

Martin Marietta Red Canyon Quarry

Blasting Procedures

This document shall be reviewed and, and updated as needed, on an annual basis.

1. Blast Design

- Before a new blast pattern is designed, results from the previous blast, including seismic outcomes, will be reviewed by quarry management and the blasting contractor.
- Safety and environmental considerations, including nearby neighbors, will be discussed prior to blast layout.
- No holes will be drilled without discussion with the blasting contractor, and quarry management, to determine the location and design that is best fit for the intended blast outcome, and the capabilities of the blasting contractor's crew and equipment.
- At a minimum, all holes along an open face will be placed by the blasting contractor after measurement of the face profiles, or with the assistance of setbacks.
- Any changes in blast design parameters (burden, spacing, borehole diameter, etc) will be communicated and documented via the drill log and/or blast layout diagram ("dot sheet").

2. Blast Scheduling and Notification

- All blasting will be conducted on weekdays, and between the hours of 8am and 3pm.
- Blasts will be scheduled with the blasting contractor at least 72 hours in advance.
 - Planned Blast Date: 11-29-16 Planned Blast Time: Noon - 3 pm
- The following persons/entities will be notified at least 72 hours in advance.
 - Tim Cazier, Colorado Division of Reclamation, Mining & Safety: 303.866.3567, ext. 8169
 - Ken Bishop, adjoining property owner: ken@kidlynx.com
- If a scheduled blast must be postponed due to weather or other complications, the above persons must be notified as soon as possible, and updated with the revised blast schedule.

NOTIFIED
BY EMAIL
ON 11-21-16

3. Blast Reporting and Recordkeeping

- A blast report will be completed by the certified Blaster In Charge after each blast, and will include the following information, at a minimum.
 - Blast date, time, and location, including GPS coordinates of the blast.
 - Weather conditions and wind direction.
 - Blast hole diameter, depth, explosives and inert (stemming) load, and quantity.
 - Overall blast geometry, including hole burden and spacing, tonnage, and a blast diagram.
 - Overall explosives consumption, including detonators and packaged explosives product.
 - Seismic data recorded from at least one critical location, such as the nearest non-quarry-owned inhabited structure.
 - After blast loading is complete, and prior to initiation, explosives inventories will be counted and compared to load records to ensure no explosives were left on-bench. Prior to departure, the blasting contractor will provide quarry management with a record of all explosives consumed onsite.

4. Blast Day Communication

- A safety meeting will be the morning of the each blast, to include the blasting contractor and quarry management (pit foreman or above). The group will review the blast load plan and clearing procedures, safety considerations, and the completed driller's log.
- While the blast is being loaded, access to the blast area will be restricted to authorized personnel, and a representative of Martin Marietta will remain within communication range of the loading crew.
- After loading is complete, and prior to any energy source is connected to the blast, quarry management (pit foreman or above) will ensure that all personnel are evacuated from the blast zone.
- The certified Blaster In Charge will make the final drive-through of the blast area to ensure that all personnel and equipment are cleared out.
- Radio silence will be maintained, except for emergency or blasting-related communication.
- A head count of persons at the quarry will be taken prior to initiating the blasting sequence.

5. Concerns & Complaints

- Further policy and procedure guidance is available through Martin Marietta's *Blasting Rules and Regulations* handbook (the "Orange Book"). Additional copies can be obtained from Martin Marietta's Explosives Engineering Department.
- All blasting-related complaints will be documented at the mine site, and addressed as per company standards outlined in the Orange Book.
- Safety, performance, and neighbor relations concerns will be addressed as needed, including involvement from Martin Marietta's Explosives Engineering department.

