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Volume 1 – The “Plan”

Regional District of Kitimat-Stikine

**SOLID WASTE  
MANAGEMENT PLAN**

**December 1995**

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**TABLE OF CONTENTS**

**Page No.**

**LIST OF TABLES AND FIGURES**

|            |   |           |
|------------|---|-----------|
| <b>1.0</b> | <b>INTRODUCTION</b>                                 | <b>1</b>  |
| <b>2.0</b> | <b>PLAN POLICIES</b>                                | <b>3</b>  |
| 2.1        | GUIDING PRINCIPLES OF THE PLAN                      | 3         |
| 2.2        | REGIONAL DISTRICT'S PLAN OBJECTIVES                 | 4         |
| 2.3        | REGIONAL DISTRICT'S PLAN STRATEGIES                 | 5         |
| <b>3.0</b> | <b>IMPLEMENTATION</b>                               | <b>20</b> |
| 3.1        | DIVERSION TARGETS                                   | 20        |
| 3.2        | IMPLEMENTATION SCHEDULE                             | 22        |
| 3.3        | ADMINISTRATION AND JURISDICTION                     | 27        |
| 3.4        | STAFFING  | 29        |
| 3.5        | PLAN MONITORING                                     | 32        |
| 3.6        | WASTE DIVERSION CONTINGENCY PLANS                   | 33        |
| 3.7        | DISPUTE RESOLUTION PROCEDURES                       | 35        |
| <b>4.0</b> | <b>PLAN FINANCING</b>                               | <b>36</b> |
| 4.1        | PLAN COSTS  | 36        |
| 4.2        | PLAN FUNDING  | 36        |
| 4.3        | FUNDING FORMULA                                     | 42        |
| <b>5.0</b> | <b>OPERATING STRATEGIES AND REQUIREMENTS</b>        | <b>44</b> |
| 5.1        | LANDFILL SITING CRITERIA AND METHODOLOGY            | 44        |
| 5.2        | OPERATING REQUIREMENTS FOR FACILITIES               | 45        |
| 5.3        | LICENSES FOR WASTE MANAGEMENT OPERATORS             | 46        |
| 5.4        | MITIGATIVE MEASURES                                 | 46        |
| 5.5        | RISK ASSESSMENT CRITERIA FOR SETTING SECURITY BONDS | 52        |

**TABLE OF CONTENTS (Continued)**

|   | <b>Page No.</b> |
|---|-----------------|
| <b>6.0 COMMITTEES</b>   | <b>53</b>       |
| 6.1 PLAN MONITORING ADVISORY COMMITTEE  | 53              |
| 6.2 LANDFILL SITING ADVISORY SUB-COMMITTEE  | 53              |
| 6.3 FINANCIAL WORKING SUB-COMMITTEE   | 53              |
| <br>  |                 |
| <b>APPENDIX A - LANDFILL ACTION PLANS</b>   |                 |
| <b>APPENDIX B - DRAFT OPERATIONAL CERTIFICATE</b>                                   |                 |
| <b>APPENDIX C - DRAFT LICENSES</b>  |                 |
| <b>APPENDIX D - PLAN MONITORING ADVISORY COMMITTEE DRAFT<br/>TERMS OF REFERENCE</b> |                 |

**LIST OF TABLES AND FIGURES**

|  | <b>Page No.</b> |
|--|-----------------|
| <b>Tables</b>  |                 |
| Table 2-1 - Existing Landfills   | 16              |
| Table 3-1 - Solid Waste Stream Targets   | 21              |
| Table 3-2 - Proposed Implementation Schedule   | 26              |
| Table 3-3 - Jurisdictional Responsibilities  | 28              |
| Table 3-4 - Personnel Requirements   | 30              |
| Table 4-1 - Estimated Program Costs - 1995 \$  | 37              |
| Table 4-2 - Plan Benefits and Funding Participation Matrix                                 | 39              |
| Table 5-1 - Potential Environmental Impacts and Mitigation Measures: Recycling Facilities  | 47              |
| Table 5-2 - Potential Environmental Impacts and Mitigation Measures: Composting Facilities | 48              |
| Table 5-3 - Potential Environmental Impacts and Mitigation Measures: Transfer Stations     | 49              |
| Table 5-4 - Potential Environmental Impacts and Mitigation Measures: Landfills             | 50              |
| <br>   |                 |
| <b>Figures</b>   |                 |
| Figure 4-1 - The Funding Model   | 43              |

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## 1.0 INTRODUCTION

Under Bill 58, The Waste Management Amendment Act (1989), Regional Districts are required to develop and submit solid waste management plans on or before December 31, 1995. Such plans are to include measures that would permit the province-wide per capita weight of waste requiring landfilling to be reduced by 50% by January 1, 2000. These measures were to be based on the sequential hierarchy of the 3R's - reduce, reuse and recycle - plus recovery and residuals management. In 1992, Bill 29 further amended the Waste Management Act to expand the definition of municipal solid waste (MSW) to:

- include demolition, land clearing and construction (DLC) waste;
- expand the scope of solid waste management planning to include recyclable material; and
- provide new enabling authority that would allow Regional Districts to implement solid waste management plans without having to go to the electorate for direct approval.

In accordance with the requirements of the Waste Management Act of 1989 and its later amendments, the Regional District of Kitimat-Stikine (RDK-S) has completed Stages 1 and 2 of the Plan development. Stage 1 involved the following:

- description of the physical and political nature of the Regional District;
- documentation of the existing solid waste management system;
- development of the general options which could be used to help divert solid waste from landfills using the principles of reduction, reuse, recycling and recovery; and
- an assessment of existing landfills to determine their potential for further development within the Plan.

Stage 2 involved detailed examinations of the diversion options including:

- education and promotion requirements;
- reduction and reuse incentives;
- alternative recycling and composting programs;
- a preliminary evaluation of the economics of a waste-to-energy facility for the District of Stewart; and
- evaluation of alternative combinations of landfills and transfer stations that would maximize efficiency of residuals management within RDK-S.

In addition, Stage 2 included a preliminary development of a phased implementation plan for the recommended components of the Plan.

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Stage 3 has involved building on the information in the Stage 2 report and refining and/or developing the necessary implementation and monitoring strategies, draft operational certificate requirements and bylaw-related information to create a Plan under which the Regional District can control the fate of its solid waste while striving to achieve the appropriate waste diversion goals. The December 1994 Ministry of Environment, Lands and Parks (MELP) document, "**Guide to the Preparation of Regional Solid Waste Management Plans by Regional Districts**" (hereafter referred to as the "Guidelines") contains a list of the required elements of the Plan and has been used in the development of this Stage 3 report.

Once a draft Plan is prepared, it must be reviewed by the existing public advisory committee (PAC) and technical advisory committee (TAC), before being sent to the regional MELP Environmental Protection manager for review and comment. The final draft will incorporate any necessary changes and will then be prepared for review by the public. After incorporating any changes resulting from the public review process, the Regional District will approve the Plan in principle and submit it to the MELP for review and approval. Following a request from the Minister, the regional MELP Environmental Protection manager will forward the final review and recommendation for consideration by the Minister. If the Minister is satisfied that the Plan is in accord with the Act and the Guidelines, the submitted Plan will be approved by the Minister. The approval letter would direct the Regional District to consult with the regional MELP Environmental Protection manager regarding the issuance of the operational certificates that would be associated with the operation of the sites and/or facilities specific to the approved Plan.

The following sections describe the strategies and policies that make up the RDK-S Solid Waste Management Plan. Section 2.0 contains a description of the guiding principles, Regional District objectives, and the policies and strategies that reflect these principles and objectives. Section 3.0 discusses the considerations for implementation of the strategies in Section 2.0. This includes the implementation schedule, target diversion rates, administrative considerations, potential staffing levels and plan monitoring procedures. Plan monitoring and dispute resolution procedures are also discussed. Section 4.0 contains a summary of Plan cost estimates, and cost recovery mechanisms necessary for effective implementation of the Plan. Section 5.0 contains operating strategies and requirements required to implement the Plan. These include mitigative measures required to overcome impacts of facilities, landfill siting methodologies and criteria, operating requirements for facilities, licenses for operators and risk assessment criteria for setting security bonds. Section 6.0 contains specifics about the various committees that will be required to assist in implementation of the Plan. This includes the makeup and roles of the committees, including terms of reference. Detailed cost estimates are contained in Volume 2 of this Plan, under separate cover.

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## 2.0 PLAN POLICIES

### 2.1 GUIDING PRINCIPLES OF THE PLAN

Environmental guiding principles underlie all Plan policies and strategies and act as a guide and common base for making day-to-day decisions in the implementation stage of the Plan. Throughout the stages of the RDK-S planning process, guiding principles have been included in explicit and implicit forms. The final list of environmental guiding principles, as stated below, is based on the Stage 2 list and input from various groups within RDK-S.

- reduce the amount of waste generated to the greatest extent possible, through the 5 R's (in order of priority);
- ensure that waste is minimized in a most cost effective and environmentally safe manner;
- ensure that the remaining waste is disposed of in a cost effective and environmentally safe manner;
- ensure all individuals and businesses within RDK-S have access to information which will assist in making appropriate waste management decisions;
- ensure that the primary responsibility for waste is held by stakeholders (municipalities, institutions, businesses, etc.) and residents that generate the waste;
- ensure that all members of the public, to the greatest extent possible, have access to and benefit from the systems and facilities in the final waste management system.
- Plan implementation should permit flexibility so that the timing of implementation of Plan components can reflect the priorities and abilities of the RDK-S, its member municipalities and First Nations communities to finance and implement the Plan. Flexibility is also essential so that the RDK-S can choose to implement plan components either directly or through private firms or the non-profit organizations (NPO's) via a public proposal and/or tendering process.

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## 2.2 REGIONAL DISTRICT'S PLAN OBJECTIVES

Regional objectives are to be reflected in the specific policies or strategies of the Plan. During the development of the Stage 1 and 2 reports, it has become evident that the RDK-S has certain objectives for its Plan. These objectives include the following:

- Encouraging the Provincial and Federal governments to develop and implement programs that promote reduction and reuse including encouraging manufacturers to reduce, reuse and/or recycle wastes that are created through inefficient packaging.
- Cooperating with the Province and/or industry in the implementation and operation of programs such as the paint stewardship program that target the safe handling and disposal of household hazardous products (HHP), provided that the funding and liability responsibilities remain with the sponsoring industry.
- Minimizing undesirable waste handling and disposal methods, including littering.
- Providing reasonable access to recycling and disposal facilities to all residents and businesses within RDK-S.
- Targeting materials coming from institutional, commercial and industrial (ICI) sectors for diversion through reduction and reuse, recycling and composting.
- Controlling the wastes generated within RDK-S but not necessarily through the direct provision of RDK-S services, i.e. fostering the development of private sector and/or non-profit organization initiatives, where appropriate, including the contracting out of Plan components such as recycling and/or composting through a proposal request or public tendering process.
- Cooperating with adjacent regional districts when such cooperation is mutually advantageous.
- Maximizing the use of existing landfill capacity, where appropriate.
- Replacing any disposal facilities that will have exceeded capacity during the term of the Plan.
- Developing remedial closure plans for closed landfills, as may be required by the regional MELP manager.



- Designing, operating, closing and monitoring landfills and transfer stations in accordance with the MELP Landfill Criteria for Municipal Solid Waste or justified exemptions.
- Minimizing animal conflicts at landfills and transfer stations.
- Eliminating the open burning of municipal solid waste (including DLC), where possible.
- Developing a financial strategy for full cost recovery of the entire waste management system; including utilization of the user pay philosophy.

## 2.3 REGIONAL DISTRICT'S PLAN STRATEGIES

The following strategies and policies are based on the work completed in Stages 1 and 2 of the Plan and have considered the guiding principles and regional objectives in their selection.

### .1 Administrative Concerns

#### .1 Jurisdiction

This Solid Waste Management Plan, once approved by the Minister of Environment, Lands and Parks, gives RDK-S power to implement the policies and measures outlined in the Plan. The 1992 Bill 29 authorizes the Regional District to exercise control over solid waste management within its boundaries. This may include authorizing the operation and administration of programs and sites by municipalities and other groups within RDK-S. RDK-S will not take responsibility for any waste disposed of on the property on which it was generated. Collection of waste and other materials will be the domain of member municipalities and the RDK-S (for the electoral areas). With some exceptions, reduction and reuse, recycling, composting and residuals management will ultimately be the responsibility of the RDK-S. Existing landfill owners will remain as before. As landfills close, RDK-S will become administrators of the regional Residuals Management System.

This Plan was produced with the cooperation and input from its member municipalities, stakeholders in the waste handling industry, environmental groups and members of the public.

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## .2 Committees

*A Plan Monitoring Advisory Committee (PMAC) and, perhaps, some task-oriented sub-committees will be formed to help the Regional District implement and administer the Plan.* The PMAC will be responsible for ensuring that the waste management strategies are being implemented in accordance with the Plan, and that the target diversion rates are being accomplished. The PMAC would recommend alternate strategies to be implemented if targets are not being reached. A landfill siting advisory sub-committee (LSAC) could be formed to have input into the landfill siting exercise, to ensure that the outlined procedures are being followed, and that adequate public input is being obtained. The Financial Working Committee (FWC) from Stage 3 may be continued during the Plan implementation as a sub-committee that would review, on an annual basis, cost recovery mechanisms for implementation of the Plan. This would include determining how costs are recovered (user pay, taxes, grants and funding, tipping fees, etc) and from whom (Regional District, municipalities, senior government, industry, consumers, etc.) The LSAC and the FWC will report to the PMAC, which will, in turn, report to the Regional District staff and/or Board. More information on the committees can be found in Section 6.0.

## .3 Plan Review

*As per Section 36 (2) of the Guidelines, the Plan should be subject to a comprehensive review every five years to ensure that the strategies in the Plan are still appropriate for the changing demographics of RDK-S.* The reviews would be completed at the direction of the Plan Monitoring Advisory Committee.

## .4 Coordination with Other Groups

*RDK-S will encourage communication among all groups potentially affected by the Plan implementation, with the goal of coordinating efforts to the greatest extent possible.* These groups include the following:

- member municipalities;
- adjacent regional districts (including Bulkley Nechako and Skeena-Queen Charlotte);
- First Nations communities within RDK-S;

- operators of existing landfills;
- operators of existing recycling facilities and/or companies;
- the public; and
- other stakeholders.

## 2. Reduction and Reuse

*RDK-S shall formally encourage and insist that the Senior government develop and implement programs and policies which will encourage the reduction and reuse of waste materials.* The priorities that RDK-S sees as paramount to achieving its waste diversion targets include the following Senior government jurisdiction programs:

- communication and promotion, in the form of "Power Smart"-style commercials, sticker campaigns, mail-outs, etc.;
- changing values and beliefs;
- education and technical assistance, primarily to the ICI sector;
- Waste Exchange information, including expanding access and funding for the existing federal and provincial waste exchanges;
- continuation and expansion of environmental labelling, such as the existing "Environmental Choice" program, labelling for household hazardous products, labelling which identifies the percent packaging by weight, identification of the destination of a product or its packaging (bluebox or bluebag, composting, hazardous, landfill) etc.;
- removal or reduction of subsidies on virgin materials;
- green taxes and charges to encourage reduction of difficult or hazardous products, e.g., the new "ecofee" on household paint;
- development of product standards which will reduce the amount of material or virgin material which goes into certain wasteful products;
- required waste audits and reduction plans for larger companies;
- reduction of packaging through initiatives such as the National Packaging Protocol, labelling and standards;
- increased emphasis of packaging programs on reduction and reuse, versus recycling; and
- increased funding for life cycle analysis (LCA) to enhance the knowledge of which products are environmentally superior.

*RDK-S shall direct staff to develop and disseminate educational and promotional material to the public and to businesses on effective ways to reduce waste.* This would be done with the assistance of local recycling and environmental groups.

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Educational packages would be disseminated through various media (television, radio, newspaper) and also through mail-outs, Welcome Wagon and other community groups, etc. and would include information such as:

- informed consumerism:
  - choosing products with little or no packaging,
  - choosing non-disposable items,
  - choosing longer lasting items,
  - applying the "B.U.D." principle (i.e., Buy or Borrow only what you need, Use what you buy, and Dispose of what you cannot use in an environmentally responsible manner),
  - purchasing materials in bulk,
  - renting seldom used items,
  - refusing plastic shopping bags and carrying goods in a reusable bag owned by the consumer,
  - buying used items,
  - taking used items to reuse and repair stores, or charity organizations such as Salvation Army or Goodwill,
  - stopping junk mail deliveries to the home,
  - choosing products based on the materials used in the product or its packaging (lighter weight, single materials, renewable resources, etc.),
  - the use of backyard chippers/shredders to increase the diversion of yard waste, and
  - leaving mowed grass on the lawn (with the use of a mulching mower);
- information about backyard composting;
  - how to operate, trouble shooting,
  - types and costs of bins, advantages and disadvantages, and
  - building instructions for homemade compost bins,
- lists of reuse options for certain products and materials;
- lists of companies enabling reduction and reuse (scrap dealers, haulers, used product dealers, bottle depots, etc.);
- promotion of other RDK-S reduction and reuse programs;
- promotion of other RDK-S waste management strategies; and
- information on Provincially sponsored or instigated programs such as return facilities for paint, batteries, tires, waste paint exchanges, used oil depots, etc.

*RDK-S shall set tipping fees at regional landfill facilities to at least partially cover the costs of developing, operating, closing and monitoring the landfills. Other landfills in RDK-S but not owned by RDK-S may be required to match tipping fees with the closest RDK-S facility. Certain problem wastes may be charged a higher fee in an attempt to cover costs for handling and to reduce the quantity used. The lists of banned and higher-fee materials shall be reviewed annually by the Plan Monitoring Advisory Committee.*

*RDK-S shall implement certain material bans at specific municipal solid waste landfills in the Regional District. Material bans would reflect the regional recycling and composting systems as implemented, and could include materials such as:*

- old corrugated cardboard (OCC);
- white goods without CFC's removed;
- yard and wood waste;
- certain DLC waste, such as wood, gypsum and land clearing debris (unless the site is a DLC landfill); and
- quantities of recyclable/returnable materials such as cans, bottles, certain plastics, etc.

Some of the wood and yard waste will be chipped and used as mulch on regional and municipal properties. The remainder will be composted in windows with other organics.

*For all areas serviced by a formal collection service, RDK-S and its member municipalities shall, through the advice of the Plan Monitoring Advisory Committee, set limits on curbside waste at a specific number of specific volume cans or bags.*

*RDK-S shall work with the local school districts to promote and encourage curriculum changes with respect to waste management. A liaison will work closely in all the schools for the first few years of implementation, developing programs and assisting in education.*

*RDK-S shall establish in-house reduction and reuse programs. This program will promote activities such as:*

- use of ceramic mugs and other non-disposable dishes in place of Styrofoam and paper products;

- use of reusable coffee filters;
- double sided copying in reports and other office publications;
- use of electronic records and mailing;
- reduction of junk mail leaving and entering the office;
- smaller typeset for reports and correspondence; and
- reuse programs for paper.

*The above program will be encouraged in other government offices and private and public organizations within the RDK-S through the education program.*

*RDK-S shall require segregation of certain materials at all landfills in the Regional District. Materials to be set aside may include items such as truck tires, large metal objects, white goods, plastics, cans and bottles, auto hulks, and wood. In addition, community reuse areas will be encouraged, although not required. Community reuse areas would involve setting aside any household items which could be feasibly reused and that would not constitute a health hazard. Controlled salvaging of separated primary materials (metals, wood, etc.) will be encouraged. Scavenging from the active tipping face by members of the public would be banned.*

*RDK-S shall encourage the participation of local recycling and environmental groups, such as K.U.T.E. and the Three Rivers Recycling Society, in reduction and reuse education and promotion through grants and other funding support.*

*RDK-S shall explore and encourage opportunities for private sector and non-profit society involvement in solid waste management.*

*RDK-S may assist in advertising and would encourage participation in materials and waste exchanges available to industry. Exchanges currently available include:*

- BC Waste Exchange, Vancouver
- Pacific Materials Exchange (Spokane)
- Industrial Metals Exchange (Seattle)

### 3 Recycling

*RDK-S shall include education and promotion as high priorities to encourage participation in the regional recycling program. The mechanisms will be similar to the reduction and reuse education and promotion programs.*

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*RDK-S shall develop an in house procurement program for recycled content products.* The procurement program will utilize practices such as:

- purchasing paper with a stated minimum post-consumer recycled content;
- where recycled content paper is not available, report stock should be recyclable and preferably unbleached;
- purchasing waste bins of recycled content that are smaller than typically used; and
- purchase plain paper fax machines as opposed to thermal paper fax machines.

*Member municipalities and other private and public organizations will be encouraged to develop procurement programs similar to that of the Regional District.*

*RDK-S shall encourage its member municipalities to develop bylaws requiring new commercial, institutional and multi-unit and multi-family developments (greater than four units in one building) to include adequate space for integrated waste management.* The space should include areas for storage of waste, recyclables and compostables.

*RDK-S shall make every effort to recycle as many materials as possible, to the extent that economics does not prevent their collection and processing.* The Regional District will have a minimum set of materials that it will accept in its recycling depots, assuming markets allow. These materials will include the following:

- all grades of paper;
- all grades of cardboard; and
- aluminum beverage cans.

Other materials will be accepted as markets become available or are strengthened. These may include the following:

- specific plastics, e.g. HDPE, PET, etc.;
- commingled plastics;
- tin-plated steel cans;
- glass;
- textiles; and
- rubber.

However, no materials will be accepted by the regional recycling program until a bonafide market has been secured for that material. This will prevent the costly storage and ultimate disposal of quantities of "recyclable" materials without markets.

*RDK-S shall continually search for new and better markets for materials.* This may be done either solely or as a marketing cooperative with adjacent regional districts. Marketing may be done through recycling brokers or direct to markets, as appropriate for each material.

*The RDK-S shall develop a drop-off depot system for recyclables.* The depots will be located in the Kitimat-Terrace-Hazelton corridor, with a number of bins in each community based on the anticipated quantity of materials. The number of bins required will be calculated based on a fill rate of one week. The bins could either be segmented 30 cu. yd. roll-off containers or separate materials bins. They would be located in high use areas (malls, plazas, gas stations, grocery stores, etc.). The program would target the populations in the corridor, but the bins would be available to anyone. Residents in more remote communities such as Stewart and Highway 37 north would be encouraged to bring recyclable materials with them when they travel into the corridor. Development of the appropriate central processing facility would be the responsibility of RDK-S, either directly or through an RDK-S call for proposals and public tendering process. Haulage of materials to a central processing facility will be contracted to a private hauler.

*RDK-S shall encourage the private and non-profit sectors to pick-up office paper from commercial establishments and deliver this material to an appropriate recycling facility.*

*Under bylaw, RDK-S may develop a reserve fund to help finance any capital expenditures required to expand or upgrade the central recycling facility.*

*RDK-S will encourage parks and/or resorts to include on-site drop-off facilities for recyclable materials, to be delivered to the regional recycling facility.*

*RDK-S will continue to investigate the possibility of coordinating with other regional districts for joint processing and shipment of recyclable materials.*

*RDK-S may assist in advertising alternative recycling opportunities, operated by private enterprise or other groups, that are not a part of the regional waste management program.*



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*Collection and recycling of difficult wastes will be reserved for private enterprise. (Difficult waste includes auto hulks, tires, batteries, etc.).*

*Member municipalities of RDK-S will not be discouraged from implementing a recycling program which involves more sophisticated technology than what the Regional District is utilizing, as long as the effective diversion rate is at least that obtained by the regional system. If costs are significantly higher, a Plan amendment and full public review may be required.*

*RDK-S shall investigate the feasibility of, and may subsequently implement, a more sophisticated recycling system, if this is deemed necessary to attain the projected waste diversion targets. If costs are significantly higher, a Plan amendment and full public review may be required. RDK-S will investigate the opportunities available to coordinate with adjacent regional districts such as Bulkley Nechako or Skeena-Queen Charlotte.*

#### 4 Composting

*RDK-S shall include education and promotion as a high priority to encourage participation in the regional composting program. The mechanisms will be similar to reduction, reuse and recycling education and promotion programs.*

*RDK-S shall develop an in-house procurement program. The program will basically involve a commitment to utilize compost from the regional composting program for regional parks and other regional sites. Member municipalities will be encouraged to make similar compost utilization commitments.*

*RDK-S composting programs will target as many organic materials as economically possible, while minimizing odour problems. Materials which will be targeted include residential food waste (in backyard bins); yard waste including leaves, trimmings, brush and limited quantities of grass; wood waste from demolition and renovation projects; and land clearing debris.*

*RDK-S may provide, to most interested residents, backyard composting bins at a subsidized cost. This program would not be available to residents in areas where severe bear problems are perceived, such as the District of Stewart. RDK-S will take advantage of any funding opportunities provided by the provincial government. The split of the bin cost could be 1/3 for each of senior government, regional government and resident. RDK-S staff will research existing bin technology to determine the best, most cost effective bin for distribution. RDK-S*

staff will arrange storage and distribution of the bins as appropriate to ensure the greatest participation in the program. Educational/informational packages will be distributed with the bins.

*RDK-S may establish and maintain a compost demonstration garden staffed by qualified individuals.* Depending on the success of the garden, gardens at other locations may be established.

*On establishing a compost garden, RDK-S may establish a composting hotline to respond to enquiries about operation of home composting bins and other local waste management issues.* The hotline would be housed in the demonstration garden and operated by the garden staff.

