

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

RECEIVED
Office of Oil and Gas

DEC 18 2015

WV Department of
Environmental Protection

API 47-051-01702 County Marshall District Clay
Quad Powhatan, OH-WV Pad Name Berger Field/Pool Name _____
Farm name Berger Well Number 1H
Operator (as registered with the OOG) Chevron Appalachia, LLC
Address 800 Mountain View Drive City Smithfield State PA Zip 15478

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4413872.10 Easting 520992.07
Landing Point of Curve Northing 4413780.46 Easting 521383.83
Bottom Hole Northing 4412347.83 Easting 522500.66

Elevation (ft) 1292' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
non aqueous fluid containing weighting agent, fluid loss additive, emulsifier, viscosity, and rheological control agent, oil-wetting agent, fluid rheology conditioner

Date permit issued 2/26/2014 Date drilling commenced 6/25/2014 Date drilling ceased 2/17/2015
Date completion activities began 8/4/2015 Date completion activities ceased 12/10/2015
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 169' MD Open mine(s) (Y/N) depths N
Salt water depth(s) ft N/A Void(s) encountered (Y/N) depths N
Coal depth(s) ft 768'MD, 820'MD, 830'MD, 850'MD Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y

Reviewed by:
EB 2-22-16
02/26/2016

API 47-051 - 01702 Farm name Berger Well number 1H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	36	30	40	New	118.76#; X-42		
Surface	17 1/2	13 3/8	303	New	54.50#; J-55		
Coal							
Intermediate 1	12 1/4	9 5/8	2683	New	40#; N-80		
Intermediate 2							
Intermediate 3							
Production	8 1/2	5 1/2	13372	New	20#; P-110		
Tubing							
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Bulk	60					
Surface		384	15.60	1.21	465	Surface	8
Coal							
Intermediate 1		925	15.60	1.23	1138	Surface	8
Intermediate 2							
Intermediate 3							
Production	Class A; Easy BLOK	2589	15.20	1.30	3366	Surface	8
Tubing							

Drillers TD (ft) 13417' Loggers TD (ft) 13417'
 Deepest formation penetrated Marcellus Plug back to (ft) n/a
 Plug back procedure n/a

Kick off depth (ft) 5153'

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING Bow spring centralizer every two joints on the water
and intermediate string. Production string has two centralizer every joint in the lateral and curve, then one every two joints from KOP to surface.

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS See attached perforation/stimulation report

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

API 47- 051 - 01702 Farm name Berger Well number 1H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	SEE	ATTACHED			

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
		SEE	ATTACHED					

Please insert additional pages as applicable.

API: 47-5101702	Well Name: Berger	Well Number: 1H
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PERFORATION RECORD					
Stage No.	Perforation Date	Perforated From TMD Ft.	Perforated To TMD Ft.	Number of Perforations	Formation(s)
1	10/19/15	13370	13368	50	Marcellus
2	10/20/15	13170	13008	50	Marcellus
3	10/21/15	12970	12808	50	Marcellus
4	10/21/15	12770	12608	50	Marcellus
5	10/22/15	12570	12408	50	Marcellus
6	10/22/15	12370	12208	50	Marcellus
7	10/22/15	12170	12005	50	Marcellus
8	10/23/15	11967	11808	50	Marcellus
9	10/23/15	11770	11610	50	Marcellus
10	10/24/15	11570	11408	50	Marcellus
11	10/24/15	11370	11208	50	Marcellus
12	10/24/15	11168	11008	50	Marcellus
13	10/25/15	11970	10813	50	Marcellus
14	10/25/15	11767	10613	50	Marcellus
15	10/26/15	10572	10408	50	Marcellus
16	10/27/15	10370	10212	50	Marcellus
17	10/27/15	10170	10008	50	Marcellus
18	10/27/15	9970	9808	50	Marcellus
19	10/28/15	9770	9608	50	Marcellus
20	10/28/15	9568	9407	50	Marcellus
21	10/29/15	9367	9213	50	Marcellus
22	10/29/15	9171	9008	50	Marcellus
23	10/30/15	8968	8808	50	Marcellus
24	10/30/15	8770	8608	50	Marcellus
25	10/31/15	8568	8408	50	Marcellus
26	10/31/15	8368	8208	50	Marcellus
27	10/31/15	8170	8008	50	Marcellus
28	11/1/15	7968	7808	50	Marcellus
29	11/1/15	7770	7605	50	Marcellus
30	11/1/15	7567	7411	50	Marcellus
31	11/1/15	7368	7208	50	Marcellus
32					
33					
34					
35					
36					
37					
38					
39					
40					

Please insert additional copies of this page if additional rows/stages are needed.

