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(54) EX-SITU SOLIDIFICATION SYSTEM

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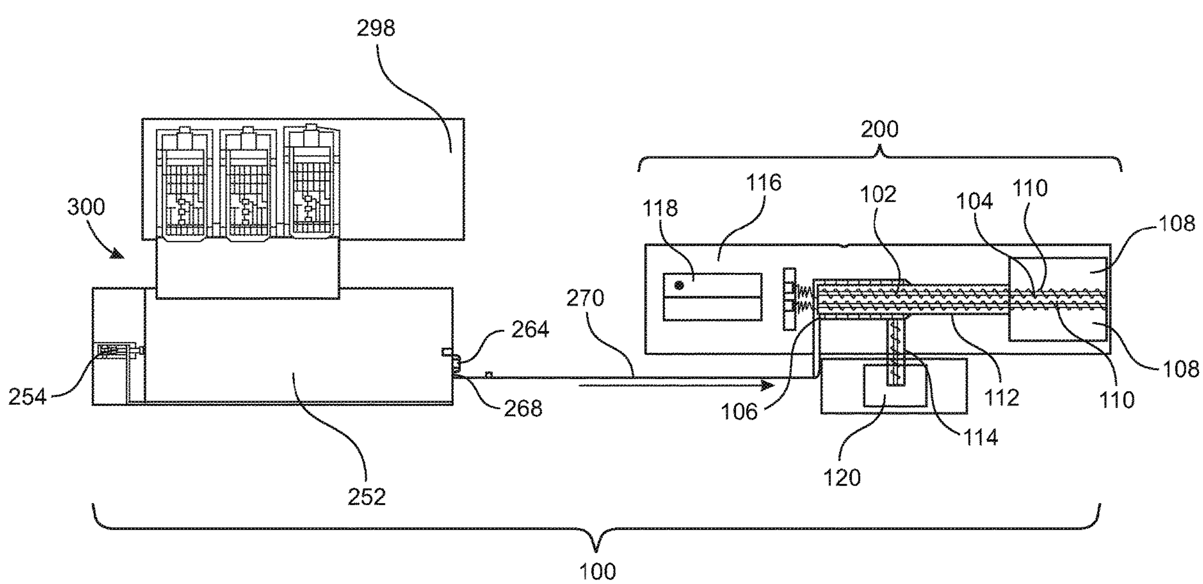
(57) **ABSTRACT**

An apparatus is disclosed which includes at least one feed line, a mixer including a first inlet configured to receive flow from the feed line and a second inlet configured to receive a flow from an external source, an outlet, at least one first conveyor to feed a first flow from the at least one feed hopper to the mixer, and at least one second conveyor to discharge a flow from the mixer via the outlet.