*RDK-S will establish a yard waste composting program accessible to residents and businesses in the Regional District.* The program will involve windrow technology at several locations, primarily at existing or closed landfill sites. Locations could include Iskut, Meziadin, Kitwanga, Hazelton, Rosswood, Terrace/Thornhill and Kitimat. Accepted materials will be non-food organic waste, such as brush, trimmings, leaves, grass (in low quantities), stumps and land clearing debris. Large pieces such as stumps will undergo volume reduction, e.g. in a chipper/hammermill contracted to RDK-S, which will be transported between sites. The program will be strictly on a drop-off basis at each windrow site, with (initially) no charge for materials. The final compost product will be utilized in Regional District operations and sold at low cost to buyers. Municipalities which own landfills will be encouraged to develop similar composting facilities on their sites.

*Member municipalities of RDK-S will not be discouraged from implementing a composting program which involves more sophisticated technology than what the Regional District is utilizing, as long as the effective diversion rate is at least that obtained by the regional system.* If costs are significantly higher or the change in service is considerable, a Plan amendment and full public review may be required.

*In the event that revenues from recycling paper and cardboard products decrease substantially for a sustained period of time, the RDK-S reserves the option of composting these materials as an alternative to stockpiling them until favourable market conditions return.* The RDK-S is aware that composting of these materials may require increased care regarding blowing litter and may have increased costs relative to yard waste composting.

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*RDK-S shall investigate the feasibility of, and may subsequently implement, a more sophisticated composting technology, if this is deemed necessary to attain the projected waste diversion targets.* This technology may be in-vessel technology to capture more food and horticultural/wood waste. If a centralized technology is utilized, RDK-S will investigate the opportunities available to coordinate with adjacent regional districts such as Skeena-Queen Charlotte or Bulkley-Nechako. RDK-S will consider any private proposals for in-vessel composting that arise, and may consider a subsidy to any private operations. If costs are significantly higher or the change in service is considerable, a Plan amendment and full public review may be required.

5 Energy Recovery

*RDK-S shall not, at this time, consider energy recovery as a component of its waste management system.* This option is not considered for economic reasons, based on the demographics of the Regional District.

*RDK-S reserves the right to review the economic and environmental viability of incineration in each Plan review (every five years).*

*Private sector proposals for incineration, energy recovery or co-generation within RDK-S boundaries shall be presented to RDK-S for approval.* Public input will be received on any proposals before approval. With any proposed incineration/energy recovery/co-generation project, the safe and environmentally sensitive disposal of ash and the quality of the discharged gases must be considered paramount.

6 Residuals Management

Existing permitted landfills will remain in operation as long as capacity, environmental protection and economics allow. A list of current landfills is presented in Table 2.1. Regional District, Municipal and/or First Nations landfills will continue to be operated by the operational certificate holder(s) until these landfills are closed. Subject to hydrogeological assessments and expansion potential being favourable and an inter-Band agreement being set-up, a single First Nations landfill, located near Laxgalts'ap (Greenville) (a proposed new landfill site) or Gitlakdamix (New Aiyansh) (an existing landfill) could service all of the Nass Valley. Landfill action plans for all existing municipal waste landfills in the RDK-S is presented in Appendix A.

Table 2.1  
Existing Landfills

| Landfill                               | Owned/Operated by   | Upgrades Required | Operational Certificate Required | Comments   |
|--|---------------------|-------------------|----------------------------------|--|
| Telegraph Creek                        | RDKS/First Nations  | Y                 | Y                                | The old landfill is proposed to be closed. A new landfill is being negotiated.   |
| Hazelton                               | RDKS                | Y                 | Y                                | Close as soon as a new site is available (2-5 years).  |
| Laxgalits'ap                           | First Nations       | N                 | N                                | To be closed ASAP.   |
| Usk                                    | RDKS                | N                 | N                                | Closed   |
| Terrace                                | City of Terrace     | N                 | Y                                | Close as soon as an alternate site is available (2-4 years).   |
| Gitsegukla                             | First Nations       | N                 | N                                | Closed.  |
| Kispiox                                | First Nations       | N                 | N                                | To be closed ASAP.   |
| Kitwanga                               | RDKS                | Y                 | Y                                | To be closed in 8-10 years or when full.   |
| Bob Quinn                              | BCBC                | Y                 | Y                                | 20 year operation.   |
| Stewart                                | District of Stewart | Y                 | Y                                | 20 year operation (to be confirmed)  |
| Rosewood                               | RDKS                | Y                 | Y                                | 20 year operation.   |
| Thornhill                              | RDKS                | Y                 | Y                                | 5 to 20 year operation depending on hydrogeological evaluations, economics, public acceptance and availability of a new sub-regional site. |
| Kitimat                                | District of Kitimat | Y                 | Y                                | 20 year operation.   |
| Gitlakdamix                            | First Nations       | Y                 | Y                                | 20 year operation.   |
| Iskut                                  | RDKS                | N                 | Y                                | 10+ year operation.  |
| Meziadin                               | RDKS                | Y                 | Y                                | New site to be developed.  |
| Thornhill/Terrace/<br>Kitimat Corridor | RDKS                | Y                 | Y                                | New 50 year landfill to be sited.  |

The Stage 2 evaluations of Greater Terrace landfilling options indicated that the most cost effective landfilling solution appeared to be closing down the Terrace landfill and expanding and upgrading the Thornhill landfill to accept all Greater Terrace municipal solid waste. However, this would be subject to the results of a hydrogeological and environmental evaluation of the Thornhill site conducted in 1996-97; the Ministry of Environment, Lands and Parks amending the Thornhill operational certificate, public review and RDK-S Board approval of this option. If the Thornhill site proves to be acceptable as the single Greater Terrace landfill site, it would be subject to a public review of the environmental, social and financial viability of the site, at least every five years. Since there may be insurmountable problems using the Thornhill site, during the first two years of plan implementation, siting of a new subregional landfill that will ultimately serve Terrace, Thornhill and, perhaps, Kitimat would occur in parallel with the Thornhill evaluations. In the interim, both the Thornhill and Terrace landfills would continue to be operated.

Any new landfills in the RDK-S shall be designed, constructed, operated and closed in accordance with the **BC Landfill Criteria for Municipal Solid Waste** or justified exemptions. Existing landfills would be upgraded in accordance with the Action Plans contained in Appendix A.

In incorporated areas, waste collection will remain a municipal responsibility.

Landfills will have areas set aside for the storage of white goods, wood waste and vehicle hulks. Dead animal pits and septage disposal facilities will be provided at landfills where these services are required.

Transfer stations may be implemented to service areas where landfills have been closed. Where implemented, transfer stations will be of a design proven to function under the climatic conditions prevalent in the RDK-S and be resistant to wildlife. The transfer stations will be owned by the RDK-S and operations will be contracted to the private sector.

Closure plans will be developed, by the owner/operational certificate holder, for all existing permitted landfills. All closure plans for RDK-S landfills will be submitted to the Plan Monitoring Advisory Committee prior to submission to the Ministry of Environment Lands and Parks. Closure plans shall be in compliance with the BC Landfill Criteria, and shall include information, such as:

- the anticipated date of closure;

- works required to close the site;
- the final shape of the landfill;
- the end use of the landfill;
- environmental monitoring and controls required;
- a wildlife management plan; and
- estimated cost of closure and post-closure care.

For landfills with restricted access and supervision, operating hours shall be established that maximize service while minimizing costs.

Cover frequency for each landfill shall be as agreed with the Regional Manager of BC Environment and stipulated in the operational certificate.

If any problems with abandoned landfill sites are identified, the owner/operator will be responsible for the clean-up and closure procedures.

Household hazardous products (HHP) continue to be a concern that has no complete solution at this time. It is hoped that industry stewardship programs such as the paint-return program being developed by the Paint Care Association will be expanded to other HHP's including dry-cell batteries and pesticides/herbicides. In the interim the Plan education program will emphasize alternate and less hazardous products, and the **B.U.D.** principle (Buy or Borrow it only if it is truly needed, Use all and Dispose of it safely).

Untreated pathological biomedical waste and special waste will not be accepted at municipal landfills. The responsibility for ensuring proper disposal of special waste shall rest solely with the generator of the special waste.

RDK-S landfills will not accept products containing ozone-depleting substances (ODS). These must be removed by certified technicians or authorized removal companies.

RDK-S will support the concept of true industry stewardship with respect to the handling and recycling of household hazardous products and difficult-to-dispose wastes. The RDK-S will cooperate with the province and industry groups in developing drop-off facilities for problem wastes, but only to the point that the drop-off system is fully funded by the industry, and the RDK-S is absolved of any liability with respect to handling, storage, transportation and disposal of the material. Industry associations would be responsible for the ultimate market or disposal of any materials collected.

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The RDK-S may exercise the right given to it by Bill 29, the Waste Management Amendment Act 1992, to control waste movement within its boundaries through the issuance of Waste Stream Management Licenses, Hauler Licenses and Recyclers Licenses.

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### 3.0 IMPLEMENTATION

Implementation of the strategies that have been put forward will be very complex. Considerations regarding implementation are outlined in this section. These include the following:

- solid waste stream targets;
  - diversion targets;
  - implementation schedule;
  - administration, jurisdiction and responsibility;
  - levels of staffing;
  - Plan monitoring;
  - contingency plans; and
  - dispute resolution procedures.
- funding and priorities of the RDK-S, member municipalities and First Nations Bands

#### 3.1 DIVERSION TARGETS

At the outset of the Plan, it is important that there be a target handling procedure for each material class and type in the waste stream. Table 3-1 indicates the intended objective for each material identified in the waste composition tables from Stage 2. All of the waste stream will be reduced and reused, with some streams targetted more than others (e.g. packaging waste is highly targetted, such as paper products and plastics). The materials with strong recycling markets will be recycled through regional drop-off and private recycling, with other materials being included as markets expand. The primary organics (food, yard and wood waste) will be composted through a combination of residential backyard composting and drop-off windrow composting. Any materials not handled through reduction, reuse, recycling or composting will be landfilled. The Plan Monitoring Advisory Committee will review these waste stream targets annually to identify potential modifications that reflect changes in markets or economics.

Certain target diversion rates have been assumed for each of the strategies outlined in Section 2.0. The target diversion rates are as follows:

- a total of approximately 15.0% through reduction and reuse strategies, including approximately 10.0% through reduction and reuse strategies implemented by senior government and approximately 5.0% through reduction and reuse strategies implemented by RDK-S;



TABLE 3-1  
SOLID WASTE STREAM TARGETS  
REGIONAL DISTRICT OF KITIMAT-STIKINE

| Waste Component          | Residential *                           | ICI                                | DLC |
|--------------------------|---|------------------------------------|-----|
| Old Newspaper            | reduction, reuse, recycle (do)          | reduce, reuse, recycle (do)        | n/a |
| Fine Paper               | reduction, reuse, recycle (do)          | R&R, recycle (do, as office print) | n/a |
| Boarding                 | reduce, reuse, recycle (do)             | reduce, reuse, recycle (do)        | n/a |
| Old Corrugated Cardboard | reduce, reuse, recycle (do)             | reduce, reuse, recycle (do)        | n/a |
| Mixed Paper/Magazines    | reduce, reuse, recycle (do)             | reduce, reuse, recycle (do)        | n/a |
| Glass                    | reduce, reuse, potentially recycle      | reduce, reuse, potentially recycle | n/a |
| Ferrous Metal            | reduce, reuse, potentially recycle      | reduce, reuse, potentially recycle | n/a |
| Non-Ferrous              | reduce, reuse, recycle (do)             | reduce, reuse, recycle (do)        | n/a |
| HDPE                     | reduce, reuse, recycle in future        | reduce, reuse, recycle in future   | n/a |
| PE                       | reduce, reuse, recycle in future        | reduce, reuse, recycle in future   | n/a |
| Other Plastic            | reduce, reuse, potentially recycle      | reduce, reuse, potentially recycle | n/a |
| Food Waste               | reduce, reuse, compost (by/do)          | reduce, reuse, compost (do)        | n/a |
| Yard Waste               | reduce, reuse, compost (by/do)          | reduce, reuse, compost (do)        | n/a |
| White Goods              | reduce, reuse, salvage/recycle          | reduce, reuse                      | n/a |
| Bulky                    | reduce, reuse                           | n/a                                | n/a |
| Residential DLC          | reduce, reuse, potentially recycle (do) | n/a                                | n/a |
| Wood                     | reduce, reuse, recycle, compost (do)    | reduce, reuse, recycle, compost    | n/a |
| HHW                      | reduce, reuse, return to retail         | n/a                                | n/a |
| Other Combustibles       | various                                 | various                            | n/a |
| Other Non-Combustibles   | n/a                                     | n/a                                | n/a |
| Mixed Wood DLC           | n/a                                     | n/a                                | n/a |
| Mixed Soil               | n/a                                     | n/a                                | n/a |
| Roofing & Unclassified   | n/a                                     | n/a                                | n/a |
| Concrete & Asphalt       | n/a                                     | n/a                                | n/a |
| Stumps and Brush         | n/a                                     | n/a                                | n/a |
| Other DLC                | n/a                                     | n/a                                | n/a |

\* do = drop-off program  
 pu = pick-up program  
 by = backyard  
 n/a = not applicable

- a total of approximately 9.1% through recycling programs, including approximately 4.7% through residential drop-off recycling, approximately 1.4% through private ICI drop-off recycling, and approximately 3.0% through private DLC drop-off recycling; and
- a total of approximately 8.9% through composting programs, including approximately 4.0% through distribution and use of residential backyard composting bins, and approximately 4.9% through voluntary drop-off yard waste windrow composting for all sectors.

This amounts to a total diversion target of approximately 33%. This diversion rate is based on the assumption that all of the strategies detailed above are implemented, including the recycling and composting incentives. The target diversion rate is intended to be achieved by the year 2000, after programs have been phased into implementation over approximately three years. The target relies on senior government to develop reduction and reuse initiatives that will divert approximately 10% from the waste stream.

### 3.2 IMPLEMENTATION SCHEDULE

To reach the diversion targets identified in the preceding section in time to meet the provincial target date of 2000, it is necessary to implement many of the strategies in advance of 2000. The recycling program will be initiated in stages, building up the number of drop-off bins as the interest in the drop-off program (and the amount diverted) increases. The composting program would begin in 1997 with bin distribution and development of the first windrow facilities. However, all windrow facilities would not be built for a few years. Other strategies would be phased in more quickly. A rough schedule is outlined below and shown in Table 3-2.

- **Reduction and Reuse:** Regional District reduction and reuse incentives will be implemented primarily in the first two years of the Plan. A position of waste reduction coordinator will be created and staffed to coordinate all diversion initiatives (reduction, reuse, recycling and composting). The highest reduction and reuse priorities, to be completed in the first two years, will be:
  - encouragement of senior government to implement reduction and reuse programs;
  - development of RDK-S education and promotion programs and material;
  - modified tipping fees at regional facilities;
  - certain material bans and segregation of material at the landfills;
  - development of residential can limit bylaws for the member municipalities and electoral areas with collection services;

- planning and development of a program for increased waste management topics in the local school districts; and
- planning and preliminary work for a demonstration program.

During the next year, the following priorities will be completed:

- continued and enhanced RDK-S education and promotion;
  - implementation of can limit bylaws;
  - implementation of school curriculum changes;
  - requirements for waste reduction plans and/or waste audits for businesses;
  - implementation of non-procurement practices at regional offices; and
  - commissioning of a demonstration garden.
- **Recycling:** The existing drop-off recycling system in Kitimat will be continued and expanded to include other areas in the Kitimat/Terrace/Hazelton area. Expansion will occur as required by public participation and materials recovery governs. Drop-off bins will generally consist of 30 cubic yard roll-off style bins, with separate compartments for various material classes. RDK-S will maintain flexibility in terms of specific bin locations, based on demand and haul distance. As required, some expansions will be carried out at the Kitimat recycling facility to accommodate increased materials. The drop-off program will be accompanied by an intense initial education effort. In addition to the drop-off bins, an OCC depot would be established in both Terrace and Hazelton in the first two years of the Plan. These depots would each consist of a small facility with a baler and forklift to compact OCC before shipping to the Kitimat transshipment point.
  - **Composting:** The residential backyard composting program may be initiated as quickly as bins can be ordered. A bin order covering approximately 10% of the population of RDK-S (4500 people, approximately 1500 bins) may be ordered in the first two years. The rate at which bins are purchased will determine the size of subsequent orders. After initial bins are ordered, RDK-S will contract with retailers (nursery, hardware) to supply further bins to new residents and replacement bins to existing residents.

In the first two years, an area at one of the existing landfills (e.g. Terrace, Thornhill or Kitimat), or at a suitably zoned non-landfill site, will be set aside for windrow composting of dropped-off yard waste. Yard waste will initially be accepted free of charge at the site. The material will be shredded, windrowed and turned occasionally. After the first two years, similar facilities will be established at other locations such as Iskut, Kitwanga, Hazelton, and Rosswood. RDK-S will

maintain flexibility on which locations receive yard waste composting, based on demand and economics.

- **Residuals Management:** Most existing landfills will be utilized as long as allowed by capacity, environmental impacts, and economics. Landfills that remain in operation will require some upgrading as identified in the Action Plans. As some landfills are closed (e.g. Kitwanga and Kispiox), transfer stations would be built on site to maintain the level of service to that area. Other landfills would be replaced by new landfills (Telegraph Creek and Hazelton), while others would not be replaced at all.
- landfills to be closed as soon as possible and replaced with new local landfills:
  - Telegraph Creek, 1996 - 97
  - Hazelton, 1997-99
- landfills to be closed as soon as possible without replacement (haul to nearest landfill):
  - Laxgalt's ap (Greenville), 1996. It is recommended that the Nisga'a First Nations agree to the concept of an integrated waste management system for the Nass Valley. To aid in this decision and to complement the work already done in evaluating the proposed "Ksedin Camp" landfill site, it is suggested that the Nisga'a First Nations undertake a hydrogeological and environmental investigation of the existing Gitlakdamix site. This will enable a comparison of the two sites and a determination of the best option within the context of an integrated Nass Valley waste management system. Regardless of which option is selected, an agreement between the Nisga'a First Nations and the implementation of an appropriate collection and/or transfer system may be required.
  - Usk, 1995
  - Terrace (subject to hydrogeological evaluations, etc., an approved Thornhill landfill operational certificate amendment, public review and RDK-S Board approval, and upgrading of the Thornhill landfill), 1997-98
  - Gitsegukla, 1997

- landfills to be closed as needed and replaced with transfer stations:
  - Kispiox, 1997
  - Kitwanga, 2005
- landfills to be kept open and upgraded, as required:
  - Bob Quinn
  - Stewart
  - Rosswood
  - Thornhill (subject to the outcome of a hydrogeological evaluation of the site, an approved Thornhill landfill operational certificate amendment, public review and RDK-S Board approval, and the upgrading necessary to prevent any environmental impacts and/or have the site meet the MELP landfill guidelines)
  - Kitimat
  - Gitlaktamix (New Aiyansh) (subject to the outcome of a hydrogeological evaluation of the site, comparison to the proposed "Ksedin Camp" landfill site, and an agreement between the Nisga'a First Nations to cooperate in an integrated Nass Valley waste management system)
  - Iskut
- new landfills to be developed:
  - Meziadin, 1996 - 1998
  - New subregional site for Terrace and Thornhill - siting only, 1996 - 1999 (unless the Thornhill landfill cannot be upgraded/expanded, in which development of the new site would have to proceed following siting)

More details regarding landfills and transfer stations are found earlier in Section 2.3.6.

Table 3-2 contains a summary of the proposed residuals management implementation program.

TABLE 3-2

PROPOSED IMPLEMENTATION SCHEDULE  
 REGIONAL DISTRICT OF KITIMAT-STIKINE SOLID WASTE MANAGEMENT PLAN  
 Reduction & Reuse, Drop-off Recycling, Backyard and Community Composting, Integrated Residuals Management

| COMPONENT  | 1996  | 1997  | 1998   | 1999   | 2000   | 2001   | 2002   | 2003   | 2004   | 2005   | 2006        |
|--|---|---|--|--|--|--|--|--|--|--|-------------|
| <b>Reduction &amp; Reuse plus other incentives</b> | <ul style="list-style-type: none"> <li>no new Regional initiatives</li> <li>limited senior government programs</li> </ul>   | <ul style="list-style-type: none"> <li>limited Regional RAR, including recycling and composting</li> <li>expanded senior government programs</li> </ul>   | <ul style="list-style-type: none"> <li>expanded Regional RAR</li> <li>expanded senior government programs</li> </ul>   | <ul style="list-style-type: none"> <li>full Regional reduction and reuse</li> <li>expanded senior government programs</li> </ul>   | <ul style="list-style-type: none"> <li>full Regional reduction and reuse increased effectiveness</li> <li>expanded senior government programs</li> </ul> | - no change  | - no change  | - no change  | - no change  | - no change  | - no change |
| <b>Recycling</b>                                   | <ul style="list-style-type: none"> <li>no modification of existing recycling</li> </ul>   | <ul style="list-style-type: none"> <li>order and establish initial drop-off bins</li> <li>minor modifications/responses to existing recycling facility</li> <li>KI and D.C. assessment</li> <li>handling of recyclables to central facility</li> </ul>  | <ul style="list-style-type: none"> <li>expanded drop-off system</li> <li>handling of recyclables to central facility</li> <li>development of CCC depots in Terrace and Hazelton</li> </ul>   | <ul style="list-style-type: none"> <li>expanded drop-off system</li> <li>handling of recyclables to central facility</li> </ul>  | <ul style="list-style-type: none"> <li>no change</li> <li>expand materials as technology allows</li> </ul>   | - no change  | - no change  | - no change  | - no change  | - no change  | - no change |
| <b>Composting</b>                                  | <ul style="list-style-type: none"> <li>no further composting</li> </ul>   | <ul style="list-style-type: none"> <li>limited compost distribution</li> <li>development of initial window sites</li> <li>operation of developed window sites</li> </ul>  | <ul style="list-style-type: none"> <li>continued bin distribution</li> <li>further development of window sites</li> <li>operation of window sites</li> </ul>   | <ul style="list-style-type: none"> <li>continue bin distribution</li> <li>operation of window sites</li> </ul>   | <ul style="list-style-type: none"> <li>supplemental and replacement bins</li> <li>operation of window sites</li> </ul>                                   | - no change  | - no change  | - no change  | - no change  | - no change  | - no change |
| <b>Residuals Management Capital *</b>              | <ul style="list-style-type: none"> <li>investigate Thornhill landfill re-hydrogeological aspects</li> <li>investigate sites for Meziadin landfill</li> <li>investigate sites for Greater Terrace subregional landfill</li> <li>begin Hazelton siting</li> <li>encourage Nigah First Nations to pursue single landfill, begin investigation of Gildasane landfill</li> </ul> | <ul style="list-style-type: none"> <li>continue Thornhill investigations</li> <li>continue Meziadin and Hazelton site investigations</li> <li>continued site investigations for Greater Terrace subregional landfill</li> <li>preliminary work to close Terrace landfill</li> <li>close Telegraph Creek, Langah'ay, Gungah'ay and English landfills</li> <li>begin upgrading Hazelton, Kivwaga, Bob Quinn, Stewart, Rosswood, Elva, Thornhill, Kitimat and Gildasane landfills</li> <li>open new Telegraph Creek landfill</li> <li>open new Klappan transfer station</li> <li>Nigah First Nations facility on single landfill site, begin site development</li> </ul> | <ul style="list-style-type: none"> <li>continue site investigations for Greater Terrace subregional landfill</li> <li>close Terrace landfill **</li> <li>continue landfill upgrades</li> <li>develop Meziadin landfill</li> <li>develop new Hazelton landfill</li> </ul> | <ul style="list-style-type: none"> <li>close old Hazelton landfill</li> <li>continued site investigations for Greater Terrace subregional landfill</li> <li>open Meziadin landfill</li> </ul>  | <ul style="list-style-type: none"> <li>close Kivwaga landfill</li> <li>open new Kivwaga transfer station</li> </ul>                                      |  |  |  |  |  |             |
| <b>Residuals Management Operation</b>              | <ul style="list-style-type: none"> <li>operate Hazelton, Kivwaga, Bob Quinn, Stewart, Rosswood, Elva, Thornhill, Kitimat, Gildasane, Terrace and Telegraph Creek landfills</li> </ul>   | <ul style="list-style-type: none"> <li>operate except the following:</li> <li>operate new Telegraph Creek landfill</li> <li>operate Klappan transfer station</li> <li>post closure care for Langah'ay, Elk, Klappan and Gungah'ay landfills</li> </ul>  | <ul style="list-style-type: none"> <li>continue except the following:</li> <li>post closure care of Telegraph Creek landfill</li> <li>Hazelton takes greater Hazelton waste</li> <li>operate single Nasa Valley landfill</li> </ul>                                      | <ul style="list-style-type: none"> <li>continue except the following:</li> <li>operate new Meziadin landfill</li> <li>post closure care of old Hazelton landfill</li> <li>operation of new, replacement Hazelton landfill</li> <li>post closure care of Terrace landfill **</li> </ul> | <ul style="list-style-type: none"> <li>continue</li> <li>continue</li> <li>continue</li> <li>continue</li> </ul>   | <ul style="list-style-type: none"> <li>continue</li> <li>continue</li> <li>continue</li> <li>continue</li> </ul> | <ul style="list-style-type: none"> <li>continue</li> <li>continue</li> <li>continue</li> <li>continue</li> </ul> | <ul style="list-style-type: none"> <li>continue</li> <li>continue</li> <li>continue</li> <li>continue</li> </ul> | <ul style="list-style-type: none"> <li>continue</li> <li>continue</li> <li>continue</li> <li>continue</li> </ul> | <ul style="list-style-type: none"> <li>operate Hazelton landfill takes Kivwaga waste</li> <li>operate new Kivwaga transfer station</li> <li>post closure care of Kivwaga landfill</li> </ul> |             |

Note: Plan implementation should permit flexibility so that the timing of implementation of Plan components can reflect the priorities and abilities of the RDK-S, its member municipalities and First Nations Communities to finance and implement the Plan. Flexibility is also essential so that the RDK-S can choose to implement plan components either directly or through private firms or non-profit organisations (NPO's) via a public proposal and/or tendering process.

