

Buckley Powder Co.

BLAST REPORT

SERVICE SITE LOCATION: LouviersORDER NO.: D7403879BLAST NUMBER: #6-05-2018 BLAST TIME: 1:23 pm BLAST DATE: 05/04/2018CUSTOMER: MARTIN MARIETTA MINE: RED CANYON ADDRESS: Colorado Springs, COROCK TYPE: Granite Tons/Yd3: 2.20 EXPECTED VIBRATION: 38.000 IPS

LOCATION OF BLAST

LOCATION OF BLAST IN MINE: North BENCH: Bench 6BLAST GPS POINTS: N 038 36 25.44000 & W -104 56 40.14000

WEATHER

WEATHER: Partly Cloudy CEILING: High TEMPERATURE: 63 F WIND DIRECTION & SPEED: North 3 MPH

NEAREST NON-OWNED STRUCTURE

NAME: North Hillside GPS Points: N 038 36 22.41000 & W -104 56 31.21980DISTANCE: 771 (FT) DIRECTION: 113°

SEISMOGRAPH DATA

LOCATION				DISTANCE		GPS POINTS			CALIBRATION DATE	
1	North Hillside			771 (FT)		N 038 36 22.41000 & W -104 56 31.21980			09/02/2017	
	L (F)	T (F)		V (F)		AIR (db)	SEISMOGRAPH	SERIAL	OPERATOR	
1	0.045	16.7	0.070	20	0.080	41.7	118	VibraTech 7816	7816	

BLAST DATA

NUMBER OF HOLES (EA)		EXPLOSIVES SIZE, TYPE & WEIGHT		
	92	SIZE	TYPE	WEIGHT
HOLE DIAMETER (IN)	4.5	0.44	SPARTAN 200	26.4
HOLE DEPTH (FT)	11 - 48	0.75	SPARTAN 350SR	48
FACE HEIGHT (FT)	45	BULK	TITAN 1000 XL	12,400
SUB DRILLING (FT)	1			
AVG. STEM FACE HOLES (FT)	13.615			
STEM OTHER HOLES (FT)	9.759			
BURDEN FRONT ROW (FT)	13			
BURDEN OTHER ROWS (FT)	13 - 15			
SPACING FRONT ROW (FT)	15			
SPACING OTHER ROWS (FT)	15			
TOTAL WEIGHT (LB):				12,474.4

DETONATORS USED IN BLAST: Electronic MATS USED: No STEM TYPE: 3/4 x 1/2 CRUSHED TOTAL DRILL DEPTH: 2,356 (FT)

TYPE	MFG	DATE CODE	USED	TYPE	MFG	DATE CODE	USED
DIGISHOT DETONATOR 50FT	Dyno Nobel Global	19MA18	65	EZDET 25/350 30 FT	Dyno Nobel Global	19FE18	40
EZDET 25/350 40 FT	Dyno Nobel Global	22JA18	20	EZTL 17MS 20FT	Dyno Nobel Global	06NO17	13
SPARTAN 200	Dyno Nobel Global	08DE17	60	SPARTAN 350SR	Dyno Nobel Global	15AU17	64

CU YDS IN SHOT: 17,233 SCALED DISTANCE FACTOR: 29 % OF ANFO: 0TONS IN SHOT: 37,914 HOLES/DELAY: 3 FUEL OIL % (BULK): 0MAX LBS/DELAY: 682 AVERAGE LBS/HOLE: 136POWDER FACTOR (TONS/LB): 3.04 POWDER FACTOR POUNDS/YD3: 0.72BLASTER'S NAME: Farmer, Jimmie BLASTER'S NUMBER & STATE: 7340 WyomingBLASTER'S SIGNATURE: [Signature] SITE SAFETY INSPECTION PERFORMED: YesNUMBER OF PERSONNEL ON SITE: 4

REMARKS : The main shot loaded good Then we went to the 11' toe hole Pumping these with two feet of powder. The 19' holes We had Two of us tied off to load -stem and tie in this area. The main shot has good breakage and the other holes were more blocker.

START TIME	END TIME	TOTAL TIME	TRUCK NUMBERS
7:30 AM	12:45 PM	05:15	5093

APPENDIX A

Date: 5-4-18

Location: MH Rwy

shot #: 6



BLASTER'S CHECKLIST

Must be filled out as you go!

