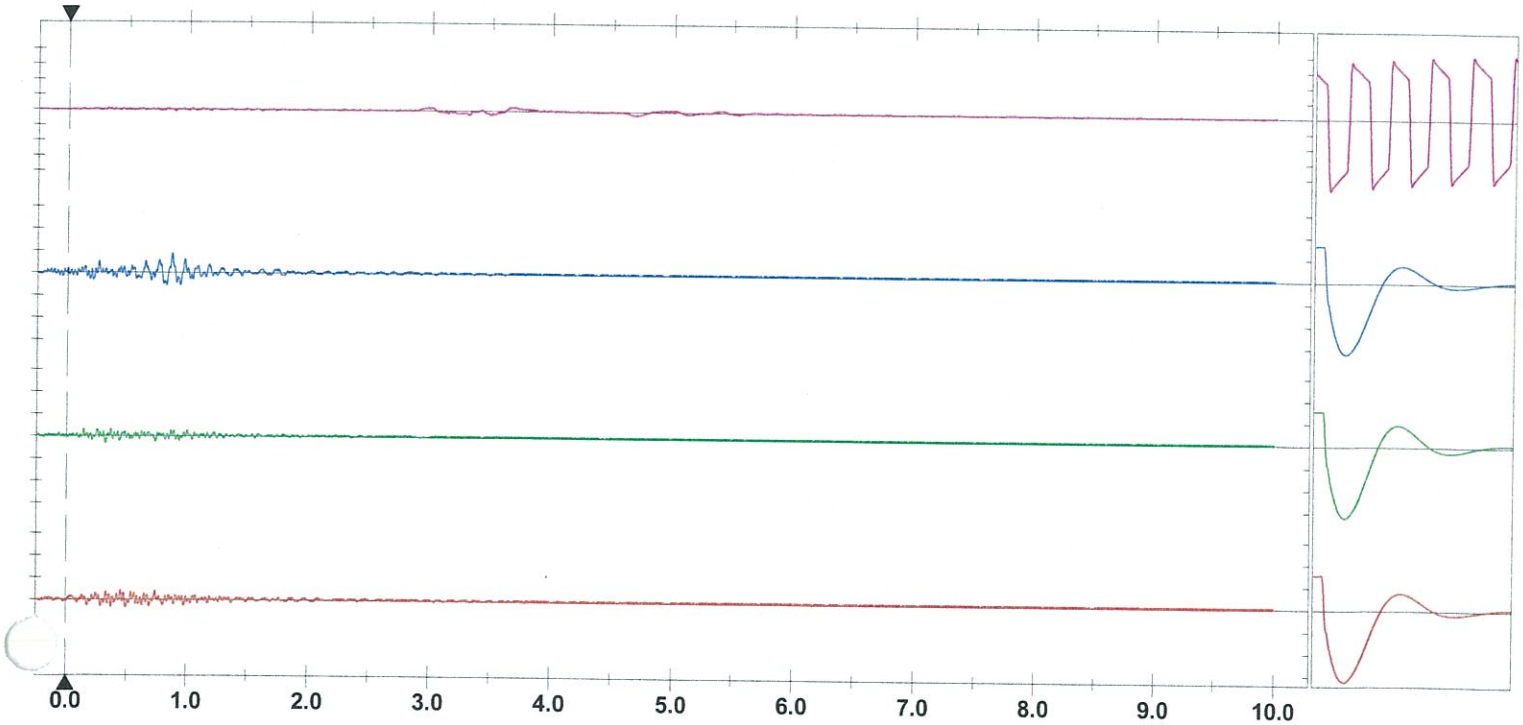
Microphone	Linear Weighting
PSPL	98.8 dB(L) at 3.307 sec
ZC Freq	3.0 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 517 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0350	0.0850	in/s
ZC Freq	30	27	8.4	Hz
Time (Rel. to Trig)	0.449	0.322	0.862	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00024	0.00021	0.00111	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.3	7.7	7.3	Hz
Overswing Ratio	4.1	3.3	4.1	

Peak Vector Sum 0.0887 in/s at 0.863 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.

Format Copyrighted 1996-2003 Instantel Inc.

VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1/25/16 Blast No. 1-25-2016 4A Time 12:15 pm

Exact Blast Location 4A

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' 57.7"
W: 98° 17' 36.4"

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 3531 ft.

Peak Overpressure 112.8 dB Scaled Distance ------

Peak Particle Velocity 0.100 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1/25/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:15:59 January 25, 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	6.4 Volts
Calibration	March 12, 2015 by Vibra-Tech Inc.
File Name	O270G7O2.2N1

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

Extended Notes

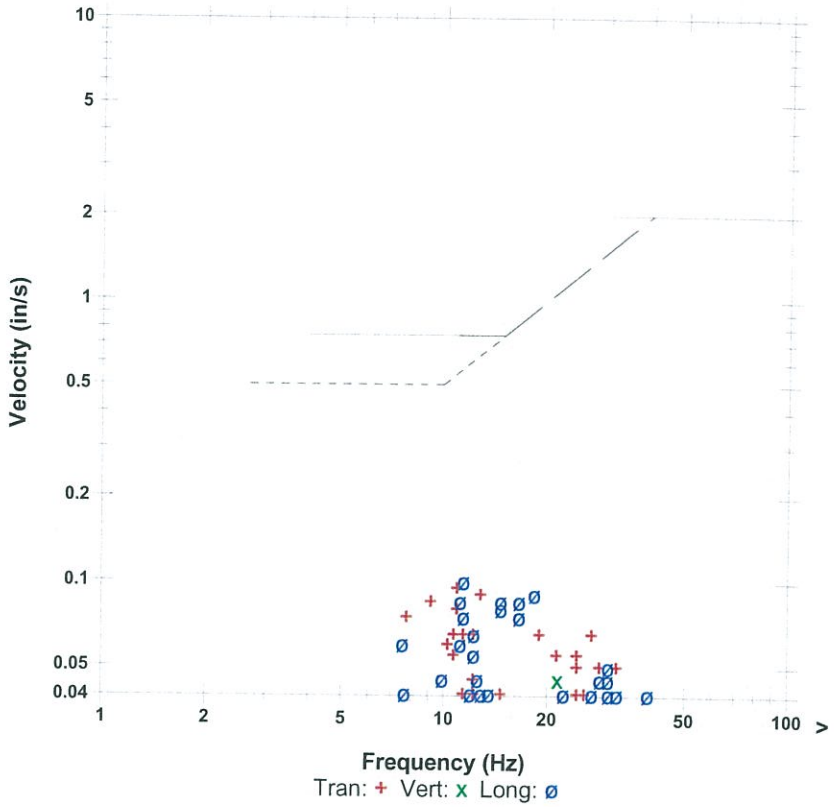
Post Event Notes
Warden Residence
3531 feet to Blast

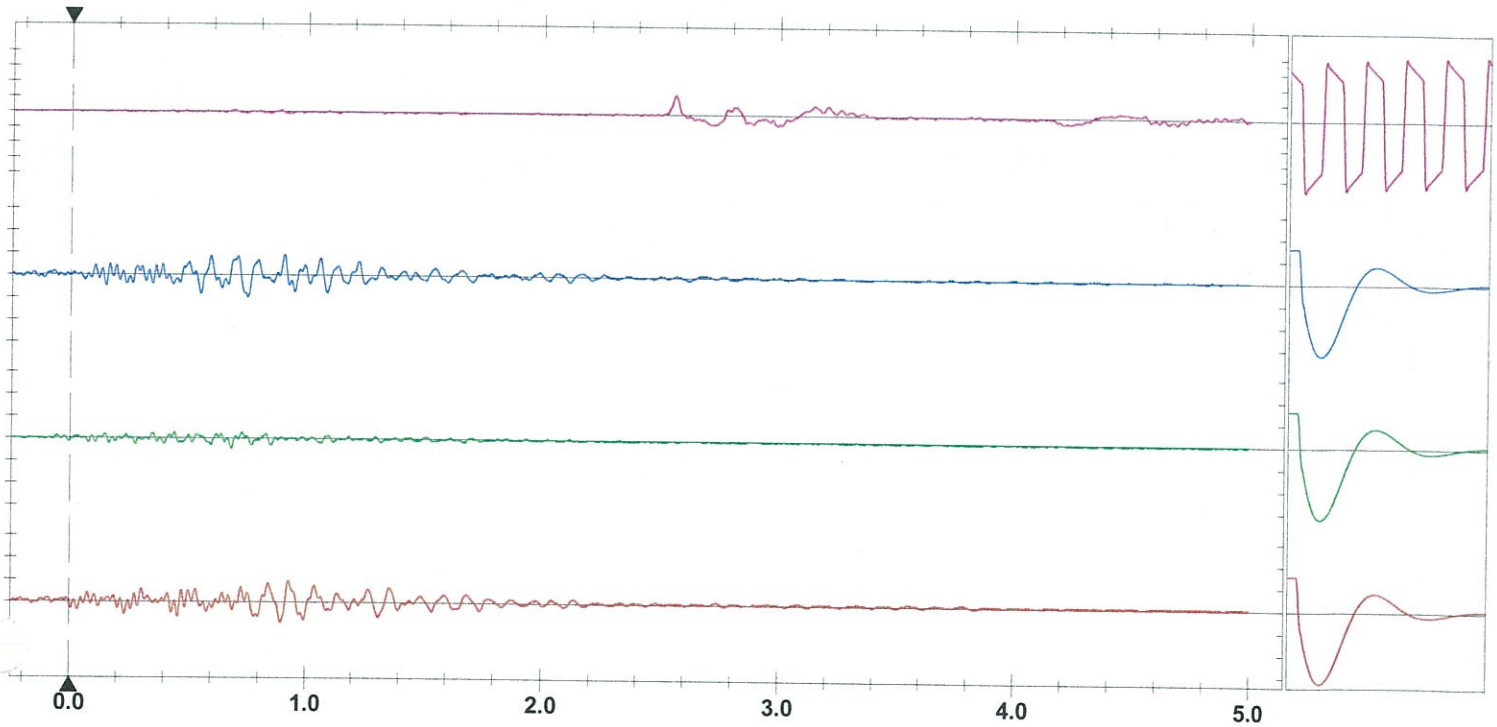
Microphone	Linear Weighting
PSPL	112.8 dB(L) at 2.557 sec
ZC Freq	6.2 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 530 mv)

	Tran	Vert	Long	
PPV	0.0950	0.0450	0.1000	in/s
ZC Freq	11	21	11	Hz
Time (Rel. to Trig)	0.926	0.681	0.746	sec
Peak Acceleration	0.0398	0.0265	0.0398	g
Peak Displacement	0.00129	0.00033	0.00150	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.3	7.4	7.3	Hz
Overswing Ratio	3.8	3.6	3.9	

Peak Vector Sum 0.120 in/s at 0.898 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 1/25/16 Blast No. 1-25-2016 4A Time 12:15 pm

Exact Blast Location 4A

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°38'57.7"

W: 98°17' 36.4"

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 3322 ft.

