Summerland Landfill Compost

Introduction to Residential Food Scrap Removal and the Proposed Summerland Organics Processing Facility

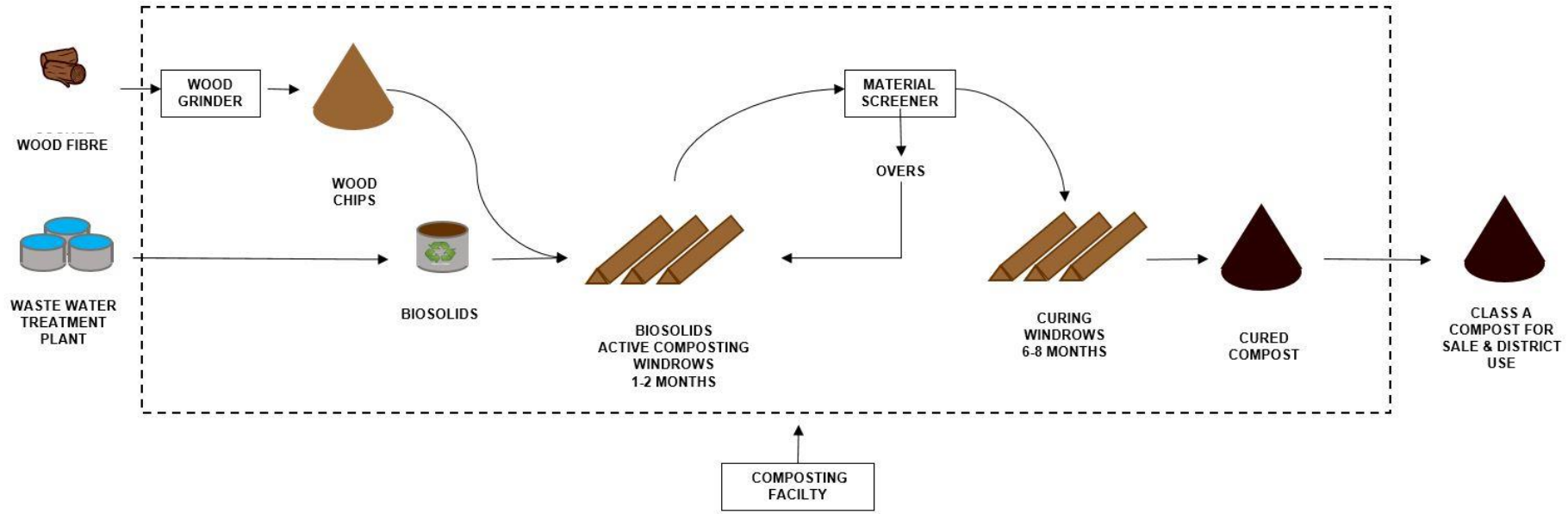


Deacon Liddy, P.Eng., MBA | March 18, 2019

Overview

1. Current Compost System
2. MOE Inspection Results
3. BC Organics Infrastructure Program
4. Residential Food Scrap Composting
5. Forecast of Materials to be Composted
6. Composting Facility Feasibility
    a. Potential Locations
    b. Composting Technologies
    c. Potential Concepts
    d. Cost Estimate Summary
    e. Recommended Concept
7. Potential Next Steps

Current Compost System



Annual tonnes Processed (2018)

- 700 t of biosolids composted per year
- 630 t of yard waste – curbside pickup
- 220 t of yard waste – drop-off at landfill
- 1,150 t of wood – drop-off at landfill

1 t Biosolids : 3 t Wood/Yard Waste

Current Site Photos – March 9, 2019

LOOKING EAST

N S

LOOKING WEST

S N

MOE Inspection Results

Noted Issues

- *Record keeping*
- *Meeting leachate management requirements*
- *Removal of half of stored compost annually*
- *Plans and specifications completed by Qualified Professional*
- *Perimeter fencing – vector attraction*