\* Closure Plans will be required in advance of any landfill closure, and operation plans (including filling plans) and closure plans will be required for any existing or new landfills remaining in service.

\*\* Subject to the results of the Thornhill site investigation and/or locating and developing an alternative subregional site

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### 3.3 ADMINISTRATION AND JURISDICTION

In the Plan strategies and policies, it has been identified that some programs shall involve cooperation and involvement of other organizations, such as municipalities. For example, collection of residential solid waste will be the responsibility of the member municipalities of RDK-S. Commercial and institutional establishments not serviced by municipal collection will be serviced by private firms. The RDK-S may arrange mandatory collection in the more densely populated portions of the Electoral areas. Table 3-3 indicates which organizations are involved and what responsibilities they will have in implementation of the Plan.

The Senior government responsibility in the implementation of the Plan is primarily through reduction and reuse, education and funding. The ability of RDK-S to reach its 33% target diversion rate will be affected by the Senior government activities.

RDK-S responsibility is to develop and implement most components of the Plan. This includes development and implementation of most portions of the reduction and reuse, recycling and composting programs, and siting and development of transfer stations and landfills.

Member municipalities will be responsible for cooperating with the Regional District in implementation, assisting with education programs, sitting on advisory committees, and developing and implementing municipal waste collection programs. Part of the cooperation with RDK-S may involve passing certain bylaws with respect to collection or other aspects related to waste management.

First Nations bands have been included in the Plan as participants. First Nations governments will be encouraged to cooperate with the Regional District in implementing and participating in the waste management system. Any waste or recycling collection programs within First Nations communities will be the responsibility of the First Nations groups.

Landfill operators, such as Bob Quinn Highways Camp, will continue operations of existing landfills until they are closed or the RDK-S has assumed operative responsibility. They will be required to cooperate with any landfill-related Plan strategies, such as operating hours, material bans, tipping fee modifications, etc.

RDK-S will look for opportunities to cooperate with other adjacent regional districts in order to reduce costs through economies of scale. Although there are four directly

TABLE 3-3  
JURISDICTIONAL RESPONSIBILITIES  
REGIONAL DISTRICT OF KITIMAT-STIKINE

| Entity                 | Reduction & Reuse                      | Recycling                              | Composting                  | Collection                    | Transfer Stations | Landfills                      | Administration |
|------------------------|--|--|-----------------------------|-------------------------------|-------------------|--------------------------------|----------------|
| Federal Government     | develop/implement                      |  |                             |                               |                   |                                |                |
| Provincial Government  | develop/implement<br>partial funding * | partial funding *                      | partial funding *           |                               | partial funding * |                                |                |
| RDK-S                  | develop/implement                      | develop/implement                      | develop/implement           | cooperate/assist<br>implement | develop/implement | develop/implement<br>close     | primary        |
| Member Municipalities  | cooperate/assist                       | cooperate/educate<br>collect<br>bylaws | cooperate/educate<br>bylaws | supply collection<br>service  |                   | operate<br>close               | secondary      |
| First Nations          | cooperate                              | cooperate                              | cooperate                   | develop/implement             |                   | operate<br>close               | secondary      |
| Landfill Owners        |  | salvage                                | operate                     |                               |                   | operate until closure<br>close |                |
| Recycling Societies ** | cooperate/assist                       | cooperate/assist<br>educate            | cooperate/assist<br>educate |                               |                   |                                |                |

\* if available  
volunteer basis; subject to any governmental responsibilities

\*\*



adjacent regional districts to the RDK-S, the two most likely regional districts that provide cooperation possibilities are Skeena-Queen Charlotte and Bulkley Nechako.

Cooperation with the two regional districts identified above may be fostered in the following manner, if economical:

- developing educational information for reduction and reuse programs;
- continued technology transfer between regional districts;
- transporting and developing markets for recyclable materials through an inter-regional district marketing cooperative;
- sharing equipment for windrow composting operations; and
- some sharing of landfill space, if appropriate agreements can be reached.

### 3.4 STAFFING

The implementation of this Plan will require a number of staff. Such staff could either be hired directly by the RDK-S or provided through a contract process with the private and/or non-profit sectors. There are already approximately 12 people involved in the non-collection aspects of solid waste management in the RDK-S. Plan implementation may require reassignment of these personnel or additional hiring or contracting. Staffing levels will fluctuate for the first few years while the Plan is being implemented, but will level off after the initial period. The following is an estimate of the total personnel that may be required to implement the Plan. The actual number will depend on what programs the RDK-S chooses to provide directly and what programs will be provided under contract with the private or non-profit sectors. This information is also shown in Table 3-4.

- At least one waste management coordinator will be required to coordinate all implementation activities of the Plan. The position would include tendering of any required contracts, coordinating the implementation committees, developing reduction and reuse programs and education packages, heading siting studies, developing the annual cost recovery formula with the input of the FWC, and supervising operations such as recycling, composting, landfilling and transfer stations.
- Existing regional staff will be required to assist in distribution of backyard composting bins to the public.
- One part-time school liaison will be required to assist in development and implementation of the waste management education program at schools. This position could be shared with the coordinator position(s).

TABLE 3-4

WASTE MANAGEMENT SYSTEM IMPLEMENTATION  
PERSONNEL REQUIREMENTS  
REGIONAL DISTRICT OF KITIMAT-STIKINE  
SOLID WASTE MANAGEMENT PLAN

| Position                                      | Personnel<br>(Full Time Equiv)<br>Required* |
|---|---|
| Waste Management Coordinator/School Liaison   | 1.5   |
| Demonstration Garden Personnel                | 0.5   |
| Recycling Facility - Office Personnel/Manager | 1   |
| Recycling Facility - Processors               | 6   |
| Windrow Compost Operator                      | 1   |
| Landfill Staff                                | 6   |
| License Administrator                         | 0.5   |
| Total   | 16.5  |

\* current staffing level = 12

- One part-time person may be required at the composting demonstration garden. Duties would be to set up the garden with different types of composters, operate composters, educate about reduction and reuse including composting, and operate a hotline.
- At least seven persons will be required for the expanded recycling facilities. This would include one office person to take care of administration, marketing and supervision of day-to-day operations, plus three staff to operate material sorting, balers, forklifts and other equipment at the main facility, and two full-time and two half-time positions to run the two OCC depots.
- Initially one person will be required to operate the windrow composting facilities. Initially, free drop-off areas will be open to the public without supervision. This person would transport any required equipment between the sites for shaping and turning of the piles, movement of materials, screening, etc. Depending on the nature of the operations, more people may be required to attend and to operate the sites. The above duties related to composting may be contracted out by RDK-S if economics favour this alternative.
- Attendants will be required at each residuals management facility (transfer stations and landfills). Ultimately, RDK-S will operate one regional transfer station and five landfills. The smallest landfills will require approximately 10% staffing levels (i.e. one person one-half day per week), where the larger landfills will require approximately 250% staffing levels (i.e. 2.5 full time staff). The landfill personnel would include attendants (where necessary), equipment operators and casual labour. The attendants will be responsible for receiving and directing vehicles at the site during open hours, ensuring disposal of acceptable materials only, and collecting fees. The equipment operators will be responsible for separation of materials, waste compaction, landfill shaping, applying cover, litter control, monitoring of environmental controls, developing on-site roads and equipment maintenance. Casual labour would be hired during holiday time, sick leave and as general help. Transfer stations will require one attendant with similar duties as the landfill attendants. Ultimately, Rosswood, Iskut and Meziadin would require operators each at 10% time, Thornhill would require a full-time supervisor and a full-time operator, Hazelton would require a full time attendant, and a part-time operator at about 15% time, and each transfer station would require one attendant at about 75% time. This would be the equivalent of approximately five full-time staff, but would actually employ more than five staff.

- If the RDK-S chooses to utilize Waste Stream Management, Hauler and/or Recycler Licenses, at least one staff member would be required for issuance, administration and inspections related to these licenses.

With all the above considerations, up to 16.5 full time positions (i.e., 4.5 more than the current 12) will be required to implement the specifics of this Plan. The RDK-S may choose to contract out any or all of the personnel requirements of this Plan, depending on the financial situation and the wishes of the Board.

### 3.5 PLAN MONITORING

It is necessary to establish a procedure for determining how effectively the Plan is being implemented. The most important aspect is that the Plan is achieving the diversion rates that are anticipated. The following describes the Plan monitoring procedures that will be followed.

- A Plan Monitoring Advisory Committee (PMAC) will be established, to which all information regarding Plan effectiveness will be directed. More information about the PMAC is contained in Section 6.0.
- The primary means of determining the effectiveness of the Plan will be through monitoring quantities of material passing through all regional facilities. These facilities primarily include landfills, recycling facilities and composting facilities. Private operators will be required, through a Regional District by-law and/or Waste Stream Management Licenses, to submit records of materials passing through their facility. This would apply also to scrap dealers and private recyclers. Information should be supplied on a weight basis. If collection of material weights is cost prohibitive, the facility owner may apply to collect material volumes instead. In the case that a landfill lacks the facilities to collect quantities, a survey of the landfill must be completed from which the changing volume can be tracked and weight estimated. Where a ground survey is being used, an indication of cover quantities must be supplied, as well as documentation of compacting procedures and equipment being used.

Annual landfill quantities directly indicate the amount of diversion occurring, while quantities at other facilities indicate where the material that is being diverted is going (whether to legitimate or non-legitimate practices). Both of these exercises should be completed.

- Quantities from the landfills will be divided by the estimated population of the Regional District to determine the per capita rate of waste generation. By comparing to the baseline waste generation rate and the landfill quantities from year to year, the yearly diversion rate will be calculated. The baseline waste generation rate was determined to be 0.66 tonnes per capita per year (tpcy) in Stage 1, based on a rate of 0.8 tpcy for Terrace and Kitimat, and 0.5 tpcy for other areas.
- Quantities from all non-landfill facilities will be divided by the estimated population of the Regional District to determine the per capita diversion through each of these measures. An estimate will be made of the reduction and reuse that is occurring, based on the level of initiatives in place. If the sum of the per capita landfill rate and the per capita diversion rate is significantly less than the baseline waste generation rate, then it is possible that some unknown disposal or handling of waste is occurring, and, therefore, should be investigated.
- All records will be submitted to the PMAC to be evaluated versus the target diversion rates established in this Plan.
- The Plan Monitoring Advisory Committee will conduct an annual review of certain components of the Plan to determine whether minor changes need to be done. These components will include at least the following:
  - effectiveness of can limits;
  - effectiveness of landfill material bans;
  - content and aggressiveness of educational and promotional material; and
  - effectiveness of tendered contracts.
- The PMAC, with the assistance of the Financial Working Committee, will annually assess the effectiveness of the cost recovery model in generating revenue to cover waste management costs, and assist the coordinator in determining the appropriate cost recovery structure for the approaching year.

### 3.6 WASTE DIVERSION CONTINGENCY PLANS

It is quite possible that the target diversion rates are not maintained upon implementation of the Plan. The following sets out roughly what the procedure would be to deal with this possibility.

The first step in any contingency is to identify that a problem is occurring (i.e. diversion rates are not being met). This will likely be established by the Waste Management Coordinator or the Plan Monitoring Advisory Committee, through the annual accrual of Plan monitoring data. The coordinator and PMAC will determine what the problem is, i.e. the reason the diversion rate is not being met. Reasons for not achieving target diversion rates could include the following:

- markets for materials are degraded for reasons outside RDK-S control;
- public participation and enthusiasm are lower than expected;
- technology utilized is not as effective as anticipated;
- a technology is no longer available or is unable to be implemented;
- Plan monitoring activities indicate that some undesirable dumping may be occurring;
- Plan monitoring activities indicate that reduction and reuse rates are low;
- senior government has not fully developed reduction and reuse programs; or
- ICI/DLC sector is not achieving diversion rates through private means.

Using whatever means are necessary or available, the PMAC and the coordinator will determine the best course of action to overcome the problem. These measures could include the following:

- increasing the emphasis on reduction and reuse initiatives, including primarily education and promotion programs;
- re-evaluating technologies;
- re-evaluating markets for materials, including investigating further afield;
- increasing the level of enforcement;
- increasing the service to ICI and DLC sectors;
- implementing a system of Waste Stream Management, Recycler and Hauler Licenses to provide better control over waste flow; or
- modifications to the rate structure, e.g. tipping fees and user-pay mechanisms.

The committee may hire an outside consultant to design and/or develop programs to improve the implementation of the Plan.

### 3.7 DISPUTE RESOLUTION PROCEDURES

Disputes may arise during implementation of the Plan which must be addressed. This Plan establishes a dispute resolution procedure for the following disputes:

- an administrative decision made by the Regional District in the issuance of a license,
- interpretation of a statement or provision in the Plan, or
- any other matter not related to a proposed change to the actual wording of the Plan or an operational certificate.

The following is a structure to be followed if any of the above disputes arises.

- In the event of a dispute, both parties will make all efforts to come to an equitable agreement.
- In the event that an agreement cannot be reached between the two parties, the Plan Monitoring Advisory Committee will be utilized as a mediator between the parties. All attempts will be made to reach an agreement.
- In the event that an agreement cannot be reached with the assistance of a mediator, an arbitrator (an outside consultant) will be assigned, the cost of which will be equally split between both parties. The PMAC will submit a report to the arbitrator detailing the dispute, having been approved by both dissenting parties. The arbitrator, having read the report and made any inquiries felt necessary, will settle the dispute in whatever means he or she feels appropriate. The decision must be accepted by both parties.

The goal of this procedure would be to have the dispute settled early, without going to arbitration. The cost sharing of an outside arbitrator will hopefully be a deterrent to reaching this step.

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## 4.0 PLAN FINANCING

One of the key components of the Plan implementation is financing; namely "How much will it cost?" and "How will we pay for it?". The following sections detail these considerations.

### 4.1 PLAN COSTS

An estimate of what the Plan will cost to implement during the first 10 years of operation is presented in Table 4.1. These estimates were developed during Stage 2 and indicate order-of-magnitude costs for planning purposes. The initial stages of plan implementation will see a further refinement of estimates, as actual cost proposals are received for recycling programs, and site assessments and closure plans more closely define landfill upgrading and operating costs.

The average annual costs estimated for the first 11 years of operation are approximately \$2,100,000. Based on the 1994 population estimates, this equates approximately to:

- \$35/person/year (residential portion); or
- \$9/household/month (residential portion); and
- \$53/tonne (for ICI and DLC portion).

The possible means by which these costs can be recovered is discussed below.

### 4.2 PLAN FUNDING

Communities in the Regional District of Kitimat-Stikine (RDK-S) will be participating in the Regional Solid Waste Management Plan (Plan) to varying degrees. For example, Kitimat and Stewart will maintain their municipal landfills, Gitlakdamix will be owned and operated by First Nations, and the balance of the region will be served by sites and transfer stations operated by the RDK-S. Only the more densely populated areas will participate in recycling and composting. However, all residents in the RDK-S will benefit from waste reduction, reuse and education initiatives. The costs of the various waste reduction and disposal initiatives are well defined from Stage 2, and a model is now being developed to determine where the funds to cover these costs would come from.

From discussions with the RDK-S, the public and technical advisory committees, the various municipalities and area representatives, as well as the general public, it has already



**TABLE 4-1  
ESTIMATED PROGRAM COSTS - 1995 \$  
REGIONAL DISTRICT OF KITIMAT-STIKINE  
Reduction & Reuse, Drop-off Recycling, Backyard and Community Composting, Integrated Residuals Management**

| COMPONENT                                     | 1996        | 1997        | 1998        | 1999        | 2000        | 2001        | 2002        | 2003        | 2004        | 2005        | 2006        | Annual       |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| <b>Reduction, Reuse and Admin.</b>            | \$25,000    | \$174,000   | \$184,000   | \$184,000   | \$193,000   | \$193,000   | \$193,000   | \$193,000   | \$193,000   | \$193,000   | \$193,000   | \$1,411,314  |
| <b>Drop-off Recycling</b>                     | \$50,000    | \$170,000   | \$184,000   | \$184,000   | \$193,000   | \$193,000   | \$193,000   | \$193,000   | \$193,000   | \$193,000   | \$193,000   | \$1,411,314  |
| <b>Composting</b>                             | \$1,370,000 | \$250,000   | \$442,000   | \$442,000   | \$442,000   | \$442,000   | \$442,000   | \$442,000   | \$442,000   | \$442,000   | \$442,000   | \$4,099,347  |
| <b>Transfer Station</b>                       | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$1,800,000  |
| <b>Kitwaga/Kiptope</b>                        | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$1,800,000  |
| <b>Total Transfer Station</b>                 | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$180,000   | \$1,800,000  |
| <b>Landfill Closure</b>                       | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$500,000    |
| Telegraph Creek                               | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$500,000    |
| Harrison                                      | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$500,000    |
| Lehigh/Big                                    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$500,000    |
| Ulk   | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$500,000    |
| Ternax  | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$500,000    |
| Chimikwa                                      | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$500,000    |
| Kiptope                                       | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$500,000    |
| <b>Total Landfill Closure</b>                 | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$500,000    |
| <b>Landfill Upgrade &amp; Operation</b>       | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| Telegraph Creek                               | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| Harrison                                      | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| Ternax  | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| Kitwaga                                       | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| Rob-Quinn                                     | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| Stewart                                       | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| Reithwood                                     | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| Thorn Hill                                    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| Kilmer  | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| Chimikwa                                      | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| Blair   | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| Namasin                                       | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| Ternax/Thornhill/Kitwaga                      | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| <b>Total Landfill Upgrade &amp; Operation</b> | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$25,000    | \$250,000    |
| <b>Total</b>                                  | \$300,000   | \$4,511,000 | \$4,780,000 | \$4,780,000 | \$4,963,000 | \$4,963,000 | \$4,963,000 | \$4,963,000 | \$4,963,000 | \$4,963,000 | \$4,963,000 | \$41,133,314 |

\* Estimates are order of magnitude costs for budgeting  
 Note: Plan implementation should permit flexibility so that the timing of implementation of Plan components can reflect the priorities and abilities of the RDK-S, its member municipalities and First Nations communities to finance and implement the Plan. Flexibility is also essential so that the RDK-S can choose to implement the plan either directly or through private firms or non-profit organizations (NPOs) via a public proposal and/or tendering process

been determined which areas will be responsible for, and benefit from, the various services provided under the plan. This information is presented in Table 4-2.

As can be seen from Table 4-2, all communities will benefit from and support waste reduction, reuse and education services provided by the RDK-S. Initially, only Kitimat, Terrace/Thornhill, part of Areas "B" and "C", and the Hazeltons will have a recycling program, as well as benefit from centralized yard waste composting.

Stewart plans to upgrade and maintain its own municipal landfill, and Kitimat intends to do the same. For the purposes of developing a funding model, it has been assumed that Terrace and Thornhill will use one landfill site (yet to be determined). The balance of the region will be served by RDK-S and First Nations landfills.

Landfills that are privately owned and operated, such as Bob Quinn, are not included in this evaluation. First Nations landfills are included. It has been assumed that an agreement can be reached whereby the RDK-S will pay a predetermined \$/person/year to First Nations for off-reserve users who utilize First Nations landfills. Conversely, it has been assumed that First Nations will pay the RDK-S the same \$/person/year for using regional district landfills.

The RDK-S has struck a financial working committee (FWC) comprising representatives from the RDK-S, municipalities, and First Nations. The committee's purpose is to develop proposals for plan funding. The premise for these proposals is practicality, waste control and affordability. During implementation, the proposals will be reviewed by the respective organizations and then presented to the Plan Monitoring Advisory Committee and the RDK-S Board for approval. The chosen funding proposal may constitute part of the funding by-law, which will be prepared after Ministry approval of the Stage 3 report.

As a first step, the FWC has begun work on a funding model. The purpose is to have a tool that can be refined and manipulated for budgeting purposes in the future.

In the funding model, and subsequently during plan implementation, the following parameters will be used:

- funding must cover 100% of plan implementation costs;
- funding may come partially from the tax base and partially from the user pay systems;

Table 4-2 Plan Benefits and Funding Participation Matrix

| Area/<br>Community      | Reduce,<br>Reuse<br>Education | Recycling<br>*   | Centralized<br>Community<br>Composting of<br>Yard Waste          | Landfills and<br>Transfers | Comments  |
|-------------------------|-------------------------------|--|--|----------------------------|---|
| Kitimat                 | ✓                             | ✓  | ✓  | Municipality               |   |
| Terrace                 | ✓                             | ✓  | ✓  | RDK-S                      | Terrace Municipal<br>responsibility until<br>landfill closes          |
| Stewart                 | ✓                             | non-plan<br>initiatives  | non-plan<br>initiatives  | Municipality               |   |
| New Hazelton            | ✓                             | ✓  | ✓  | RDK-S                      |   |
| Hazelton                | ✓                             | ✓  | ✓  | RDK-S                      |   |
| Area "A" <sup>WAS</sup> | ✓                             | --   | --   | RDK-S                      |   |
| Area "B" <sup>HAZ</sup> | ✓                             | partial  | partial  | RDK-S                      |   |
| Area "C" <sup>WAS</sup> | ✓                             | partial  | partial  | RDK-S                      |   |
| Area "D" <sup>WAS</sup> | ✓                             | --   | --   | RDK-S                      |   |
| Area "E"<br>(Thornhill) | ✓                             | ✓  | ✓  | RDK-S                      |   |
| First Nations           | ✓                             | non-plan<br>initiatives<br>and/or per<br>capita<br>contributions | non-plan<br>initiatives<br>and/or per<br>capita<br>contributions | Band and<br>RDK-S          | RDK-S will<br>contribute for use<br>of sites on First<br>Nations Land |

Note: \* Recycling may be expanded in the future to include additional areas/communities on a cost-sharing basis.

- user pay mechanisms may be phased-in over a period of years in the Terrace/Thornhill area, Stewart, Hazelton, and, perhaps, Kitimat.
- the proportion of funding that comes from user pay mechanisms will be determined by:
  - **affordability:** the user fee paid by residents and businesses shall not create financial hardship;
  - **practicality:** in the lightly populated areas of the far north, implementing a true user pay system may not be practical; and
  - **waste control:** user fees must not be excessive in order to avoid illegal dumping.

The mechanisms for user fee collection will be based on actual costs for waste transfer and disposal. Waste collection will remain a municipal responsibility (in incorporated areas). Waste transfer and disposal costs, that will be recovered through user fees, for all RDK-S landfills will be converted into tipping fees at larger landfills. The landfills at which tipping fees may be implemented include:

- Kitimat;
- Terrace (until it closes);
- Thornhill;
- Hazelton;
- Stewart; and
- Kitwanga.

Any individuals or businesses bringing wastes to these sites may be charged directly for the volume or weight of waste delivered based on the fee structure in place at that landfill. Scales may be used in the future at the largest sites. Municipalities, or their contractors, disposing of waste will also pay the tipping fee. These costs can then be passed-on directly to the generators of waste through various mechanisms, such as:

- bag tags;
- can subscriptions; and
- utility charge per residence.

Recovering collection and disposal costs through user fees will remain a municipal responsibility.

In remote areas, maintaining site attendants at landfills is not cost effective. The remote sites include:

- Telegraph Creek (First Nations site)
- Iskut;
- Meziadin (planned);
- Gitlakdamix and/or Laxgalts'ap (First Nations site(s)); and
- Rosswood.

Cost recovery for these sites will come from taxation and/or per capita levies.

First Nations users of RDK-S facilities will be requested to pay a "per person" charge. Similarly, where non-First Nations RDK-S residents use First Nations sites (e.g., Telegraph Creek and Gitlakdamix) the RDK-S will contribute the operation of those landfills.