Peak Overpressure 113.3 dB Scaled Distance ------

Peak Particle Velocity 0.095 ips Operator Clayton Smith

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1/25/16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 12:15:59 January 25, 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	6.3 Volts
Calibration	November 22, 2015 by Vibra-Tech Inc.
File Name	O922G7O2.2N1

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

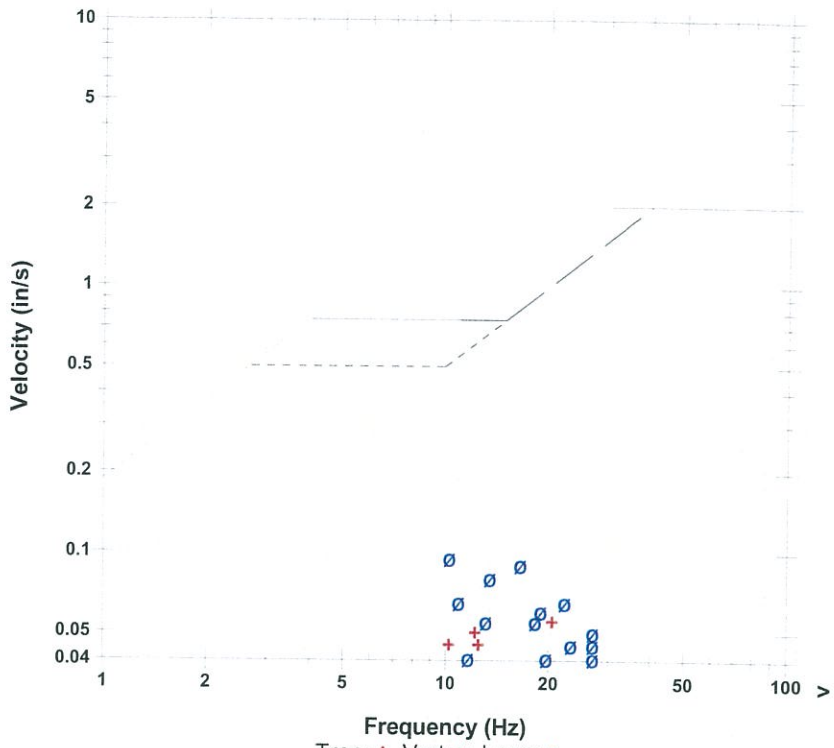
Post Event Notes
Warden Property Line
3322 feet to Blast

Microphone	Linear Weighting
PSPL	113.3 dB(L) at 2.418 sec
ZC Freq	5.2 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 585 mv)

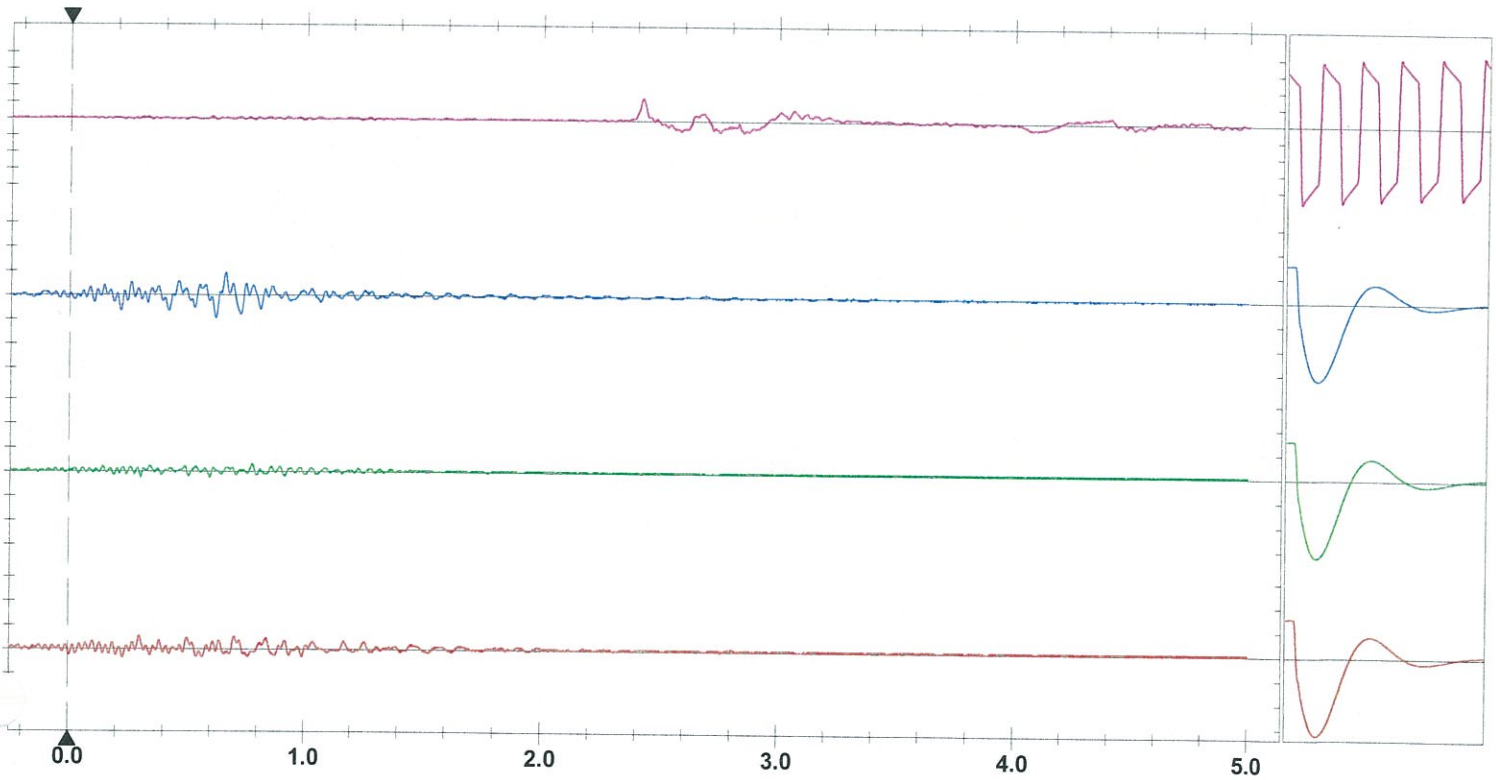
	Tran	Vert	Long	
PPV	0.0550	0.0300	0.0950	in/s
ZC Freq	20	26	10	Hz
Time (Rel. to Trig)	0.301	0.774	0.615	sec
Peak Acceleration	0.0265	0.0265	0.0398	g
Peak Displacement	0.00064	0.00020	0.00104	in
Dynamic Geo Cal.	Passed	Passed	Passed	
Frequency	7.4	7.5	7.1	Hz
Overswing Ratio	3.7	3.6	4.1	

Peak Vector Sum 0.0997 in/s at 0.615 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 = ▶—— ——◀

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 1-28-16 Blast No. 1-28-16 4B Time 11:53

Exact Blast Location FACE 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' .30"
W 98° 17' 34.9"

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 ~~5,156'~~ 4,171'

Peak Overpressure 109.2 dB Scaled Distance ------

Peak Particle Velocity .040 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 1-28-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:53:03 January 28, 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

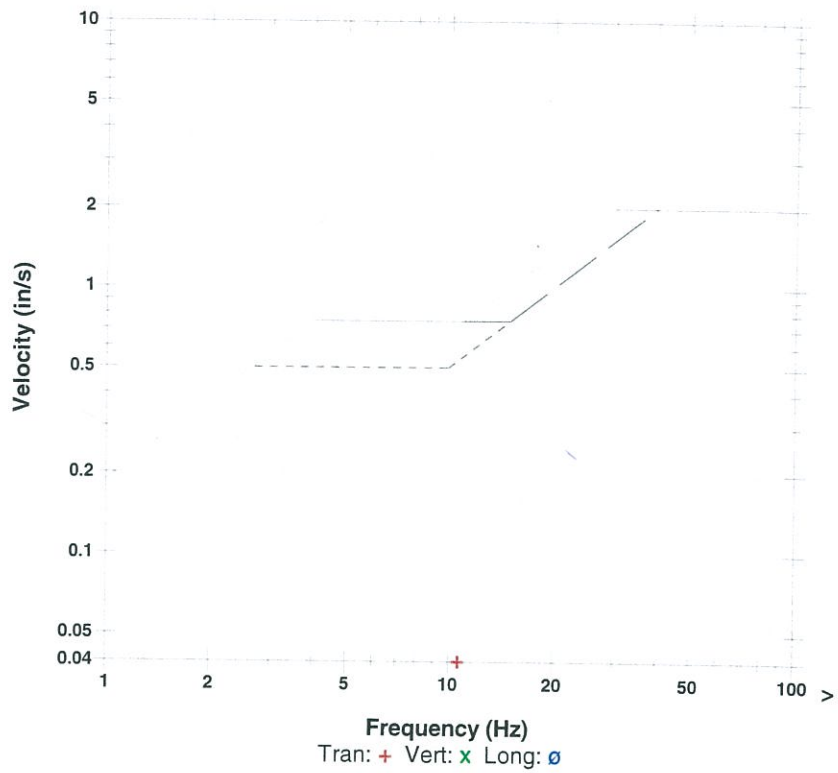
Serial Number	BD6191 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	H191G7TL.0F1

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

Extended Notes

Post Event Notes
City Property Line: 4,171'