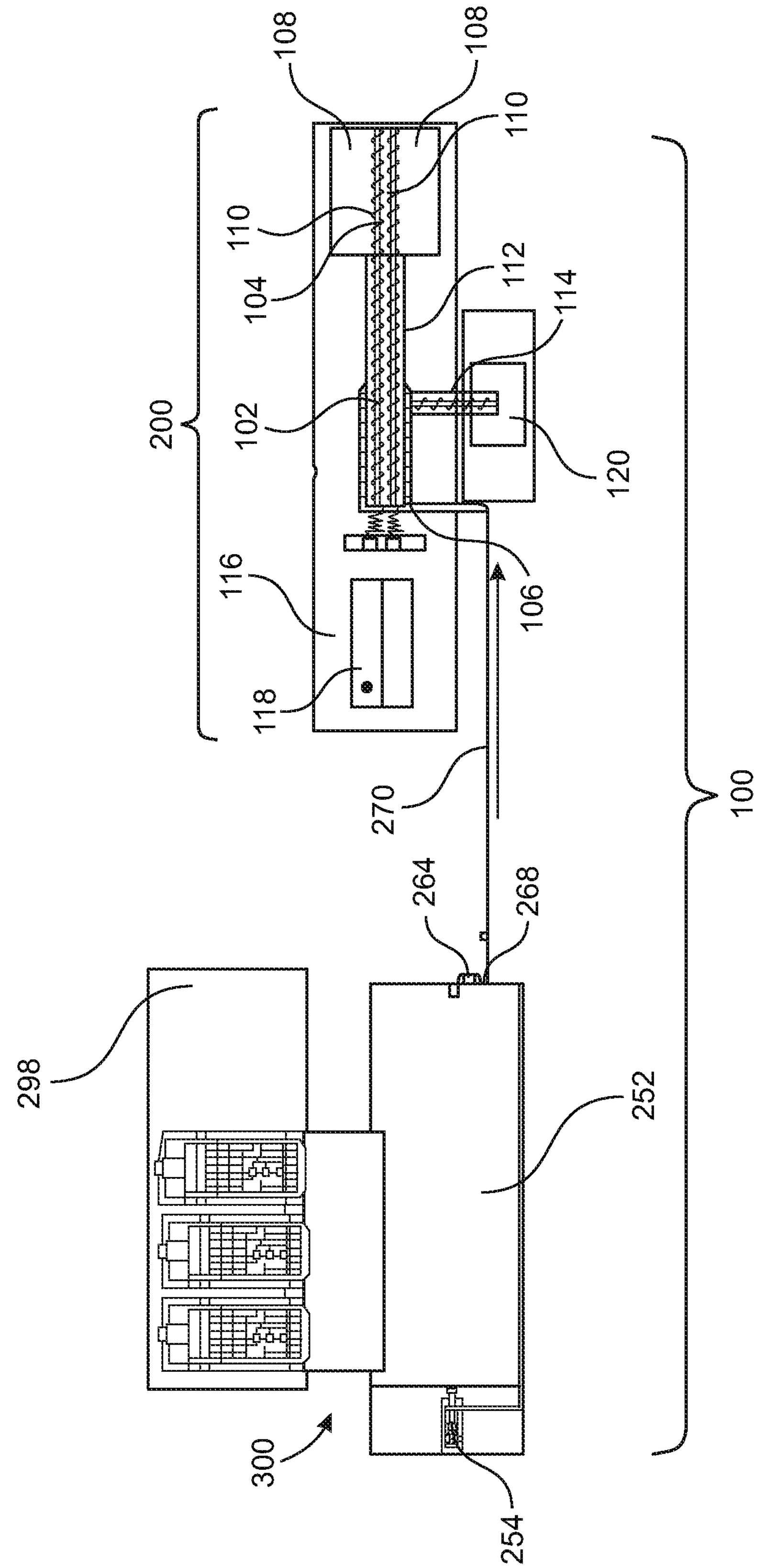

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FIG. 1

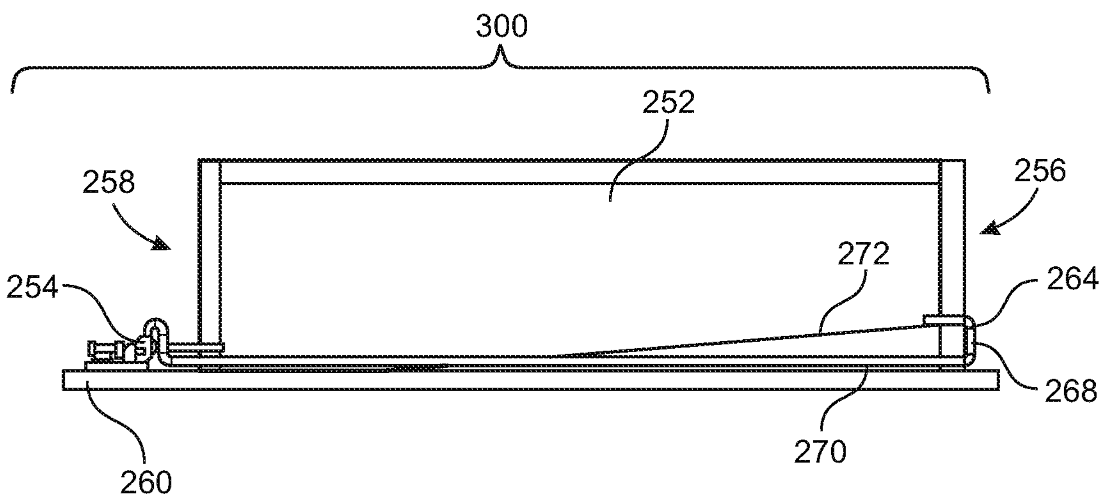

FIG. 2a

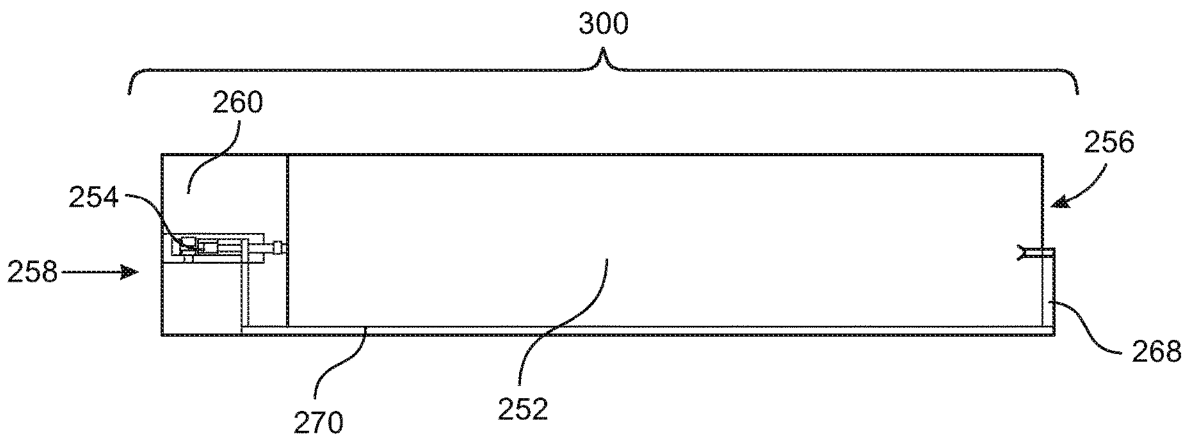

FIG. 2b

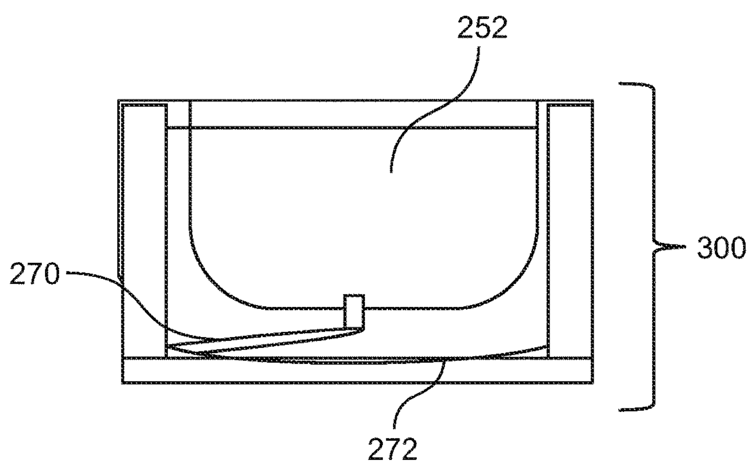

FIG. 2c

EX-SITU SOLIDIFICATION SYSTEM

[0001] This application claims priority from U.S. Provisional Application No. 62/645,597, filed Mar. 20, 2018, herein incorporated by reference in its entirety.

BACKGROUND

[0002] Drilling locations are increasingly subject to environmental regulations that prohibit drill cuttings disposal on location or in rig-site pits and require companies to solidify or stabilize cuttings prior to haul-off for disposal. Drill cuttings are typically a combination of 50% liquid and 50% cuttings. Additional streams from the rig, such as waste collected from water hoses, spilled mud at connections, and general discharges may be added to the drill cuttings, which may further liquefy the drill cuttings, increasing the amount of agents needed to stabilize the mixture.

[0003] Current practices include in-situ mixing where the cuttings are stabilized prior to transportation off-site for disposal or secondary uses like road building, construction site fill, or location building for the next well. This in-situ processing occurs near the drilling rig, which may create an unsafe environment for workers on the rig. Regulations further require the solidified cuttings to be relatively free of heavy metals and toxins, and to have a pH less than 11.

BRIEF DESCRIPTION OF DRAWINGS

[0004] FIG. **1** is a schematic view of a processing system in accordance with the present disclosure.

