

| LIST OF APPROVED DRILLING, GROUTING, REHABILITATION, HEAT EXCHANGE FLUIDS & ABANDONMENT PRODUCTS (DNR BUREAU OF DRINKING WATER & GROUNDWATER) | | | | | |
|--|---------------------|-------------------------------------|--|--|--|
| | | | | | April 20, 2010 |
| Approval Date | Product Name | Manufacturer or Distributor | Materials(s) | Uses | Special Conditions |
| 03-13-1996 | "ABI Crumbles" | ABI, Inc. | 100% granular sodium bentonite | Clay slurry ingredient; casing sealing material and lost circulation additive | None |
| 03-13-1996 | "ABI Gel" | ABI, Inc. | Powdered drilling mud-type bentonite (200-mesh) with polyacrylate polymer | Rotary drilling mud bentonite and clay slurry ingredient | None |
| 03-13-1996 | "ABI Granular" | ABI, Inc. | 100% granular sodium bentonite | Clay slurry ingredient; casing sealing material for percussion drilling; and lost circulation additive | None |
| 03-13-1996 | "ABI Grout" | ABI, Inc. | High solids bentonite grout (NSF Approved) | Bentonite grout-allowed for low capacity wells where neat cement grout is not required | Mixed according to Mfg's instructions |
| 03-13-1996 | "ABI Hi Yield" | ABI, Inc. | Powdered drilling mud-type sodium bentonite (200-mesh) with polyacrylate polymer added | Rotary drilling mud bentonite clay; clay slurry ingredient | None |
| 03-13-1996 | "ABI Plug" | ABI, Inc. | 100% chipped sodium bentonite, slow hydrating chips | Well, drillhole and pit abandonment | None |
| 08-29-1989 | "Air Foam" | Wyo-Ben, Inc. | Anionic Surfactant-alkyl ether sulfate | For rotary drilling to help remove drill cuttings, but only for bedrock | None |
| 08-29-1989 | "Amfoam" | Desert Drilling Fluids, Inc. | Anionic Surfactant | Foam for rotary drilling to help remove drill cuttings, but only for bedrock | (See approval) |
| 12-04-1998 03-30-2000 | "Aqua-Clear AE" | Baroid Industrial Drilling Products | Liquid blend of acid & acid enhancers | Well rehabilitation; to control bacterial slime caused by iron & sulfur reducing bacteria. | * See warning at end of this table. |
| 01-05-2000 | "Aqua-Clear MGA" | Baroid Industrial Drilling Products | Dry blend of granular acid with additives | Well rehabilitation; to remove iron, manganese and carbonate scale | * See warning at end of this table. |
| 01-06-2000 | "Aqua-Clear MSR" | Baroid Industrial Drilling Products | Dry granular pyrophosphate blended with a dispersant | Well development & rehabilitation; to help remove drilling mud residue and sediment from well screens and other components | None |

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|---------------|--|---|--|---|--|
| 04-08-2004 | "Aqua-Clear PFD" | Baroid Industrial Drilling Products | Dry granular co-polymer viscosifying agent | Drilling fluid product to be added to mix water to improve drillhole stability for rotary mud-circulation drilling and to improve carrying capacity for air or air/foam drilling. | May only be used as an additive and not as a complete replacement for rotary drilling mud; Also, may not be used in highly porous limestone or dolomite. |
| 01-30-1996 | "Aqua Freed Process" | Aqua Freed Water Retrieval Specialists | Carbon dioxide-liquid & gaseous & carbonic acid (created) | Well rehabilitation-removal of mineral encrustation and biofilm slimes | * See warning at end of this table. |
| 05-19-1988 | "Aquagel" | N. L. Baroid | Powdered drilling mud-type sodium bentonite (200-mesh) with 0.0125% polyacrylate polymer added | Rotary drilling mud clay; Clay slurry ingredient | (See approval) |
| 04-08-1988 | "Aquagel Gold Seal" | N. L. Baroid | Untreated 100% drilling mud sodium bentonite (powder)(200-mesh) | Rotary drilling mud clay; clay slurry ingredient | None |
| 07-08-1993 | "AquaGrout Catalyst: a.k.a. "Benseal-AquaGrout Catalyst" | N.L. Baroid | Granular bentonite mixed with a catalyst composed of four inorganic ingredients | High solids bentonite grout. For use where neat cement grout is not required | Allowed only for low cap. private & non-comm. wells where neat cement grout not required. |
| 07-12-1994 | "Aqua Guard Grout" | Baroid Drilling Fluids, Inc. | Granular bentonite (30-mesh) mixed with two proprietary inorganic ingredients to delay swelling of granules and to reduce pH | High solids bentonite grout & annular space seal. For use where neat cement grout not required | May not be used where neat cement grout is the required seal |
| 01-30-2009 | "AQF-2" | Halliburton (Baroid) Industrial Drilling Products | Anionic Surfactant | Foam for rotary drilling to help remove cuttings, but only for bedrock | None |
| 07-16-2003 | "Baroid Granular" | Baroid Industrial Drilling Products | Granular bentonite (30-mesh) | Clay slurry ingredient; lost circulation material for rotary-mud drilling; Seal for mounding around casing during driving | None |
| 01-26-2004 | "Barotherm" | Baroid Industrial Drilling Products | High-solids, bentonite grout for heat-exchange drillholes | Grout, sealing or heat exchange material for closed-loop heat pump drillholes. | None – May also be used for water well construction. |
| 06-05-2009 | "Barotherm Gold" | Halliburton (Baroid) Industrial Drilling Products | High-solids thermally conductive bentonite grout for heat-exchange drillholes | Grout, sealing or heat exchange material for closed-loop heat pump drillholes. | None – May also be used for water well construction. |
| 02-02-2009 | "Barotherm Plus" | Halliburton (Baroid) Industrial Drilling Products | High-solids thermally conductive bentonite grout for heat-exchange drillholes | Grout, sealing or heat exchange material for closed-loop heat pump drillholes. | None – May also be used for water well construction. |

