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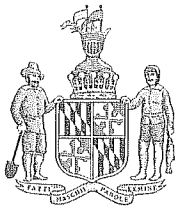

STATE OF MARYLAND
OFFICE OF THE ATTORNEY GENERAL

FACSIMILE NO.
(410) 576-7036

WRITER'S DIRECT DIAL NO.
(410) 576-6311

April 29, 2011

Via Certified United States Mail

Chesapeake Energy Corporation
Chesapeake Energy Louisiana Corporation
Chesapeake Energy Marketing, Inc.
Chesapeake Midstream Operating, L.L.C
Chesapeake E&P Holding Corporation
Chesapeake Exploration, L.L.C
Chesapeake Land Development Co., L.L.C.
Chesapeake Louisiana, L.P.
Chesapeake Operating, Inc.
CHK Holdings Corporation
Louisiana Midstream Gas Services, L.L.C
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Oklahoma City, Oklahoma 73118

Chesapeake Appalachia, L.L.C.
P.O. Box 18496
Oklahoma City, Oklahoma 73154-0496

Nomac Drilling, L.L.C.
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El Reno, Oklahoma 73036

Chesapeake Energy Corporation
Chesapeake Energy Louisiana Corporation
Chesapeake Energy Marketing, Inc.
Chesapeake Midstream Operating, L.L.C
Chesapeake Appalachia, L.L.C.
Chesapeake E&P Holding Corporation
Chesapeake Exploration, L.L.C
Chesapeake Land Development Co., L.L.C.
Chesapeake Louisiana, L.P.
Chesapeake Operating, Inc.
Nomac Drilling, L.L.C.
CHK Holdings Corporation
Louisiana Midstream Gas Services, L.L.C
C/O The Corporations Company
1833 South Morgan Road
Oklahoma City, Oklahoma 73128

Chesapeake Midstream Development, L.P.
The Corporation Trust Company
Corporation Trust Center
1209 Orange Street
Wilmington, Delaware 19801

RE: Notice of Intent to Sue for Violations of the Resource Conservation and Recovery Act, the Clean Water Act, and the Pennsylvania Clean Streams Law at Towanda Creek in Pennsylvania

Dear Sirs and Madams:

The State of Maryland ("State") hereby gives notice of its intent to sue Chesapeake Energy Corporation and its affiliates Chesapeake Appalachia, L.L.C. and Nomac Drilling (together "Chesapeake Energy") under 42 U.S.C. § 6972(a)(1)(B) for violating the federal Resource Conservation and Recovery Act

("RCRA") by creating an imminent and substantial endangerment to health and the environment at the Atgas 2H well in Leroy Township, Pennsylvania, its surrounding environs, an unnamed tributary of the Towanda Creek, the Towanda Creek, and the Susquehanna River. The State additionally gives notice of its intent to sue Chesapeake Energy under 33 U.S.C. § 1365(a)(1)(A) for violating the federal Clean Water Act ("CWA") and under 35 P.S. § 691.601(c) for violating the Pennsylvania Clean Streams Law by discharging pollution to surface waters of the United States and the commonwealth of Pennsylvania. In its action, the State will seek injunctive relief and civil penalties under RCRA, the CWA, and the Pennsylvania Clean Streams Law for the unlawful discharge of pollutants to surface waters including an unnamed tributary of Towanda Creek, Towanda Creek, and the Susquehanna River; solid or hazardous waste contamination of soils and groundwaters; and solid or hazardous waste contamination of the surface waters and sediments of Towanda Creek and the Susquehanna River. All of the contamination may pose, separately and collectively, an imminent and substantial endangerment to the health of the population adjacent to the well site, recreational users of the Towanda Creek and the Susquehanna River and to the environment surrounding the well site and downstream of the well site.

I. The Contamination of Towanda Creek with RCRA Solid or Hazardous Waste.

Towanda Creek, located in central north Pennsylvania, is a tributary of the Susquehanna River, which provides 45% of the fresh water in the Chesapeake Bay. It is situated above the Marcellus Shale, an underground rock formation that spans portions of Maryland, West Virginia, Pennsylvania, and New York, underlying approximately two thirds of Pennsylvania.

The Marcellus Shale is estimated to contain between 250-500 trillion cubic feet of natural gas, a valuable energy resource.[1] Thanks to recent advances in technology, natural gas deposits in the Marcellus Shale are now able to be extracted through a process of vertical and horizontal drilling known as hydraulic fracturing, "hydrofracking," or "fracking."[2] This process involves the injection of fluids containing a mixture of water, chemicals, and other compounds into a well that has been drilled into the Marcellus Shale, fluids that, at high pressure, can fracture rock formations in the Shale and release natural gas, which can then be extracted. These fluids are referred to as "drilling fluids, "fracturing fluids," or "fracking fluids." Although the precise mixture of these fracking fluids is not known, a recent Congressional study found that they contain 750 chemicals and other components, including several extremely toxic compounds, such as benzene (a carcinogen) and lead, as well as 2-butoxyethanol (a compound associated with blood and organ damage[3]),

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[1] Testimony of John W. Ubinger, Jr., S. Comm. on Environment & Public Works (Apr. 12, 2011), *available at:* http://epw.senate.gov/public/index.cfm?FuseAction=Hearings.Testimony&Hearing_ID=270378f4-802a-23ad-4d07-c6b1fd44510b&Witness_ID=529aa3c6-9a49-4112-a60b-5a256922bebe.

[2] *Id.*

[3] *See infra* Part II.

and ethylene glycol (the primary ingredient in antifreeze).[4] High levels of these contaminants remain in the fracking fluid that returns to the surface as wastewater after a well has been hydrofracked. This wastewater, referred to as "flowback water," is then contained at the well site, either to be recycled or hauled away for disposal.

Chesapeake Energy owns and operates numerous natural gas wells in the Marcellus Shale, including the Atgas 2H well in Leroy Township in Bradford County, Pennsylvania. At approximately 11:45 p.m. on April 19, 2011, essential components of the Atgas 2H well failed, causing tens of thousands of gallons of fracking fluids to be released. These fluids escaped Chesapeake Energy's inadequate containment, crossed over neighboring farm fields, and flowed into Towanda Creek. In response to the spill, Chesapeake Energy reportedly temporarily relocated seven families and advised a neighboring farmer to prevent his cows from drinking surface water. The spill was not confirmed to have been brought fully under control until sometime on Friday, April 22.

Pennsylvania's Department of Environmental Protection ("DEP") has since taken samples from the Creek to test for levels of contamination but the results have not yet been reported. DEP's samples are reportedly being tested specifically for chlorides, sulfates, arsenic, barium, iron, magnesium, and strontium, but not toxins such as benzene and ethylene glycol.[5]

II. The RCRA Solid or Hazardous Wastes Disposed of By Chesapeake Energy May Present an Imminent and Substantial Endangerment to Health or the Environment.

The contents of the fluid released at the well site and into Towanda Creek are unknown because Chesapeake Energy is not required to report the chemical constituents of its fracking fluid. However, self-reporting by Chesapeake Energy at other well sites in Bradford County indicates that it has used methanol, 2-butoxyethanol, and ethylene glycol, among other chemicals, in its fracking fluid.[6] In the Congressional study mentioned previously, methanol was reported to be the most commonly found component in fracking fluid. Methanol is a hazardous air pollutant and a candidate for regulation under the Safe Drinking Water

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[4] MINORITY STAFF OF H. COMMITTEE ON ENERGY & COMMERCE, CHEMICALS USED IN HYDRAULIC FRACTURING 1-9 (Comm. Print 2011); *see id.* at Appx. A (listing all the different chemicals and compounds found) (hereinafter "CHEMICALS USED IN HYDRAULIC FRACTURING") (attached as Exhibit A to this letter).

[5] *See Crews stop flow of drilling fluid from Pa. well*, Assoc'd Press, Apr. 22, 2011, *available at:* http://www.forbes.com/feeds/ap/2011/04/22/general-energy-us-gas-drilling-frackwater-spill_8430791.html.