[0005] FIG. **2***a* is a side view of a cuttings catch tank in accordance with the present disclosure.

[0006] FIG. **2***b* is a top view of a cuttings catch tank in accordance with the present disclosure.

[0007] FIG. **2***c* is an end view of a cuttings catch tank in accordance with the present disclosure.

DETAILED DESCRIPTION

[0008] Embodiments of the present disclosure will now be described in detail with reference to the accompanying Figures. Like elements in the various figures may be denoted by like reference numerals for consistency. Further, in the following detailed description of embodiments of the present disclosure, numerous specific details are set forth in order to provide a more thorough understanding of the claimed subject matter. However, it will be apparent to one of ordinary skill in the art that the embodiments disclosed herein may be practiced without these specific details. In other instances, well-known features have not been described in detail to avoid unnecessarily complicating the description. Additionally, it will be apparent to one of ordinary skill in the art that the scale of the elements presented in the accompanying Figures may vary without departing from the scope of the present disclosure.

[0009] The present disclosure relates to a system for mixing drill cuttings with additives to solidify the drill cuttings at a location away from the drilling rig. More specifically, embodiments disclosed herein relate to a method of moving drill cuttings a distance from a drilling rig and mixing the drill cuttings with additives to solidify the drill cuttings at the distance from the drilling rig.