PRE-TRIP CHECKLIST

☒	Measuring Tapes and lead ends
☒	Burden pole Tape/ Profiler
☒	Loading Poles
☒	Marking Paint
☒	Starter and primers
☒	Blasting Signs & cones
☒	Sirens in working order
☒	Set back stakes
☒	Digital video camera & Tripod

yes / no / NA

☒	Scientific Calculator
☒	Pocket Mirror
☒	Empty Shot bags
☒	Powder Punch
☒	GPS
☒	Non sparking Knife
☒	Wire strippers
☒	Splices
☒	Flash Light & Batteries

yes / no / NA

☒	Drill Logs
☒	Shot reports
☒	Hold Hammieses
☒	Seismographs
☒	Density Cup and Scales
☒	Two Way Radios / fully
☒	Wheel Chocks
☒	Harness & Lanyard / "T" post
☒	First Aid Kits

PRESHIFT CHECKLIST

☒	Inspect blast area for Unsafe Working Conditions (including face) for voids, cracks, caves, etc..
☒	Ensure all employees have their site specific training.
☒	Secure blast site with warning signs and cones (including floor in front of face)
☒	Check shot access including traffic activity
☒	Pre shift inspections on all equipment -OK and safe to operate (includes back up alarms, brakes, horns, etc..)
☒	Mark fall zone area at least six(6) feet from the crest
☒	Inspect Harness/ Lanyard <i>before each use</i> if needed for fall zone or on top of trucks
☒	Insure all needed products are present-enough boosters, detonators etc
☒	Calculate Minimum Burden and Measure front row burden with burden pole or profiler (Document)
☒	Check drill log and all holes for proper depth and blockage
☒	Insure blast design is consistent with closest structures requirements
☒	Any need for calling assistance (Hold Harmless, equipment to close, drilling problems, etc...)
☒	Conduct pre-blast safety meeting with blast crew. <i>if there is not a timing diagram, detonator tie-in must be discussed at the</i>
	Calculate pounds per delay: Expl density x expl diam ² x .3405 = _____ lbs/ ft x avg powder column= _____
	lbs/hole x expected _____ holes / delay = _____ lbs/delay
	Calculate scale distance: 1) Distance _____ 2) divided by lbs/delay _____ 3) hit square root then equals _____ =S.D. (4)
	Calculate expected vibration: S.D.(4) _____ Push 1/x on calculator. Push (yx) key then 1.6 hit equals x 160 = _____ exp. vib.

TIE-IN CHECKLIST

☒	Shot tie inspected and signed off by two persons prior to shot including lead line <i>(include names below)</i>
☒	Blast area is cleared and blocked before attaching starter cap and lead line <i>Mark K Loy</i>
☒	Blaster in charge in communication with all guards at this time
☒	Blaster in charge will insure blast area has been cleared and guarded before the siren is sounded
☒	After proper waiting time blaster in charge will contact all guards before firing blast
☒	Seismograph located at nearest off site structure or at the Property Line related to nearest off-site
☒	Video Recording Made of Shot

POST BLAST CHECKLIST

☒	Maintain guards until shot is cleared and "all clear" is sounded
☒	Check for misfires, undetonated explosives or burning product and other dangers
☒	Sound all clear that is audible to all parties
☒	Dispose of lead line in approved manner
☒	Dispose of empty boxes in approved methods only
☒	Complete all required paper work prior to leaving customer location- shipping Papers, delivery ticket, Blaster's
☒	Make one final check of blast site before leaving property to insure no materials have been left
	and that no hazards are present that may have been missed during clearing process

Must completed and turned in daily- end of shift

Blaster In Charge

J.D. Farmer

Seismic Analysis

Velocity Waveform Analysis

Serial Number: 7816
 Firmware Version: 0C-06.05
 Event Date: 05/04/2018 13:23:41 (UTC -06:00)
 Event number: 14
 Recording Time: 5 s
 Client: Martin Marietta
 Operation: Red Canyon Quarry
 Location: North Hill Side
 Distance:
 Operator: Vibra Tech
 Comment: Pueblo, Colorado
 Seismic Trigger: 0.02 in/s
 Sound Trigger: 133 dB

