1. Procedure summary

This procedure outlines the method to operate the ISCO 3700 autosampler during harvest processing.

1.1. Related Procedures

DAF Harvest Monitoring	CB-02-004-003

1.2. Procedure impacts and concerns

Safety	Personnel must be follow PPE standards when operating the equipment which includes eye protection, a long sleeve shirt, and steel toed boots.	<Additional notes>
Quality	Improper operation of the autosampler can severely impact data collection and process results.	<Additional notes>
Delivery	Samples must be delivered to the lab after completion of the harvest on the same day with appropriation sample submission documentation.	
Environmental	Loss of containment	<Additional notes>
Cost	N/A	<Additional notes>
Compliance	Compliance with OSHA's Hazardous Waste Operations and Response, and Hazardous Communication Standard in addition to the Sapphire Energy, Inc. Chemical Hygiene Plan is required where applicable. See 29 CFR 1910.120 and 1200. An AUL list, MSDSs and label information will be available for easy reference in a binder in the administration building.	

1.3. Responsibilities and owners

Document Owner	Manage content and distribution	Tony Matsumoto
Process Owner	Responsible for content and process validation	Tony Matsumoto
Plant Manager	Responsible for implementation and conformance	Dhawal Dhonde

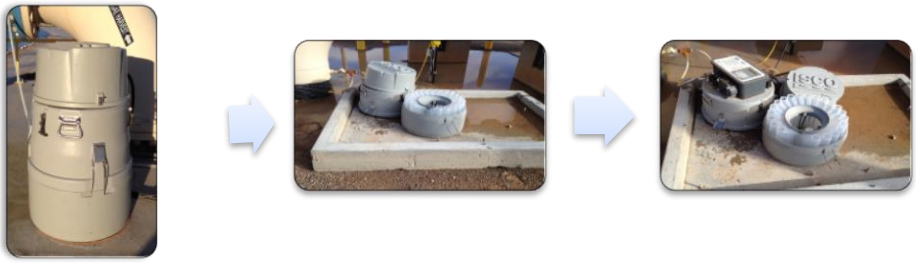
2. Process

2.1. Process description

The procedure describes how to operate the ISCO 3700 autosampler at the DFP and SN sump during harvest processing.

2.2. Process diagram

Autosampler Diagram

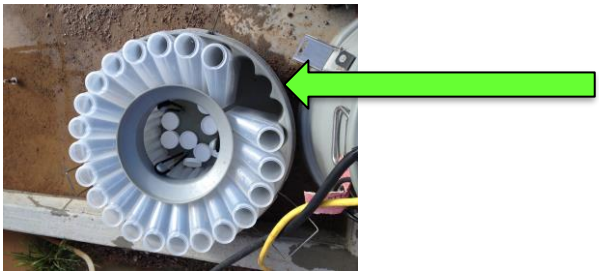


Note: Autosampler disassembles in 3 pieces.

2.3 Process Steps

2.3.1 Autosampler preparation

2.3.1.1. Sample bottle placement. See picture below.



Also note: There should not be any empty spaces in sample bottle holder.

2.3.1.1.1. Remove sample bottle holder (bottom portion of autosampler) from unit.

2.3.1.1.2. Insert 24 clean, uncapped, and labeled (i.e. bottle #, date, time, operator initials) one liter ISCO manufactured sample bottles into the bottom portion of the sampler.

2.3.1.1.3. Fill out sample submission form. Which is located in Columbus drive/field operations/Checklists/Harvest area checklists/Autosampler checklist. See picture 2.3.1.1.3

2.3.1.1.4. Place center plastic ring at the center of the sample bottles and wrap elastic bands around clips attached to ring.

2.3.1.1.5. Fasten loaded sample bottle holder back to autosampler using metal clips on the side of the unit.

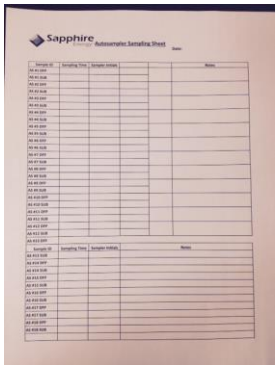
2.3.1.2 Programing autosampler

2.3.1.2.1. Press “on/standby” button on autosampler pump control box (figure 1).

Note: Photo of sample bottle.

Note: Match the sample bottle number to the correct slot number in sample bottle holder.

2.3.1.1.3



Note: To increase sample bottle from

Figure 1: Autosampler control box

2.3.1.2.2. Press “enter/program”
2.3.1.2.3. Display reads [Program (blinking), Control], press “enter/program”.
2.3.1.2.4. Display reads [time (blinking), flow, storm], press “enter/program”.
2.3.1.2.5. Display reads [uniform (blinking), non-uniform], press “enter/program”.
2.3.1.2.6. Using “arrow” button and number key pad, adjust sampling to every 60 minutes.
2.3.1.2.7. Display reads “1 (blinking) bottles per sample event, press “enter/program”.
2.3.1.2.8. Display reads [time, sample (blinking)], press “enter/program”.
2.3.1.2.9. Display reads “Sample continuously [Yes, No (blinking), press “enter/program”.
2.3.1.2.10. Display reads “Sample volume, 1000 ml (blinking)”, press “enter/program”.
2.3.1.2.11. Display reads “Calibrate sample volume [Yes, No (blinking)], press “enter/program”.
2.3.1.2.12. Display reads “Enter start time [Yes, No (blinking)], press “enter/program”.
2.3.1.2.13. Display reads “0 stop (blinking) or Resume”, press “enter/program”.
2.3.1.2.13. Display will read “Programming Sequence Complete”.