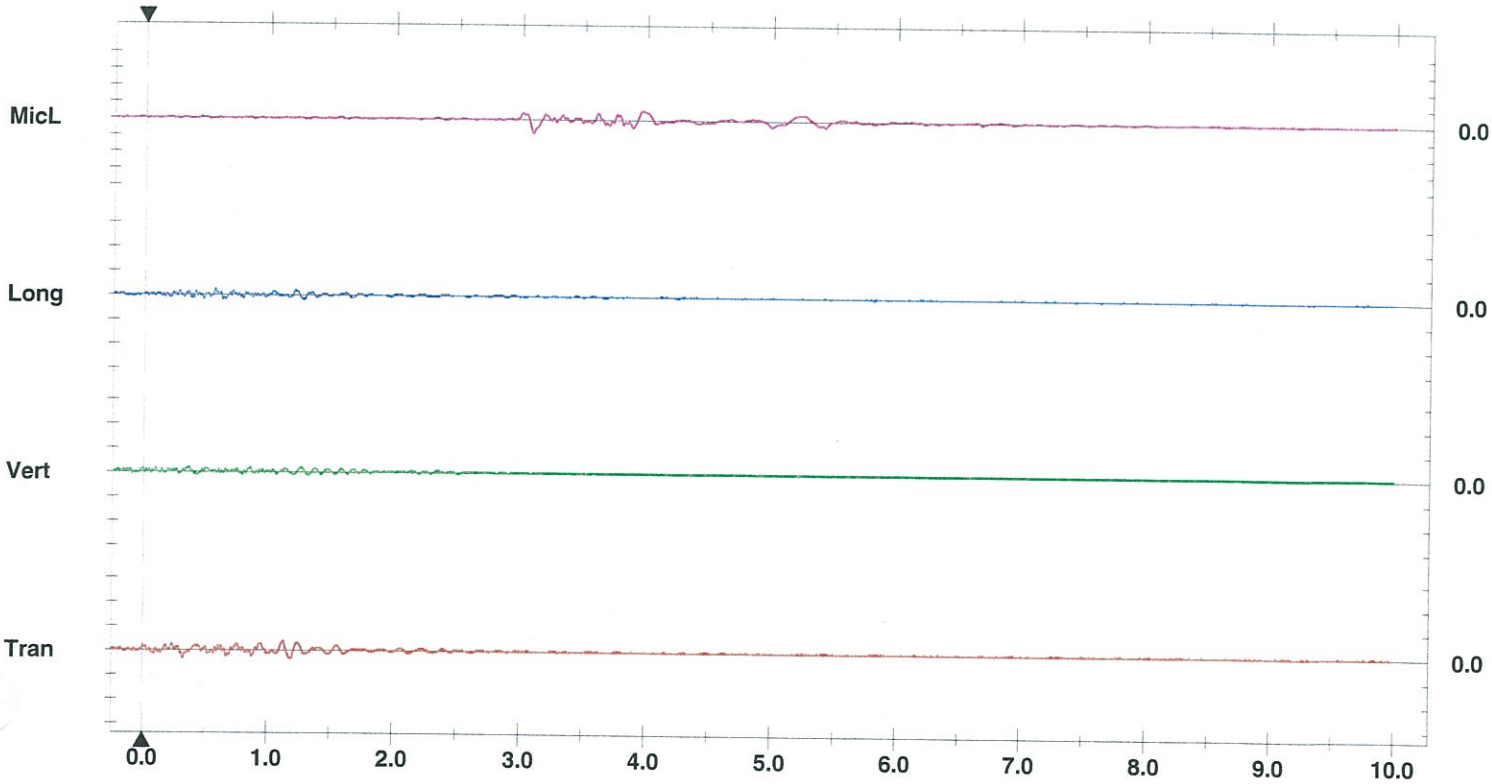
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	109.2 dB(L) at 3.088 sec
ZC Freq	5.3 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 566 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0200	0.0250	in/s
ZC Freq	11	12	26	Hz
Time (Rel. to Trig)	1.129	0.355	0.562	sec
Peak Acceleration	0.0133	0.0133	0.0133	g
Peak Displacement	0.00066	0.00034	0.00032	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0427 in/s at 1.130 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 1-28-16 Blast No. 1-28-16 4B Time 11:57

Exact Blast Location FACE 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' .30"
W 98° 17' 34.4"

MONITOR GPS

N 29 38 31.84
W 98 18 23.43

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 McCormick Residence: 21403 Liguria Drive, George Ranch Subdivision

15' E off NE corner of garage

Seismograph Distance from Blast 5,156'

Peak Overpressure 97.5 dB Scaled Distance ------

Peak Particle Velocity .060 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-28-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:53:01 January 28, 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

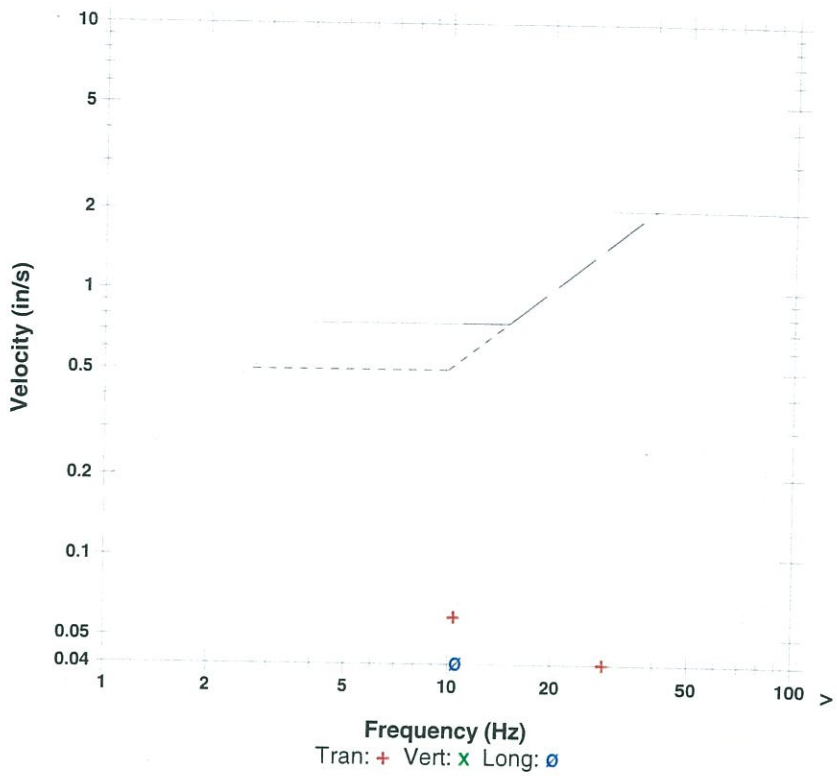
Serial Number	BF8949 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	J949G7TL.0D1

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

Extended Notes

Post Event Notes
McCormick Residence: 5,156'

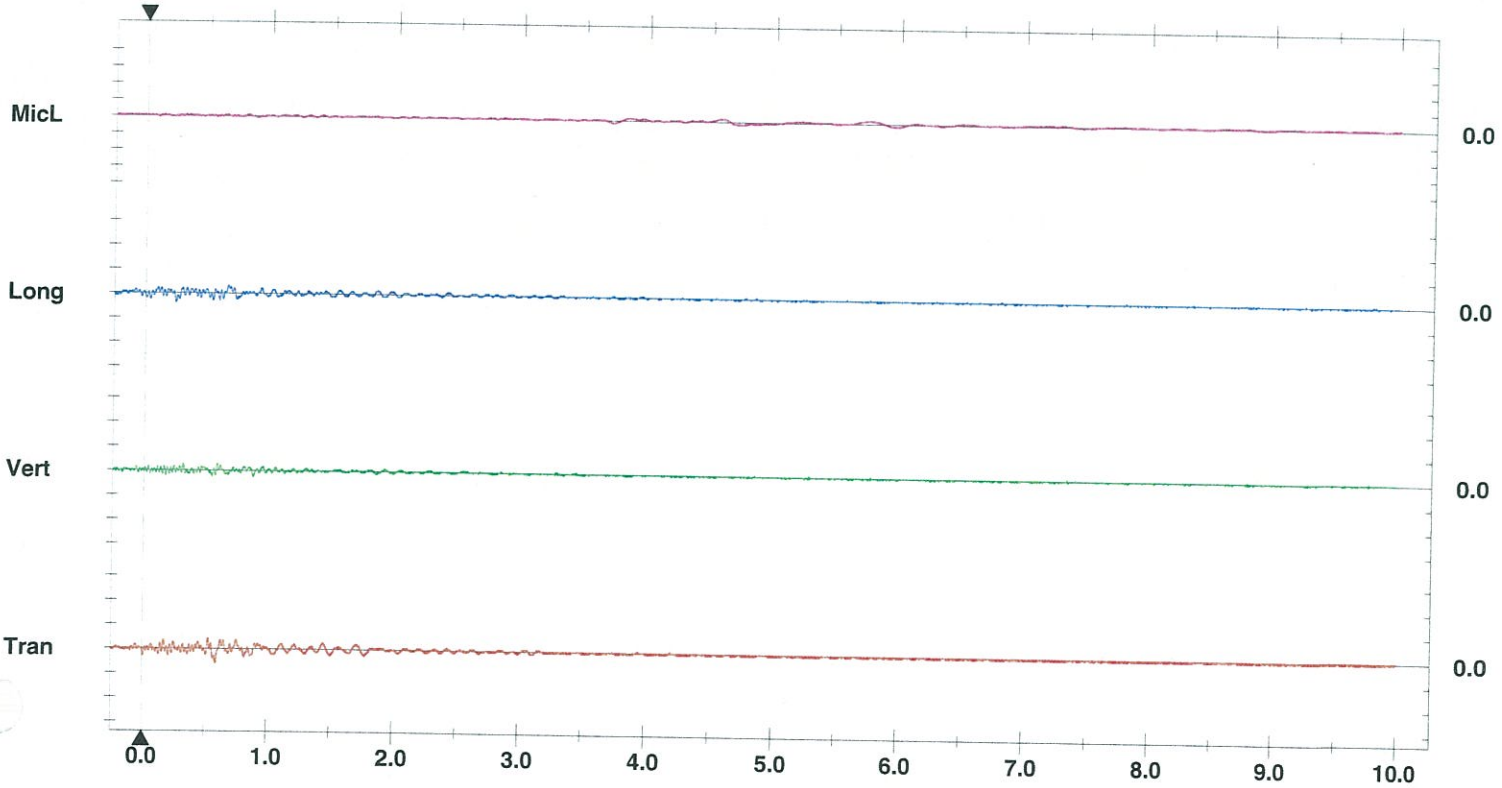
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	97.5 dB(L) at 5.759 sec
ZC Freq	2.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 560 mv)

	Tran	Vert	Long	
PPV	0.0600	0.0250	0.0400	in/s
ZC Freq	10	32	11	Hz
Time (Rel. to Trig)	0.590	0.310	0.239	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00083	0.00021	0.00049	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0680 in/s at 0.590 sec



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

Printed: January 28, 2016 (V 7.03 - 7.01)

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-28-16 Blast No. 1-28-16 4B Time 11:53

Exact Blast Location FACE 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' .30"
W 98° 17' 34.9"

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 Taveres Residence: 9118 Tuscan Hills Drive, Georg Ranch Subdivision

10' E of NE corner of house

Seismograph Distance from Blast 4,010'

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

Peak Particle Velocity .080 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-28-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:53:05 January 28, 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	L626G7TL.0H1

Notes

Location:	Taveres Residence
Client:	Hanson ServTex
User Name:	
General:	Vibra-Tech

