Operation Plan

SPA HILLS
COMPOSTING FACILITY

Prepared for Compliance with the Organic Matter Recycling Regulation administered by the BC Ministry of the Environment. Authorization Number 104962

Plan prepared by John Paul, PhD, Professional Agrologist
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1 General Information

1.1 Contact Person:

XXXX XXXX
2223 Yankee Flats Rd., Salmon Arm, BC. V1E 3J2
Tel.: XXXX

1.2 Hours of Operation

Monday to Saturday, 7:00 am to 5.00 pm.

1.3 Location

This compost facility is located on the farm at 2223 Yankee Flats Rd., near the small community of Silver Creek, 14 km south of Salmon Arm, British Columbia. The farm is located in the Electoral Area D of the Columbia Shuswap Regional District (CSRD).

The land has been farmed since approximately 1912. There are areas with open forest on three sides of the farm, and a gully with tree cover that runs in a northeast direction away from the barn area. The farm is approximately 60 ha in size.

The coordinates of the site are

Longitude: 50º 32’ 00” North

Latitude: 119º 22’ 10” West

The farm is bordered on all sides by agricultural or rural residential properties. The nearest neighbour is a minimum of 100 m from the storage area, and there are approximately 12 residential properties within one kilometer of the site. The closest public institution is approximately 4-6 km north of the composting site. These include the Silver Creek Elementary School, senior’s centre, church and community hall.

Spa Hills has moderately cool winters with little snowfall and warm, dry, sunny summers. The annual mean total rainfall is 516 mm, the annual mean total snowfall is 130 mm. The annual

mean daily temperature in July is 18.7°C, and in January is -5.2 °C. The extreme daily precipitation is 38.1 mm. The wind direction is generally from the southwest to the northeast.

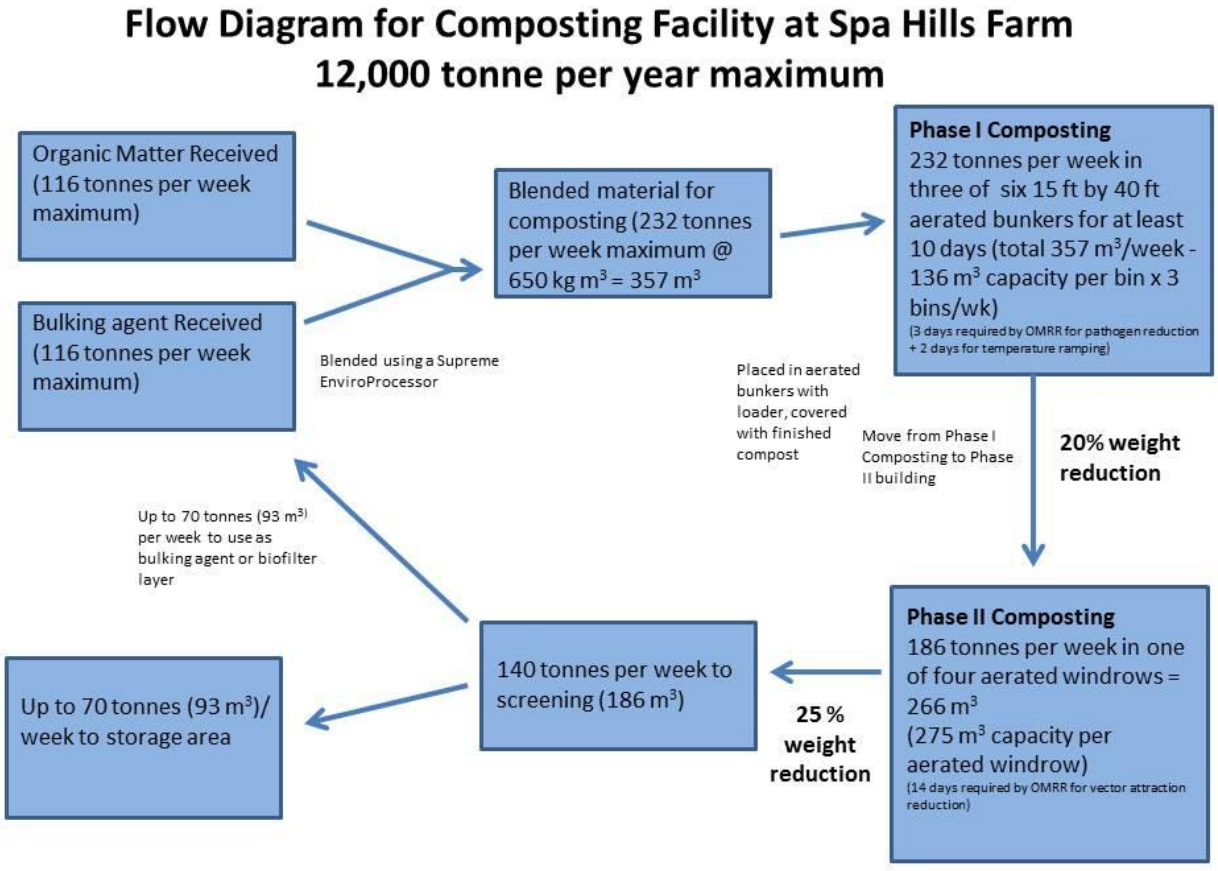
Source for weather information: Final Report: Environmental Impact Assessment: Proposed slaughterhouse waste composting facility; Silver Creek, BC. Prepared by Summit Environmental Consultants, Sept 2009.