API: 47-5101702	Well Name: Berger	Well Number: 1H
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STIMULATION INFORMATION / STAGE								
Complete a separate record for each stimulation stage. (Please insert additional lines for additional stages or additional pages as applicable).								
Stg No.	Stimulation Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	10/19/15	97	8960	5812	4060	402337	10545	n/a
2	10/20/15	96	9023	6543	6509	400820	10893	n/a
3	10/21/15	97	8806	n/a	4170	356386	10461	n/a
4	10/21/15	94	8837	6490	4392	372148	10563	n/a
5	10/22/15	98	8476	6035	4999	401402	10805	n/a
6	10/22/15	99	8101	5863	4656	404909	10796	n/a
7	10/22/15	95	8520	5910	4888	399425	10834	n/a
8	10/23/15	97	8277	n/a	4803	401725	10881	n/a
9	10/23/15	97	7928	6644	4888	401311	10769	n/a
10	10/24/15	98	7616	6189	4824	398589	10683	n/a
11	10/24/15	97	8270	6264	4850	405023	10674	n/a
12	10/24/15	97	8504	6444		399552	10649	n/a
13	10/25/15	68	8839	6557	4895	235885	10893	n/a
14	10/25/15	97	8609	6100	4650	403332	10785	n/a
15	10/26/15	97	8380	6444	4999	404127	10697	n/a
16	10/27/15	97	8473	6538	4444	402064	10727	n/a
17	10/27/15	97	7884	n/a	4748	400124	10348	n/a
18	10/27/15	98	8421	6991	4620	347668	10138	n/a
19	10/28/15	98	7936	6100	4646	402238	10825	n/a
20	10/28/15	101	8233	6424	4625	390050	10502	n/a
21	10/29/15	97	7842	6470	4735	401180	10516	n/a
22	10/29/15	91	7090	6532	4611	399275	10592	n/a
23	10/30/15	98	7467	6753	4378	401043	10368	n/a
24	10/30/15	97	8002	6152	4471	373231	9905	n/a
25	10/31/15	96	7539	5806	5250	373388	10373	n/a
26	10/31/15	98	7893	6027	4372	398314	10281	n/a
27	10/31/15	97	7841	6680	4702	402461	10374	n/a
28	11/1/15	98	7356	6085	4873	400474	10663	n/a
29	11/1/15	98	7745	6311	4900	347195	10019	n/a
30	11/1/15	99	7709	6562	5131	796425	10385	n/a
31	11/1/15	97	7685	6819	4801	387288	10063	n/a
32								
33								
34								
35								
36								
37								
38								
39								
40								

API 47- 051 - 01702 Farm name Berger Well number 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
	TVD	MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump
 SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs
 OPEN FLOW Gas _____ mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY
 Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		
Pittsburgh Coal	830	831	830	831	Solid Coal Seam
Burkett	6296	6314	6680	6717	Grey shale
Tully	6314	6355	6717	6806	Limestone
S5	6355	6404	6806	6992	Black shale
S3	6404	6428	6992	7156	Black shale
Stafford	6428	6430	7156	7178	Limestone
S2B	6430	6439	7178	7268	Black shale

Please insert additional pages as applicable.

Drilling Contractor SEE ATTACHED
 Address _____ City _____ State _____ Zip _____

Logging Company ALS Group USA Corp
 Address 3352 128th Avenue City Holland State MI Zip 49424

Cementing Company SEE ATTACHED
 Address _____ City _____ State _____ Zip _____

Stimulating Company Schlumberger Technology Corp
 Address 4600 J Barry Court, Suite 200 City Canonsburg State PA Zip 15307

Please insert additional pages as applicable.

Completed by Jackie M. Scholar Telephone 724-564-3721
 Signature  Title Regulatory Compliance Team Lead Date 12/15/2015

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

API: 47-5101702	Well Name: Berger	Well Number: 1H
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CEMENTING CONTRACTORS		
Name Schlumberger Technology Corp	Name Baker Hughes	Name
Address Two Robinson Plaza, Suite 200	Address 5373 West Alabama, Suite 300	Address
City - State - Zip Pittsburgh, PA 15205	City - State - Zip Houston, TX 77056	City - State - Zip

API: 47-5101702	Well Name: Berger	Well Number: 1H
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DRILLING CONTRACTORS		
Driller	Driller	Driller
Name Rocky Mountain Drilling	Name Highlands Drilling LLC	Name Nabors Drilling USA
Address 185 North Vernal Avenue, Suite 2	Address 900 Virginia Street East	Address 10100 NW 10th Street
City - State - Zip Vernal, UT 84078	City - State - Zip Charlestown, WV 25301	City - State - Zip Oklahoma City, OK 73127