BC Organics Infrastructure Program

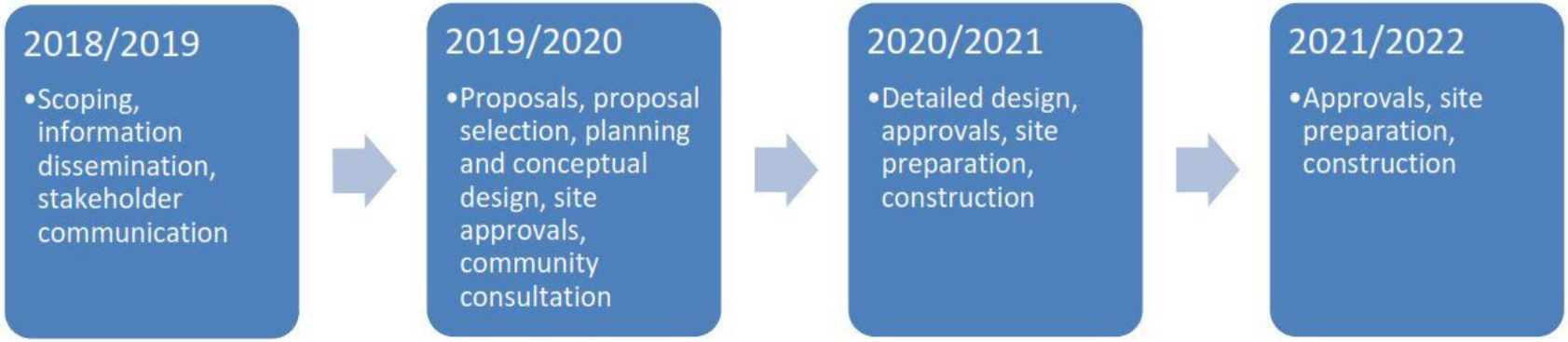
- $20 million in funding from Provincial and Federal Government
- 2/3 funding to projects
- Funding infrastructure to
  - Divert unprocessed municipal organic waste and/or agricultural waste for beneficial re-use, with the goal of reducing greenhouse gas emissions.
  - Expand processing capacity for organic residuals
  - Divert new organic waste to higher value end uses
  - Support the use of nutrient recovery transformation technologies in the agricultural sector

Organics Infrastructure Program Fund Application Timeline:

Program Timeline

Organics Infrastructure Program Fund Application Timeline:

Organics Infrastructure Program Fund Overall Timeline:



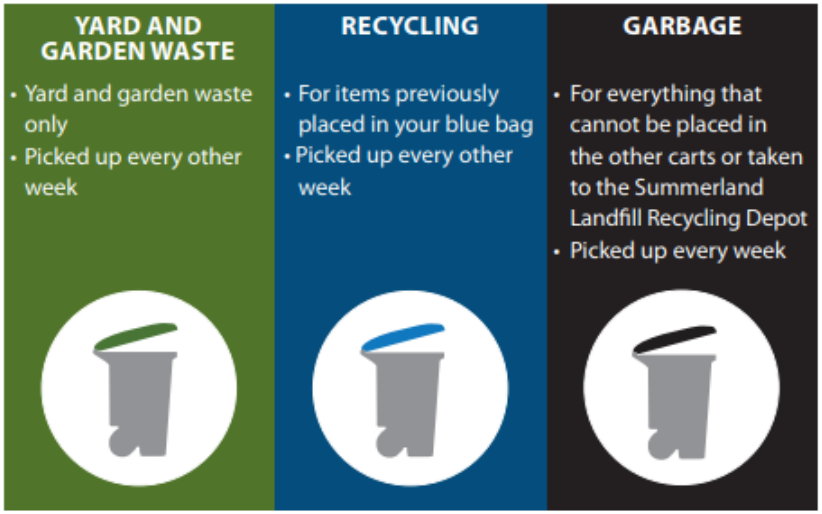
Summerland Curbside Organics Program

Collect household organics in green bin as part of current program

Collection Estimates

- Current Curbside Collection (2016/2017/2018 average)
  - Garbage: 1,600 t
  - Yard Waste: 550 t

- Assuming 40% organics in waste and 50% recovery
  - Organics: 320 t = 1,550 x 0.4 x 0.5
  - Organics + Yard Waste: 870 t
  - Garbage: 1,280 t



Residential Food Scraps Composting
Local and Regional Benefits

Summerland

- No increase in truck traffic – green bins already collected
- Reduced waste to Landfill – 10% reduction
- Extended Landfill life – 10% increase
- 66% capital costs funded by organics fund – approximately $1,000,000

Regional District of Okanagan-Similkameen

- Alignment with regional Solid Waste Management Plan
- Increased diversion from landfill
- Increased recovery for beneficial use
- Does not compete with RDOS regional facility

