6.5.3.3 MLTR Pump Operation

The MLTR pumps recycle mixed liquor from the mixed liquor transfer return channel (MBR basin effluent channel) to Zone 3 of the MBR aeration basin. The system is designed for one pump operation with the second pump to provide redundancy. The control system automatically alternates the pumps to provide equal time on both pumps.

MLTR Pump Control Screen

The MLTR pumps are controlled through SCADA from MLTR pump screen. The access to these screens is discussed in the following sections.

MLTR Pump Control Screen

The automatic operation of the MLTR pumps is controlled through the SCADA system from the membrane main screen (***Figure 6.5.3.3-1***). The screen is accessed by clicking on the **MBR** button **<1>** on the top of the screen. The MLTR Pumps screen is accessed by selecting the **MLTR Pumps icon <2>**.

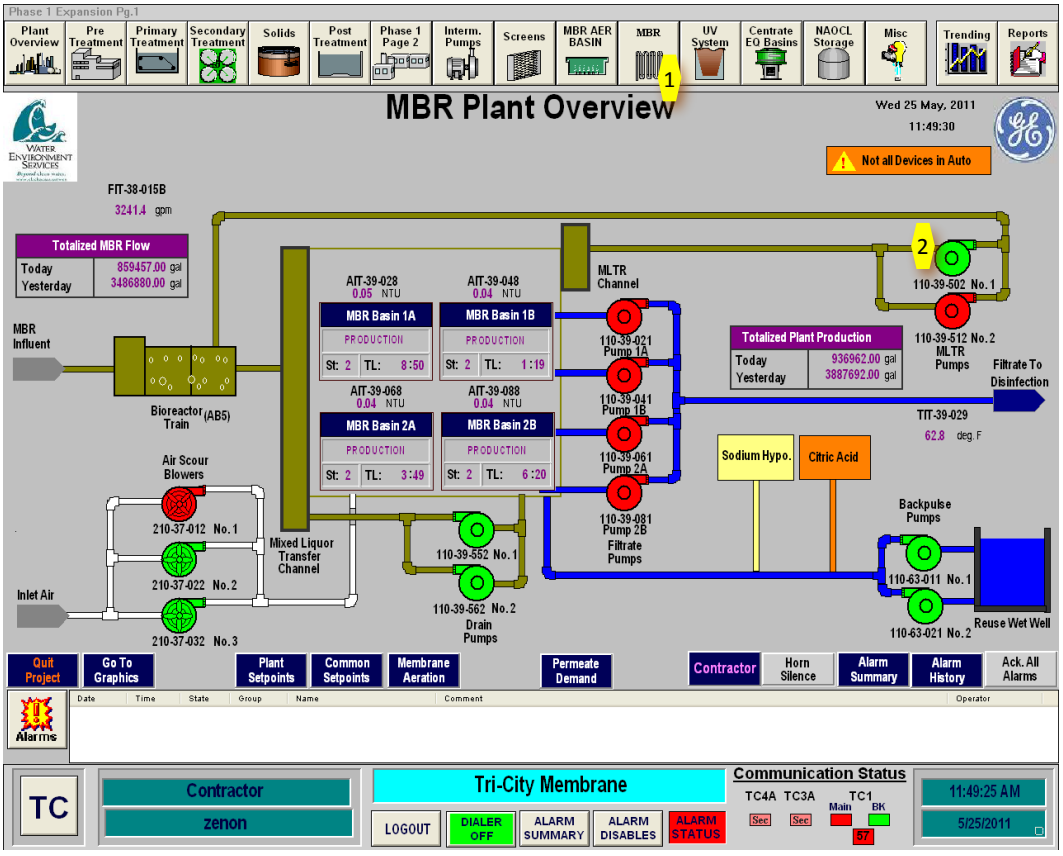

Figure 6.5.3.3-1 – Membrane System Control Panel

MLTR Pump Controls

The MLTR pump screen (***Figure 6.5.3.3-2***) provides for status and control of the MLTR pumps. The pumps flow rate is paced off of the MBR plant flow. The MBR control system monitors the MLTR channel level **<3>** and varies the filtrate pump speed dependent on a number of the MLTR channel level. Two **level indicators <4>** measure the MLTR channel level. The level indicators can be enabled or disabled on this screen.

At least one of the level indicators must be enabled. Clicking on the level box will give a popup box that provides for entry of the alarm setpoints for MLTR channel level.