Seismic Analysis

Velocity Waveform Analysis

Serial Number: 9835
 Firmware Version: 0C-06.05
 Event Date: 11/29/2016 14:12:23 (UTC -07:00)
 Event number: 2
 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

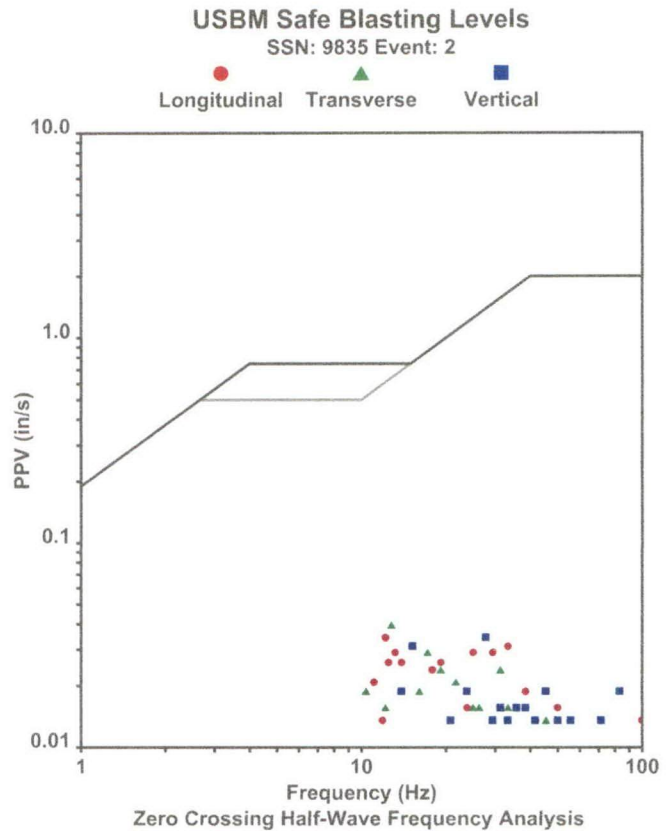
Summary Data

	L	T	V
PPV (in/s):	0.033	0.038	0.033
FREQ (HZ):	11.6	12.5	21.7
PD (.001"):	0.36	0.38	0.28
PPA (g):	0.026	0.026	0.026

Peak Vector Sum: 0.04 in/s
 Peak Air Pressure: 112 dB
 0.0013 psi @ 3.5 HZ

Shaketable Calibrated

On: 10/21/2016 (UTC -07:00)
 By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40203 U.S.A.

