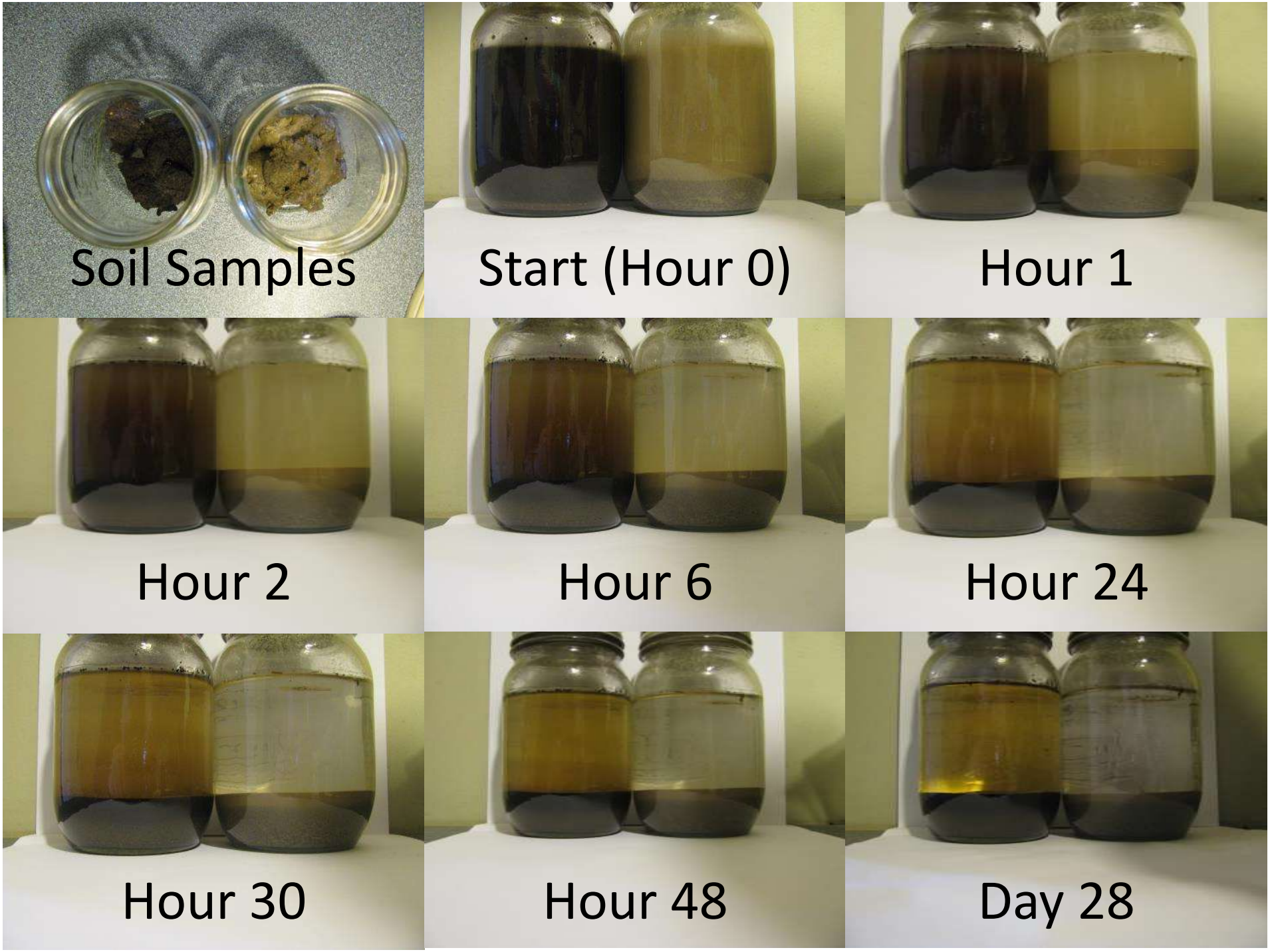
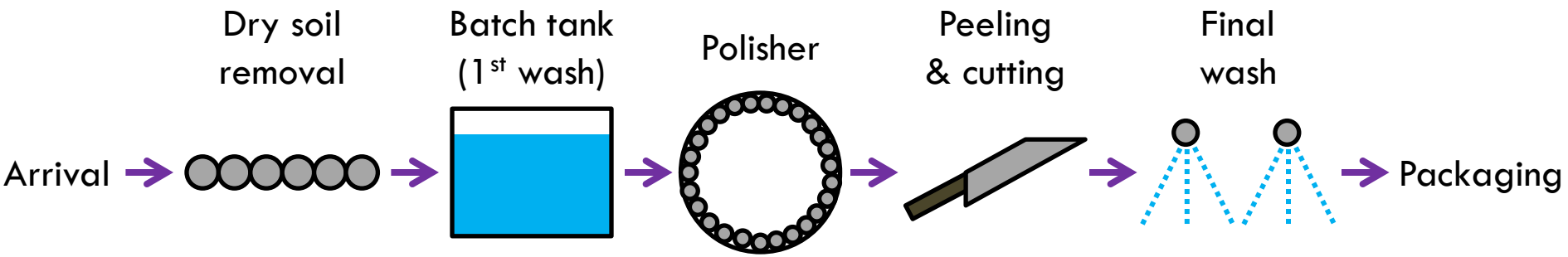
Water Project Update 2016

