READER PLEASE NOTE: This Web Access version of the original Report is for discussion only and is not to be used for planning and design purposes. The planning and design of community agriculture systems is a unique activity requiring the expertise of specialists in this field.

Black Creek Urban Agriculture Project

Operational and Economic Feasibility

June 2004

"Organic farming seeks to create ecosystems that achieve sustainable productivity and provide weed and pest control, through a diverse mix of mutually-dependent life forms, through recycling of plant and animal residues and though crop selection and rotation, water management, tillage and cultivation. Soil fertility is maintained and enhanced by a system which optimizes soil biological activity as the means to provide nutrients for plant and animal life as well as to conserve soil resources."

Consumer and Corporate Affairs Canada

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Executive Summary

The Black Creek Urban Agriculture Project (BCUAP) is a major step forward in the practice of organic urban agriculture in Canada. The project simultaneously provides local organic produce, employment opportunities, meaning social programming and protection of the local environment. Economic self-sufficiency was an important consideration in designing the farm landscape. However, many other considerations also played a part, including a need for crop diversity including perennial and woody culture, the need for a multi-functional main building for education, produce distribution and retail sales, a focus on providing meaning social programs, and protection of existing naturalized areas.

This report focuses on operational and economic feasibility. It identifies potential gaps in project needs and suggests ways and means to address such gaps. Often, farm operations and economic reality are closely associated such that the quantity and quality of operations has direct economic consequences.

Perhaps the single largest physical constraint is size of the currently available land area. Looking at the project purely from the point of economic self-sufficiency and land-use production yields, it is estimated that the proposed intensive cultivation area of 4.23 acres would only provide vegetables for about 254 people for approximately 26 weeks. A reasonable level of economic self-sufficiency seems to be achieved when feeding about 800 people for the same time period, which requires about 13.3 acres. Some or all of the proposed border areas, comprising some 2.2 acres could feed another 132 individuals, but this would come at the expense of not establishing long-term edible woody borders which also provide valuable visual screening, beneficial insect and bird habitat, and production diversity. Clearly, some additional cultivated land is needed, up to 9.1 acres preferably in close proximity to the subject lands, if organic food production is to be the main generator of economic return.

Many other ways and means to supplement farm income are suggested which involve direct and indirect (wholesale and retail) sales relationships, and providing a full slate of social services including fee-based educational workshops and seminars. The economic model proposed herein, although based on a typical farm business model, supports vertical economic integration through materials and services diversification. Value-added processing is considered an effective means to deal with surpluses (eg. making jams and jellies), or to work with materials close at hand (eg. selling excess compost or specialized soil mixes), that can create additional income and provide employment. Finally, the importance of being frugal and entrepreneurial, creative and adaptive in keeping costs down and income up should be emphasized. Every investment needs to pay off, and offering no salary , or a base salary linked to bonuses may provide the necessary incentive to be fiscally responsible.

A farm business plan was beyond the scope of this project, however an initial listing of likely income and expenses is offered in Table 1. Table subsections 1.1 - 1.3 show that the farm in its proposed form would basically run as a break-even operation. This is not without substantial additional outside capital injection totaling some $ 715,350 over five years, listed in subsection 1.4. Creative funding arrangements, cutting down on expenses and working only with priority items listed in Drawing M3 and Table 1 may be part of the total economic management of this project. The project team in consultation with other major stakeholders including the project Subcommittee will be responsible for setting future direction and economic goals for this project. Staffing arrangements are discussed, which focus on having one farmer or one farm co-ordinator and one or two 'apprentices' as lead hands. Other workers and volunteers are brought in on a seasonal basis.

This report includes Drawings M1 Existing Conditions, and M2 Removals. M3 shows all of three proposed phases over a five-year plan development period. Appendix A lists Contacts and Sources of Information, Appendix 2 offers Operational Guidelines, and Appendix 3 contains supplementary information.

Black Creek Urban Agriculture Project

Operational and Economic Feasibility

1.0 Project Overview

1.1 Social and Environmental Context

The Black Creek Urban Agriculture Project (BCUAP) is a major step forward in practice of organic urban agriculture in the Greater Toronto Area of Ontario. As such this project represents a further realization of the broader social goal of environmentally-responsible sustainable living. The landmark TRCA report titled Urban Agriculture Project, 2003, amply justifies this project in institutional, social and environmental contexts. This report compliments the TRCA 2003 report by providing a practical conceptual framework for operational and economic management of two parcels of land, totaling 11.6 acres that make up the initial stage of the Black Creek Urban Agriculture Project.

The basis for design and management of an urban agriculture necessarily rests on organic practices and application of permaculture principles. Organic production systems are inherently healthy; based on ecosystem nutrient recycling, composting, and enlightened tillage, that avoid use of petro-chemical inputs. Permaculture is a design philosophy that builds energy efficiency, wise resource use and both personal and community awareness into sustainable, long-term land management systems.