Residential Food Scraps Composting Environmental Benefits

- Class A Compost (biosolids) – Beneficial reuse in the community
- Class A Compost – (food scraps and yard waste) – Can be used as an input on organically certified farms
- Lined compost areas – reduced potential for groundwater impacts
- Reduced greenhouse gas emissions - 250 tonnes eCO2/year, equivalent to removing emissions from 50 vehicles each year

Forecast of Materials to be Composted

	Biosolids	Green Bin (food scraps)	Green Bin (yard waste)	Yard Waste + Wood (Landfill Drop-off)	Ratio (biosolids + food scraps : wood + yard waste)
	tonnes/year				
Current	700	0	630	1,370	1:3
With Curbside Organics	700	320	630	1,370	1:2

If composting on a hard surface with leachate collection:

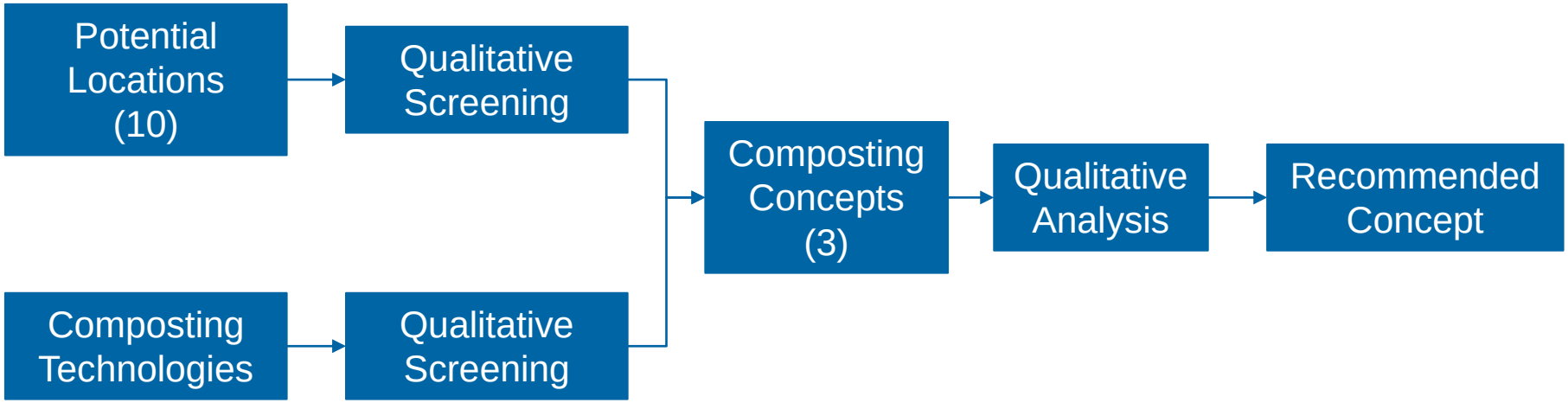
- 1 Biosolids : 2-3 Wood (depending on moisture content of biosolids)
- 1 Food Scraps : 2 Wood
- 1 Food Scraps/Yard Waste : 1-2 Wood

- Therefore – No additional wood needed
- 13% Increase in composted mass
- Small increase in volume