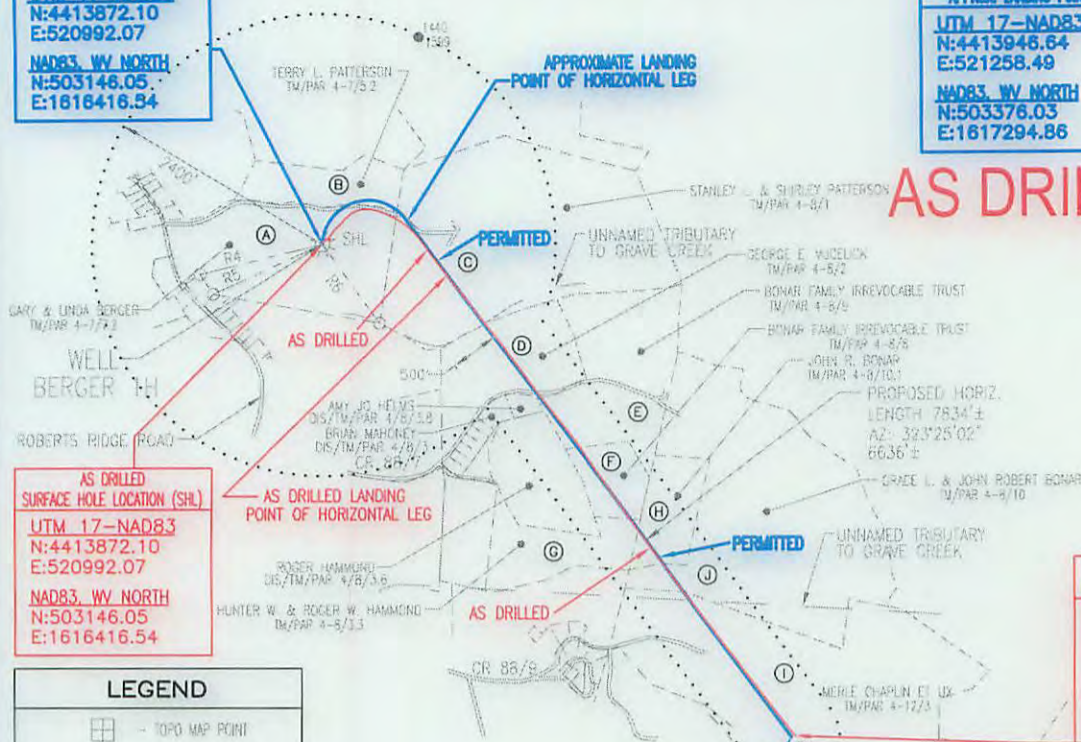
Well is located on topo map 124' feet south of Latitude: 39° 52' 30"

PERMITTED SURFACE HOLE LOCATION (SHL)
 UTM 17-NAD83
 N:4413872.10
 E:520992.07
 NAD83_WV NORTH
 N:503146.05
 E:1616416.34

PERMITTED APPROX. LANDING POINT
 UTM 17-NAD83
 N:4413946.64
 E:521258.49
 NAD83_WV NORTH
 N:503376.03
 E:1617294.86

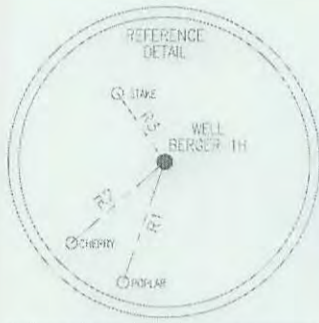
AS DRILLED APPROX. LANDING POINT
 UTM 17-NAD83
 N:4413780.46
 E:521383.83
 NAD83_WV NORTH
 N:502823.85
 E:1617696.54

AS DRILLED PLAT



LEGEND

- TOPO MAP POINT
- WELL
- ALL ARE POINTS UNLESS OTHERWISE NOTED
- LEASE LETTER
- MINERAL TRACT BOUNDARY
- PARCEL LINES
- WELL REFERENCE
- PROPOSED HORIZONTAL WELL
- ROAD
- STREAM CENTER LINE
- AS DRILLED
- EXISTING WELLS
- EXISTING WELLS
- PLUGGED WELLS



LINE	BEARING	DISTANCE
R1	S 18°51'00" W	264.07'
R2	S 48°30'45" W	255.26'
R3	N 34°22'04" W	172.88'
R4	S 76°40'46" W	1303.13'
R5	S 65°59'24" W	1243.90'
R6	S 35°59'44" E	1000.33'

AS DRILLED BOTTOM HOLE LOCATION (BHL)
 UTM 17-NAD83
 N:4412347.83
 E:522500.66
 NAD83_WV NORTH
 N:498061.41
 E:1621282.84