Organic urban agriculture speaks directly to living more sustainably by helping to:

- diminish the 'ecological footprint' of food by producing healthy, good tasting food locally, without use of petro-chemicals, with minimum transportation requirements,
- reduce green house gas emissions and improve air quality as biologically active systems, that also close waste loops by recycling organic wastes and rainwater,
- promote personal well-being, cultural expression, social discourse and understanding of natural processes by the very act of growing, marketing and distributing food from local sources,
- provide local employment, significant learning and skills development opportunities,
- protect pockets of good farmland, and from a land-use planning perspective helps to retain land use diversity and biodiversity, that also act as a buffer for natural areas, and as such is entirely consistent with principles of Smart Growth and control of urban sprawl.

These and other related benefits are articulated more fully in the TRCA Urban Agriculture Project report.

The organic market garden model proposed here is flexible in terms of production, marketing and distribution of food - which may be by CSA shares, wholesale, retail or direct to consumer, market sales, donations or any number of other means. Note that CSA, or 'community supported agriculture' is just one model where a farmer gets paid up-front at the beginning of the season, which entitles the purchaser to a 'share' or portion of the produce on a weekly or twice-weekly basis, typically about 24 weeks duration.

Economically, the farm is organized to run in a 'nearly' self-sufficient mode. This acknowledges the reality that most organic market garden farms, in order to be economically viable, supplement their revenue through off-farm employment, or other farm operations such as dairy, cattle, a farm store, direct market sales, or as in the case of NGOs or publically-run projects grants, donations, sponsors, foundations, etc. The number of choices to supplement land-based revenue is large and will ultimately be determined by needs or wishes of the farm operators and the local community. Thus this project can serve as a model for future adaption and use by other organic producers within the GTA, on either private or public land, recognizing that economic self-sufficiency is likely not possible by sales of organic produce alone. The environmental and social benefits of CSAs in context of sustainable living are considered to be great, and for these reasons warrant creative solutions to income diversification.

In this report, the BCUAP land are also be referred to as Black Creek Farm, or BCF.

1.2 Agricultural Ecosystems

Traditional mixed-use farms have always been managed, in one manner or another, as production ecosystems. Viewed as an 'ecosystem', known inputs (solar energy, water, nutrients, minerals, fuel, equipment, soil amendments, seed, animals, etc.) and outputs (grain, forage, hay and straw, vegetables, fruits, nuts, animals that provide eggs, milk and meat - and manure with spent bedding) are balanced through processes of recycling nutrients back to the land. Producers (plants) and consumers (animals and people) ultimately rely on decomposers (bacteria, algae, fungi, actinomycetes and micro- and macro-invertebrates) in the soil. *What is crucial in organic systems are healthy biological processes and recycling of water and nutrients that are managed in a stable and balanced production ecosystem.*

Use of petro-chemical inputs over the last 80 years or so, in form of synthetic pesticides and herbicides, hormone enhancers, and antibiotics, etc., resulted in astounding gains in quantity of production and control of pestilence, but often at the expense of widespread environmental degradation of soils, water, air and some production quality. Today, biotechnology represents a further challenge that results in a bewildering array of environmental, social, moral, ethical and economic concerns.

Contemporary organic agriculture is not a return to old-fashioned farming methods, but is farming based on ecological principles. This involves not only *avoiding* use of petrochemical-based and questionable biotechnological inputs that can degrade water and soil, disrupt ecosystem dynamics, and contaminate gene pools, but also *building healthy relationships* between trophic levels using *proven organic techniques and applied ecological principles.* Organic agriculture recognizes that 'everything is connected to everything else', that **ecosystem diversity controls pests and disease**, and that **nutrient recycling and composting** is fundamentally necessary for ecosystem health and optimum soil fertility. **Crop rotations** play a central role in controlling pests and disease and optimizing soil fertility, **water** is carefully managed, and proper **tillage and cultivation** based on both technique and timing are fundamentally important in managing the farm production ecosystem. The laws of biology and principles of ecology on the farm, or anywhere, do not change but our understanding and application of them continues to evolve. Organic agriculture begins with the management of healthy, productive, biologically-active soils and the conservation of soil resources.

Organic operations recognize that:

- healthy, biologically active soils are the primary resource needed to establish an organic agriculture,
- nutrient, mineral and biological management through proper recycling of compost, animal wastes and/or green manures is central to maintaining healthy, productive soils, clean and safe water and air,
- the proper use of farm animals, large and small, often has a positive effect on farm operations,
- crop diversity, strategically planned and rotated helps to control weeds, pests and disease, and gives rise to a healthy 'permanent agriculture' that can include annual intensive production, perennial vegetable beds, green manure crops (fallowing), greenhouses, orchardry, berry and nut culture, apiculture, and supporting habitat for beneficial insects and birds. The farm ecosystem may be further diversified through aquiculture (fish) and mycoculture (mushroom production), season extension shelters, enhanced organic composting, and nutrient recycling regimes that use soil mixing facilities. Or, the farm can be diversified along more traditional lines that emphasize fiber or biofuel production, hay, grain, and straw, and pasturage,
- the adjacent natural environment is protected and managed according to accepted principles of bioregional ecosystem management, and
- people who contribute receive both material sustenance and social benefits that build a 'permanent culture' on the land. Social activities revolving around teaching and learning,

research and education, on-farm experience and related employment including value-added processing, marketing and distribution, and opportunities to express cultural identity, eg. in community kitchens, work bees and workshops should also be part of farm operations.