Additional Info:

j-GEO-16060
 N38 36 22 W104 56 31

Summary Data

	L	T	V
PPV (in/s):	0.045	0.07	0.08
FREQ (HZ):	16.7	20	41.7
PD (.001"):	0.43	0.58	0.67
PPA (g):	0.039	0.046	0.059

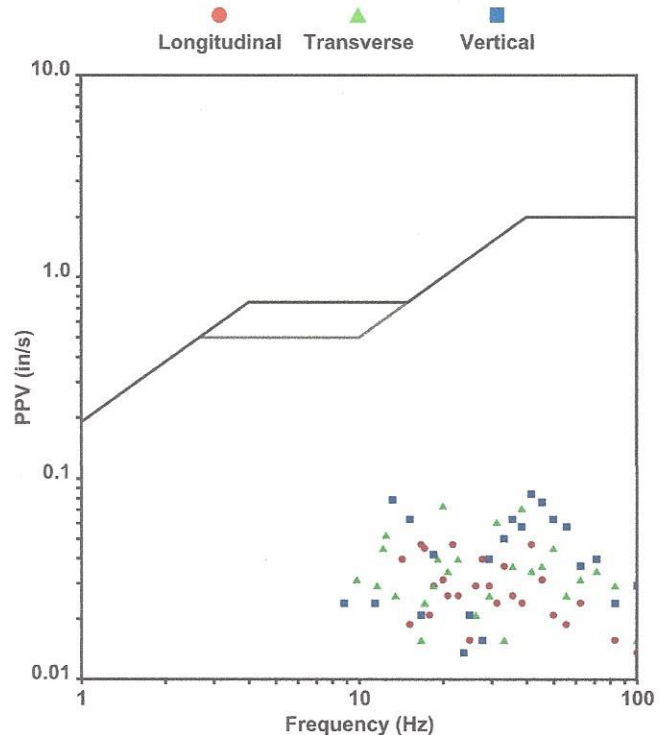
Peak Vector Sum: 0.088 in/s
 Peak Air Pressure: 118 dB
 0.0025 psi @ 5.1 HZ

Shaketable Calibrated

On: 09/02/2017 (UTC -06:00)
 By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40203 U.S.A.

USBM Safe Blasting Levels

SSN: 7816 Event: 14



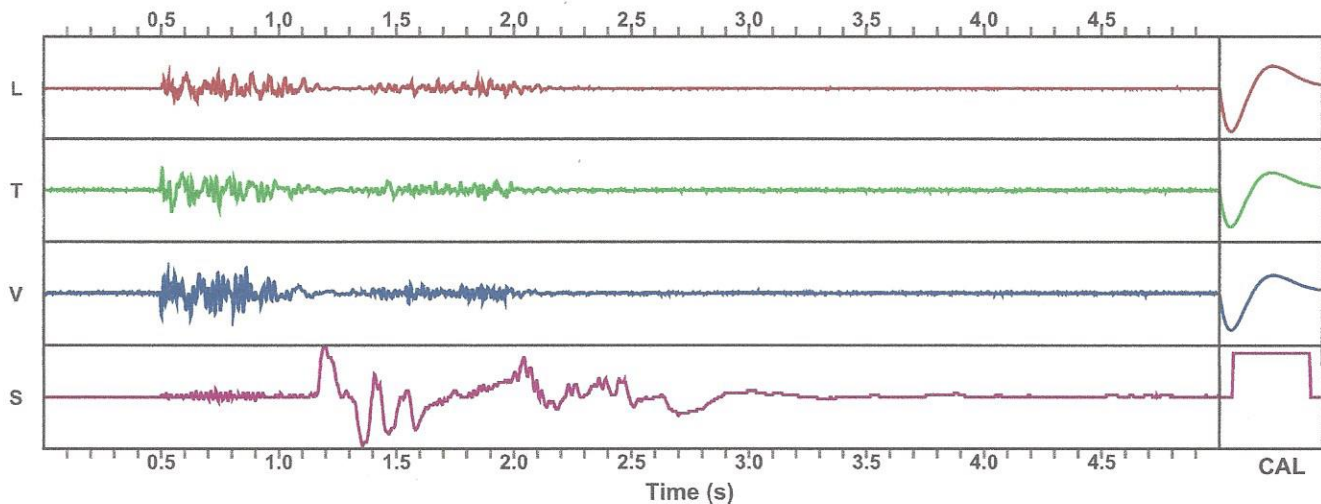
Zero Crossing Half-Wave Frequency Analysis

