Fisher Road Recycling

OPERATING PLAN

Prepared in accordance with CVRD Bylaw No. 2570
Section 11.1 – Operating Plan Requirements
Version: March 4, 2014

Overview

This Operating Plan is describing operations at the Fisher Road Recycling Facility located at 1355 Fisher Road in Cobble Hill. This facility contains a composting unit and a recycling center. The facility has been in operation since September 2000 and is operating under the Organic Matter Recycling Regulation (OMRR), with an annual operating capacity of 18,000 metric tonnes (MT). The facility supports regional waste diversion initiatives by recycling yard/garden trimmings, source-separated organics (SSO) and biosolids. It produces a Class A compost for unrestricted distribution and diverts recyclables to reuse facilities.

Upon taking ownership of the facility in March 2006, Fisher Road Recycling (FRR) made modifications to responsibly operate the facility under Interim 'Phase 1' operating procedures while the permanent infrastructure upgrades, as committed to in the previous version of the Operating Plan and procured and installed within the specified timeframe.

As set out in the previous Operating Plan, a Recycling Centre was planned, and has been made operational. This version of the Plan references current and planned recycling activities that are permitted by the Solid Waste Management License, including amendments approved in 2013.

This Operating Plan has been prepared in accordance with Section 11.1 – Operating Plan Requirements of CVRD Bylaw No 2570. This Operating Plan has been prepared and submitted by a Qualified Professional as required by the Cowichan Valley Regional District (CVRD).

Previous versions of the plan have been updated to reflect operational changes based on various reviews and recommendations.

Composting
The facility receives yard and garden waste, food waste and biosolids. Material is received over the scale and after inspection is unloaded in the grinding area or the operations building. Yard and garden waste is stored in the designated area on an impermeable pad with contact storm water control, and after it has been ground it is placed in the operations building or on a pad with leachate control. Food waste and biosolids are received in the operations building and are immediately mixed with ground yard and garden waste and are covered with that material. The compost mix is placed in the Primary Composting Cells (or bio-cells) for primary processing and pathogen control. From the Primary Composting Cells the mix is transferred to the indoor aerated floors (aerated pads) for secondary composting. Here, moisture is adjusted where required and the mix is aerated. The secondary composting area consists of 6 aerated bays and material is turned by moving it to the next air floor bay. During primary and secondary composting the compost is meeting the vector control parameters.

From the last secondary aerated bay the compost is transferred to the first of 16 outside aerated curing bays. Material is turned by transferring it to the next bay. After quality testing the compost is screened and stored on a pad with leachate capture while awaiting sale.

Recycling Centre
The Recycling Centre receives waste materials for sorting and recycling. Materials are received over the scale and after inspection are unloaded on the floor of the recycling shelter, or in designated bunkers. Unloaded material is sorted by staff into the various components which are then placed in the designated bunkers and roll-off containers. Material unsuitable for recycling is placed in a transport bin for transport to an approved disposal facility. All materials leaving the site are scaled or accounted for otherwise.

11.1(a) <u>the site and location of all works within the facility</u>
The facility has undergone many transformations since FRR took over in 2006. The list below provides the various upgrades that have been implemented since 2006.

The Pre-modification status of the site included the following works:
- covered receiving building (Receiving Area)
- covered Processing Area
- Working Pad finished with impervious concrete
- Reinforced, insulated concrete bio-cells

Phase 1 Interim Upgrades:
- 20 cm asphalt retention berm installed around the perimeter of the existing Working Pad.
- repaired impervious seams along retention wall bases.
- collection of contact storm water in sump and disposal of contact storm water to approved facility or inclusion in composting process redirected building downspouts away from Working Area

- non-contact storm water collection system including an interceptor ditch to prevent water from reaching the Working Pad.
- removed and replaced biofilter media with layered woodchips and medium to coarse compost..
- yard and garden waste stored under tarps or plastic sheets; non-contact storm water run-off diverted from piles., with the completion of the building, ground yard and garden waste is now stored in-doors.

The Phase 2 Permanent Infrastructure Upgrades:

- Expanded impervious Working Pad;
- Secondary Composting Area, finished in concrete with positive-aeration channels.
- Yard waste stored under cover with non-contact storm water re-directed to the infiltration ditch and any leachate produced captured, or stored on impermeable surface with run-off containment installed and disposal or re-use of run-off (May 1st, 2007).
- A building with air quality control measure including a Prosweet air conditioning system. Building to cover Working Area complete with functioning ventilation/odour control works - receiving, processing and storage of active compost materials will occur inside a building to prevent leachate generation and mitigate nuisance odours. (March 31, 2007). The working area is covered by a building with leachate control and odour control ("**the operations building"**).

Phase 3 New Permanent Infrastructure Upgrades.

- The Prosweet system was replaced by a new biofilter for facility odour control. The main airflow was diverted to the new biofilter; the old biofilter is used for treating the off gases from the composting cell, and has been refurbished. The ProSweet system will stay connected to the air treatment system, but is not used as a primary system.
- Air supply systems have been modified.

Phase 4 Removing the compost from the soil

- Compost has been removed from the soil surface by building aerated floors and finishing the storage pad. All run-off from these facilities is collected in ponds and storage tanks on-site. All collected water is used for wetting compost in the process and dust control. Composting, especially during the summer period is a net-user of water.

As of October, 2011, all compost was "disconnected" from the soil and all compost piles in process are located on aerated floors with leachate collection. No additional pads have been constructed since September 2012. Finished and screened compost is placed on concrete pads with storm water collection. All leachate and storm water collected from the aerated and concrete pads is collected and stored in lined ponds. Collected contact leachate and storm water is used in the composting process or for dust control during grinding. No contact leachate and contact storm water will be discharged.

11.1(b) <u>the types, quantity, and quality of municipal solid waste and recyclable material that will be managed within the facility</u>

The facility will manage the types and quantity of specified feed stocks and waste streams as listed in the table below. Materials 1 and 2 noted in the in-vessel composting section of the table below are scaled in upon arrival. Materials 3 and 4 are process intermediates, and material 5 is scaled out of the facility. All the materials in the Recycling Centre are scaled-out except for product care items.