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|---------------|---|---|---|---|--|
| 12-12-1988 | "Benseal" | N. L. Baroid | 100% coarsely-ground (8-mesh) sodium bentonite | Clay slurry ingredient; lost circulation material for rotary-mud drilling; Seal for mounding around casing during driving | None |
| 09-12-2001 | "BH ²⁰ Grout" | Geo Pro, Inc. & Black Hills Bentonite, L.L.C. | High solids (20%) bentonite grout | Grout, sealing or heat exchange material for closed-loop heat pump drillholes. | None – May also be used for water well construction. |
| 08-06-2002 | "BH Ultra" | Geo Pro, Inc. & Black Hills Bentonite, L.L.C. | High solids (20%) bentonite grout | Grout, sealing or heat exchange material for closed-loop heat pump drillholes. | None – May also be used for water well construction. |
| 08-19-1999 | "Bio Purge BD-2000" | Rin Rockford (Stiles-Kem Division) | Biodispersant and biopenetrant | Control biofilms and reduce other biologically related problems in wells | None |
| 08-21-2002 | "Bio Sabre" | Calciquest | Sodium-based blend of phosphate ingredients | Well rehabilitation, especially to penetrate and break down biofilms in wells. | None |
| 11-07-2006 | "Black Hills Bentonite Plug" | Black Hills Bentonite LLC | 100 % Bentonite chips | Well, Drillhole & Pit Abandonment | None |
| 10-22-2004 | "Black Hills Gel" | GeoPro, Inc. | Powdered, drilling mud-type bentonite (lower yield) (200-mesh), with polymer | Rotary drilling mud bentonite clay; clay slurry ingredient | None |
| 04-18-1996 | "BMR" (Bentonite Mud Remover) | CETCO | Inorganic acid salt (NSF Approved) | Well Development - by breaking down bentonite mud & natural clays and by dispersing and suspending clay particles | None |
| 07-15-2003 | "Casing Seal" | Baroid Industrial Drilling Products | Granular bentonite (8-14 mesh) | Clay slurry ingredient; lost circulation material for rotary-mud drilling; Seal for mounding around casing during driving | None |
| 05-17-1989 | "CETCO Chips" (Formerly "Volclay Chips") | CETCO | 100% chipped sodium bentonite-slow hydrating chips (medium –1/4-3/8") (coarse – 3/8-3/4") | Well, drillhole & pit abandonment | None |
| 05-19-1993 | "CETCO Crumbles" (Formerly "Crumbles" & "Volclay Crumbles") | CETCO | 100% ground (8-20 mesh) granular sodium bentonite (No additives) (NSF Approved) | Clay slurry ingredient; seal for driving casing and last circulation material for rotary mud drilling | None |

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|---------------|---|--|--|---|---|
| 06-25-1987 | CETCO Grout" (Formerly "Volclay Grout") (Bentonite Grout) | CETCO | Low yield bentonite single component bentonite grout - no additives (NSF Approved) | High solids bentonite grout for use where neat cement grout is not required | Allowed only where neat cement grout is not required - must be mixed according to instructions with product |
| 09-09-1999 | "ChloralPal" | Design Water Technologies | Buffered acid | To control pH during well chlorination procedures | * See warning at end of this table. |
| 10-06-1993 | "Clear Well Bacteria Controller" (BC&BE) | CETCO; formerly Clear Well Sales, Inc. | Weak acid plus a proprietary surfactant additive | Acidation product for wells to remove organic screen encrustation | Acid be properly flushed and neutralized. * Also see warning at end of this table. |
| 10-06-1993 | "Clear Well Granular Acid" ("GA") | CETCO; formerly Clear Well Sales, Inc. | Weak acid plus a proprietary inhibitor & surfactant | Acidation product for wells to remove inorganic screen encrustation | Acid be properly flushed and neutralized. * Also see warning at end of this table. |
| 07-28-1993 | "Clear Well Sediment and Mud Remover" (SR) | CETCO; formerly Clear Well Sales, Inc. | Phosphates | Dispersant for removing drilling mud, sediments and clays from wells during development | None |
| 08-11-1998 | "Cowboy Brand Bentonite Chips" (Fine, Medium & Coarse) | Cowboy Mining Co. | 100% Bentonite Chips | Well, Drillhole & Pit Abandonment | None |
| 08-12-1998 | "Cowboy Brand Granular Seal" | Cowboy Mining Co. | 100% Granular Bentonite (8-mesh) | Clay slurry ingredient; casing sealing material for percussion drilling & lost circulation additive | None |
| 08-13-1998 | "Cowboy Brand Grout" | Cowboy Mining Co. | High Solids Bentonite Grout (100% Bentonite) (NSF-Approved) | High Solids Bentonite Grout – Allowed for low capacity wells when neat cement grout not required | Mixed according to Mfg.'s instruction |
| 05-19-1993 | "Crumbles" (Volclay) (See "CETCO Crumbles") | CETCO | 100% ground (8-20 mesh) granular sodium bentonite (No additives) (NSF Approved) | Clay slurry ingredient; seal for driving casing and lost circulation material for rotary mud drilling | None |
| 05-22-1989 | "Custom Seal Granular" (C/S Granular-Volclay) | CETCO | 100% ground (40-50 mesh) sodium bentonite (granular) | Clay slurry ingredient & lost circulation material for rotary-mud drilling; Seal for driving casing | None |
| 01-30-1995 | "DDF Foamer" | Desert Drilling Fluids, Inc. | Anionic Surfactant | Foam for rotary drilling to help remove cuttings, but only for bedrock | None |