A recommended design for establishing an urban agricultural use on the subject lands is offered on **Drawing M3, Sustainable Farm Master Plan.** It focuses on the basics of building healthy soils through nutrient recycling to produce a diverse array of organic crops. Adequate infrastructure in form of buildings, parking and servicing is also suggested. A few small animals, chickens, ducks or rabbits for the most part, with perhaps a goat and two pigs during the active season, are an optional but highly desirable component on this 'farm ecosystem'. Animals may be purchased and sold at the beginning and end of the traditional growing season, or they may be borrowed, lent or exchanged through other animal care-givers or organizations, or kept over winter. Animals add pizzazz, diversity, interest and nutrients to farm operations.

The project is divided into three stages or Phases of implementation. **Drawing M3** shows that elements 1 - 16 fit into Phase I, elements 17 - 23 fit into Phase II, and elements 24 - 27 fit into Phase III. Actual needs and circumstances however may permit variations within this sequence, with appropriate budgetary adjustment. Phase III elements carry the Sustainable Farm model further by including a more diverse array of inputs (brewery and farm animal wastes) to produce more diverse outputs (mushrooms, aquiculture, i.e. fish) through more diverse faunal pathways (red wriggler worms, fish and farm animals). This elements can be implemented right away, or can be retrofit in whole or in part any time after the project is successfully up and running.

2.0 Operational Feasibility

2.1 Building Capacity

Every organic market garden has limitations that can be improved, or put another way, has opportunities to build production capacity. This section identifies some opportunities for BCF.

2.1.1. Bio-Physical

Among bio-physical considerations for organic agriculture on the subject sites are micro-climate, soils and hydrology, and urban atmospheric contamination.

The production sites reside in the 6a/6b climatic zone and as such are very conducive to growing a variety of vegetables, fruits, and nuts. Improvement in microclimate growing conditions have been incorporated into the site plans as wind breaks and coniferous hedgerows. Orientation of intensive growing beds are generally east-west to catch sun. Various elements such as row covers, greenhouses or polyhouses, including movable greenhouses, should play an important role in providing vegetable sets and extending the growing season. Some of these structures have been included in Drawing M3, and should be used to get an early start on production and demonstrate potential of four season harvests.

Soils at the Jane Street site are a clay loam. A soil test report for this site is included in Appendix B. Essentially, the soils are quite fertile. However, such soils can often have a limiting capacity for proper drainage and are easily compacted when wet. Given such conditions, it will be important to:

- avoid deep tilling of soil resulting in disturbance of B horizons, i.e. lightly till surface layers only in drier, not wet, conditions, consider only one initial shallow (6" depth) turning of the soil,
- avoid using rotary tillers that may glaze and harden subsurface soil layers, i.e. use chisel plow, low-till and discing techniques,
- avoid use of heavy machinery, resulting in soil compaction, especially during wet conditions, i.e. use smaller machinery during dry or semi-dry conditions only; this includes activities during site clearing where wood chipping and tree spading may be carried out,
- consider non-mechanized site clearing techniques such as controlled burn(s), girdling, continuous cutting, or concentrated salt and vinegar solutions as an alternative to 'Round-up',

- build organic matter content in the soil and improving soil structure and drainage by incorporating copious amounts of organic matter into the soil, carrying out an intensive composting program, rotating crops according to accepted organic practices, and growing green manure crops for incorporation into the soil, years in advance of actual cultivation, if possible.
- improve the mineral composition, available nutrient complex, and microorganism population diversity by carrying out a continuous comprehensive soil testing and improvement program.

Tile drains may be needed if soil saturation persists into the growing season. However, emphases should first be placed on organic techniques to increase organic matter and improve soil texture.

Urban atmospheric contamination, including air-borne road salts and other particulate contamination can be elevated by:

- planting coniferous wind breaks and multi-use hedgerows as recommended in Drawing M3,
- maintaining a high degree of biological activity in the soil, by keeping organic matter content high and soils covered from direct exposure to sunlight through mulching, growing green manure cover crops and low-till techniques. These techniques maintain soil structure and assist with rapid breakdown of both organic and in-organic compounds.

2.1.2. Location and Size

A total of 11.6 acres of land in two separate land parcels are included in this study. The land near Jane St. and Steeles Ave. accounts for 8.8 acres. The Rockcliff Service Yard in the old City of Toronto has 2.8 acres of land for use in the BCF. Upon ultimate development, the *total cultivated* area of proposed intensive row crops in all phases including any fallow rotation areas within both sites is 4.23 acres. This leaves about 2.20 acres in proposed perennial vegetable crops, orchard and cane fruit border areas, a small paddock, permanent and/or movable green houses, and about 5.17 acres in other service uses: buildings, parking, farm lanes, other access routes of various kinds, two childrens' gardens, and natural wooded buffers. The above figures are based on the ultimate proposed use of Jane St. shown in Phases II and III of Drawing M3. The historic Braeburn home and its landscape comprising 1.0 acre are not included in this analysis.