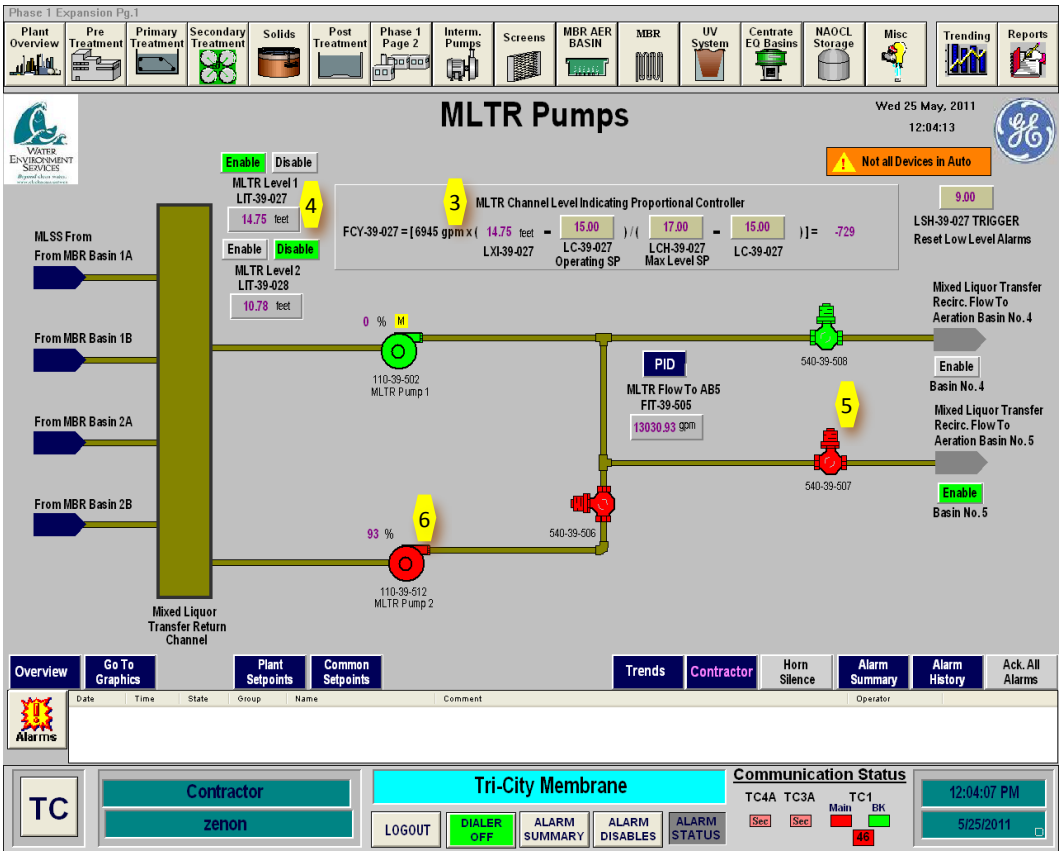

Figure 6.5.3.3-2 – MLTR Pump Screen

The valves can be opened and closed by clicking on the **valve icon <5>**. Clicking on the icon will give a popup box that will allow for opening and closing of the valve. The local control station for the valve must be set to REMOTE for this function to work from SCADA. The valves allow for sending the MLTR flow to either CAS AB#4 or to MBR AB#5.

Clicking on the **pump icon <6>** accesses the pump controls as shown in ***Figure 6.5.3.3-2***. Clicking on the pump icon will give a popup box that provides pump control as discussed in the following section and shown in ***Figure 6.5.3.3-3***.

MLTR Pump Control

The pumps must be in automatic in order for the pumps to run in automatic mode. When the system auto is on and the pumps are in AUTO mode, the pumps will turn on and run as needed to meet the flow setpoint. If the lead pump is not able to meet the flow setpoint, the lag pump will automatically start.

The pump mode of control is set with the AUTO, START and STOP buttons. This pump should be set in AUTO by clicking on the AUTO button **<7>**. The pumps can be started manually with the START/STOP buttons.