[0010] FIG. **1** shows a system **100** including a tank module **300** and a solidification module **200**. The tank module **300** may be configured to collect drill cuttings from a separator **298** of a drilling rig and pump the drill cuttings a selected distance to the solidification module **200**. The solidification module **200** may be configured to mix the drill cuttings with one or more additives, and thereby solidify the drill cuttings for transportation and/or disposal, in accordance with relevant regulations.

[0011] The tank module **300** may include a catch tank **252** and a pump **254**. The tank module **300** may be located proximate a drilling rig or proximate a vibratory separator **298** of a drilling rig, such that the tank **252** may catch drill cuttings therefrom. Drill cuttings may be transferred from the vibratory separator **298** to the catch tank **252** by any means known in the art, such as pumping, pneumatic transference, or the use of a mechanical conveyor. In some embodiments, the catch tank **252** may be about thirty feet long, five feet wide, and eight feet high. In some embodiments, the dimensions and volume of the catch tank **252** may be selected based on the number and size of separators **298** at the drilling rig. In some embodiments, the catch tank **252** may hold up to 50 cubic yards of drill cuttings, up to 40 cubic yards, up to 30 cubic yards, or any lesser, greater or therebetween volume, such as approximately 33 cubic yards of drill cuttings. The drill cuttings may weigh between about 2,500 and 3,000 pounds per cubic yard. Therefore, the catch tank **252** may hold between about 40 and 50 tons of drill cuttings. One of ordinary skill in the art will be able to design the size and dimensions of the catch tank **252** based upon the drilling operation of the drilling rig.

[0012] The catch tank **252** may be coupled to an inlet of the pump **254**. An outlet of the pump **254** may be fluidly coupled to the solidification module **200**. In some embodiments, the outlet of the pump may be fluidly coupled to the solidification module **200** via a flowline **270**. One of ordinary skill in the art will appreciate that the outlet of the pump may be connected to the solidification module **200** using any means known in the art, based on the flow rate of cuttings of the particular rig site, including the desired location of the tank module **300** and solidification module **200**.

[0013] The pump **254** may pump drill cuttings out of the catch tank **252**, through the flowline **270** to the solidification module **200**. The solidification module **200** may be located on the drilling rig site at some distance from the tank module **300**. In some embodiments, the solidification module **200** may be located between one hundred and one hundred fifty feet from the tank module **300**. In some embodiments, the solidification module **200** may be located less than one hundred feet from the tank module. In some embodiments, the solidification module **200** may be located between one hundred and two hundred feet from the tank module **300**. In some embodiments, the solidification module **200** may be located about one hundred fifty feet from the tank module **300**. One skilled in the art may choose a location of the solidification module **200** relative to the tank module **300** based on the configuration of the rig site and to keep the solidification module **200** a safe distance from the tank module.

[0014] The tank module **300** may be located in situ relative to a drilling rig. In other words, the tank module **300** may be relatively close to the drilling rig. The solidification module **200** may be located at the rig site, but may be located ex situ relative to the drilling rig. In other words, the solidification module **200** may be located some distance from the drilling rig. This distance may allow access to the solidification module **200** to be restricted from personnel who have also access to the drilling rig.

[0015] In some embodiments, the pump **254** may be capable of pumping the drill cuttings the distance between the catch tank **252** and the solidification module **200**. The drill cuttings may be approximately 50% liquid and 50% solid. In some embodiments, the pump **254** may be capable of pumping mixtures including as little as 20% liquid. The pump **254** may be an eddy pump, a centrifugal pump, a positive displacement pump or any type of pump capable of moving drill cuttings having an amount of liquid therein over the distance between the tank module **300** and the solidification module **200**. In some embodiments, the pump **254** should be resistant to corrosion.

[0016] As discussed above, the solidification module **200** may be located at a selected distance from the tank module **300**. Therefore, the system **100** may require less equipment and personnel to be located in the immediate vicinity of the drilling rig than current practices of in situ solidification of drill cuttings. In some embodiments, the solidification module **200** may be located in an area designated as a restricted area. Thus, the configuration of system **100** may reduce the risk of injury to personnel or damage to the rig during solidification processes of drill cuttings.

[0017] As shown in FIG. **1**, the solidification module **200** may include a mixer **102**, at least one feed hopper **108**, and a discharge auger **114**. In some embodiments, the solidification module **200** includes at least one feed hopper **108** for providing additives to the drill cuttings to solidify and/or stabilize the drill cuttings. In the embodiment shown in FIG. **1**, two feed hoppers **108** are included. One of ordinary skill in the art will appreciate that the number of feed hoppers **108** may be selected based upon the number, volume, and types of additives fed to the mixer to provide a product that meets current regulations. In some embodiments, a single feed hopper **108** may be used to feed multiple additives, the additives being mixed prior to being fed to the feed hopper. The size of the feed hoppers **108** may be selected such that minimal restocking of the contents occurs. In some embodiments, the contents of the feed hopper **108** may be a solid or a liquid.