A List of Material(s)	B Phase	C Maximum Onsite Quantity (MT)	D Maximum Annual Throughput (MT)
Composting			
1. Yard waste (ground plus unground based on incoming materials)			**10,000**
Ground yard waste	S	220	
Unground yard waste	S	40	
2. Food waste and biosolids (based on incoming materials). [1]	S	0	**8,000**
3. Mixed Organics [2]	P	168	-
4. Class A Compost (unscreened) [3]	P	660	-
5. Class A Compost (screened) [3]	P	4,400	-
Recycling Centre			
1. Drywall	S	11	1,100
2. Wood Waste	S	57.2	4,950
3. Scrap Metal	S	11	1,210
4. Concrete/Brick/Rubble	S	11	264
5. Asphalt shingle roofing	S	16.5	1,100
6. Cardboard	S	2.2	160
7. Mixed Waste Paper	S	1.1	110
8. Mixed Rigid Containers	S	1.1	275
9. Product Stewardship items	S	N/A	N/A
10. Tar and Gravel roofing	S	15	300
11. General Refuse [4]	S	50	5485

[1] Biosolids to a maximum of 2376 tonnes annually.
[2] Mixed Organics = the mixture of food waste, biosolids and ground yard waste awaiting placement in one of the biocells.
[3] This refers to compost produced on the site.
[4] General refuse consists of materials sorted out from incoming loads that include recyclables, and materials screened out of compost. General refuse is material that is not recyclable or compostable, and may include putrescible waste that is stored in the Composting Building, and is shipped to an approved facility. The

11.1(c) <u>the methods for handling municipal solid waste and recyclable material within the facility</u>

This section describes the methods that will be used for handling municipal solid waste materials as listed in the table above. All incoming materials for compost are scaled and carefully recorded and reported. Maximum annual throughput for yard waste and food waste in the composting facility will be calculated based on incoming materials. Maximum annual throughput for general refuse in the composting facility and all categories in the recycling facility will be calculated based on outgoing materials.

Recycling Centre items are weighted in except for stewardship items, free drop offs and flat fee items. Recycling Centre items will be scaled when leaving the site except for batteries, Styrofoam, oils, antifreeze and other product care items which will be accounted for through other methods and programs.

This section describes how materials are received and handled. Materials described below include mixed loads for the Recycling Centre and those for the Composting Operation. For clarity, the section that includes General Refuse, describes material that is generated from the sorting, screening and other separation processes undertaken both in the Recycling Centre and the Composting Operation.

Materials will be received in the following ways: single load shipments, combination of materials in separated compartments of single trucks, and loads of mixed materials destined for the Recycling Centre. After scaling and inspection, single loads will be received directly at respective receiving area. Combined loads will be unloaded at the respective receiving areas such as the composting area for green waste and food waste, or the Recycling Centre sorting floor for others.

<u>Materials Handling</u>

Staff will sort the materials and transfer them to the appropriate storage bunkers. Sorted materials will be shipped to their appropriate designations. Material that cannot be recycled will be directly placed in the bin destined for disposal at an approved facility.

Yard Waste – Yard Waste is sourced from municipal and commercial haulers, through yard waste collection programs, and through drop-off by CVRD residents. All loads are inspected. Non-recyclable, residual contaminants sorted from delivered loads, or separated during grinding will be deposited and stored in a roll-off container and hauled to an approved facility for disposal.

Should yard waste be required to be stored outside the building, it will be stored on an impermeable pad. Leachate and contact storm water are collected in a tank or pond for

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maximum annual throughput of General Refuse is approximately equivalent of three 35 tonne loads per week.

reuse in the composting process, dust control or for disposal in a regulatory approved manner (such as to a sewage treatment plant).

Once sufficient yard waste is collected, it will be ground with a grinder. If yard waste is dry and dusty operators will use a water spray it into the feed of the grinder for dust suppression. As a grinder is on-site, the holding time for unground yard waste is in the order of one week. Due to the short holding time odours and anaerobicity will not occur.

Ground yard waste is incorporated in the composting process. All ground yard waste is stored in the operations building or, when required, stored on an aerated pad with leachate control, or in another manner to be approved by the CVRD Manager.

Food Waste – The composting facility directly supports waste diversion programs in the Capital Regional District (CRD), Cowichan Valley Regional District (CVRD) and Regional District of Nanaimo (RDN). Initiatives to divert Food Waste (source separated organics, SSO) are well-documented by the three Regional Districts facing limited landfill space and high waste export costs. Food Waste consists of source-separated organics diverted by municipal and commercial haulers.

Food Waste deliveries are directed to and received in the operations building. Loads are inspected for product quality and sorted by a site operator. Non-recyclable, residual contaminants sorted from delivered loads, or separated during screening will be deposited and stored in the compost byproducts holding container which is placed inside the operations building and hauled to an approved facility for disposal.

Contaminant-free food waste is immediately blended with ground yard waste to balance moisture, prevent and suppress odours and discourage attraction by vectors. Properly mixed materials are then transferred to the bio-cells or held in the operations building until cells become available.

Biosolids – Only biosolids will be accepted with characteristics consistent with producing a Class A Compost as per Organic Matter Recycling Regulation (OMRR) Part 3, Division 5.

Biosolids are received inside the operations building in an area bermed with ground yard waste. Biosolids are immediately blended with ground yard waste to balance moisture and to mitigate odour emissions. Blended biosolids are immediately transferred to the bio-cells or held in the operations building until cells become available. Biosolids mix that is temporarily stored in the operations building is capped with ground wood waste or ground yard waste for odour suppression.

Hazardous Waste and Controlled Waste - Hazardous Waste will not be received. Controlled Waste that is accepted is handled and stored as per industry guidelines, methods prescribed by recycling companies and according to product care programs. The Recycling Centre does not accept pre-1990 drywall without proper documentation, dusty materials, asbestos, thermostats or sharps**.**

General Refuse - General Refuse is material that has been sorted for recyclables, that is sorted out from the composting process, and that will be disposed of at approved facilities. Any material from the Recycling Centre that is destined for disposal at an approved facility is stored in one active garbage bin in the Recycling Centre. This Recycling Centre garbage bin may be held for no longer than one week. The full "swing bin" will be tarped and removed from the Recycling Centre and will be stored on the property awaiting transportation to an approved facility when a truck becomes available.

Any putrescible or wet waste that is generated through sorting of mixed loads, is kept in the compost byproduct holding container which is placed inside the operations building within the odour and leachate control area.

Recyclables, except scrap metal, asphalt roofing, concrete, brick and rubble unless such materials have the potential to create leachate, will be stored in covered storage bunkers with storm water run-on protection or on an impermeable pad with a run-off collection and management system, or in roll-off bins.

In-Vessel Composting Process

Presently, the facility is operating in compliance with OMRR with a documented in-vessel capacity of 18,000 MT of incoming (scaled) organic waste.

The composting process exists of several phases: primary processing takes place in the primary composting cells; secondary processing takes place on 6 impermeable aerated pads indoors, and curing takes place on 16 impermeable aerated pads outside with contact storm water management. Storing of finished compost takes place on an impermeable non-aerated pad with contact storm water collection and management. All pads are constructed with re-enforced concrete.