2 Facility Design

2.1 General Description

The facility is designed to process 12,000 tonnes (corresponding to 18,500 m^3 assuming a bulk density of 650 kg/m^3) of waste annually in a two phase composting process.

The composting process for pathogen reduction and vector attraction reduction includes a minimum of 10 days in an aerated concrete bin followed by 25 days in an aerated windrow. The primary composting bins (Phase I) includes six bins has an aerated floor and a separate blower system with timer and temperature feedback inside a building. The secondary composting process (Phase II) includes four aerated windrows inside a building.



This design meets the requirements for the BC Organic Matter Recycling Regulation (OMRR), which requires a potential pathogen reduction process (> 55 C for a minimum of three days – OMRR Schedule 1) and a vector attraction reduction process (>14 days under aerobic conditions at average temperature > 45 C – OMRR Schedule 2).

The incoming organic waste is received on an impervious surface, inspected for non-permitted material, blended, and composted for a minimum of 10 days in one of six aerated bunkers. The material is removed from the aerated bunker after a minimum of 10 days, then further composted for 25 days on an aerated windrow.

The process includes adding compost overs (from screening) as a biofilter on top of the composting material in the aerated bins and aerated windrows as required. Following curing and screening, the overs are returned back for use as odour control or blended for further composting.

The Phase I composting building measures 36 m (120 ft) long by 15 m (50 ft) wide. Each of the six aerated bunkers inside this building are 4.5 m (15'9") wide and 12 m (40 ft) long. Receiving and blending occurs inside this building or on the impervious surface outside of this building. Following the Phase I composting process, the material is moved to the Phase II building, a 15 m (50 ft) wide by 36.5 m (120 ft) long covered building that can accommodate four 7 m (24 ft) wide by 18 m (60 ft) long windrows.

2.2 Type of Waste

The facility can receive up to 12,000 tonnes of total organic material per year, including bulking agent. The organic waste includes Spa Hills sorted plant and animal waste as per OMRR Schedule 12. Poultry manure produced on farm is also used in the composting process. The bulking agent consists primarily of virgin woodchips from Ponderosa pine, Lodgepole pine, cedar and Douglas fir. The oversized compost from the screening process is used as bulking agent as well as the biofilter layer on top of the composting material.

2.3 Components

2.3.1 Receiving Area

The potentially putrescible waste is received inside the composting building or on the impervious pad next to this building. Each load is segregated and manually inspected and sorted for non-permitted material before mixing with other material. It is then processed within 24 hours of receiving or covered with bulking agent to minimize the risk of odour. The floor in this receiving area is sloped to a drain to collect any excess moisture. Excess moisture from inside the building is collected in a 4500 L (1000 gallon) leachate collection tank.

The bulking agent is received and stored adjacent to the composting building.

2.3.2 Mixing Area and Mixer

A Supreme EnviroProcessor Model 500T vertical auger mixer is used for grinding and blending the organic waste and bulking agent. The mixer operates either inside the Phase I composting building or just outside of it. The mixer is powered by a farm tractor.

2.3.3 Phase I Aerated Composting Bins

The Phase I aerated composting bins consist of six aerated concrete bins that are 4.8 m (15' 9") wide, 12.2 m (40 ft) long and 2.4 m (8 ft), fillable up to 2.4 m (8 ft) for the composting process. This corresponds to a fillable capacity of 120 cubic meters (160 yd^3) per bin. Three bins are filled weekly when the facility is operating at capacity (12,000 tonnes or 18,500 m^3 of material per year).

The aeration system is embedded in the concrete floor. The floor is poured as a structural slab. The bin walls are poured on the structural floor slab. The aeration floor consists of seven perforated 5 cm (2 in) diameter schedule 40 PVC pipes placed lengthwise on the bottom of each of the aerated bins. Air is provided by one 1.1-kW (1.5- hp) blower for each of the aerated bins, located at the end of the aerated bins.

The bin floor has a 1% slope from the back of the bins to the leachate collection trench located at the front of the bins to ensure leachate collection.

There is a 15.2 m (50 ft) x 12.2 m (40 ft) concrete pad between the two sets of three bins, which allows clean and easy filling and discharging of the bins. The total area of the aerated composting bins and receiving mixing pad is 36.6 m x 15.2 m, (120 ft x 50 ft) which corresponds to 556 m^2.

2.3.4. Phase II Aerated Composting Windrows

The Phase II aerated composting windrows are housed inside a building that measures 15.2 m (50 ft) by 36.5 m (120 ft), and is located close to the Phase I composting building. There are four aerated windrows that are 4 m (12 ft) high, 7 m (24 ft) wide and 18 m (60 ft) long.

Each of the aerated windrows has one removable aeration pipe underneath the center of the windrow. Air is provided by one 1.1-kW (1.5- hp) blower for each of the aerated windrows. Temperature probes (1 m long) are inserted manually into the composting material. These thermocouples provide temperatures for datalogging, feedback to the blowers and to the alarm system.