Bridget Visser
Communications
Holland Marsh Growers' Association Water Project

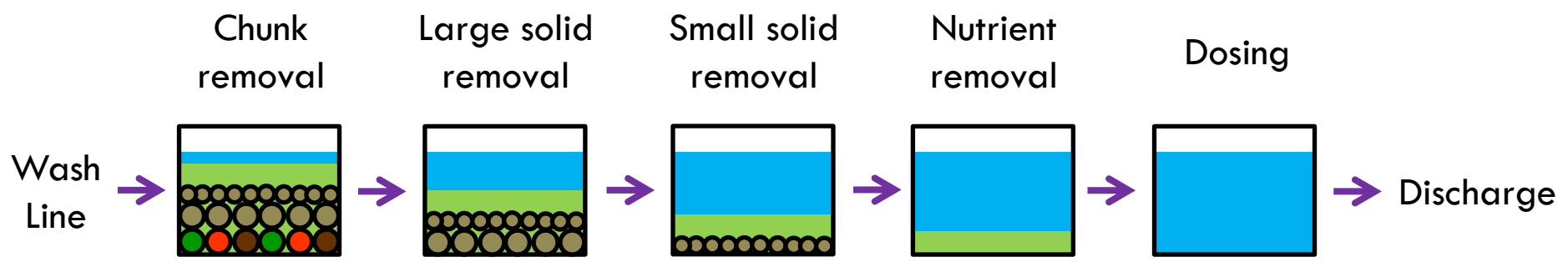

Soil Samples
Start (Hour 0)
Hour 1
Hour 2
Hour 6
Hour 24
Hour 30
Hour 48
Day 28

Generalized Washing Process



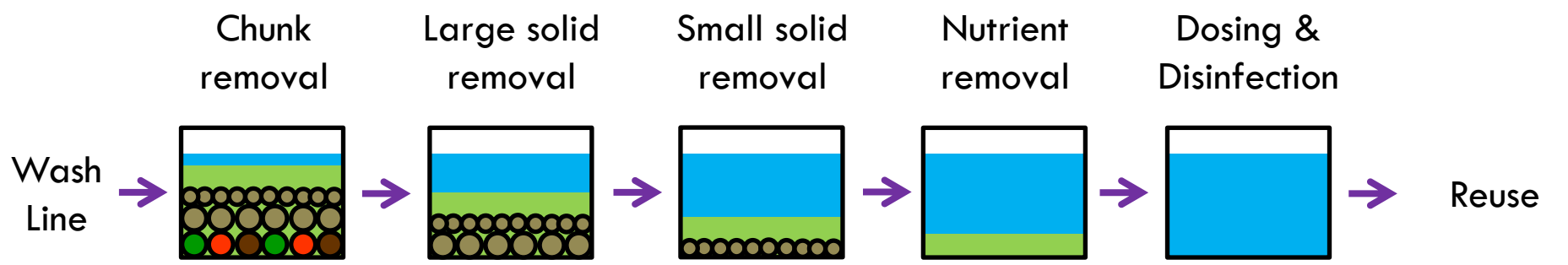
Contributions to washwater:		**Soil**	**Soil** **Nutrients**	**Nutrients**
Factors				
Start point:	**Here**	vs.	**Here**	
Amount and placement of water used:				Water can be reused one or two steps back

Generalized Treatment Process



Target	Tops, root pieces	Soil aggregates	Soil particles	Nutrients	DO, pH, etc.
Example Technol-ogies	Parabolic filter screen/ Hydrosieve Chopper pumps	Settling tanks Filter bags Geotubes Drum filters Hydrocyclone	Flocculation	Biofilters Ultra-filtration Reverse osmosis Anaerobic digester	Aeration

Generalized Recycle Process



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Technology Testing

- Parabolic Filter Screen
- Hydrosieve

Chunk removal

- Settling Ponds
- Coagulation/Flocculation
- Drum Filter
- Hydrocyclone
- Filter bags
- Bishops Water Technologies Geotube®

Large solid removal

- Coagulant & Flocculants

Fine solid removal

- Newterra ultrafiltration system
- Voltea Capacitive Deionization
- Biofiltration

Nutrient removal

- Aeration