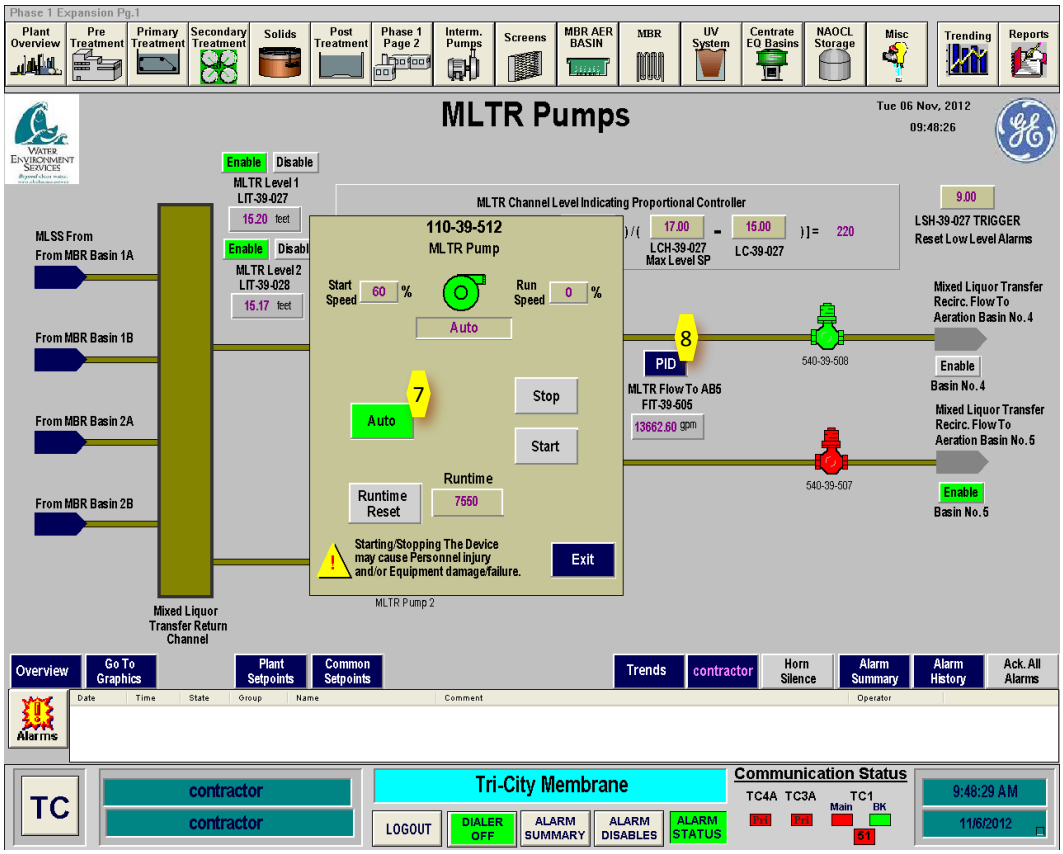

Figure 6.5.3.3-3 – MLTR Pump Control Screen

MLTR Pump PID Loop Controller

Clicking on the **PID button <8>** (***Figure 6.4.3.2-3***) will give a popup box with the PID controller for the filtrate pump as shown in ***Figure 6.4.3.3-4***. This box provides a trend plot of the process variable for the pump as well as the PID control variables to tune the pump. These values have been set by the GE Technician and should not be changed without confirmation from GE.