Solid waste management plan elements will be paid for in the following manner:

| Plan Element                                   | Funded by   | Area Paying   |
|--|---|---|
| Administration,<br>Reduce, Reuse,<br>Education | Taxation (based on<br>assessment and/or<br>population)                  | Entire Region   |
| Recycling,<br>Centralized<br>Composting        | Taxation (based on<br>assessment and/or<br>population)                  | Kitimat, Terrace, Thornhill,<br>Hazeltons, portions of Areas<br>"B" and "C" |
| RDK-S Landfills                                | User Fees (partial)<br>Taxation (partial)<br>First Nations contribution | Entire region except Kitimat<br>and Stewart                                 |
| Terrace Landfill                               | Municipal funding decision  | Terrace   |
| Kitimat Landfill                               | Municipal funding decision  | Kitimat; Kitamaat Village   |

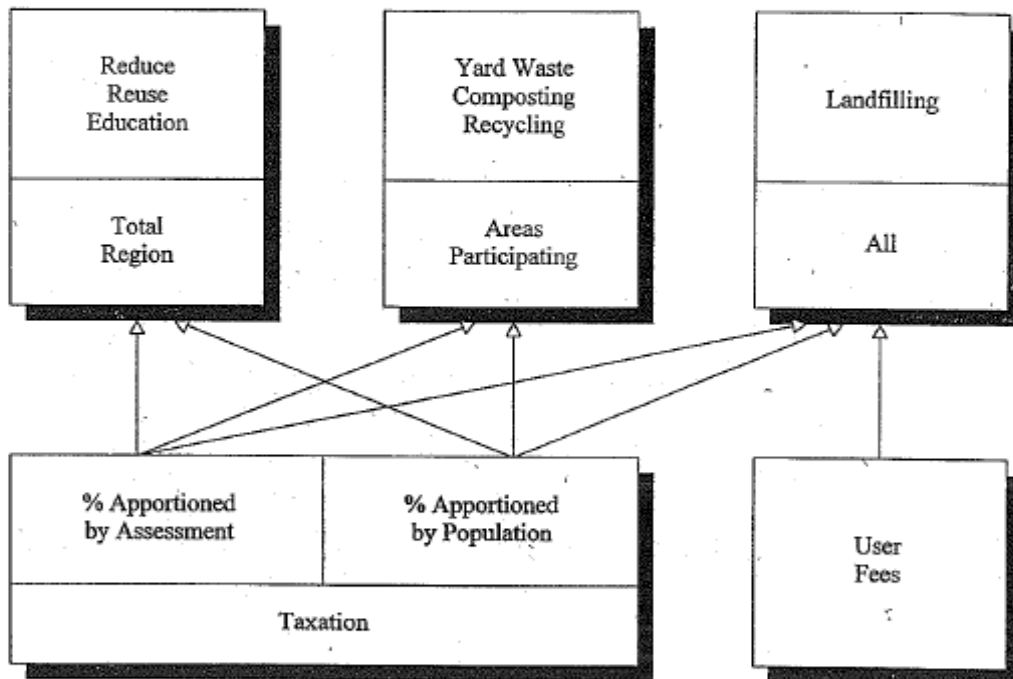
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| <b>Plan Element</b>  | <b>Funded by</b>                         | <b>Area Paying</b>    |
|----------------------|--|-----------------------|
| Stewart Landfill     | Municipal funding decision               | Stewart               |
| Bob Quinn Landfill   | Privately funded                         | BCBC                  |
| Nass Valley Landfill | First Nations with contribution by RDK-S | Nass Valley Residents |

#### 4.3 FUNDING FORMULA

The existing funding "formula" consists of taxation plus user fees (tipping fees) at major landfills in the region. This formula meets the basic user pay "requirement" and will remain in force until the FWC develops, and obtains, RDK-S Board approval for an improved funding formula, as described in this document. The general nature of the proposed components of the improved funding formula is shown graphically in Figure 4-1.

FIGURE 4-1: THE FUNDING MODEL



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## 5.0 OPERATING STRATEGIES AND REQUIREMENTS

In order to implement and operate the solid waste management system as defined above, certain operating strategies and specifications are required. The following section includes procedures and operating requirements for landfill siting, Operational Certificates, Licenses, mitigation requirements and risk assessment criteria for setting security bonds.

### 5.1 LANDFILL SITING CRITERIA AND METHODOLOGY

The following procedure will be followed when selecting sites for a new sub-regional Greater Terrace RDK-S landfill and/or landfills for the Hazelton and Meziadin areas.

- The landfill siting exercise shall be completed by the RDK-S with the assistance of a qualified consulting team.
- Landfill Siting Advisory sub-committee(s) (LSAC) may be formed before the commencement of this exercise, and shall be fully involved in all steps. The makeup and role of the LSAC are discussed in Section 6.0.
- New data which may include waste quantities, population, land use or physical geographical information, should be incorporated into the process.
- Using a constraint mapping or a positive attribute mapping process, candidate landfill sites should be identified.
- Consideration should be given to any offers of land for landfill sites
- The candidate landfill areas identified would be subject to a detailed screening assessment based on criteria which are reflective of the **B.C. Landfill Criteria for Municipal Solid Waste** and/or technical landfill development considerations. These criteria and considerations may include:
  - distance from residences;
  - distance from parks, schools, playgrounds, other public recreational property;
  - distance from surface water;
  - depth to groundwater;
  - proximity to areas of previous groundwater contamination;



- proximity to high rate water wells;
  - floodplains;
  - agricultural land reserves (ALR);
  - forest tenure agreements;
  - elevation (related to snow impacts, where applicable);
  - depth of overburden, where available;
  - potential for off-site users of energy from methane;
  - distance from airports;
  - unstable areas;
  - accessibility (distance from paved public road);
  - municipal zoning; industrial or rural, non-agricultural being desirable;
  - economics - cost to design, build, operate and transport; and
  - haulage impacts
  - potential for wildlife and fisheries habitat impacts
- These criteria shall be reviewed at the time of the study to determine whether other criteria are appropriate for addition. The criteria may be set into an evaluation matrix, with weights and scoring being established by the LSAC.
  - Rating of the candidate areas will result in a short list of approximately two landfill sites, which will be further evaluated and subjected to hydrogeotechnical testing. After securing options to purchase the land at both sites, the results of the study to this point will be taken to public meetings for public input.
  - The final site(s) will be determined through the input of the public and the committees, based on the technical information available for each site.

## 5.2 OPERATING REQUIREMENTS FOR FACILITIES

Operational Certificates are required for any landfills and transfer stations that are part of the Plan. These will ultimately replace the BC Environment permit system. Operational Certificates (OC) will be issued by the Ministry of Environment Lands and Parks for landfills within RDK-S. The OC's will contain clauses and conditions which will ensure that the landfill siting, design, operation and closure are in conformance with the requirements of the Provincial government including the Waste Management Act and the **BC Landfill Criteria for Municipal Solid Waste**.

There are two types of landfills that could be expected in the Regional District that fall under the jurisdiction of the Plan, i.e. those accepting municipal waste and those accepting DLC waste (which would be classified as a modified landfill under the **Landfill**

**Criteria).** Each type of landfill would have a different OC. A draft sample of an OC for a municipal waste or DLC waste landfill is contained in Appendix B.

### 5.3 LICENSES FOR WASTE MANAGEMENT OPERATORS

Bill 29, the Waste Management Amendment Act (1992), gives the Regional Districts the option to develop and issue licenses for operators of waste management facilities and services within the context of their Solid Waste Management Plans. The potential licenses include:

- Waste Stream Management Licenses (WSML) for facilities handling municipal solid waste or a portion thereof;
- Recycler Licenses for operators of recycling services in the Regional District; and
- Hauler Licenses for hauling operator which operate within the boundaries of the Regional District.

These licenses are a means that the RDK-S may choose to ensure that facilities and services are being operated in conformance with the requirements of the Plan. Licenses will not be required for any facilities or services operated by RDK-S, but may be required for any operated by other organizations within RDK-S. This would include landfills; transfer stations; recycling centres, including those for only single materials such as old corrugated cardboard; centralized composting facilities; and hauling services for any waste or recyclable materials. Draft samples of these Licenses are contained in Appendix C.

### 5.4 MITIGATIVE MEASURES

Most of the strategies brought forward in this Plan have some negative impacts, which were identified in Stage 2 of the Plan development. These impacts have been identified as being minor or at least "treatable". These impacts will be mitigated to the greatest extent possible during implementation and operation of the Plan. Tables 5-1 through 5-4 show, for each of recycling, composting, transfer stations and landfills, what the impacts are expected to be and how they will be mitigated through siting, design and operation considerations.

Reduction and reuse measures are not included because the benefits far outweigh any potential negative impacts which may occur. Impacts from recycling are primarily from the physical building and operations, and can be mitigated quite easily through operation considerations. Impacts from composting can be more extreme than for recycling due to the nature of the materials. Odour, other nuisances such as dust and noise, and potential for groundwater contamination are the most significant impacts. These can be mitigated

TABLE 5-1  
 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:  
 RECYCLING FACILITIES  
 REGIONAL DISTRICT OF KITIMAT-STIKINE

| EFFECTS  | MITIGATION MEASURES  |  |  |
|--|--|--|--|
|  | LOCATION   | DESIGN   | OPERATION  |
| <b>PUBLIC HEALTH AND SAFETY</b>                          |  |  |  |
| surface water contamination                              | locate remote from surface water   | provide means of storm water collection and treatment<br>store materials in containers or building | avoid prolonged storage of materials   |
| noise and litter   | locate away from residential development (but close enough to reduce transportation distances) | locate equipment indoors   | noise suppression, prescribed operating hours, liner collection and housekeeping |
| effects of increased truck traffic                       | locate on major roads<br>avoid residential areas, schools and bus routes                       | upgrade roads along haulage routes   | prescribed operating hours   |
| <b>NATURAL ENVIRONMENT</b>                               |  |  |  |
| effects on flora and fauna                               | locate remote from valuable wildlife habitat   |  |  |
| <b>SOCIAL AND CULTURAL ENVIRONMENT</b>                   |  |  |  |
| effects on residents of existing or planned developments | avoid existing or planned residential areas<br>avoid recreational areas, schools, churches     | provide buffer from residences   | low impact site operations   |

TABLE 5-2  
 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:  
 COMPOSTING FACILITIES  
 REGIONAL DISTRICT OF KITIMAT-STIKINE

| EFFECTS  | MITIGATION MEASURES  |  |   |
|--|--|--|---|
|  | LOCATION   | DESIGN   | OPERATION   |
| <b>PUBLIC HEALTH AND SAFETY</b>                          |  |  |   |
| surface and groundwater contamination                    | locate remote from surface water<br>locate in low permeability soils<br>avoid recharge areas, shallow aquifers, high groundwater uptake<br>avoid floodplains | provide means of storm water collection and treatment<br>divert surface water around site<br>provide low permeability surface (eg. pavement)<br>provide buffer around site<br>provide roof in high precipitation areas | develop monitoring plus control development around site   |
| air emissions, noise, odour, dust                        | locate away from residential development (but close enough to reduce transportation distances)   | provide paved roads<br>provide buffer zone around site<br>restrict type of materials to reduce odours  | dust control<br>noise suppression on equipment<br>prescribed operating hours<br>cover collection vehicles |
| effects of rodents                                       | -----  | -----  | avoid feed waste in windrows  |
| effects of increased truck traffic                       | locate on major roads<br>avoid residential areas, schools and bus routes   | upgrade roads along haulage routes   | prescribed operating hours  |
| <b>NATURAL ENVIRONMENT</b>                               |  |  |   |
| effects on flora and fauna                               | locate remote from valuable wildlife habitat   | proper leachate control  | -----   |
| <b>SOCIAL AND CULTURAL ENVIRONMENT</b>                   |  |  |   |
| effects on residents of existing or planned developments | select areas of low population density<br>avoid existing or planned residential areas<br>avoid recreational areas, schools, churches                         | provide buffer<br>public participation in site selection   | low impact site operations  |

TABLE 5-3  
 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:  
 TRANSFER STATIONS  
 REGIONAL DISTRICT OF KITIMAT-STIKINE

| EFFECTS  | MITIGATION MEASURES  |  |  |
|--|--|--|--|
|  | LOCATION   | DESIGN   | OPERATION  |
| <b>PUBLIC HEALTH AND SAFETY</b>                          |  |  |  |
| surface and groundwater contamination                    | locate remote from surface water<br>locate in low permeability soils<br>avoid recharge areas, shallow aquifers, high groundwater uptake<br>avoid floodplains | provide means of storm water collection and treatment<br>provide low permeability surface in active area (e.g. pavement)<br>provide roof over bins | avoid littering<br>ensure stormwater controls are in good working order  |
| noise, odour, litter and dust                            | locate away from residential development (but close enough to reduce transportation distances)   | store waste in sealable containers or in building<br>provide buffer zone around site   | noise suppression<br>prescribed operating hours<br>avoid prolonged storage of waste<br>litter collection and housekeeping<br>utilize waste collection vehicles with covers |
| effects of animals                                       | -----  | store waste in containers or building; bar fences  | avoid prolonged storage<br>pest control  |
| effects of increased truck traffic                       | locate on major roads<br>avoid residential areas, schools and bus routes   | upgrade roads along haulage routes   | prescribed operating hours   |
| <b>NATURAL ENVIRONMENT</b>                               |  |  |  |
| effects on flora and fauna                               | locate remote from valuable wildlife habitat   | proper pollution control   | -----  |
| <b>SOCIAL AND CULTURAL ENVIRONMENT</b>                   |  |  |  |
| effects on residents of existing or planned developments | select areas of low population density<br>avoid existing or planned residential areas<br>avoid recreational areas, schools, churches                         | provide buffer<br>public participation in site selection   | good operating and housekeeping  |

TABLE 5-4  
POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:  
LANDFILLS  
REGIONAL DISTRICT OF KITIMAT-STIKINE

| EFFECTS  | MITIGATION MEASURES   |  |   |
|--|---|--|---|
|  | LOCATION  | DESIGN   | OPERATION   |
| <b>PUBLIC HEALTH AND SAFETY</b>                                  |   |  |   |
| surface and groundwater contamination                            | locate remote from surface water<br>locate in low permeability soils<br>avoid groundwater recharge areas<br>avoid shallow aquifers<br>avoid major floodplains | provide means of storm water collection and treatment<br>divert surface water around site<br>provide impermeable liner (if soil conditions warrant)<br>provide leachate collection and treatment<br>provide sediment control ponds<br>provide a buffer zone around waste<br>provide final cover to minimize infiltration | develop monitoring and contingency plans<br>provide daily cover of waste<br>provide adequate compaction of waste<br>provide litter control<br>control development around site |
| air emissions, gas migration, noise, odour, litter and dust      | locate away from residential development<br>locate in low permeability soils (reduces inground migration from site)   | provide liner system<br>provide environmental controls (gas collection and venting, leachate collection and treatment)<br>provide adequate buffer zone<br>paved roads<br>litter control  | noise suppression,<br>prescribed operating hours,<br>litter collection and housekeeping<br>dust control<br>daily cover of waste   |
| effects of increased truck traffic                               | locate on major roads<br>avoid residential areas, schools and bus routes  | upgrade roads along haulage routes   | prescribed operating hours  |
| <b>NATURAL ENVIRONMENT</b>                                       |   |  |   |
| effects on flora and fauna                                       | locate remote from valuable wildlife habitat  | -----  | -----   |
| effects on aquatic ecology                                       | avoid rerouting of streams<br>provide buffer from watercourses<br>avoid major floodplains   | minimize diversion<br>provide sedimentation control  | close and vegetate as filling occurs<br>monitor water quality   |
| effects of vectors and nuisances (birds, rodents, insects, bees) | avoid licensed airfields<br>avoid specific wildlife habitat   | waste shredding prior to burial  | minimize working face<br>daily waste cover<br>pest control<br>bear fences if required   |

TABLE 5-4 Continued  
 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:  
 LANDFILLS  
 REGIONAL DISTRICT OF KITIMAT-STIKINE

| EFFECTS  | MITIGATION MEASURES  |   |   |
|--|--|---|---|
|  | LOCATION   | DESIGN  | OPERATION   |
| loss of mineral, forest and agricultural reserves        | avoid areas of mineral resources, if possible<br>avoid forest management areas, if possible<br>avoid agricultural land reserves, if possible | provide reforestation in buffer zone<br>minimize changes in ground water flow | extract mineral resources as site is developed<br>salvage timber as site is developed<br>reforest or revegetate on closure<br>restore soil to minimum rangeland standards |
| SOCIAL ENVIRONMENT                                       |  |   |   |
| effects on residents of existing or planned developments | avoid existing or planned residential areas<br>avoid recreational areas, schools, churches   | provide buffer from residences  | low impact site operations  |

quite successfully through siting, design and operation considerations. Transfer station impacts tend to be quite minimal, and can be easily mitigated through siting and operation considerations.

Landfills are perceived to have the most numerous and most publicized impacts of all waste management facilities, due to the typical size and operation of these facilities. Environmental and social impacts can be quite high, and tend to be more costly to mitigate than for other types of facilities. Siting, design and operating considerations are very important. It is for this reason that the comprehensive siting procedure outlined in Section 5.1 has been developed.

#### 5.5 RISK ASSESSMENT CRITERIA FOR SETTING SECURITY BONDS

According to the Criteria and to the OC's and Waste Stream Management Licenses, a security bond should be posted for landfill operators other than RDK-S. The intent of the security bond is to have sufficient funds readily available to the RDK-S should the facility operator cease operation and/or otherwise be unable to fulfill his/her obligations including clean-up of spills, etc. and site closure.

The amount of the security bond for a private operator should be equal to the dollar amount determined by the RDK-S, or its consultant, to close the site in accordance with the Criteria plus a contingency of approximately 20%. This will permit remediation of any environmental problems that have occurred on site and have not been remediated by the owner.

The only private operator currently operating in the Regional District is the British Columbia Building Commission at Bob Quinn.



## 6.0 COMMITTEES

In order for this Plan to be implemented efficiently, up to three committees will have to be established. As identified earlier in the Plan, these committees include a Plan Monitoring Advisory Committee (PMAC), a Landfill Siting Advisory sub-Committee (LSAC) and a Financial Working sub-Committee (FWC). The following is a description of each of the committees as well as the terms of reference for each of the committees.

### 6.1 PLAN MONITORING ADVISORY COMMITTEE

The PMAC will be extensively involved in the implementation of this Plan. The general role of the PMAC is to act in an advisory role to the RDK-S Board and staff in order to ensure the successful implementation of the Plan. More specifically, the PMAC will review all information related to ongoing waste and material quantities, establish the progress of Plan implementation in relation to the targets, act as a mediator in dispute resolutions, and annually review several aspects of the Plan. The PMAC will report to the RDK-S staff and/or the RDK-S Board.

A draft terms of reference for the PMAC is contained in Appendix D.

### 6.2 LANDFILL SITING ADVISORY SUB-COMMITTEE

The LSAC will be involved primarily in siting of the new Greater Terrace landfill and/or the Meziadin and new Hazelton area landfills. The LSAC will be a multi-interest committee, with membership derived from the PMAC plus a representative of the Agricultural Land Commission. The LSAC will act in an advisory role during the landfill siting process and report to the PMAC. The actual siting exercise will likely be done by a qualified consulting team, under the procedure defined in Section 5.1. The LSAC will review the work done by the consultants and ensure that an adequate level of public involvement is achieved.

### 6.3 FINANCIAL WORKING SUB-COMMITTEE

The FWC, which has already been formed, will oversee the financing mechanisms of the Plan. A number of cost recovery mechanisms have been proposed, including taxes, tipping fees, bag tags, senior government funding, fees and fines and service charges. It is necessary, each year, to determine the levels required for each of these mechanisms, in order to pay for the waste management system. Reporting to the PMAC, the FWC will

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review records of the Plan costs, project costs for each year with the help of the cost estimates included in this Plan, and advise on the breakdown of cost recovery mechanisms required to fund the Plan. The FWC will also ensure that RDK-S maintains the highest level of senior government funding possible in each given year.

APPENDIX A

LANDFILL ACTION PLANS

## 1.0 GENERAL

All landfills in the RDK-S shall be operated, closed and monitored in accordance with the June 1993 MELP document "Landfill Criteria for Municipal Solid Waste" or justified exemptions. Input will be provided to the MELP Regional Manager for the development of operational certificates and this input will reflect the specific requirements of the individual landfills in the RDK-S.

Certain operating, closure and reporting requirements are common to all landfills, while others are site-specific. In the following landfill action plan they are presented as follows:

- common actions (apply to all landfills); and
- site-specific actions.

## 2.0 COMMON ACTIONS

These actions apply to all landfills in the RDK-S. For those landfills that are closed, or will be closed, the operational actions (2.1 to 2.9, inclusive) are not applicable.

### 2.1 PROHIBITED WASTES

The following waste will be prohibited from being landfilled with general, municipal solid waste:

- special wastes;
- bulk liquids and semi-solids;
- used oil;
- automobiles, white goods, large metal objects and tires;
- pathological biomedical waste; and
- dead animals.

Recyclable materials may be accepted and stored in a separate area. Dead animals must be buried in an area separate from the municipal solid waste; or, if animals are buried together with solid waste, then the burial area shall be covered with soil immediately.

Wastes from outside of the RDK-S will normally not be accepted unless prior authorization has been granted.

## 2.2 SEGREGATION AREAS

Certain materials will be segregated for the purpose of reuse or recycling. These include:

- white goods;
- batteries;
- yard waste;
- wood waste;
- auto hulks;
- metals in quantity; and
- other materials as may be established from time to time.

A separate area for accepting septage will be maintained at most RDK-S sites.

The Thornhill landfill has set aside a reuse area. The effectiveness of this program will be evaluated and may be introduced at other large landfills in 1996 or 1997.

## 2.3 SIGNAGE

Signs on the property shall include:

- site name;
- site owner and operator;
- number and address of contact person;
- emergency phone number;
- hours of operation;
- accepted materials;
- banned materials; and
- tipping fee.

## 2.4 LITTER CONTROL

Litter will be prevented from leaving the site through the use of litter fencing, proper operation at the open face, good housekeeping practices and other appropriate methods.

## 2.5 ACCESS

Where access is restricted, it shall be enforced using lockable gates. Perimeter fencing shall be installed if the gates are insufficient to control vehicle access.

## 2.6 OPEN BURNING

Open burning of garbage at landfill sites will be prohibited. Permitted burning of wood waste will be conducted in accordance with the operational certificate.

## 2.7 BEAR CONTROL

Notwithstanding individual measures required at each landfill, the minimization of human/bear interaction and the protection of humans from bears attracted to garbage is paramount throughout the RDK-S. However, the definition of the "bear/garbage problem", the methodology and/or proven solutions and implementation strategies were under review at the time of Plan submission.

## 2.8 COMPACTION AND COVER

Compaction techniques and cover frequency and type will be in accordance with an agreement between the RDK-S and the Ministry of Environment, Lands and Parks.

## 2.9 OPERATION PLAN

In accordance with operational certificates, operating plans will be developed for all landfills in the RDK-S. The contents of the operating plans will include, as a minimum, the following:

- description of the operation;
- a filling plan;
- means of animal conflict resolution;
- prohibited materials;
- monitoring program (if required);
- reporting;
- closure and post-closure;
- security; and
- determination of landfill gas management requirements.

## 2.10 CLOSURE PLAN

A closure plan shall be developed for all landfills in the RDK-S. These closure plans shall include, as a minimum, the following:

- anticipated closure date;
- work required to close the site;
- the final shape of the landfill;
- the final land use of the site;

- the need for and extent of post-closure monitoring and controls;
- a wildlife management plan; and
- estimated cost of closure and post-closure care.

## **2.11 REPORTING**

An annual report shall be prepared for BC Environment. In this report, the operational certificate holders will provide information on site operations and monitoring (if applicable). Annual reports for closed sites will continue for a period of time appropriate for that site.

## **3.0 SITE SPECIFIC ACTIONS**

### **3.1 BOB QUINN LANDFILL**

The Bob Quinn incinerator and landfill are owned and operated by BCBC. BCBC will continue to operate and manage local waste.

#### **3.1.1 Landfilling Method**

The current trench method of filling will be continued.

#### **3.1.2 Supervision**

The site will not be supervised and will be open to receive waste 24 hours per day. General housekeeping duties will be accomplished by the site operator when waste is covered on a regular basis.

#### **3.1.3 Waste Measurement**

Given the small service population, there will be no waste measurement at this site.

#### **3.1.4 Monitoring**

The closure plan shall assess the need for groundwater monitoring. Given the small volumes of waste and the incineration of the putrescible fraction of the waste stream, an exemption could be requested from monitoring requirements.

#### **3.1.5 Bear Control**

Incinerating the putrescible waste should reduce the bears' attraction to the landfill. Together with regular cover, it may be possible to operate this site without additional bear control measures.

### **3.2 GITLAKDAMIX LANDFILL**

The Gitlakdamix landfill has an estimated capacity for 20 years of operation, and could serve the entire Nass Valley. This is contingent on the landfill meeting hydrogeological requirements as a suitable site. It would be owned and operated by First Nations.

#### **3.2.1 Landfilling**

The current method of area fill will continue at this site. The size of the working face should be reduced.

#### **3.2.2 Supervision**

Some form of supervision may be implemented to help maintain a small working face and limit the number of landfill fires. The extent of supervision will be determined in the operational certificate.

#### **3.2.3 Waste Measurement**

This is a First Nations site and the degree of waste measurement will be decided by the Band Council. Annual surveys may be used.

#### **3.2.4 Monitoring**

Based on preliminary investigations, the ground or surface water contamination potential is unknown. The closure plan shall assess the need for monitoring.

#### **3.2.5 Bear Control**

This site is well known for its grizzly bear population. An electric bear fence has been installed.

### **3.3 GITSEGUKLA LANDFILL**

A decision has been made to close the Gitsegukla landfill. The former users of this site shall redirect their waste to the Hazelton or Kitwanga landfills.

#### **3.3.1 Monitoring**

Based on visual observations, there is the potential for ground/surface water contamination. In the closure plan, the type and extent of monitoring required shall be assessed.



### 3.4 HAZELTON LANDFILL

Although approximately a ten year capacity remains at this site, there are concerns about surface water contamination and high costs associated with importation of cover material. Siting for a new landfill will begin in 1996 and as soon as a new site is available, the existing Hazelton landfill will be closed.

#### 3.4.1 Landfilling Method

The current method of area fill will continue.

#### 3.4.2 Supervision

The site shall be supervised during hours of operation. Access shall be restricted with a gate when the landfill is closed. The attendant and signs shall direct users in the placement of materials for recycling and disposal.

#### 3.4.3 Waste Measurement

When tipping fees are introduced, waste measurement shall be on the basis of volume estimates. A scale may be considered at the new landfill, if volume estimates are controversial and the economics of a scale appear feasible.

#### 3.4.4 Scavenging

Scavenging will be prohibited at the open face. Controlled salvaging of segregated materials will be permitted.

