



Sludge Screening and Dewatering



This fact sheet has been created to provide information on and address common questions about **sludge screening and dewatering processes** being incorporated into the proposed upgrades to the Franklin WRF biosolids facility.

Purpose and Benefits of Process

Sludge screening and pre-dewatering are two of the first steps in the Franklin WRF's new biosolids treatment process. The purpose of screening is to remove large, potentially damaging solids from the waste activated sludge (WAS) before it is further treated. The removal of these solids will reduce wear and tear on the treatment equipment, preserving its useful life and reducing downtime due to repairs. Pre-dewatering removes water from the screened WAS so that the sludge can be processed by the thermal hydrolysis system.

Post-dewatering of the thermally hydrolyzed, digested sludge further removes water, producing a Class A cake that is suitable for drying in the solar dryers or distribution to local farms for beneficial reuse.

Description of Process

The sludge screens will be located on the second floor of the Solids Processing Building. They will receive WAS pumped from the existing WAS pump stations. The screened solids will drop into bins on the first floor of the building before being disposed at a landfill.

After the sludge has been screened, it flows into the WAS Storage Tank adjacent to the Solids Processing Building. Pumps inside the building will withdraw the WAS from the tank and deliver it to the Pre-Dewatering Centrifuges on the second floor. The dewatered cake will drop into a storage bin, also inside the Solids Processing Building. From this bin, the cake will be pumped to the thermal hydrolysis system just outside the building.

The Post-Dewatering Screw Presses, also inside the Solids Processing Building, will dewater the sludge after it has been thermally hydrolyzed and digested. Pumps inside the building will deliver the digested sludge to the presses. Cake from the screw presses will be loaded into trucks for transport to the solar dryer or to farms. The cake is a Class A biosolids product that is suitable for beneficial use as-is, or after it has been dried in the solar dryer.

The liquid removed by the pre- and post-dewatering processes will be sent to the plant's liquid treatment process for treatment.

What process modifications will be made?

The Solids Processing Building, which houses the processes described above, will be an addition

to the site rather than a modification of existing structure or systems. The entire existing biosolids system at the Franklin WRF is past its useful life and is being replaced with the proposed new biosolids process.

Is the process a potential odor source? Is the process odor controlled?

The sludge screens, pre-dewatering centrifuges, and post-dewatering screw presses are all enclosed pieces of equipment, which means that they are completely sealed machines that are not sources of odor. The individual screens, centrifuges, and screw presses are not odor controlled.

Liquid WAS from the sludge screens flows into the WAS Storage Tank, which is odor controlled. The screenings that drop into bins on the first floor of the Solids Processing Building are located in an odor-controlled room.

The Pre-Dewatering Centrifuges' liquid and solids discharge chutes will be odor controlled, as will the cake storage bin. For the rare instances when the thermal hydrolysis system is out of service, the pre-dewatered cake will be loaded into a truck parked inside the truck loading bay of the Solids Processing Building. This bay is odor controlled, as is the adjacent truck bay where the cake from the Post-Dewatering Screw Presses will be loaded into a truck.

Does the process include equipment that has the potential to create noise? If so, is there any noise control provided?

The sludge screens, Pre-Dewatering Centrifuges, Post-Dewatering Screw

Presses, and their supporting systems are all expected to emit varying levels of noise. However, all of the equipment and supporting pumps and systems are located inside the Solids Processing Building, and so the noise they produce will not be heard beyond the WRF property.

Will the process modification change the look and feel of the site?

The proposed modifications will result in addition of the Solids Processing Building and the adjacent storage tanks for pre dewatered sludges, but will allow demolition of nine existing tanks and multiple small structures

The proposed two-story Solids Processing Building was designed with aesthetics as well as functionality in mind. The building aesthetic incorporates contextual cues from the site, as well as design elements to visually reduce the scale of the building. Contextual cues from existing on-site buildings include material selection and color to blend the new building into the surrounding fabric.

Visually, the scale of the building is reduced through design elements such as varying color, brick pilasters, accents and varying heights of the building. The scale of the building is first reduced by varying the roof line heights which breaks down the visual impact by creating multiple lines that draw the eye to more than one point on the building. The visual scale of the building is further deconstructed by the use of the vertical and horizontal brick pilasters and accents that give visual relief to the building elevations, breaking them down into smaller relational pieces. In addition, the proportion and scale of the building is refined through the use of operable vision windows in the occupied spaces of the building and translucent window systems in the process areas of

the building to divide the elevations and increase the visual rhythms of the building. The final element incorporated was a building cornice detail with multiple levels of brick stepping out to cap the top of the building.

Will the process modification change the safety of the site?

None of the equipment carries thermal, high pressure, or high voltage, hazards, because it does not operate at high temperatures or have high voltage equipment. The pre- and post-dewatering processes use polymer and alum, chemicals that have a long history of safe use in water and wastewater treatment. Plant staff performing routine sampling of the pre- and post-dewatered cake will be provided with appropriate protective equipment to reduce the potential for contact with the sludge. None of these pose and risk to offsite areas.

The sludge being treated in the screening and dewatering processes have some potential to produce methane, hydrogen sulfide and odor causing compounds. Potential safety concerns associated with these gases are mitigated through the use of several safety measures that are part of compliance with National Fire Protection Association (NFPA) 820 standards for fire protection at wastewater treatment plants, including ventilation of the tanks and building at rates that will maintain gas concentrations below levels that can result in explosion or health hazards, use of intrinsically safe equipment where required, use of gas monitoring equipment. The air that is extracted from the building and the tanks is treated in an odor control system before being released to the atmosphere.