[0018] The mixer **102** may be any mixer configured to mix solids and liquids to produce a product having a desired consistency. In some embodiments, the consistency of the mixer product is fluid like, such that the product can be discharged from the mixer. In some embodiments, the mixer **102** may be a pugmill or a dual auger mixer. The mixer **102** may include spinning paddles which may be adjustable to change the angle of the paddles and the rotational speed of the paddles based on the materials being mixed, the torque of mixing desired, or other considerations. In some embodiments, the mixer **102** may include a first inlet **104** at a first end of the mixer **102**, a second inlet **106** at a second end of the mixer opposite the first end, and an outlet **112**. In some embodiments, the outlet **112** may be located between the first inlet **104** and the second inlet **106**. One of ordinary skill in the art will appreciation that the location of the first inlet **104**, the second inlet **106** and the outlet **112** may vary depending upon, for example, the type of mixer, the feed rates to the mixer and the product to be discharged from the mixer.

[0019] The first inlet **104** of the mixer **102** may be configured to receive a flow of material from each of the feed hoppers **108**. In some embodiments, each feed hopper **108** may have a first conveyor **110** which carries material from the feed hopper **108** to the first inlet **104** of the mixer **102**. In some embodiments, both feed hoppers **108** may use a single first conveyor **110** to carry material from the feed hoppers **108** to the first inlet **104** of the mixer **102**. In some embodiments, the first conveyors **110** may be variable frequency drive augers. The first conveyor **110** may be any equipment capable of moving the contents of the feed hoppers **108** to the first inlet **104**. The first conveyors **110** may be designed based upon the contents of the feed hoppers **108**, the mixing properties of the mixer **102** and the desired product to be discharged from the mixer **102**. In some embodiments, the first conveyors **110** may have a capacity of 15 tons/hour.

[0020] The second inlet **106** of the mixer **102** may be configured to receive a flow of material from an external source. The external source may be the tank module **300**. In some embodiments, the flowline **270** may be fluidly coupled to the second inlet **106** such that the second inlet **106** receives drill cuttings from the flowline **270**. Additives introduced at the first inlet **104** are conveyed via the first conveyor **110** to the mixer where they are mixed with drill cuttings entering the second inlet **106** to produce solidified cuttings.

[0021] Solidified drill cuttings may exit the mixer **102** through the outlet **112**. A discharge auger **114** may carry the solidified drill cuttings away from the outlet **112**. In some embodiments, the discharge auger **114** may have a diameter of sixteen inches and a length of twelve feet. In some embodiments, the diameter of the discharge auger **114** may be between twelve and twenty inches, or between fourteen and eighteen inches. In some embodiments, the length of the discharge auger **114** may be between eight and sixteen feet, or between ten and fourteen feet. The configuration and dimensions of the discharge auger **114** may be selected based on, for example, the consistency or properties of the solidified drill cuttings, the flow rate of the solidified drill cuttings, and/or the distance over which the solidified drill cuttings are to be moved.

[0022] In some embodiments, the solidification module **200** may include a tank **120**. The tank **120** may be fluidly coupled to the outlet **112** or to the second conveyor **114**, such that the tank **120** may receive solidified drill cuttings flowing out of the outlet **112**. The tank **120** may be any size and/or type of vessel capable of receiving and holding the solidified drill cuttings. In some embodiments, the tank **120** may be a three-sided tank. The tank **120** may be configured such that the solidified drill cuttings may be moved from the tank **120** to a dump truck or other vehicle. In some embodiments, the tank **120** may be transportable by a vehicle.

[0023] In some embodiments, the solidification module **200** may further include a generator **118** to provide power to the equipment of the solidification module. Specifically, the generator **118** may power one or more of the mixer **102**, the first conveyors **110**, and the discharge auger **114**. The generator **118** allows the solidification module **200** to operate without an external power source, such as a rig. The generator **118** may generate a current of between one hundred and three hundred kilovolt amps, or between one hundred fifty and two hundred fifty kilovolt amps. In some embodiments, the generator **118** may generate a current of two hundred kilovolt amps. In other embodiments, the power to the mixer **102**, the first conveyors **110**, and the discharge auger **114** may be supplied by the rig power supply or another external source.