#### 3.4.5 Monitoring

The closure plan shall recommend the degree to which surface/groundwater monitoring will be required at this site.

#### 3.4.6 Bear Control

In light of the impending closure of this landfill, the use of electric fences as a means of animal conflict resolution will be assessed and compared with other options, such as frequency of cover, attendants, and limited operating hours. (NOTE: At the time of writing this document, the issue of bear fencing at the Hazelton landfill was under appeal.)

### **3.5 ISKUT LANDFILL**

The Iskut landfill will remain open and continue to service the area. The site has approximately 10 years capacity left. After five years, the site shall be assessed to determine whether it can be expanded or waste can be transferred to another site in the vicinity.

#### **3.5.1 Landfilling Method**

Operation will continue using the trench method of landfilling.

#### **3.5.2 Supervision**

The site will not be supervised and will be open to receive waste 24 hours per day. General housekeeping duties will be accomplished by the site operator when waste is covered on a regular basis.

#### **3.5.3 Waste Measurement**

Given the small service population, there will be no waste measurement at this site.

#### **3.5.4 Monitoring**

The closure plan shall determine the need for groundwater monitoring. Given the small volumes of waste and the remoteness of the site, an exemption could be requested from monitoring requirements.

#### **3.5.5 Bear Control**

Local users of this site claim that there is no problem with human-bear interaction. This shall be reviewed and reported periodically to determine the need for additional bear control measures in the future.

### **3.6 KISPIOX LANDFILL**

The Kispiox First Nations Band has indicated that their landfill will be closed as soon as possible and replaced by a transfer station or waste collection system.

#### **3.6.1 Monitoring**

The closure plan shall determine the monitoring requirements at this landfill.

### **3.6.2 Bear Control**

Since closure of the landfill is proposed as soon as the transfer station or alternative arrangement for local waste is in place, the need for additional bear control measures needs to be determined.

## **3.7 KITIMAT LANDFILL**

The District of Kitimat will continue to operate this landfill site for the municipality and surrounding areas, such as Kitimaat Village, until the site reaches capacity, which is estimated to be in 20 years. After this time, Kitimat will consider sending its waste to the proposed new subregional facility between Kitimat and Terrace.

### **3.7.1 Landfilling Method**

The current method of area fill, with cover as per the operational certificate, will continue.

### **3.7.2 Supervision**

The site shall be supervised when in operation. The gates will be locked when closed. The attendant and signs shall direct people to the recycling areas and open face, for the deposit of recyclable and disposable materials.

### **3.7.3 Waste Measurement**

Waste measurement shall continue to be on the basis of volume estimates and a rate schedule for load sizes. A scale may be considered if this appears economical and/or if the existing method becomes unacceptable.

### **3.7.4 Scavenging**

Scavenging will be prohibited at the open face. Controlled salvaging of segregated materials will be permitted.

### **3.7.5 Monitoring**

The closure plan shall determine what degree of monitoring is appropriate in order to ascertain whether and to what extent leachate is being generated and whether it is leaving the site.

### **3.7.6 Bear Control**

For bear control measures, the Kitimat landfill has an electrical bear control fence and operates with daily cover. Additional measures are not foreseen.

## **3.8 KITWANGA LANDFILL**

This landfill will be maintained and operated until it reaches capacity in approximately 8 to 10 years time. Once full, a transfer station will be constructed to haul Kitwanga waste to the Hazelton landfill.

### **3.8.1 Landfilling Method**

The current method of area fill will continue at this landfill.

### **3.8.2 Supervision**

The site shall be supervised during hours of operation. Access shall be restricted with a gate when the landfill is closed. The attendant and signs shall direct users in the placement of materials for recycling and disposal.

### **3.8.3 Waste Measurement**

When tipping fees are introduced, waste measurement shall be on the basis of volume estimates and a schedule for various load sizes.

### **3.8.4 Scavenging**

Scavenging will be prohibited at the open face. Controlled salvaging of segregated materials will be permitted.

### **3.8.5 Monitoring**

Initial site reconnaissance could not determine the potential for ground and surface water contamination. The closure plan shall address this issue and suggest monitoring requirements, if any.

### **3.8.6 Bear Control**

Grizzly and black bears have been reported at this landfill and some form of bear control, such as electric fencing, may be required at this site.

### **3.9 LAXGALTS'AP LANDFILL**

The old Laxgalts'ap landfill is being closed and a new site (near Ksedin Camp) has been identified. It is recommended that the Nisga'a First Nations agree to the concept of an integrated waste management system for the Nass Valley. To aid in this decision and to complement the work already done in evaluating the proposed "Ksedin Camp" landfill site, it is suggested that the Nisga'a First Nations undertake a hydrogeotechnical and environmental investigation of the existing Gitlakdamix site. This will enable a comparison of the two sites and a determination of the best option within the context of an integrated Nass Valley waste management system. Regardless of which option is selected, an agreement between the Nisga'a First Nations and the implementation of an appropriate collection and/or transfer system may be required.

#### **3.9.1 Monitoring**

Based on initial observations, it appears that there is a concern about groundwater contamination. The closure plan shall address the extent of monitoring requirements.

### **3.10 ROSSWOOD LANDFILL**

The Rosswood landfill will remain open to service the Rosswood area. Once this site is full, wastes could be transferred to the new subregional site (planned) for the Kitimat/Terrace corridor.

#### **3.10.1 Landfilling Method**

The current method of trench filling will continue.

#### **3.10.2 Supervision**

Operating hours will be limited and the site shall have a gate to restrict access when closed.

#### **3.10.3 Waste Measurement**

Given the small service population, there will be no waste measurement at this site.

#### **3.10.4 Monitoring**

Initial reconnaissance could not determine the risk to ground or surface water from this landfill. The closure plan shall address the procedures for determining monitoring requirements.

### **3.10.5 Bear Control**

Bears have been reported at this site and bear control measures shall be considered.

### **3.11 STEWART LANDFILL**

The District of Stewart will continue to own and operate this landfill, which is being upgraded and is expected to provide disposal capacity to the District of Stewart for another 20 years.

#### **3.11.1 Landfilling Method**

Area fill has replaced the trench method for operation. This will continue until the landfill has reached capacity.

#### **3.11.2 Supervision**

The site will have limited operating hours and shall be supervised, when open. The attendant and signs shall direct users to drop-off areas for recyclables and disposables. Tipping fees will be charged for non-Stewart users.

#### **3.11.3 Waste Measurement**

Waste will be measured on the basis of volume estimates.

#### **3.11.4 Scavenging**

Scavenging will be prohibited at the open face. Controlled salvaging of segregated materials will be permitted.

#### **3.11.5 Monitoring**

A landfill site assessment is being conducted and should be completed in 1996. This should provide the basis for a closure plan and input into the determination of monitoring requirements. These will be written into the operational certificate.

#### **3.11.6 Bear Control**

The Stewart landfill has implemented an electric bear control fence. No additional bear control measures are anticipated.

### **3.12 TELEGRAPH CREEK**

The existing Telegraph Creek landfill will be closed and replaced with a new landfill. This is under development and negotiations are underway between the local Band Council and the RDK-S to cost-share the operation of the site. The new landfill would serve the Telegraph Creek area for the next 20 years.

#### **3.12.1 Landfilling Method**

The new Telegraph Creek landfill will be operated using the trench-filling method.

#### **3.12.2 Supervision**

The site will not be supervised and will be open to receive waste 24 hours per day. General housekeeping duties will be accomplished by the site operator when waste is covered on a regular basis.

#### **3.12.3 Waste Measurement**

Given the small service population, there will be no waste measurement at this site.

#### **3.12.4 Monitoring**

The new landfill is being developed in a suitable area and it is anticipated that groundwater monitoring will not be required, due to the small volumes of waste being disposed.

### **3.13 TERRACE LANDFILL**

It is intended that the Terrace landfill be closed as soon as either expansion of the Thornhill landfill is approved or a Greater Terrace subregional landfill site (yet to be determined) is identified, approved and developed. In the interim, the Terrace landfill will continue to be operated.

#### **3.13.1 Landfilling Method**

The current method of area fill will continue until the landfill closes.

#### **3.13.2 Supervision**

The landfill is supervised during operating hours. An attendant is on-site and directs users to the various recycling and disposal areas.

### **3.13.3 Waste Measurement**

Tipping fees exist on the basis of volume estimates and a schedule of rates for various sized loads and vehicles.

### **3.13.4 Scavenging**

Scavenging will be prohibited at the open face. Controlled salvaging of segregated materials will be permitted.

### **3.13.5 Monitoring**

Due to the location of this landfill (close to groundwater and close to a river) leachate monitoring will be required. The closure plan shall recommend the number of wells and their locations.

### **3.13.6 Bear Control**

Human-bear interaction at Terrace has been reduced through the use of electric fencing and daily cover. No further measures are anticipated until the landfill closes.

## **3.14 THORNHILL LANDFILL**

The Thornhill landfill will be subject to a hydrogeotechnical assessment to determine its suitability as a long-term site and as a potential receiving site for waste from Terrace and Thornhill. In the latter case, the Thornhill landfill operational certificate would have to be amended, which may include a public review process. In either case, at least every five years, the ongoing status of the Thornhill landfill, as a receiving site for waste from the Thornhill and/or Terrace area, will be subject to a public review of a report which assesses the environmental, social and financial viability of the site.

### **3.14.1 Landfilling Method**

Operation will continue on the basis of area fill and the use of on-site cover, which will be administered according to the operational certificate.

### **3.14.2 Supervision**

The site will continue to be supervised during all hours of operation and the gate will be locked when closed. Signs and/or the attendant will direct users to the proper drop-off and disposal areas.



### **3.14.3 Waste Measurement**

A schedule of tipping fees is in effect, based on vehicle/load sizes and volume estimates. A scale will be considered if the Thornhill landfill site also accepts Terrace waste.

### **3.14.4 Scavenging**

Scavenging at the open face will be prohibited. Controlled salvaging of segregated materials will be permitted. A separate area has been set aside for reusable materials and this will continue.

### **3.14.5 Monitoring**

Concerns about potential leachate at the toe of the landfill will require some form of groundwater monitoring. An assessment will be carried out in 1996 to determine whether the Thornhill landfill is suitable for continued operation. This will include the placement of a minimum number of monitoring wells and an assessment of whether additional wells are required. Results of this monitoring program will reveal whether additional leachate control measures are required.

### **3.14.6 Bear Control**

The Thornhill landfill site assessment will also include a determination of whether additional bear control measures are required. The current practice of regular compaction and cover, along with good housekeeping practices may be adequate. However, if bear-human interface occurs, additional measures may be required.

## **3.15 USK LANDFILL**

The Usk landfill was closed in April 1995 and waste has been redirected to the Thornhill landfill.

### **3.15.1 Monitoring**

The site shall be inspected semi-annually by RDK-S staff for signs of animal activity or other degradation of the cover.

### 3.16 MEZIADIN LANDFILL

The RDK-S will site and construct a new, modified landfill in the Meziadin area. Planning will begin in 1996 and construction and operation will begin as soon as an operational certificate is received. Sitings will be targeted in the vicinity of the Meziadin junction and the landfill would accept waste from residents of Meziadin Lake, as well as various construction and logging camps in the vicinity (on the basis of fees, to achieve cost recovery). The Meziadin landfill also provides an option for Stewart, should the cost be more attractive than maintaining operation of the Stewart landfill.

The landfill will be designed, built and operated in full compliance with Ministry requirements for modified landfills.

### 3.17 SUBREGIONAL LANDFILL

Planning will begin in 1996 for a new subregional landfill. This landfill will be located, if possible, centrally between Terrace/Thornhill and Kitimat, so that it ultimately can receive wastes directly from these communities. Although there is adequate capacity at Thornhill for 20 years, having a site available within five years would provide the plan with the flexibility to close Thornhill earlier, if continued operation becomes environmentally, socially or financially non-viable.

The new subregional landfill will be designed as a true sanitary landfill and would be laid out for a 50 year life. The new site would fully comply with the "Landfill Criteria for Municipal Solid Waste."

**APPENDIX B**

**DRAFT OPERATIONAL CERTIFICATE**

MINISTRY OF ENVIRONMENT,  
LANDS AND PARKS

**OPERATIONAL CERTIFICATE**

Under the Provisions of the Waste Management Act  
And in Accordance with the Regional District of Kitimat-Stikine Solid Waste  
Management Plan

**Name**

**Address**

**City, British Columbia**

**XXX XXX**

is authorized to manage recyclable material and municipal solid waste from within the boundaries of the Regional District of Kitimat-Stikine subject to the conditions listed herein. Contravention of any of these conditions is a violation of the Waste Management Act and may result in prosecution.

**1 Location of Authorized Facility(ies)**

The location of the facility for the management of recyclable materials and municipal solid wastes to which this operational certificate is applicable is *[lot description]*.

**2 Management of Recyclable Materials**

**2.1. *Recyclable Material Storage at the Landfill***

- 2.1.1. The works authorized are a recyclable material storage area and related appurtenances approximately as shown on the attached site plan.
- 2.1.2. The maximum authorized quantity of recyclable materials which may be managed at the storage facility at any given time shall occupy an area no larger than 100 square metres and be no higher than three metres.
- 2.1.3. The characteristics of the recyclable materials which may be managed at the storage facility are municipal solid waste which may be reused or reprocessed into a useful and environmentally sound product.

## 2.2. *Windrow Composting Operation*

- 2.2.1. The works authorized are a windrow composting facility and related appurtenances approximately as shown on the attached site plan.
- 2.2.2. The maximum authorized quantity of compostable materials which may be managed at the composting facility at any given time is [*? tonnes; cubic metres*].
- 2.2.3. The characteristics of the recyclable materials which may be managed at the composting facility are those of yard wastes; sewage sludge; and other compostable but nonputrescible materials].

## 3 Management of Municipal Solid Waste

### 3.1. *Sanitary Landfill*

- 3.1.1. The works authorized are a sanitary landfill and related appurtenances approximately as shown on the attached site plan.
- 3.1.2. The maximum authorized rate at which the waste may be discharged to the landfill is [*? tonnes; cubic metres per averaging period not to exceed one year*].
- 3.1.3. The characteristics of the waste which may be discharged to the landfill are those of: municipal solid waste/demolition, land clearing and construction debris.

### 3.2. *Landfill Leachate Treatment Plant*

- 3.2.1. The works authorized are a leachate collection and treatment system and related appurtenances approximately as shown on the attached site plan.
- 3.2.2. The maximum authorized rate at which the treated leachate effluent may be discharged to the storm sewer is [*? cubic metres per day*].
- 3.2.3. The characteristics of the treated leachate effluent shall be equivalent to or better than effluent from the Terrace wastewater treatment sytem.

## 4 Operating Plan

### ***EITHER***

An operating plan which addresses, but is not limited to, the design, operation, prohibited materials and/or discharges, monitoring, reporting, closure and post-closure care, security, liability and performance requirements for the facility(ies) authorized in Section 1 through

Section 3, inclusive, shall be submitted for the approval of the Regional Waste Manager prior to the acceptance of recyclable materials and municipal solid waste at this site. Following approval of the operating plan by the manager, the facility shall be operated in accordance with the approved operating plan.

OR

The facility shall be operated in accordance with the *[operating plan, title]* as approved by the Regional Waste Manager in accordance with this certificate on *[date]*.

AND

Written authorization from the Regional Waste Manager shall be obtained prior to implementing any changes to the approved operating plan. Based on any information obtained in connection with the(se) facility(ies), the operating plan may be extended or altered by the Regional Waste Manager, where in the opinion of the manager the extension or alteration is in accordance with this operational certificate.

- 5 Monitoring
- 6 Reporting
- 7 Security, Liability and Performance
- 8 Closure and Post-Closure

*[At the discretion of the Regional Waste manager, items 5 - 8 may be included in the operating plan for the facility, rather than as separate sections].*

**APPENDIX C**

**DRAFT LICENSES**

REGIONAL DISTRICT OF KITIMAT-STIKINE  
SOLID WASTE DEPARTMENT

**WASTE STREAM MANAGEMENT LICENSE**

Under the provisions of the Waste Management Act in accordance with the Regional District of Kitimat-Stikine Solid Waste Management Plan and the Regional District of Kitimat-Stikine Solid Waste By-Law No. 1234

Joe Landfill

hereinafter referred as the **LICENSEE** is authorized to discharge **SOLID WASTE TO THE LAND** and to **RECOVER RECYCLABLE MATERIAL** at a site located at 123 Anyroad, Terrace, B.C.

This **WASTE STREAM MANAGEMENT LICENSE** has been issued under the terms and conditions, including definitions, prescribed in Regional District of Kitimat-Stikine Solid Waste By-Law No. 1234 hereinafter referred to as the **BYLAW** for discharge sources and works existing or planned on December 31, 1995.

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste



## 1.0 SITE

### 1.1 Location of Authorized facility(ies)

The operation of the facility to which this WASTE STREAM MANAGEMENT LICENSE applies shall be restricted to the land described as \_\_\_\_\_. This land is located at 123 Anyroad, Terrace, B.C. The location is approximately as shown on Drawing Number 1 of the WASTE STREAM MANAGEMENT LICENSE.

### 1.2 Access

Access to the site and vehicle routing through the site shall be constructed from all-weather material and clearly marked.

### 1.3 Site Requirements

~~(Some of these requirements are to be met during the license application phase.)~~

The site shall be surrounded by a fence, trees, shrubbery, or natural features so as to control access and be screened from the view of immediately adjacent neighbours.

The site shall have a locking gate on the access road to prevent the discharge of unauthorized waste at the site.

The site shall have a sign that identifies the facility, hours of operation, unacceptable disposal material, and other necessary information posted at the site entrance.

*(Optional)* The site shall have a scale that records in 10 kg increments that is approved by Consumer and Corporate Affairs - Weights and Measures Section. The scale shall be long enough to weigh the total axle length for the largest trucks that are using the facility.

The site shall have communication capabilities to immediately summon fire, police or emergency service personnel in the event of an emergency.

The site shall have a buffer zone of 15 metres from the active area to the nearest property line in areas zoned for residential.

The site shall not be located within 100 metres of an unstable area.

The distance between the discharge waste and the nearest surface water shall be a minimum of 100 meters.

Issued \_\_\_\_\_, 1995

Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste

The distance between the discharge waste and the nearest residence, water supply well, water supply intake, hotel, restaurant, food processing facility, school, church, and public park shall be a minimum of 300 meters.

The site shall not be located within 8 kilometres of an airport or the site shall provide bird control measures acceptable to the Solid Waste Manager.

The site shall require flood protection approved by the Water Management Branch if located within the 200 year floodplain.

## **2.0 OPERATING REQUIREMENTS**

### **2.1 Type of Facility**

The facility to which this license applies is a Municipal Solid Waste Landfill.

### **2.2 Hours of Operation**

The licensee shall only landfill refuse and allow access to vehicles transporting refuse from 8:00 a.m. to 8:00 p.m. from Monday to Saturday unless the licensee notifies the Manager, Solid Waste otherwise in writing at least 24 hours in advance of landfilling outside of these specified times. The licensee shall also notify the (municipality) environmental control department of any changes to these specified times.

### **2.3 Site Supervision**

An attendant employed by the licensee shall be present at all times that the facility is open for business or accepting waste. An attendant shall be present at the active face whenever waste is being discharged in order to monitor the quantity and quality of the waste. Any unauthorized refuse shall be removed from the site as soon as practical for reuse, composting, recycling, or recovery or alternatively, it shall be disposed of at a site and in a manner authorized by the Solid Waste Manager.

### **2.4 Acceptable Material**

The facility may accept domestic and commercial waste for land filling.

The maximum authorized rate at which the waste may be discharged to landfill is an annual average of \_\_\_\_ cubic meters uncompacted volume per day up to a total of \_\_\_\_ cubic metres of uncompacted volume during the active life of the landfill.

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # LL-01.

\_\_\_\_\_  
Manager - Solid Waste

The maximum height that the waste may be discharged to the landfill is 5 meters geodetic.

## **2.5 Recyclable Materials**

The following solid waste may be accepted at the site but must be reclaimed and not incorporated into the landfill:

- cardboard
- white goods and appliances
- tires
- gypsum
- yard waste
- clean wood
- metal

The maximum authorized quantity of recyclable materials which may be managed or stored at the facility at any given time is (tonnes).

As the viability of recycling these or other materials changes, the Solid Waste Manager may add materials or delete them from the list.

## **2.6 Public Health Safety and Nuisance**

The landfill shall not be operated in a manner such that a significant threat to public health or safety or public nuisance is created with respect to: unauthorized access, roads, traffic, noise, dust, litter, vectors or wildlife attraction.

## **2.7 Litter Control**

Litter is to be controlled by compacting the waste, minimizing the working face area, applying cover at appropriate frequencies, providing litter control fences and instituting a regular litter pickup and general good housekeeping or any other measures deemed necessary or required by the Solid Waste Manager

## **2.8 Area Maintenance**

The licensee will be responsible for maintaining public and private roadways within 100 metres of the site free from litter, mud or debris which may be attributed to the site, its customers or its suppliers.

## **2.9 Hazardous Materials**

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Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste

Any hazardous or dangerous materials received at the site shall be stored in a secure area and removed to an authorized facility within 72 hours.

#### 2.10 Drainage

Site drainage and surface water shall be managed in accordance with the site operating plan dated December 31, 1995.

#### 2.11 Load Inspection

All waste loads received for processing shall be inspected before incorporation into the landfill. Loads which contain unauthorized material shall be rejected and removed from the site. In the event that a load contains both authorized and unauthorized material the licensee may reject and have removed only the unauthorized material. A record shall be maintained of rejected loads including date, time, type of material, haulers name and vehicle license number.

#### 2.12 Works

The works authorized at this site include:

- A landfill operated according to the approved plan of operation dated January 1, 1996.
- Leachate collection and treatment system
- Scale (*optional*)

#### 2.13 Licensed Haulers

The licensee shall only accept waste material from haulers that hold a valid Haulers License from the RDK-S.

#### 2.14 CFC Recovery

Any white goods or other appliances containing CFC's must have the CFC's recovered by a licensed technician before the appliance is removed from the site. If CFC's have been removed off site, the appliance must display a RDK-S sticker as an indication of CFC removal.

#### 2.15 Plan of Operation

The licensee shall develop, keep and abide by a plan of operation approved as part of the licensing process. Each plan of operation shall include:

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste

- How solid wastes are to be handled on-site during the term of operation.
- How inspections and monitoring are conducted and their frequency.
- Fire and Emergency Plan.
- Safety Plan or procedures.
- Actions to take if ground water or storm water is contaminated.
- How equipment is to be maintained.
- Odour, dust, litter, rodent and bird control plan.
- Management of leachate.
- Management of landfill gas.

#### **2.16 Scavenging**

The licensee shall prohibit scavenging at this facility. However, controlled salvaging of segregated materials is allowed.

#### **2.17 Cover Material**

All refuse shall be confined to the smallest practical area and reduced to the smallest practical volume at the operating face of the landfill. A minimum 0.3 metres of intermediate cover shall be applied on all exposed solid waste at least once per month. The Manager, Solid Waste may vary the frequency of covering when weather conditions adversely affect normal operation.

Intermediate cover shall consist of a uniform compacted layer of at least 0.3 metres of non combustible soil.

Unless otherwise authorized by the Manager, Solid Waste, the licensee shall install a final cover, consisting of a uniform compacted layer of at least 1.0 metre of non combustible low permeability compacted soil (with a maximum hydraulic conductivity of  $1 \times 10^{-5}$  cm/s) and 0.15 m of topsoil within 90 days of landfill closure or on any surface of the landfill which will not receive any more refuse within the next 12 months. Completed portions of the landfill are to progressively receive final cover during the active life of the landfill. The licensee shall upgrade the final cover with additional layers of natural soils (including earth or aggregates) or synthetic materials or other methods if necessary to ensure that the final cover restricts the infiltration of precipitation, promotes surface runoff, prevents fire and prevents pollution.

Erosion of the final cover and berms shall be prevented by grading seeding with suitable vegetation and/or taking other appropriate measures acceptable to the Manager, Solid Waste.

#### **2.18 Unacceptable Material**

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste

The facility may not accept:

- gypsum
- industrial waste - specific exceptions may be granted
- Special Wastes as defined by the regulations under the Waste Management Act
- Liquid or semi-solid waste
- Biomedical waste
- Dead animals and slaughterhouse, fish hatchery or cannery waste

#### **2.19 Burning Prohibited**

The burning of refuse at this site is prohibited.

#### **2.20 Fire Protection**

The Licensee shall provide and maintain an adequate water supply, a sufficient quantity of non combustible soil and earth moving/excavation equipment on site for extinguishing any fires, should they occur. A fire guard around the active areas, acceptable to the Solid Waste Manager shall be cleared and maintained free of combustible material. The Licensee is responsible for complying with all municipal fire safety requirements, including preparing and implementing any fire safety and/or emergency plan required by the local fire authority, and shall take all measures necessary to prevent fires.

In the event of a fire the Licensee shall immediately notify the local fire department and the Solid Waste Manager and take all measures necessary to extinguish the fire.

It is the responsibility of the Licensee to cover the costs of extinguishing any fires.

#### **2.21 Drainage Works and Site Restoration**

The site shall have appropriate surface water diversionary works and ground water collection systems. The licensee shall maintain the surface water diversionary works and any ground water collection systems needed in such a manner that they will be able to convey all drainage water past the site under all conditions without endangering the safety or property of downstream residents.