It is generally accepted that economic self-sufficiency is approached when enough produce is grown to feed about 800 people (400 adults and 400 children, or 600 adults). This equates to about 200 full CSA shares. If on average one acre feeds 60 people for 26 weeks, then about 13.3 acres of intensive production including rotation areas need to be in cultivation. Some larger CSAs in the U.S. report producing up to 500 shares, that fully need about 33.3 acres in intensive cultivation and fallow for intensive cultivation. This scale of operation tends to be economically self-sufficient. The relatively small size of the intensive cultivated area, 3.76 ac. of intensive row crops at Jane Street, and 4.23 ac. for both sites in total, suggests that food for only about 254 people or the equivalent of that much food could be produced by the proposed intensive areas. This includes areas in fallow rotation. It is quite acceptable to produce food for 254 people, and it may take 2 to 3 years to fully cultivate this amount of land. This also suggests it may be desirable to bring additional intensively cultivated areas on-line in future to more successfully demonstrate economic feasibility, i.e. economic self-sufficiency. This is of course notwithstanding the common practice that almost every farm, public or private, finds it necessary to supplement its income from other sources than intensive production. *Some practitioners suggest that direct market garden sales provide more economic return than seasonal CSA share sales, in which case the land requirement for economic self sufficiency would decrease slightly. Careful production and sales records per unit area need to be kept in order to determine future land requirements relative to economic sustainability.*

One way to easily increase intensive cultivated area is to simply convert all or part of the

proposed 2.20 acres in perennial vegetable and orchard areas to intensive cultivation. However, this should be considered only if diversity of perennial and orchard crops, and the extra income they potentially provide, is knowingly reduced in favour of higher income intensive crops. This may be justified if areas for other less intensive crops can be found later, elsewhere, or the BCF develops a market niche in certain intensive crops at the expense of others. Remember however, that crop diversity plays an important role in disease and pest control and is an important for local market self-sufficiency. Another way to effectively increase cultivated area is to use more land normally held in fallow rotation. Again however, this not advisable since organic rotations do best with full fallow years, rather than growing green manure catch crops between continuous marketable crops. This measure should only be practiced with an aggressive composting and nutrient recycling program backed up by years of soil tests that prove long-term, stable soil structure and increasing soil fertility. Finally, augmenting farm income through other means listed in 2.1.5. may prove to be a better approach, particularly if finding additional land to increase the number of shares is difficult.

2.1.3. Future Land Requirements

Assuming that feeding 800 people is a suitable target for economic self-sufficiency, and that about 254 people can be fed on 4.23 acres, it is estimated that feeding another 546 people would require an additional 9.1 acres of land in intensive production or land in rotation for intensive production. The ratio of additional 'supporting' land area for paddocks, edible borders, windbreaks, a pond, natural buffers, and service uses including access and buildings : actual intensive production area in this project is about 2.7 : 1.0. If this ratio was maintained in bringing additional properties into use, a total of 13.33 acres would need to be in intensive production or fallow rotation, and the total project land area - including all other uses such as orchards and access - would be about 36.0 acres, and increase of 27.2 acres over the existing area.

These numbers are based on many assumptions and a large number of variables such as cultivation techniques, types of crops grown, site characteristics, type of marketing i.e. direct sales or CSA sales, social programming (a need for community and children's gardens, etc.), level of infrastructure (the need for public access), use of season extension techniques, land for environmental buffers, etc.

It is likely that some amount less than 27.2 additional acres would suffice, particularly if public access was not needed, large natural buffers were not necessary, very intense but sustainable production practices were carried out, and a production, harvesting and marketing strategy adopted that optimized economic return. That is, if the land is open and the farm is run largely from a business perspective.

Note that the 1.0 acre Braeburn property north of the Jane Street site would contribute little in the way of actual production. Strategically however, its function is to absorb and expand service uses which are minimal and somewhat constricted on the Jane Street site, and to serve as a project office and possibly as a residence as a payment perk for the farm manager, interns or others. The historic character of the property also lends it self very well to related, adjacent agricultural use.

Other lands brought into the project would not necessarily need water as the Jane Street site now has, but could be used for growing lower-maintenance, lower resource input, space-consumptive crops such as trailing vines of squash, cucumber and pumpkin, and root crops such as potatoes, beets, turnips, garlic, etc., and perhaps even pasturage and/or hay for farm animals, grains or corn. Such sites could function as an important extension of the project that take pressure off Jane Street to produce less material needy and more space-consumptive crops. However, it is very desirable to have additional intensive cropping land in production, in addition to the 4.23 acres currently available. It would also be desirable to have associated sites in close proximity to the main Jane Street site, to minimize road safety hazards in moving agricultural equipment between sites, and to gain efficiencies in moving harvests to a central wash station and produce distribution/pick-up location.