[0024] The mixer **102**, the feed hoppers **108**, the first conveyors **110**, the second conveyor **114**, and the generator **118** may be mounted on a trailer **116** or other portable frame, as shown in FIG. **1**. In some embodiments, the trailer **116** may be a low profile trailer. The trailer **116** may have a length between thirty and sixty feet, or a length between forty and fifty feet. The trailer **116** may have a length of forty-five feet. The trailer **116** may include outriggers to support the weight of the equipment disposed on it. The mixer **102**, the feed hoppers **108**, the first conveyors **110**, the discharge auger **114**, and the generator **118** may be permanently or removably attached to the trailer **116**. One having ordinary skill in the art may arrange and attach the components on the trailer **116** in any desired configuration, informed by the size of the components and the rig location of the solidification module **200**. The solidification module **200**, including the trailer **116**, may be transported between rig sites without dismantling components from the trailer **116** or disconnecting components from each other. In this manner, the solidification module **200** may require less time to be set up at a rig site or removed from a rig site than currently used equipment. In some embodiments, the solidification module **200** may be able to be set up in less than three hours, less than two hours, or less than one hour. The solidification module **200** may be able to be set up in about one hour and removed from a rig site in about one hour.

[0025] FIGS. **2***a*-**2***c* show a tank module **300** in more detail, illustrating a side view, a top view, and an end view, respectively. The catch tank **252** may have a first end **256** and a second end **258** opposite the first end. The pump **254** may be located proximate the second end **258** of the catch tank **252**. The inlet of the pump **254** may be fluidly coupled to the second end **258**, proximate a bottom surface **272** of the catch tank **252**. In some embodiments, the pump **254** may be located on a pump porch **260** which extends from the second end **258** of the catch tank **252**. The pump **254** may be located on the pump porch **260** and may be shielded by a protective guard (not shown). In some embodiments, the pump **254** may be located in any configuration relative to the catch tank **252** and may be coupled to any portion of the catch tank **252**. In some embodiments, redundant pumps may be located in the tank module.

[0026] The bottom surface **272** of the catch tank **252** may be sloped. The bottom surface **272** may slope downwards from the first end **256** to the second end **258** of the catch tank **252**. For example, the bottom surface **272** may be about one foot higher at the first end **256** of the tank **352** than at the second end **258**. In some embodiments, the bottom surface may have a slope (height over length) between 0.01 and 0.1, or between 0.02 and 0.05. The bottom surface may have a slope of about 0.03. The sloped bottom surface **272** may promote the flow of drill cuttings toward the inlet of the pump **254**. In some embodiments, the bottom surface **272** may have any slope angle. The configuration of the tank **252**, including the bottom surface **272**, may be selected based on a desired flow of the drill cuttings and properties of the drill cuttings. The tank **252** may include split jets (not shown) proximate the first end **256** to move drill cuttings towards the second end **258**. One of ordinary skill in the art may design the catch tank **252** to include means to promote a desired movement of the drill cuttings.

[0027] Connecting the pump **254** and the mixer **202** of the solidification unit **200** is a flowline **270**. The pump **254** pumps drill cuttings from the catch tank **252** into the flowline **270**. In some embodiments, a recirculation flowline **264** may fluidly couple the flowline **270** to an opening in the first end **256** of the catch tank **252**. In some embodiments, the recirculation flowline **264** may be connected to any location on the catch tank **252**, such that the drill cuttings remain in solution and do not settle in the catch tank **252**. A valve assembly **268** may be disposed proximate a junction of the flowline **270** and the recirculation flowline **264**. The valve assembly **268** may control a rate at which drill cuttings flow through the flowline **270** and the recirculation flowline **264**. The pump **254** pumps drill cuttings into the flowline **270** to the valve assembly **268** which diverts the drill cuttings to either the solidification module **200** or the catch tank **252** through the recirculation line **264**. The valve assembly **368** may be a remote controlled valve or may be operable at the tank module **300** or the solidification module **200**, or from any other desired location.

[0028] During use of the system **100**, an operator may control the rates at which drill cuttings and additives flow into the mixer **102**. The flow rate of the drill cuttings may be controlled through the operation of the valve assembly **268** of the recirculation line. The flow rate of the drill cuttings may be controlled by any means known in the art. The flow rate of the additives may be controlled by controlling the rotational speed of the first conveyors **110**, which may be variable frequency drive augers. If more than one first conveyor **110** is used, the first conveyors **110** may be controlled to rotate at the same speed or at different speeds. Any means known in the art may be used to control the flow rate of the additives.

[0029] The flow rates of the drill cuttings and the additives may be controlled such that a desired ratio of drill cuttings to additives is added to the mixer **102** to produce a desired product. If more than one additive is being added to the mixer, the flow rates of the additives may be controlled such that the additives are added to the mixer at a desired ratio to each other. The ratios may be volume ratios, weight ratios, or any other ratio known in the art. The valve assembly **268** may be operated based on the operation of the first conveyors **110** and the second conveyor **114**. The valve assembly **268**, the first conveyors **110** and the second conveyor **114** may be controlled manually or automatically. The operation of the valve assembly **268**, the first conveyors **110** and the second conveyor **114** may be controlled based on properties of the drill cuttings, properties of the additives, desired properties of the solidified drill cuttings, or any other factors.