[6] *See* Hydraulic Fracturing Fluid Product Component Information Disclosure, Chesapeake Appalachia, L.L.C., Kent 2H, *available at:* https://www.hydraulicfracturingdisclosure.org/fracfocusfind/ (attached as Exhibit B to this letter).

Act.[7] The study also found that, between 2005 and 2009, companies used 747,416 gallons of hydraulic fracturing products containing 2-butoxyethanol, also referred to as 2-BE.[8] 2-BE is a hemolytic agent, causing destruction of red blood cells, and can also damage the spleen, liver, and bone marrow.[9] The half-life of 2-BE in surface water has been estimated as being between 7 and 28 days.[10] Other toxic chemicals like benzene, lead, toluene, formaldehyde, and acrymalide are also found in hydraulic fracturing products.[11] Some of these chemicals are known human carcinogens.[12]

Flowback water also contains high levels of radioactive materials. The New York Times has reported that both industry and EPA confidential studies indicate that these materials "cannot be fully diluted in rivers and other waterways."[13] Radioactivity levels in Pennsylvania fracking wastewater have sometimes been thousands of times above the maximum allowed by the federal standard for drinking water.[14]

The release of these chemicals and radioactive minerals to the environment may present an imminent and substantial endangerment to health or the environment at the spill site and downstream areas. Maryland has reason to believe that contaminants have reached as many as twelve adjacent properties, including land used as cow pasture. Towanda Creek includes waterway segments with designated uses as exceptional value waterways, cold water fisheries, warm water fisheries and trout stocked fisheries. Exposure to unknown quantities of carcinogens and toxics substantially endangers the neighbors and livestock surrounding the spill site and the waters and habitats of Towanda Creek.

Moreover, as the contaminants persist in the environment, they will travel to Maryland within approximately five days from the date of this letter. Towanda Creek is a tributary of the Susquehanna River,

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[7] CHEMICALS USED IN HYDRAULIC FRACTURING at 6.

[8] *Id.* at 7.

[9] *Id.*

[10] AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY (ATSDR), U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, PUBLIC HEALTH SERVICE, TOXICOLOGICAL PROFILE FOR 2-BUTOXYETHANOL AND 2-BUTOXYETHANOL ACETATE 300 (1998), http://www.atsdr.cdc.gov/ ToxProfiles/tp118.pdf.

[11] CHEMICALS USED IN HYDRAULIC FRACTURING at 8-10.

[12] *Id.*

[13] Ian Urbina, *Regulation Lax as Gas Wells' Tainted Water Hits Rivers*, N.Y. TIMES, Feb. 27, 2011, at A-1.

[14] *Id.*

which flows into Maryland and empties into the Chesapeake Bay. The Susquehanna River supplies drinking water for approximately 6.2 million people, and serves as the back-up water supply for the City of Baltimore during periods of drought and is projected to serve as a continuous source of drinking water in the near future. Marylanders and Pennsylvanians alike use the Susquehanna for recreation, and sensitive fish populations like the American shad and striped bass are moving into the Susquehanna flats at this time of year. Exposure to toxic and carcinogenic chemicals in unknown quantities creates a risk of imminent and substantial endangerment to humans using Pennsylvania and Maryland waterways for recreation and to the environment.

III. The Fluid Released to Towanda Creek Constituted RCRA Solid or Hazardous Wastes.

The fracking fluid components spilled or leaked into the ground and Towanda Creek constitute "solid waste" under RCRA. "Solid waste" includes "discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities." 42 U.S. § 6903(27). Although the circumstances surrounding the failure of the Atgas 2H remain the subject of ongoing inquiry, information made publicly available to date indicates that Chesapeake Energy "discarded" the fracking fluid both by allowing it to spill onto the ground surface and, once contained within on-site containment structures, allowing those structures to fail, causing the release of fracking fluid into a tributary of Towanda Creek and Towanda Creek itself. Having been released onto the ground and into nearby surface waters, the fracking fluid was abandoned by Chesapeake Energy and no longer put to further use in Chesapeake Energy's industrial process. Indeed, Maryland has reason to believe that much of the fluid was trucked off-site for disposal, both as the spill was occurring and afterwards. These activities constitute the disposal of a solid waste, which disposal may present an imminent and substantial endangerment to both human health and the environment.

Moreover, the fluid itself is inherently "solid waste." Chesapeake Energy claims to recycle 100% of its fracking fluid using an onsite process that removes suspended solids, but does not remove dissolved material, like salts. These salts remain in the wastewater because it is uneconomic to remove them, not because they are useful in the industrial process. In fact, excessive dissolved salts can increase formation of scales in the mineshaft, leading to an increased chance of spills and leaks. Up to 85% of the fluids used during hydraulic fracturing remain underground and are never removed for safe disposal. Chesapeake's "recycling" of flowback water therefore amounts to discarding these unwanted salts by re-injecting them into the ground. The recycled water is, therefore, itself a "solid waste" under RCRA. Cf. API v. United States EPA, 216 F.3d 50, 59 (D.C. Cir. 2000) ("abandoning a material is discarding even if labeled recycling").

IV. Releasing the Fracking Fluid to Towanda Creek Has Resulted in the Unpermitted Discharge of a Pollutant to the Waters of the United States.

Upon information and belief, Chesapeake Energy does not have, and has never applied for, a permit to discharge fracking fluid to waters of the United States under the Clean Water Act's National Pollutant Discharge Elimination System ("NPDES") program. In fact, it would not be eligible for such a permit because the best practicable control technology for onshore drilling, including in the Marcellus Shale, requires that "there shall be no discharge of waste water pollutants into navigable waters from any source

associated with production, field exploration, drilling, well completion or well treatment (i.e., produced water, drilling muds, drill cuttings, and produced sand)."[15]

Fracking fluid consists of "chemical wastes, . . . , radioactive materials, heat, . . . , rock, sand, . . . and industrial, municipal, and agricultural waste discharged into water" and is therefore a "pollutant" as defined in the Clean Water Act ("CWA").[16] While water, gas, "or other material which is injected into a well to facilitate production of oil or gas" is exempt from the definition of "pollutant" under the CWA, [17] the discharged wastewater at issue here does not meet the terms of the exemption because, when discharged, it was no longer used to facilitate production. Nor was the fracking fluid contained within an underground injection site well approved by the state of Pennsylvania. Therefore, when fracking fluid entered an unnamed tributary of Towanda Creek and Towanda Creek itself, Chesapeake Energy's actions constituted the "discharge of any pollutant" not in accordance with the requirements of the CWA; accordingly, that discharge was "unlawful."[18]

Moreover, although Chesapeake Energy now claims that the discharge has ceased, it is intermittent and likely to recur.[19] Chesapeake Energy was issued the most violations of any corporation operating in the Marcellus Shale by DEP between January 1, 2008 and August 20, 2010.[20] Upon information and belief, Chesapeake Energy has repeatedly demonstrated that it does not take sufficient precautions to prevent discharges of harmful pollutants including hydrochloric acid and petroleum products or to prevent other major industrial accidents like well fires. Chesapeake Energy has reported that a flange, below the frac stack,

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[15] 40 C.F.R. § 435, Subpart C; *see also* Attachment to memorandum from James Hanlon, Director of EPA's Office of Wastewater Management to the EPA Regions, entitled, "Natural Gas Drilling in the Marcellus Shale under the NPDES Program" (March 16, 2011).

[16] 33 U.S.C. § 1362(6).

[17] *Compare* 33 U.S.C. § 1362(6)(B) (excluding from the definition of "pollutant" water, gas, "or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil or gas production and disposed of in a well, *if the well used either to facilitate production or for disposal purposes is approved by authority of the State* in which the well is located, *and if such State determines that such injection or disposal will not result in the degradation of ground or surface water resources*") (emphasis added).

[18] 33 U.S.C. § 1311(a).

[19] *See Gwaltney of Smithfield, Ltd. v. Chesapeake Bay Foundation, Inc.*, 484 U.S. 49, 64 (1987).