2.4.5. Aeration Control and Datalogging

The composting organic waste will be tracked through the minimum 35 day composting process in order to meet PFRP and Vector Attraction Reduction requirements.

In Phase I, the aeration blowers are activated using a combination of timer and temperature feedback from continuous temperature monitoring by temperature probes inserted in the composting material.

In Phase II, the aeration blowers are activated by timers. Temperature is also recorded in the aerated windrows.

The temperature of the Phase I and Phase II process is recorded daily for PFRP and Vector Attraction Reduction purposes (Process to Further Reduce Pathogens). The Rosebud aeration control system records all temperatures and prepares time vs temperature graphs for each composting batch.

Temperature probes (1 m long) are inserted manually into the composting material. These thermocouples provide temperatures for datalogging, feedback to the blowers and to the alarm system.

2.4.6. Screening Area and Screener

The composted material will be screened using a trommel screen following curing and storage. The screening area is located north of the Phase II composting building. The overs from the screening process will be utilized as bulking agent or for the biofilter layer on top of the composting material.

2.3.7. Leachate Collection Area

The facility will be operated with little risk of leachate as the process occurs in covered buildings and composting blends will be designed to 55-60% moisture content, resulting in negligible leachate production. The Phase I building includes a complete leachate collection system in case a mix is blended too wet, or if the building needs to be washed and cleaned.

The leachate collection system in the Phase I building consists of the aeration pipes in trenches in the floor that also serve as leachate collection trenches. Any leachate in the trenches drains towards the front of the bins, which is then directed to the central leachate collection tank. The aerated bins are sloped slightly towards the front of the bins, with the lowest point at 1.5 m (5 ft) from the front of the bin. This will minimize the risk of any leachate seeping out of the bins. An additional drain is located in the center of the mixing floor. The leachate collection tank is approximately 4500 liters (1000 gallons), which is much larger than it needs to be based on the expected amount of leachate.

If leachate is produced, it will be reintroduced into the composting process by pumping it directly into the mixer together with dry bulking agent. This material would then go through the composting process along with the other feedstock.

Leachate produced in the Phase II building may result from incoming precipitation only, as the composting material will not be causing leachate at this time. Any additional water in this building will be absorbed with dry compost material.

2.4.7. Storage and Residuals

The incoming organic waste may contain some non-compostable material, which will be removed prior to composting, or following screening. Larger material from screening will be re-introduced as bulking material at the beginning of the composting process. Residuals not used for the process will be place in a container and disposed of at the local landfill. Residuals will not exceed 15 m^3 at any time of the year.

2.4.8. Water and Electricity Supply

The 220 V single phase electrical service is supplied to a 3 m (10 ft) by 3 m (10 ft) electrical room on the side of the composting building. This room will contain the electrical control panels, and the aeration control system.

Water will be supplied to the electrical mechanical room via a 2-2.5 cm (¾" to 1") underground pipe. A hose will be attached to this when some washing may be required in the composting building.

3. Operation Plan and Composting Process

3.4. Pre-Processing

Each load of incoming material is segregated in the receiving area and manually inspected and sorted for non-permitted material before mixing with other materials.

The organic waste is blended with the bulking agent using a Supreme Model 500 EnviroProcessor, a 9 cubic meter (12 yd^3) capacity vertical auger mixer. This unit is mobile and powered by a 120 hp farm tractor.

The approximate mix ratio of wet organic waste to bulking agent is approximately 1:3 by volume (1:1 by weight). This results in a moisture content of between 50 – 60% (wet weight). The blending process will be approximately 5 minutes per batch, plus time to load and unload. During the mixing process, the auger of the unit will mix the ingredients. A good initial mixture of material optimizes the composting process by providing more uniformity in the aerated concrete bins.

3.5. Active Composting

After the mixing the material is placed into the bins using a loader. Three aerated bins are required for each week's input of material. The material is removed from the aerated bunker after a minimum of 10 days of composting, then mixed and moved to the aerated windrow area for another 25 days of composting. The mix process is important to ensure potential pathogen kill. Following the minimum 35 day composting process, the material is moved to the storage area.

The material placed into the bins will be covered with a 15-30 cm (6-12") layer of woodchips and finished compost for odour control and insulation.

During the active composting process (Phase I and II), the temperature of the compost will be maintained at optimal composting temperatures (55 to 65^{o} C) for at least 3 days, and at > 40°C with an average temperature over 45°C for at least 14 days. The temperature of the compost will be maintained at optimal composting temperatures by managing the aeration rate of the centrifugal blowers.

Temperature will be monitored and recorded daily with the Rosebud Aeration Control system. This software will allow time vs temperature reports to ensure that the process meets the pathogen reduction and vector attraction reduction requirements for producing Class A compost.

The production of Class A compost requires the following pathogen reduction process as per OMRR Schedule 1:

OMRR Schedule 1, Part 4. One of the following pathogen reduction processes specified in paragraphs (a) to (c) is required to produce Class A compost:

(b) the static aerated pile composting method consisting of a compost process involving mechanical aeration of the compost pile, with the compost pile insulated and a temperature of not less than 55º Celsius maintained throughout the compost pile for at least 3 consecutive days.