Primary Composting

The in-vessel composting occurs within sealed aerated cells. The air in the cell is re-circulated continuously, and is computer monitored and regulated and balanced based on its moisture, temperature and airflow. Any exhaust air is emitted through two biofilters specifically serving the primary compost cells. Leachate is collected in the sloped sub-floor within the bio-cell and re-circulated through the compost in the cell via sprinkler pipes installed near the top of both side-walls. Condensate is collected and stored in tanks and then UV treated before being used on biofilters or for rewetting compost.

The limiting factor for the composting facility is the through-put of the Primary Compost cells (or bio-cells). Each of 3 cells has a capacity of approximately 168 tonnes input. The mixed compost substrate is processed in a batch mode. A primary compost cycle is upto 10 days in duration. Thus, on a 365 day work year, this represents 36 cycles for each of 3 Primary Compost cells. The total throughput for the facility is thus 36 * 3 * 168 = 18,144 tonnes.

Over the years FRR has reduced the bulk density of the mix to optimize operating conditions. Current operational data show the following:

- *Volume in bunker around 240 (218 -260) m3*
- *Operating bulk density: 450 - 500 kg/m3*
- *Tonnage in bunker between 108 and 120 tonnes of mix.*

The facility adheres to OMRR Schedule 1 4-c, requiring no less than 55°C for three days maintained during the composting process. This is managed during the active composting phase as conducted in bio-cell. The computerized system is set up to maintain the required temperatures over a period of more than 4 days, and temperature records are kept (and are printed out) to verify meeting the conditions of OMRR Schedule 1.

Secondary Composting

The facility is operated on a 14 day active composting cycle as mandated by OMRR, Schedule 2, 2(a) for Pathogen Reduction and Vector Attraction Reduction for in-vessel systems. After the primary compost phase the material is composted further in the indoor secondary composting area consisting of 6 aerated bays with temperatures and oxygen levels monitored. Compost is turned by moving it from one composting bay to the next with at least 6 turns before the compost is placed on the outdoor aerated floors for further curing. Compost is monitored daily for temperature, oxygen and moisture and water is added where required. Combining the primary and secondary compost cycles, compost will easily adhere to the OMRR requirement of average of 45°C over 14 days with minimum of 40°C.

Curing

Once the compost has completed the secondary composting stage on the indoor aerated pads, the material is cured on 16 outdoor aerated pads. Material is turned by transferring it from one air floor to the next until it meets the Solvita maturity requirements. Temperature and oxygen levels are monitored during the curing phase, and moisture is adjusted where required.

Screening

After the compost is tested for maturity it is screened. The fines or marketable compost is stored on an impermeable pad with leachate collection. The overs are also stored on an impermeable pad with leachate collection, are then cleaned by hand-sorting and vacuum separation. Cleaned overs are either stored on an impermeable pad with leachate collection or transported to the Operations Building for inclusion in the compost mix.

Re-use of contact storm water and process water

Collected contact storm water and process water from the composting cells is collected in various tanks and containers. The process water is UV treated prior to beneficial reuse and all pond water is chlorine treated prior to re-use in the composting process, to prevent cross contamination of compost after the OMRR pathogen reduction step as described above.

Compost Product

The produced compost adheres to the standards for OMRR Class A compost, allowing unrestricted distribution.

Compost is tested for metals (to meet OMRR Schedule 4) and for pathogens (OMRR Schedule 3-1), on a frequency of one sampling event per 1000tonnes dry weight (OMRR Schedule 3-3). Compost will adhere to the CtoN ratio range as per OMRR Schedule 2-2. Maturity will be determined by Solvita test, with a reading of ranging from 6 to 7 for cured compost.

Cured compost products awaiting shipment are placed on impermeable surfaces with leachate collection.

Note 1: The storage piles are not aerated, and breathable fabric is not required for process control. FRR will use woven tarps for weather protection.

Note 2: According to accepted conditions in other jurisdictions such as Ontario, mature compost has a CO_2 evolution of less than 4mg/gram of compost as measured per TMECC 05.08-B. This is equivalent with Solvita Maturity index of 6.0 or higher. Decimal readings can be obtained with an optical reader. Solvita 5-6 is equivalent to CO_2 evolution of 5-7mg/gr and is not mature. Any readings over 6.0 are considered mature and stable with CO_2 evolution of between 4 and 2 mg/gr. FRR targets a Solvita reading between 6 and 7 for cured compost.

11.1(d) the measures that will be taken to protect the environment, the site, and the lands adjacent to the facility

The measures that will be taken, to protect the on-site and surrounding environment include measures related to:

Odour Management

Odour management is an issue in composting that requires attention. Typically, odours are generated from unprocessed materials and from the process itself. In general, odours can be managed by following careful house-keeping such as cleaning systems and floors, management of materials through timely incorporation and covering, through careful process management and through providing ample air to the compost. As well, capture and treatment of odour-laden air is an option. FRR has implemented all of these odour control strategies.

House keeping

Measures have been taken to keep the facility clean. A procedure is in place to prepare the correct mix for composting and the process is managed based on measuring parameters and any spillage is removed immediately. All stray litter will be removed from the Recycling Centre, and stored materials will be protected from the weather. Garbage will not be stored for more than one week.

Receiving and processing
All compost materials will be received and stored inside the operations building, which is outfitted with an air treatment system. Highly odorous liquid waste such as septage and tankage will not be accepted at the site.

The operation building encloses the working pad, and the Bio-cell openings. The main access door will only be opened to allow truck and equipment access and remains closed otherwise. This door will be opened only for the minimum duration. The door has been checked and can be opened or closed in less than 60 seconds. Exhaust fans will direct collected air to an odour treatment unit comprised of an extended biofilter with a capacity of 30,000 CFM . The biofilter medium consists of layered wood chips, bark and medium to coarse compost, and is monitored and maintained for optimal operating conditions.

Activities within the building requiring the movement and mixing of materials will only take place when doors are closed and the odour control system is operated at its maximum level. Activities may include unloading trucks, mixing, loading of cells, unloading of cells, building secondary composting windrows, and turning of the materials.

Recyclables will be received in the Recycling Centre in covered bunkers or other areas protected from the weather. Any putrescible garbage received is placed in the compost by-products holding container located within the compost operations building. No odour is expected to be emitted from the Recycling Centre.

Unground yard waste is received and ground within a week. It is received on a pad with leachate collection, and due to the short holding time the yard waste will not become anaerobic.

Ground yard waste is stored inside the operations building and is used in the composting process. Any surplus ground yard waste that cannot be stored inside, is stored on an aerated pad with leachate control. Such storage will be for short periods.

Bio-cells
The bio-cells could potentially generate odours. Odour generation from the bio-cells is prevented as doors and walls are sealed and all air is re-circulated. Any exhaust air is channeled to the biofilters before release to the atmosphere. A set of two biofilters is installed to catch any odour causing compounds originating from the bio-cells. The biofilter medium consists of layered wood chips, bark and medium to coarse compost, and will be monitored and maintained for optimal operating conditions. The bio-cell process control software continuously measures the volume and characteristics of the process air (temperature) to evaluate the effectiveness of the biofilter medium. Operations are monitored remotely and contain alarm functions for maintenance and operation of major equipment.