[20] *See* Pennsylvania Land Trust Association, *Marcellus Shale Drillers in Pennsylvania Amass 1614 Violations since 2008* (Oct 1, 2010), http://conserveland.org/violationsrpt (Chesapeake Energy was issued 149 violations and operated 190 wells during the examined time period).

failed, resulting in loss of control of the well.[21] Then, the containment area itself failed as the flowback water and fracturing fluid escaped the berm surrounding the well pad site.[22] This incident demonstrates that Chesapeake Energy's well pad design is not adequate to prevent the release of contaminated flowback water and fracking water in the event of well component failure. This is especially troubling because the potential for such failures was, or should have been, known to Chesapeake given the numerous occurrences of major spills of flowback water and fracturing fluid after containment equipment failure experienced by other industry participants. Because of the design failure of Chesapeake Energy's containment systems, discharges are likely to be intermittent and recur at the Atgas 2H well and at other wells owned or operated by Chesapeake Energy.

Chesapeake Energy's actions, allowing pollution to enter waters of the commonwealth of Pennsylvania, also constitute a violation of Pennsylvania's Clean Streams Law.[23]

V. The State of Maryland's Intention to File Suit.

In light of all the facts described above, Chesapeake Energy, as a past or present generator, transporter, or owner and operator of facilities where solid or hazardous wastes were treated, stored, or disposed of, has contributed, or is contributing, to the past or present handling, storage, treatment, transportation, or disposal of solid and of hazardous wastes in such a way as may create an imminent and substantial endangerment at its facility, the surrounding land, in Towanda Creek, and, ultimately, in Maryland. Pursuant to the RCRA citizen suit provision, 42 U.S.C. § 6972(a)(1)(B), the State accordingly intends to sue Chesapeake Energy Corporation for "contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment." RCRA defines disposal as a "discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters." See 42 U.S.C. § 6903(3).

Chesapeake Energy is in violation of RCRA's imminent and substantial endangerment provision until such time as it ceases to dispose of pollutants, and until it remediates such pollutants. At the close of the 90-day notice period, the State intends to file a citizen suit against Chesapeake Energy pursuant to 42 U.S.C. § 6972(a)(1)(B). The State intends to seek all available injunctive relief for the companies' creation of an imminent and substantial endangerment in violation of RCRA, any and all appropriate civil penalties, and the State's legal fees and costs.

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[21] Notice of Violation from Jennifer W. Means, Environmental Program Manager, Oil and Gas Management, Pennsylvania Department of Environmental Protection, to Tal Oden, Regulatory Manager, Chesapeake Energy Corporation (April 22, 2011).

[22] *Id.*

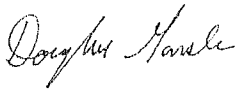
[23] 35 P.S. § 691.401.

Chesapeake Energy is also in violation of the CWA's prohibition on unpermitted pollution to waters of the United States. Pursuant to the CWA citizen suit provision, 33 U.S.C. § 1365(a)(1)(A), which permits any person having an interest in the action to file suit against any person alleged to be in violation of any effluent standard established by the CWA, the State accordingly intends to sue Chesapeake Energy for violating the CWA by discharging pollutants without a permit. At the close of the 60-day notice period, the State intends to file suit pursuant to 33 U.S.C. § 1365(a)(1)(A) and will seek all available injunctive relief necessary to ensure a cease to all intermittent effluent standard violations, any and all appropriate civil penalties, and the State's legal fees and costs. In addition, the State may include claims pursuant to the Pennsylvania Clean Streams Law, 35 P.S. § 691.601(c) and (e).

The claims set forth above are not exclusive. The State may additionally assert claims of private or public nuisance or other common law tort claims in conjunction with the claims discussed above. This Notice of Intent to Sue is sent without waiver of or any prejudice to the rights of the State of Maryland, the Attorney General of the State of Maryland, or any other agency or officer of the State of Maryland to advance any additional or further legal and/or factual claims, including any federal claim for relief and/or state law and/or common law cause of action based upon information or facts that are now known or may become known in the future.

Notice of Intent to Sue is hereby given. If you have any questions about the content of this letter or the State of Maryland's intentions, please do not hesitate to contact either Adam Snyder, Assistant Attorney General, at (410) 576-6326, or Sarah Rice, Assistant Attorney General, at (410) 576-7005.

Sincerely,



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On behalf of the State of Maryland

cc: (Via Certified Mail)

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Exhibit A

UNITED STATES HOUSE OF REPRESENTATIVES
COMMITTEE ON ENERGY AND COMMERCE
MINORITY STAFF
APRIL 2011

CHEMICALS USED IN HYDRAULIC FRACTURING

PREPARED BY COMMITTEE STAFF FOR:

Henry A. Waxman
Ranking Member
Committee on Energy and Commerce

Edward J. Markey
Ranking Member
Committee on Natural Resources

Diana DeGette
Ranking Member
Subcommittee on Oversight and Investigations

Appendix A. Chemical Components of Hydraulic Fracturing Products, 2005-2009[35]

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
1-(1-naphthylmethyl)quinolinium chloride	65322-65-8	1
1,2,3-propanetricarboxylic acid, 2-hydroxy-, trisodium salt, dihydrate	6132-04-3	1
1,2,3-trimethylbenzene	526-73-8	1
1,2,4-trimethylbenzene	95-63-6	21
1,2-benzisothiazol-3	2634-33-5	1
1,2-dibromo-2,4-dicyanobutane	35691-65-7	1
1,2-ethanediaminium, N, N'-bis[2-[bis(2-hydroxyethyl)methylammonio]ethyl]-N,N'-bis(2-hydroxyethyl)-N,N'-dimethyl-,tetrachloride	138879-94-4	2
1,3,5-trimethylbenzene	108-67-8	3
1,6-hexanediamine dihydrochloride	6055-52-3	1
1,8-diamino-3,6-dioxaoctane	929-59-9	1
1-hexanol	111-27-3	1
1-methoxy-2-propanol	107-98-2	3
2,2`-azobis (2-amidopropane) dihydrochloride	2997-92-4	1
2,2-dibromo-3-nitrilopropionamide	10222-01-2	27
2-acrylamido-2-methylpropanesulphonic acid sodium salt polymer	*	1
2-bromo-2-nitropropane-1,3-diol	52-51-7	4
2-butanone oxime	96-29-7	1
2-hydroxypropionic acid	79-33-4	2
2-mercaptoethanol (Thioglycol)	60-24-2	13
2-methyl-4-isothiazolin-3-one	2682-20-4	4
2-monobromo-3-nitrilopropionamide	1113-55-9	1
2-phosphonobutane-1,2,4-tricarboxylic acid	37971-36-1	2
2-phosphonobutane-1,2,4-tricarboxylic acid, potassium salt	93858-78-7	1
2-substituted aromatic amine salt	*	1
4,4'-diaminodiphenyl sulfone	80-08-0	3
5-chloro-2-methyl-4-isothiazolin-3-one	26172-55-4	5
Acetaldehyde	75-07-0	1
Acetic acid	64-19-7	56
Acetic anhydride	108-24-7	7
Acetone	67-64-1	3
Acetophenone	98-86-2	1
Acetylenic alcohol	*	1
Acetyltriethyl citrate	77-89-4	1
Acrylamide	79-06-1	2
Acrylamide copolymer	*	1
Acrylamide copolymer	38193-60-1	1

[35] To compile this list of chemicals, Committee staff reviewed each Material Safety Data Sheet provided to the Committee for hydraulic fracturing products used between 2005 and 2009. Committee staff transcribed the names and CAS numbers as written in the MSDSs; as such, any inaccuracies on this list reflect inaccuracies on the MSDSs themselves.