Waveform Graph Scale

Time Scale: 0.1 s
 Seismic Scale: +/- 0.16 in/s
 Sound Scale: +/- 0.0025 psi

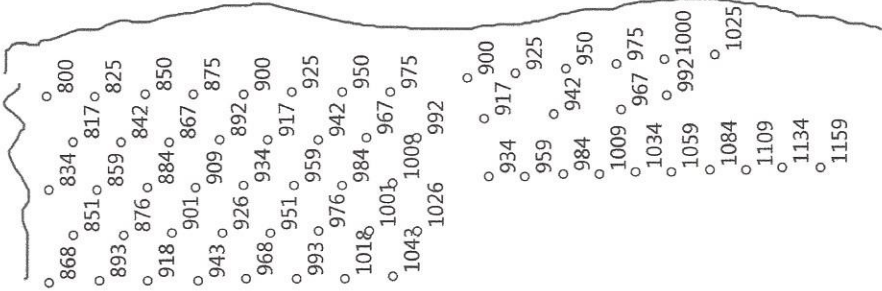
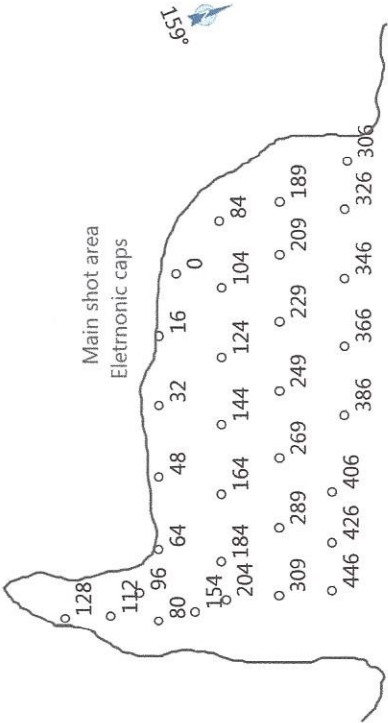
Velocity Waveform

SSN: 7816 Event: 14



Buckley Powder Co.
 CUSTOMER NAME: RED CANYON
 BENCH: Bench 6
 BLASTER'S NAME: Farmer, Jimmie

DIAGRAM
 BLAST DATE: 05/04/2018
 BLAST NUMBER: #6-05-2018



Shot: #6-05-2018

Bench: Bench 6

Customer: MARTIN MARIETTA

Site: Louviers

Load Sheet Report



Mine: RED CANYON	Shot: #6-05-2018	Date: 5/4/2018	Time: 1:23PM
Blaster: Farmer, Jimmie	License: 7340	Material: Granite	Holes: 92
Diameter: 4.5 (IN)	Burden: 15 (FT)	Spacing: 15 (FT)	Primers: 124
Exp. Vibration: 38.00 IPS	Fr. Burden: 13 (FT)	Fr. Spacing: 15 (FT)	Total Exp.: 12,474 (LB)
Fuel: 0 (LB)	AN: 0 (LB)	ANFO: 0 (LB)	Emulsion: 12,400 (LB)
Depth: 11 - 48 (FT)	YD3: 17,233	Tons: 37,914	Tons/Lb: 3.04
Gallons of Fuel: 0			
Max Lbs/Delay: 682 (LB)	Holes / 8ms: 3	Location: N 038 36 25.44000	& W -104 56 40.1400
Temperature: 63° F	Wind Dir: North	Wind Speed: 3 MPH	Ceiling: High
Conditions: Partly Cloudy	Method of Detonation: Electronic		
Pre-Blast Inspection Performed: ☒ Yes / ☐ No	Initiation: Remote		
Load Started: 7:30 AM	Load Ended: 12:45 PM	Total Load Time: 05:15	
Comments: The main shot loaded good Then we went to the 11' toe hole Pumping these with two feet of powder. The 19' holes We had Two of us tied off to load -stem and tie in this area. The main shot has good breakage and the other holes were more blocker.			