Extended Notes

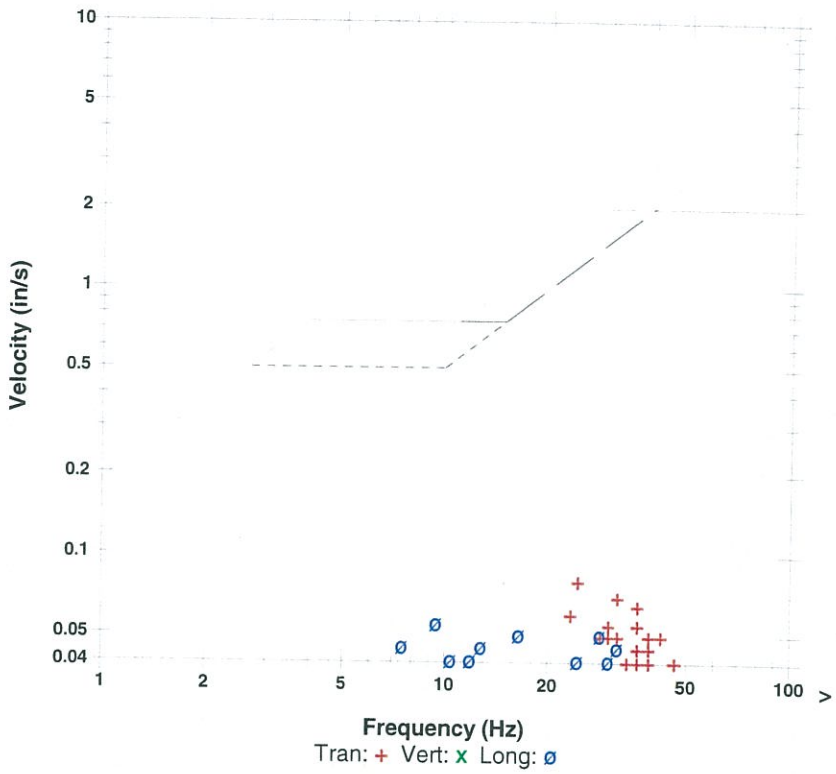
Post Event Notes
Taveres Residence: 4,010'

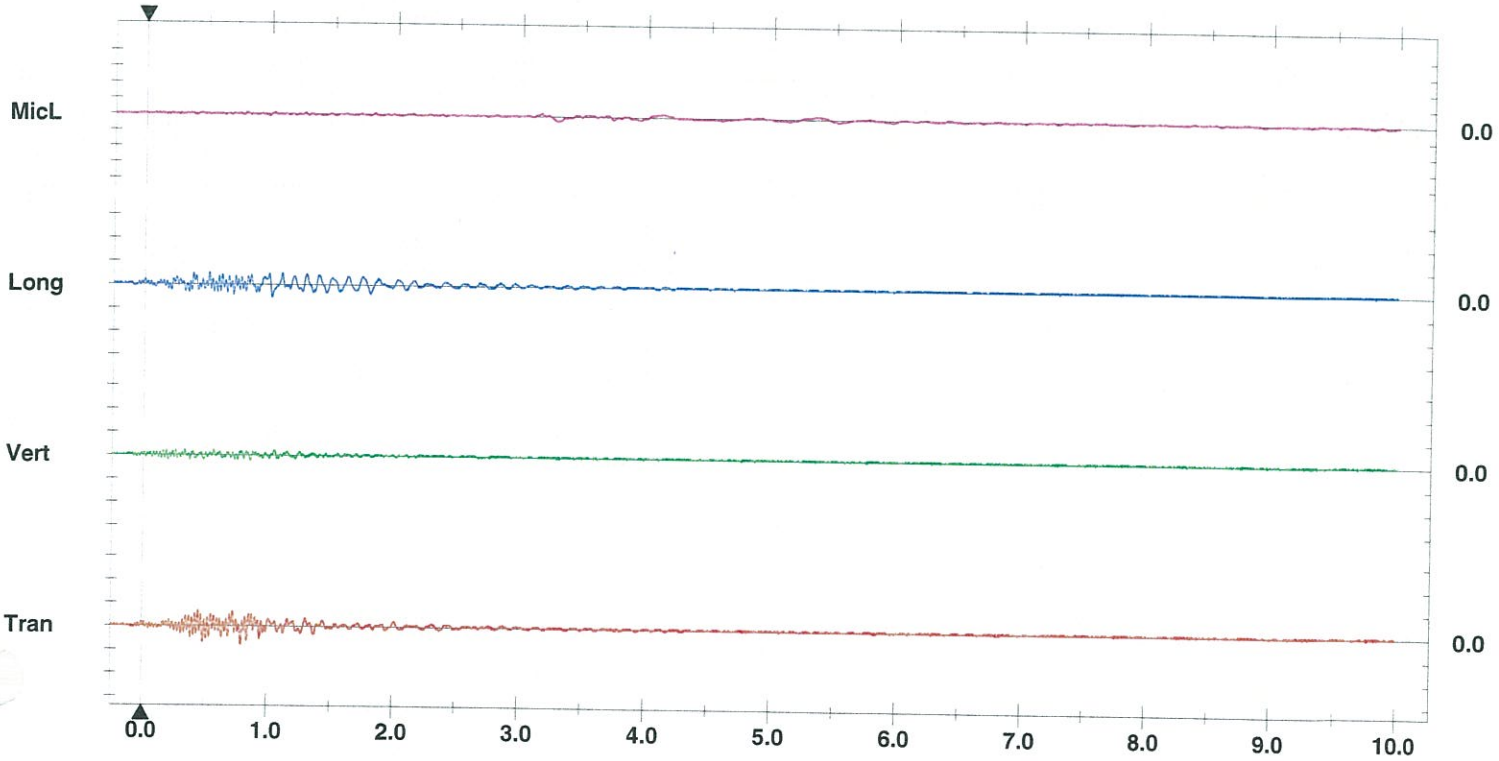
Microphone	Linear Weighting
PSPL	101.0 dB(L) at 3.280 sec
ZC Freq	5.0 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 667 mv)

	Tran	Vert	Long	
PPV	0.0800	0.0250	0.0550	in/s
ZC Freq	24	32	9.5	Hz
Time (Rel. to Trig)	0.793	0.856	1.014	sec
Peak Acceleration	0.0398	0.0265	0.0265	g
Peak Displacement	0.00053	0.00016	0.00086	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0812 in/s at 0.794 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 1-28-16 Blast No. 1-28-16 4B Time 11:53

Exact Blast Location FACE 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' .30"
W 98° 17' 34.9"

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 3,806'

Peak Overpressure 109.2 dB Scaled Distance ------

Peak Particle Velocity .095 ips Operator DAVID GARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-28-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:53:06 January 28, 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	6.4 Volts
Calibration	March 12, 2015 by Vibra-Tech Inc.
File Name	O270G7TL.0I1

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

Extended Notes

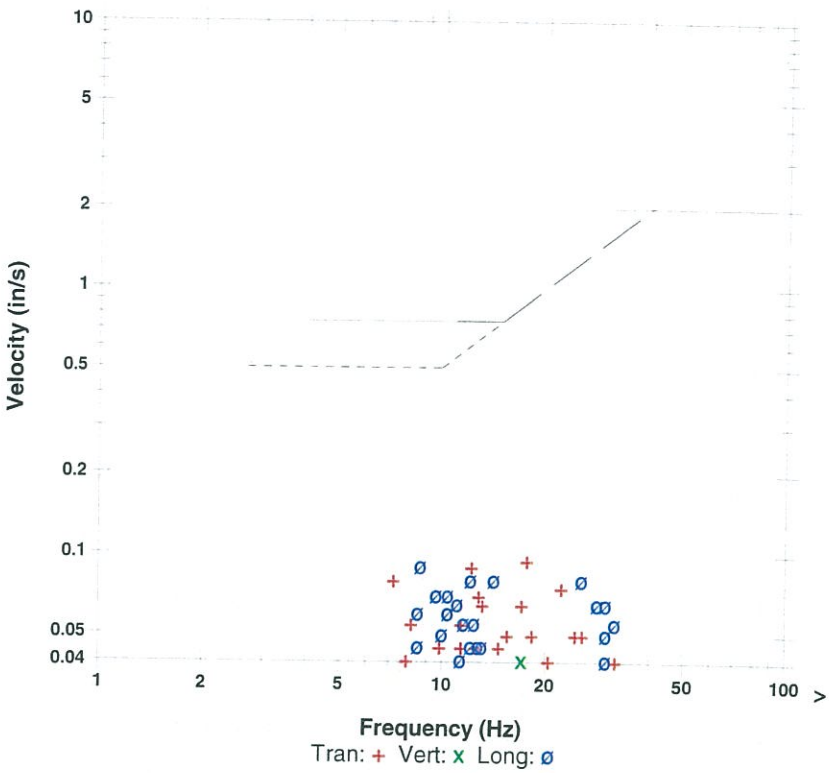
Post Event Notes
Warden Residence: 3,806'

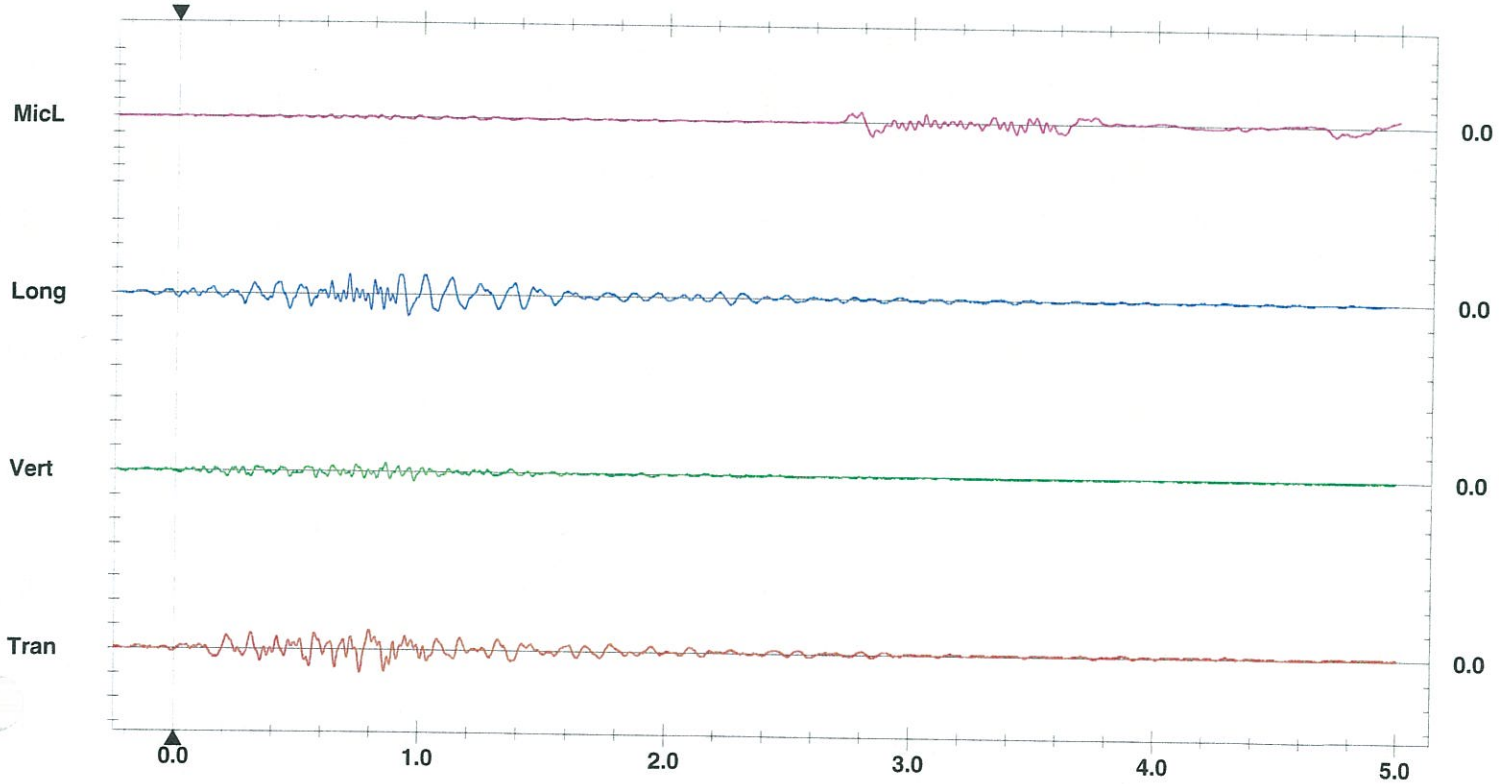
Microphone	Linear Weighting
PSPL	109.2 dB(L) at 2.829 sec
ZC Freq	4.7 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 537 mv)