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| 12-22-1989 | "Detergent; liquid dishwashing-food grade" | Several brands | Liquid surfactant | Cleaning wells contaminated with PCB oils from submersible pumps and capacitors | Food grade; no additives-like color or scent additives |
| 11-20-2008 | "DOWFROST" | Dow Chemical Company | Propylene glycol based antifreeze fluid with corrosion inhibitor | Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems | None |
| 09-17-1990 | "DPA" | CETCO | Concentrated, white granular nonvolatile inorganic acid (NSF Approved) | Well treatment for cleaning mineral scale from screens, gravel packs and formation material | No additives. * Also see warning at end of this table. |
| 04-08-1988 | "Drilfoam" | N. L. Baroid | Anionic surfactant composed of alkyl ether sulfate (ammonium salt) | For rotary drilling to help remove drill cuttings, but only in bedrock | See approval |
| 05-01-2003 | "Dril-Sol" | Wyo-Ben, Inc. | Surfactant-based drilling fluid additive | For rotary drilling operations where air or air/foam drilling methods are allowed | None |
| 05-24-1996 | "Drispac" | Drilling Specialists Company | Polyanionic cellulose | Drilling fluid additive to be added to clear water for drillhole stability | None |
| 05-29-1997 | "Dry Acid" | Cotey Chemical Corp. | Chemical powder that produces sulfuric acid when mixed with water | Well development and rehabilitation | * See warning at end of this table. |
| 05-29-1997 | "Dry Acid Special" | Cotey Chemical Corp. | Chemical powder that produces sulfamic acid when mixed with water | Well development and rehabilitation | * See warning at end of this table. |
| 06-25-1990 | "Econoplug" | Distributed by Economy Mud Products Co. | 100% chipped sodium bentonite - slow hydrating chips; medium (1/4 - 3/8 ") & coarse (3/8 - 3/4") | Well, drillhole & pit abandonment | See instruction sheet |
| 06-28-1990 | "Econoplug Grout" | Distributed by Economy Mud Products Co. | High solids (30%) sodium bentonite grout material | High solids bentonite (clay) grout for use where neat cement grout is not required | Mud weight of 9.9 lbs/gal. - check for settling |
| 10-06-2004 | "8/25 Granular" | GeoPro, Inc. | Granular bentonite (100%) | Clay slurry ingredient; lost circulation material for rotary-mud drilling; Seal for mounding around casing during driving | None |
| 1992 | "EnviroCoke IV" | Loresco; Distributed by Cathodic Engineering Equip. Co., Inc. | Conductive Carbon Grout; High temperature calcined petroleum coke particles and Portland cement. | Grout for deep anode drillholes used for cathodic protection. | NR 812 requires prior department approval for a cathodic protection drillhole. |
| 02-27-2009 | "EnviroGard" | Rhomar Water Management, Inc. | Non-toxic propylene glycol based antifreeze fluid. | Heat transfer fluid for ground-coupled, closed-loop geothermal heat exchange systems | None |

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|-------------------------|----------------------------|---|---|---|--|
| 09-18-2009 | "Environol" | WaterFurnace International | Non-toxic ethanol (grain) alcohol-based antifreeze fluid with additives for lubrication, denaturing and coloring. | Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems | None |
| 05-18-1989 | "Enviroplug" | Wyo-Ben, Inc. | 100% chipped sodium bentonite, slow hydrating, chips (med. 1/4- 3/8" & coarse 3/8 - 3/4") | Well, drillhole & pit abandonment | See instruction sheet |
| 06-26-1990 | "Enviroplug Grout" | Wyo-Ben, Inc. | High solids (30%) sodium bentonite grout material | High solids bentonite (clay) grout for use where neat cement grout is not required | Mud weight of 9.9 lbs/gal. - check for settling |
| 06-29-1990 | "Enviroplug No. 8" | Wyo-Ben, Inc. | 100% coarsely-ground (8-mesh) granular sodium bentonite | Clay slurry ingredient; lost circulation material for rotary-mud drilling | None |
| 09-18-1991 | "Enviroplug No. 16" | Wyo-Ben, Inc. | 100% coarsely-ground (16-mesh) (granular) sodium bentonite | Clay slurry ingredient; bentonite grout ingredient; lost circulation material for rotary mud drilling | None |
| 11-20-2009 | "Ethanol SDA-3C 200 Proof" | Brenntag Great Lakes, LLC (Auer Steel, Distributor) | Ethanol alcohol antifreeze fluid with isopropyl alcohol as denaturing additive | Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems | None |
| 05-31-1989 & 09-18-1991 | "Extra High Yield" | Wyo-Ben, Inc. | Powdered drilling mud-type sodium bentonite (200-mesh) with 2-3 lbs/ton of proprietary polymer added (NSF Approved) | Rotary drilling mud & bentonite slurry ingredient | None |
| 04-27-2001 | "E-Z Mud Drilling Polymer" | Baroid Industrial Drilling Products | Co-polymer viscosifying drilling fluid agent | Additive for well drilling fluids | May not be used in highly porous limestone or dolomite formations; nor as a replacement for bentonite drilling mud. |
| 04-09-2004 | "E-Z Mud DP" | Baroid Industrial Drilling Products | Dry granular co-polymer viscosifying agent | Drilling fluid product to be added to mix water to improve drillhole stability for rotary mud-circulation drilling and to improve carrying capacity for air or air/foam drilling. | May only be used as an additive and not as a complete replacement for rotary drilling mud; Also, may not be used in highly porous limestone or dolomite. |