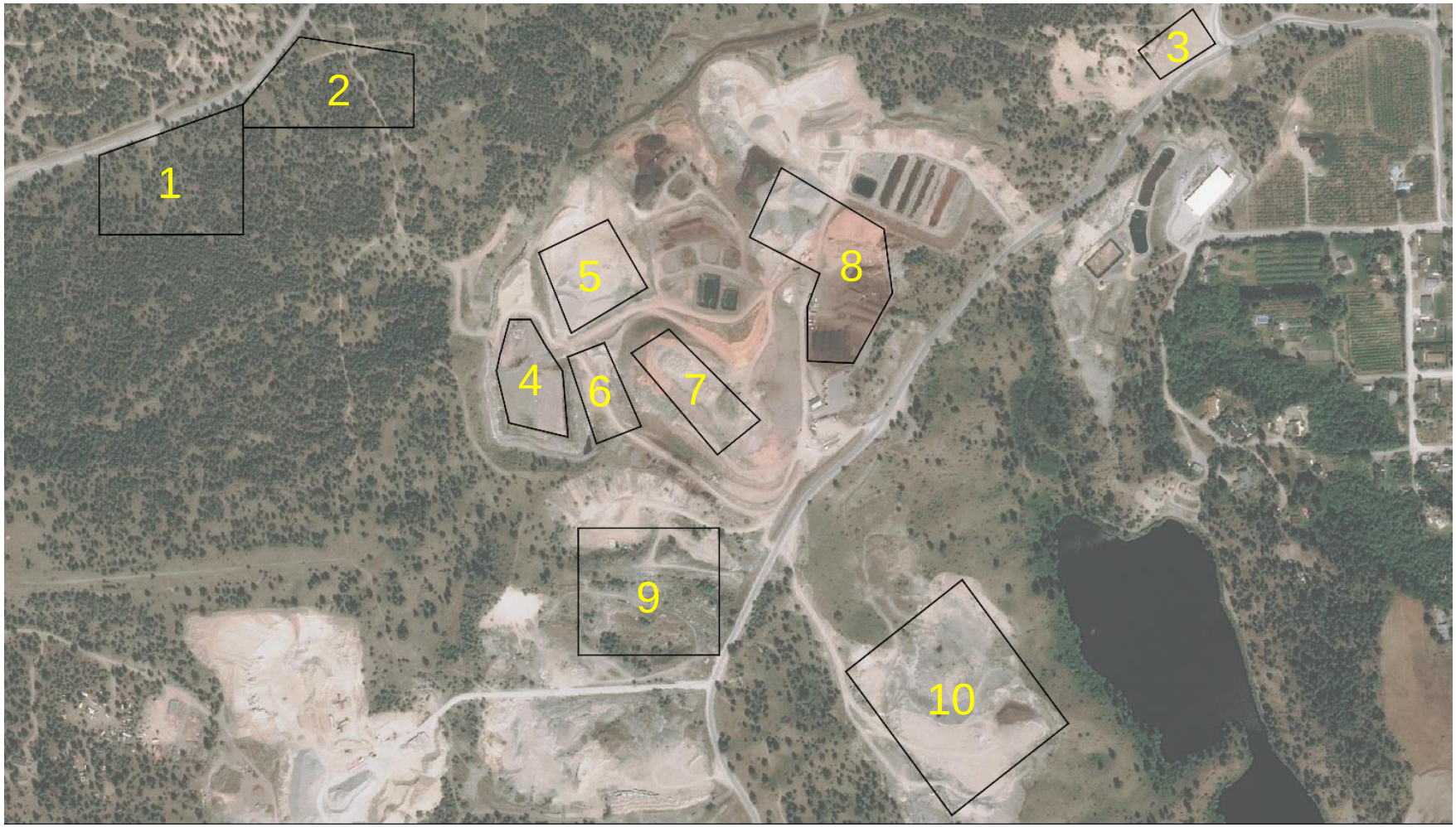
Compost Facility Feasibility

Feasibility Steps

- Identify and assess composting methods
- Identify and assess composting locations
- Develop and analyze scenarios (locations + technology)



Potential Locations



Location Screening

Location	Advantages	Disadvantages	Carried Forward
#1 - Off-site NW of Landfill	• Relatively flat • Distant from Summerland	• Undeveloped • Requires significant operational changes	✗
#2 - Off-site NW of Landfill	• Relatively flat • Distant from Summerland	• Undeveloped • Requires significant operational changes	✗
#3 - Off-site NE of Landfill	• Low relief with graded areas	• Undeveloped • Small footprint • Requires significant operational changes	✗
#4 – Phase 1/2	• Leachate collection systems in place • No active landfilling • Not in the public drop-off area	• Limited area • Steep road access	✓
#5 – Phase 4	• Leachate collection systems in place • Not in the public drop-off area	• Footprint would need to be moved upon completion of filling in the current active cell • Paving not feasible over waste • Active landfilling area	✗
#6 – Future Phase 3	• Flat area • Not in the public drop-off area • Leachate management needed in this area	• Limited area • Future Landfill Phase 3 – Will need to be relocated in 10 to 15 years.	✓
#7 - On Old Landfill footprint	• Minimal changes to operations	• Requires the installation of leachate collection systems • Close to Summerland and the receiving area	✗
#8 - Expansion at existing site	• Minimal changes to operations	• Requires the installation of leachate collection systems • Close to Summerland and receiving area • Relocation of existing gravel stockpile	✓
#9 - Off-site South of Landfill	• Close to the site and sufficiently large to support operations	• No lined areas • Significant grading required • Existing stockpiles would need to be relocated	✗
#10 - Off-site Southeast of Landfill	• Large site	• Requires significant development including the construction of a relatively long access road and regrading • Close to reservoir • Close to Summerland than the current site • Not District owned	✗