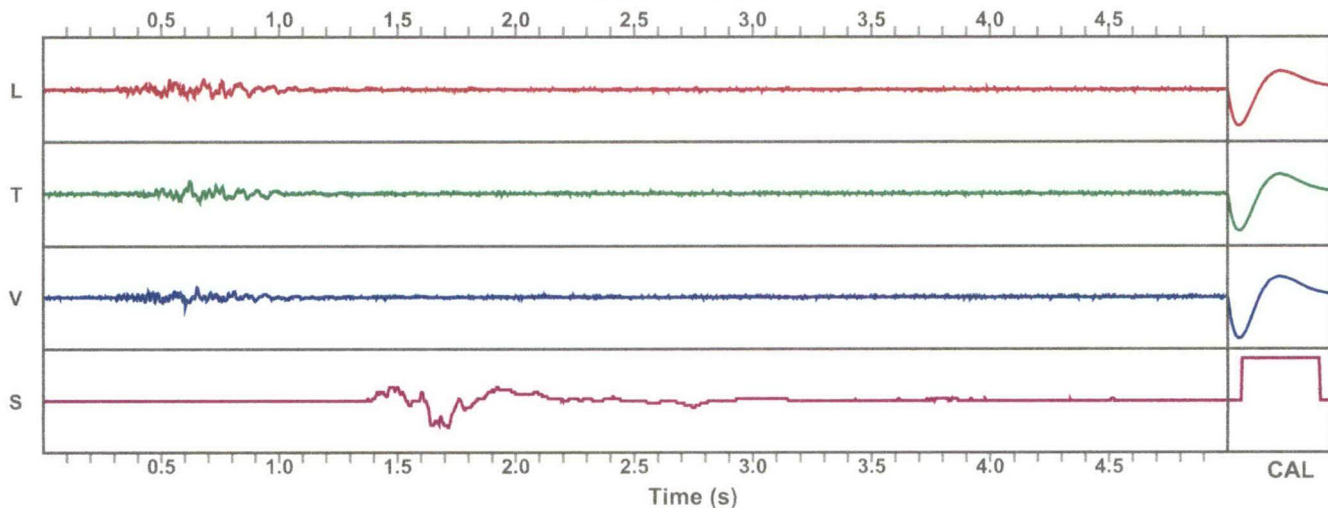


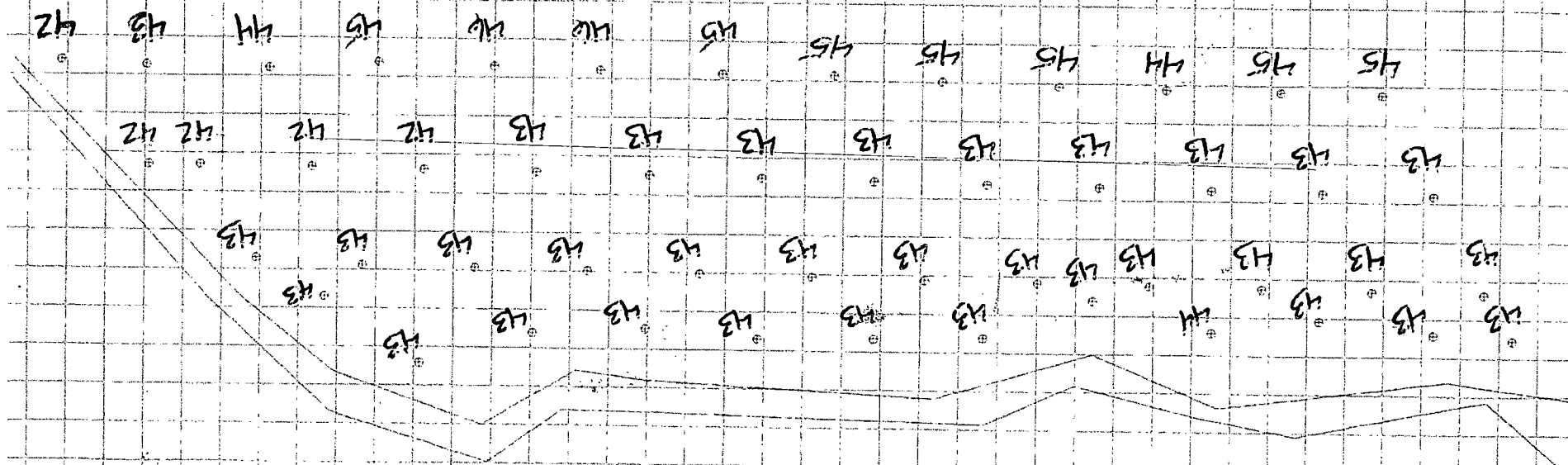
Waveform Graph Scale

Time Scale: 0.1 s
 Seismic Scale: +/- 0.16 in/s
 Sound Scale: +/- 0.0023 psi

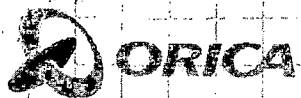
Velocity Waveform

SSN: 9835 Event: 2



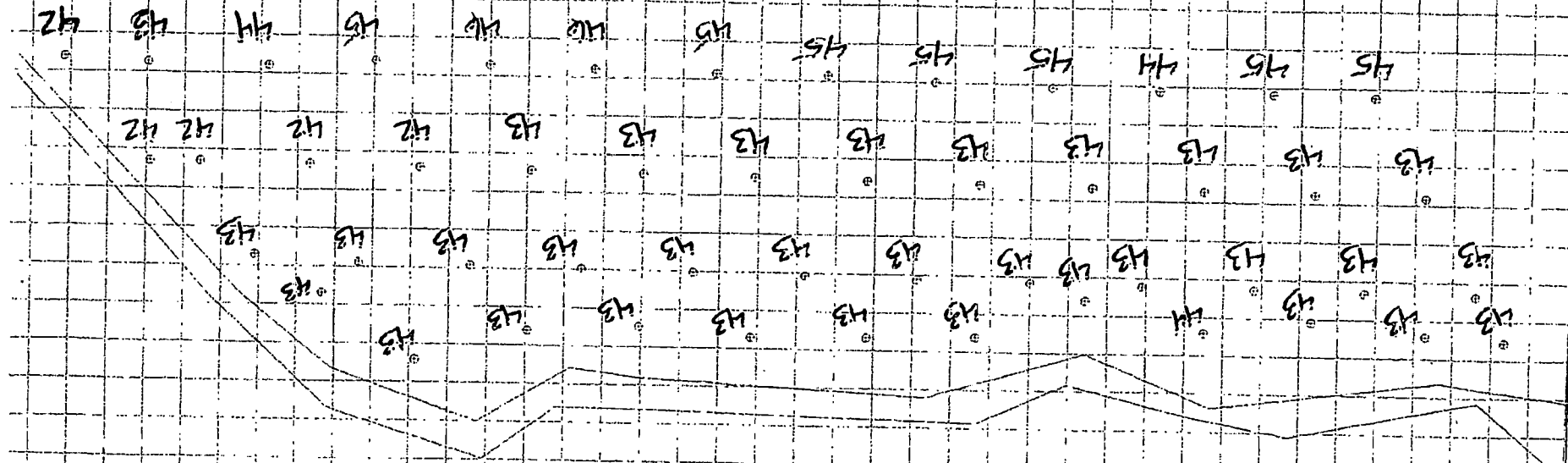


Highwall

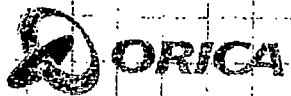


Scale 1:250

ShotPlus5.5.4.1.0	11/15/16
Mine	
Location	
Title/author	
Filename	Drill Pattern.spf



Highwall



Scale 1:250

ShotPlus5 5/4.1.0	11/15/16
Mine	
Location	
Title/author	
Filename	Drill.Pattern.spf

SOUTHWEST ENERGY LLC
2040 WEST GARDNER LANE
TUCSON, ARIZONA 85705-2208
(520) 696-9495

DAILY BLAST REPORT

Tuesday, November 29, 2016

Martin Marietta - Red Canyon

PRODUCT DESCRIPTION		HOLES	QUANTITY	UNIT
Shot # 11-2 Main Pit 5	Holes	50		
	502 (Fortis Control)		10,282	Lbs
	i-kon Duplex Harness Wire 400m		3	Spool
	Orica Fortel Plus 3" x 13Lb		38	Ea
	Pentex DP 12 (340)		102	Ea
	Unitronic 600 15M 50'		71	Ea
	Unitronic 600 6M 20'		32	Ea
Totals for 11/29/16	Total Holes	50		
	502 (Fortis Control)		10,282	Lbs
	i-kon Duplex Harness Wire 400m		3	Spool
	Orica Fortel Plus 3" x 13Lb		38	Ea
	Pentex DP 12 (340)		102	Ea
	Unitronic 600 15M 50'		71	Ea
	Unitronic 600 6M 20'		32	Ea



BLAST REPORT

SOUTHWEST ENERGY LLC