PARCEL	LESSOR
A	GARY & LINDA BERGER
B	TERRY L. PATTERSON
C	STANLEY L. & SHIRLEY L. PATTERSON
D	GEORGE E. & REBECCA WUCELICK
E	WILLIAM T. & MONICA BONAR
F	WILLIAM T. BONAR
G	CLARA E. HAMMOND
H	JOHN ROBERT BONAR
I	PURPLEBURGH VENTURES, LLC
J	GRACE L. & JOHN ROBERT BONAR

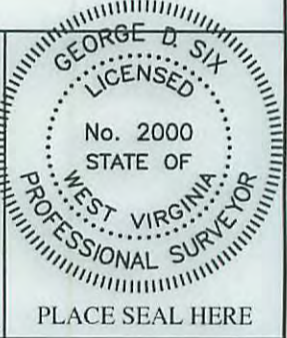
- NOTES:
- There are no water wells or developed springs within 250' of proposed well.
 - There are no existing buildings within 625' of proposed well.
 - Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
 - There are no native trout streams within 300' of proposed well.
 - Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
 - It is not the purpose or intention of this plat to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, are based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.

Blue Mountain Inc.
 10125 MASON DIXON HIGHWAY
 BURTON, WV 26562
 PHONE: (304) 662-6486

FILE #: BERGER 1H-AS DRILLED
 DRAWING #: BERGER 1H-AS DRILLED
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: *George D. Six*
 R.P.E.: _____ L.L.S.: P.S. No. 2000



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304



DATE: SEPTEMBER 28, 2015
 OPERATOR'S WELL #: BERGER 1H-AS DRILLED
 API WELL #: 47 51 01702
 STATE COUNTY PERMIT

Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: MIDDLE GRAVE CREEK - GRAVE CREEK ELEVATION: 1287.49'

COUNTY/DISTRICT: MARSHALL / CLAY QUADRANGLE: POWHATAN, OH-WV 7.5'

SURFACE OWNER: GARY & LINDA BERGER ACREAGE: 51.753±

OIL & GAS ROYALTY OWNER: GARY & LINDA BERGER ACREAGE: 542.505±

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,538'± TMD: 13,817'±

WELL OPERATOR CHEVRON APPALACHIA, LLC DESIGNATED AGENT KENNETH E. TAWNEY
 Address 800 MOUNTAIN VIEW DRIVE Address 500 LEE STREET, EAST SUITE 1600
 City SMITHFIELD State PA Zip Code 15478 City CHARLESTON State WV Zip Code 25301-3202

Well is located on topo map 1261' feet west of Longitude: 80° 45' 00"

02/26/2016

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	10/19/2015
Job End Date:	11/1/2015
State:	West Virginia
County:	Marshall
API Number:	47-051-01702-00-00
Operator Name:	Chevron USA Inc.
Well Name and Number:	Berger 1H
Longitude:	-80.75452400
Latitude:	39.87463700
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,487
Total Base Water Volume (gal):	13,493,162
Total Base Non Water Volume:	



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Base Fluid	Chevron	Carrier/Base Fluid					
			Water (Including Mix Water Supplied by Client)	7732-18-5	100.00000	90.23771	
Proppant	Schlumberger	Proppant					
			Crystalline Silica	14808-60-7	100.00000	9.63006	
7.5% Acid	Schlumberger	Perf Cleanup					
			Hydrochloric Acid	7647-01-0	8.00000	0.00854	
J580	Schlumberger	Gelling Agent					
			Carbohydrate Polymer	Proprietary	100.00000	0.00314	
M300	BASF Corporation	Biocide					
			Water	7732-18-5	75.00000	0.00165	
			Glutaral	111-30-8	25.00000	0.00055	
U042	Schlumberger	Iron Chelating Agent					
			Tetrasodium ethylenediaminetetraacetate	64-02-8	60.00000	0.00162	
			Trisodium nitrilotriacetate (impurity)	5064-31-3	10.00000	0.00027	
			Sodium hydroxide	1310-73-2	5.00000	0.00013	
L058	Schlumberger	Iron Stabilizer					
			Sodium erythorbate	6381-77-7	100.00000	0.00037	
B317	Schlumberger	Scale Inhibitor					

			Ethane-1,2-diol	107-21-1	5.00000	0.00010
			Trisodium ortho phosphate	7601-54-9	5.00000	0.00010
A264	Schlumberger	Corrosion Inhibitor				
			Methanol	67-56-1	40.00000	0.00005
			Aliphatic alcohols, ethoxylated #1	Proprietary	30.00000	0.00003
			Aliphatic acids	Proprietary	30.00000	0.00003
			Prop-2-yn-1-ol	107-19-7	10.00000	0.00001
J134	Schlumberger	Gel Breaker				
			Hemicellulase enzyme	9012-54-8	100.00000	0.00008
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.						

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)