IMPROVEMENT OF ACTIVATED SLUDGE PROCESS IN WASTEWATER TREATMENT

FIELD

[0001] The present disclosure relates to methods of treating highly contaminated wastewater using waste activated sludge as an adsorbent.

BACKGROUND

[0002] In a waste treatment process, contaminants need to be removed before disposal. Insoluble contaminants can be physically separated and disposed of and soluble contaminants can be biologically metabolized. Bacteria may be used to break down or metabolize the soluble contaminants. The bacteria are often part of a composition called activated sludge. Once the bacteria have been used to break down the soluble contaminants, a portion of the activated sludge, referred to as return activated sludge, is recycled back into the process to continue metabolizing contaminants in the waste stream. The rest of the waste activated sludge is usually disposed of.

[0003] In another part of the waste treatment process, chemical coagulants may be used to aggregate insoluble and a small percentage of soluble contaminants (<15%) for separation and removal. Chemical coagulants are expensive.

SUMMARY

[0003a] In a first aspect of the present disclosure, there is provided a method of treating a waste stream comprising: (a) providing a waste stream comprising contaminants; (b) providing waste activated sludge in an amount that is at least 15% of the volume of the waste stream, the waste activated sludge comprising at least 1% bacterial concentration; (c) combining the waste stream and the waste activated sludge for no more than 5 minutes; and (d) allowing the contaminants in the waste stream to adsorb onto the bacteria in the waste activated sludge.

[0004] Surprisingly, waste activated sludge has been found to be useful for treating highly concentrated waste streams. Instead of being disposed of, the waste activated sludge can be recycled and combined with highly concentrated waste streams for short periods of time. While combined, the bacteria in the waste activated sludge does not metabolize the waste stream. Rather, the waste adsorbs onto the bacteria.

[0005] Accordingly, in a first embodiment, the disclosed method includes providing a waste stream comprising contaminants, providing waste activated sludge in an amount that is at least about 10% of the volume of the waste stream, the waste activated sludge comprising at least about 1% bacterial concentration, combining the waste stream and the waste activated sludge for a limited period of time, and allowing