Notwithstanding the above, finding and using more land is desirable not just from the point of view of growing additional food. Particularly if greater self-sufficiency is the goal, and animal husbandry is taken seriously, additional land area would be needed to produce bio-diesel (about 16 ac./small

tractor/year), hay (about 1.0ac/cow/year), pasture (about 1.0ac./cow/year), plus additional land for feed grains for cows, horses and other small animals. The total production land area requirement for the BCF for intensive crops, fallow, orchards, including hay, pasture, grains, and bio-diesel, could easily be 40 to 50 ac./year. A total acreage of 60 to 90 or more acres could easily be used when Including supporting areas for pathways, tractor turn-arounds, access routes, buildings, protected natural areas, etc.

In the end, the current total land area of 11.6 ac. is sufficient to begin the project. The reality is that the total acreage required to approach economic self-sufficiency, that is to grow up to food for 800 people for 26 weeks is not present on the current two sites. Decisions on *whether or not*, and then *how* to demonstrate economic self-sufficiency will need to be made in time. *Over and above economic efficiencies gained by having larger areas in production, optimum farm size and overall project success may also be defined by other social, cultural and other environmental factors.*

The following land area : number of full food share ratio existed in 2003 for the following southern Ontario CSAs:

- Everdale: 7.0 ac. cultivated and 5.0 ac. in rotation for 180 full shares, or 15 shares/acre
- St. Ignatius: 5.5 ac. cultivated and 0.0 ac. in rotation for 85 full shares*, or 15 shares/acre
- Four Fold Farm: 7.5 ac. cultivated and 2.5 ac. in rotation for 100 full shares, or 10 shares/acre.
- Guelph Line, about 10 ac. cultivated for 120 full shares, or 12 shares/acre.

* St. Ignatius reported 125 'not quite' full shares, suitable for 2 adults. A full share is generally for a family of three adults or two adults and two children. Part shares are often quantified for two adults only. Everdale produces 75 full shares plus a wholesale market that equals another 105 full shares.

While some proponents of CSAs suggest that a yield of 25 shares/acre can be expected, the above mean is 15 shares/acre. Cultivated areas can be divided into leafy greens, root crops and herbaceous fruits. Fluctuating ratios near 1:1:1 for these crop types are not uncommon. Rotations can include flowers with a fallow cover crop, or just a cover crop. More on rotations is found in section 2.2.2 of this report.

In practice, yields of amount of produce/acre vary greatly due to many factors such as land productivity, types of crops, preferred cropping practices (eg. hand vs. machine), density of plantings, soil management, cover cropping practice, size of share, access to irrigation, harvest schedule, and vagaries of climate and weather. Even the equivalent of 200 full shares at a full price of $ 600 would gross only $ 120,000 per year, barely enough to pay wages for two people, let alone all other farm expenses. Therefore, additional income, discussed in section 2.1.5 below, is likely necessary.

2.1.4. Education and Experience

Organic market garden farming is a highly specialized and evolving profession that requires integration of organic horticulture with intensive row crop techniques, orchardry, and small animal husbandry. Additional experience in apiculture (bee keeping), aquiculture, mycoculture (mushroom production), may be desirable to fully diversify and demonstrate a high degree of production ecology.

At minimum, a successful organic production operation will require practical and thorough understanding of such topics as soil management, composting, crop rotations, tillage and cultivation for planting, weeding, and nutrient recycling, mulching, water management, plus pest management and control, harvesting, marketing, seed saving, value-added processing, and perhaps special skills in apiculture and aquiculture, not to mention a need for organizational, mechanical and people skills. While performance of this work is based on age-old concepts and techniques, much of this knowledge needs to

be relearned or adapted to modern organic farming principles and techniques. More importantly, such knowledge continues to evolve and grow as experience within the larger CSA / organic farming community evolves through learning and sharing with other farmers.

Specialized training in related fields in order to apply new knowledge, and regular attendance at educational conferences, such as the Guelph Organic Conference held at University of Guelph during the last weekend of January of every year, for example, are invaluable in building a specialized body of knowledge and training, particularly for the farm manager and farm lead hand or apprentice(s). Research links or partnerships with other educational institutions such as University of Guelph and/or York University (in the immediate neighbourhood) should be investigated, and realized in order to advance understanding and practice of urban organic market farming.

It is very important that the farm manager and lead hands i.e. 'apprentices' or 'interns', be highly trained and experienced. Succession through job positions may be based on years of training where new people are brought into the profession through several years of dedicated apprenticeship. People moving out of responsible job positions would be expected to train their replacements before leaving, in order to ensure continuity in farm operations and a high level of continued service to the community.

2.1.5. Economics

This section not available for web access.

2.2 Description of Production Areas

As noted above two properties have been identified for establishment of the Black Creek Farm. One parcel, totaling 8.8 acres, is found on TRCA lands near Jane and Steels Ave. in North York, and the second parcel includes 2.8 acres of the Rockcliff Service Yard in the old City of Toronto, for a total of 11.6 acres. Each area has been programmed based on its intrinsic character, and its ability to contribute to the whole project. Over time this emphasis is expected to evolve to greater complexity and stability as the whole project matures; takes on challenges, possibly assumes more land, and nurtures more people.

Each of the two initial sites are described in terms of its Location and Size, Characteristics and Site Preparation, and Function.

2.2.1. Jane Street

Location and Size

This section not available for web access.

Characteristics and Site Preparation

This section not available for web access.