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|---------------|---|--|--|---|--|
| 02-02-2009 | "EZ Mud Gold" | Halliburton (Baroid) Industrial Drilling Products | Dry anionic polymer (beads) - viscosifying agent | Drilling fluid product to be added to mix water to improve drillhole stability for rotary mud-circulation drilling and to improve carrying capacity for air or air/foam drilling. | May only be used as an additive and not as a complete replacement for rotary drilling mud; Also, may not be used in highly porous limestone or dolomite. |
| 07-09-2004 | "E-Z Seal" | Baroid Industrial Drilling Products | High solids bentonite grout material (one-sack product) | High solids bentonite grout | Allowed only for low cap. private & non-comm. wells where neat cement grout not required. |
| 03-07-1996 | "F-25 Well Conditioner" | The Kjell Corporation | Liquid polymerized anionic phosphate complex | Well rehabilitation-cleaning wells contaminated with biofilms | None |
| 07-18-1991 | "Federal 200"; a.k.a. "Federal High Yield" | M-1 Drilling Fluids (Federal) | Powdered (200-mesh) drilling mud-type bentonite with proprietary ingredient additive @ 0.10-0.15% | Drilling mud bentonite; clay slurry ingredient | None |
| 03-03-1993 | "Federal-BP-8" | M-1 Drilling Fluids (Federal) | 100% Granular sodium Bentonite (8-20 mesh) | Clay slurry ingredient - sealant for driving casing; lost circulation material | None |
| 03-05-1993 | "Federal Granular" | M-1 Drilling Fluids (Federal) | 100% Granular sodium Bentonite (~48-150 mesh) | Clay slurry ingredient - sealant for driving casing; lost circulation material | None |
| 03-03-1993 | "Federal Plug" | M-1 Drilling Fluids (Federal) | 100% of chipped sodium bentonite - slow hydrating; medium (1/4" – 3/8") and coarse (3/8 – 3/4inch) | Well, drillhole and pit abandonment | See instruction sheet |
| 09-11-2009 | "Fremont 9134FG; 9134FG-25D; 9134FG-30D; 9134FG-35D; 9134FG-40D; 9134FG-45D & FG9134-50G" | Fremont Industries Water Management Solutions | Propylene glycol-based antifreeze fluid with corrosion inhibitor | Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems | None |
| 01-26-1998 | "Gel Supreme" | Federal Summit | Untreated powdered (200-mesh) drilling mud bentonite (no additives) | Drilling mud, clay slurry ingredient | None |
| 12-08-2009 | "Geo SuperGrout" | SuperGrout Products, LLC | Cementitious grout containing Portland Cement and other cement derivatives | Grouting material for closed-loop, heat exchange drillholes. | None |
| 06-07-2004 | "Geothermal Grout" | CETCO Drilling Products | High-solids bentonite grout for heat-exchange drillholes | Grout, sealing or heat exchange material for closed-loop heat pump drillholes. | None – May also be used for water well construction. |