[0030] Additives may be any material capable of solidifying the drill cuttings when mixed. Examples of additives include soil and blends of ground absorbent materials. The ground absorbent materials may include calcium based products such as quick lime, fly ash, gypsum, and cement kiln dust. The mix may be relatively free of heavy metals and toxins and have a pH less than 11. In some embodiments, native soil and Zorbix—an absorbent mix containing gypsum, quick lime, and other materials—may be used as additives. (Zorbix is available from Diversified Minerals, Inc.)

[0031] Test runs were performed of systems and methods consistent with embodiments disclosed herein. Zorbix and a system consistent with that shown and described with respect to FIG. **1** was used to determine consistencies of the solidified drill cuttings produced by a variety of additive ratios.

Example 1

[0032] A mixture made of 50% drill cuttings, 25% soil, and 25% Zorbix, by volume was produced. The mixture was observed to be dry and crumbly and did not contain free liquid. The mixture has a pH of 10, which is in accordance with present regulations.

Example 2

[0033] A mixture made of 70% drill cuttings, 15% soil, and 15% Zorbix, by volume was produced. The mixture was observed to be wet, but thick enough to not pass through a standard paint filter. The mixture was observed to dry further with time.

Example 3

[0034] A mixture was made up of 60% drill cuttings, 20% soil, and 20% Zorbix, by volume was produced. The mixture was observed to be wet, but thick enough to not pass through a standard paint filter. The mixture was observed to dry further with time.

[0035] Based on the ratios of EXAMPLE 1, processing rates of system **100** were estimated. Based on the catch tank **252** holding approximately 160 bbls (33 cubic yards) and the cuttings weighing about 13.7 ppg (575 ppb or 2762 pounds per cubic yard), each tank will have approximately 91,146 pounds of cuttings per tank to be blended with soil and reagent. Soil may weigh 21.6 ppg (906 ppb or 4351 pounds per cubic yard), thus 71,791 pounds of soil will be added to the tank. Zorbix may weigh 18.2 ppg (767 ppb or 3,681 pounds per cubic yard) will be added to the tank. In summary, the amount of products to be mixed include 36 tons of soil, 30 tons of Zorbix and 45.5 tons of drill cuttings, the mixture having a volume ratio of 50% drill cuttings, 25% soil, and 25% Zorbix. With the mixer **202** having a capacity of 30 tons/hour, it may take 3.7 to 4 hours to process one catch tank **252** of drill cuttings.

[0036] During use of the system **100**, the drill cuttings may be sent the catch tank **252** from the separators **298**. Zorbix may be stored in the first feed hopper **108** and soil may be stored in a second feed hopper **108**. The valve assembly **268** of the recirculation line **264** may control the flow rate of the drill cuttings into the mixer **102**, and the first conveyors **110** may control the flow of the Zorbix and the soil into the mixer **102**. The valve assembly **268** and the first conveyors **110** may be controlled such that the mixer **102** includes 50% drill cuttings, 25% Zorbix, and 25% soil at any given time.

[0037] The components of the drill cuttings processing module disclosed herein may be preinstalled on a trailer. Therefore, the module may be easily moved from one rig site to another. Processing drill cuttings with the module may reduce installation time and demobilization time, and thereby reduce the cost of processing drill cuttings. Being able to readily move the module from one rig site to another may reduce non-productive time for the equipment. The module may be self-powered through a generator. Therefore, the module does not require power from a rig site.

[0038] The system disclosed herein may be capable of moving drill cuttings a distance away from a rig before processing them. This may reduce the amount of personnel and equipment in the area around the rig, and thereby reduce the risk of injury to personnel and damage to equipment. The system includes a recirculation loop which may prevent drill cuttings from settling before they are processed. This may improve the ease with which drill cuttings may be moved and prevent downtime caused by pump clogging or other equipment failures. The catch tank may allow cutting treatments to be scheduled and may minimize the personnel necessary for processing drilling cuttings.

[0039] The module, method, and system disclosed herein may provide for variable speed control of the flow rates of drill cuttings and additives and the speed of the paddles in the pump. Therefore, a ratio of drill cuttings and additives may be able to be mixed at a desired speed. This may allow for flexibility of processing different types of drill cuttings or making modifications based on other considerations.