The bio-cells are only accessible from within the operating building. Any odours from the bio-cells generated during loading or unloading are trapped within the operations building and are treated as part of the air flow from that facility.

Feed stock is blended into a proper composting mix to prevent odour generation during composting. The target parameters for the composting mix are:

- C:N 15 – 30 with an optimum of 25;
- Bulk density 450 – 650 kg/m3; and
- Moisture content between 50 and 60%, depending on the mix and ingredients.
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. The control mechanism of the Bio-cells corrects for temperature effects by adjusting the recycling rate of condensate and the aeration rate.

The target parameters for the compost in the secondary composting are:

- C:N ratio 15 -30;
- Moisture content between 30 and 40%; and
- Bulk density between 450 and 550 kg/m3.

Moisture content is set through the computer feed-back system of the Bio-cell. Where required, the moisture content will be adjusted to fit the target moisture content prior to further composting.

Odour may be generated from the bio-cells during loading/unloading. Changing the air-flow characteristics of the bio-cell being loaded will prevent generation of odour. Prior to opening the sealed door, the air supply to the cell to be opened will be discontinued, and air will be extracted from the top of that cell. This will generate a slight inward air movement, sufficient to contain odours generated by material already in the bio-cell. All air is captured and circulated to the other operating bio-cells. Any exhaust air is cycled through the biofilters. The opening of the doors of the bio-cells are located within the operations building.

The Bio-cells are outfitted with an aeration system which is automatically controlled. The control system tracks air pressures in the system and alerts when aeration ducts become clogged. Control instrumentation is monitored remotely, and can be adjusted as required.

The air quality control system (fans, ducting, dampers, biofilter etc.) will be checked weekly for signs of damage or malfunction. Quarterly the equipment will be inspected for proper operation, including the dampers and valves which will be moved through their full range of motion.

If problems with air pressure arise and are noted through the automated system, duct work will be inspected and where required cleaned and pressure washed.

Operations will be checked semi-annually with hand held instruments. Airflows will be measured near the automatic sensors and the system adjusted where required.

Biofilters may generate condensate. Condensate will be collected in the bottom of the biofilters and stored in tanks for beneficial reuse in the composting process or moistening biofilter beds. Should more condensate be generated than can be re-used, the surplus will be discharged to an authorized facility.

Secondary Processing
Curing takes place on aerated floors within the receiving and processing building. All air from the processing building is routed through the biofilters. Movement of compost and turning of the secondary composting piles inside the receiving and processing building will only take place when all doors are closed and the aeration system is operating. While moving materials and building or turning of piles, the operators will ensure not to compact the materials.

Curing
Curing will take place on outside impermeable aerated pads. Temperatures and oxygen levels will be monitored to ensure the process is progressing satisfactorily. The aerated floors collect any leachate and contact storm water. This is then stored in collection ponds for beneficial re-use within the facility. Ponds are aerated and agitated for odour control.

Market compost will be stored on impermeable concrete or asphalt pads with contact storm water collection

Screening
To prevent dust from screening, the materials to be screened will be checked for moisture content. If the material is too dry (<30% moisture) water will be added. The moisture content will be checked with a handheld moisture meter.

Contact storm water and leachate
Leachate management relies on effective design and handling procedures to minimize leachate. The intent of a leachate management plan is to control and monitor all leachate and eliminate risk of negative impacts to ground and surface water.

All leachate generating activities in the operations building take place on the working pad within the operations building. The working pad consists of a sealed concrete pad with a 1% slope to the middle. The pad is surrounded by berms and sealed retainer walls. Any leachate is collecting in the middle of the pad. Any pooled leachate is absorbed using dry yard waste or wood waste and is included in the compost mix.

Doors are protected by a grate and gutter system. The gutter is checked , and cleaned where required, after a batch of compost has been moved within the composting building or to the curing and storage facility.

Any leachate generated in the bio-cells will be collected at the bottom end of each cell in a collection channel. Leachate will be reused in the cell as a source of moisture. Surplus

moisture will be collected and re-used. No leachate will be discharged to outside the bio-cell at any time.

Curing and storage will take place on impermeable pads with run-off collection, and all contact storm water will be collected for beneficial reuse. Run-off ponds are sized to hold three times the expected rain volume for the 6 month winter period. If it becomes necessary, excess contact storm water will be hauled to an approved disposal facility. Ponds will be aerated and circulated continuously for odour suppression. As well, stored compost has a large capacity to absorb moisture.

Measures to maintain compost quality such as tarping and weather protection may be implemented where required for operational reasons.

Ground yard waste is stored inside the operations building and is used in the composting process. Any surplus ground yard waste that cannot be stored inside, is stored on an aerated pad with leachate control. Such storage will be for short periods.Any leachate generated will be collected in tanks and disposed of in a licensed facility or will be incorporated in the composting process.

Non-contact storm water such as roof run-off and run-off from driveways will be directed to the on-site storm water management system which includes an oil-water separator.

To ensure pond stability, prevent breakage and puncture, and to reduce potential the following measures were taken: Ponds were installed only within the undisturbed natural till layer/hard pan on-site to provide stability. Ponds are lined with 45mil rubber liner. Contoured ponds are tapered with sand lined bottom and sides, with the liner protected by landscaping fabric.

Block-ponds are built from lock blocks lined with landscaping fabric and the sharp edges of the blocks smoothed to protect the liner.

Aerators are applied to each pond to circulate water and to provide aeration to prevent anaerobicity, odours and mosquito infestation. Ponds without aerators are outfitted with circulation pumps for the same purpose.

Water Balance for Composting Facility FRR.

The objective of the water management for FRR is two-fold:

- To capture all leachate to protect the environment and aquifer, and
- To optimize water capture for beneficial re-use.

The following include assumptions and data used for the water balance calculation for the paved areas at the FRR site.

Impermeable outdoor floor space on September 30, 2012:
Three aerated floors of 623 m^2 each and one non-aerated storage pad of 2276m^2 have been completed by September 2012. Both the floors and pad are drained into leachate holding tanks.
Total surface: **4145 m^2**.

Water storage space on September 30, 2012:
On September 30, 2012, the facility will contain the following water storage facilities:

Three holding tanks of 113m^3 each
Four holding tanks of 760 m^3 each
Six tanks of 11.4 m^3 each
Two tanks of 12 m^3 each.

Total water storage capacity equals **3471m^3**.

No change in configuration has been made since.