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|---------------|------------------------------------|--|--|---|--|
| 05-06-2008 | "Gopher Grout" | M-I SWACO HDD Mining and Water Well Group | High solids bentonite grout (NSF Certified) | Bentonite grout. Allowed for low capacity wells where neat cement grout is not required. | Mud weight at least 9.4 lbs/gal. |
| 02-04-1997 | "Grout-Well" | Wyo-Ben, Inc. | High solids bentonite grout (NSF Approved) | Bentonite grout. Allowed for low capacity wells where neat cement grout is not required. | Mud weight at least 9.4 lbs/gal. |
| 02-04-1997 | "Grout-Well DF" | Wyo-Ben, Inc. | Same as above except grout uses granular. | Bentonite grout. Allowed for low capacity wells where neat cement grout is not required. | Mud weight at least 9.4 lbs/gal. |
| 11-25-2009 | "Heat Transfer Fluid-PG-ND" | Wausau Chemical Corporation | Propylene glycol-based antifreeze fluid with corrosion inhibitor | Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems | None |
| 02-09-2010 | "Heat Transfer Fluid HTF-PG-HD" | Wausau Chemical Corporation | Propylene glycol-based antifreeze fluid with two corrosion inhibitors | Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems | None |
| 01-23-1998 | "Hi-Yield Gel" | Federal Summit | Powdered (200-mesh) drilling mud bentonite with proprietary additive @ 0.10-0.15% | Drilling mud; clay slurry ingredient | None |
| 01-02-1989 | "Holeplug" | N. L. Baroid | 100% chipped sodium bentonite; 3/8" and 3/4" slow hydrating chips | Well, drillhole and pit abandonment | See instruction sheet |
| 06-26-1990 | "Hydrogel" | Wyo-Ben, Inc. | Powdered, drilling mud-type bentonite (200-mesh) with 1/4 - 1/3 lb./ton polyacrylate polymer | Rotary drilling mud clay; clay slurry ingredient | (See approval) |
| 10-21-2004 | "HYG 200 GEL" | GeoPro, Inc. | Powdered, drilling mud-type bentonite (high yield) (200-mesh), with polymer | Rotary drilling mud clay; clay slurry ingredient | None |
| 10-29-2001 | "IntelliChlor" | Carus Chemical Company | Liquid blend of acid with an additive enhancer | Controlling pH during chlorination disinfection procedures & for well rehab. | * See warning at end of this table. |
| 10-15-2008 | "Intercool P-323" | Interstate Chemical Co. Inc. | Propylene glycol based antifreeze fluid with corrosion inhibitor | Heat exchange fluid for closed-loop geothermal heat exchange heating/cooling systems | None |
| 04-09-1990 | "Interfoam" | International Drilling Fluids, Inc. | Anionic surfactant | Foam for rotary drilling to help remove cuttings, but only in bedrock | None |
| 06-29-1990 | "Kwik-Ben" | Distributed by International Drilling Fluids, Inc. | Powdered, drilling mud-type bentonite (200- mesh) with 1/2 lb./ton proprietary polymer added (NSF Approved) | Rotary drilling mud clay; clay slurry ingredient | None |

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|--------------------------|--|---|---|---|--|
| 01-28-1998 | "Kwik-Plug Coarse & Medium" | Federal Summit | 100% chipped sodium bentonite. coarse (3/4") medium (3/8") | Well, drillhole and pit abandonment | None |
| 02-09-1998 | "Kwik-Plug Fine" | Federal Summit | Granular bentonite (8-mesh) | High Solids bentonite grout; Annular space seal for driving casing | None |
| 02-09-1998 | "Kwik-Plug Micro" | Federal Summit | Granular bentonite (16-20 mesh) | High Solids bentonite grout; Annular space seal for driving casing | None |
| 10-25-1996 01-26-1998 | "Kwik-Thik" | Federal Summit (Formerly M-1 Drilling Fluids) | Powdered (200-mesh) bentonite for rotary drilling mud with proprietary ingredient at 0.10-0.15% | Drilling mud bentonite and clay slurry ingredient | None |
| 12-07-2007 | "Layne Oximate" | Layne Christensen Company | Liquid acidic/surfactant product | Help control pH of disinfection/rehabilitation solution | None |
| 07-19-1990 | "LBA" (Liquid Chelatin Agent) (Formerly Liquid Biofouling Agent) | CETCO | Liquid organic acid chelating agent (NSF Approved) | Well treatment for iron bacteria by removing slime and destroying bacteria | That instructions be supplied with product. * Also see warning at end of this table. |
| 05-29-1997 | "Liquid Acid Descaler" | Cotey Chemical Corp. | A mixture of liquid acids (Hydrochloric and glycolic) and a surfactant | Well development and rehabilitation | * See warning at end of this table. |
| 02-02-2001 | "Loresco Type SC.3" | Loresco International, Inc. | A base carbon material with a proprietary ingredient for reducing surface tension for compact settling under water. | Conductive backfill material to surround anodes in a cathodic protection drillhole. | NR 812 requires prior department approval for a cathodic protection drillhole. |
| 01-26-1998 | "Max-Gel" | Federal Summit | Powered (200-mesh) drilling mud bentonite with proprietary additive @ 0.10-0.15% | Drilling mud; clay slurry ingredient | None |
| 04-22-1989 | "Micatex" | N. L. Baroid | Muscovite mica (fluorhlogopite) flakes (powder to small gain consistency) | Restore circulation of rotary drilling fluid after last circulation occurs | To be used only as a last resort to restore circulation |
| 04-04-2003 | "Mud-Gel" | Baroid Industrial Drilling Products | Powdered drilling mud-type sodium bentonite (200-mesh) with 0.0125% polyacrylate polymer added | Rotary drilling mud clay; clay slurry ingredient | None |
| 05-29-1997 | "Mud-Nox" | Cotey Chemical Corp. | Nonionic Surfactant | Well development and rehabilitation | None |
| 05-21-2002 | "Muriatic Acid 20 degree 103L" | Hydrite Chemical Company | Muriatic acid with an inhibitor | Well rehabilitation and controlling pH during well chlorination. | * See warning at end of this table. |