Crew

Name	Hours	Name	Hours
Jerry Wright	6	Matt Klepfer	7
Thomas Stocker	6		

Trucks Used: 5093

Inventory

Description	Date Code	Out	Description	Date Code	Out
EZTL 17MS 20FT	06NO17	13	SPARTAN 200	08DE17	60
SPARTAN 350SR	15AU17	64	EZDET 25/350 30 FT	19FE18	40
EZDET 25/350 40 FT	22JA18	20	DIGISHOT DETONATOR 50FT	19MA18	65

Services

Service	Quantity	Service	Quantity
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Product Totals

Product	Total (LB)
SPARTAN 200	26.4
SPARTAN 350SR	48
TITAN 1000 XL	12,400

Row	Col	Depth	Rise	Stem	Wet?	Product	Hole Total (LB)
A	1	48	34	14	No	SPARTAN 350SR	1.5
A	1	48	34	14	No	TITAN 1000 XL	317.5
A	2	48	34	14	No	SPARTAN 350SR	1.5
A	2	48	34	14	No	TITAN 1000 XL	317.5
A	3	48	34	14	No	SPARTAN 350SR	1.5
A	3	48	34	14	No	TITAN 1000 XL	317.5
A	4	48	34	14	No	SPARTAN 350SR	1.5
A	4	48	34	14	No	TITAN 1000 XL	317.5
A	5	48	34	14	No	SPARTAN 350SR	1.5
A	5	48	34	14	No	TITAN 1000 XL	317.5
A	6	48	34	14	No	SPARTAN 350SR	1.5
A	6	48	34	14	No	TITAN 1000 XL	317.5
A	7	48	34	14	No	SPARTAN 350SR	1.5
A	7	48	34	14	No	TITAN 1000 XL	317.5
A	8	48	34	14	No	SPARTAN 350SR	1.5
A	8	48	34	14	No	TITAN 1000 XL	317.5
A	9	48	34	14	No	SPARTAN 350SR	1.5
A	9	48	34	14	No	TITAN 1000 XL	317.5
B	1	48	34	14	No	SPARTAN 350SR	1.5
B	1	48	34	14	No	TITAN 1000 XL	317.5
B	2	48	39	9	No	SPARTAN 350SR	1.5
B	2	48	39	9	No	TITAN 1000 XL	339.5
B	3	48	39	9	No	SPARTAN 350SR	1.5
B	3	48	39	9	No	TITAN 1000 XL	339.5
B	4	48	39	9	No	SPARTAN 350SR	1.5
B	4	48	39	9	No	TITAN 1000 XL	339.5
B	5	48	39	9	No	SPARTAN 350SR	1.5
B	5	48	39	9	No	TITAN 1000 XL	339.5
B	6	48	39	9	No	SPARTAN 350SR	1.5
B	6	48	39	9	No	TITAN 1000 XL	339.5
B	7	48	39	9	No	SPARTAN 350SR	1.5
B	7	48	39	9	No	TITAN 1000 XL	339.5
B	8	48	39	9	No	SPARTAN 350SR	1.5
B	8	48	39	9	No	TITAN 1000 XL	339.5
C	1	48	34	14	No	SPARTAN 350SR	1.5
C	1	48	34	14	No	TITAN 1000 XL	317.5
C	2	48	39	9	No	SPARTAN 350SR	1.5
C	2	48	39	9	No	TITAN 1000 XL	339.5
C	3	48	39	9	No	SPARTAN 350SR	1.5
C	3	48	39	9	No	TITAN 1000 XL	339.5
C	4	48	39	9	No	SPARTAN 350SR	1.5

