Proposed WFN12A Hydraulic Fracturing Fluid Additives

Ingredients	Chemical Abstract Service Number (CAS #)	% of Total Usage (by Mass)
Water	7732-18-5	83.35733%
Crystalline Silica in the form of Quartz	14808-60-7	16.45950%
AA/ATBS Co-polymer	9003-05-8	0.03803%
Hydrogen chloride	7647-01-0	0.02993%
Alkanes, C12-26-branched and linear	90622-53-0	0.02992%
Alcohol alkoxylate	68511-12-2	0.00427%
Glutaraldehyde	111-30-8	0.00206%
AA/Maleic Anhydride Co-polymer	9003-04-7	0.00128%
Citric acid	77-92-9	0.00038%
Methyl alcohol	67-56-1	0.00037%
Quaternary Ammonium Compounds	68424-85-1	0.00031%
Didecyl dimethyl ammonium chloride	7173-51-5	0.00031%
Ethanol	64-17-5	0.00015%
Ethylene glycol	107-21-1	0.00011%
N,N-Dimethylformamide	68-12-2	0.00005%
Cinnamaldehyde	104-55-2	0.00003%
2-Butoxyethanol	111-76-2	0.00003%
Poly(oxy-1,2-ethanediyl), .alpha.-(4-nonylphenyl)-.omega.-hydroxy-, branched	127087-87-0	0.00003%
Tar Bases, quinoline derivs, benzyl chloride-quat	72480-70-7	0.00003%

Additive	Specific Gravity	Additive Quantity	Unit
Water	1.00	20,706,000	gal
StimSTREAM 9800	1.08	19,671	gal
Clearal 268	1.03	2,485	gal
StimStream SC 398	1.03	3,106	gal
ACI-150	0.88	150	gal
Citric Acid 50%	1.23	150	gal
HCL Acid (28%)	1.14	23,304	gal
Sand	2.65	33,408,000	lbs

Additive	Specific Gravity	Additive Quantity	Unit
Water	1.00	20,706,000	gal
StimSTREAM 9800	1.08	19,671	gal
Clearal 268	1.03	2,485	gal
StimStream SC 398	1.03	3,106	gal
ACI-150	0.88	150	gal
Citric Acid 50%	1.23	150	gal
HCL Acid (28%)	1.14	23,304	gal
Sand	2.65	33,408,000	lbs

Proposed WFN12B Hydraulic Fracturing Fluid Additives

Ingredients	Chemical Abstract Service Number (CAS #)	% of Total Usage (by Mass)
Water	7732-18-5	83.47755%
Crystalline Silica in the form of Quartz	14808-60-7	16.33916%
AA/ATBS Co-polymer	9003-05-8	0.03809%
Hydrogen chloride	7647-01-0	0.02997%
Alkanes, C12-26-branched and linear	90622-53-0	0.02996%
Alcohol alkoxylate	68511-12-2	0.00428%
Glutaraldehyde	111-30-8	0.00206%
AA/Maleic Anhydride Co-polymer	9003-04-7	0.00128%
Citric acid	77-92-9	0.00038%
Methyl alcohol	67-56-1	0.00037%
Quaternary Ammonium Compounds	68424-85-1	0.00031%
Didecyl dimethyl ammonium chloride	7173-51-5	0.00031%
Ethanol	64-17-5	0.00015%
Ethylene glycol	107-21-1	0.00011%
N,N-Dimethylformamide	68-12-2	0.00005%
Cinnamaldehyde	104-55-2	0.00003%
2-Butoxyethanol	111-76-2	0.00003%
Poly(oxy-1,2-ethanediyl), .alpha.-(4-nonylphenyl)-.omega.-hydroxy-, branched	127087-87-0	0.00003%
Tar Bases, quinoline derivs, benzyl chloride-quat	72480-70-7	0.00003%