The present composting process will exceed these requirements in that it includes one mix that ensures that all of the material being composted reaches the temperatures required for potential pathogen kill. In addition to this, it will be covered with finished compost, which will further insulate the pile to ensure temperatures adequate for pathogen kill.

The production of Class A compost also requires the following vector attraction reduction process as per OMRR Schedule 2:

OMRR Schedule 2, Part 2. One of the following vector attraction reduction processes are required for Class A compost:

(a) Class A compost must be treated in an aerobic process for 14 days or longer. During that time, the temperature of the compost must be higher than 40° Celsius and the average temperature of the compost must be higher than 45° Celsius. After the vector attraction reduction process is completed the carbon to nitrogen ratio of the compost must be greater than or equal to 15:1 and less than or equal to 35:1.

3.6. Post-Processing: Screening and Maturation

After a minimum of 35 days of active composting, the material will be stored before screening and field application.

The overs from the screening process will be returned to further blend with organic waste.

The size of the screened material will be approximately 2 cm (3/4”) minus. The composted wood overs from screening are returned to the composting process as bulking agent or used as an ingredient for the biofilter medium on top of the aerated bins.

3.7. Treatment of Final Product and Residuals

3.7.5. Compost Sampling and Quality

The objective of the composting process is to create Class A compost. Seven separate samples and one composite sample will be taken from each batch of finished compost as per OMRR requirements.

Samples will be randomly taken at a 30-cm to 60-cm (1-2 ft) depth into the pile from the outside surface of the finished compost piles. The sampling procedure is as follows:

1. Divide the pile/windrow into seven sections of approximately the same length. At each section, choose one side randomly for each sample.
2. At each sampling location, cut in with a shovel, loader, or sample boring device. If done by hand, remove the top 20 cm (10 in) of material from the surface prior to sampling. The "cleaned" area should be roughly circular and about 30 cm (1 ft) in diameter
3. Take one scoop (approx. 0.3 liter (0.08 gal.)) in a bucket. The amount can vary according to the number of subsamples required, but should amount to a total of at least 5 liter (1.3 gal.) for the composite sample. Samples should be taken randomly at variable distances from surface (between > 30 cm (1 ft) and < 1m (3 ft)). Use different instruments or clean thoroughly after removing the cover layers and for taking the sample to avoid contamination. Latex gloves works very well for this.
4. Take a second scoop (approx. 0.3 liter (0.08 gal.)) in a sampling cup/durable zip lock plastic bag and close.
5. Clean or change sampling instrument, and proceed to next sampling location
6. Thoroughly mix samples in bucket to create composite sample with a sanitized instrument. Fill composite sample in sampling/zip lock bag(s).
7. Label the samples with the date, and a number that you can refer back to the sampling location.
8. Place immediately in cool container (< 4°C (39°F))
9. Deliver to an accredited laboratory within 8 hours if possible, particularly for the fecal coliform testing.

The seven separate samples will be tested for coliforms (as per requirement for the OMRR) and *Salmonellae (as per requirement for CFIA).* The composite sample will be tested for metal content in compliance with the Organic Matter Recycling Regulation, and for C:N ratio (which will include total N as required for the nutrient management plan.

The Class A compost reporting requirements include the pathogen reduction process and vector attraction reduction processes as described in section 3.2.

3.7.6. Intended Distribution

The composted material will be utilized as a soil conditioner and fertilizer on the farmed acreage of Spa Hills Farm. A 12,000 tonne per year composting facility will produce 3,000 to 4,000 tonnes of finished compost annually. This compost will be applied to the fields as a fertilizer or soil conditioner either in the spring or in the fall. The application rate will be based on the nutrient content of the compost, which will be measured at the same time as the analyses for metals and coliforms as required by the OMRR.

As per ALC requirements, a minimum of 50% of the compost will be utilized on the farm, with the balance offered for sale for other farmers and compost users.

3.7.7. Residual Management

The import of community organics may generate non-compostable residual waste. Any foreign material will be deposited in a waste container already on site. This waste container is already picked up regularly for disposal. Residuals stored on the premises will not exceed 15 cubic meters at any time as per OMRR requirement.

Compostable overs from the screening process will re-enter the compost process. Foreign matter will be stored in appropriate containers and regularly removed from the site to a landfill.

3.7.8. Contingency Planning

A contingency plan is required if some of the compost does not meet Class A compost requirements. As the time allowed for pathogen reduction and vector reduction requirements are exceeded in the process, the greatest likelihood for non-compliance is if some of the samples exceeded the 1000 MPN/g compost for Coliform bacteria. If this were to happen, there is enough time allowed during the composting process to reprocess some of the material as required and still fall well under the OMRR time requirements for pathogen reduction and vector attraction reduction.

4. Environmental Protection, Health and Safety

4.4. Odour Management

During a typical composting process, odours are most likely to occur at the initial stages of composting, i.e. the pre-processing (receiving, mixing, piling) and the first turning. The risk of odour emissions is significantly increased if the feedstock is not immediately processed, if the feedstock mix is unbalanced and/or if process conditions are not optimal.

Feedstock will be mixed with moisture and odour-absorbing bulking material within 24 hours of delivery if possible with the objective to obtain an optimal blend as for porosity, moisture and nutrient balance.