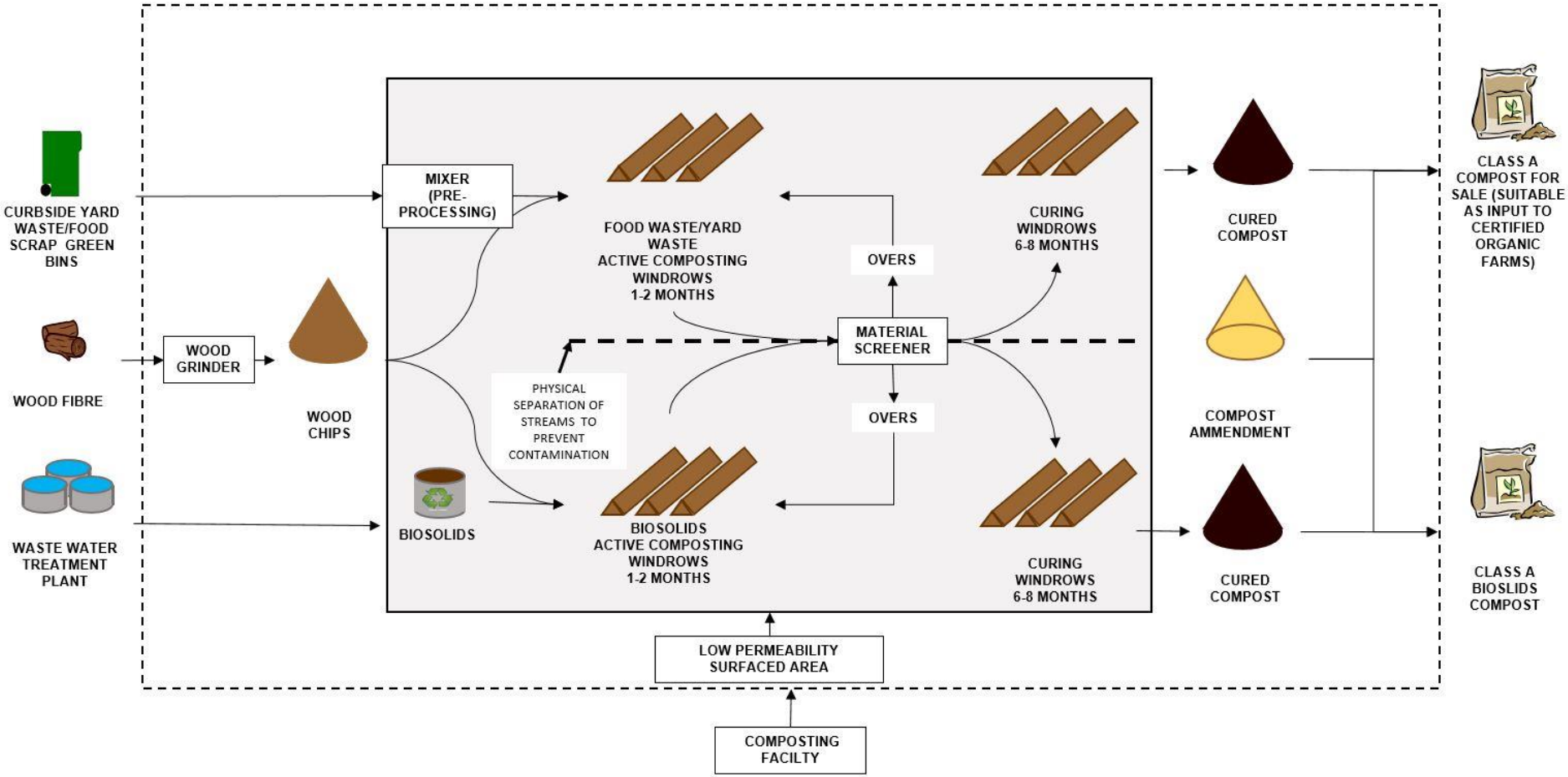
Potential Composting Technologies

- Static pile windrowing
- Aerated static pile windrowing
- Mixed/turned windrow
- Covered pile windrowing (non-woven breathable covers & microporous membranes)
- In-vessel composting

