



Manual of Permitted Operations

Prepared For: Special Planning Area 1 Water Reclamation Facility, City of Surprise

Prepared By: Walnut Canyon Wastewater

1. Purpose

The purpose of this Manual of Permitted Operations (MOPO) is to ensure that proposed changes to the Special Planning Area 1 (SPA 1) Water Reclamation Facility (WRF) are constructed safely and without interrupting the WRF's ongoing treatment requirements. This MOPO identifies foreseen construction activities, potentially required construction activities, and potentially required maintenance activities that may need to be completed while construction is ongoing. An order in which the required construction should be completed to ensure there are no interruptions is established. Additionally, a matrix showing activities that can and cannot be completed safely in adverse weather/potentially limiting conditions was developed. Finally, a matrix showing which activities can and cannot be safely completed simultaneously was also developed.

2. Defining Safety

For this MOPO, safety includes both workers' personal safety as well as the safety of the facility's ongoing operations. Any condition that endangered either workers' health, wellbeing, or life, or put the facility at risk of not being able to maintain continuous operations was deemed to be unsafe. Both conditions were determined to be impermissible and are not distinguished in subsequent matrices.

3. Construction Sequencing

The ability of the facility to continuously operate and produce effluent within its permit levels is of paramount importance. To ensure this, it is important to ensure that each system maintains as much redundancy as possible during construction.

The replacement of the facility's fine screens with band screens in the headworks should be done one screen at a time to ensure that at least two screens are functioning at all times. The two screen types are made by the same manufacturer and the new band screen systems should fit into the headworks essentially the same as the fine screens, limiting effects on other systems.

For the oxidation ditches, no real construction work is required. The weirs and brush aerators are controlled digitally, these systems will require some reprogramming. When transitioning the oxidation ditches in Plants 4 and 5 it is recommended to transition them one at a time so that there is a minimum of two plants in full operation. Each plant will need a short period of batching to adjust the microbiome to new conditions (approx. 30 min.).

It is recommended that the new band screens be installed in the facility's headworks before the Plant 4 and 5 oxidation ditches are switched to the new operating style. The current fine screens allow rags through, which can damage brush aerators in the oxidation ditches, requiring replacement. By installing the band screens first, it



reduces the risk that an oxidation ditch will be taken offline while a plant is being batched to adjust to the new operating style. Changes to the headworks and oxidation ditches should not be made at the same time. The reduction of screens from 3 to 2 increases the likelihood that overflow channels must be used, which only has a bar screen. This increases the likelihood that rags or other objects that can bypass headworks and damage the oxidation ditches. If the facility also has a plant down for batching, the risk that one of the remaining plants is damaged is impermissible.

Many existing systems require ongoing maintenance, and in general it is recommended that required maintenance take priority over recommended construction. For example, if all existing fine screen systems are due to have their fine screens be replaced, at least two systems should have that maintenance done before the replacement of a system with a new band screen system. In this way, when the third screen is removed, there are two additional screens to handle the incoming influent. Additionally, it is recommended that if any brush aerators need replacement, that this be done before the systems are converted to the new operating style. In this way, when the systems are being batched, the other two systems will be available to handle incoming flow until the batching system is ready to handle new flow.

The aerobic digestors are currently unused, and while connected to other systems, currently do not take flow from or provide flow to other systems. This means that the construction required to convert them to anaerobic digestors can coincide with most other maintenance and construction activities.

Finally, any deliveries of large equipment should be planned and scheduled so as not to interfere with the loading and hauling of dried solids offsite to the landfill.

4. Permissible Coinciding Activities and Conditions

A table was created to show which activities are permissible both during adverse weather conditions, and which activities can be completed at the same time. A box labeled in green represents that no additional safety requirements are expected and the two can coincide. A box labeled in yellow represents that the work can be done, but increased caution should be used or additional equipment and safety procedures are required. Finally, a box labeled red means that the work is unsafe to either the plant or worker and the two should not coincide.

The first table shows which activities are and are not recommended during adverse weather conditions and during high influent flow.

The second table shows which construction and maintenance activities are and are not recommended to happen simultaneously.

Adverse Weather and High Influent Flow



	High Influent Flow, Greater than 50% Existing Capacity (6.4 MGD)	Night Time Work	Heavy Precipitation	Lightning	Limited Visibility (Dust, Rain, Fog, etc.)	High Winds	High Ambient Temperature (>45 Deg C)
Required Construction Activity							
Fine Screen Removal							
Band Screen Installation							
Ditch Rotor/Weir Reprograming							
Ditch Batching during Conversion							
Retrofitting of Existing Aerobic Digestors							
Refurbishing Sludge Piping Leading to Aerobic Digester							
Addition of Gas Collection System for Solids Handling							
Addition of Air Scrubber for Solids Handling							
Addition of Heat Exchanger and Boiler							
Potentially Required Construction Activities							
Excavation							
Working at Heights							
Use of Crane or Other Lifting Apparatus							
Confined Space Entry							
On-Site Vehicle Use, Including for Dried Sludge and Solids Disposal							
Outdoor Concrete Pouring							
Delivery of Large Equipment							
Potential Required Maintenance							
Replacement of Individual Fine screen Parts							
Maintenance on Grit Chamber							
Replacement of Brush Aerators							
Maintenance on RAS/WAS Pumps							
Replacement of Disk Filters							
Maintenance on Chlorine Generation System							
Maintenance on Chlorine Contact Basins							
Maintenance on Centrifuge Sludge Dewaterers							
Maintenance on Solar Drying Facility							
Maintenance on Reclaimed Water Distribution Pumps							

No Additional Safety Concerns Expected
 Use Extra Caution, Equipment, or Procedures
 Do Not Complete at The Same Time
 N/A or Duplicate



Permissible Coinciding Construction and Maintenance

	Required Construction Activity	Fine Screen Removal	Band Screen Installation	Ditch Rotor/Weir Reprogramming	Ditch Batching during Conversion	Retrofitting of Existing Aerobic Digestor	Refurbishing Sludge Piping Leading to Aerobic Digestor	Addition of Gas Collection System for Solids Handling	Addition of Air Scrubber for Solids Handling	Addition of Heat Exchanger and Boiler	Potential Required Maintenance	Replacement of Individual Fine screen Parts	Maintenance on Grit Chamber	Replacement of Brush Aerators	Maintenance on RAS/WAS Pumps	Replacement of Disk Filters	Maintenance on Chlorine Generation System	Maintenance on Chlorine Contact Basins	Maintenance on Centrifuge Sludge Dewaterers	Maintenance on Solar Drying Facility	Maintenance on Reclaimed Water Distribution Pumps
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