During the Phase I composting process, processing conditions will be controlled by an aeration on/off cycle and by temperature feedback. Optimal processing conditions minimize the generation of odours. In addition, feedstock placed into the aerated bunkers is covered by a 15 cm – 30 cm (6” - 12”) layer of composted material that acts as a biofilter. This is a widely recognized method to control effectively odour emissions. Experience by Transform Compost

Systems with composting facilities of similar design shows that this significantly reduces odour during composting.

The Phase II composting process occurs in aerated windrows, which can also be covered with a biofilter layer of compost “overs” if required.

A further advantage of the present system is the reduced number of turns required to produce high-quality compost and to meet regulation requirements. The material is not turned during the first 10 days, when the likelihood of odour emission is the highest.

There are currently 6 procedures in place that minimize odour risk, and several more can be implemented as required.

1. Incoming material is mixed with bulking agent as soon as possible after delivery and placed in the aerated bins, hence odour in the receiving area will be minimal.
2. The composting blend will be aerated immediately to maintain aerobic conditions in the composting material.
3. The composting blend will be covered with finished compost as an odour control layer.
4. The composting blend is turned after a minimum of 10 days, when the odour potential is significantly reduced.
5. The composting material will remain under cover for a total of at least 35 days, reducing the potential for anaerobic conditions resulting from excess moisture.
6. The Phase I composting building is currently ventilated with large exhaust fans, which can be retrofitted and redirected through a biofilter if necessary.

After the active composting phase of at least 35 days, expected odour nuisance from compost will be minimal. Aerobic conditions will be maintained by a well-planned windrow design and careful piling. Furthermore, should any odour persist, the storage piles may be covered by Compostex material or an adequate material as additional efficient odour barrier. Compostex is a compost cover material with a more than 15-year successful track record in the composting industry.

Any activity that could potentially cause odour will be planned in accordance with wind direction, air temperature and time of day.

Spa Hills Farm has a weather station that will allow monitoring and recording of wind direction, precipitation and temperature, which may be important in relation to odour concerns from residents.

Compost facility operators are trained to observe and detect any odours that are unusual or that may be objectionable.

4.5. Leachate, Run-on and Run-off Management

The low precipitation at this location minimizes the risk of leachate, run-on and run-off water. Nevertheless, the facility layout and the composting process are designed to collect and/or to control leachate from the material, or run-on and run-off from precipitation or other sources.

Feedstock will be received and composted inside the composting building, therefore, there will be little risk of leachate from this process. The incoming organic waste will be mixed with bulking agent to produce a blend having 60% moisture content or less within 24 hours of receiving the material if possible. At this moisture content level, there is little risk of free water ('leachate') draining through or from the pile.

The high composting temperatures during the active composting process will further evaporate a considerable amount of moisture. Should any leachate occur in the Phase I composting process, it will be collected by the aeration trenches and drain to a central 4500 L (1000 gallon) leachate collection tank. Any leachate that is collected will be circulated back into the beginning of the composting process.

No leachate is anticipated during material storage as a result of considerable moisture loss during the active composting process. Any precipitation falling on outdoor storage piles can be absorbed by the compost.

4.6. Groundwater Protection

From well information on the farm, the distance to groundwater is approximately 18 m (60 ft) below the ground surface. There is bedrock and clay interspersed with sands and gravels.

All potential leachate from the Phase I composting will be collected in a 4500 L (1000 gallon) leachate collection tank. This leachate will be used in the composting process, and no leachate will be discharged into the environment. Any potential leachate from the Phase II process will be absorbed by the composting material.

4.7. Noise Control

The loader will operate up to 10 hours per day. The screener may also operate for at least 8 hours per day during periods of screening. The noise level is comparable to typical farm operations.

Trucks will deliver the organic waste during the week. Therefore, traffic does not pose a noise nuisance. Hours at the facility are limited to Monday to Saturday from 7:00 am to 5:00 pm.

The closest resident is a minimum of 100 m from the compost storage area. Compost facility operators will utilize ear protection when operating noisy equipment.

4.8. Dust

Dust may be generated by truck and equipment traffic, in particular during the dry summer months. The operators respect weather conditions during their operations. Water will be sprayed on the driveways if dust conditions are problematic.

4.9. Buffer Zones

The facility, which includes the active composting buildings, storage area and screening area will be more than 20 m from the property line. There is no natural water course or surface water course or wetland within 300 m, nor is there any drainage system that discharges to a natural course at less than 30 m.

There are approximately 12 rural residents within the 1 km distance from the composting facility. Any public institutions such as a church, school, and community centre are 4-6 km from the site.

The water table is more than 18 m from the surface.

4.10. Animal Attraction and Vector Control

After the PFRP have been met, temperature at > 40°C and an average temperature of 45°C for at least 14 days after are maintained during the active compost process which meets the OMRR requirements for vector control. The site will be kept clean, and water will be prevented from ponding to minimize fly breeding sites.

4.11. Visual Protection

The composting building is a typical farm building, similar to the other farm buildings on the property. Hence it blends inconspicuously in with the surrounding landscape, and requires no further visual barriers.

4.12. Contingency Plan

A generator to supply power for the aeration blowers can be on site within one hour. This minimizes the risk of anaerobic decomposition in the case of power loss.