2040 W GARDNER LANE
TUCSON, ARIZONA 85705-2208
(520) 696-9495

Date: 11/29/16 Customer: Martin Marietta Materials, In Location: Martin Marietta - Red Can
Shot Fired: 2:02 PM Permit No: 0405136 Pit: Main Pit Level: 5

Shot Number:	11-2	Shot Coordinates:	38°36'25.8"N 104°56'45.32
Rock Type:	Limestone/Granite	Rock Density:	149 lbs/cu ft
Shot Classification:	Production	Mats Used:	No
Sky Conditions:	Clear	Temperature:	37 °F
Wind Direction:	E	Wind Speed:	5 mph
Hole Diameter:	4.5 in	Avg Stem Height:	9 ft
Burden-Spacing:	13 x 15 ft	Avg Hole Depth:	45 ft
Holes:	35	Sub-Drilling:	3 ft
Burden-Spacing:	20 x 15 ft	Avg Hole Depth:	45 ft
Holes:	15	Sub-Drilling:	3 ft
Total Holes:	50	Shot Tons:	35,436
Total Lbs Explo:	10,853	Powder Factor:	0.31 lbs/ton
Max Lbs/Delay:	580	Max Holes/Delay:	2
Stemming Type:	Crushed Stone	Shot Duration:	463 ms
Contract Blaster:	Jim Santhuff	License No:	1-998-09915
Blast Crew:	Smith, Blakley, Santhuff, Melick		
Note:	Bulk Emulsion used electronic initiation		
Safety Meeting:	Yes	Workplace Inspection:	Yes

Tuesday, November 29, 2016

Contract Blaster: _____

Rocky Mountain Materials & Asphalt, Inc
Red Canyon Quarry
Blasting Plan

The onsite Foreman will follow the following plan when blasting is to be initiated at Rocky Mountain Materials' Red Canyon Quarry site.