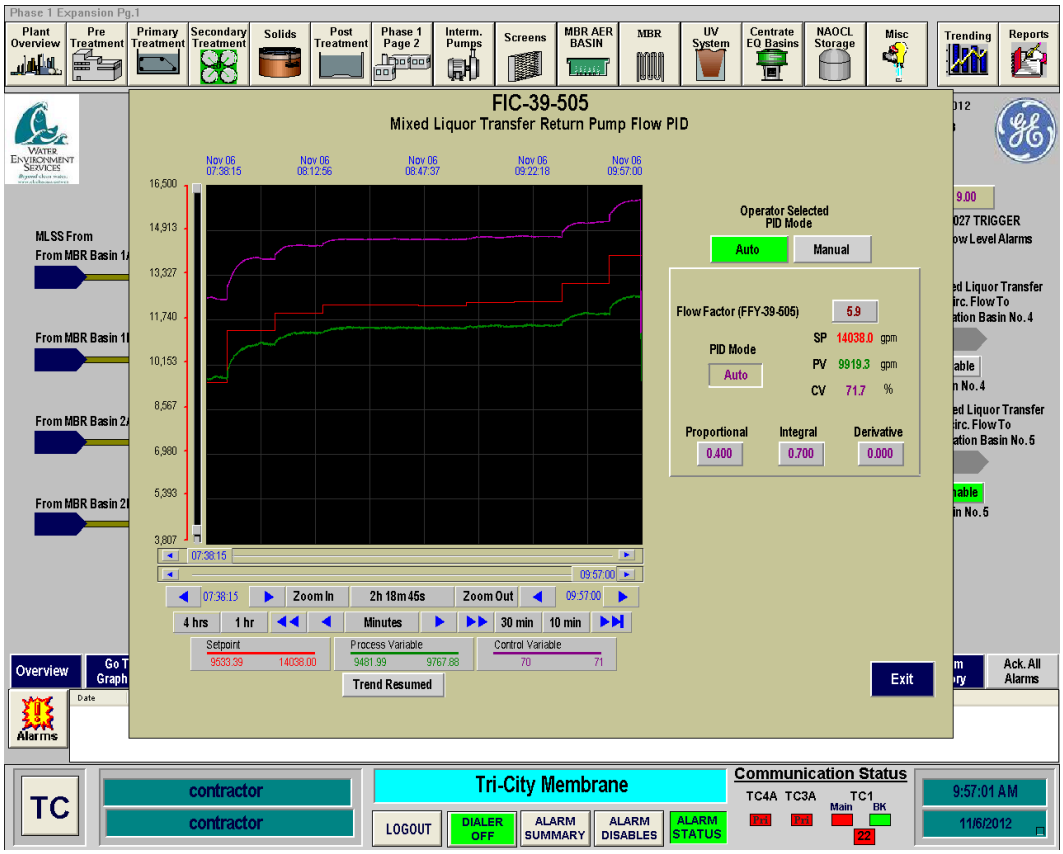

Figure 6.5.3.3-4 – MLTR Pump PID Control Screen

MLTR Pump Flowrate Control

The MLTR pump flowrate is controlled as a percent of the MBR flow. This flowrate is adjusted every 15-minutes by the MBR control system. The percent of MBR flow is set by the **Common Setpoints input box <1>** on the MBR screen shown in ***Figure 6.5.3.3-5***.