Technology Screening

Technology	Advantages	Disadvantages	Carried Forward
Static Pile	• Lowest operations cost	• Longest treatment time • Largest footprint • Does not meet OMRR on its own	✔ (compost curing)
Aerated Static Pile	• Increased control of potential nuisance odours • Relatively small footprint • Greater process control	• Additional capital costs compared with other systems	✔ (active composting, optional)
Mixed/Turned	• Consistent with current equipment/operations • Meets OMRR at low cost	• Potential for nuisance odours during turning	✔ (active composting)
Covered Piles (non-woven breathable & microporous membrane)	• Greater control of composting process • Reduced impact of variable water content • Increased control of potential nuisance odours	• Higher capital costs • Minor benefits due to low precipitation • Requires additional approval under OMRR	✗
In Vessel	• Good process control • Faster composting time • Odour containment • Smaller footprint	• High capital and operations cost • Inefficient at small scale	✗

Compost Process Schematic



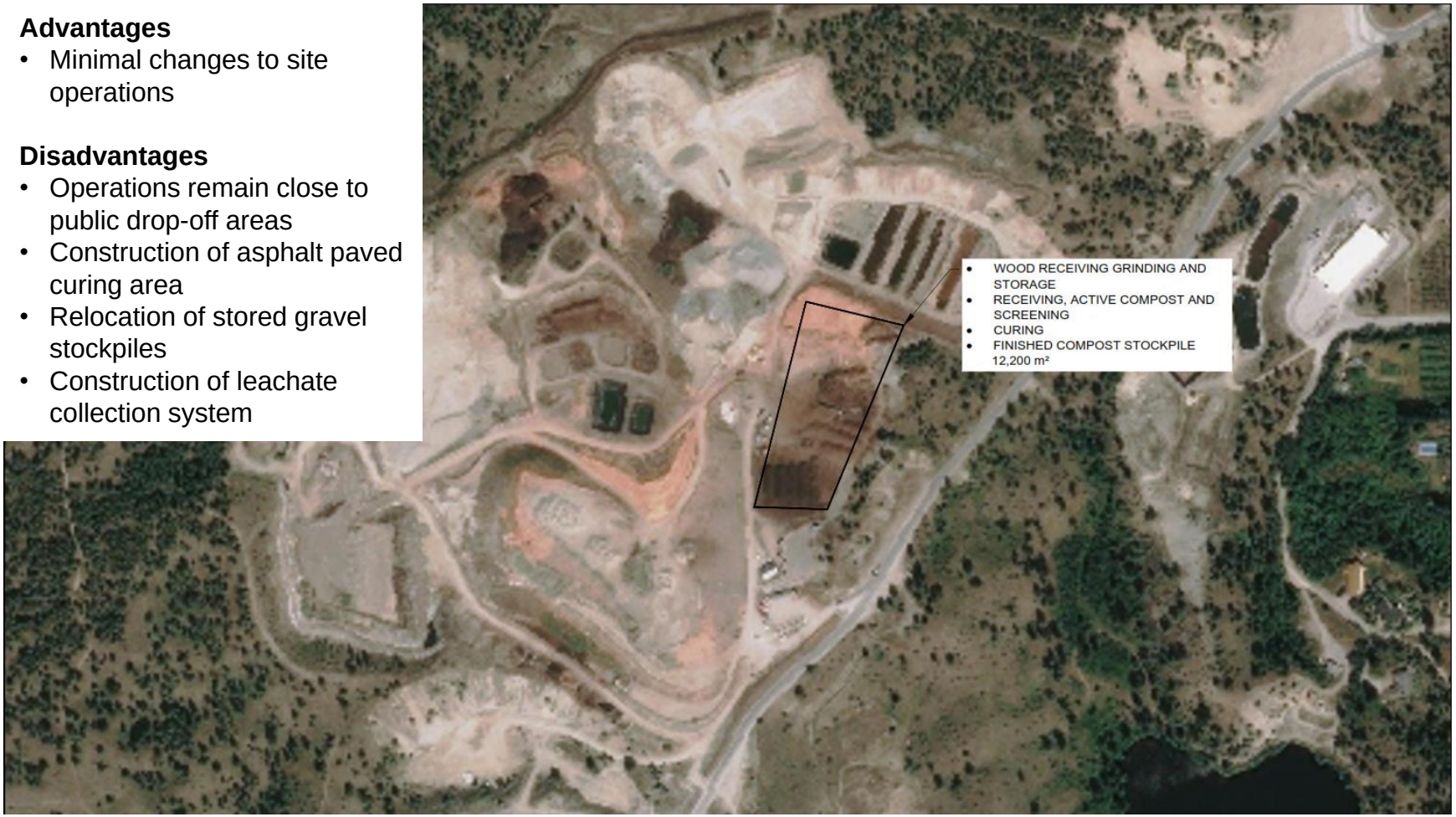
Concepts

Concept Name	Location	Technology
#1 - Receiving Area Consolidation	Current public drop-off area	Active composting: mixed/turned windrows Compost curing: static pile windrows
#2 - Relocated Receiving Area	Landfill Phases 1/2 & Future Phase 3	Active composting: mixed/turned windrows Compost curing: static pile windrows
#3 - Split Operations	Landfill Phase 1 & Current Public Drop-off Area	Active composting: mixed/turned windrows Compost curing: static pile windrows

Concept #1 – Receiving Area Consolidation

Advantages
- Minimal changes to site operations

Disadvantages
- Operations remain close to public drop-off areas
- Construction of asphalt paved curing area
- Relocation of stored gravel stockpiles
- Construction of leachate collection system



Concept #2 – Relocated Receiving Area

Advantages

- Movement of active composting distant from site entrance and receiving facilities
- Use existing infrastructure – on lined landfill footprint, connection of leachate collection system, installation of power connection
- Public drop-off area can be expanded

Disadvantages

- Construction of asphalt lined receiving and active composting areas

Concept #3 – Split Operations

Advantages

- Use of existing lined Phase 2 for curing
- Minimal changes to site operations

Disadvantages

- Travel between operational areas
- Operations remain close to public drop-off area
- Construction of asphalt paved receiving and active composting areas
- Construction of leachate collection system

