1. Procedure summary

This procedure describes how to collect samples around a DAF harvest to monitor performance.

1.1. Related Procedures

Polymer Make Down Station Operations	CB-02-002-002
Saturation Tank Operations	CB-02-005-003
DAF Operation	CB-02-004-004

1.2. Procedure impacts and concerns

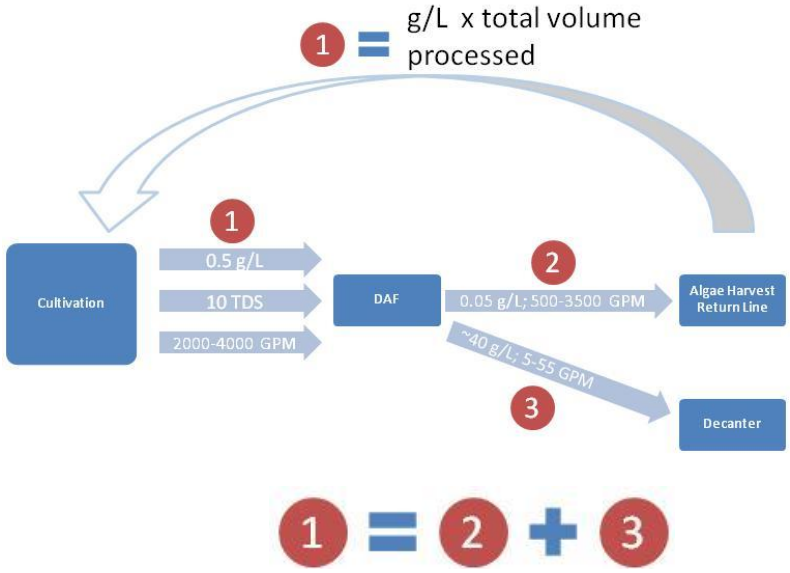
Safety	Standard PPE and nitrile gloves
Quality	Samples must be representative of the content in a specific process point. Non mixed samples will reflect incorrect numbers when reporting system performance.
Delivery	DAF harvest samples should be delivered to the QA/QC lab for analysis.
Environmental	Spills in the sampling area need to be cleaned as soon as possible and in most cases avoided.
Cost	All process sample volumes should be conserved to save as much product as possible.
Compliance	The procedure below should be followed by all sampling personnel to ensure quality control.

1.3. Responsibilities and owners

Document Owner	Manage content and distribution	Timothy Langer
Process Owner	Responsible for content and process validation	Rebecca White
Plant Manager	Responsible for implementation and conformance	Rebecca White

2. Process

2.1. Process diagram



Samples must be taken at each step in the DAF harvest process

Total solids into the DAF should equal the total of what comes out of the DAF.

Figure 1.
Figure 1 Sampling of the DAF harvest.

2.2. DAF sampling and performance monitoring

2.3.1 DAF sampling

This method will outline how to sample the DAF to determine the efficiency of the harvest and determine mass harvested through the system.

The harvest team is responsible for taking the samples from all process equipment to monitor performance.
The first sample is a DAF feed sample that is used for the polymer dosing determination and represents step 1 in the process diagram. This sample

should be 1 L in volume.
The second sample is taken from the DAF subnatant return. This sample should be 1 L in volume.(Sample off weir)
The third sample is taken from the DAF float box to sample the DAF product. This sample should be 1 L in volume (TA sample) but filled about
¾.

NOTE: If TA sample filled to the top product can expand in heat and when you go to open sample it will burst product everywhere.

**NOTE: As per QAQC or site manager there are times when an extra sample is needed. Sample is taken with a 50 ml conical tube submerged in the subnatant water or weir box.

NOTE: Will need to make 2 copies of harvest sample submission sheet. One for QAQC and the second for cultivation.

Samples should be taken EVERY hour until advised otherwise by the HMI operator. The harvest samples and submission sheet are then delivered to QAQC for analysis after harvest is completed.

2.3.2 Active process performance monitoring

2.3.2.1 Using an NTU reader, fill the vial up with DAF feed sample from the ponds being harvested and record the NTU value. **(A)**

2.3.2.2 Using the NTU reader, fill the sample vial up with the SN return sample and record the NTU value **(B)**

2.3.2.3 To determine an instantaneous DAF efficiency for qualitative monitoring follow the following equation :

$$\% \text{ efficiency} = 1 - (B/A)$$

2.3.2.4 NTU values from samples need to be entered into PI Process Book and logged on the Harvest Record.

2.3.2.5 **Weir sample taken with 50ml conical tube will also need to be logged on the “Harvest Sample Sheet”. You will NOT have to do equation as listed above in (2.3.2.3) but will just need to log weir ntu in the notes.

NOTE: SN ntu and Weir ntu should be roughly the same. These are little things to look for and reported to team lead or HMI operator immediately to figure out problem.

3. Required documents

3.1. Input documents

Harvest Record <Input document number>

3.2. Output documents

Harvest Record <Output document number>

4. Document control

4.1. **Revision history**

R0 – Initial Release – Timothy Langer	March 23, 2012
R1 – Updated procedure – Marcos Delgado R2-Magdalena Pacheco	September 5, 2012 March 3, 2015

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>