Precipitation
The requirement for water storage is for 6 months rainfall, from October to March (inclusive). Normal rainfall for Shawnigan Lake for that period is 999mm with the total normal precipitation for the year of 1276mm (Environment Canada [5]). There appears to be a gradient in rainfall between Shawnigan Lake and Cobble Hill, where Cobble Hill / Fisher Road receives less precipitation than the Shawnigan Lake area. This is reflected in the local weather data. For 2010, a wet year, the total precipitation measured at the Shawnigan Lake School was 1515mm with the six winter months contributing 1119mm. (Victoria School Based Weather Station Network [6]). Total precipitation for that year at the Frances Kelsey School in Mill Bay (a similar weather type to Cobble Hill / Fisher Road) was registered as 892mm with winter precipitation of 616mm (Victoria School Based Weather Station Network[7]). Thus, calculations based on Shawnigan Lake are over-estimating the total rainfall. The actual winter precipitation at the FRR site would be closer to that measured at the Frances Kelsey School at 600mm. A fair amount for maximum winter rainfall for Cobble Hill/Fisher Road would be 700mm, including a 25 year maximum (which would be 696mm and 13% more than the 2010 rainfall based on the comparison of the 25year rainfall in 1997).

Potential run-off from composting facilities.
Not all precipitation that falls on a composting facility (or a bare asphalt or concrete pad for that matter) reaches the run-off collection system. Water is evaporated from the bare hard surface, and even more is lost through evaporation from the rough dark surface of a

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[5] http://www.climate.weatheroffice.gc.ca/climate_normals/results_e.html?stnID=97&prov=&lang=e&dCode=1&dispBack=1&StationName=shawnigan_Lake_&SearchType=Contains&province=ALL&provBut=&month1=0&month2=12

[6] http://www.victoriaweather.ca/raintotal.php?id=160&year=2010&action=See+Data

[7] http://www.victoriaweather.ca/raintotal.php?id=103&year=2010&action=See+Data

compost windrow. Work by Kabala at.al. (2007)[8] and Wilson et.al. (2004)[9] have evaluated surface run-off from a composting facility in New Brunswick, Canada, with a similar climate during the testing period (winter temperature and rain fall) to Cobble Hill, BC. This team from the University of New Brunswick found that the run-off coefficient for a tested composting site (depending on the coverage of the hard surface) ranged from 0.68 to 0.50, with a typical **empty** hard surface having a run-off coefficient of 0.85. The run-off coefficient is the percentage of precipitation that reaches the collection system. The New Brunswick composting system was a passively aerated turned windrow system, In contrast, the FRR outdoor composting system is actively aerated and thus the evaporation from the windrows is higher than that in the New Brunswick test. As well, the site coverage at FRR would be higher than in the New Brunswick test, lowering the run-off co-efficient further. Keeping this in mind the run-off coefficient of 0.6 would be a fair assumption.

Absorption by Compost from the indoor facility.
The FRR composting system is based on Cell composting followed by indoor aerated piles, followed by out of doors aerated piles. When compost is released from the indoor facility to the outdoor facility and is piled on the first available airfloor, the moisture content is about 40%. When this batch of compost is then exposed to rain on the outdoor aerated pad, its moisture content may increase to 60%. Each new pile on the first available aerated outdoor cell is the content of Primary Compost cells with a total dry weight of ~105tonnes. An increase in moisture of 20% in the first outdoor batch would absorb 105 * 0.2 = 21 m^3 of water. As one outdoor cell is built each week, continuous composting would absorb 84m^3 of water per month, or 504m^3 during the 6 winter months. This amount of water is not stored in the pond system. Depending on the moisture content of the compost (can be as low as 35%), and the water holding capacity of wet compost (can be as high as 65%), and the aeration rate of the piles, the absorption of water in the newly placed compost can be as high as 1087m^3 . Thus 504m^3 is a conservative assumption.

The Facility is a net-user of water in the process. However, water use during the rainy season is not taken into account in the water balance.

Water Balance
Surface area to be collected from: 4145 m^2
Winter precipitation: 700mm
Run-off coefficient: 0.6
Water to be collected: 4145 * 0.700 * 0.6 = 1741m^3

Minus: absorption 504m^3

[8] Kabala, L., B. G. Wilson and K Haralampides, 2007. A storm Water Runoff Model for Open Windrow Composting Sites. Compost Science and Utilization, Vol 15, No 3, 142-150. ,
[9] Wilson B.G., K. Haralompides and S. Levesque, 2004. Stormwater runoff from Open Windrow Composting Facilities. J.Environmental Engineering Science Volume 3, 537-540.

Net water to storage: $1237m^3$

Available Storage: $3471m^3$

Conclusion:
The storage capacity is more than two times the required capacity of 6 months storage of run-off from the composting and storage pads. This will also allow FRR to direct some non-contact storm water to the holding tanks for use during the summer. The storage capacity will meet the requirements of 6 months of 25year rainfall events set out by CVRD staff.

In case of ponds threatening to overflow, water will be collected and discharged to an authorized facility or in an approved manner.

Non-contact Storm Water
Non-contact Storm water and site run-off will be diverted away from the working areas by berms, interceptor ditches and swales. As well, any roof runoff from covered areas will be directed away from the working areas. Non-contact storm water from paved areas and roadways will be directed to an oil-water separator and then collected in a series of swales at the lower end of the property.. The swales are planted with bulrushes, cattails and other suitable plants to absorb any nutrients and help evaporate storm water. It is expected that the storm-water system will be dry from early spring to late fall.

The main swale is an area formed between the berm along Fisher Road and a formed concrete wall. Non -contact storm water run-off is infiltrated on-site or will be dealt with in an approved manner.

Litter
Stray litter is prevented through careful management and selectivity in accepting loads. Litter will be collected and disposed of at an approved disposal facility. Stray litter will be collected on a daily basis at the FRR gate and fence line along Fisher Road for a maximum length of 300m. Garbage not intentionally or illegally dumped will be picked up. Illegal dumping will be reported to the CVRD.

Noise
To prevent nuisance of noise from operations the following measures have been implemented;

Loud diesel grinding equipment will not be run before 8am and after 5pm; and will not operate on Saturdays.

Loud air-compressors will operate between 8am and 5pm only.

The Recycling Centre will operate from 7am to 7pm, with operators to be encouraged not to drop material from heights, bang steel containers or drag containers around until after 8 am.

Traffic

To discourage large vehicle traffic from traveling through Cobble Hill Village, a sign has been installed and maintained inside the gated access, visible to vehicles leaving the facility. The sign shows a 'No Right Turn' icon, and reads 'Over 10,000 Kgs. Lic. GVW'.

The access to the facility will be kept free from brush according to the Ministry of Transportation guidelines (9.0m throat and 9.0m curve radius) to facilitate commercial site access. The access will be inspected bi-annually, and where necessary, brush will be removed.