	Tran	Vert	Long	
PPV	0.0950	0.0400	0.0900	in/s
ZC Freq	18	17	8.7	Hz
Time (Rel. to Trig)	0.759	0.976	0.945	sec
Peak Acceleration	0.0398	0.0265	0.0398	g
Peak Displacement	0.00139	0.00031	0.00125	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.105 in/s at 0.945 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 1-28-16 Blast No. 1-28-16 4B Time 11:53

Exact Blast Location FACE 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' .30"
W 98° 17' 34.9"

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 3,595'

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

Peak Particle Velocity .065 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: [signature] Date: 1-28-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:53:06 January 28, 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	O922G7TL.0I1

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

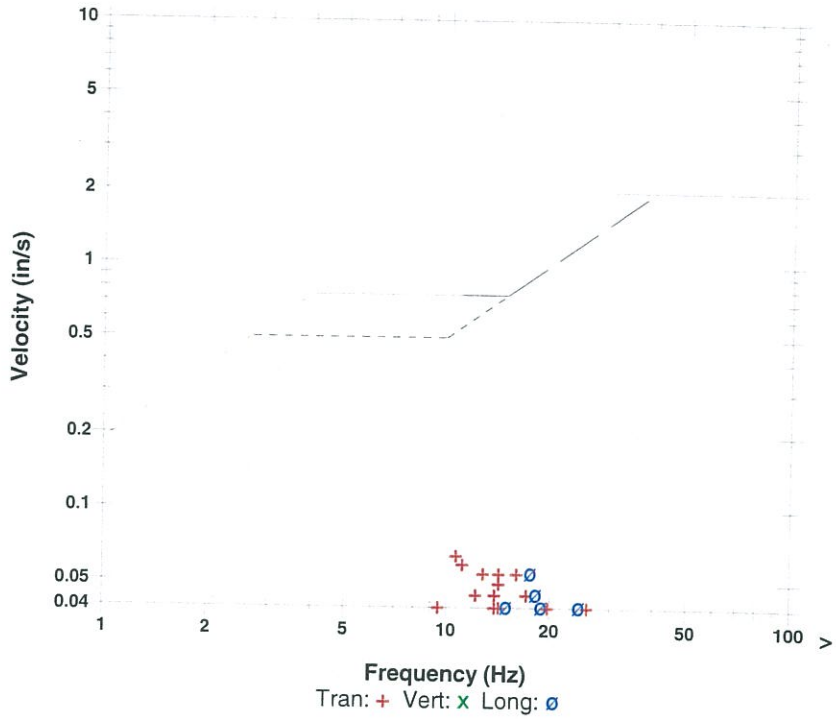
Post Event Notes
Warden Property Line: 3,595'

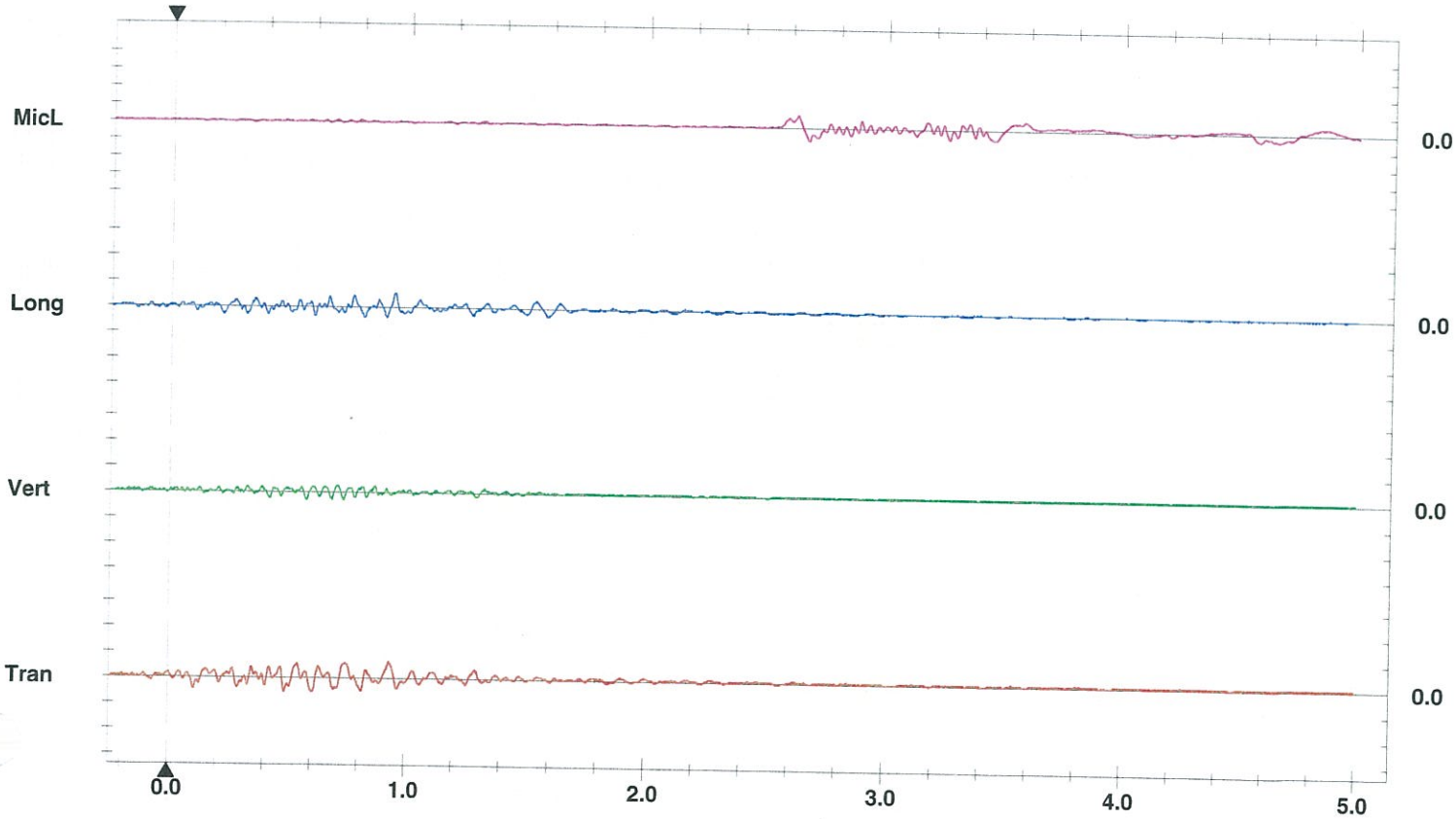
Microphone	Linear Weighting
PSPL	108.0 dB(L) at 2.620 sec
ZC Freq	4.5 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 574 mv)

	Tran	Vert	Long	
PPV	0.0650	0.0300	0.0550	in/s
ZC Freq	11	26	18	Hz
Time (Rel. to Trig)	0.932	0.574	0.938	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00093	0.00023	0.00054	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0815 in/s at 0.938 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 = ▶—— ——◀

Printed: January 28, 2016 (V 7.03 - 7.01)

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-29-16 Blast No. 1-29-16 5B Time 11:42

Exact Blast Location FACE 5B

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' 01.5"

W 98° 17' 17.1"

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 5,105'

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

Peak Particle Velocity .020 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: _____ Date: 01-29-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Vert at 11:42:52 January 29, 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

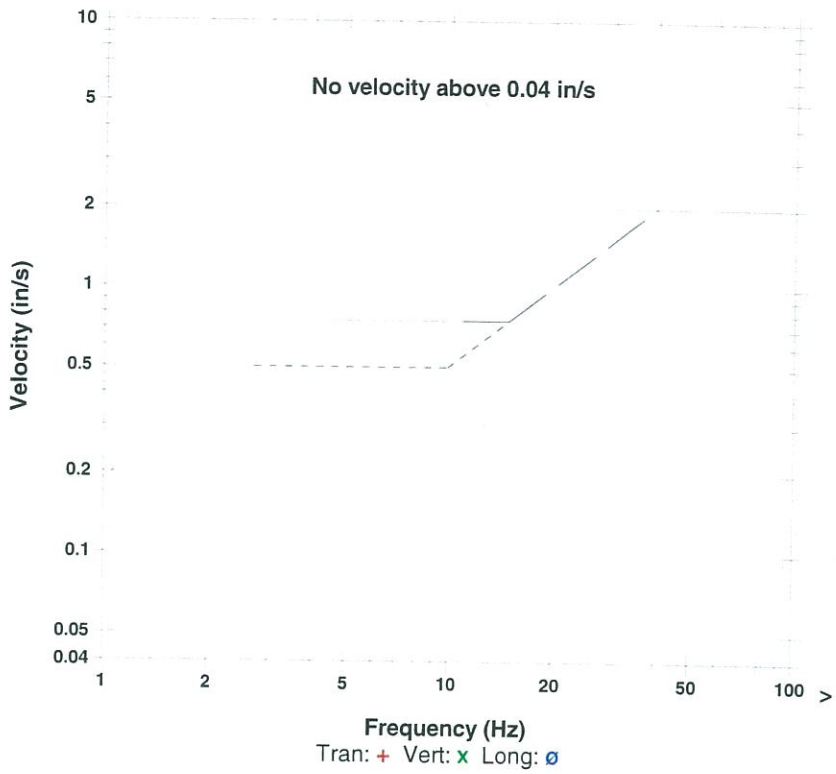
Serial Number	BD6191 V 7.04-8.0 MultiSeis Plus
Battery Level	6.3 Volts
Calibration	July 16, 2015 by Vibra-Tech Inc.
File Name	H191G7VF.7G1