#### **2.22 Ground and Surface Water Quality**

Ground and Surface Water Quality Requirements

- ambient quality at or beyond landfill boundary

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste

- meets Approved and Working Criteria for Water Quality
- treatment, if necessary, to meet Ministry's policy

### 2.23 Landfill Gas Collection System

#### Gas Venting or Recovery and Management Systems

- < 100,000 tonnes LFG collection system is not required.
- required if > 100,000 tonnes and non-methane organic compounds (NMOCs) exceed 150 tonnes/yr
- combustible gas concentrations must not exceed lower explosive limit (LEL) in soils at the property boundary or 25% of the LEL in on-site or off-site structures
- Minimum recommended spacing of gas vents is two per hectare.

### 2.24 Emergency Procedures

In the event of an emergency which prevents the licensee from complying with a requirement of the license that would otherwise be applicable, that requirement will be suspended for such time as the emergency exists or until otherwise directed by the Solid Waste Manager provided that:

- i. The licensee can demonstrate that exercise of due diligence in the relation to the process, operation or event which caused the emergency and that the emergency has occurred notwithstanding this exercise of due diligence;
- ii. The Solid Waste Manager and the Emergency Control Coordinator of the (municipality) has been immediately notified of the emergency; and
- iii. The Licensee is proceeding with due diligence to correct the emergency condition.

Notwithstanding i, ii, and iii above the Solid Waste Manager may require the Licensee to reduce or suspend operation to protect the environment while correcting the situation.

### 2.25 Disposal of Water

The licensee shall not dispose of waste into water and shall divert surface water to restrict contact with waste.

### 2.26 Landfill Operation (*site specific*)

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste

It is the responsibility of the Licensee to carry out the landfill operation in a manner that prevents pollution.

(1) The Licensee shall maintain buffer zones so that no refuse, structure or berm is placed within

- (i) 15 metres of all ditches or surface waters;
- (ii) 15 metres of any landfill site property boundary line except for property boundary lies between the landfill and adjacent land owned by the Licensee or the owner of the property on which the landfill is located where the Licensee maintains a minimum 15 metre wide buffer zone adjacent to the landfill perimeter berms and has registered covenants as charges against the affected properties under the Land Title Act acceptable to the Manager, Solid Waste or

The Licensee shall clear and maintain all buffer zones free of combustible materials.

In addition, the Licensee shall not discharge any waste or place any berms outside of the landfill area authorized by this permit and shown in the attached site plan (Appendix A).

The Licensee shall retain a qualified land surveyor to clearly mark buffer zones, property lines and right-of-way using survey stakes with flagging or other methods acceptable to the Manager, Solid Waste. If required by the Manager, Solid Waste, the Licensee shall carry out additional land surveys of the landfill site.

(2) The refuse shall be land filled in cells not exceeding one hectare (10,000 m<sup>2</sup>) in area.

Prior to depositing any waste within each lift of a cell, the Licensee shall:

- (a) completely encompass each lift of the cell with a berm that is at least as high as the refuse that will be contained in that lift; or
- (b) completely encompass each lift of the cell with a minimum 1.0 metre high initial berm. The Licensee shall install a final berm around each lift of the cell within 60 days of completing that lift of the cell unless otherwise authorized by the Manager, Solid Waste. The final berm for



each lift shall be at least as high as the refuse within that lift of the cell.

All berms shall be constructed in a manner that prevents the discharge of toxic leachate and pollution. All berms except for initial berms shall consist of uniform compacted non combustible low permeability soil with a maximum of hydraulic conductivity of  $1 \times 10^{-5}$  cm/s, unless otherwise authorized or specified by the Manager, Solid Waste.

The Licensee shall spread wastes onto the working face in thin layers not exceeding 0.6 metres in thickness and compact each layer. The height of each lift shall not exceed 3.0 metres.

#### **2.27 Process Modifications**

The Licensee shall notify the Solid Waste Manager prior to implementing changes to any process or method that may adversely affect the quality and/or quantity of the discharge.

### **3.0 INSPECTIONS**

#### **3.1 Inspections**

The site shall be subject to regular inspections by RDK-S staff at any time during the operating period specified in Section 2.

The licensee shall conduct regular inspections of the works and operation to prevent malfunctions and deterioration, operation errors and hazardous discharges.

### **4.0 MONITORING**

#### **4.1 Monitoring**

A monitoring program as specified herein shall be undertaken by the licensee. The Manager, Solid Waste may modify the program based on results submitted as well as any other data obtained by Environmental Protection.

#### **4.2 Soils sampling and analyses**

Four times each calendar year, the licensee shall obtain a representative sample of soil being landfill that is likely to be most highly contaminated and analyse it for:

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste

- THE,
- heavy metals (Ag, As, Ba, Cd, Cr, Co, Cu, Pb, Hg, Mo, Ni, Se, Sn, and Zn)
- BETX (benzene, ethyl benzene, toluene and xylene),
- mineral oil and grease and
- LAH (light aliphatic hydrocarbons)

The licensee shall obtain representative samples of all ash, sandblast sand and shotblast material destined for land filling, measure the temperature of the ash and analyse the samples for heavy metals (Ag, As, Ba, Cd, Cr, Co, Cu, Pb, Hg, Mo, Ni, Se, Sn and Zn). The licensee shall ensure that the results of the temperature measurements and analyses comply with the requirements of this License prior to land filling the waste.

All test data for soil deposited at the site shall be kept available for inspection at any time and shall be submitted to the Manager, Solid Water upon request.

(It is the responsibility of the licensee to comply with any more restrictive requirements imposed by municipal authorities with respect to allowable contaminant levels and monitoring).

#### 4.3 Analyses

Obtain analyses of the samples and monitoring data as follows:

| <u>Parameter</u>   | <u>Sampling Locations and Frequencies</u> |              |
|--|---|--------------|
|  | <u>Ditches</u>                            | <u>Wells</u> |
| (Unless otherwise specified, the units are ug/L or mg/L) |   |              |
| pH, pH Units   | Q   | S            |
| Temperature, °C  | Q   | S            |
| Total hardness (as CaCO <sub>3</sub> )                   | Q   | S            |
| 5-day Biochemical oxygen demand (BOD <sub>5</sub> )      | Q   | S            |
| Dissolved oxygen   | Q   | S            |
| Chemical oxygen demand                                   | Q   | S            |
| Total sulfide  | Q   | S            |

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste

|  |                         |    |
|--|-------------------------|----|
| Total ammonia nitrogen   | Q                       | S  |
| Total and dissolved metals<br>(Ag, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn,<br>Mo, Ni, Sb, Se, Sn and Zn) | Q                       | S  |
| Dissolved Aluminum   | Q                       | S  |
| Total mercury  | Q (sediment<br>samples) | -- |
| Mineral oil and grease   | Q                       | S  |
| Benzene  | Q                       | S  |
| Dissolved sulphates  | Q                       | S  |
| Phenols  | Q                       | S  |
| Toxicity*, 96h LC20  | Q                       | -- |
| Water elevation  | --                      | S  |
| Flow direction & estimated rate (L/min)  | Q                       | -- |

Q - quarterly (once every three months)

S - twice per year (once during the wet season when the water table is highest and once during the dry season when the water table is lowest.)

\*Note: If more than 5 fish die during any of the 96h LC20 bioassays, the Licensee shall provide a 96h LC50 bioassay result.

The MDC (minimum detection concentration) for total copper, lead and sulfide shall be 0.001 mg/L. The MDC for total zinc shall be 0.005 mg/L. The MDC for pentachlorophenols and tetrachlorophenols shall be 0.0001 mg/L. Wherever it is achievable using ministry procedures, the MDC for other parameters shall be less than or equal to the criteria for each parameter.

In addition, the Licensee shall carry out the monitoring program specified in Appendix B of this permit with the exception that 96h LC20 bioassays may be conducted instead of the 96H LC50 bioassays:

Additional ground water monitoring wells and baseline monitoring.

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste

Prior to land filling any waste, the Licensee shall retain a qualified professional to install at least one additional ground water monitoring well acceptable to the Manager, Solid Waste and carry out baseline water quality monitoring that includes, but is not limited to, at least two sets of sampling, analyses and measurements specified in this license.

The Manager, Solid Waste may require the Licensee to install and monitor additional ground water wells. The locations and structural details of the wells are subject to the approval of the Manager, Solid Waste.

#### **4.4 Sampling and flow measurement procedures**

Sampling and flow measurement shall be carried out in accordance with the procedures described in "Field Criteria for Sampling Effluents and Receiving Waters", April 1989, 17 pp. or by suitable alternative procedures as authorized by the Manager, Solid Waste.

Copies of the above mentioned manual are available from the Environmental Protection Division, Ministry of Environment, Lands and Parks, 777 Broughton Street, Victoria, B.C. V8V 1X5, at a cost of \$20.00 and are available for inspection at all Environmental Protection Offices.

#### **4.5 Chemical analyses**

Analyses are to be carried out in accordance with procedures described in the "BRITISH COLUMBIA ENVIRONMENTAL LABORATORY MANUAL for the Analysis of Water, Wastewater, Sediment and Biological Materials", or by suitable alternative procedures as authorized by the Manager, Solid Waste.

A copy of the above manual may be purchased from the Queens Printer Publications Centre, 563 Superior Street, Victoria, British Columbia, V8V 4R5 (phone 1-800-663-6105 or 387-4161). The manual is also available for review at all Environmental Protection Program Offices.

#### **4.6 Toxicity**

Analyses for determining the toxicity of liquid effluent to fish shall be carried out in accordance with the procedures described in the "Laboratory Procedures for Measuring Acute Lethal Toxicity of Liquid Effluent to Fish", dated November, 1982.

Copies of the above mentioned manual are available from the Environmental Protection Division, Ministry of Environment, Lands and Parks, 777b Broughton Street, Victoria, British Columbia, V8V 1X5 at a nominal cost of \$5.00, and are also available for

inspection at all Environmental Protection Program Offices.

The procedures for the 96h LC20 bioassay are the same as the procedures for the 96h LC50 bioassay except that the 96h LC20 bioassay is a static bioassay on salmonoid species, expressed as percent by volume of the liquid sample in diluent water that is required to give 80% survival of the test fish over 96 hours.

## **5.0 REPORTING**

### **5.1 Reporting**

The records shall be submitted to RDK-S on a quarterly basis before the 15th of April, July, October and January for the preceding 3 months of operation.

### **5.2 Scale Tickets**

Scale tickets or an approved equivalent must be submitted to validate the quantities of waste received and receipts from a buyer stating the quantity and type of material must be submitted for the recyclable material removed.

### **5.3 Record Keeping**

The Licensee shall record and maintain the following information both on-site and at the legal address of the Licensee:

- Copy of this license
- Inspection records for inspections conducted by the Licensee and regulatory agencies,
- Training procedures and the training status of site personnel,
- Contingency plan and notification procedures,
- Closure and post-closure care plans,
- Monitoring results,
- Interpretations of monitoring,
- Financial security documentation and
- Copies of all annual reports.

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Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste

## 6.0 FEES

### 6.1 Administration Fee

The administration fee payable to the RDK-S in respect of this license shall be as follows:

| ADMINISTRATION FEE: | FEE     |
|---------------------|---------|
| Annual Fee          | \$1,000 |

### 6.2 Application Fee

The application fee payable to the RDK-S in respect of this license shall be as follows:

| APPLICATION FEES | FEE     |
|------------------|---------|
| New License      | \$1,000 |
| Amending License | \$500   |

### 6.3 License Fee

The license fee payable to the RDK-S in respect of this license shall be based on the quantity of waste going to disposal as follows.

| LICENSE FEE | FEE                            |
|-------------|--------------------------------|
| Annual Fee  | \$4/tonne of waste to disposal |

## 7.0 TERMS

### 7.1 Existing Operation

This license is issued to an existing operation.

### 7.2 Compliance Date

The requirements of this license must be met by June 30, 1996 and thereafter.

## 8.0 SECURITY and PERFORMANCE

### 8.1 Security

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Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste

The Licensee shall post security with the Minister of Finance and Corporate Relations in the amount equal to \$500,000.00 in a form acceptable to the Manager, Solid Waste prior to commencing discharge. The Manager, Solid Waste may require the Licensee to post additional security.

The security may be applied at the discretion of the Manager, Solid Waste under the provisions of the Waste Management Act to address

- (i) emergencies, or
- (ii) conditions that the Licensee was requested by the Manager, Solid Waste to address or correct, but has failed to correct or address to the satisfaction of the Manager, Solid Waste within 30 days or such other reasonable time period specified by the Manager, Solid Waste.

The Manager, Solid Waste may use the security to correct any inadequacy of the works as it relates to their construction, operation and maintenance; stop pollution; extinguish or prevent fires; control or stop leachate, control or stop landfill gas; remediate or close the site; monitor the impact on the environment; and/or carry out any other activities to protect the environment.

Unless otherwise authorized by the Manager, Solid waste, in the event that the all or part of the security is used, the Licensee shall not discharge or landfill any refuse unless the Licensee re-posts security in an amount and in a form acceptable to the Manager, Solid Waste.

The Licensee may request the return of all or part of the security provided that the Licensee demonstrates to the satisfaction of the Manager, Solid Waste that adequate landfill closure and post-closure measures have been implemented and that no pollution of fire will be caused by the closed landfill. Granting of the request is at the discretion of the Manager, Solid Waste.

## **9.0 CLOSURE and POST-CLOSURE**

### **9.1 Closure Plan**

The Licensee shall retain a professional engineer (and other qualified professionals as appropriate) to prepare a preliminary closure plan and submit it to the Manager, Solid Waste within 6 months of the date of this License, unless otherwise authorized or specified by the Manager, Solid Waste. The closure plan shall include, but not be

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Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste

limited to, the following:

- Anticipated total waste volumes and tonnage, and life of the landfill (ie. closure date);
- A topographic plan showing the final elevation contours of the landfill and surface water diversion and drainage controls;
- Design of the final cover including the thickness and permeability of barrier layers and drainage layers, and information on topsoil, vegetative cover and erosion prevention controls;
- Procedures for notifying the public and/or persons who use the landfill about the closure and about alternative waste disposal facilities;
- Proposed end use of property after closure;
- An assessment of the need for and a plan for monitoring ground water, surface water, erosion and settlement and the length of time that monitoring is required;
- An assessment of the need for and a plan for operating any required pollution abatement engineering works such as leachate collection and treatment systems and the length of time that the works are required to prevent pollution;
- The planned location of any pollution control works that may be needed (The Licensee shall set aside and hold in reserve for future use a suitable standby area, as determined by a qualified professional engineer, for the location of any pollution control works that may be needed. The standby area shall be maintained free of any permanent structures);
- Recommended measures to prevent fire; and
- An estimated cost to carry out closure and post-closure activities

The Licensee shall submit annually to the Manager, Solid Waste a report prepared by a professional engineer (and other qualified professionals as appropriate) with an update of the anticipated closure date and estimated cost to carry out closure and post-closure activities.

The Licensee shall retain a professional engineer (an other qualified professional as appropriate) to prepare a final closure plan and submit it to the Manager, Solid Waste at least six months prior to ceasing discharge of waste, unless otherwise authorized

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Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste



or specified by the Manager, Solid Waste. The final closure plan shall include, but not be limited to, the closure plan requirements listed above.

The Licensee shall carry out closure and post-closure activities as specified in the closure plan, unless otherwise specified or authorized by the Manager, Solid Waste, and shall take all other measures necessary to prevent pollution or fire. After landfill closure is completed, the Licensee shall submit, to the Manager, Solid Waste, a report prepared by a professional engineer (and other qualified professionals as appropriate) with an assessment on whether all necessary closure activities have been carried out and adequate measures have been taken to prevent pollution or fire, and recommendations on any further measures that are required.

It is the responsibility of the Licensee to comply with any requirements that the municipal or regional district authorities have for control and management of landfill gas.

## 9.2 Legal Survey

Landfills sited on titles land must register a covenant that the property was used for the purpose of waste disposal.

JV/bs/942340.5

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Waste Stream Management License # LL-01

\_\_\_\_\_  
Manager - Solid Waste

THE REGIONAL DISTRICT OF KITIMAT-STIKINE  
SOLID WASTE DEPARTMENT

**WASTE STREAM MANAGEMENT LICENSE**

Under the provisions of the Waste Management Act and in accordance with the Regional District of Kitimat-Stikine Solid Waste Management Plan and the Regional District of Kitimat-Stikine Solid Waste By-Law No. \_\_\_\_\_.

Joe Recycler

hereinafter referred to as the **LICENSEE** is authorized to receive **RECYCLABLE MATERIAL** and to **OPERATE A RECYCLING FACILITY** at a site located at 123 Anyroad, Terrace, B.C.

This **WASTE STREAM MANAGEMENT LICENSE** has been issued under the terms and conditions, including definitions, prescribed in the Regional District of Kitimat-Stikine Solid Waste By-Law No. \_\_\_\_\_ hereinafter referred to as the **BYLAW** for discharge sources and works existing or planned on December 31, 1995.

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # RL-01

\_\_\_\_\_  
Manager - Solid Waste

## **1.0 SITE**

### **1.1 Location**

The operation of the facility to which this license applies shall be restricted to the land described as \_\_\_\_\_. This land is located at 123 Anyroad, Terrace, BC. The location is approximately as shown on Drawing Number 1 of the license.

### **1.2 Access**

Access to the site and vehicle routing through the site shall be constructed from all-weather material and clearly marked.

### **1.3 Site Requirements**

The site shall be surrounded by a fence, trees, shrubbery, or natural features so as to control access and be screened from the view of immediately adjacent neighbours.

The site shall be sturdy and constructed of easily cleanable materials.

The site shall have a sign that identifies the facility, hours of operation, acceptable material, and other necessary information posted at the site entrance.

The site shall have communication capabilities to immediately summon fire, police or emergency service personnel in the event of an emergency.

The site shall have a buffer zone of 15 m. from the active area to the nearest property line in areas zoned for residential.

## **2.0 OPERATING REQUIREMENTS**

### **2.1 Type of Facility**

The facility to which this license applies is a recycler-broker which accepts clean recyclables from the solid waste stream.

### **2.2 Hours of Operation**

The facility may operate Monday through Saturday from 8:00 am to 6:00 pm subject to municipal bylaws and zoning requirements.

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Waste Stream Management License # RL-01

\_\_\_\_\_  
Manager - Solid Waste

### 2.3 Site Supervision

An attendant employed by the licensee shall be present at all times that the facility is operating or accepting waste or recyclable material.

### 2.4 Acceptable Materials

The facility may accept for processing and brokering purposes clean recyclable material specifically: *(example)*

- all paper types
- all glass types
- non-industrial metals
- all plastics types
- cardboard

### 2.5 Storage Quality

The storage of the following materials on the site are limited to the following quantities:

|           |       |                                  |
|-----------|-------|----------------------------------|
| paper     | _____ | tonnes                           |
| glass     | _____ | tonnes                           |
| plastic   | _____ | tonnes                           |
| cardboard | _____ | tonnes                           |
| total of  | _____ | tonnes of all materials combined |

### 2.6 Contaminated Material

Material consisting of or contaminated with putrescible material must be removed within 48 hours of receipt.

### 2.7 Nuisance

Should dust, odour, or noise be a nuisance, to neighbouring residences or businesses or to the host municipality the licensee shall correct the problem with whatever measures are appropriate.

### 2.8 Windblown Debris

Windblown debris will be prevented from leaving the site.

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Waste Stream Management License # RL-01

\_\_\_\_\_  
Manager - Solid Waste

## **2.9 Area Maintenance**

The licensee will be responsible for maintaining public and private roadways within 100 metres of the site free from litter, mud or debris which may be attributed to the site, its customers or its suppliers.

## **2.10 Hazardous Materials**

Any hazardous or dangerous materials received at the site shall be stored in a secure area and removed to an authorized facility within 72 hours.

## **2.11 Drainage**

Site drainage and surface water shall be managed in accordance with the site work plan dated January 1, 1996.

## **2.12 Load Inspection**

All loads of material received for processing shall be inspected before acceptance into the facility. Loads which contain unauthorized material shall be rejected and removed from the site. A record shall be maintained of rejected loads including date, time, type of material, haulers name and vehicle license number.

## **2.13 Supply of Receipt**

The licensee shall be required to provide a receipt for all suppliers of recyclable material stating licensee's name and the type and quantity of material received and date of transaction.

## **2.14 Licensed Haulers**

The licensee shall only accept recyclable material from haulers holding a valid license from RDK-S.

## **2.15 CFC Recovery**

Any white goods or other appliances containing CFC's must have the CFC's recovered by a licensed technician before the appliance is removed from the site.

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Waste Stream Management License # RL-01

\_\_\_\_\_  
Manager - Solid Waste

## **2.16 Plan of Operation**

The licensee shall develop, keep and abide by a plan of operation approved as part of the licensing process. Each plan of operation shall include:

- How materials are to be handled on-site during the term of operation.
- How inspections and monitoring are conducted and their frequency.
- Fire and Emergency Plan.
- Safety Plan or procedures.
- Actions to take if ground water or storm water is contaminated.
- How equipment is to be maintained.
- Odour, dust, litter, rodent and bird control plan.

## **2.17 Scavenging**

The licensee shall prohibit scavenging at this facility.

## **3.0 INSPECTIONS**

### **3.1 Inspections**

The site shall be subject to regular inspections by RDK-S staff at any time during the operating period specified in Section 2.2.

## **4.0 REPORTING**

### **4.1 Recording and Reporting**

The licensee must record the quantity of recyclable material received and shipped from the site each month. The records shall be submitted to RDK-S on a quarterly basis before the 15th of April, July, October and January, for the preceding 3 months of operation.

## **5.0 FEES**

### **5.1 License Fee**

An annual license fee of \$0.10 per tonne, based on the annual quantity of material passing through the facility, is required.

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # RL-01

\_\_\_\_\_  
Manager - Solid Waste

## 6.0 TERMS

### 6.1 Existing Operation

This license is issued to an existing operation.

### 6.2 Compliance Date

The requirements of this license must be met by the following completion dates and will be subject to same exemption: \_\_\_\_\_.

JV/lp/942340.2

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # RL-01

\_\_\_\_\_  
Manager - Solid Waste

THE REGIONAL DISTRICT OF KITIMAT-STIKINE  
SOLID WASTE DEPARTMENT

**WASTE HAULING LICENSE**

Under the provisions of the Waste Management Act and in accordance with the Regional District of Kitimat-Stikine Solid Waste Management Plan and the Regional District of Kitimat-Stikine Solid Waste By-Law No. \_\_\_\_\_.

Joe Hauler

hereinafter referred to as the **LICENSEE** is authorized to transport **SOLID WASTE** and **RECYCLABLE MATERIALS** within the Regional District of Kitimat-Stikine.

This **WASTE HAULING LICENSE** has been issued under the terms and conditions, including definitions, prescribed in Regional District of Kitimat-Stikine Solid Waste By-Law No. \_\_\_\_\_ hereinafter referred to as the **BYLAW** for discharge sources and works existing or planned on December 31, 1995

\*\* NOTE - DISCUSSION WITH STAKEHOLDERS IS REQUIRED BEFORE FINALIZATION OF LICENSES

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # HL-01

\_\_\_\_\_  
Manager - Solid Waste



## 1.0 TRANSPORT

### 1.1 Transport

This license does not authorize the transportation of special waste or dangerous goods as defined in provincial regulation.

### 1.2 Transport Area

The licensee shall only transport or deliver or unload solid waste and recyclable materials to a facility authorized by the RDK-S to receive those materials. The facility shall be located within the area included in the RDK-S Solid Waste Management Plan or a neighbouring regional district's Solid Waste Management Plan.

## 2.0 VEHICLES

Vehicles used to transport solid waste and recyclable material must provide containment to prevent material falling off or leaking from the vehicle.

### 2.1 Vehicle List

The vehicles to which this license applies are listed below.

VEHICLE# LICENSE # MAKE/MODEL CONFIGURATION CAPACITY (tonnes & m3)

## 3.0 INSPECTIONS

### 3.1 RDK-S Inspections

The vehicles listed herein shall be subject to regular inspections by RDK-S staff at any time.

### 3.2 Load Inspections

All waste loads delivered to a PLAN facility may be inspected before acceptance into the facility. Loads which contain unauthorized material may be rejected and removed from the site. In the event that a load contains both authorized and unauthorized material the hauler shall remove the unauthorized material to an authorized facility that

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Waste Stream Management License # HL-01

\_\_\_\_\_  
Manager - Solid Waste

can accept the material. The removal of unauthorized material from a site or facility is the responsibility of the hauler.

#### 4.0 FEES

##### 4.1 License Fees

*(In this section a fee structure will be defined per vehicle)*

#### 5.0 TERMS

##### 5.1 Compliance Date

The requirements of this license must be met by December 31, 1995 and thereafter.

##### 5.2 Penalties

A licensee that does not comply with the requirements of a license will be subject to a fine not exceeding \$\_\_\_\_\_.

The Solid Waste Manager may revoke a license on the basis of non-compliance.

JV/lp/942340.3

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # HL-01

\_\_\_\_\_  
Manager - Solid Waste

THE REGIONAL DISTRICT OF KITIMAT-STIKINE  
SOLID WASTE DEPARTMENT

**WASTE STREAM MANAGEMENT LICENSE**

Under the provisions of the Waste Management Act and in accordance with the  
Regional District of Kitimat-Stikine Solid Waste By-Law No. \_\_\_\_\_

Joe Transfer

hereinafter referred to as the **LICENSEE** is authorized to operate a **TRANSFER STATION**  
at a site located at 123 Anyroad, Terrace, B.C.