Spills

Spill kits are available at FRRs site. Spill containment and cleanup measures will be deployed when spills happen. The following measures will be taken:

1) Storm drains will be protected by surrounding them with sock-type absorbents
2) Spills of fuel and oil on concrete surfaces will be surrounded by sock-type absorbent materials and the spill will be sopped up with absorbent
3) Spills on soil will be surrounded with sock-type absorbent material, the spill will be sopped up with absorbent, and affected soil will be removed.
4) All spill-affected materials will be discharged to authorized facilities.
5) As required by Law, spills will be reported.

11.1(e) a monitoring program to assess the measures in Subsection (d) above

The monitoring program will be conducted by a qualified, independent party, and will include the following:

Non-contact storm water The monitoring results were assessed after one year and the monitoring schedule was reviewed and updated. – non-contact storm water will be monitored **quarterly** for total nitrogen, ammonia, nitrate, pH, BOD, fecal coliform and phosphorus. The infiltration ditch, when water is present, will be sampled for this monitoring event. The infiltration ditch water will be sampled at least twice a year. Details can be found in Table 4A below.

Ground water – ground water will be monitored quarterly for total nitrogen, ammonia, nitrate, BOD, pH, fecal coliform and phosphorus. The domestic well on-site will be sampled for this monitoring event. This well is not used for drinking water. The water is used for industrial purposes only.

Compost – Compost temperatures in the primary composting stage will be monitored and recorded continuously by the control mechanism of the bio-cells. Temperature logs will be kept on-site and will be available for inspection. Compost in the secondary composting stage and the curing stage will be monitored weekly or daily for temperature, moisture and oxygen. Details can be found in Table 4B below.

Compost will be sampled once every 1000 tonnes dry finished compost produced. One sample will be submitted for metal analysis to conform with Schedule 4 of OMRR, and 7 discrete samples will be submitted for fecal coliform analysis for each sampling event.

All results will be reviewed by a qualified professional. Copies of results and specific recommendations will be forwarded to the CVRD as required and as outlined in Table 4A below. Results will be kept at the premises and may be made available for inspection upon request.

Biofilter - on a weekly basis, staff will inspect the biofilters' effectiveness. Staff will complete the **Biofilter Monitoring Form**, measuring temperature, oxygen level and moisture level within specified zones of the biofilter. Ammonia levels in the outflow air of the biofilters will be tested with test strips.

The optimum biofilter operating parameters for optimal operation should be: Contaminant Inlet Concentration: 0.0015 – 0.0045 g/m^3 Relative Humidity of Inlet Air: >98% Temperature of Bed: 25 – 35^oC Humidity of Bed: 40% - 65% moisture by weight; Pressure Drop Across Bed – Optimal: 1 – 4 inH2O, Mature Bed: 5 – 8 inH2O Contaminant Elimination Capacity: 60 – 100 $g/(m^3$-h) Bed pH: 7 Ammonia Concentration: < 0.0010 g/m^3 (Tinari report).

Should measurements show that parameters are beyond the optimal range, an investigation will commence into the cause.

Odour – each working day, operating personnel will travel to the locations specified in the Operator Checklist prior to entering the facility for the first time that day. Presence or absence of odour(s), weather and contribution factors will be recorded on an **Odour Report Form.**

Odour control locations include:

- Trans Canada and Fisher Road
- Fairfield and Fisher Road
- Fairfield and Vernier
- Watson and Fisher Road
- Galliers and Holland Ave
- Galliers at the facility propertly line.

Weekly Inspections by Management - On a weekly basis, a **Management Checklist** will be completed to ensure mechanical processes are working as intended, and operating procedures are being followed.

<u>Fisher Road Recycling – Monitoring and Data Collection.</u>

This sub-section describes Reporting and monitoring requirements for FRR.
For each monitoring or reporting event, the source is noted, and which form is being used internally.

Form	Abbreviation
Daily Checklist	DCL
Daily Temperature Log	DTL
Weekly Checklist	WCL
Weekly Management Checklist	WMCL
Quarterly Bio-Cell Equipment Checklist	QBCEC
Semi-Annual Bio-Cell Equipment Checklist	SCEC
Biofilter Monitoring Form	BMF
Staff Training Form	ST
Rejected Load Form	RL
Maturity description Form	MF
Solid Waste Management Licence 003-06	L
Bylaw 2570	B
Operating Plan	OP
Complaint Report Form	CRF

Table 4A - Monthly Statements/ required Reporting.

Type – Municipal Waste	**Frequency**	**Form**	**Requirement**
Amount/Quantity (in MT) of all municipal solid wastes and recyclable materials received at and shipped from the facility	Monthly	Monthly Statement	B – s. 12.4
Maximum net tonnage on site at any one time at the facility as measured in the delivery vehicle	Monthly	Monthly Statement	B – s. 12.4
Type – Water Samples			
Water test results for Well and Swale, Swale results twice a year minimally. Reports submitted according to industry standards for laboratory procedures and to include recommendations (if any).	Quarterly	Submitted independently	OP – s. 11.1(e)
Type – Compost Samples			
Compost samples (taken once per 1000 tonnes finished compost), includes one (1) metal sample, and seven (7) discrete samples for fecal coliform.	Once per each 1000 dry tonnes finished compost	Submitted independently	OP – s. 11.1(e)
Report of qualified professional who reviewed each compost sample	Once per compost sample	Submitted independently	OP – s. 11.1(e)

Each monthly statement must be signed by an officer or a principal of the owner/operator of the facility. Each monthly statement must be delivered monthly to CVRD within 21 days after the last day of the previous month (e.g., March 2010 monthly statement must be delivered to CVRD by April 21, 2010).

Table 4B -- Records to be kept on file at the Facility.
FRR will keep records on-file for on-site inspection by authorities – after being given due notice and documents will be compiled upon request for on-site review. The following records will be kept on file.