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

Extended Notes

Post Event Notes
City Prop Line: 5,105'

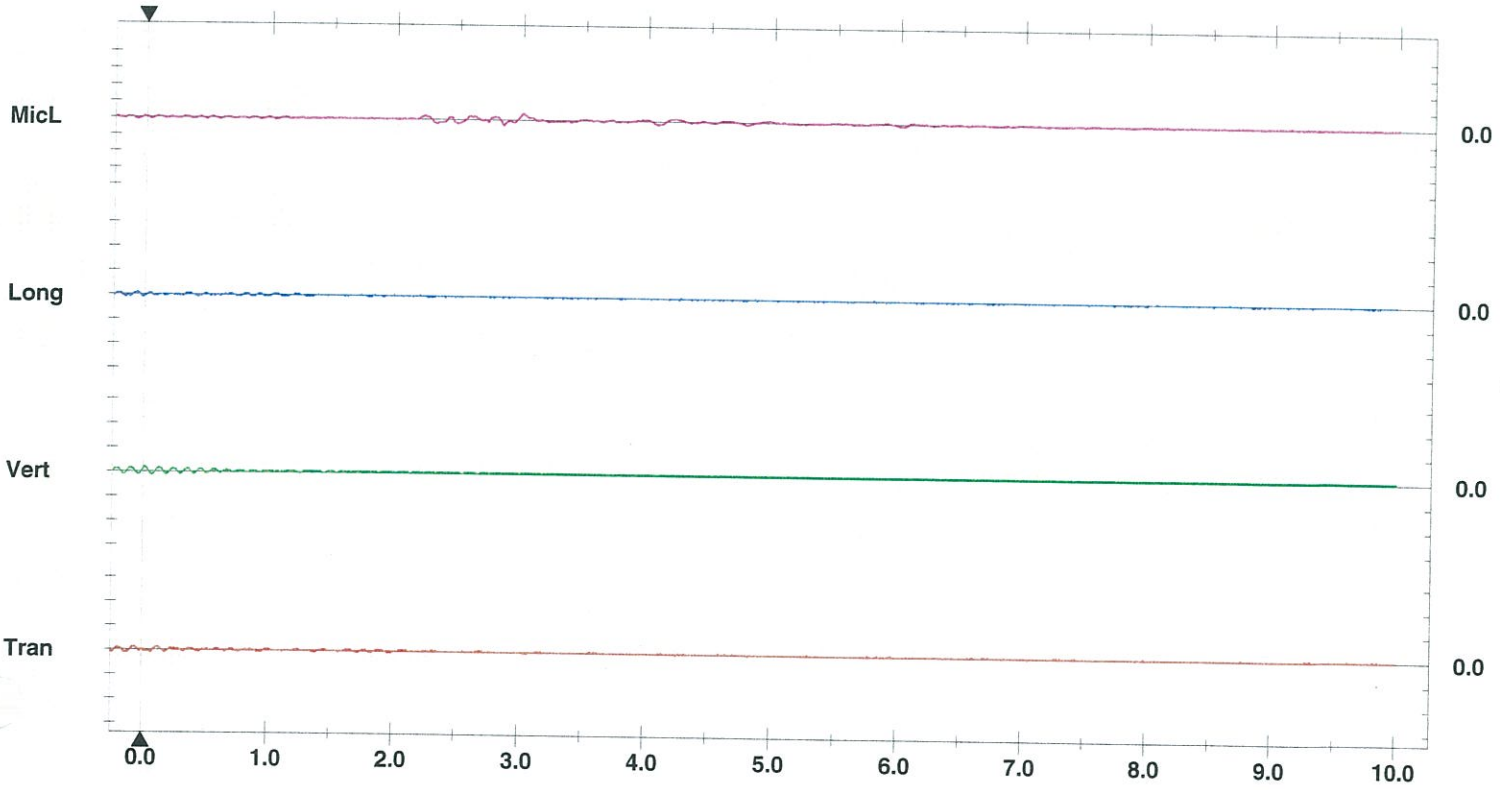
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	101.9 dB(L) at 2.992 sec
ZC Freq	4.1 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 591 mv)

	Tran	Vert	Long	
PPV	0.01000	0.0200	0.01000	in/s
ZC Freq	>100	12	>100	Hz
Time (Rel. to Trig)	-0.248	0.000	-0.165	sec
Peak Acceleration	0.0133	0.0133	0.0133	g
Peak Displacement	0.00015	0.00031	0.00005	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0206 in/s at 0.000 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 1-29-16 Blast No. 1-29-16 5B Time 11:42

Exact Blast Location FACE 5B

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' 01.5"
W 98° 17' 17.1"

MONITOR GPS

N 29 38 31.84
W 98 18 23.43

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 McCormick Residence: 21403 Liguria Drive, George Ranch Subdivision
15' E off NE corner of garage

Seismograph Distance from Blast 6,570'

Peak Overpressure 110.6 dB Scaled Distance ------

Peak Particle Velocity 1030 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: D. L. Date: 01-29-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:42:47 January 29, 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	J949G7VF.7B1

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

Extended Notes

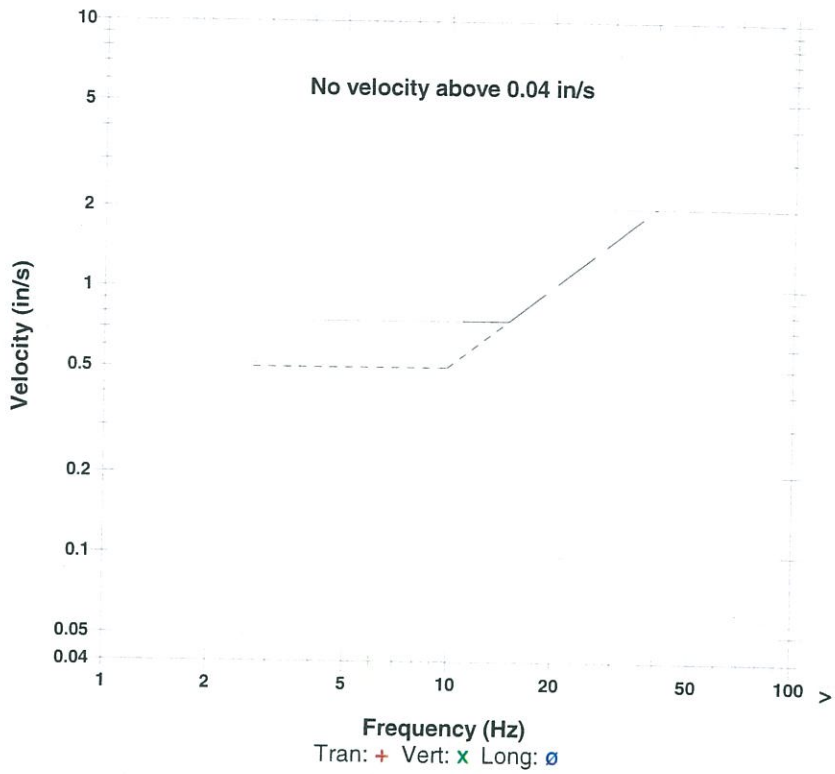
Post Event Notes
McCormick Res: 6,570'

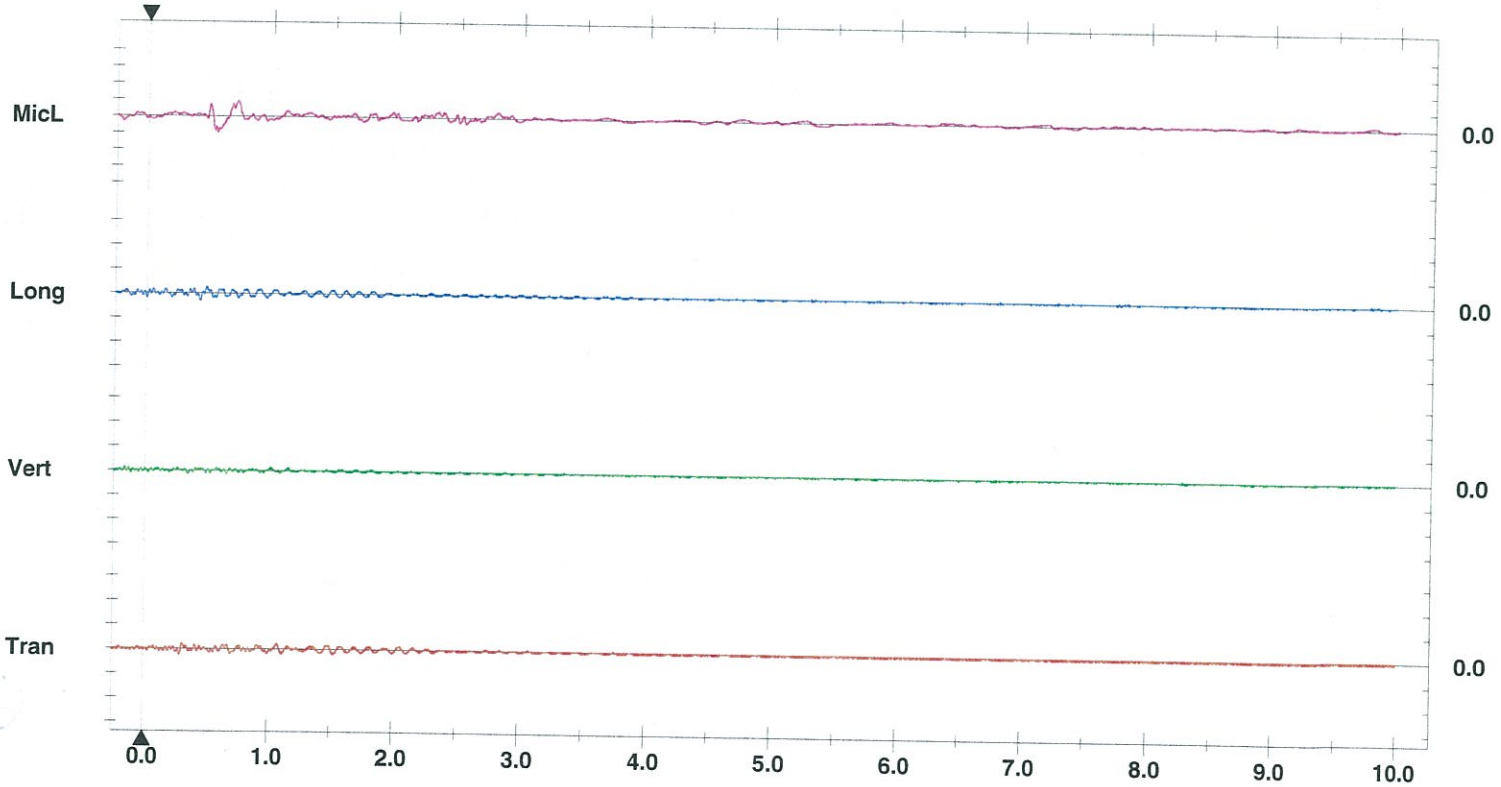
Microphone	Linear Weighting
PSPL	110.6 dB(L) at 0.546 sec
ZC Freq	3.9 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 585 mv)