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Acrylate copolymer	*	1
Acrylic acid, 2-hydroxyethyl ester	818-61-1	1
Acrylic acid/2-acrylamido-methylpropylsulfonic acid copolymer	37350-42-8	1
Acrylic copolymer	403730-32-5	1
Acrylic polymers	*	1
Acrylic polymers	26006-22-4	2
Acyclic hydrocarbon blend	*	1
Adipic acid	124-04-9	6
Alcohol alkoxylate	*	5
Alcohol ethoxylates	*	2
Alcohols	*	9
Alcohols, C11-15-secondary, ethoxylated	68131-40-8	1
Alcohols, C12-14-secondary	126950-60-5	4
Alcohols, C12-14-secondary, ethoxylated	84133-50-6	19
Alcohols, C12-15, ethoxylated	68131-39-5	2
Alcohols, C12-16, ethoxylated	103331-86-8	1
Alcohols, C12-16, ethoxylated	68551-12-2	3
Alcohols, C14-15, ethoxylated	68951-67-7	5
Alcohols, C9-11-iso-, C10-rich, ethoxylated	78330-20-8	4
Alcohols, C9-C22	*	1
Aldehyde	*	4
Aldol	107-89-1	1
Alfa-Alumina	*	5
Aliphatic acid	*	1
Aliphatic alcohol polyglycol ether	68015-67-8	1
Aliphatic amine derivative	120086-58-0	2
Alkaline bromide salts	*	2
Alkanes, C10-14	93924-07-3	2
Alkanes, C13-16-iso	68551-20-2	2
Alkanolamine	150-25-4	3
Alkanolamine chelate of zirconium alkoxide (Zirconium complex)	197980-53-3	4
Alkanolamine/aldehyde condensate	*	1
Alkenes	*	1
Alkenes, C>10 alpha-	64743-02-8	3
Alkenes, C>8	68411-00-7	2
Alkoxylated alcohols	*	1
Alkoxylated amines	*	6
Alkoxylated phenol formaldehyde resin	63428-92-2	1
Alkyaryl sulfonate	*	1
Alkyl (C12-16) dimethyl benzyl ammonium chloride	68424-85-1	7
Alkyl (C6-C12) alcohol, ethoxylated	68439-45-2	2
Alkyl (C9-11) alcohol, ethoxylated	68439-46-3	1
Alkyl alkoxylate	*	9
Alkyl amine	*	2

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Alkyl amine blend in a metal salt solution	*	1
Alkyl aryl amine sulfonate	255043-08-04	1
Alkyl benzenesulfonic acid	68584-22-5	2
Alkyl esters	*	2
Alkyl hexanol	*	1
Alkyl ortho phosphate ester	*	1
Alkyl phosphate ester	*	3
Alkyl quaternary ammonium chlorides	*	4
Alkylaryl sulfonate	*	1
Alkylaryl sulphonic acid	27176-93-9	1
Alkylated quaternary chloride	*	5
Alkylbenzenesulfonic acid	*	1
Alkylethoammonium sulfates	*	1
Alkylphenol ethoxylates	*	1
Almandite and pyrope garnet	1302-62-1	1
Aluminium isopropoxide	555-31-7	1
Aluminum	7429-90-5	2
Aluminum chloride	*	3
Aluminum chloride	1327-41-9	2
Aluminum oxide (alpha-Alumina)	1344-28-1	24
Aluminum oxide silicate	12068-56-3	1
Aluminum silicate (mullite)	1302-76-7	38
Aluminum sulfate hydrate	10043-01-3	1
Amides, tallow, n-[3-(dimethylamino)propyl],n-oxides	68647-77-8	4
Amidoamine	*	1
Amine	*	7
Amine bisulfite	13427-63-9	1
Amine oxides	*	1
Amine phosphonate	*	3
Amine salt	*	2
Amines, C14-18; C16-18-unsaturated, alkyl, ethoxylated	68155-39-5	1
Amines, coco alkyl, acetate	61790-57-6	3
Amines, polyethylenepoly-, ethoxylated, phosphonomethylated	68966-36-9	1
Amines, tallow alkyl, ethoxylated	61791-26-2	2
Amino compounds	*	1
Amino methylene phosphonic acid salt	*	1
Amino trimethylene phosphonic acid	6419-19-8	2
Ammonia	7664-41-7	7
Ammonium acetate	631-61-8	4
Ammonium alcohol ether sulfate	68037-05-8	1
Ammonium bicarbonate	1066-33-7	1
Ammonium bifluoride (Ammonium hydrogen difluoride)	1341-49-7	10
Ammonium bisulfate	7783-20-2	3
Ammonium bisulfite	10192-30-0	15