Additive	Specific Gravity	Additive Quantity	Unit
Water	1.00	29,988,000	gal
StimSTREAM 9800	1.08	28,489	gal
Clearal 268	1.03	3,599	gal
StimStream SC 398	1.03	4,498	gal
ACI-150	0.88	218	gal
Citric Acid 50%	1.23	218	gal
HCL Acid (28%)	1.14	33,750	gal
Sand	2.65	49,060,200	lbs

Additive	Specific Gravity	Additive Quantity	Unit
Water	1.00	29,988,000	gal
StimSTREAM 9800	1.08	28,489	gal
Clearal 268	1.03	3,599	gal
StimStream SC 398	1.03	4,498	gal
ACI-150	0.88	218	gal
Citric Acid 50%	1.23	218	gal
HCL Acid (28%)	1.14	33,750	gal
Sand	2.65	49,060,200	lbs

Proposed WFN12C Hydraulic Fracturing Fluid Additives

Ingredients	Chemical Abstract Service Number (CAS #)	% of Total Usage (by Mass)
Water	7732-18-5	83.80022%
Crystalline Silica in the form of Quartz	14808-60-7	16.01617%
AA/ATBS Co-polymer	9003-05-8	0.03824%
Hydrogen chloride	7647-01-0	0.03009%
Alkanes, C12-26-branched and linear	90622-53-0	0.03007%
Alcohol alkoxylate	68511-12-2	0.00430%
Glutaraldehyde	111-30-8	0.00207%
AA/Maleic Anhydride Co-polymer	9003-04-7	0.00129%
Citric acid	77-92-9	0.00038%
Methyl alcohol	67-56-1	0.00037%
Quaternary Ammonium Compounds	68424-85-1	0.00031%
Didecyl dimethyl ammonium chloride	7173-51-5	0.00031%
Ethanol	64-17-5	0.00016%
Ethylene glycol	107-21-1	0.00011%
N,N-Dimethylformamide	68-12-2	0.00005%
Cinnamaldehyde	104-55-2	0.00003%
2-Butoxyethanol	111-76-2	0.00003%
Poly(oxy-1,2-ethanediyl), .alpha.-(4-nonylphenyl)-.omega.-hydroxy-, branched	127087-87-0	0.00003%
Tar Bases, quinoline derivs, benzyl chloride-quat	72480-70-7	0.00003%

Additive	Specific Gravity	Additive Quantity	Unit
Water	1.00	29,988,000	gal
StimSTREAM 9800	1.08	28,489	gal
Clearal 268	1.03	3,599	gal
StimStream SC 398	1.03	4,498	gal
ACI-150	0.88	218	gal
Citric Acid 50%	1.23	218	gal
HCL Acid (28%)	1.14	33,750	gal
Sand	2.65	47,905,200	lbs

Additive	Specific Gravity	Additive Quantity	Unit
Water	1.00	29,988,000	gal
StimSTREAM 9800	1.08	28,489	gal
Clearal 268	1.03	3,599	gal
StimStream SC 398	1.03	4,498	gal
ACI-150	0.88	218	gal
Citric Acid 50%	1.23	218	gal
HCL Acid (28%)	1.14	33,750	gal
Sand	2.65	47,905,200	lbs

Proposed WFN12D Hydraulic Fracturing Fluid Additives

Ingredients	Chemical Abstract Service Number (CAS #)	% of Total Usage (by Mass)
Water	7732-18-5	83.80022%
Crystalline Silica in the form of Quartz	14808-60-7	16.01617%
AA/ATBS Co-polymer	9003-05-8	0.03824%
Hydrogen chloride	7647-01-0	0.03009%
Alkanes, C12-26-branched and linear	90622-53-0	0.03007%
Alcohol alkoxylate	68511-12-2	0.00430%
Glutaraldehyde	111-30-8	0.00207%
AA/Maleic Anhydride Co-polymer	9003-04-7	0.00129%
Citric acid	77-92-9	0.00038%
Methyl alcohol	67-56-1	0.00037%
Quaternary Ammonium Compounds	68424-85-1	0.00031%
Didecyl dimethyl ammonium chloride	7173-51-5	0.00031%
Ethanol	64-17-5	0.00016%
Ethylene glycol	107-21-1	0.00011%
N,N-Dimethylformamide	68-12-2	0.00005%
Cinnamaldehyde	104-55-2	0.00003%
2-Butoxyethanol	111-76-2	0.00003%
Poly(oxy-1,2-ethanediyl), .alpha.-(4-nonylphenyl)-.omega.-hydroxy-, branched	127087-87-0	0.00003%
Tar Bases, quinoline derivs, benzyl chloride-quat	72480-70-7	0.00003%