	Tran	Vert	Long	
PPV	0.0250	0.0150	0.0300	in/s
ZC Freq	24	47	18	Hz
Time (Rel. to Trig)	0.288	-0.161	0.424	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00032	0.00010	0.00033	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0320 in/s at 0.427 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 =

Printed: January 29, 2016 (V 7.03 - 7.01)

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-29-16 Blast No. 1-29-16 5B Time 11:42

Exact Blast Location FACE 5B

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' 01.5"

W 98° 17' 17.1"

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 5,572'

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

Peak Particle Velocity .035 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: D. L. Date: 01-29-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:42:53 January 29, 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

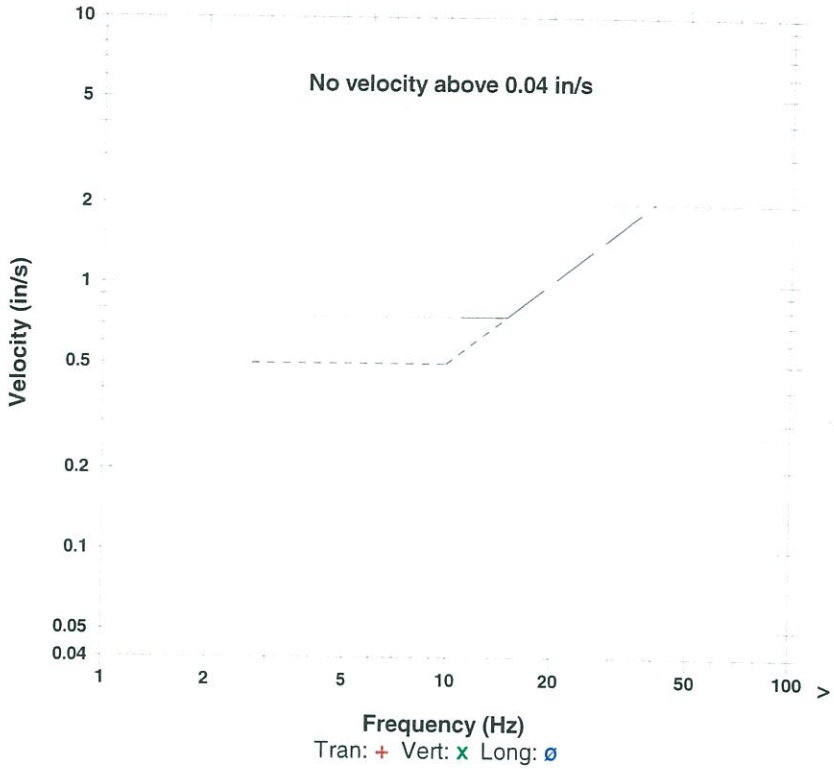
Serial Number	BB10626 V 7.04-8.0 EVERLERT III
Battery Level	6.3 Volts
Calibration	July 21, 2015 by Vibra-Tech Inc.
File Name	L626G7VF.7H1

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

Extended Notes

Post Event Notes
Taveres Res: 5,572'

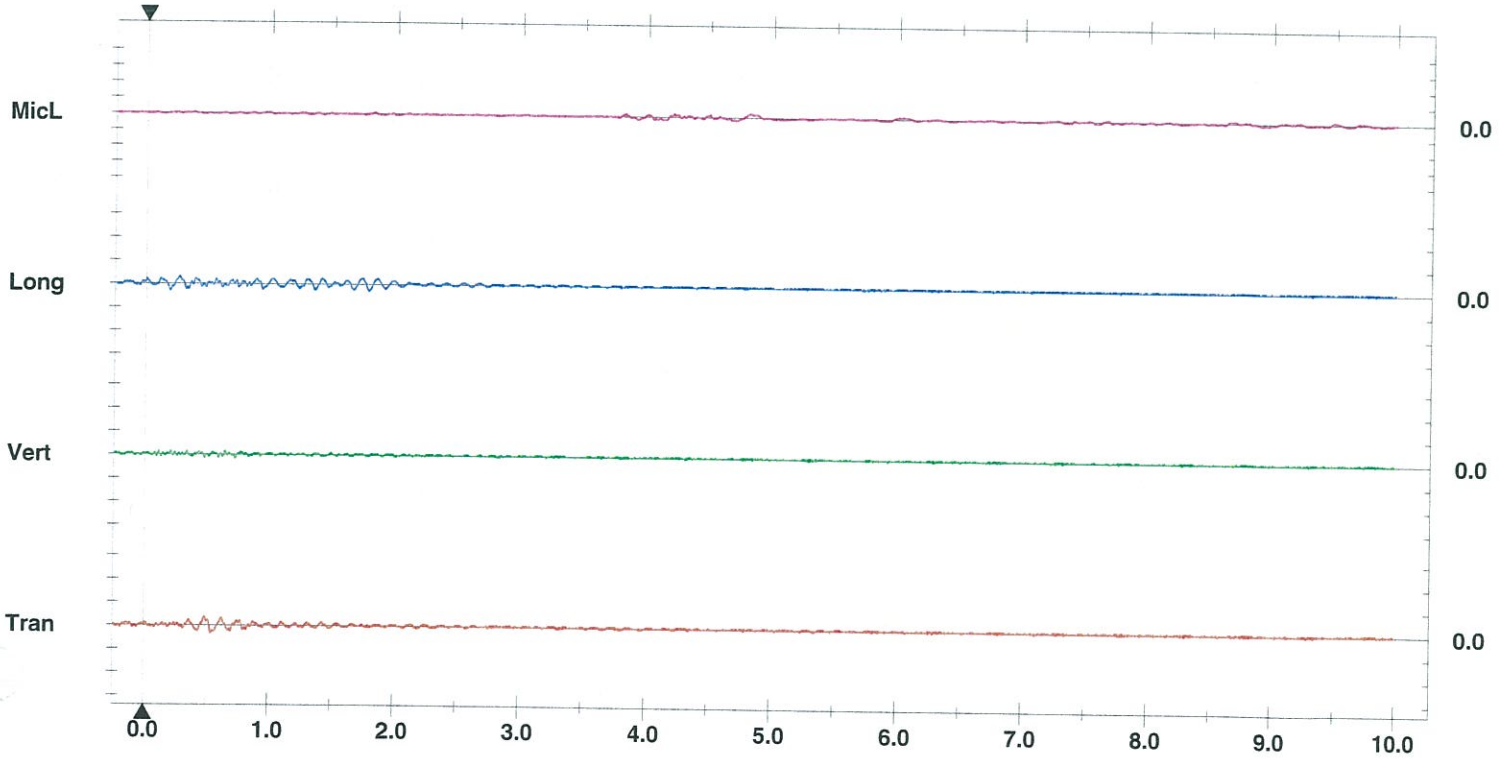
USBM RI8507 And OSMRE



Microphone	Linear Weighting
PSPL	98.8 dB(L) at 4.809 sec
ZC Freq	4.4 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 704 mv)

	Tran	Vert	Long	
PPV	0.0350	0.0150	0.0300	in/s
ZC Freq	9.1	43	9.7	Hz
Time (Rel. to Trig)	0.479	0.107	0.185	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00061	0.00009	0.00056	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0409 in/s at 0.479 sec



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

Printed: January 29, 2016 (V 7.03 - 7.01)

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VIBRA-TECH BLAST AND SEISMOGRAPHIC REPORT

BLAST DATA

Client HANSON SERVTEX

Job Location GARDEN RIDGE, TEXAS QUARRY

Date 1-29-16 Blast No. 1-29-16 5B Time 11:42

Exact Blast Location FACE 5B

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' 01.5"
W 98° 17' 17.1"

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 4,392'

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

Peak Particle Velocity .100 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: D. L. Date: 01-29-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Long at 11:42:54 January 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	BF13270 V 7.04-8.0 MultiSeis Plus
Battery Level	6.5 Volts
Calibration	March 12, 2015 by Vibra-Tech Inc.
File Name	O270G7VF.7I1

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

Extended Notes

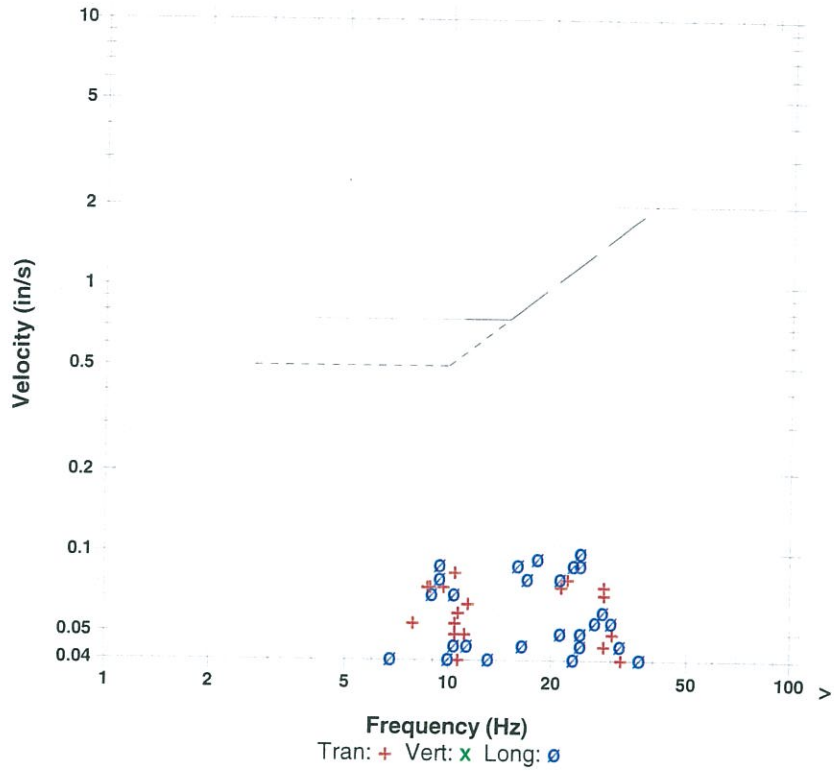
Post Event Notes
Warden Res: 4,392'