1. Blasting Schedule.

- Notification to Blasting Company
- Scheduled Blast Date: 11-29-16
Time: NOON-3pm

2. Notification of Outside Agencies. (Minimum 72 hrs. prior to blast event).

- Colorado Division Of Reclamation, Mining & Safety
Tim Cazier 303-866-3567 Ext. 8169
- Ken Bishop (Adjoining Property Owner)
Email: ken@kidlynx.com
- Additional Notification
A. NOTIFIED VIA EMAIL ON 11-21-16
B. _____

3. Ground Control. Radio communication will be maintained at all times between the site foreman and the lead blaster.

- ✕ • Safety Briefing with Blasting Crew
Date: 11/29/16 Time: 7:00
Forman: _____ Blaster: Evan Blahley
- ✕ • Access to Blast area closed
Time: 7:30 BY: Evan Blahley
- ✕ • Mine site cleared and access closed
Time: 1:52 BY: Jim Santhoff
- ✕ • Blast Initiation
Time: 2:02 By: Phil McInnis
- ✕ • Blast Area Cleared
Time: 2:30 By: Jim Santhoff

✕ 4. Blast Report: The blast report will be completed by the Certified blaster in charge of the event and will include, at minimum, the following information.

- A. Mine Site
Date
Time
Location of Blast: To include GPS coordinates of the initiation point

✕ B. Weather Conditions

✕ C. Number Of Holes
Diameter
Depth

✕ D. Size Of Blast
Tonnage
Hole Spacing/ Burden

✕ E. Explosives:
Amount Used
Stemming Depth
Number of Delays

F. Seismograph Recording
All Blasting will be recorded at the site
A minimum of one seismograph will be placed at a location chosen by the pit operator.
When available, a second unit will be placed at a location chosen by the lead blaster.

All blasting at the Red Canyon Quarry site will occur between the hours of 8:00 AM & 3:00 PM
Efforts will be made to avoid blasting during adverse weather conditions.

All blast reports and seismograph recordings will be turned in, and stored, Rocky Mountain Materials
main office Located at 1910 Rand Ave. Colorado Springs, Colorado 80905.



Southwest Energy, LLC
 2040 W. Gardner Lane.
 Tucson, AZ 85705
 Phone: (520) 696-9495
 Fax: (520) 293-2858
 BATF License #: 5-CO-019-22-8J-00828

PICKING LIST	
Shipper ID	S061979
Sales Order No.	030158
Customer ID	C549
Order Type	SWE

BILL TO:

Accounts Payable
 Martin Marietta Materials Inc.
 PO Box 30013
 Raleigh, NC 27622

SHIP TO:

Martin Marietta Materials Inc.
 3131 Barrett Road
 Colorado Springs, CO 80926

PAGE 2

F.O.B. POINT	SHIP VIA	ORDERED BY	CUSTOMER P.O. NO.
Destination	SWE Truck		Red Canyon
ORDER DATE	TERMS	CUSTOMER ATF#	SITE
11/28/16	Due 30 Days From Invoice Date	5-CO-059-33-8H-00727	051

INVENTORY ID	DESCRIPTION	UNITS	QTY	CASES	
	LINE #	MFG LOT NUMBER	QTY	CASES	QTY PICKED/DELIVERED

PICK LIST TEXT

LOADED BY: (SWE SIGNATURE):

RECEIVED DATE: _____ BY: (DRIVER SIGNATURE): _____

RECEIVED IN FULL AND ON TIME BY: (CUSTOMER SIGNATURE): _____



A SOUTHWEST ENERGY / ORICA
JOINT VENTURE

Southwest Energy, LLC
2040 W. Gardner Lane
Tucson, AZ 85705
Phone: (520) 696-9495
Fax: (520) 293-2858
BATF License #: 5-CO-019-22-8J-00828