Function

This section not available for web access.

2.2.2. Rockcliff

Location and Size

This section not available for web access.

Characteristics and Site Preparation

This section not available for web access.

Function

This section not available for web access.

2.2.3. Black Creek Pioneer Village

Location and Size

This section not available for web access.

Function

This section not available for web access.

2.2.4. Other Areas

This section not available for web access.

2.3 Strategy and Phasing

2.3.1 Implementation Recommendations and Priorities

This section not available for web access.

Table 1, Five-Year Budget and Cash Flow Projection in section **3.2** below is a listing of activities and elements and their estimated costs for project implementation for the next five years, or whatever time period(s) the partners are comfortable working in. This Projection is essentially a priority list as well, since certain activities are listed earlier in the five-year time period than others. All items are ultimately deemed important.

This section not available for web access.

2.3.2 Human Resources and Staffing

This section not available for web access.

3.0 Economic Feasibility

3.1 Overview

This section not available for web access.

3.2 Business Plan and Timing

This section not available for web access.

See more specific related discussion on this topic in part 2.3.1. above.

3.3 Business Rules

When it comes to running the farm like a business, it may be prudent to develop some 'business rules' to help make economic decisions about which crops to grow or not grow. Of course, these are aids in making business decisions only, which must also be made in context of service to the community. Moreover, the dollar values placed on these rules are somewhat arbitrary - they have worked for one

producer in the U.S. in the past for market gardens sales only, not a CSA. If such rules are adopted for the BCF it will be necessary to set appropriate thresholds for this particular project based on several years of experience, knowing yearly gross income and the relative amount of income derived from each crop. While the actual dollar values should be adjusted, the following examples provide basic formulas.

1. $ 30 / HR. RULE

This section not available for web access.

2. $ 10,000 / AC. RULE

This section not available for web access.

- End of Report –

NOTE: Drawings posed independent of report.

Black Creek Urban Agriculture Project
Appendix A
Contacts and Sources of Information

Animals
Bees - Doug McRory - Stone Road RS 826-3595 email: doug.mcrory@omafra.gov.on.ca
Rare Breeds Canada tel 705 748-1643

Books
Canadian Organic Growers. Organic Field Crop Handbook. A & B Graphics, 1992
Lampkin, Nicolas. Organic Farming. Farming Press books, 1990, 2002.
Coleman, Elliot - many books on organic gardening including Four Season Harvest
Riotte, Louise - companion planting: Carrots Love Tomatoes

Bio-Fuels, Bio-Diesel, Bio-Gas
http://www.greenincubator.com/aboutbiodiesel/

CSA contacts
Everdale, Gavin gavin@everdale.org tel 519 855-6533

Hydroculture and Aquaculture
Ocean Arcs International http://www.oceanarks.org/
Fish - Silver Creek Aquaculture - Lou Marion 519 833-2559
Plants - Acorus Restoration - Paul Morris 519 586-2603 www.ecologyart.com
Ponds - Country side Aquatics - Eugene Gmitrowicz 905 655-3939

Ontario Ministry of Agriculture and Food (OMAF)
The OMAF web site is literally a cornucopia of information on all aspects of agriculture. Below are some target pages of relevance to the BCF project.

http://www.gov.on.ca/OMAFRA/english/busdev/facts/02-043.htm

Preparing Business Plans
http://www.gov.on.ca/OMAFRA/english/busdev/facts/99-011.htm

BMP's
http://www.gov.on.ca/OMAFRA/english/environment/bmp/series.htm

EFP
http://www.gov.on.ca/OMAFRA/english/environment/efp/efp.htm

Crops on the web
http://www.gov.on.ca/OMAFRA/english/crops/index.html

Organics
http://www.gov.on.ca/OMAFRA/english/crops/organic/organic.html

Organic Food and Farming Certification
http://www.gov.on.ca/OMAFRA/english/crops/organic/certification.htm

Hugh Martin
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Ontario Ministry of Agriculture and Food
1 Stone Rd W, 1st floor NW
Guelph Ontario N1G 4Y2
phone 519-826-4587
Fax 519-826-4964
email: hugh.martin@omaf.gov.on.ca

Ont Healthy Futures, 826-3281

Organic and Heritage Seeds (Ask each supplier about organic seed)
William Dam - near Ottawa
Johnny's Seeds - USA
Fedco - Maine, USA PO Box 520 Waterville, ME 04901 fax 207 872-8317
Threshold Seeds - Vermont? USA
Heritage Seeds - contact Seeds of Diversity Canada (SDC) tel 905 623-0353
www.seeds.ca
www.seedsavers.org
vegetable variety and seed saving catalogues
Bob Wildsong tel 519 886-7542
Garet Pitenger - heritage seeds and SDC contact tel 905 880-4848
North Toronto Green Community - Helen Mills 416 781-7663 cell 416 731-4582
BCPV - Denis Pollock