This **WASTE STREAM MANAGEMENT LICENSE** has been issued under the terms and  
conditions, including definitions, prescribed in Regional District of Kitimat-Stikine Solid  
Waste By-Law No. \_\_\_\_\_ hereinafter referred to as the **BYLAW** for discharge sources  
and works existing or planned on December 31, 1995.

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # TL-01

\_\_\_\_\_  
Manager - Solid Waste

## **1.0 SITE**

### **1.1 Location**

The operation of the facility to which this license applies shall be restricted to the land described as \_\_\_\_\_. This land is located at 123 Anyroad, Terrace, B.C. The location is approximately as shown on Drawing Number 1 of the license.

### **1.2 Access**

Access to the site and vehicle routing through the site shall be constructed from all-weather material and clearly marked.

### **1.3 Site Requirements**

The site shall be surrounded by a fence, trees, shrubbery, or natural features so as to control access and be screened from the view of immediately adjacent neighbours.

The site shall have a locking gate on the access road to prevent the entry of unauthorized vehicles.

The site shall have a sign that identifies the facility, hours of operation, unacceptable disposal material, and other necessary information posted at the site entrance.

The site shall have communication capabilities to immediately summon fire, police or emergency service personnel in the event of an emergency.

The site shall have a buffer zone of 15 metres from the active area to the nearest property line in areas zoned for residential.

The site shall not be located within 100 metres of an unstable area.

The site shall not be located within 8 kilometres of an airport or the site shall provide bird control measures acceptable to the Solid Waste Manager.

The site shall require flood protection approved by the Water Management Branch if located within the 200 year floodplain.

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Waste Stream Management License # TL-01

\_\_\_\_\_  
Manager - Solid Waste

## 2.0 OPERATING REQUIREMENTS

### 2.1 Type of Facility

The facility to which this license applies is a transfer station for municipal solid waste.

### 2.2 Hours of Operation

The facility may operate from Monday to Friday, 8:00 a.m. to 6:00 p.m. and Saturday, 9:00 a.m. to 5:00 p.m., unless the licensee notifies the Manager, Solid Waste otherwise in writing at least 24 hours in advance of operating outside of these specified times. The licensee shall also notify the municipal environmental control department of any changes to these specified times.

### 2.3 Site Supervision

An attendant employed by the licensee shall be present at all times that the facility is open for business or accepting waste. Any unauthorized refuse shall be removed from the site as soon as practical for reuse, composting, recycling, or recovery or alternatively, it shall be disposed of at a site and in a manner authorized by the Solid Waste Manager.

### 2.4 Acceptable Material

~~(The acceptable materials will be site specific and greater defined)~~

The facility may accept for processing, transferring and brokering purposes municipal solid waste or some portion such as DLC, land clearing, etc.

### 2.5 Storage Quantity *(site specific)*

The storage of the following materials on the site are limited to the following quantities:

|                                   |                              |
|-----------------------------------|------------------------------|
| unprocessed municipal solid waste | _____ tonnes or cubic metres |
| clean construction wood           | _____ tonnes or cubic metres |
| green waste                       | _____ tonnes or cubic metres |
| metal                             | _____ tonnes or cubic metres |
| total                             | _____ tonnes or cubic metres |

### 2.6 Public Health Safety and Nuisance

The landfill shall not be operated in a manner such that a significant threat to public

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Waste Stream Management License # TL-01

\_\_\_\_\_  
Manager - Solid Waste

health or safety or public nuisance is created with respect to:

- unauthorized access,
- roads,
- traffic,
- noise,
- dust,
- litter,
- vectors, or
- wildlife attraction.

#### **2.7 Litter Control (*Site Specific*)**

Litter is to be controlled by providing litter control fences and instituting a regular litter pickup and general good housekeeping or any other measures required by the Solid Waste Manager. All waste handling must be done in an enclosed area which provides complete protection from the weather.

#### **2.8 Area Maintenance**

The licensee will be responsible for maintaining public and private roadways within 100 metres of the site free from litter, mud or debris which may be attributed to the site, its customers or its suppliers.

#### **2.9 Hazardous Materials**

Any hazardous or dangerous materials received at the site shall be stored in a secure area and removed to an authorized facility within 72 hours.

#### **2.10 Drainage**

Site drainage and surface water shall be managed in accordance with the site operating plan dated \_\_\_\_\_, 19\_\_.

#### **2.11 Load Inspection**

All waste loads received for processing shall be inspected before incorporation into the transfer station. Loads which contain unauthorized material shall be rejected and removed from the site. A record shall be maintained of rejected loads including date, time, type of material, haulers name and vehicle license number.

#### **2.12 Supply of Receipt**

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Waste Stream Management License # TL-01

\_\_\_\_\_  
Manager - Solid Waste

The licensee shall be required to provide a receipt for all suppliers of recyclable material stating licensee's name and the type and quantity of material received and date of transaction.

### 2.13 Works

The works authorized at this site include:

- Storm water management system.
- Leachate management system.
- Dust control equipment.
- Fire control equipment.

### 2.14 Licensed Haulers

The licensee shall only accept waste material from haulers that hold a valid Haulers License from the RDK-S.

### 2.15 CFC Recovery

Any white goods or other appliances containing CFC's must have the CFC's recovered by a licensed technician before the appliance is removed from the site.

### 2.16 Plan of Operation

The licensee shall develop, keep and abide by a plan of operation approved as part of the licensing process. Each plan of operation shall include:

- How solid wastes and recovered materials are to be handled on-site during the term of operation.
- How inspections and monitoring are conducted and their frequency.
- Fire and Emergency Plan.
- Safety Plan or procedures.
- Management of storm water or leachate.
- How equipment is to be maintained.
- Odour, dust, litter, rodent and bird control plan.

### 2.17 Scavenging

The licensee shall prohibit scavenging at this facility. Controlled salvaging by the operator/licensee is encouraged.

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Waste Stream Management License # TL-01

\_\_\_\_\_  
Manager - Solid Waste

## 2.18 Unacceptable Material

The facility may not accept:

- putrescible waste
- industrial waste
- Special Wastes as defined by the regulations under the Waste Management Act
- Liquid or semi-solid waste
- Food wastes
- Biomedical waste
- Dead animals and slaughterhouse, fish hatchery or cannery waste

Unacceptable material must be removed within 48 hours of receipt.

## 2.19 Burning Period

The burning of refuse at this site is prohibited.

## 2.20 Fire Protection

The Licensee is responsible for complying with all municipal fire safety requirements, including preparing and implementing any fire safety and/or emergency plan required by the local fire authority, and shall take all measures necessary to prevent fires.

In the event of a fire the Licensee shall immediately notify the local fire department and the Solid Waste Manager and take all measures necessary to extinguish the fire.

It is the responsibility of the Licensee to cover the costs of extinguishing any fires.

## 2.21 Emergency Procedures

In the event of an emergency which prevents the licensee from complying with a requirement of the license that would otherwise be applicable, that requirement will be suspended for such time as the emergency exists or until otherwise directed by the Solid Waste Manager provided that:

- i. The licensee can demonstrate that exercise of due diligence in the relation to the process, operation or event which caused the emergency and that the emergency has occurred notwithstanding this exercise of due diligence;
- ii. The Solid Waste Manager and the Emergency Control Coordinator of the

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Waste Stream Management License # TL-01

\_\_\_\_\_  
Manager - Solid Waste



(municipality) has been immediately notified of the emergency; and

- iii. The Licensee is proceeding with due diligence to correct the emergency condition:

Notwithstanding I, ii, and iii above the Solid Waste Manager may require the Licensee to reduce or suspend operation to protect the environmental while correcting the situation.

### **3.0 INSPECTIONS**

#### **3.1 Inspections**

The site shall be subject to regular inspections by RDK-S staff at any time during the operating period specified in section 2.2.

The licensee shall conduct regular inspections to prevent malfunctions and deterioration, operation errors and hazardous discharges.

### **4.0 REPORTING**

#### **4.1 Record Keeping/Reporting**

The licensee shall maintain for inspection at the site, records of quantities received and recyclables removed.

The records shall be submitted to RDK-S on a quarterly basis before the 15th of April, July, October and January for the preceding 3 months of operation.

### **5.0 FEES**

#### **5.1 License Fee**

*[In this section a fee structure will be outlined]*

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Waste Stream Management License # TL-01

\_\_\_\_\_  
Manager - Solid Waste

## 6.0 TERMS

### 6.1 Existing Operation

This license is issued to an existing operation.

### 6.2 Compliance Date *(site specific)*

The requirements of this license must be met by December 31, 1995 and thereafter.

## 7.0 SECURITY and PERFORMANCE

*[This section shall require that provision is made for the future financial security at and beyond closure by establishing a Closure Fund in a form acceptable to the Manager, such as an up front deposit. The terms under which the fund is controlled must be clearly outlined. The ultimate amount of the financial security must meet or exceed the estimated closure and post-closure costs plus a reasonable contingency for any remediation which may be required.]*

JV/lp/942340.4

Issued \_\_\_\_\_, 1995  
Waste Stream Management License # TL-01

\_\_\_\_\_  
Manager - Solid Waste

**APPENDIX D**

**PLAN MONITORING ADVISORY COMMITTEE DRAFT TERMS OF REFERENCE**

**REGIONAL DISTRICT OF KITIMAT-STIKINE**  
**PLAN MONITORING ADVISORY COMMITTEE**

**DRAFT TERMS OF REFERENCE**

**COMMITTEE ROLE**

The primary role of the Plan Monitoring Advisory Committee is to ensure the efficient and successful implementation of the Regional District of Kitimat-Stikine (RDK-S) Solid Waste Management Plan ("the Plan").

**COMMITTEE REPRESENTATION**

As per the **Guidelines**, Section 35 (1), the Plan Monitoring Advisory Committee (PMAC) should reflect:

- the geography, demography and political organization of the RDK-S;
- a balance between technical and non-technical interests; and
- continuity with the Public Advisory Committee (PAC), if possible, through inclusion of members of PAC who have experience gained in development of the Plan.

The RDK-S Solid Waste Management Plan was developed under the guidance of the RDK-S Board, a Technical Advisory Committee (TAC) and the above-mentioned Public Advisory Committee (PAC). Based on applications to be on the PMAC, it is the intention of the RDK-S Board to form the PMAC from four sources: the Board, the TAC and PAC committees and representatives of other groups, as is deemed necessary to fulfill the objectives of the PMAC.

**SCOPE**

The Plan area includes all areas of the Regional District of Kitimat-Stikine. The Plan will be implemented by the year 2000, and will require monitoring up to this time and beyond. The general role of the PMAC is to act in an advisory role to the RDK-S Board in order to ensure that the Plan is successfully implemented.

**OBJECTIVES AND TASKS**

1. To meet on at least a bi-monthly basis to discuss issues relating to Plan monitoring.
2. To review all information related to implementation of the Plan, including waste quantities, populations, diversion rates and costs for each Plan component.

3. To develop a cost recovery model that will incorporate at least some aspect of the user-pay principle and which will provide adequate funding for the implementation and operation of the Plan.
4. To recommend strategies to increase diversion rates where the target diversion rates are not being achieved.
4. To act in an advisory role during each major Plan review, which will occur each five years.
5. To conduct an annual Plan review and recommend updates, if necessary, of the following Plan components:
  - effectiveness of can limits and bag tag costs (if used)
  - lists of banned materials and materials with higher tipping fees
  - effectiveness of educational and promotional material
  - effectiveness of any licenses issued by the RDK-S
  - the operation of any tendered contracts
  - the availability of Provincial grants to assist in the funding of the Plan
  - the adequacy of the current funding model in financing the Plan

This review will be documented in an annual report that will be submitted to the RDK-S Board which will send it to the MELP office in Smithers for information.

6. To review any operation or closure plans for waste management facilities under the Plan.
7. To act as a mediator in any disputes arising during implementation of the Plan that pertain to:
  - an administrative decision made by the RDK-S in the issuance of a license,
  - interpretation of a statement or provision in the Plan, or
  - any other matter not related to a proposed change to the actual wording of the Plan or an operational certificate.
8. To ensure adequate public consultation in matters affecting the public, such as landfill siting, transfer station siting, etc.

The PMAC would have the right to form sub-committees and add task-oriented temporary members to assist in specific tasks such as developing the funding model, landfill siting, etc.

#### CONDUCT OF MEETINGS

A Chair and a secretary will be elected by the committee members. The meetings will be carried out on a semi-formal basis, in a manner determined by the Chair. In general, the committee is to operate on a consensus basis. The Chair will have discretion in determining when a consensus has been reached. Consensus will be formally recorded in the minutes of the meeting. In certain

circumstances, issues raised during the course of a meeting may require a formal motion and vote.

Quorum is defined as sixty percent of voting members. Agreement among committee members shall be sought whenever an agenda item is advanced as a specific recommendation to RDK-S staff and/or the RDK-S Board. Consensus will be sought by the Chair as to whether a given issue is a voting matter.

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Volume 2 – Detailed Cost Estimates

Regional District of Kitimat-Stikine

**SOLID WASTE  
MANAGEMENT PLAN**

**December 1995**

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## 1.0 INTRODUCTION

The following tables detail the cost estimates for implementation of the RDK-S Waste Management system over eleven years (1996 through 2006), until the ultimate waste management system is in place. The estimates are divided into the following sections:

- reduction, reuse and administration;
- recycling;
- composting;
- haulage;
- residuals management, including transfer stations, and landfill closure, upgrading, development and operation.

The costs presented here vary somewhat from those presented in the Stage 2 document of the RDK-S RSWMP. Some of the phasing has undergone minor modification. As a result, the following changes have occurred in the cost estimates:

- **Reduction, Reuse and Administration** - inclusion of necessary staffing and administration necessary, slight change in implementation.
- **Recycling** - Cost estimates reflect a change in the implementation of the drop-off recycling program, with program implementation beginning in 1997.
- **Composting** - Changes in composting cost estimates reflect a later implementation date (1997) than previously.
- **Haulage** - haulage costs reflect the changes in quantities of each stream, based on the revised implementation dates.
- **Residuals Management** - the only changes in residuals management costs are to reflect changing quantities due to revised implementation dates for 3R's programs, as well as a revised residuals management works schedule.



**REDUCTION, REUSE AND ADMINISTRATION  
COST ESTIMATES**

TABLE A-1

|   |  |
|---|--|
| <b>REDUCTION, REUSE AND<br/>ADMINISTRATION<br/>PHASED COST ESTIMATE</b><br><br><b>1996</b><br><br>Associated Engineering AE | <b>Date</b> 1995<br><b>Client</b> RDK-S<br><b>Proj. No.</b> 942340 |
|   | capture rate 2.0%<br>population 44,637<br>year 1996                |

| Item                         | Description                       | Quantity | Unit  | Unit Price | Cost            |
|------------------------------|-----------------------------------|----------|-------|------------|-----------------|
| <b>ANNUAL OPERATION</b>      |                                   |          |       |            |                 |
|                              | waste management coordinator      | 0        | staff | \$45,000   | \$0             |
|                              | school liaison                    | 0        | staff | \$45,000   | \$0             |
|                              | demonstration staff               | 0        | staff | \$40,000   | \$0             |
|                              | education & promotion development | 1        | LS    | \$0        | \$0             |
|                              | mailings                          | 1        | LS    | \$0        | \$0             |
|                              | demonstration operation           | 1        | LS    | \$0        | \$0             |
|                              | administration                    | 1        | LS    | \$25,000   | \$25,000        |
|                              | bag tags                          | 1        | LS    | \$0        | \$0             |
|                              | grants                            | 1        | LS    | \$0        | \$0             |
|                              | funding                           | -1       | LS    | \$0        | \$0             |
|                              | <i>subtotal</i>                   |          |       |            | \$25,000        |
| <b>REVENUE</b>               |                                   |          |       |            |                 |
|                              | bag tags                          | 0        | tags  | \$1        | \$0             |
|                              | <i>subtotal</i>                   |          |       |            | \$0             |
| <b>TOTAL ANNUAL COST</b>     |                                   |          |       |            | <b>\$25,000</b> |
| <b>TOTAL ANNUAL REVENUE</b>  |                                   |          |       |            | <b>\$0</b>      |
| <b>TOTAL ANNUAL NET COST</b> |                                   |          |       |            | <b>\$25,000</b> |

TABLE A-2

|  |                     |        |
|--|---------------------|--------|
| <b>REDUCTION, REUSE AND<br/>ADMINISTRATION<br/>PHASED COST ESTIMATE</b><br><br>1997<br><br>Associated Engineering AE | <b>Date</b>         | 1995   |
|  | <b>Client</b>       | RDK-S  |
|  | <b>Proj. No.</b>    | 942340 |
|  | <b>capture rate</b> | 5.0%   |
|  | <b>population</b>   | 45,173 |
|  | <b>year</b>         | 1997   |

| Item                         | Description                       | Quantity | Unit  | Unit Price | Cost             |
|------------------------------|-----------------------------------|----------|-------|------------|------------------|
| <b>ANNUAL OPERATION</b>      |                                   |          |       |            |                  |
|                              | waste management coordinator      | 1.5      | staff | \$45,000   | \$67,500         |
|                              | school liaison                    | 0.5      | staff | \$45,000   | \$22,500         |
|                              | demonstration staff               | 0.5      | staff | \$40,000   | \$20,000         |
|                              | education & promotion development | 1        | LS    | \$25,000   | \$25,000         |
|                              | mailings                          | 1        | LS    | \$20,328   | \$20,328         |
|                              | demonstration operation           | 1        | LS    | \$30,000   | \$30,000         |
|                              | administration                    | 1        | LS    | \$25,000   | \$25,000         |
|                              | bag tags                          | 1        | LS    | \$7,100    | \$7,100          |
|                              | grants                            | 1        | LS    | \$20,000   | \$20,000         |
|                              | funding                           | -1       | LS    | \$22,587   | (\$22,587)       |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$214,841</b> |
| <b>REVENUE</b>               |                                   |          |       |            |                  |
|                              | bag tags                          | 42,600   | tags  | \$1        | \$42,600         |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$42,600</b>  |
| <b>TOTAL ANNUAL COST</b>     |                                   |          |       |            | <b>\$214,841</b> |
| <b>TOTAL ANNUAL REVENUE</b>  |                                   |          |       |            | <b>\$42,600</b>  |
| <b>TOTAL ANNUAL NET COST</b> |                                   |          |       |            | <b>\$172,241</b> |

TABLE A-3

|   |  |
|---|--|
| <p><b>REDUCTION, REUSE AND ADMINISTRATION<br/>PHASED COST ESTIMATE</b></p> <p>1998</p> <p>Associated Engineering AE</p> | <p>Date 1995</p> <p>Client RDK-S</p> <p>Proj. No. 942340</p>       |
|   | <p>capture rate 8.0%</p> <p>population 45,715</p> <p>year 1998</p> |

| Item                         | Description                       | Quantity | Unit  | Unit Price | Cost             |
|------------------------------|-----------------------------------|----------|-------|------------|------------------|
| <b>ANNUAL OPERATION</b>      |                                   |          |       |            |                  |
|                              | waste management coordinator      | 1.5      | staff | \$45,000   | \$67,500         |
|                              | school liaison                    | 0.5      | staff | \$45,000   | \$22,500         |
|                              | demonstration staff               | 0.5      | staff | \$40,000   | \$20,000         |
|                              | education & promotion development | 1        | LS    | \$20,000   | \$20,000         |
|                              | mailings                          | 1        | LS    | \$20,572   | \$20,572         |
|                              | demonstration operation           | 1        | LS    | \$30,000   | \$30,000         |
|                              | administration                    | 1        | LS    | \$25,000   | \$25,000         |
|                              | bag tags                          | 1        | LS    | \$6,400    | \$10,000         |
|                              | grants                            | 1        | LS    | \$15,000   | \$15,000         |
|                              | funding                           | -1       | LS    | \$22,858   | (\$22,858)       |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$207,714</b> |
| <b>REVENUE</b>               |                                   |          |       |            |                  |
|                              | bag tags                          | 28,800   | tags  | \$1        | \$28,800         |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$28,800</b>  |
| <b>TOTAL ANNUAL COST</b>     |                                   |          |       |            | <b>\$207,714</b> |
| <b>TOTAL ANNUAL REVENUE</b>  |                                   |          |       |            | <b>\$28,800</b>  |
| <b>TOTAL ANNUAL NET COST</b> |                                   |          |       |            | <b>\$178,914</b> |

TABLE A-4

|  |  |
|--|--|
| <p style="text-align: center;"><b>REDUCTION, REUSE AND<br/>ADMINISTRATION<br/>PHASED COST ESTIMATE</b></p> <p style="text-align: center;">1999</p> <p style="text-align: right;">Associated Engineering AE</p> | <p>Date                    1995</p> <p>Client                 RDK-S</p> <p>Proj. No.              942340</p> |
|  | <p>capture rate        12.0%</p> <p>population         46,264</p> <p>year                 1999</p>           |

| Item                         | Description                       | Quantity | Unit  | Unit Price | Cost       |
|------------------------------|-----------------------------------|----------|-------|------------|------------|
| <b>ANNUAL OPERATION</b>      |                                   |          |       |            |            |
|                              | waste management coordinator      | 1.5      | staff | \$45,000   | \$67,500   |
|                              | school liaison                    | 0.5      | staff | \$45,000   | \$22,500   |
|                              | demonstration staff               | 0.5      | staff | \$40,000   | \$20,000   |
|                              | education & promotion development | 1        | LS    | \$20,000   | \$20,000   |
|                              | mailings                          | 1        | LS    | \$20,819   | \$20,819   |
|                              | demonstration operation           | 1        | LS    | \$30,000   | \$30,000   |
|                              | administration                    | 1        | LS    | \$25,000   | \$25,000   |
|                              | bag tags                          | 1        | LS    | \$5,700    | \$5,700    |
|                              | grants                            | 1        | LS    | \$10,000   | \$10,000   |
|                              | funding                           | -1       | LS    | \$23,132   | (\$23,132) |
|                              | <i>subtotal</i>                   |          |       |            | \$198,387  |
| <b>REVENUE</b>               |                                   |          |       |            |            |
|                              | bag tags                          | 14,600   | tags  | \$1        | \$14,600   |
|                              | <i>subtotal</i>                   |          |       |            | \$14,600   |
| <b>TOTAL ANNUAL COST</b>     |                                   |          |       |            | \$198,387  |
| <b>TOTAL ANNUAL REVENUE</b>  |                                   |          |       |            | \$14,600   |
| <b>TOTAL ANNUAL NET COST</b> |                                   |          |       |            | \$183,787  |

TABLE A-5

|   |  |
|---|--|
| <b>REDUCTION, REUSE AND<br/>ADMINISTRATION<br/>PHASED COST ESTIMATE</b><br><br><b>2000</b><br><br>Associated Engineering AE | <b>Date</b> 1995<br><b>Client</b> RDK-S<br><b>Proj. No.</b> 942340 |
|   | capture rate 15.0%<br>population 46,819<br>year 2000               |

| Item                         | Description                       | Quantity | Unit  | Unit Price | Cost             |
|------------------------------|-----------------------------------|----------|-------|------------|------------------|
| <b>ANNUAL OPERATION</b>      |                                   |          |       |            |                  |
|                              | waste management coordinator      | 1        | staff | \$45,000   | \$45,000         |
|                              | school liaison                    | 0        | staff | \$45,000   | \$0              |
|                              | demonstration staff               | 0.5      | staff | \$40,000   | \$20,000         |
|                              | education & promotion development | 1        | LS    | \$15,000   | \$15,000         |
|                              | mailings                          | 1        | LS    | \$21,069   | \$21,069         |
|                              | demonstration operation           | 1        | LS    | \$30,000   | \$30,000         |
|                              | administration                    | 1        | LS    | \$25,000   | \$25,000         |
|                              | bag tags                          | 1        | LS    | \$5,700    | \$5,700          |
|                              | grants                            | 1        | LS    | \$10,000   | \$10,000         |
|                              | funding                           | -1       | LS    | \$23,410   | (\$23,410)       |
|                              | <i>subtotal</i>                   |          |       |            | \$148,359        |
| <b>REVENUE</b>               |                                   |          |       |            |                  |
|                              | bag tags                          | 14,700   | tags  | \$1        | \$14,700         |
|                              | <i>subtotal</i>                   |          |       |            | \$14,700         |
| <b>TOTAL ANNUAL COST</b>     |                                   |          |       |            | <b>\$148,359</b> |
| <b>TOTAL ANNUAL REVENUE</b>  |                                   |          |       |            | <b>\$14,700</b>  |
| <b>TOTAL ANNUAL NET COST</b> |                                   |          |       |            | <b>\$133,659</b> |

TABLE A-6

|   |  |
|---|--|
| <b>REDUCTION, REUSE AND<br/>ADMINISTRATION<br/>PHASED COST ESTIMATE</b><br><br><b>2001</b><br><br>Associated Engineering AE | <b>Date</b> 1995<br><b>Client</b> RDK-S<br><b>Proj. No.</b> 942340 |
|   | capture rate 15.0%<br>population 47,381<br>year 2001               |

| Item                         | Description                       | Quantity | Unit  | Unit Price | Cost             |
|------------------------------|-----------------------------------|----------|-------|------------|------------------|
| <b>ANNUAL OPERATION</b>      |                                   |          |       |            |                  |
|                              | waste management coordinator      | 1        | staff | \$45,000   | \$45,000         |
|                              | school liaison                    | 0        | staff | \$45,000   | \$0              |
|                              | demonstration staff               | 0.5      | staff | \$40,000   | \$20,000         |
|                              | education & promotion development | 1        | LS    | \$15,000   | \$15,000         |
|                              | mailings                          | 1        | LS    | \$21,321   | \$21,321         |
|                              | demonstration operation           | 1        | LS    | \$30,000   | \$30,000         |
|                              | administration                    | 1        | LS    | \$25,000   | \$25,000         |
|                              | bag tags                          | 1        | LS    | \$5,700    | \$5,700          |
|                              | grants                            | 1        | LS    | \$10,000   | \$10,000         |
|                              | funding                           | -1       | LS    | \$23,691   | (\$23,691)       |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$148,331</b> |
| <b>REVENUE</b>               |                                   |          |       |            |                  |
|                              | bag tags                          | 14,900   | tags  | \$1        | \$14,900         |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$14,900</b>  |
| <b>TOTAL ANNUAL COST</b>     |                                   |          |       |            | <b>\$148,331</b> |
| <b>TOTAL ANNUAL REVENUE</b>  |                                   |          |       |            | <b>\$14,900</b>  |
| <b>TOTAL ANNUAL NET COST</b> |                                   |          |       |            | <b>\$133,431</b> |