Bio-Cell Records

Type	Frequency	Form	Requirement
Bio-cell Temperature	Continuously	DCL	L – s. 4.7
Bio-cell Process Control Software	Daily	DCL	L – s. 4.7
Bio-cell Air Quality Control System	Weekly	WCL	L – s. 4.7
Bio-cell Equipment	Quarterly	QBCEC	L – s. 4.7
Bio-cell Operations	Semi-annually	SCEC	L – s. 4.7

Secondary Compost

Type	Frequency	Form	Requirement
Temperature	Daily	DTL	L – s. 4.7
Moisture Content	Daily	DTL	L – s. 4.7
Oxygen Level	Daily	DTL	L – s. 4.7
Curing Compost Windrows	Weekly	DTL	L – s. 4.7
Aeration Systems	Quarterly	QBCEC	L – s. 4.7
Maturity	When required	MF	

Cured Compost

Type	Frequency	Form	Requirement
Maturity /Solvita	When required	MF	
Weather protection/tarping	When required	DCL	

Bio-Filter Records

Type	Frequency	Form	Requirement
Bed Humidity	Daily	DTL	L – s. 4.7
Bed Temperature	Daily	DTL	L – s. 4.7
Oxygen Level	Weekly	WCL/BMF	L – s. 4.7
Bed pH	Weekly	WCL/BMF	L – s. 4.7
Duct Pressure Drop	Weekly	WCL/BMF	L – s. 4.7
Ammonia in biofilter output	Weekly	WCL/BMF	L – s. 4.7

Facility Records

Type	Frequency	Form	Requirement
Odour Reports	Daily	DCL	L – s. 4.7; OP – s. 11.1(j)
Substantiated Odour Complaint reports	When occurring	report	

Staff Training

Type	Frequency	Form	Requirement
Initial Staff Training	As required	ST	OP – s. 11.1(j)
Annual Staff Training	Annually	ST	OP – s. 11.1(e)

Other Required Records

Type	Frequency	Form	Requirement
Rejected Loads	As required	RL	L- s. 3.5
Weight-scale Data	Once per load	N/A	OP – s. 11.1(i)
Rolling Stock Inspection	Daily	DCL	OP – s. 11.1(j)
Temperature Probe – Storage Piles/fire prevention	Daily, when required	DCL	OP – s. 11.1(j)
Record of incoming materials	Transaction	On-demand	Schedule A
Complaints Report Form	As required	CRF	Schedule A

11.1(f) <u>the methods for complying with regional disposal bans and recycling requirements</u>

No refuse containing materials banned from landfill will be sent to CVRD disposal facilities. All reasonable efforts will be made to separate recyclables from general refuse prior to disposal.

11.1(g) <u>the methods for Dust, Odour, Vector, Mud, and Litter control and prevention</u>

Dust – The concrete processing areas will be kept clean to limit dust generated by loader and vehicle traffic. During the dry season, well water will be applied for dust control on road ways as needed. No pond water will be used for dust control of road ways.

The amount of nitrogen-rich well water applied to roadways is small, is only applied when the road ways are dry, and the water will evaporate rapidly. Should nitrate residue be washed away from the roadways in a summer rainstorm, it will collect in the swale where the plant growth and microbiological action will absorb it quickly helped by the high summer temperatures and good growing conditions. However it has been found that the swale is dry from late spring to early fall, including the times when roads are wetted.

Swale samples have never indicated an elevated nitrate level above the drinking water standards (not even before the complete removal of the compost from the soil). Non-contact storm water site run-off is directed to the swale only and is not affecting any other areas. The risk to the environment from spraying well water for dust control is minimal.

Dust from grinding of wood waste and yard and garden waste grinding is suppressed by using a water spray into the feed of the grinder. Water is obtained from tanks/ponds on-site. Any surplus water is directed back to these tanks/ponds and is not released to the non-contact storm water management system.

Odour – Municipal and Commercial haulers will be encouraged to collect organics no less than once per week to prevent nuisance odour associated with anaerobic feed stocks.

Food waste is received inside the operations building and is immediately blended with dry bulking agent. Due to compost cycle, mixed waste can be stored up to 5 days before incorporated; stored waste is mixed and capped with ground yard waste. As well, all receiving, processing and storage of active composting materials will occur within the operations building kept under negative-pressure, with process air exhausted to biofilters.

Active curing piles will be aerated on air-floors.

Odours generated in the aerated in-vessel composting process are treated through two biofilters. Following standard operating procedures, loading of bio-cells will be done with the bio-cells operating under negative-aeration to help prevent process odours from escaping during this phase.

Overhead and man-doors will be kept free of compost and other debris at all times so they can be fully closed.

Overhead and man-doors will be kept closed when not in use to minimize the potential release of odours.

Operating personnel will ensure that covers on leachate sumps are kept closed.

Operating personnel will ensure that waste delivery vehicles are completely indoors and that the overhead door is fully closed when waste is unloaded.

Operating personnel will ensure that bio-cell doors are opened only when all overhead and man-doors are fully closed, and ventilation systems are operating.

At least once per week, operating personnel will remove accumulations materials from the top of bunker walls inside the operations building.

Residuals and non-compostable materials removed from incoming feedstock will be stored inside the operations building, and removed from the site weekly. .

Inspection of the facility and surrounding area for odour and nuisance conditions will be conducted at least once each working day, at prescribed locations, and the results will be recorded (see below in Monitoring).

Vector – No food waste will be left exposed to attract birds or rodents, stored waste is mixed and capped with wood waste. If rodents (ie. rats) are observed, a pest control service will be contracted to place bait traps around the processing area.

Sustained temperature during the thermophilic composting phase is effective in reducing pathogens and vector attraction as specified by the Organic Matter Recycling Regulation.

Mud – All processing areas are paved. Gravel access roads will be graded regularly and road base materials applied to maintain good vehicle access year round. Slopes and grading contours will be maintained to divert surface water and prevent pooling of stagnant water. Storm water run-off will be diverted from the working surface by means of berms and swales.

Doors are protected by a grate and gutter system, the gutters are cleaned after a batch of compost has been moved within the operations building or to the curing and storage facility. This prevents tracking of compost to the outside and will keep the leachate control system operating.

Litter – Good housekeeping practices are followed to keep litter from contaminating clean materials or leaving the site. Stray litter will be collected along 300m of Fisher Road.

Staff Training - A training session will be held annually for new staff and as a refresher for current staff. This session will cover the basics of composting and will make staff aware of odour, vector and nuisance issues. The training session will be held on-site, and documented.

11.1(h) <u>the methods for handling any waste delivered to the facility which is not authorized by the license.</u>

Most deliveries are scheduled in advance from known generators. All loads will be inspected prior to receiving. Non-acceptable loads will be refused. If the truck has already been unloaded, the rejected waste product will be reloaded for removal from the facility. The event will be reported verbally to the CVRD Manager as soon as practically possible and will be followed up in writing within 48 hours. The event will also be recorded for notification with monthly submissions to CVRD staff as per CVRD Bylaw 2570 Sections 12.4, 12.6 and 13. The identified generator, and hauling company will be sent a notice.

11.1(i) the procedures for weigh scale operation at the facility, or other site where municipal solid waste and recyclable material is weighed for acceptance at the facility or removal from the facility

A certified weigh scale serviced by a certified independent scale company has been in operation at the site since September 2000. All loads are scaled in and out to record the net delivery weight except for stewardship items, free drop-off and flat fee items which will be scaled upon these materials leaving the site, All data is recorded on the scale computer. All data will be maintained, and submitted as required by CVRD Bylaw 2570 Sections 12.4 and 12.6 and 13.