Additive	Specific Gravity	Additive Quantity	Unit
Water	1.00	29,988,000	gal
StimSTREAM 9800	1.08	28,489	gal
Clearal 268	1.03	3,599	gal
StimStream SC 398	1.03	4,498	gal
ACI-150	0.88	218	gal
Citric Acid 50%	1.23	218	gal
HCL Acid (28%)	1.14	33,750	gal
Sand	2.65	47,905,200	lbs

Additive	Specific Gravity	Additive Quantity	Unit
Water	1.00	29,988,000	gal
StimSTREAM 9800	1.08	28,489	gal
Clearal 268	1.03	3,599	gal
StimStream SC 398	1.03	4,498	gal
ACI-150	0.88	218	gal
Citric Acid 50%	1.23	218	gal
HCL Acid (28%)	1.14	33,750	gal
Sand	2.65	47,905,200	lbs

Proposed WFN12E Hydraulic Fracturing Fluid Additives

Ingredients	Chemical Abstract Service Number (CAS #)	% of Total Usage (by Mass)
Water	7732-18-5	83.35733%
Crystalline Silica in the form of Quartz	14808-60-7	16.45950%
AA/ATBS Co-polymer	9003-05-8	0.03803%
Hydrogen chloride	7647-01-0	0.02993%
Alkanes, C12-26-branched and linear	90622-53-0	0.02992%
Alcohol alkoxylate	68511-12-2	0.00427%
Glutaraldehyde	111-30-8	0.00206%
AA/Maleic Anhydride Co-polymer	9003-04-7	0.00128%
Citric acid	77-92-9	0.00038%
Methyl alcohol	67-56-1	0.00037%
Quaternary Ammonium Compounds	68424-85-1	0.00031%
Didecyl dimethyl ammonium chloride	7173-51-5	0.00031%
Ethanol	64-17-5	0.00015%
Ethylene glycol	107-21-1	0.00011%
N,N-Dimethylformamide	68-12-2	0.00005%
Cinnamaldehyde	104-55-2	0.00003%
2-Butoxyethanol	111-76-2	0.00003%
Poly(oxy-1,2-ethanediyl), .alpha.-(4-nonylphenyl)-.omega.-hydroxy-, branched	127087-87-0	0.00003%
Tar Bases, quinoline derivs, benzyl chloride-quat	72480-70-7	0.00003%

Additive	Specific Gravity	Additive Quantity	Unit
Water	1.00	29,988,000	gal
StimSTREAM 9800	1.08	28,489	gal
Clearal 268	1.03	3,599	gal
StimStream SC 398	1.03	4,498	gal
ACI-150	0.88	218	gal
Citric Acid 50%	1.23	218	gal
HCL Acid (28%)	1.14	33,750	gal
Sand	2.65	49,492,800	lbs

Additive	Specific Gravity	Additive Quantity	Unit
Water	1.00	29,988,000	gal
StimSTREAM 9800	1.08	28,489	gal
Clearal 268	1.03	3,599	gal
StimStream SC 398	1.03	4,498	gal
ACI-150	0.88	218	gal
Citric Acid 50%	1.23	218	gal
HCL Acid (28%)	1.14	33,750	gal
Sand	2.65	49,492,800	lbs