Concept Comparison

Concept	Advantages	Disadvantages
#1 - Receiving Area Consolidation	• Minimal changes to site operations	• Operations remain close to public drop-off areas • Construction of asphalt paved curing area • Relocation of stored gravel stockpiles • Construction of leachate collection system • Dedicate leachate collection system and power supply • Dedicated fencing
#2 - Relocated Receiving Area	• Movement of active composting distant from site entrance and receiving facilities • Use existing infrastructure – on lined landfill footprint, connection of leachate collection system, installation of power connection • Public drop-off area can be expanded	• Construction of asphalt lined receiving and active composting areas
#3 - Split Operations	• Use of existing lined Phase 2 for curing • Minimal changes to site operations	• Travel between operational areas • Operations remain close to public drop-off area • Construction of asphalt paved receiving and active composting areas • Construction of leachate collection system

Cost Estimate Summary

Item	Concept #1 Receiving Area Consolidation	Concept #2 Relocated Receiving Area	Concept #3 Split Operations
Equipment	$400,000	$400,000	$400,000
Grading, Paving & Aeration	$715,000	$260,000	$260,000
Leachate Collection	$80,000	$40,000	$60,000
Power Supply	$125,000	$140,000	$120,000
Fencing	$70,000	$240,000	$240,000
Engineering	$175,000	$175,000	$175,000
Permitting	$30,000	$30,000	$30,000
Contingency (20%)	$319,000	$257,000	$257,000
Total	$1,914,000	$1,542,000	$1,542,000

Recommendation:
Concept #2 Relocated Receiving Area to Phase 3

- Cost effective
- New equipment reduces wood stockpiling area and grinding costs
- Move active composting away (odours) from drop-off area
- Provides upgrades to meet OMRR for biosolids composting
- Supports long term development strategy by developing leachate management system piping, power supply and site fencing
- Supports increased diversion and public experience by allowing for expanded public drop-off area
- Minimizes changes to operations by maintaining current curing and screening in Landfill Phase 2

Relocated Receiving Area to Phase 3

Potential Next Steps

Council decision on residential food scrap removal program

- Organics fund requires new material to be diverted to be eligible

Prepare Funding Proposal Submission – April 2019

- Select location for active composting area
- Detailed design of active composting area
- Develop construction cost estimate
- Obtain quotes for new equipment
- OMRR compliance summary

Submit Funding Application – Late May 2019

www.ghd.com