11.1(j) the frequency and method of facility inspection to be carried out by facility staff

On-going monitoring - All data collected by bio-cell sensors are documented for evaluation and facility auditing. The bio-cell process control software can be monitored on-site, and remotely by internet access. Operating personnel will monitor the program data daily to ensure dampers, valves, and airflows through aeration piping are working as intended. Should the software indicate a problem, operating personnel will repair and maintain the equipment as required to keep the process control software and components working as intended. Remote monitoring is also carried out by contractors in Germany who completed the major software and component upgrade in early 2008. With this internet monitoring, they are also able to advise local operating personnel when specific maintenance or repair work is required.

Weekly Inspections by Management - On a weekly basis, a **Management Checklist** will be completed to ensure mechanical processes are working as intended, and operating procedures are being followed.

Biofilter - on a weekly basis, operating personnel will inspect the biofilters' effectiveness. Staff will complete the **Biofilter Monitoring Form**, measuring temperature, oxygen level and moisture level within specified zones of the biofilters.

Bio-cell The equipment related to the Bio-Cell is remotely monitored, and management will be notified immediately of malfunctions. Bio-Cell control equipment is inspected annually for proper operations, including valves and dampers.

Secondary Composting and Curing – Secondary composting areas and curing areas will be inspected weekly, and on a quarterly basis, air pressure will be measured and air ducts and fans will be inspected.

Odour – each working day, operating personnel will travel to the locations specified in the Operator Checklist.
Confirmation of odour(s), weather and contribution factors will be recorded on the **Odour Record Form**.

Complaints regarding facility operations from neighbours and other affected parties will be received by phone to the responsible parties operating the FRR facilities, or if any third party regulator, including the CVRD expects FRR to respond, complaints must be provided to the facility staff immediately after being received by the third party, regulator or the CVRD.

It is noted that incomplete or partial information will usually not allow for a meaningful investigation. Therefore, it is requested that when a concerned party wishing to register a complaint, pass on as much detail as possible as to the date, time, place, weather conditions, wind direction, the nature of the concern, (e.g. odour tone and strength), and any other information that may be useful. This will effectively help identify any potential issues arising from the facility operations. Odour events are often short lived and FRR wishes to respond to such events as soon as possible. Facility operators can effectively identify nuisances when;

1. concerned parties contact facility operators directly;
2. concerned parties contact facility operators at the time the nuisance is experienced; and
3. provide as much details as possible with the complaint.

All complaints will be responded to in a courteous and respectful manner and investigated immediately.

FRR is currently collaborating with the CVRD to develop an improved and more effective odour complaint procedure as it is FRR's goal to mitigate any nuisances from the facilities.

Telephone access

As per Section 6(d), operators will ensure that at all times the facility maintains telephone service with which to immediately summon fire, police or other emergency personnel in the event of an emergency.

Weather Data

A weather station and windsock have been installed to adjust operations based on weather patterns. Back-up for weather conditions is obtained when required, from the two local school sites and their weather data gathering facilities available on-line.

Staff Training

Once all new systems are in place, staff will be trained on these systems, on the general principles of composting and on odour control. Training will be repeated when new staff is hired. Training records will be kept.

11.1(k) measures to protect the site and adjacent lands in case of fire, seismic disturbance, or flood

To prevent fire from breaking out during grinding, water will be added to wood to be ground.

All equipment is blown clean daily with the use of air compressor generated air flow to prevent fibers from building up and catching fire.

All piles are monitored daily with temperature probes to ensure piles remain at safe temperatures and do not present a fire risk. Any hot piles will be broken down. Water will be applied to increase moisture content where required. All rolling stock is equipped with fire extinguishers. In addition, a fire extinguisher is installed in the scale house, in the receiving area and in the process control room. Fire hoses will be maintained in proximity to all active processing/storage areas. Operator contact information will be maintained on file with local fire departments.

A fire hydrant is located across Fisher Road, approximately 100m from the site. In addition, the onsite water well and storage ponds maintain adequate water supply year-round to effectively extinguish fires. In the event of a fire, the local fire department and CVRD Manager will immediately be notified, and all measures will be taken to extinguish the fire.

Stockpiled materials will never be piled so high as to have the potential to become unstable and/or pose a risk to the site or adjacent lands in the event of a seismic disturbance.

The facility is located on a hillside and flooding is unlikely. Storm run-off is diverted away from active areas by means of berms and swales.

In the event of a flood, incoming deliveries of organic materials will be restricted or refused to keep immature feedstock from coming in contact with surface water. The sealed Bio-cell doors will remain closed to prevent water from contacting the Mixed Organics being composted.

11.1(l) the methods for containment and treatment of Runoff at the facility and the prevention of Runoff from the facility to adjacent lands

Non-contact run-off from the facility will be collected in a system of swales and infiltrated in an infiltration ditch or in accordance to any other approved method.

11.1(m) the actions that will be taken if ground or surface water becomes contaminated as a result of operations at the facility

As outlined above in section 11.1(e), results from the on-site ground water well sampling will be provided. Well water sampling will be conducted quarterly.

Issues remain regarding neighboring land-use and their potential for water contamination. The primary concern is groundwater. Therefore, FRR has and will continue to focus first on ensuring there is no path to the aquifer for potential contamination. To the extent this leads to having to address surface water quality, containment, or routes, there will be ongoing work on required strategies. FRR intends to work with CVRD and neighboring properties on this issue.

CLOSURE AND DISCLAIMER

This operations plan was prepared and updated by Timmenga & Associates Inc. of Vancouver BC, to support the license application of Fisher Road Holdings Ltd. of Saanichton BC. Timmenga & Associates Inc. has accepted the appointment of Qualified Professional for the composting facility to be licensed. The role of Qualified Professional is limited to what is outlined in OMRR and CVRD Bylaw 2570, and includes composting systems lay-out and pollution prevention.

The findings and recommendations in this submission are based upon data and information obtained during a site visit and interviews with the original and new owners of the site and recycling operation at the time of a site visit and on the basis of information provided to us by the client. We have relied on good faith upon the representations, information and instructions provided by the client and others concerning the facility and its operations. Accordingly we do not accept responsibility for any deficiency, mis-statement or inaccuracy contained in this submission as a result of mis-statements or omissions of persons providing information to us.

This submission was prepared by a professional working in the field of compost consulting and composting research since 1989. Timmenga & Associates Inc. is therefore qualified in the non-engineering design, assessment and monitoring of composting facilities, and has worked in this capacity for several facilities across Canada.

The work provided by Timmenga & Associates Inc. is non-engineering in scope and is based on pollution prevention and compost operations. Any work that requires engineering design including but not limited to that of buildings, equipment, storm water apertures, or any other devices, must be referred by the client to engineering professionals qualified for such fields of practice.

This submission has been prepared to meet the composting standards as outlined in the OMRR.

Timmenga & Associates Inc.

Per

Hubert Timmenga, PhD., P.Ag., CAC
President