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|--------------------------|--------------------|--|---|--|--|
| 01-27-2004 | "N-Seal" | Baroid Industrial Drilling Products | Extrusion spun mineral fiber | Lost circulation material | None |
| 09-18-1991 | "Naturalgel" | Wyo-Ben, Inc. | Powdered (200-mesh) western sodium bentonite (montmorillonite) | Rotary drilling mud clay; clay slurry ingredient | None |
| 09-18-1991 | "Naturpel" | Wyo-Ben, Inc. | Chipped sodium bentonite | Well, drillhole & pit abandonment. | None |
| 04-19-2010 | "NOBURST HD | Noble Company | Monopropylene (Propylene glycol) - based antifreeze fluid with corrosion inhibitor | Heat exchange fluid for closed-loop geothermal heat exchange heating/cooling systems | None |
| 04-20-2010 | "NOBURST HD 50%" | Noble Company | Monopropylene (Propylene glycol) - based antifreeze fluid with corrosion inhibitor and defoaming agent | Heat exchange fluid for closed-loop geothermal heat exchange heating/cooling systems | None |
| 04-16-2010 | "NOBURST HD 100" | Noble Company | Monopropylene (Propylene glycol) - based antifreeze fluid with corrosion inhibitor and defoaming agent | Heat exchange fluid for closed-loop geothermal heat exchange heating/cooling systems | None |
| 02-22-1980 | "Nu-Well" | Johnson Division, UOP, Inc. (now U.S. Filter/Johnson Screen) | Pelletized sulfamic acid with inhibition wetting agent and other ingredients (information confid. held by Department) | Dissolve encrustation on well screens and surrounding formation | * See warning at end of this table. |
| 12-26-2002 01-13-2003 | "NW-220" | Water Systems Engineering, Inc. | Polymeric dispersant | Well development and redevelopment – To remove clays, muds and sediment from a well | None |
| 02-11-2000 | "NW-310" | U.S. Filter/Johnson Screen | Polymeric acid (To be used in combination with "Nu-Well") | Well rehabilitation. To help break biofilms, disperse mineral salts, maintain acid reaction and hold debris in suspension. | * See warning at end of this table. |
| 02-10-1994 | "Opti Seal" | Bentonite Corp. | 100% chipped sodium bentonite; 3/8" & 3/4" slow hydrating chips | Well, drillhole and pit abandonment | None |
| 07-24-1989 | "PdsCo Granular" | Polymer Drilling System (PdsCo) | 100% ground (8-20 mesh) granular sodium bentonite | Clay slurry ingredient & lost circulation material for rotary mud drilling | None |
| 03-13-1996 | "PdsCo Grout" | Polymer Drilling systems (PdsCo) | High Solids Bentonite Grout (NSF Approved) | High solids bentonite grout-allowed for low capacity wells where neat cement grout not required | Mixed according to Mfg's instructions |
| 07-24-1989 | "PdsCo High Yield" | Polymer Drilling Systems (PdsCo) | Powdered drilling mud-type sodium bentonite (200-mesh) with 2-3 lbs/ton of sodium polyacrylate polymer added | Rotary drilling mud & clay slurry ingredient | (See approval) |

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| 07-23-1989 & 05-26-1989 | "PdsCo Plug" | Polymer Drilling Systems (PdsCo) | 100% chipped sodium bentonite slow hydrating chips (coarse – 3/4") (medium – 3/8") | Well, drillhole & pit abandonment | None |
| 02-28-1990 | "Permaplug" | Loresco. Distributed by Cathodic Engineering Equip. Co., Inc. | 100% chipped sodium bentonite - slow hydrating chips; medium (1/4 – 3/8") & coarse (1/2 – 3/4") | Well, drillhole & pit abandonment | None |
| 02-01-2004 | "Penetrol" | Baroid Industrial Drilling Products | Non-ionic wetting agent | Drill fluid additive where air or air/foam drilling methods are used | None |
| 05-22-2003 | "Plugz-It" | Wyo-Ben, Inc. | Coated granular bentonite (8 to 40 mesh) | Clay slurry ingredient; casing sealing material for percussion drilling & a lost circulation additive for rotary drilling | None |
| 05-23-2003 | "Plugz-It Max" | Wyo-Ben, Inc. | Coated granular bentonite (4 to 16 mesh) | Clay slurry ingredient; casing sealing material for percussion drilling & a lost circulation additive for rotary drilling | None |
| 09-20-2005 | "Poly-Bore" | Baroid Industrial Drilling Products | 100% dry granular polymer (PHPA) | Water based drilling fluid additive for reverse-rotary (and horizontal directional drilling) methods – Designed to improve viscosity characteristics of drilling fluid & to help stabilize drillhole | None |
| 06-26-1990 | "Poly-Gel" | Distributed by Economy Mud Products Co. | Powdered, drilling mud-type bentonite (200-mesh) with ½ lb./ton proprietary polymer added (NSF Approved) | Rotary drilling mud clay; clay slurry ingredient | None |
| 12-03-2007 | "PowerTEC" | GeoPro, Inc. | Graphite-based product | Additive for approved high solids bentonite grout, but only for closed-loop geothermal drillholes. | To be used only for geothermal drillholes, according to Mfg.'s instructions. |
| 07-17-1989 | "Premium Gel" | CETCO | Powdered drilling mud-type sodium bentonite (200-mesh) with ½ -1 lb./ton of sodium polyacrylate polymer added; 90 bbl yield; API Drilling Fluid (NSF Approved) | Rotary drilling mud & clay slurry ingredient | None |
| 07-18-1991 | "Pure Gold Gel" | CETCO | Untreated powdered (200-mesh) drilling mud-type bentonite - additive free; 90 bbl yield - organic free (NSF Approved) | Rotary drilling mud clay; clay slurry ingredient esp. for environmental drilling | None |