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Ammonium C6-C10 alcohol ethoxysulfate	68187-17-7	4
Ammonium C8-C10 alkyl ether sulfate	68891-29-2	4
Ammonium chloride	12125-02-9	29
Ammonium fluoride	12125-01-8	9
Ammonium hydroxide	1336-21-6	4
Ammonium nitrate	6484-52-2	2
Ammonium persulfate (Diammonium peroxidisulfate)	7727-54-0	37
Ammonium salt	*	1
Ammonium salt of ethoxylated alcohol sulfate	*	1
Amorphous silica	99439-28-8	1
Amphoteric alkyl amine	61789-39-7	1
Anionic copolymer	*	3
Anionic polyacrylamide	*	1
Anionic polyacrylamide	25085-02-3	6
Anionic polyacrylamide copolymer	*	3
Anionic polymer	*	2
Anionic polymer in solution	*	1
Anionic polymer, sodium salt	9003-04-7	1
Anionic water-soluble polymer	*	2
Antifoulant	*	1
Antimonate salt	*	1
Antimony pentoxide	1314-60-9	2
Antimony potassium oxide	29638-69-5	4
Antimony trichloride	10025-91-9	2
a-organic surfactants	61790-29-8	1
Aromatic alcohol glycol ether	*	2
Aromatic aldehyde	*	2
Aromatic ketones	224635-63-6	2
Aromatic polyglycol ether	*	1
Barium sulfate	7727-43-7	3
Bauxite	1318-16-7	16
Bentonite	1302-78-9	2
Benzene	71-43-2	3
Benzene, C10-16, alkyl derivatives	68648-87-3	1
Benzenecarboperoxoic acid, 1,1-dimethylethyl ester	614-45-9	1
Benzenemethanaminium	3844-45-9	1
Benzenesulfonic acid, C10-16-alkyl derivs., potassium salts	68584-27-0	1
Benzoic acid	65-85-0	11
Benzyl chloride	100-44-7	8
Biocide component	*	3
Bis(1-methylethyl)naphthalenesulfonic acid, cyclohexylamine salt	68425-61-6	1
Bishexamethylenetriamine penta methylene phosphonic acid	35657-77-3	1
Bisphenol A/Epichlorohydrin resin	25068-38-6	5
Bisphenol A/Novolac epoxy resin	28906-96-9	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Borate	12280-03-4	2
Borate salts	*	5
Boric acid	10043-35-3	18
Boric acid, potassium salt	20786-60-1	1
Boric acid, sodium salt	1333-73-9	2
Boric oxide	1303-86-2	1
b-tricalcium phosphate	7758-87-4	1
Butanedioic acid	2373-38-8	4
Butanol	71-36-3	3
Butyl glycidyl ether	2426-08-6	5
Butyl lactate	138-22-7	4
C10-C16 ethoxylated alcohol	68002-97-1	4
C-11 to C-14 n-alkanes, mixed	*	1
C12-C14 alcohol, ethoxylated	68439-50-9	3
Calcium carbonate	471-34-1	1
Calcium carbonate (Limestone)	1317-65-3	9
Calcium chloride	10043-52-4	17
Calcium chloride, dihydrate	10035-04-8	1
Calcium fluoride	7789-75-5	2
Calcium hydroxide	1305-62-0	9
Calcium hypochlorite	7778-54-3	1
Calcium oxide	1305-78-8	6
Calcium peroxide	1305-79-9	5
Carbohydrates	*	3
Carbon dioxide	124-38-9	4
Carboxymethyl guar gum, sodium salt	39346-76-4	7
Carboxymethyl hydroxypropyl guar	68130-15-4	11
Cellophane	9005-81-6	2
Cellulase	9012-54-8	7
Cellulase enzyme	*	1
Cellulose	9004-34-6	1
Cellulose derivative	*	2
Chloromethylnaphthalene quinoline quaternary amine	15619-48-4	3
Chlorous ion solution	*	2
Choline chloride	67-48-1	3
Chromates	*	1
Chromium (iii) acetate	1066-30-4	1
Cinnamaldehyde (3-phenyl-2-propenal)	104-55-2	5
Citric acid (2-hydroxy-1,2,3 propanetricarboxylic acid)	77-92-9	29
Citrus terpenes	94266-47-4	11
Coal, granular	50815-10-6	1
Cobalt acetate	71-48-7	1
Cocaidopropyl betaine	61789-40-0	2
Cocamidopropylamine oxide	68155-09-9	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Coco bis-(2-hydroxyethyl) amine oxide	61791-47-7	1
Cocoamidopropyl betaine	70851-07-9	1
Cocomidopropyl dimethylamine	68140-01-2	1
Coconut fatty acid diethanolamide	68603-42-9	1
Collagen (Gelatin)	9000-70-8	6
Complex alkylaryl polyo-ester	*	1
Complex aluminum salt	*	2
Complex organometallic salt	*	2
Complex substituted keto-amine	143106-84-7	1
Complex substituted keto-amine hydrochloride	*	1
Copolymer of acrylamide and sodium acrylate	25987-30-8	1
Copper	7440-50-8	1
Copper iodide	7681-65-4	1
Copper sulfate	7758-98-7	3
Corundum (Aluminum oxide)	1302-74-5	48
Crotonaldehyde	123-73-9	1
Crystalline silica - cristobalite	14464-46-1	44
Crystalline silica - quartz (SiO2)	14808-60-7	207
Crystalline silica, tridymite	15468-32-3	2
Cumene	98-82-8	6
Cupric chloride	7447-39-4	10
Cupric chloride dihydrate	10125-13-0	7
Cuprous chloride	7758-89-6	1
Cured acrylic resin	*	7
Cured resin	*	4
Cured silicone rubber-polydimethylsiloxane	63148-62-9	1
Cured urethane resin	*	3
Cyclic alkanes	*	1
Cyclohexane	110-82-7	1
Cyclohexanone	108-94-1	1
Decanol	112-30-1	2
Decyl-dimethyl amine oxide	2605-79-0	4
Dextrose monohydrate	50-99-7	1
D-Glucitol	50-70-4	1
Di (2-ethylhexyl) phthalate	117-81-7	3
Di (ethylene glycol) ethyl ether acetate	112-15-2	4
Diatomaceous earth	61790-53-2	3
Diatomaceous earth, calcined	91053-39-3	7
Dibromoacetonitrile	3252-43-5	1
Dibutylaminoethanol (2-dibutylaminoethanol)	102-81-8	4
Di-calcium silicate	10034-77-2	1
Dicarboxylic acid	*	1
Didecyl dimethyl ammonium chloride	7173-51-5	1
Diesel	*	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Diesel	68334-30-5	3
Diesel	68476-30-2	4
Diesel	68476-34-6	43
Diethanolamine (2,2-iminodiethanol)	111-42-2	14
Diethylbenzene	25340-17-4	1
Diethylene glycol	111-46-6	8
Diethylene glycol monomethyl ether	111-77-3	4
Diethylene triaminepenta (methylene phosphonic acid)	15827-60-8	1
Diethylenetriamine	111-40-0	2
Diethylenetriamine, tall oil fatty acids reaction product	61790-69-0	1
Diisopropylnaphthalenesulfonic acid	28757-00-8	2
Dimethyl formamide	68-12-2	5
Dimethyl glutarate	1119-40-0	1
Dimethyl silicone	*	2
Dioctyl sodium sulfosuccinate	577-11-7	1
Dipropylene glycol	25265-71-8	1
Dipropylene glycol monomethyl ether (2-methoxymethylethoxy propanol)	34590-94-8	12
Di-secondary-butylphenol	53964-94-6	3
Disodium EDTA	139-33-3	1
Disodium ethylenediaminediacetate	38011-25-5	1
Disodium ethylenediaminetetraacetate dihydrate	6381-92-6	1
Disodium octaborate tetrahydrate	12008-41-2	1
Dispersing agent	*	1
d-Limonene	5989-27-5	11
Dodecyl alcohol ammonium sulfate	32612-48-9	2
Dodecylbenzene sulfonic acid	27176-87-0	14
Dodecylbenzene sulfonic acid salts	42615-29-2	2
Dodecylbenzene sulfonic acid salts	68648-81-7	7
Dodecylbenzene sulfonic acid salts	90218-35-2	1
Dodecylbenzenesulfonate isopropanolamine	42504-46-1	1
Dodecylbenzenesulfonic acid, monoethanolamine salt	26836-07-7	1
Dodecylbenzenesulphonic acid, morpholine salt	12068-08-5	1
EDTA/Copper chelate	*	2
EO-C7-9-iso-, C8-rich alcohols	78330-19-5	5
Epichlorohydrin	25085-99-8	5
Epoxy resin	*	5
Erucic amidopropyl dimethyl betaine	149879-98-1	3
Erythorbic acid	89-65-6	2
Essential oils	*	6
Ethanaminium, n,n,n-trimethyl-2-[(1-oxo-2-propenyl)oxy]-,chloride, polymer with 2-propenamide	69418-26-4	4
Ethanol (Ethyl alcohol)	64-17-5	36
Ethanol, 2-(hydroxymethylamino)-	34375-28-5	1
Ethanol, 2, 2'-(Octadecylamino) bis-	10213-78-2	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Ethanoldiglycine disodium salt	135-37-5	1
Ether salt	25446-78-0	2
Ethoxylated 4-nonylphenol (Nonyl phenol ethoxylate)	26027-38-3	9
Ethoxylated alcohol	104780-82-7	1
Ethoxylated alcohol	78330-21-9	2
Ethoxylated alcohols	*	3
Ethoxylated alkyl amines	*	1
Ethoxylated amine	*	1
Ethoxylated amines	61791-44-4	1
Ethoxylated fatty acid ester	*	1
Ethoxylated nonionic surfactant	*	1
Ethoxylated nonyl phenol	*	8
Ethoxylated nonyl phenol	68412-54-4	10
Ethoxylated nonyl phenol	9016-45-9	38
Ethoxylated octyl phenol	68987-90-6	1
Ethoxylated octyl phenol	9002-93-1	1
Ethoxylated octyl phenol	9036-19-5	3
Ethoxylated oleyl amine	13127-82-7	2
Ethoxylated oleyl amine	26635-93-8	1
Ethoxylated sorbitol esters	*	1
Ethoxylated tridecyl alcohol phosphate	9046-01-9	2
Ethoxylated undecyl alcohol	127036-24-2	2
Ethyl acetate	141-78-6	4
Ethyl acetoacetate	141-97-9	1
Ethyl octynol (1-octyn-3-ol,4-ethyl-)	5877-42-9	5
Ethylbenzene	100-41-4	28
Ethylene glycol (1,2-ethanediol)	107-21-1	119
Ethylene glycol monobutyl ether (2-butoxyethanol)	111-76-2	126
Ethylene oxide	75-21-8	1
Ethylene oxide-nonylphenol polymer	*	1
Ethylenediaminetetraacetic acid	60-00-4	1
Ethylene-vinyl acetate copolymer	24937-78-8	1
Ethylhexanol (2-ethylhexanol)	104-76-7	18
Fatty acid ester	*	1
Fatty acid, tall oil, hexa esters with sorbitol, ethoxylated	61790-90-7	1
Fatty acids	*	1
Fatty alcohol alkoxylate	*	1
Fatty alkyl amine salt	*	1
Fatty amine carboxylates	*	1
Fatty quaternary ammonium chloride	61789-68-2	1
Ferric chloride	7705-08-0	3
Ferric sulfate	10028-22-5	7
Ferrous sulfate, heptahydrate	7782-63-0	4
Fluoroaliphatic polymeric esters	*	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Formaldehyde	50-00-0	12
Formaldehyde polymer	*	2
Formaldehyde, polymer with 4-(1,1-dimethyl)phenol, methyloxirane and oxirane	30704-64-4	3
Formaldehyde, polymer with 4-nonylphenol and oxirane	30846-35-6	1
Formaldehyde, polymer with ammonia and phenol	35297-54-2	2
Formamide	75-12-7	5
Formic acid	64-18-6	24
Fumaric acid	110-17-8	8
Furfural	98-01-1	1
Furfuryl alcohol	98-00-0	3
Glass fiber	65997-17-3	3
Gluconic acid	526-95-4	1
Glutaraldehyde	111-30-8	20
Glycerol (1,2,3-Propanetriol, Glycerine)	56-81-5	16
Glycol ethers	*	9
Glycol ethers	9004-77-7	4
Glyoxal	107-22-2	3
Glyoxylic acid	298-12-4	1
Guar gum	9000-30-0	41
Guar gum derivative	*	12
Haloalkyl heteropolycycle salt	*	6
Heavy aromatic distillate	68132-00-3	1
Heavy aromatic petroleum naphtha	64742-94-5	45
Heavy catalytic reformed petroleum naphtha	64741-68-0	10
Hematite	*	5
Hemicellulase	9025-56-3	2
Hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine (Triazine)	4719-04-4	4
Hexamethylenetetramine	100-97-0	37
Hexanediamine	124-09-4	1
Hexanes	*	1
Hexylene glycol	107-41-5	5
Hydrated aluminum silicate	1332-58-7	4
Hydrocarbon mixtures	8002-05-9	1
Hydrocarbons	*	3
Hydrodesulfurized kerosine (petroleum)	64742-81-0	3
Hydrodesulfurized light catalytic cracked distillate (petroleum)	68333-25-5	1
Hydrodesulfurized middle distillate (petroleum)	64742-80-9	1
Hydrogen chloride (Hydrochloric acid)	7647-01-0	42
Hydrogen fluoride (Hydrofluoric acid)	7664-39-3	2
Hydrogen peroxide	7722-84-1	4
Hydrogen sulfide	7783-06-4	1
Hydrotreated and hydrocracked base oil	*	2
Hydrotreated heavy naphthenic distillate	64742-52-5	3
Hydrotreated heavy paraffinic petroleum distillates	64742-54-7	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Hydrotreated heavy petroleum naphtha	64742-48-9	7
Hydrotreated light petroleum distillates	64742-47-8	89
Hydrotreated middle petroleum distillates	64742-46-7	3
Hydroxyacetic acid (Glycolic acid)	79-14-1	6
Hydroxyethylcellulose	9004-62-0	1
Hydroxyethylethylenediaminetriacetic acid, trisodium salt	139-89-9	1
Hydroxylamine hydrochloride	5470-11-1	1
Hydroxypropyl guar gum	39421-75-5	2
Hydroxysultaine	*	1
Inner salt of alkyl amines	*	2
Inorganic borate	*	3
Inorganic particulate	*	1
Inorganic salt	*	1
Inorganic salt	533-96-0	1
Inorganic salt	7446-70-0	1
Instant coffee purchased off the shelf	*	1
Inulin, carboxymethyl ether, sodium salt	430439-54-6	1
Iron oxide	1332-37-2	2
Iron oxide (Ferric oxide)	1309-37-1	18
Iso amyl alcohol	123-51-3	1
Iso-alkanes/n-alkanes	*	10
Isobutanol (Isobutyl alcohol)	78-83-1	4
Isomeric aromatic ammonium salt	*	1
Isooctanol	26952-21-6	1
Isooctyl alcohol	68526-88-0	1
Isooctyl alcohol bottoms	68526-88-5	1
Isopropanol (Isopropyl alcohol, Propan-2-ol)	67-63-0	274
Isopropylamine	75-31-0	1
Isotridecanol, ethoxylated	9043-30-5	1
Kerosene	8008-20-6	13
Lactic acid	10326-41-7	1
Lactic acid	50-21-5	1
L-Dilactide	4511-42-6	1
Lead	7439-92-1	1
Light aromatic solvent naphtha	64742-95-6	11
Light catalytic cracked petroleum distillates	64741-59-9	1
Light naphtha distillate, hydrotreated	64742-53-6	1
Low toxicity base oils	*	1
Maghemite	*	2
Magnesium carbonate	546-93-0	1
Magnesium chloride	7786-30-3	4
Magnesium hydroxide	1309-42-8	4
Magnesium iron silicate	1317-71-1	3
Magnesium nitrate	10377-60-3	5