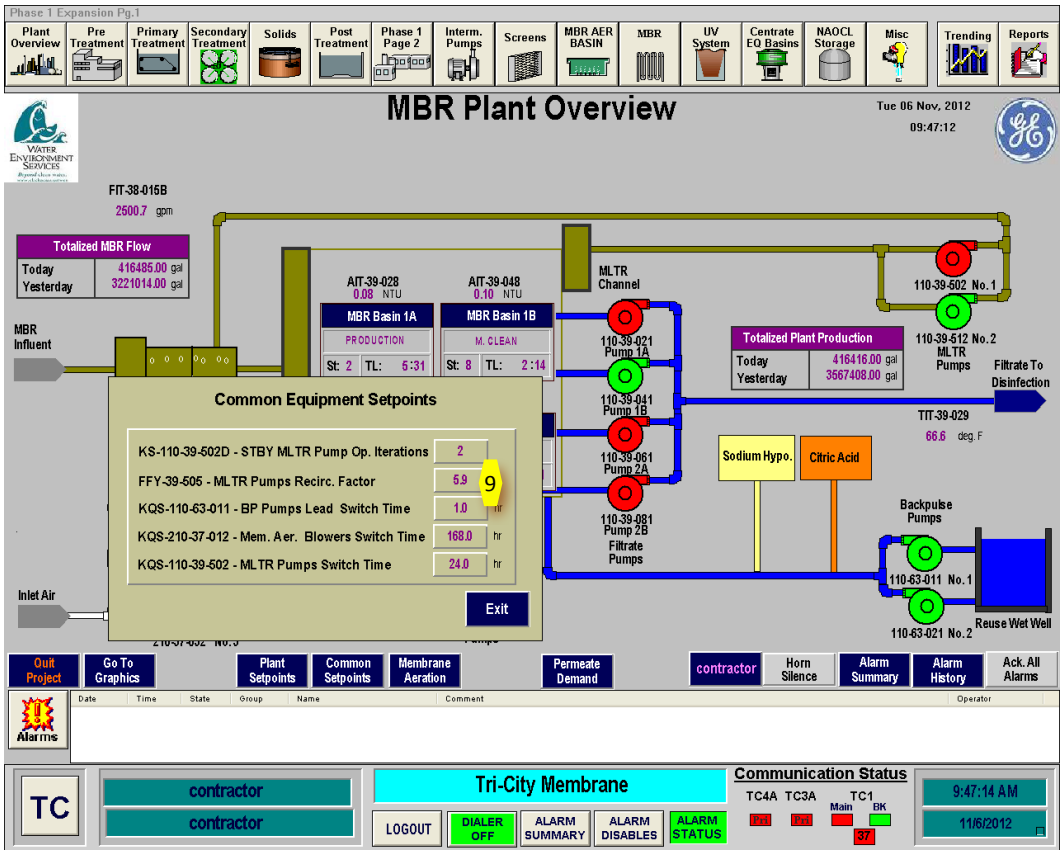

Figure 6.5.3.3-5 – MBR Common Setpoints Popup Box

Mixed Liquor Transfer Return Channel Level Alarms

The alarm setpoints for the MLTR channel are located on the MLTR pump screen. They are accessed by clicking on one of the MLTR channel level indicators. This will give a popup box with the alarm setpoints as shown in ***Figure 6.5.3.3-6***.

Mixed Liquor Transfer Return Channel Level Alarms

The alarm setpoints for the MLTR pump recirculaton flow are located on the MLTR pump screen. They are accessed by clicking on the MLTR Flow to AB#5 flow indicator. This will give a popup box with the alarm setpoints as shown in ***Figure 6.5.3.3-7***.