C	4	48	39	9	No	TITAN 1000 XL	339.5
C	5	48	39	9	No	SPARTAN 350SR	1.5
C	5	48	39	9	No	TITAN 1000 XL	339.5
C	6	48	39	9	No	SPARTAN 350SR	1.5
C	6	48	39	9	No	TITAN 1000 XL	339.5
C	7	48	39	9	No	SPARTAN 350SR	1.5
C	7	48	39	9	No	TITAN 1000 XL	339.5
D	1	48	34	14	No	SPARTAN 350SR	1.5
D	1	48	34	14	No	TITAN 1000 XL	317.5
D	2	48	39	9	No	SPARTAN 350SR	1.5
D	2	48	39	9	No	TITAN 1000 XL	339.5
D	3	48	39	9	No	SPARTAN 350SR	1.5
D	3	48	39	9	No	TITAN 1000 XL	339.5
D	4	48	39	9	No	SPARTAN 350SR	1.5
D	4	48	39	9	No	TITAN 1000 XL	339.5
D	5	48	39	9	No	SPARTAN 350SR	1.5
D	5	48	39	9	No	TITAN 1000 XL	339.5
D	6	48	39	9	No	SPARTAN 350SR	1.5
D	6	48	39	9	No	TITAN 1000 XL	339.5
D	7	48	39	9	No	SPARTAN 350SR	1.5
D	7	48	39	9	No	TITAN 1000 XL	339.5
D	8	48	39	9	No	SPARTAN 350SR	1.5
D	8	48	39	9	No	TITAN 1000 XL	339.5
E	1	11	2	9	No	SPARTAN 200	0.44
E	1	11	2	9	No	TITAN 1000 XL	18
E	2	11	2	9	No	SPARTAN 200	0.44
E	2	11	2	9	No	TITAN 1000 XL	18
E	3	11	2	9	No	SPARTAN 200	0.44
E	3	11	2	9	No	TITAN 1000 XL	18
E	4	11	2	9	No	SPARTAN 200	0.44
E	4	11	2	9	No	TITAN 1000 XL	18
E	5	11	2	9	No	SPARTAN 200	0.44
E	5	11	2	9	No	TITAN 1000 XL	18
E	6	11	2	9	No	SPARTAN 200	0.44
E	6	11	2	9	No	TITAN 1000 XL	18
E	7	11	2	9	No	SPARTAN 200	0.44
E	7	11	2	9	No	TITAN 1000 XL	18
E	8	11	2	9	No	SPARTAN 200	0.44
E	8	11	2	9	No	TITAN 1000 XL	18
F	1	11	2	9	No	SPARTAN 200	0.44
F	1	11	2	9	No	TITAN 1000 XL	18
F	2	11	2	9	No	SPARTAN 200	0.44
F	2	11	2	9	No	TITAN 1000 XL	18

F	3	11	2	9	No	SPARTAN 200	0.44
F	3	11	2	9	No	TITAN 1000 XL	18
F	4	11	2	9	No	SPARTAN 200	0.44
F	4	11	2	9	No	TITAN 1000 XL	18
F	5	11	2	9	No	SPARTAN 200	0.44
F	5	11	2	9	No	TITAN 1000 XL	18
F	6	11	2	9	No	SPARTAN 200	0.44
F	6	11	2	9	No	TITAN 1000 XL	18
F	7	11	2	9	No	SPARTAN 200	0.44
F	7	11	2	9	No	TITAN 1000 XL	18
F	8	11	2	9	No	SPARTAN 200	0.44
F	8	11	2	9	No	TITAN 1000 XL	18
G	1	11	2	9	No	SPARTAN 200	0.44
G	1	11	2	9	No	TITAN 1000 XL	18
G	2	11	2	9	No	SPARTAN 200	0.44
G	2	11	2	9	No	TITAN 1000 XL	18
G	3	11	2	9	No	SPARTAN 200	0.44
G	3	11	2	9	No	TITAN 1000 XL	18
G	4	11	2	9	No	SPARTAN 200	0.44
G	4	11	2	9	No	TITAN 1000 XL	18
G	5	11	2	9	No	SPARTAN 200	0.44
G	5	11	2	9	No	TITAN 1000 XL	18
G	6	11	2	9	No	SPARTAN 200	0.44
G	6	11	2	9	No	TITAN 1000 XL	18
G	7	11	2	9	No	SPARTAN 200	0.44
G	7	11	2	9	No	TITAN 1000 XL	18
G	8	11	2	9	No	SPARTAN 200	0.44
G	8	11	2	9	No	TITAN 1000 XL	18
H	1	11	2	9	No	SPARTAN 200	0.44
H	1	11	2	9	No	TITAN 1000 XL	18
H	2	11	2	9	No	SPARTAN 200	0.44
H	2	11	2	9	No	TITAN 1000 XL	18
H	3	11	2	9	No	SPARTAN 200	0.44
H	3	11	2	9	No	TITAN 1000 XL	18
H	4	11	2	9	No	SPARTAN 200	0.44
H	4	11	2	9	No	TITAN 1000 XL	18
H	5	11	2	9	No	SPARTAN 200	0.44
H	5	11	2	9	No	TITAN 1000 XL	18
H	6	11	2	9	No	SPARTAN 200	0.44
H	6	11	2	9	No	TITAN 1000 XL	18
H	7	11	2	9	No	SPARTAN 200	0.44
H	7	11	2	9	No	TITAN 1000 XL	18
H	8	11	2	9	No	SPARTAN 200	0.44