| Approval Date | Product Name | Manufacturer or Distributor | Materials(s) | Uses | Special Conditions |
|---------------|-------------------|---|--|---|--|
| 07-16-1991 | "Pure Gold Grout" | CETCO | Organic-free western sodium bentonite and proprietary mixture of sulfate (NSF Approved) | High solids bentonite grout for use where neat cement grout not required | None |
| 07-18-1991 | "Pure Gold Chips" | CETCO | Sodium bentonite chips (Coarse 3/8-3/4" and medium 1/4-3/8") | Well, drillhole & pit abandonment. | None |
| 04-06-1999 | "QC-21" | Layne-Northwest, subsidiary of Layne, Inc. | Aqueous solution of organic acid, with chelating agents and a surfactant. | Cleaning & well rehabilitation agent to control mineral precipitants, metal oxides and organic bio-mass deposits in well screens & gravel packs. | * See warning at end of this table. |
| 1973 | "Quik Foam" | N. L. Baroid | Anionic surfactant composed of alkyl ether sulfate (ammonium salt) | For rotary drilling to help remove drill cutting, but only in bedrock | None |
| 05-05-1988 | "Quik Gel" | N. L. Baroid | Premium grade drilling mud-type sodium bentonite (200-mesh) with 0.11% sodium, polyacrylate polymer | Rotary drilling mud clay; clay slurry ingredient | None |
| 07-12-1994 | "Quik Grout" | Baroid Drilling Fluids, Inc. | Granular Bentonite (30-mesh) mixed with two proprietary inorganic ingredients to delay swelling of granules and to reduce pH | High solids bentonite grout & annular space seal for use where neat cement grout not required | May not be used where neat cement grout is the required seal (at least 18% solids) |
| 02-05-2009 | "Quik Mud Gold" | Halliburton (Baroid) Industrial Drilling Products | Liquid copolymer – Partially hydrolyzed polyacrylamide-polyacrylate (PHPA) viscosifying agent | Drilling fluid product to be added to mix water to improve drillhole stability for rotary mud-circulation drilling and to improve carrying capacity for air or air/foam drilling. | May only be used as an additive and not as a complete replacement for rotary drilling mud; Also, may not be used in highly porous limestone or dolomite. |
| 02-04-2009 | "Quik Mud Gold" | Halliburton (Baroid) Industrial Drilling Products | Dry anionic polymer - viscosifying agent | Drilling fluid product to be added to mix water to improve drillhole stability for rotary mud-circulation drilling and to improve carrying capacity for air or air/foam drilling. | May only be used as an additive and not as a complete replacement for rotary drilling mud; Also, may not be used in highly porous limestone or dolomite. |
| 09-12-2005 | "Quik-Trol" | Baroid Industrial Drilling Products | Natural cellulosic polymer | Drilling fluid additive for water-based drilling fluids; And as an additive to be used for rotary-mud drilling fluid systems & for rotary air-foam drilling systems – to 'stiffen' the foam | None |

| Approval Date | Product Name | Manufacturer or Distributor | Materials(s) | Uses | Special Conditions |
|---------------|------------------------|--|---|--|--|
| 02-03-2009 | "Quik-Trol Gold" | Halliburton (Baroid) Industrial Drilling Products | Natural cellulosic polymer with a low molecular weight | Drilling fluid additive for water-based drilling fluid systems & as an additive for rotary-mud drilling fluid systems | None |
| 09-13-2005 | "Quik-Trol LV" | Baroid Industrial Drilling Products | Natural cellulosic polymer with a low molecular weight | Drilling fluid additive for water-based drilling fluid systems & as an additive for rotary-mud drilling fluid systems | None |
| 02-14-1994 | "Redi-Clean 1" | Jacam Chemical Partners, Ltd. | Weak acid & proprietary additives including a salt and a non-hazardous surfactant | Acidation product for wells esp. for screen encrustation | That precautions be provided with product. *Also see warning at end of this table. |
| 01-30-2009 | "RhoGard Ultra DP" | Rhomar Water Management, Inc. | Non-toxic propylene glycol based antifreeze fluid. | Heat transfer fluid for ground-coupled, closed-loop geothermal heat exchange systems | None |
| 05-18-2007 | "Safe-T-Therm" | Houghton Chemical Corporation | Propylene glycol based antifreeze fluid | Heat transfer fluid for closed-loop geothermal drillhole heat exchange systems | None |
| 05-23-1996 | "SC-200" | CETCO | Non-ionic liquid surfactant wetting agent | Well rehabilitation; enhances dispersing efficiency of other well rehab products and for well development | None |
| 05-06-2008 | "Smooth Grout 20" | M-I SWACO HDD Mining and Water Well Group | High solids bentonite grout (NSF Certified) | Bentonite grout. Allowed for low capacity wells where neat cement grout is not required. | Mud weight at least 9.4 lbs/gal. |
| 07-13-1989 | "Super Gel-X" | CETCO | High viscosity (200 bbl yield) powdered drilling mud-type sodium bentonite (200-mesh) with ½ -1 lb./ton of sodium polyacrylate polymer added (NSF Approved) | Rotary drilling mud & clay slurry ingredient | (See approval) |
| 05-15-2003 | "TD-16" | Wyo-Ben, Inc. | Coated granular bentonite grouting material | High solids bentonite grouting for use where neat cement grout is not required; And for a sealing and heat exchange material for closed-loop heat pump drillholes. | None |
| 08-06-2002 | "Thermal Grout Lite" | Geo Pro, Inc. & Black Hills Bentonite, L.L.C. | High solids (20%) bentonite grout | Grout, sealing or heat exchange material for closed-loop heat pump drillholes. | None – May also be used for water well construction. |
| 08-06-2002 | "Thermal Grout Select" | Geo Pro, Inc. & Black Hills Bentonite, L.L.C. | High solids (20%) bentonite grout | Grout, sealing or heat exchange material for closed-loop heat pump drillholes. | None – May also be used for water well construction. |
| 03-17-2010 | "Therm-Ex Grout" | Wyo-Ben, Inc. | High solids geothermal bentonite grout | Grout, sealing or heat exchange material for closed-loop heat pump drillholes. | None |