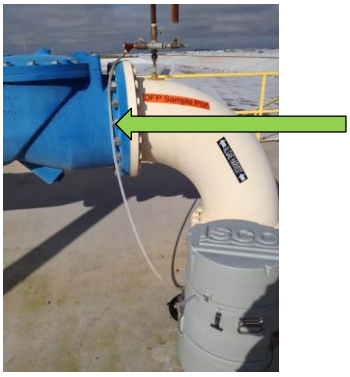
2.3.2. Starting sample collection

2.3.2.1. DFP autosampler start up. See picture 2.3.2.1 for DFP autosampler location.

2.3.2.1.1. Press “start sampling” button after the first hour of processing through the DAF or when instructed to do so by the HMI operator.

2.3.2.1.2. Observe initial sample is collected which is collected 1 MINUTE AFTER pushing start.

2.3.2.1.3. When collecting turbidity samples for efficiency updates, check the culture is flowing to the sump and the autosampler display is not reading an error.



2.3.2.2. SN sump autosampler start up. See picture 2.3.2.2 for SN autosampler location.

2.3.2.2.1. Open SN-V104

2.3.2.2.2. Press “start sampling” button after the first hour of processing through the DAF or when instructed to do so by the HMI operator.

1 to 2 for increased biomass collection change “bottles per sample event” on step 2.3.1.2.7.

Note: Ensure sampling tubing connected to sample ports at the DFP and SN. Make sure sumps are flowing before starting autosamplers.

Note: Sample taken 1 MINUTE AFTER pushing start.

Note: If an error is being displayed, collect a manual sample (note “manual” in submission form) and notify facilities or the process engineer to troubleshoot.

Note: Ensure collected samples do not spill when unfastening sample bottle holders from autosamplers.

2.3.2.1

2.3.2.2.3. Observe initial sample is collected which is collected immediately.

2.3.2.2.4. When collecting turbidity samples for efficiency updates, check that culture is flowing to SN sump and the autosampler display is not reading an error.

2.3.2.2

Note: Will need to flush out the lines from both autosamplers before using.

2.3.3. Sample collection completion

2.3.3.1. Press “stop sampling” button when sample collection has been stopped.

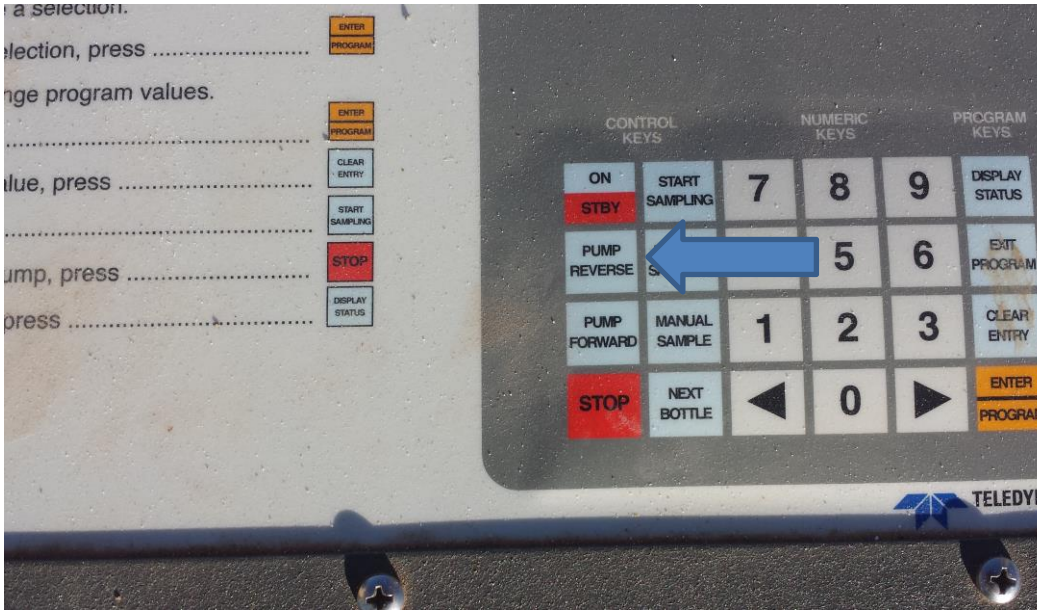
2.3.3.2. Un-fasten sample bottle holder portion from autosampler

2.3.3.3. Screw caps onto sample bottles and remove from holder.

2.3.3.4. Fasten sample bottle holder portion back to autosampler.

2.3.3.4. Add sample times to individual bottle labels for lab submission.

*When colder weather arrives you will have to make sure the lines running into Autosampler are clear of any fluids to prevent lines from freezing and damaging Autosampler. To do this you will have to take top cover off and look for button that reads PUMP REVERSE. Press button and you will hear pump start up. If there is any fluid in line you will notice it running through the clear vinyl line. Once line is clear hit the STOP button. Now re-place top cover and you’re done.



done.

3. Required documents

3.1. Input documents

Polymer/sampling station log	L:\Harvest\Harvest Records
QA/QC sample submission form	

3.2. Output documents

QA/QC harvest dry weight results	L:\QAQC\Raw Data\Harvest\Dry Weights

4. Document control

4.1. Revision history

R0 – Initial Release – Tony Matsumoto	
R1 –Julio Chavez	**October 8.2015**
R2	
R3	

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>