Components and parts that may wear and need replacing for the crucial equipment will be stocked on or not far from site. If the EnviroProcessor mixer is down for more than 48 hours, a mobile unit can be brought in as required. If there is no alternate EnviroProcessor available, another vertical farm mixer can be used.

The facility has two hydrants and access to a waterline north of the premises that allow the use of water for fire protection. Fire extinguishers will also be on site.

The facility design is such that it provides easy access for emergency vehicles.

The contingency plan for the compost if it does not meet Class A compost requirements is outlined in section 3.4.4.

4.13. Closure Plan

In the event of closure of the compost facility, any unprocessed organic waste will be composted as per operation process plan. Remaining compost overs can be used for landfill cover. The remaining compost material can be sold or given to neighboring farms. Any other residual waste will be delivered to landfill.

Upon closure, the power will be disconnected for safety reasons. Any equipment will be moved from the site, and the site will be cleaned.

4.14. Visitor and Staff Safety

4.11.1 Construction safety

All construction of facilities conforms to the National and BC Building Codes. The structures will comply with all safety and material requirements that are specific to composting facilities.

4.11.2 Staff safety

All machinery has lockouts and emergency shut-off switches. All machinery is manufactured in accordance with CSA safety standards (Canadian Standard Association). The EnviroProcessor is a tractor powered mixer. The operators will ensure that all safety labels remain visible on the mixer. These labels include reference to a rotating power shaft, and rotating augers inside the mixer. There will be no platform or any place that will allow an operator or worker to fall into the mixer. When servicing the unit (changing knives), the operators will always ensure that the mixer cannot accidentally be powered up by ensuring that the power shaft is disconnected and the key has been removed from the tractor.

Aeration blowers have local disconnects as required by the electrical code and have safety guards on the air intakes. The aeration blowers will be inspected bimonthly to ensure that all guards are in place.

There are exhaust fans in the Phase I building to remove process air from the building. The minimum air exchange in the building will be targeted to be at least 5 air exchanges per hour.

When the tractor is being operated inside the facility, the operators will ensure that the large door remains partly open to ensure adequate air exchange.

The facility operators will ensure that the exhaust fans are operating before entering the composting facility in the unlikely event that there is an accumulation of harmful gases inside the facility. A sign will be posted at the entrance to prevent entrance if the exhaust blowers are not operating. The exhaust blowers will be inspected weekly to ensure safe operation.

The facility operators will also have a personal H_2S and CO_2 monitor to alert them of any dangers that may be present.

A first-aid kit will be on site. Water for washing is available in the control room.

4.11.2 Visitor safety

The premises locked after business hours. A large sign at the facility entrance requests visitors to report at the office. Visitors are not allowed to visit the facility unattended. Any visitors will record their name and times of visits.

4.15. Procedures to Register Odour Complaints

Technical operations will be planned and implemented to avoid any causes for complaints. Nevertheless, complaints will be dealt in a courteous manner, recorded and considered as valuable contribution to further optimize the composting operations.

Staff will determine the causes and immediate appropriate action will be taken to stop or mitigate potential odour events. The complaint will be compared with all available data (weather, feedstock mix and material, time, etc.) as part of a process to avoid future complaints. The person who complained will be informed about the measures taken.

Residents and neighbors living near the compost facility will be invited to call if there is any unusual or unacceptable odour event. Anonymous odour complaints cannot be accepted as specific information on location and proximity to the farm is required.

4.16. Record Keeping

Incoming and outgoing material, number of trucks, complaints, weather data, temperature and retention time during production, turning frequency and results from compost quality testing will be recorded. A copy of all data will be kept at the facility for at least 36 months.

4.14. Detailed Maintenance Plan

The maintenance plan covers the following items which are part of the composting facility:

1. Mixer, tractor and loader – as per manufacture's maintenance requirements
2. Aeration blowers – inspect monthly
3. Aeration piping – inspect monthly or after every batch
4. Leachate collection system – inspect every two months or as required
5. Concrete floors and walls - inspect every six months
6. Exhaust blowers – inspect monthly
7. Building structure – inspect every six months

4.14.1. Mixer, tractor and loader

The mixer, tractor and loader needs to be maintained according to the manufactures' requirements, which include regular oil changes, lubrication and cleaning. In particular, air filters on the tractor and loader should be inspected weekly for accumulation of dust.

4.14.2. Aeration blowers

The aeration blowers should be inspected monthly for wear, and to ensure that all guards and safety shields are in place. The computer control system will also indicate if there are problems with the blowers, but physical inspection of electrical connections and safety guards is important.

4.14.3. Aeration piping and trenches

The aeration piping and trenches should be inspected after removal of each batch of composting material, especially in the primary composting bins. If a particular batch has been blended too wet, and some leachate is produced, particular care must be taken to ensure that the holes in the pipes are clear and free of blockages. The aeration piping should be physically pulled out of the trenches every 6 months and inspected for accumulation of material or blockages.

4.14.4. Leachate collection system

The leachate collection system should be inspected every two months for accumulation of material or blockages. If no leachate is being produced, the inspection period is 6 months. The leachate collection system should be flushed annually or as required.