PICKING LIST

Shipper ID S061979
Sales Order No. 030158
Customer ID C549
Order Type SWE

BILL TO:

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Martin Marietta Materials Inc.
PO Box 30013
Raleigh, NC 27622

SHIP TO:

Martin Marietta Materials Inc.
3131 Barrett Road
Colorado Springs, CO 80926

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ORDER DATE	TERMS	CUSTOMER ATF#	SITE
11/28/16	Due 30 Days From Invoice Date	5-CO-059-33-8H-00727	051

INVENTORY ID	DESCRIPTION	UNITS	QTY	CASES		
LINE #	MFG LOT NUMBER		QTY	CASES	QTY PICKED/DELIVERED	
WhseLoc: 00						
4400-0075-006-000	Fortel Plus 75mmx6ka (3"X13lb), EXPLOSIVES, BLASTING, TYPE E	CASE	38	38		
Lot Numbers:						
	00001 15MA16M2		38	38	<u>38</u>	<u>38</u>
0402-0000-000-000	Blasting Agent Loading Service	EACH	1			
WhseLoc: 03						
3200-0340-ODP-000	Pentex DP 12 340 (49/CS) BOOSTERS, WITHOUT DETONATOR	EACH	147	3		
Lot Numbers:						
	00001 29MY15E1		147	3	<u>147</u>	<u>102</u>
WhseLoc: 05						
5300-6600-006-000	Unitronic 600 6M (20 FT) Detonator (80/) DETONATORS, ELECTRIC	EACH	80	1		
Lot Numbers:						
	00001 15AU16B4		80	1	<u>80</u>	<u>32</u>
5300-6600-015-000	Unitronic 600 15M (50 FT) Detonator (66 DETONATORS, ELECTRIC	EACH	75	1		
Lot Numbers:						
	00001 22AU16B4		75	1	<u>75</u>	<u>71</u>
WhseLoc: 06						
5111-4335-000-000	Ikon Duplex Harness Wire (6 rolls/Case	EACH	4	1	<u>4</u>	<u>3</u>



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Tucson, AZ 85705
Phone: (520) 696-9495
Fax: (520) 293-2858
BATF License #: 5-CO-019-22-8J-00828

PICKING LIST	
Shipper ID	S061978
Sales Order No.	030157
Customer ID	C549
Order Type	SWE

BILL TO:

Accounts Payable
Martin Marietta Materials Inc.
PO Box 30013
Raleigh, NC 27622

SHIP TO:

Martin Marietta Materials Inc.
3131 Barrett Road
Colorado Springs, CO 80926

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ORDER DATE	TERMS	CUSTOMER ATF#	SITE
11/28/16	Due 30 Days From Invoice Date	5-CO-059-33-8H-00727	051

INVENTORY ID	DESCRIPTION	UNITS	QTY	CASES	
	LINE #	MFG LOT NUMBER	QTY	CASES	QTY PICKED/DELIVERED

WhseLoc: 00

0210-2502-000-000 Fortis Control / Centra Control
EXPLOSIVES, BLASTING, TYPE E

LBS

17,140

17,140 10,282

PICK LIST TEXT

LOADED BY: (SWE SIGNATURE):

RECEIVED DATE: _____

BY: (DRIVER SIGNATURE): _____

RECEIVED IN FULL AND ON TIME BY: (CUSTOMER SIGNATURE): _____

THIS SHIPPING ORDER

must be legibly filled in, in Ink, in Indelible Pencil or in Carbon, and retained by this Agent.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Original Bill of Lading,

the property described below, in apparent order, except as noted (contents and conditions of contents of packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth. (1) in Uniform Freight Classification in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

This is to certify that the herein named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation, according to the applicable regulations of the Department of Transportation.

Signature

From Southwest Energy, LLC
1201 County Rd Mile 202
At Empire, CO 80438



Ship Date

11/29/2016

Shipper's No.

5-CO-019-22-8J-00828

CONSIGNEE TO AND DESTINATION

Martin Marietta Materials Inc.
2131 Barrett Road
Colorado Springs, CO 80925

SOLD TO

Martin Marietta Materials Inc.

Customer Order No.