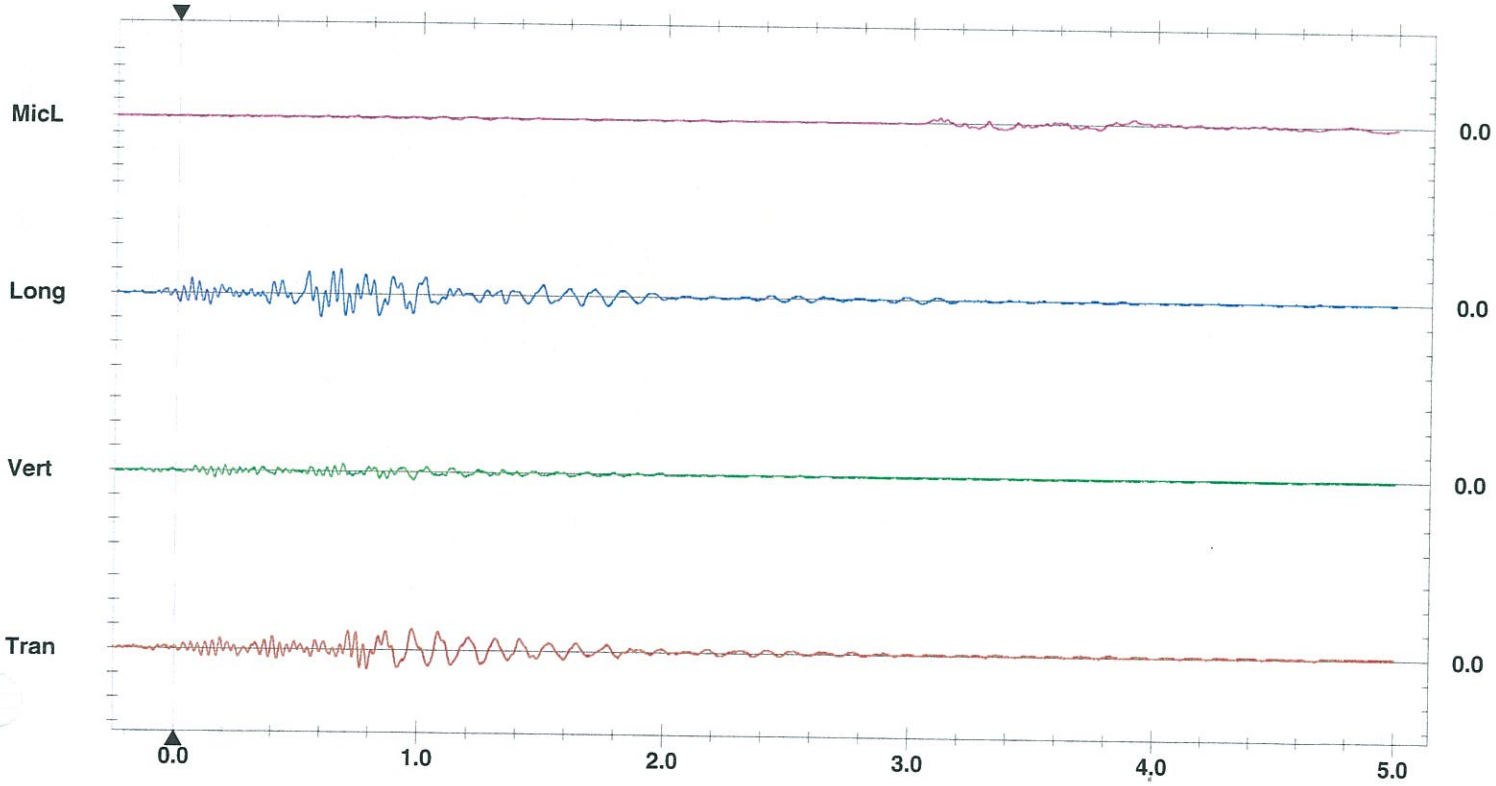
Microphone	Linear Weighting
PSPL	101.0 dB(L) at 3.108 sec
ZC Freq	5.1 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 495 mv)

	Tran	Vert	Long	
PPV	0.0850	0.0350	0.1000	in/s
ZC Freq	10	13	24	Hz
Time (Rel. to Trig)	0.974	0.976	0.673	sec
Peak Acceleration	0.0398	0.0265	0.0398	g
Peak Displacement	0.00128	0.00041	0.00129	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.114 in/s at 0.974 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 1-29-16 Blast No. 1-29-16 5B Time 11:42

Exact Blast Location FACE 5B

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' 01.5"
W 98° 17' 17.1"

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 4,171'

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

Peak Particle Velocity .070 ips Operator DAVID LARNER

Remarks: GEOPHONE SPIKED AND SANDBAGGED

Vibration Analysis by: D. L. Date: 01-29-16

VIBRA-TECH
The Vibration Monitoring Experts

Event Report

Date/Time	Tran at 11:42:54 January 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	BF13922 V 7.04-8.0 MultiSeis Plus
Battery Level	6.4 Volts
Calibration	November 22, 2015 by Vibra-Tech Inc.
File Name	O922G7VF.7I1

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

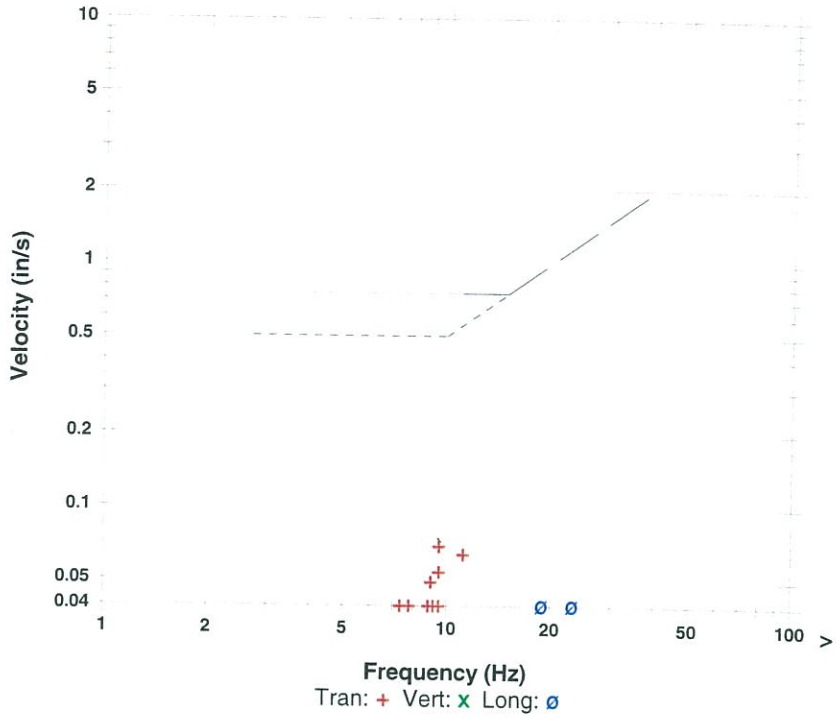
Post Event Notes
Warden Prop Line: 4,171'

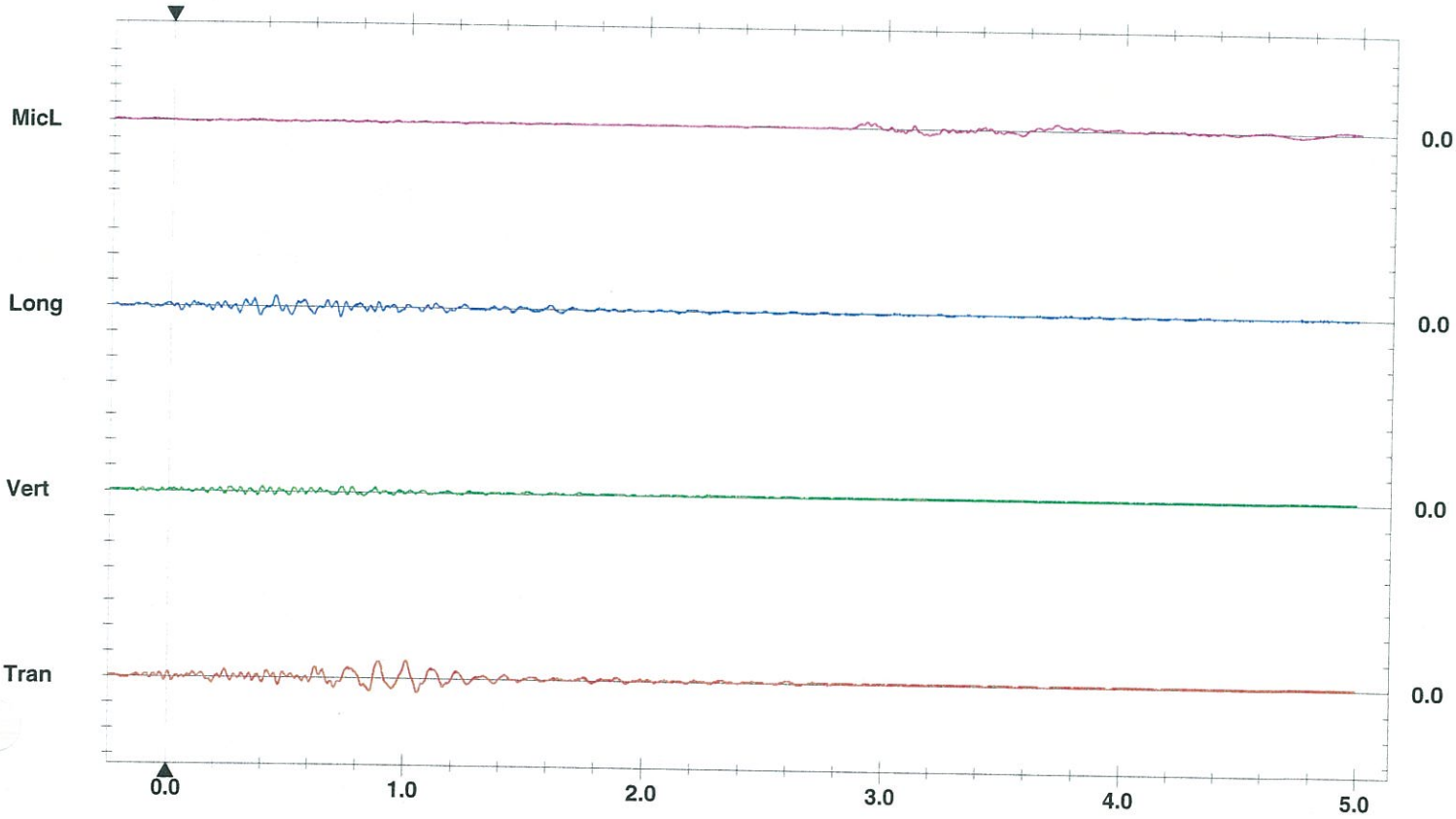
Microphone	Linear Weighting
PSPL	102.8 dB(L) at 2.909 sec
ZC Freq	4.5 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 534 mv)

	Tran	Vert	Long	
PPV	0.0700	0.0200	0.0400	in/s
ZC Freq	9.5	27	19	Hz
Time (Rel. to Trig)	1.008	0.394	0.439	sec
Peak Acceleration	0.0265	0.0265	0.0265	g
Peak Displacement	0.00102	0.00017	0.00042	in
Dynamic Geo Cal.	Passed	Passed	Passed	

Peak Vector Sum 0.0707 in/s at 1.011 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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