4.14.5. Concrete floors and walls

The concrete floors and walls should be inspected every six months for cracks or damage. Any cracks should be immediately repaired, particularly on the floor.

4.14.6. Exhaust blowers

The exhaust blowers should be inspected monthly for wear, particularly on the wiring. Exhaust blower function is checked daily as it is important that the exhaust blowers are working before anyone enters the building. The air intake shutters should also be inspected to determine that they are opening properly.

4.14.7. Building structure

The building structure should be inspected every six months.

5. Personnel, and personnel training (personnel training plan)

The compost facility will be operated by, or under the supervision of, the owners of Spa Hill Farms. The owners are long standing farmers with a long experience in operating and maintaining farm equipment and machinery.

The operators have successfully completed a compost facility operator course in compliance with OMRR regulations. The course is provided by Transform Composts Systems in Abbotsford, BC. The course content includes:

- The objectives of composting (pathogen control, product quality production, waste diversion)
- Pertinent regulations, namely
  - Part 3, Divisions 5 and 6 of the OMRR regarding Class A and B compost quality and class A and B biosolids and the relationships between time, temperature and pathogen kill
  - Schedule 5 of the OMRR – Sampling and Analysis
  - Schedule 6 of the OMRR Record Keeping
  - All other pertinent sections of the OMRR
- Basic elements of composting
  - Biological, chemical and physical processes
  - Phases of the composting process
  - Process parameters (porosity, aeration, C/N, moisture, pH, stability indices)
  - Suitable feedstock material, quality and chemical, biological and physical properties; material balance for optimal moisture and aeration conditions
- Composting technology and design
  - Composting systems (aerated static piles, windrows with mechanical turning, in-vessel facilities)
  - Receiving and sorting incoming organic waste for non-permitted material

- Preparation of material (grinding, mixing)
- Aeration (piping, blowers)
- Piling and turning, pile dimensions, turning frequency
- Screening
- Curing

- Odour management
  - Odour units and odour panels
  - Odour control technology
- Leachate management (run-on, run-off, leachate recycling and disposal)
- Disposal of non-compostable material, and overs management
- Monitoring
  - Temperature control
  - Moisture and oxygen analysis
  - Sampling and record keeping
- Troubleshooting (odour and leachate issues, equipment, pathogen destruction, contingency plans)
- Product storage
- Safety aspects

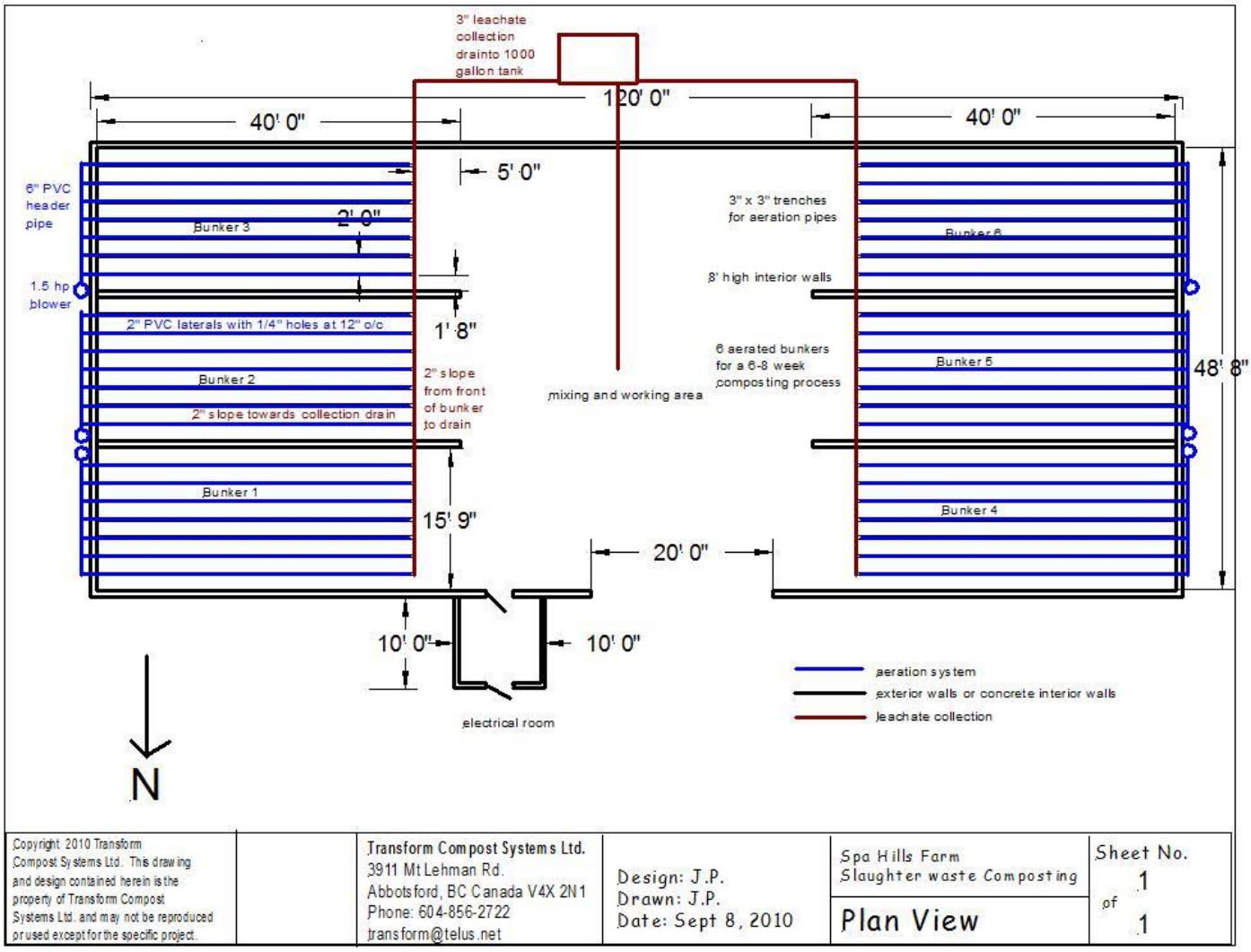
Additional personnel, if required, will also be acquainted in depth with all elements of modern composting technologies, their environmental impact and pertinent regulations.