| Approval Date | Product Name | Manufacturer or Distributor | Materials(s) | Uses | Special Conditions |
|--------------------------|--|-----------------------------|---|--|---|
| 03-18-2010 | "Therm-Ex Grout Plus" | Wyo-Ben, Inc. | High solids geothermal bentonite grout | Grout, sealing or heat exchange material for closed-loop heat pump drillholes. | None |
| 10-11-2004 | "3/8-inch & 3/4-inch Bentonite Plug" (chips) | GeoPro, Inc. | Bentonite chips (100%) | Well, drillhole & pit abandonment | None |
| 05-05-2003 07-01-2004 | "ThinZ-It" | Wyo-Ben, Inc. | Polymeric drilling fluid additive and well development dispersant. | Drilling fluid additive -- to reduce viscosity; Or Well development dispersant -- to help remove clay and sediment from a well | As a drilling additive: May be used where air/foam drilling methods are allowed, Or In drilling mud, but only if drill mud slurry is replaced with neat cement grout at completion of well. |
| 05-30-1989 | "Tower Plug" | Black Hills Bentonite Co. | 100% chipped bentonite - slow hydrating chips (both 3/8" & 3/4" chips) | Well, drillhole & pit abandonment | None |
| 10-06-2004 | "12/40 Granular" | GeoPro, Inc. | Granular bentonite (100%) | Clay slurry ingredient; lost circulation material for rotary-mud drilling; Seal for mounding around casing during driving | None |
| 05-02-2003 | "Uni-Drill" | Wyo-Ben, Inc. | Liquid polymer drilling fluid additive | Drill fluid additive where air or air/foam drilling methods are used | None |
| 07-01-1987 | "Versafoam" | CETCO | Anionic Surfactant composed of alkyl ether sulfate (ammonium salt) | For rotary drilling to help remove drill cuttings; but only in bedrock | None |
| 05-17-1989 | "Volclay Chips" (See CETCO Chips") | CETCO | 100% chipped sodium bentonite-slow hydrating chips (medium -1/4-3/8") (coarse - 3/8-3/4") | Well, drillhole & pit abandonment | None |
| 05-19-1989 | "Volclay Crumbles" (See "CETCO Crumbles") | CETCO | 100% ground (8-20 mesh) granular sodium bentonite | Clay slurry ingredient & lost circulation material for rotary mud drilling | None |
| 06-25-1987 | "Volclay Grout" (See CETCO Grout") (Bentonite Grout) | CETCO | Low yield bentonite single component bentonite grout - no additives (NSF Approved) | High solids bentonite grout for use where neat cement grout is not required | Allowed only where neat cement grout is not required - must be mixed according to instructions with product |
| 05-29-1997 | "Welgicide Cleaner" | Cotey Chemical Corp. | Chemical Powder - containing a silicate, hydroxide and a pyrophosphate | Well rehabilitation | None |

| Approval Date | Product Name | Manufacturer or Distributor | Materials(s) | Uses | Special Conditions |
|---------------|--|---|---|---|--------------------|
| 05-26-1989 | "Well-Plug" | Fluidril Mud Systems (from Black Hills Bentonite) | 100% chipped bentonite - slow hydrating chips (both 3/8" & 3/4" chips) | Well, drillhole & pit abandonment | None |
| 08-21-2002 | "WS ² 3602 -- Well Conditioner" | Water Well Solutions | Sodium-based blend of phosphate ingredients | Well rehabilitation, especially to penetrate and break down biofilms in wells. | None |
| 04-30-2003 | "Wyo-Vis" | Wyo-Ben, Inc. | Liquid polymer viscosifying agent | Drilling fluid additive for both rotary mud and rotary air/foam drilling operations | None |
| 06-11-1997 | "XY-12" | Ecolab, Inc. | Primarily sodium hypochlorite | Well disinfection and treatment | None |
| 04-22-1988 | "Zeogel" | N. L. Baroid | Ground attapulgite clay - magnesium aluminum silicate ("Fuller's Earth") (a.k.a. sweeping compound) | Rotary drilling mud clay for drilling information with high salt content | None |

*** When a product containing an acid is added to a well in combination with a chlorine product, adding too much of the acid or adding it too quickly, can lower the pH of the solution to a point where hazardous chlorine gas can be released. Appropriate safety precautions should be taken in this regard, especially when the well is located within an enclosure. In addition, any acid product must be properly flushed and neutralized following the rehabilitation procedure.**

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