Dosing

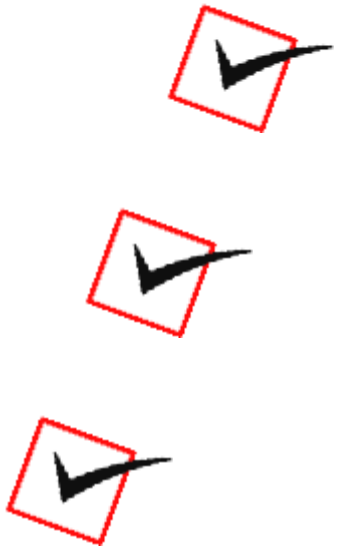
Theoretical Treatment Plan

- Using experimental and sampling results, theoretical plans can be produced
- Following example based on 190,000 L daily flow and 260 days/year of operation

Technology	Phosphorus removal (kg/year)	Phosphorus balance (kg)	Nitrogen removal (kg/year)	Nitrogen balance (kg)	Solid removal (kg/year)	Solid balance (kg)
Water to be treated		160.0		760.0		43,000
Option 1: Geotube & Flocculation + Ultrafiltration						
Geotube	77.1	82.9	529.6	230.4	55,545	0
UF	48.5	34.4	240.3	0		
Option 2: Existing Average Settling Tank + Ultrafiltration						
Settling	121.8	38.2	459.0	301.0	41,299	1,701
UF	48.5	0	240.3	60.6	9,558	0

Lessons Learned

- Water characterization…soil is not a nutrient and needs to come out first
- Technology requires attention and optimization
- New category of maintenance
  - Electrical/plumbing and IT combination
- Location of water treatment
  - Infrastructure needs
  - Monitoring
- Complex regulatory system
  - Involving MOECC staff in search for solutions is beneficial



Challenges Moving Forward

- Technology costs
- Whole plant processing assessment leading to optimized treatment costs
- Compare techs including pre-treatment needs
- On-site technical staff capacity