Other People and Organizations
Canadian Organic Growers (GOG) tel 1 888 375-7383 or 613 216-0741. www.cog.ca.
Ecological Farmers Associaiton of Ontario Box 127, Wroxeter, ON N0G 2X0
Resource Efficient Agricultural Production tel 514 398-7743
Organic Crop Improvement Association tel 905 659-2069
Todd Leuty - OMAFRA, Fergus. Agricultural Forestry. 519 846-3390
John Kort telephone (306) 695-5130 email: kortj@em.agr.ca. Prairie Farm Rehabilitation Administration, Shelterbelt Biologist, Agriculture and Agri-Food Canada. www.agr.ca/pfra/shelterbelt.htm

Soils
Hugh Martin - OMAFRA, Woodstock. Organic specialist on soils, biodynamics?, etc. (519) 826-4587 email: hugh.martin@omafra.gov.on.ca
Joe Scrimger - USA
Global Repair - Michael Morris 416 693-8976 (source unknown - check out first)
Soil testing OMAFRA 767-6226 x 6500 www.uoguelph.ca/labserv under anylit/sol and nutrient lab
95 Stone Road West, Guelph, N1H 8J7 8-5 M-F North Side of Stone Road Fire Station.

Vegetables
MOE tests soil for 11 heavy metals: arsenic, selenium, mercury, copper, cobalt, chromium, cadmium, lead, nickel, zinc, maligdimum. 1 800-265-8658, 826-4255.
Marie Webb - Food Safety Network - 1 866-503-7638 for lead, cadmium, mercury, arsenic
Food Share - Field to Table - 416 363-6442 x 25 Karine Jaoich research starting program Sept 03, in Laura Bermine's (co-ordinator's) garden 416 392-6654

Woody Plants see also OMAFRA FactSheets and many other publications at 1 Stone Road, Guelph.
Native Plants: Native Plant Resource Guide - Society for Ecological Restoration 905 641-2252 X 6494

Apples and Stone Fruits - Woodwinds - see attached catalogue tel 519 335-3749
- Siloam Orchards 905 852-9418
Ontario Fruit Testing Association - Vineland Station, Ontario tel 905 688-0990
Mushrooms and other Fungi - Dr. Dan Rinker - Vineland Station / U of G 905 562-4142 or 4197
Grapes and Tender Fruit Specialist - Ken Slingerland - Vineland 905 562-4141
Nuts - Grimo Nut Nursery, Niagara-on-the-lake 1-905 934-6887
- Rhora's Nut Farm and Nursery 905 899-3508
Small fruits and berries - Pam Fisher - OMAFRA Simco Office
- Strawberry Tyme see attached catalogue tel 519 426-3099
- Guesquire - Simcoe/Delhi?
- Ontario Berry Growers Assn. tel 905 649 2101
Kiwi vines - Northern kiwi nursery: 905 468-5013
Herbs: - Richters 905 640-6677
- Ontario Herbalists Assn. 1 877- 536-1509
Herbs: Ginseng, Goldenseal, - Todd Leuty 519 846-3390
- Medonte Forest Ginseng Farms 705 835-2920

Windbreaks
John Kort - Ag Canada - Prairie Research Station - Sask. Prairie Farm Rehabilitation Centre
Martin Newman - GRCA, Cambridge
Windbreak Technology, 1988. Ed. Brandle, J.R., et. al. Elsevier

Black Creek Urban Agriculture Project
Appendix B
Operational Guidelines

The following covers some operational guidelines for intensive organic food production in Canada.

Bed Widths and Row Numbers

This section not available for web access.

Crops and Crop Rotations

This section not available for web access.

Composting

Composting is a central part of the decomposer cycle within the integrated farm ecosystem. Composting involves the breakdown and mineralization of both plant and animal waste biomass into constituent parts, primarily effective and colloidal humus, that when applied back onto growing areas recycle essential nutrients, improve soil texture, CEC, moisture holding capacity, and deal with the abundance of farm wastes. Composting is an art and people who know how to compost well are often called master composters, who should be brought into the farm operations team. High rates of biological activity lead to spontaneous heat production which is desirable, but must be monitored and controlled. Composting must be done safely and effectively to reduce risk of disease transfer to humans and other organisms. Good compost can be bagged or sold in bulk for extra farm income. Most of it however should be used on site or shared between project sites.

Compost windrows can be formed and turned right on garden plot areas in fallow or rotation, so that the piles migrate around the plots to take advantage of percolation of rich substrates into the soil and presence of micoorganisims that boost soil health and fertility. Pigs can be used to turn piles seeded with grain corn. Clay minerals and micronutrients can be added to the compost as needed. Otherwise, initial composting can take place at selected sites which is then moved to secondary chambers where spontaneous heat production can also be used to heat greenhouses. Suggestions on the location of compost operations are made in Drawing M3.

Cover Crops and Mulch

This section not available for web access.