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Magnesium oxide	1309-48-4	18
Magnesium peroxide	1335-26-8	2
Magnesium peroxide	14452-57-4	4
Magnesium phosphide	12057-74-8	1
Magnesium silicate	1343-88-0	3
Magnesium silicate hydrate (talc)	14807-96-6	2
Magnetite	*	3
Medium aliphatic solvent petroleum naphtha	64742-88-7	10
Metal salt	*	2
Metal salt solution	*	1
Methanol (Methyl alcohol)	67-56-1	342
Methyl isobutyl carbinol (Methyl amyl alcohol)	108-11-2	3
Methyl salicylate	119-36-8	6
Methyl vinyl ketone	78-94-4	2
Methylcyclohexane	108-87-2	1
Mica	12001-26-2	3
Microcrystalline silica	1317-95-9	1
Mineral	*	1
Mineral Filler	*	1
Mineral spirits (stoddard solvent)	8052-41-3	2
Mixed titanium ortho ester complexes	*	1
Modified alkane	*	1
Modified cycloaliphatic amine adduct	*	3
Modified lignosulfonate	*	1
Monoethanolamine (Ethanolamine)	141-43-5	17
Monoethanolamine borate	26038-87-9	1
Morpholine	110-91-8	2
Mullite	1302-93-8	55
n,n-dibutylthiourea	109-46-6	1
N,N-dimethyl-1-octadecanamine-HCl	*	1
N,N-dimethyloctadecylamine	124-28-7	3
N,N-dimethyloctadecylamine hydrochloride	1613-17-8	2
n,n'-Methylenebisacrylamide	110-26-9	1
n-alkyl dimethyl benzyl ammonium chloride	139-08-2	1
Naphthalene	91-20-3	44
Naphthalene derivatives	*	1
Naphthalenesulphonic acid, bis (1-methylethyl)-methyl derivatives	99811-86-6	1
Natural asphalt	12002-43-6	1
n-cocoamidopropyl-n,n-dimethyl-n-2-hydroxypropylsulfobetaine	68139-30-0	1
n-dodecyl-2-pyrrolidone	2687-96-9	1
N-heptane	142-82-5	1
Nickel sulfate hexahydrate	10101-97-0	2
Nitrilotriacetamide	4862-18-4	4
Nitrilotriacetic acid	139-13-9	6