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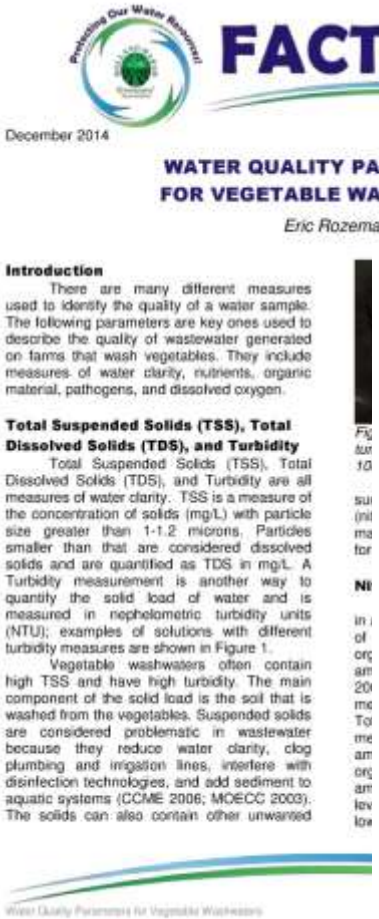

FACTSHEET

December 2014 # 001

WATER QUALITY PARAMETERS FOR VEGETABLE WASHWATERS

Eric Rozema

Introduction

There are many different measures used to identify the quality of a water sample. The following parameters are key ones used to describe the quality of wastewater generated on farms that wash vegetables. They include measures of water clarity, nutrients, organic material, pathogens, and dissolved oxygen.

Total Suspended Solids (TSS), Total Dissolved Solids (TDS), and Turbidity

Total Suspended Solids (TSS), Total Dissolved Solids (TDS), and Turbidity are all measures of water clarity. TSS is a measure of the concentration of solids (mg/L) with particle size greater than 1-1.2 microns. Particles smaller than that are considered dissolved solids and are quantified as TDS in mg/L. A Turbidity measurement is another way to quantify the solid load of water and is measured in nephelometric turbidity units (NTU); examples of solutions with different turbidity measures are shown in Figure 1.

Vegetable washwaters often contain high TSS and have high turbidity. The main component of the solid load is the soil that is washed from the vegetables. Suspended solids are considered problematic in wastewater because they reduce water clarity, clog plumbing and irrigation lines, interfere with disinfection technologies, and add sediment to aquatic systems (CCME 2006; MOECC 2003). The solids can also contain other unwanted

FACTSHEET

July 2015 # 008

DRUM FILTERS

Bridget Visser

Introduction

A drum filter uses a rotating screened drum to filter solids out of washwater. It is best suited to removing coarse solids early in a treatment system. Drum filters produce two different streams, the clarified water that can be further treated if necessary to be discharged or reused and the waste stream of concentrated solids.

Description

Drum filters can be installed as a gravity-fed system or fed with a pump. The path through the system begins when water enters the inlet and flows through the screen (Figure 1 and 2); different screen sizes can be used depending on the size of solids in the water. The treated water which exits through an outlet may be treated further for either discharge or reused for a primary wash. As the screen becomes clogged with the solids, the water level rises within the drum. At a specified level a motor rotates the drum so that the clogged portion is over a collection tray. A spray bar outside the drum sprays recycled water, collected from under the drum, through the screen and removes the solids which fall into the collection tray (Figure 3). The waste flows into a collection basin through the waste outlet. This system creates a concentrated waste stream which can be further treated or disposed. There is a water fraction in addition to the solids in the waste as it is used to remove the solids from the screen. The percentage of solids in the waste stream is dependent on the initial concentration.

The spray cycle is operated by a programmable logic controller (PLC) that will rotate the drum the water once the level sensor has been tripped. This is useful for inconsistent flows as it operates on an as-needed basis. Changing the duration of the spraying will impact the water to solids ratio in the waste stream.

There are several factors to consider when selecting and sizing a drum filter. The screen size is dependent on the size and

Figure 1: Components of a drum filter (HMGA Water Project)

Protecting Our Water Resources!

HOLLAND MARSH Growers' Association

Questions?

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