Small and Large Animal Husbandry

Organic production at any scale benefits from small-scale small animal husbandry. Chickens, turkeys, geese, ducks, and rabbits are commonly included in organic operations for benefits they provide in terms of pest and weed control, fertilizer, eggs or meat, some tilling of the soil, and even body heat for the greenhouse! Active-foraging chickens are common, which range on mowed grass or grass grazed by sheep. Chickens can be allowed for limited periods in production areas, but for the most part kept in a permanent coop or small movable houses on wheels, called 'chicken tractors' (see Appendix B), which are moved short distances every morning. Ducks may be favoured in smaller, more urban settings such as Rockcliff since they are well-behaved, quieter than chickens, provide superior slug control and a steady supply of eggs. Many breeds of ducks are available, each with its own virtues, such as Australian Spotted Bantams, Welsh, Harlequin and Indian Runner. Ducks are fenced out of small seedling areas

but provide excellent control of slugs in the 'buffer zone' between production areas and the outside world. Ducks are kept a night in permanent coops or more effectively kept in moveable mesh-bottom houses with wheels, similar to moveable chicken houses.

Larger farm animals also have a positive role to play. Sheep are beneficial for keeping range short for breeds of active-foraging chickens, such as White Rock, Dark Cornish, or Mottled Houdan, and turkeys. Sheep can be purchased as lambs in the spring, grazed during the poultry season and sold at the end of the year if desired. Horses can play an important role in providing 'horse power' to pull small farm implements for this size of operation, and more importantly provide an ideal soil amendment for general vegetable crops: horse manure mixed with straw bedding, applied at a rate of 20 tons/acre/year. One horse produces 15 tons of manure with bedding per year. Horses can be boarded for the winter as an alternative to year-round residency. Goats are excellent milkers and their otherwise rangy behaviour may dealt with through careful breed selection, such as Nubian. Cows are an integral component of most farms and an essential component for the operation of biodynamic farms. Pigs are excellent foragers and have been used to turn compost piles in some organic operations. Cows and pigs however have manure and other management needs that may embellish but potentially complicate this project's focus on intensive organic food production.

Tillage and Cultivation

This section not available for web access.

Table 1 - Five-Year Budget and Cash Flow Projection

This section not available for web access.

Water Management

Water management is another central activity that often falls into place on the well-managed organic production farm. Since 'water is literally everywhere', its management falls into several categories. These include the management of:

* solid and liquid livestock wastes in form of animal manure - which at minimum must be carried out according to new Provincial Guidelines from OMAF on this subject, and otherwise incorporated into composting operations,

* soil moisture in production areas, which is best managed in conjunction with soil texture, organic matter content, appropriate crop selection, field composting and mulching regimes, and judicious selection and careful use of water-conserving drip irrigation technologies,

* careful collection, storage and distribution of storm water from building roofs and ground surfaces that can be used for watering production areas (rain barrels or roof-collection cisterns and a small irrigation pond is included in Drawing M3). This pond is not large enough to replace use of municipal water for the entire project, but may be used to demonstrate such use within one or two production plots.

* careful collection, treatment, storage and distribution of greywater from buildings that can be used for watering production areas, or otherwise be treated on site (this may be further considered in the design of service buildings for the project) subject to municipal inspection and approval.

* the outfitting of 'smart' buildings with water-saving devices.

In some respects the management of water may be an indicator of how other valuable resources including nutrients, soil, animals and plants are managed in sustainable or permanent agricultural systems.

Weed and Pest Control

This section not available for web access.

Working Together

Often one grower will produce a bumper crop of one vegetable, or require some other crop due to some shortfall in production. This can initiate purchasing, selling or trading relationships between CSAs in order to satisfy customer demand and fulfill the needs of larger organic retail and home drop-off suppliers. Organic markets are stronger together than if they exist in isolation. Some experienced operators maintain that buying and trading between farms is the only way to go, and that growing all 40+ crops for your clients is both operationally complex and financially unsustainable. The BCF will have to experiment with how self-sufficient it wishes to become and forge partnerships with others and make adjustments in its crop repertoire over time.

Black Creek Urban Agriculture Project
Appendix C
Photos, Soil Test and Supplementary Information

This section not available for web access.

Photos and Diagrams not shown.

Animal tractors come in all shapes and sizes from cages and coops to small huts - but they all have wheels. From Gaia's Garden by Toby Hemenway. Chelsea Green, 2001.

Small animals play an important role in organic operations - in this case making valuable compost. From Gaia's Garden by Toby Hemenway. Chelsea Green, 2001.

C. Brad Peterson Environmental Management and Landscape Architecture
e-mail edc@sentex.net www.bradpeterson.ca

Mobile or movable greenhouses take may forms. This is an early, simple, and effective design. From Four-Season Harvest by Eliot Coleman. Chelsea Green, 1999.

One option for detail of end walls of mobile greenhouse.
From Four-Season Harvest by Eliot Coleman. Chelsea Green, 1999.

C. Brad Peterson Environmental Management and Landscape Architecture
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The First Harvest - Puffballs - From the BCF Jane St. site. Autumn, 2003

Mr. Puffball, having just seen the proposed BCF Jane St. lands, Autumn, 2003

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View of BCF Jane St. site. Autumn, 2003

View of BCF Jane St. site. Autumn, 2003

C. Brad Peterson Environmental Management and Landscape Architecture
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View of Rockcliff Service Yard area - Autumn, 2003

C. Brad Peterson Environmental Management and Landscape Architecture
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View of BCF Braeburn property. Autumn, 2003

View of BCF Braeburn property. Autumn, 2003

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