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Nitrilotriacetonitrile	7327-60-8	3
Nitrogen	7727-37-9	9
n-Methylpyrrolidone	872-50-4	1
Nonane, all isomers	*	1
Non-hazardous salt	*	1
Nonionic surfactant	*	1
Nonyl phenol ethoxylate	*	2
Nonyl phenol ethoxylate	9016-45-6	2
Nonyl phenol ethoxylate	9018-45-9	1
Nonylphenol	25154-52-3	1
Nonylphenol, ethoxylated and sulfated	9081-17-8	1
N-propyl zirconate	*	1
N-tallowalkyltrimethylenediamines	*	1
Nuisance particulates	*	2
Nylon fibers	25038-54-4	2
Octanol	111-87-5	2
Octyltrimethylammonium bromide	57-09-0	1
Olefinic sulfonate	*	1
Olefins	*	1
Organic acid salt	*	3
Organic acids	*	1
Organic phosphonate	*	1
Organic phosphonate salts	*	1
Organic phosphonic acid salts	*	6
Organic salt	*	1
Organic sulfur compound	*	2
Organic titanate	*	2
Organiophilic clay	*	2
Organo-metallic ammonium complex	*	1
Other inorganic compounds	*	1
Oxirane, methyl-, polymer with oxirane, mono-C10-16-alkyl ethers, phosphates	68649-29-6	1
Oxyalkylated alcohol	*	6
Oxyalkylated alcohols	228414-35-5	1
Oxyalkylated alkyl alcohol	*	1
Oxyalkylated alkylphenol	*	1
Oxyalkylated fatty acid	*	2
Oxyalkylated phenol	*	1
Oxyalkylated polyamine	*	1
Oxylated alcohol	*	1
Paraffin wax	8002-74-2	1
Paraffinic naphthenic solvent	*	1
Paraffinic solvent	*	5
Paraffins	*	1
Perlite	93763-70-3	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Petroleum distillates	*	26
Petroleum distillates	64742-65-0	1
Petroleum distillates	64742-97-5	1
Petroleum distillates	68477-31-6	3
Petroleum gas oils	*	1
Petroleum gas oils	64741-43-1	1
Phenol	108-95-2	5
Phenol-formaldehyde resin	9003-35-4	32
Phosphate ester	*	6
Phosphate esters of alkyl phenyl ethoxylate	68412-53-3	1
Phosphine	*	1
Phosphonic acid	*	1
Phosphonic acid	129828-36-0	1
Phosphonic acid	13598-36-2	3
Phosphonic acid (dimethlamino(methylene))	29712-30-9	1
Phosphonic acid, [nitrilotris(methylene)]tris-, pentasodium salt	2235-43-0	1
Phosphoric acid	7664-38-2	7
Phosphoric acid ammonium salt	*	1
Phosphoric acid, mixed decyl, octyl and ethyl esters	68412-60-2	3
Phosphorous acid	10294-56-1	1
Phthalic anhydride	85-44-9	2
Pine oil	8002-09-3	5
Plasticizer	*	1
Poly(oxy-1,2-ethanediyl)	24938-91-8	1
Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched (Nonylphenol ethoxylate)	127087-87-0	3
Poly(oxy-1,2-ethanediyl), alpha-hydro-omega-hydroxy	65545-80-4	1
Poly(oxy-1,2-ethanediyl), alpha-sulfo-omega-(hexyloxy)-, ammonium salt	63428-86-4	3
Poly(oxy-1,2-ethanediyl),a-(nonylphenyl)-w-hydroxy-, phosphate	51811-79-1	1
Poly-(oxy-1,2-ethanediyl)-alpha-undecyl-omega-hydroxy	34398-01-1	6
Poly(sodium-p-styrenesulfonate)	25704-18-1	1
Poly(vinyl alcohol)	25213-24-5	2
Polyacrylamides	9003-05-8	2
Polyacrylamides	*	1
Polyacrylate	*	1
Polyamine	*	2
Polyanionic cellulose	*	2
Polyepichlorohydrin, trimethylamine quaternized	51838-31-4	1
Polyetheramine	9046-10-0	3
Polyether-modified trisiloxane	27306-78-1	1
Polyethylene glycol	25322-68-3	20
Polyethylene glycol ester with tall oil fatty acid	9005-02-1	1
Polyethylene polyammonium salt	68603-67-8	2
Polyethylene-polypropylene glycol	9003-11-6	5

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Polylactide resin	*	3
Polyoxyalkylenes	*	1
Polyoxyethylene castor oil	61791-12-6	1
Polyphosphoric acid, esters with triethanolamine, sodium salts	68131-72-6	1
Polypropylene glycol	25322-69-4	1
Polysaccharide	*	20
Polyvinyl alcohol	*	1
Polyvinyl alcohol	9002-89-5	2
Polyvinyl alcohol/polyvinylacetate copolymer	*	1
Potassium acetate	127-08-2	1
Potassium carbonate	584-08-7	12
Potassium chloride	7447-40-7	29
Potassium formate	590-29-4	3
Potassium hydroxide	1310-58-3	25
Potassium iodide	7681-11-0	6
Potassium metaborate	13709-94-9	3
Potassium metaborate	16481-66-6	3
Potassium oxide	12136-45-7	1
Potassium pentaborate	*	1
Potassium persulfate	7727-21-1	9
Propanol (Propyl alcohol)	71-23-8	18
Propanol, [2(2-methoxy-methylethoxy) methylethoxyl]	20324-33-8	1
Propargyl alcohol (2-propyn-1-ol)	107-19-7	46
Propylene carbonate (1,3-dioxolan-2-one, methyl-)	108-32-7	2
Propylene glycol (1,2-propanediol)	57-55-6	18
Propylene oxide	75-56-9	1
Propylene pentamer	15220-87-8	1
p-Xylene	106-42-3	1
Pyridinium, 1-(phenylmethyl)-, ethyl methyl derivatives, chlorides	68909-18-2	9
Pyrogenic silica	112945-52-5	3
Quaternary amine compounds	*	3
Quaternary amine compounds	61789-18-2	1
Quaternary ammonium compounds	*	9
Quaternary ammonium compounds	19277-88-4	1
Quaternary ammonium compounds	68989-00-4	1
Quaternary ammonium compounds	8030-78-2	1
Quaternary ammonium compounds, dicoco alkyldimethyl, chlorides	61789-77-3	2
Quaternary ammonium salts	*	2
Quaternary compound	*	1
Quaternary salt	*	2
Quaternized alkyl nitrogenated compound	68391-11-7	2
Rafinnates (petroleum), sorption process	64741-85-1	2
Residues (petroleum), catalytic reformer fractionator	64741-67-9	10
Resin	8050-09-7	2

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Rutile	1317-80-2	2
Salt of phosphate ester	*	3
Salt of phosphono-methylated diamine	*	1
Salts of oxyalkylated fatty amines	68551-33-7	1
Secondary alcohol	*	7
Silica (Silicon dioxide)	7631-86-9	47
Silica, amorphous	*	3
Silica, amorphous precipitated	67762-90-7	1
Silicon carboxylate	681-84-5	1
Silicon dioxide (Fused silica)	60676-86-0	7
Silicone emulsion	*	1
Sodium (C14-16) olefin sulfonate	68439-57-6	4
Sodium 2-ethylhexyl sulfate	126-92-1	1
Sodium acetate	127-09-3	6
Sodium acid pyrophosphate	7758-16-9	5
Sodium alkyl diphenyl oxide sulfonate	28519-02-0	1
Sodium aluminate	1302-42-7	1
Sodium aluminum phosphate	7785-88-8	1
Sodium bicarbonate (Sodium hydrogen carbonate)	144-55-8	10
Sodium bisulfite	7631-90-5	6
Sodium bromate	7789-38-0	10
Sodium bromide	7647-15-6	1
Sodium carbonate	497-19-8	14
Sodium chlorate	7775-09-9	1
Sodium chloride	7647-14-5	48
Sodium chlorite	7758-19-2	8
Sodium cocaminopropionate	68608-68-4	2
Sodium diacetate	126-96-5	2
Sodium erythorbate	6381-77-7	4
Sodium glycolate	2836-32-0	2
Sodium hydroxide (Caustic soda)	1310-73-2	80
Sodium hypochlorite	7681-52-9	14
Sodium lauryl-ether sulfate	68891-38-3	3
Sodium metabisulfite	7681-57-4	1
Sodium metaborate	7775-19-1	2
Sodium metaborate tetrahydrate	35585-58-1	6
Sodium metasilicate, anhydrous	6834-92-0	2
Sodium nitrite	7632-00-0	1
Sodium oxide (Na2O)	1313-59-3	1
Sodium perborate	1113-47-9	1
Sodium perborate	7632-04-4	1
Sodium perborate tetrahydrate	10486-00-7	4
Sodium persulfate	7775-27-1	6
Sodium phosphate	*	2

