1. Procedure summary

This procedure describes monthly maintenance to be performed on the paddlewheels.

1.1. Related Procedures

Paddlewheel Inspection and Cleaning	CB-04-004-001
Paddlewheel Operation	CB-04-004-002
Lock Out Tag Out Policy	

1.2. Procedure impacts and concerns

Safety	Paddlewheel assembly must be locked out when performing inspection of the system mainframe. Wader pants and felt soled boots, safety glasses and gloves must be worn during this procedure. A (2) person rule will apply when performing this procedure.
Quality	Ensure Production Team Lead/Cultivation Director is notified prior to shutting down system for inspection.
Delivery	
Environmental	
Cost	
Compliance	

1.3. Responsibilities and owners

Document Owner	Manage content and distribution	Mark DuPont
Process Owner	Responsible for content and process validation	Mark DuPont
Site Manager	Responsible for implementation and conformance	Rebecca White

2. Process

2.1. Process description

This procedure describes the process to perform inspection and maintenance of the paddlewheel assembly to include the motor drive assembly, electrical, safety disconnect and mounting hardware.

2.2. Process diagram: Work Instruction

As per MFG recommended maintenance procedures and schedules. Consult MFG manual for details.

2.3. Process steps

2.3.1 Visual Inspection

2.3.1.1. With system operating perform a visual inspection of the drive assembly to include: Unusual noises, missing or damaged paddles, missing hardware, frayed wiring, fluid leaks.

2.3.2 Electrical Inspection

2.3.2.1. Locate the electrical contacts for the paddlewheel assembly within the main electrical panel.

2.3.2.2. Using a multi-meter check the AMP draw and voltage readings on A, B and C phases.

2.3.2.3. Record the readings on the provided document located within the electrical panel.

2.3.2.4. Using a laser thermo recording device record the temperature of the electrical contacts associated with the paddlewheel assembly. 2.3.2.5. Record thermo reading on the document located within the electrical panel.

Inform the Cultivation Director prior to performing the following steps

2.3.3 Pond Entry

Prior to entering the pond put on wader pants and felt soled boots. Use caution when entering the pond due to high viscosity of the liner surface. Do not enter the pond within the sump area in order to avoid damage to the CO2 distribution assembly

2.3.3.1 Remove the paddlewheel from service by rotating the "On/Off" switch located on the main control panel to the "Off" position.

2.3.3.2. At the handrail location rotate the motor disconnect switch to the "Off" position.

NOTE: Make sure paddlewheel ceases operation.

2.3.3.3. Lock and tag the disconnect switch in the "Off" position prior to performing the following steps.

2.3.4 Inspect Motor Drive

2.3.4.1. Inspect the motor drive assembly for loose or missing hardware.

2.3.4.2. Note the transmission fluid level on the indicator sight glass. Add additional fluid as necessary.

2.3.4.3. Inspect the bearing assemblies for signs of unusual wear, loose or missing hardware. Lubricate assemblies as per MFG recommended intervals.

NOTE: If transmission oil level is below normal limits, inspect drive assembly for possible seal damage.

2.3.5 Inspect Emergency Stop System

2.3.5.1. Perform a visual and function test of the (2) cable E-stop systems by manually pulling the cable assembly.

2.3.5.2. Ensure the (2) cable E-stop assemblies are reset upon completion.

2.3.6 Pond Exit

2.3.6.1. Upon completion exit the pond.

2.3.7 Re-energize System

2.3.7.1. Remove the lock/tag from the electrical disconnect switch. Rotate the disconnect switch to the "On" position.

2.3.7.2. At the main electrical panel, rotate the "on/off' switch to the "on" position.

NOTE: Use caution when exiting the pond due to high viscosity of liner surface.

2.3.8 Visual Inspection

2.3.8.1. While in operation perform a visual inspection of the paddlewheel assembly. Note any unusual noises during operation.

NOTE: Strobe light and audible warning signal will sound prior to paddlewheel start up.

2.3.9 Emergency Stop Function Check

With the paddlewheel in operation perform a function check of the E-stop assemblies using the following procedures

2.3.9.1. Using a safety hook assembly, gently apply pressure to (one) of the (two) cable E-stops.

2.3.9.2. Reset the cable E-stop by rotating the reset switch located on the E-stop assembly.

2.3.9.3. At the main electrical panel rotate the "On/Off" switch to the "off" position.

NOTE: The paddlewheel will cease operation.

2.3.9.4. Depress the reset button located on the front of the electrical control panel for 10 seconds.

2.3.9.5. Attempt to restart the paddlewheel by rotating the "On/Off switch to the "On" position.

2.3.9.6. Repeat steps 2.3.9.1-2.3.9.5 for the second cable E-stop.

With the paddlewheel in operation proceed to the handrail assembly.

2.3.9.7. Depress the red E-stop switch located on the PLC.

2.3.9.8. Rotate the red E-stop switch in the direction as indicated by the arrows located on the switch. This will reset the E-stop switch. 2.3.9.9 At the main electrical panel rotate the "On/Off" switch to the "Off" position.

2.3.9.10. Depress and hold the reset button for 10 seconds.

2.3.9.11. Attempt to restart the paddlewheel by rotating the "On/Off" switch to the "On" position.

2.3.9.12 Conduct a visual inspection on the paddlewheel assembly to ensure the system is fully operational.

2.3.10 Reporting

2.3.10.1. Inform the Production Team Lead/ Cultivation Director that the paddlewheel is back in service.

2.3.10.2. Report any discrepancies to the maintenance supervisor.

NOTE: The rapid flashing strobe light indicating a fault has occurred.

NOTE: Flashing strobe and audible alarm prior to start-up.

NOTE: The paddlewheel assembly will cease to operate.

NOTE: The rapid flashing strobe light indication a fault has occurred.

NOTE: Flashing strobe and audible alarm prior to start up.

3. Required documents

3.1. Input documents

3.2. Output documents

4. Document control

4.1. Revision history

R0 – Initial Release – Mark DuPont	04/02/2012
R1 –	

4.2. Document approval

<Name> <Approval date>

4.3. Document reviewers

<Name> <Last reviewed date>
<Name> <Last reviewed date>

5. Risk analysis

<Risk name> <Mitigation plan> <Owner> <RPN>