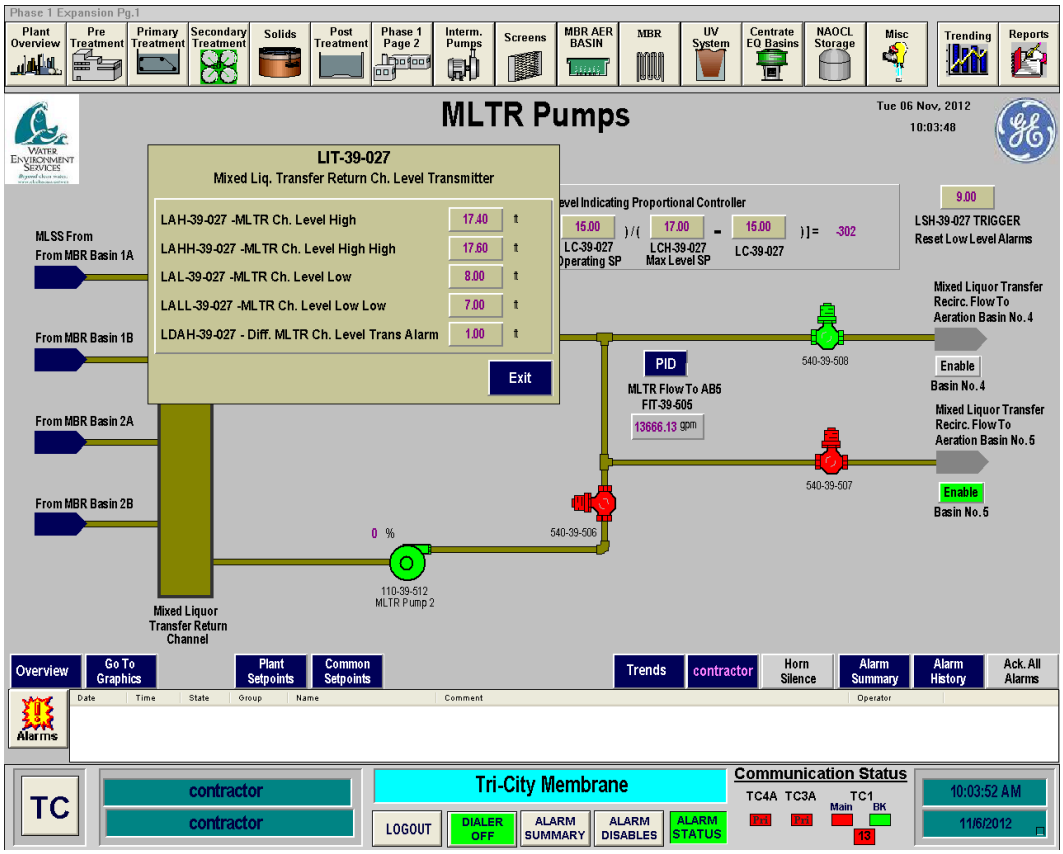

Figure 6.5.3.3-6 – MLTR Channel Alarm Setpoints Popup Box

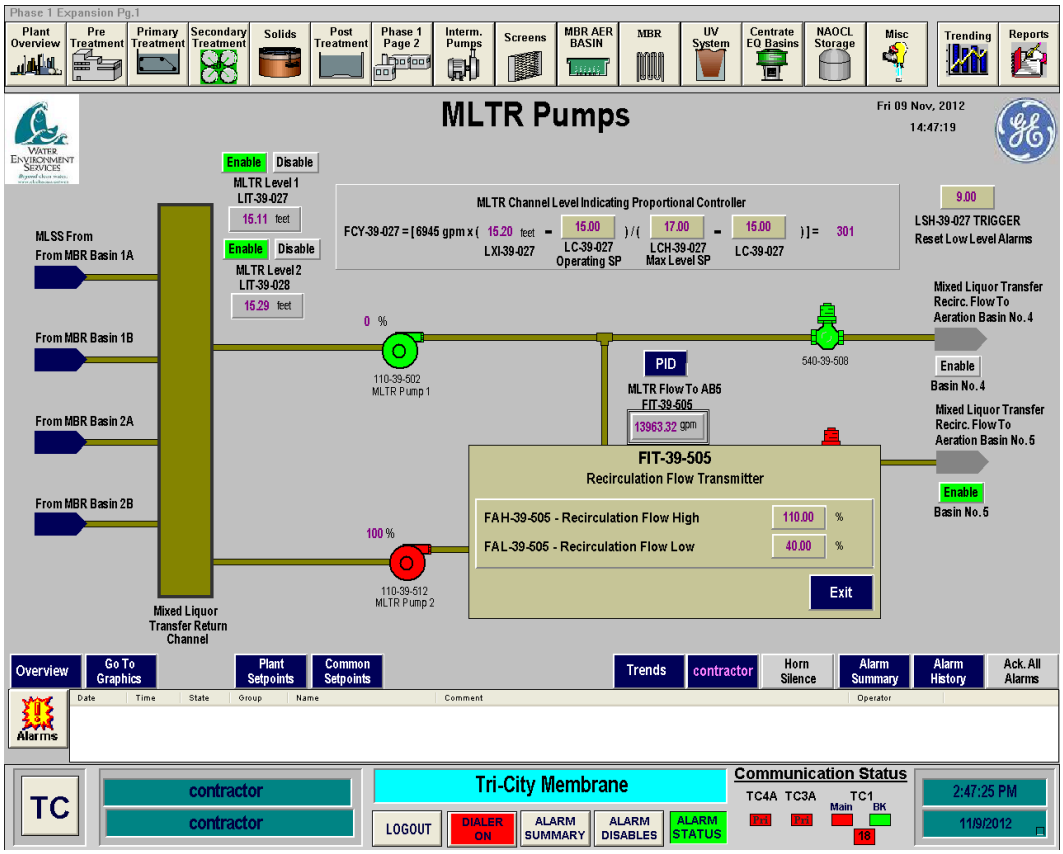

Figure 6.5.3.3-7 – Recirculation Flow Transmitter Setpoint Popup Box

MLTR Pump Startup Sequence

To start up the MLTR pumps in Automatic Mode, follow the following sequence. This sequence is for a cold startup of the pumps. If the system is operating, confirmation that the equipment is off may not be necessary.

Step	Action	Location
	Confirm Equipment is in Off	
1	Confirm MLTR Pumps are OFF	SCADA Main Screen
2	Confirm MLTR Pumps are in Off Position in SCADA	SCADA Main Screen
3	Confirm MLTR Pumps are in OFF Position at Local VFD Panel	MBR Electrical Room
4	Confirm MLTR Pumps Breaker is OPEN at the MCC Panel	MBR Electrical Room
	Ready Equipment	
1	Confirm MLTR valve to the aeration basin (540-35-507) is open (For AB#5)	AB#5
2	Confirm MLTR Pump suction and discharge valves are Open	MBR Building Lower Level
3	Close Breaker in MCC for MLTR pumps at MCC	MBR Electrical Room MCC
4	Close Breaker on MLTR pump VFD for both MLTR pumps	MBR Electrical Room VFD
5	Place MLTR pumps in REMOTE at MLTR pump VFD Panel	MBR Electrical Room VFD
6	Confirm MLTR pumping rate setpoint on the MBR Common Setpoint screen. Design setpoint is 400%.	SCADA Membrane System Common Setpoint Screen
7	Place MLTR pumps in AUTO on MLTR pump SCADA Screen	SCADA MLTR Pump Screen
8	Pumps will now operate when called by the MBR control system	