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Sodium polyphosphate	68915-31-1	1
Sodium salicylate	54-21-7	1
Sodium silicate	1344-09-8	2
Sodium sulfate	7757-82-6	7
Sodium tetraborate	1330-43-4	7
Sodium tetraborate decahydrate	1303-96-4	10
Sodium thiosulfate	7772-98-7	10
Sodium thiosulfate pentahydrate	10102-17-7	3
Sodium trichloroacetate	650-51-1	1
Sodium tripolyphosphate	7758-29-4	2
Sodium xylene sulfonate	1300-72-7	3
Sodium zirconium lactate	174206-15-6	1
Solvent refined heavy naphthenic petroleum distillates	64741-96-4	1
Sorbitan monooleate	1338-43-8	1
Stabilized aqueous chlorine dioxide	10049-04-4	1
Stannous chloride	7772-99-8	1
Stannous chloride dihydrate	10025-69-1	6
Starch	9005-25-8	5
Steam cracked distillate, cyclodiene dimer, dicyclopentadiene polymer	68131-87-3	1
Steam-cracked petroleum distillates	64742-91-2	6
Straight run middle petroleum distillates	64741-44-2	5
Substituted alcohol	*	2
Substituted alkene	*	1
Substituted alkylamine	*	2
Sucrose	57-50-1	1
Sulfamic acid	5329-14-6	6
Sulfate	*	1
Sulfonate acids	*	1
Sulfonate surfactants	*	1
Sulfonic acid salts	*	1
Sulfonic acids, petroleum	61789-85-3	1
Sulfur compound	*	1
Sulfuric acid	7664-93-9	9
Sulfuric acid, monodecyl ester, sodium salt	142-87-0	2
Sulfuric acid, monooctyl ester, sodium salt	142-31-4	2
Surfactants	*	13
Sweetened middle distillate	64741-86-2	1
Synthetic organic polymer	9051-89-2	2
Tall oil (Fatty acids)	61790-12-3	4
Tall oil, compound with diethanolamine	68092-28-4	1
Tallow soap	*	2
Tar bases, quinoline derivatives, benzyl chloride-quaternized	72480-70-7	5
Tergitol	68439-51-0	1
Terpene hydrocarbon byproducts	68956-56-9	3

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Terpenes	*	1
Terpenes and terpenoids, sweet orange-oil	68647-72-3	2
Terpineol	8000-41-7	1
Tert-butyl hydroperoxide	75-91-2	6
Tetra-calcium-alumino-ferrite	12068-35-8	1
Tetraethylene glycol	112-60-7	1
Tetraethylenepentamine	112-57-2	2
Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione (Dazomet)	533-74-4	13
Tetrakis (hydroxymethyl) phosphonium sulfate	55566-30-8	12
Tetramethyl ammonium chloride	75-57-0	14
Tetrasodium 1-hydroxyethylidene-1,1-diphosphonic acid	3794-83-0	1
Tetrasodium ethylenediaminetetraacetate	64-02-8	10
Thiocyanate sodium	540-72-7	1
Thioglycolic acid	68-11-1	6
Thiourea	62-56-6	9
Thiourea polymer	68527-49-1	3
Titanium complex	*	1
Titanium oxide	13463-67-7	19
Titanium, isopropoxy (triethanolaminate)	74665-17-1	2
Toluene	108-88-3	29
Treated ammonium chloride (with anti-caking agent a or b)	12125-02-9	1
Tributyl tetradecyl phosphonium chloride	81741-28-8	5
Tri-calcium silicate	12168-85-3	1
Tridecyl alcohol	112-70-9	1
Triethanolamine (2,2,2-nitrilotriethanol)	102-71-6	21
Triethanolamine polyphosphate ester	68131-71-5	3
Triethanolamine titanate	36673-16-2	1
Triethanolamine zirconate	101033-44-7	6
Triethanolamine zirconium chelate	*	1
Triethyl citrate	77-93-0	1
Triethyl phosphate	78-40-0	1
Triethylene glycol	112-27-6	3
Triisopropanolamine	122-20-3	5
Trimethylammonium chloride	593-81-7	1
Trimethylbenzene	25551-13-7	5
Trimethyloctadecylammonium (1-octadecanaminium, N,N,N-trimethyl-, chloride)	112-03-8	6
Tris(hydroxymethyl)aminomethane	77-86-1	1
Trisodium ethylenediaminetetraacetate	150-38-9	1
Trisodium ethylenediaminetriacetate	19019-43-3	1
Trisodium nitrilotriacetate	18662-53-8	8
Trisodium nitrilotriacetate (Nitrilotriacetic acid, trisodium salt monohydrate)	5064-31-3	9
Trisodium ortho phosphate	7601-54-9	1
Trisodium phosphate dodecahydrate	10101-89-0	1
Ulexite	1319-33-1	1

Chemical Component	Chemical Abstract Service Number	No. of Products Containing Chemical
Urea	57-13-6	3
Wall material	*	1
Walnut hulls	*	2
White mineral oil	8042-47-5	8
Xanthan gum	11138-66-2	6
Xylene	1330-20-7	44
Zinc chloride	7646-85-7	1
Zinc oxide	1314-13-2	2
Zirconium complex	*	10
Zirconium dichloride oxide	7699-43-6	1
Zirconium oxide sulfate	62010-10-0	2
Zirconium sodium hydroxy lactate complex (Sodium zirconium lactate)	113184-20-6	2

** Components marked with an asterisk appeared on at least one MSDS without an identifying CAS number. The MSDSs in these cases marked the CAS as proprietary, noted that the CAS was not available, or left the CAS field blank. Components marked with an asterisk may be duplicative of other components on this list, but Committee staff have no way of identifying such duplicates without the identifying CAS number.*

Exhibit B

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	4/12/2011
State:	PENNSYLVANIA
County:	BRADFORD
API Number:	3701520476
Operator Name:	CHESAPEAKE APPALACHIA LLC
Well Name and Number:	KENT 2H
Longitude:	-76.510555
Latitude:	41.763303
Long/Lat Projection:	NAD27
Production Type:	Gas
True Vertical Depth (TVD):	5,716
Total Water Volume (gal)*:	7,180,866

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
Fresh Water		Carrier/Base Fluid				72.00700%	
Recycled Produced Water		Carrier/Base Fluid				16.33686%	
Sand (Proppant)		Proppant				11.16665%	
ACID, HYDROCHLORIC, 15 PCT	WEATHERFORD	Acid	Hydrochloric Acid	007647-01-0	15.00%	0.04117%	
WIC-641L	WEATHERFORD	Iron Control Agent	Citric Acid	000077-92-9	50.00%	0.00191%	
WAI-251LC	WEATHERFORD	Corrosion Inhibitor	Ethylene Glycol	000107-21-1	40.00%	0.00026%	
			Dimethyl Formamide	000068-12-2	30.00%	0.00020%	
			Proprietary	N/A	13.00%	0.00008%	
			Decanol	000112-30-1	7.00%	0.00005%	
			Isopropanol (Isopropyl Alcohol, Propan-2-ol)	000067-63-0	7.00%	0.00005%	
			Octanol	000111-87-5	7.00%	0.00005%	
			2-Butoxyethanol (Ethylene Glycol Monobutyl Ether)	000111-76-2	5.00%	0.00003%	
Bactron K-139	CHAMPION TECHNOLOGIES INC	Anti-Bacterial Agent	Quaternary Ammonium Compound	068424-85-1	10.00%	0.00359%	
			Ethanol	000064-17-5	5.00%	0.00180%	
			Glutaraldehyde (Pentanediol)	000111-30-8	5.00%	0.00180%	
Gyptron T-390	CHAMPION	Scale Inhibitor	Methanol (Methyl Alcohol)	000067-56-1	10.00%	0.00111%	

	TECHNOLOGIES INC						
WFR-59LA	WEATHERFORD	Friction Reducer	Polyacrylamide	009003-05-8	100.00%	0.04389%	
			Petroleum Distillate Hydrotreated Light	064742-47-8	40.00%	0.01756%	

* 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%

All component information listed was obtained from the supplier' s Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration' s (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.