[0040] In one aspect, the present disclosure relates to an apparatus including at least one feed line, a mixer including a first inlet configured to receive flow from the feed line and a second inlet configured to receive a flow from an external source, an outlet, at least one first conveyor to feed a first flow from the at least one feed hopper to the mixer, and at least one second conveyor to discharge a flow from the mixer via the outlet. In some embodiments, the apparatus may include at least one feed hopper connected to the at least one feed line. In some embodiments, the apparatus may include a generator configured to power at least one of the mixer the at least one first conveyor, and the at least one second conveyor. In some embodiments, the apparatus may be mounted on a trailer. In some embodiments, the mixer may be a pugmill. In some embodiments, the at least one first conveyor and/or the at least one second conveyor may be an auger.

[0041] In another aspect, the present disclosure relates to a system including a tank module including a catch tank and a pump, a solidification module including a mixer; and a flowline connecting the pump to the mixer. In some embodiments, the tank module may be located in situ relative to a drilling rig and the solidification module may be located ex situ relative to a drilling rig. In some embodiments, the catch tank may include a downward sloped bottom from a first end to a second end. In some embodiments, the pump may be an eddy pump. In some embodiments, the tank module may include a recirculation flowline connecting a flowline to the catch tank, and a valve assembly to control flow through a junction of the recirculation flowline and the flowline. In some embodiments, the mixer may include a first inlet configured to receive flow from a feed line and a second inlet configured to receive a flow from an external source and, an outlet. The solidification module may include the at least one feed line, at least one first conveyor to feed a first flow from the at least one feed hopper to the mixer, and at least one second conveyor to discharge a flow from the mixer via the outlet.

[0042] In another aspect, the present disclosure relates to a method including discharging drill cuttings from a rig, pumping the drill cuttings to a mixer located a distance from the rig at a first rate, and mixing the drill cuttings with a first additive and a second additive to produce solidified drill cuttings. In some embodiments, the method may include controlling a rate of the first additive and a rate of the second additive which are conveyed to the mixer. In some embodiments, the method may include controlling a weight ratio of the rate of the first additive to the first rate of drill cuttings conveyed to the mixer, or controlling a weight ratio of the rate of the second additive to the first rate of drill cuttings conveyed to the mixer. In some embodiments, the method may include controlling the pumping of the drill cuttings with a valve assembly. In some embodiments, the method may include mixing 50 volume percent drill cuttings with twenty-five volume percent first additive, and twenty-five volume percent second additive. The first additive may be Zorbix and the second additive may be soil.

[0043] While the disclosure includes a limited number of embodiments, those skilled in the art, having benefit of this disclosure, will appreciate that other embodiments may be devised which do not depart from the scope of the present disclosure. Accordingly, the scope should be limited only by the attached claims.

What is claimed is:

1. A system comprising:
- a tank module comprising a tank and a pump;
- a solidification module comprising a mixer located a distance from the tank module, the solidification module configured to receive flow from the tank module and an external source; and
- a flowline connecting the pump to the mixer.

2. The system of claim **1** wherein the tank module is located in situ relative to a drilling rig and the solidification module is located ex situ relative to a drilling rig.

3. The system of claim **2**, wherein the tank comprises a downward sloped bottom.

4. The system of claim **1**, wherein the tank module further comprises a valve assembly to control flow to the tank and the solidification module.

5. An apparatus comprising:
- a feed line;
- a mixer comprising a first inlet configured to receive flow from the feed line, a second inlet configured to receive a flow from an external source, and an outlet;
- a first conveyor to feed a first flow from the feed hopper to the mixer; and
- a second conveyor to discharge a flow from the mixer via the outlet.

6. The apparatus of claim **5**, further comprising a feed hopper connected to the feed line.

7. The apparatus of claim **5**, further comprising a generator configured to power at least one of the mixer the first conveyor, and the second conveyor.

8. The apparatus of claim **5**, wherein the apparatus is mounted on a trailer.

9. The apparatus of claim **5**, further comprising a tank coupled to the outlet.

10. A method comprising:
- discharging drill cuttings from a rig;
- pumping the drill cuttings to a mixer located a distance from the rig at a first rate;
- mixing the drill cuttings with an additive to produce solidified drill cuttings.

11. The method of claim **10**, further comprising controlling a rate of the additive conveyed to the mixer.

12. The method of claim **10**, further comprising controlling a weight ratio of the rate of the additive to the rate of drill cuttings conveyed to the mixer.

13. The method of claim **10**, further comprising controlling the pumping of the drill cuttings with a valve assembly.

14. The method of claim **10**, wherein the mixing comprises mixing 50 volume percent drill cuttings and 50 percent additive.

15. The method of claim **10**, wherein the additive comprises twenty-five volume percent absorption stabilizer/solidifier, and twenty-five volume percent soil.

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