Appendix 1

Phase I and II Composting Buildings and Storage Area at Spa Hills Farm

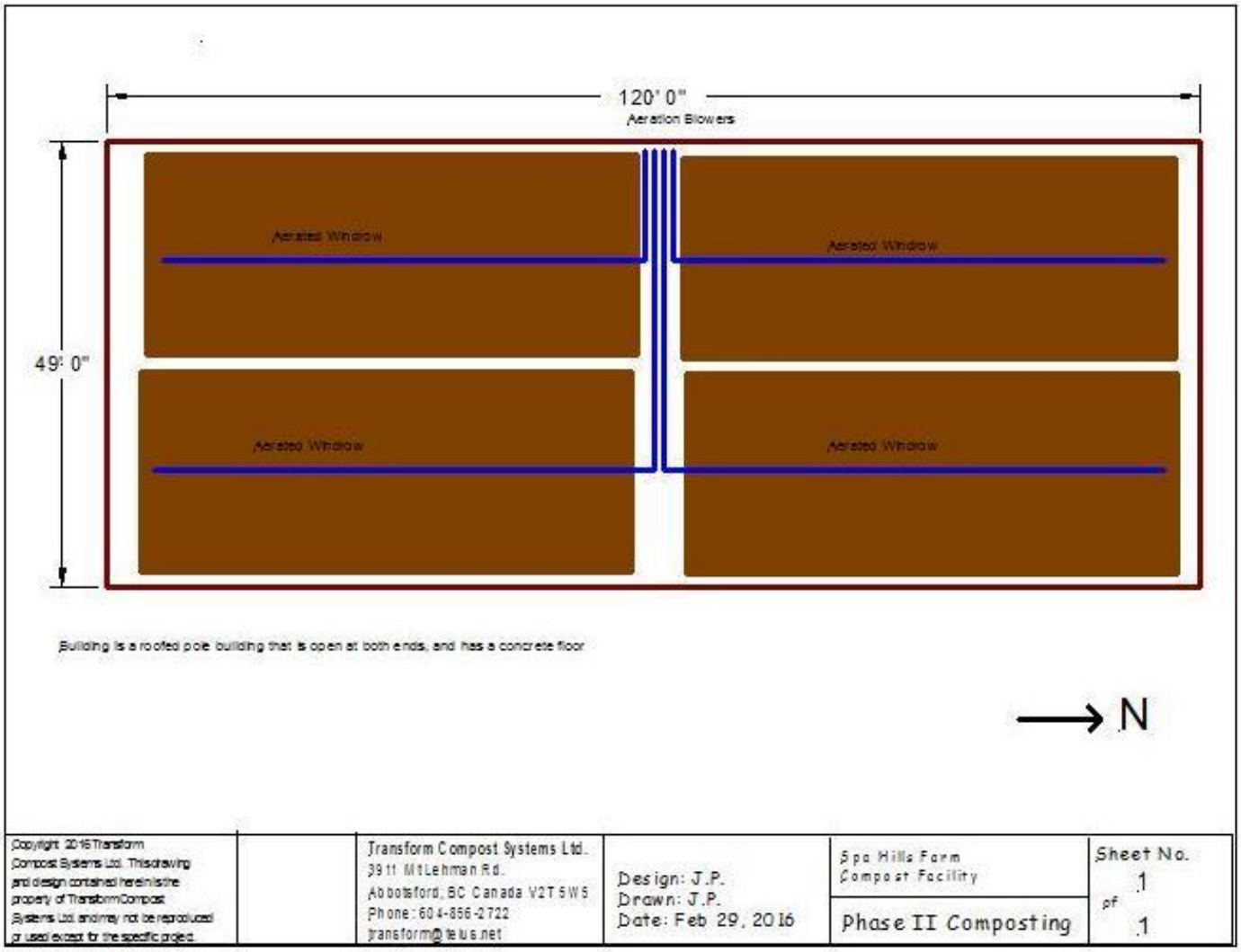
Appendix 2.

Drawing and Layout of the Phase I Compost Building at Spa Hills Farm



Appendix 3.

Drawing and Layout of the Phase II Composting Building at Spa Hills Farm



Appendix 4

1 Km Radius from Compost Facility at Spa Hills Farm