H	8	11	2	9	No	TITAN 1000 XL	18
I	1	11	2	9	No	SPARTAN 200	0.44
I	1	11	2	9	No	TITAN 1000 XL	18
I	2	11	2	9	No	SPARTAN 200	0.44
I	2	11	2	9	No	TITAN 1000 XL	18
I	3	11	2	9	No	SPARTAN 200	0.44
I	3	11	2	9	No	TITAN 1000 XL	18
I	4	11	2	9	No	SPARTAN 200	0.44
I	4	11	2	9	No	TITAN 1000 XL	18
I	5	11	2	9	No	SPARTAN 200	0.44
I	5	11	2	9	No	TITAN 1000 XL	18
I	6	11	2	9	No	SPARTAN 200	0.44
I	6	11	2	9	No	TITAN 1000 XL	18
I	7	11	2	9	No	SPARTAN 200	0.44
I	7	11	2	9	No	TITAN 1000 XL	18
I	8	11	2	9	No	SPARTAN 200	0.44
I	8	11	2	9	No	TITAN 1000 XL	18
J	1	19	7	12	No	SPARTAN 200	0.44
J	1	19	7	12	No	TITAN 1000 XL	54
J	2	19	7	12	No	SPARTAN 200	0.44
J	2	19	7	12	No	TITAN 1000 XL	54
J	3	19	7	12	No	SPARTAN 200	0.44
J	3	19	7	12	No	TITAN 1000 XL	54
J	4	19	7	12	No	SPARTAN 200	0.44
J	4	19	7	12	No	TITAN 1000 XL	54
J	5	19	7	12	No	SPARTAN 200	0.44
J	5	19	7	12	No	TITAN 1000 XL	54
J	6	19	7	12	No	SPARTAN 200	0.44
J	6	19	7	12	No	TITAN 1000 XL	54
J	7	19	7	12	No	SPARTAN 200	0.44
J	7	19	7	12	No	TITAN 1000 XL	54
J	8	19	7	12	No	SPARTAN 200	0.44
J	8	19	7	12	No	TITAN 1000 XL	54
J	9	19	7	12	No	SPARTAN 200	0.44
J	9	19	7	12	No	TITAN 1000 XL	54
J	10	19	7	12	No	SPARTAN 200	0.44
J	10	19	7	12	No	TITAN 1000 XL	54
K	1	19	7	12	No	SPARTAN 200	0.44
K	1	19	7	12	No	TITAN 1000 XL	54
K	2	19	7	12	No	SPARTAN 200	0.44
K	2	19	7	12	No	TITAN 1000 XL	54
K	3	19	7	12	No	SPARTAN 200	0.44
K	3	19	7	12	No	TITAN 1000 XL	54

K	4	19	7	12	No	SPARTAN 200	0.44
K	4	19	7	12	No	TITAN 1000 XL	54
K	5	19	7	12	No	SPARTAN 200	0.44
K	5	19	7	12	No	TITAN 1000 XL	54
K	6	19	7	12	No	SPARTAN 200	0.44
K	6	19	7	12	No	TITAN 1000 XL	54
K	7	19	7	12	No	SPARTAN 200	0.44
K	7	19	7	12	No	TITAN 1000 XL	54
K	8	19	7	12	No	SPARTAN 200	0.44
K	8	19	7	12	No	TITAN 1000 XL	54
K	9	19	7	12	No	SPARTAN 200	0.44
K	9	19	7	12	No	TITAN 1000 XL	54
K	10	19	7	12	No	SPARTAN 200	0.44
K	10	19	7	12	No	TITAN 1000 XL	54