Red Canyon

Ship Date

11/29/2016

Shipper BOL

BDS1678

CARRIER	PREPAID or COLLECT	FOB	Pag		
Truck 1192					
NO. OF PKGS.	NO. UNITS	DESCRIPTION OF HAZARDOUS MATERIAL	EMERGENCY RESPONSE PROCEDURE GUIDE NO.	DELIVERY WEIGHT (LBS)	NET EXPLOSIVE CONTENTS
1.00	80.00 EACH	UN0030 DETONATORS, ELECTRIC 1.1B, PG:II	112	12.89	
1.14	75.00 EACH	UN0030 DETONATORS, ELECTRIC 1.1B, PG:II	112	28.28	
3.00	147.00 EACH	UN0042 BOOSTERS, WITHOUT DETONATOR 1.1D, PG:II	112	118.48	1
38.00	38.00 CASE	UN0332 EXPLOSIVES, BLASTING, TYPE E 1.5D, PG:II	112	494.00	2
0.67	4.00 EACH	IKON HARNESS WIRE DUPLEX		23.99	
43.83	344.00	TOTAL		677.63	1

Route US-40 E-I-70 E/C-470 E/I-25 S / Hwy 115 S.

TOTAL DELIVERY WEIGHT

TOTAL NET EXPLOSIVE CONTENT

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT
CALL CHEMTREC — DAY OR NIGHT IN THE U.S.A. Call 800-424-9300 or
703-527-3887 REFERENCE CUSTOMER #1961533 1BS

PLACARD APPLIED:

604 71 1 BS

Southwest Energy, LLC

Permanent Address of Shipper
2040 West Gardner Lane
Tucson, Arizona 85705

Per

I acknowledge receipt of the above products. I have read, understand and agree to the terms and conditions as printed on this form.

BUYER'S SIGNATURE

DATE

I have been offered placards identifying the shipment as specified in 49CFR Subpart F of Part 172. I have read and agree to all conditions on reverse side. I have received the above goods in apparent good order and condition.

CONSIGNEE/CARRIER

BY:

DATE

IF F SHIPPING ORDER 4/11

COPY 1

THIS SHIPPING ORDER

must be legibly filled in, in Ink, in Indelible Pencil or in Carbon, and retained by this Agent.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Original Bill of Lading,

the property described below, in apparent order, except as noted (contents and conditions of contents of packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth. (1) in Uniform Freight Classification in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

This is to certify that the herein named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation, according to the applicable regulations of the Department of Transportation.

Signature

From Southwest Energy, LLC
1201 County Rd Mile 202

At Empire, CO 80438



Ship Date 11/29/2016

Shipper's No. 5-CO-019-22-8J-00828

CONSIGNEE TO AND DESTINATION

Martin Marietta Materials Inc.
3131 Barrett Road
Colorado Springs, CO 80926

SOLD TO

Martin Marietta Materials Inc.

Customer Order No.

Red Canyon

Ship Date

11/29/2016

Shipper BOL

8831878

CARRIER		PREPAID or COLLECT		FOB		Pag	
278							
SHIP WEIGHT NO. OF PKGS.	NO. UNITS	DESCRIPTION OF HAZARDOUS MATERIAL		EMERGENCY RESPONSE PROCEDURE GUIDE NO.	DELIVERY WEIGHT (LBS)	NET EXPLOSIVE CONTENTS	
17,140.00 LBS		UN0332 EXPLOSIVES, BLASTING, TYPE E		112	17,140.00	17,1	
		1.5D, PG:II					
17,140.00		TOTAL			17,140.00	17,	

Prove: US-40E/TC-70E/C-470E/TC-255/HWT 115 S.

TOTAL DELIVERY WEIGHT

TOTAL NET EXPLOSIVE CONTENT

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT
CALL CHEMTREC — DAY OR NIGHT IN THE U.S.A. Call 800-424-9300 or
703-527-3887 REFERENCE CUSTOMER #1961511 IRS

PLACARD APPLIED:

17,140.00 LBS

Southwest Energy, LLC

Permanent Address of Shipper
2040 West Gardner Lane
Tucson, Arizona 85705

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IF F SHIPPING ORDER 4/11

COPY 1