TABLE A-7

|  |   |
|--|---|
| <b>REDUCTION, REUSE AND<br/>ADMINISTRATION<br/>PHASED COST ESTIMATE</b><br><br>2002<br><br>Associated Engineering AE | <b>Date</b> 1995<br><b>Client</b> RDK-S<br><b>Proj. No.</b> 942340        |
|  | <b>capture rate</b> 15.0%<br><b>population</b> 49,949<br><b>year</b> 2002 |

| Item                         | Description                       | Quantity | Unit  | Unit Price | Cost             |
|------------------------------|-----------------------------------|----------|-------|------------|------------------|
| <b>ANNUAL OPERATION</b>      |                                   |          |       |            |                  |
|                              | waste management coordinator      | 1        | staff | \$45,000   | \$45,000         |
|                              | school liaison                    | 0        | staff | \$45,000   | \$0              |
|                              | demonstration staff               | 0.5      | staff | \$40,000   | \$20,000         |
|                              | education & promotion development | 1        | LS    | \$15,000   | \$15,000         |
|                              | mailings                          | 1        | LS    | \$22,477   | \$22,477         |
|                              | demonstration operation           | 1        | LS    | \$30,000   | \$30,000         |
|                              | administration                    | 1        | LS    | \$25,000   | \$25,000         |
|                              | bag tags                          | 1        | LS    | \$5,800    | \$5,800          |
|                              | grants                            | 1        | LS    | \$10,000   | \$10,000         |
|                              | funding                           | -1       | LS    | \$24,975   | (\$24,975)       |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$148,303</b> |
| <b>REVENUE</b>               |                                   |          |       |            |                  |
|                              | bag tags                          | 15,700   | tags  | \$1        | \$15,700         |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$15,700</b>  |
| <b>TOTAL ANNUAL COST</b>     |                                   |          |       |            | <b>\$148,303</b> |
| <b>TOTAL ANNUAL REVENUE</b>  |                                   |          |       |            | <b>\$15,700</b>  |
| <b>TOTAL ANNUAL NET COST</b> |                                   |          |       |            | <b>\$132,603</b> |



TABLE A-8

|   |                     |        |
|---|---------------------|--------|
| <b>REDUCTION, REUSE AND<br/>ADMINISTRATION<br/>PHASED COST ESTIMATE</b> | <b>Date</b>         | 1995   |
|   | <b>Client</b>       | RDK-S  |
| <b>2003</b>   | <b>Proj. No.</b>    | 942340 |
|   | <b>capture rate</b> | 15.0%  |
| <b>Associated Engineering AE</b>  | <b>population</b>   | 48,525 |
|   | <b>year</b>         | 2003   |

| Item                         | Description                       | Quantity | Unit  | Unit Price | Cost             |
|------------------------------|-----------------------------------|----------|-------|------------|------------------|
| <b>ANNUAL OPERATION</b>      |                                   |          |       |            |                  |
|                              | waste management coordinator      | 1        | staff | \$45,000   | \$45,000         |
|                              | school liaison                    | 0        | staff | \$45,000   | \$0              |
|                              | demonstration staff               | 0.5      | staff | \$40,000   | \$20,000         |
|                              | education & promotion development | 1        | LS    | \$15,000   | \$15,000         |
|                              | mailings                          | 1        | LS    | \$21,836   | \$21,836         |
|                              | demonstration operation           | 1        | LS    | \$30,000   | \$30,000         |
|                              | administration                    | 1        | LS    | \$25,000   | \$25,000         |
|                              | bag tags                          | 1        | LS    | \$5,800    | \$5,800          |
|                              | grants                            | 1        | LS    | \$10,000   | \$10,000         |
|                              | funding                           | -1       | LS    | \$24,263   | (\$24,263)       |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$148,374</b> |
| <b>REVENUE</b>               |                                   |          |       |            |                  |
|                              | bag tags                          | 15,300   | tags  | \$1        | \$15,300         |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$15,300</b>  |
| <b>TOTAL ANNUAL COST</b>     |                                   |          |       |            | <b>\$148,374</b> |
| <b>TOTAL ANNUAL REVENUE</b>  |                                   |          |       |            | <b>\$15,300</b>  |
| <b>TOTAL ANNUAL NET COST</b> |                                   |          |       |            | <b>\$133,074</b> |

TABLE A-9

|   |  |
|---|--|
| <b>REDUCTION, REUSE AND<br/>ADMINISTRATION<br/>PHASED COST ESTIMATE</b><br><br><b>2004</b><br><br>Associated Engineering AE | <b>Date</b> 1995<br><b>Client</b> RDK-S<br><b>Proj. No.</b> 942340 |
|   | capture rate 15.0%<br>population 49,107<br>year 2004               |

| Item                         | Description                       | Quantity | Unit  | Unit Price | Cost             |
|------------------------------|-----------------------------------|----------|-------|------------|------------------|
| <b>ANNUAL OPERATION</b>      |                                   |          |       |            |                  |
|                              | waste management coordinator      | 1        | staff | \$45,000   | \$45,000         |
|                              | school liaison                    | 0        | staff | \$45,000   | \$0              |
|                              | demonstration staff               | 0.5      | staff | \$40,000   | \$20,000         |
|                              | education & promotion development | 1        | LS    | \$15,000   | \$15,000         |
|                              | mailings                          | 1        | LS    | \$22,098   | \$22,098         |
|                              | demonstration operation           | 1        | LS    | \$30,000   | \$30,000         |
|                              | administration                    | 1        | LS    | \$25,000   | \$25,000         |
|                              | bag tags                          | 1        | LS    | \$5,800    | \$5,800          |
|                              | grants                            | 1        | LS    | \$10,000   | \$10,000         |
|                              | funding                           | -1       | LS    | \$24,554   | (\$24,554)       |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$148,345</b> |
| <b>REVENUE</b>               |                                   |          |       |            |                  |
|                              | bag tags                          | 15,400   | tags  | \$1        | \$15,400         |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$15,400</b>  |
| <b>TOTAL ANNUAL COST</b>     |                                   |          |       |            | <b>\$148,345</b> |
| <b>TOTAL ANNUAL REVENUE</b>  |                                   |          |       |            | <b>\$15,400</b>  |
| <b>TOTAL ANNUAL NET COST</b> |                                   |          |       |            | <b>\$132,945</b> |

TABLE A-10

|   |  |
|---|--|
| <b>REDUCTION, REUSE AND<br/>ADMINISTRATION<br/>PHASED COST ESTIMATE</b> | <b>Date</b> 1995<br><b>Client</b> RDK-S<br><b>Proj. No.</b> 942340 |
|   | capture rate 15.0%<br>population 49,696<br>year 2005               |
| 2005<br><br>Associated Engineering AE                                   |  |

| Item                         | Description                       | Quantity | Unit  | Unit Price | Cost             |
|------------------------------|-----------------------------------|----------|-------|------------|------------------|
| <b>ANNUAL OPERATION</b>      |                                   |          |       |            |                  |
|                              | waste management coordinator      | 1        | staff | \$45,000   | \$45,000         |
|                              | school liaison                    | 0        | staff | \$45,000   | \$0              |
|                              | demonstration staff               | 0.5      | staff | \$40,000   | \$20,000         |
|                              | education & promotion development | 1        | LS    | \$15,000   | \$15,000         |
|                              | mailings                          | 1        | LS    | \$22,363   | \$22,363         |
|                              | demonstration operation           | 1        | LS    | \$30,000   | \$30,000         |
|                              | administration                    | 1        | LS    | \$25,000   | \$25,000         |
|                              | bag tags                          | 1        | LS    | \$5,800    | \$5,800          |
|                              | grants                            | 1        | LS    | \$10,000   | \$10,000         |
|                              | funding                           | -1       | LS    | \$24,848   | (\$24,848)       |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$148,315</b> |
| <b>REVENUE</b>               |                                   |          |       |            |                  |
|                              | bag tags                          | 15,600   | tags  | \$1        | \$15,600         |
|                              | <i>subtotal</i>                   |          |       |            | <b>\$15,600</b>  |
| <b>TOTAL ANNUAL COST</b>     |                                   |          |       |            | <b>\$148,315</b> |
| <b>TOTAL ANNUAL REVENUE</b>  |                                   |          |       |            | <b>\$15,600</b>  |
| <b>TOTAL ANNUAL NET COST</b> |                                   |          |       |            | <b>\$132,715</b> |

TABLE A-11

|   |                     |               |
|---|---------------------|---------------|
| <b>REDUCTION, REUSE AND<br/>ADMINISTRATION<br/>PHASED COST ESTIMATE</b> | <b>Date</b>         | <b>1995</b>   |
|   | <b>Client</b>       | <b>RDK-S</b>  |
| <b>2006</b>   | <b>Proj. No.</b>    | <b>942340</b> |
|   | <b>capture rate</b> | <b>15.0%</b>  |
|   | <b>population</b>   | <b>50,293</b> |
|   | <b>year</b>         | <b>2006</b>   |
| <b>Associated Engineering AE</b>  |                     |               |

| Item                         | Description                       | Quantity | Unit  | Unit Price | Cost             |
|------------------------------|-----------------------------------|----------|-------|------------|------------------|
| <b>ANNUAL OPERATION</b>      |                                   |          |       |            |                  |
|                              | waste management coordinator      | .1       | staff | \$45,000   | \$45,000         |
|                              | school liaison                    | 0        | staff | \$45,000   | \$0              |
|                              | demonstration staff               | 0.5      | staff | \$40,000   | \$20,000         |
|                              | education & promotion development | 1        | LS    | \$15,000   | \$15,000         |
|                              | mailings                          | 1        | LS    | \$22,632   | \$22,632         |
|                              | demonstration operation           | 1        | LS    | \$30,000   | \$30,000         |
|                              | administration                    | 1        | LS    | \$25,000   | \$25,000         |
|                              | bag tags                          | 1        | LS    | \$5,800    | \$5,800          |
|                              | grants                            | 1        | LS    | \$10,000   | \$10,000         |
|                              | funding                           | -1       | LS    | \$25,147   | (\$25,147)       |
|                              | <b>subtotal</b>                   |          |       |            | <b>\$148,285</b> |
| <b>REVENUE</b>               |                                   |          |       |            |                  |
|                              | bag tags                          | 15,800   | tags  | \$1        | \$15,800         |
|                              | <b>subtotal</b>                   |          |       |            | <b>\$15,800</b>  |
| <b>TOTAL ANNUAL COST</b>     |                                   |          |       |            | <b>\$148,285</b> |
| <b>TOTAL ANNUAL REVENUE</b>  |                                   |          |       |            | <b>\$15,800</b>  |
| <b>TOTAL ANNUAL NET COST</b> |                                   |          |       |            | <b>\$132,485</b> |

**RECYCLING COST ESTIMATES**

TABLE RP-1

|  |  |
|--|--|
| <b>SYSTEM 2 - RECYCLING<br/>PHASED COST ESTIMATE</b> | <b>Date</b> 1995<br><b>Client</b> RDK-S<br><b>Proj. No.</b> 942340-003   |
| <b>SEPARATED DROP-OFF</b>                            | <b>Year:</b> 1996<br><b>Diversion:</b> 0.0%<br><b>Population:</b> 44,637 |
| Associated Engineering AE                            |  |

| Item                              | Description                                 | Quantity | Unit   | Unit Price | Cost       |
|-----------------------------------|---|----------|--------|------------|------------|
| <b>PRELIMINARY</b>                |   |          |        |            |            |
|                                   | program design                              | 1        | LS     | \$0        | \$0        |
|                                   | public education & promo                    | 1        | LS     | \$0        | \$0        |
|                                   | other administrative - incentives           | 1        | LS     | \$0        | \$0        |
|                                   | contingency                                 | 10       | (%)    |            | \$0        |
|                                   | <i>subtotal</i>                             |          |        |            | \$0        |
| <b>CAPITAL</b>                    |   |          |        |            |            |
|                                   | processing facility - expansion of facility | 0        | sq. m. | \$1,000    | \$0        |
|                                   | OCC depots - Terrace and Hazelton           | 0        | sq. m. | \$800      | \$0        |
|                                   | processing equipment                        |          |        |            |            |
|                                   | -sorting conveyor (paper)                   | 0        | units  | \$40,000   | \$0        |
|                                   | -baler                                      | 0        | units  | \$50,000   | \$0        |
|                                   | -forklift                                   | 0        | units  | \$20,000   | \$0        |
|                                   | -scales                                     | 0        | units  | \$25,000   | \$0        |
|                                   | dropoff depots                              | 0        | * bin  | \$10,000   | \$0        |
|                                   | equipment credit                            | (1)      | LS     | \$0        | \$0        |
|                                   | funding                                     | -30      | (%)    |            | \$0        |
|                                   | contingency                                 | 10       | (%)    |            | \$0        |
|                                   | <i>subtotal</i>                             |          |        |            | \$0        |
| <b>ANNUAL OPERATION</b>           |   |          |        |            |            |
|                                   | staff - office                              | 0        | person | \$45,000   | \$0        |
|                                   | staff - processing                          | 0        | person | \$30,000   | \$0        |
|                                   | administration                              | 1        | LS     | \$0        | \$0        |
|                                   | insurance                                   | 1        | LS     | \$0        | \$0        |
|                                   | processing                                  |          |        |            |            |
|                                   | -equipment maintenance & replacement        | 10       | (%)    |            | \$0        |
|                                   | -utilities                                  | 1        | LS     | \$0        | \$0        |
|                                   | transportation to end markets               | 0        | tonne  | \$30       | \$0        |
|                                   | contingency                                 | 10       | (%)    |            | \$0        |
|                                   | <i>subtotal</i>                             |          |        |            | \$0        |
| <b>ANNUAL REVENUES</b>            |   |          |        |            |            |
|                                   | materials                                   | 0        | tonne  | (\$40)     | \$0        |
|                                   | <i>subtotal</i>                             |          |        |            | \$0        |
| <b>TOTAL ANNUAL COST</b>          |   |          |        |            | <b>\$0</b> |
| <b>TOTAL ANNUAL REVENUE</b>       |   |          |        |            | <b>\$0</b> |
| <b>TOTAL ANNUAL NET COST</b>      |   |          |        |            | <b>\$0</b> |
| <b>COST PER TONNE - RECYCLING</b> |   |          |        |            | <b>\$0</b> |

\* "bin" in this case is a 30 cu. yd. roll-off bin

LS = lump sum

TABLE RP-2

|  |  |
|--|--|
| <b>SYSTEM 2 - RECYCLING<br/>PHASED COST ESTIMATE</b><br><br><b>SEPARATED DROP-OFF</b><br><br>Associated Engineering AE | Date 1995<br>Client RDK-S<br>Proj. No. 942340-003<br><br>Year: 1997<br>Diversion: 2.3%<br>Population: 45,173 |
|--|--|

| Item                              | Description                                 | Quantity | Unit   | Unit Price | Cost               |
|-----------------------------------|---|----------|--------|------------|--------------------|
| <b>PRELIMINARY</b>                |   |          |        |            |                    |
|                                   | program design                              | 1        | LS     | \$15,000   | \$15,000           |
|                                   | public education & promo                    | 1        | LS     | \$20,000   | \$20,000           |
|                                   | other administrative - incentives           | 1        | LS     | \$25,000   | \$25,000           |
|                                   | contingency                                 | 10       | (%)    |            | \$6,000            |
|                                   | <b>subtotal</b>                             |          |        |            | <b>\$66,000</b>    |
| <b>CAPITAL</b>                    |   |          |        |            |                    |
|                                   | processing facility - expansion of facility | 930      | sq. m. | \$1,000    | \$930,000          |
|                                   | OCC depots - Terrace and Hazelton           | 0        | sq. m. | \$800      | \$0                |
|                                   | processing equipment                        |          |        |            |                    |
|                                   | -sorting conveyor (paper)                   | 1        | units  | \$40,000   | \$40,000           |
|                                   | -baler                                      | 1        | units  | \$50,000   | \$50,000           |
|                                   | -forklift                                   | 0        | units  | \$20,000   | \$0                |
|                                   | -scales                                     | 1        | units  | \$25,000   | \$25,000           |
|                                   | dropoff depots                              | 3        | * bin  | \$10,000   | \$30,000           |
|                                   | equipment credit                            | (1)      | LS     | \$115,000  | (\$115,000)        |
|                                   | contingency                                 | 10       | (%)    |            | \$107,500          |
|                                   | <b>subtotal</b>                             |          |        |            | <b>\$1,067,500</b> |
| <b>ANNUAL OPERATION</b>           |   |          |        |            |                    |
|                                   | staff - office                              | 1        | person | \$45,000   | \$45,000           |
|                                   | staff - processing                          | 2        | person | \$30,000   | \$60,000           |
|                                   | administration                              | 1        | LS     | \$30,000   | \$30,000           |
|                                   | insurance                                   | 1        | LS     | \$3,000    | \$3,000            |
|                                   | processing                                  |          |        |            |                    |
|                                   | -equipment maintenance & replacement        | 10       | (%)    |            | \$14,500           |
|                                   | -utilities                                  | 1        | LS     | \$5,000    | \$5,000            |
|                                   | transportation to end markets               | 684      | tonne  | \$30       | \$20,510           |
|                                   | contingency                                 | 10       | (%)    |            | \$17,801           |
|                                   | <b>subtotal</b>                             |          |        |            | <b>\$195,811</b>   |
| <b>ANNUAL REVENUES</b>            |   |          |        |            |                    |
|                                   | materials                                   | 684      | tonne  | (\$40)     | (\$27,346)         |
|                                   | <b>subtotal</b>                             |          |        |            | <b>(\$27,346)</b>  |
| <b>TOTAL ANNUAL COST</b>          |   |          |        |            | <b>\$1,329,311</b> |
| <b>TOTAL ANNUAL REVENUE</b>       |   |          |        |            | <b>(\$27,346)</b>  |
| <b>TOTAL ANNUAL NET COST</b>      |   |          |        |            | <b>\$1,301,964</b> |
| <b>COST PER TONNE - RECYCLING</b> |   |          |        |            | <b>\$1,904</b>     |

\* "bin" in this case is a 30 cu. yd. roll-off bin

LS = lump sum

TABLE RP-3

|  |
|--|
| <b>SYSTEM 2 - RECYCLING<br/>PHASED COST ESTIMATE</b> |
| <b>SEPARATED DROP-OFF</b>                            |
| Associated Engineering AE                            |

|             |            |
|-------------|------------|
| Date        | 1995       |
| Client      | RDK-S      |
| Proj. No.   | 942340-003 |
| Year:       | 1998       |
| Diversion:  | 5.7%       |
| Population: | 45,715     |

| Item                              | Description                          | Quantity | Unit      | Unit Price | Cost       |
|-----------------------------------|--------------------------------------|----------|-----------|------------|------------|
| <b>PRELIMINARY</b>                |                                      |          |           |            |            |
|                                   | program design                       | 1        | LS        | \$0        | \$0        |
|                                   | public education & promo             | 1        | LS        | \$0        | \$0        |
|                                   | other administrative - incentives    | 1        | LS        | \$0        | \$0        |
|                                   | contingency                          | 10       | (%)       |            | \$0        |
|                                   | <i>subtotal</i>                      |          |           |            | \$0        |
| <b>CAPITAL</b>                    |                                      |          |           |            |            |
|                                   | processing facility - OCC depots     | 0        | sq. m.    | \$1,000    | \$0        |
|                                   | OCC depots - Terrace and Hazelton    | 80       | sq. m.    | \$800      | \$64,000   |
|                                   | processing equipment                 |          |           |            |            |
|                                   | -sorting conveyor (paper)            | 0        | units     | \$40,000   | \$0        |
|                                   | -baler                               | 2        | *** units | \$50,000   | \$100,000  |
|                                   | -forklift                            | 2        | *** units | \$20,000   | \$40,000   |
|                                   | -scales                              | 0        | units     | \$25,000   | \$0        |
|                                   | dropoff depots                       | 5        | * bin     | \$10,000   | \$50,000   |
|                                   | equipment credit                     | (1)      | LS        | \$0        | \$0        |
|                                   | contingency                          | 10       | (%)       |            | \$25,400   |
|                                   | <i>subtotal</i>                      |          |           |            | \$279,400  |
| <b>ANNUAL OPERATION</b>           |                                      |          |           |            |            |
|                                   | staff - office                       | 1        | person    | \$45,000   | \$45,000   |
|                                   | staff - processing                   | 3        | ** person | \$30,000   | \$90,000   |
|                                   | administration                       | 1        | LS        | \$30,000   | \$30,000   |
|                                   | insurance                            | 1        | LS        | \$3,000    | \$3,000    |
|                                   | processing                           |          |           |            |            |
|                                   | -equipment maintenance & replacement | 10       | (%)       |            | \$19,000   |
|                                   | -utilities                           | 1        | LS        | \$5,000    | \$5,000    |
|                                   | transportation to end markets        | 1730     | tonne     | \$30       | \$51,889   |
|                                   | contingency                          | 10       | (%)       |            | \$24,389   |
|                                   | <i>subtotal</i>                      |          |           |            | \$268,278  |
| <b>ANNUAL REVENUES</b>            |                                      |          |           |            |            |
|                                   | materials                            | 1730     | tonne     | (\$40)     | (\$69,186) |
|                                   | <i>subtotal</i>                      |          |           |            | (\$69,186) |
| <b>TOTAL ANNUAL COST</b>          |                                      |          |           |            | \$547,678  |
| <b>TOTAL ANNUAL REVENUE</b>       |                                      |          |           |            | (\$69,186) |
| <b>TOTAL ANNUAL NET COST</b>      |                                      |          |           |            | \$478,492  |
| <b>COST PER TONNE - RECYCLING</b> |                                      |          |           |            | \$277      |

\* "bin" in this case is a 30 cu. yd. roll-off bin

\*\* includes 3 workers at the recycling facility plus 2 half-time workers at the OCC depots

\*\*\* includes 1 baler and 1 forklift at each of the OCC depots

LS = lump sum



TABLE RP-4

|  |  |
|--|--|
| <b>SYSTEM 2 - RECYCLING<br/>PHASED COST ESTIMATE</b><br><br><b>SEPARATED DROP-OFF</b><br><br>Associated Engineering AE | <b>Date</b> 1995<br><b>Client</b> RDK-S<br><b>Proj. No.</b> 942340-003<br><br><b>Year:</b> 1999<br><b>Diversion:</b> 8.0%<br><b>Population:</b> 46,264 |
|--|--|

| Item                              | Description                          | Quantity | Unit   | Unit Price | Cost              |
|-----------------------------------|--------------------------------------|----------|--------|------------|-------------------|
| <b>PRELIMINARY</b>                |                                      |          |        |            |                   |
|                                   | program design                       | 1        | LS     | \$0        | \$0               |
|                                   | public education & promo             | 1        | LS     | \$0        | \$0               |
|                                   | other administrative - incentives    | 1        | LS     | \$0        | \$0               |
|                                   | contingency                          | 10       | (%)    |            | \$0               |
|                                   | <i>subtotal</i>                      |          |        |            | \$0               |
| <b>CAPITAL</b>                    |                                      |          |        |            |                   |
|                                   | processing facility                  | 0        | sq. m. | \$1,000    | \$0               |
|                                   | OCC depots - Terrace and Hazelton    | 0        | sq. m. | \$800      | \$0               |
|                                   | processing equipment                 |          |        |            |                   |
|                                   | -sorting conveyor (paper)            | 0        | units  | \$40,000   | \$0               |
|                                   | -baler                               | 0        | units  | \$50,000   | \$0               |
|                                   | -forklift                            | 0        | units  | \$20,000   | \$0               |
|                                   | -scales                              | 0        | units  | \$25,000   | \$0               |
|                                   | dropoff depots                       | 3        | bin    | \$10,000   | \$30,000          |
|                                   | equipment credit                     | (1)      | LS     | \$0        | \$0               |
|                                   | contingency                          | 10       | (%)    |            | \$3,000           |
|                                   | <i>subtotal</i>                      |          |        |            | \$33,000          |
| <b>ANNUAL OPERATION</b>           |                                      |          |        |            |                   |
|                                   | staff - office                       | 1        | person | \$45,000   | \$45,000          |
|                                   | staff - processing                   | 4        | person | \$30,000   | \$120,000         |
|                                   | administration                       | 1        | LS     | \$30,000   | \$30,000          |
|                                   | insurance                            | 1        | LS     | \$3,000    | \$3,000           |
|                                   | processing                           |          |        |            |                   |
|                                   | -equipment maintenance & replacement | 10       | (%)    |            | \$3,000           |
|                                   | -utilities                           | 1        | LS     | \$5,000    | \$5,000           |
|                                   | transportation to end markets        | 2451     | tonne  | \$30       | \$73,518          |
|                                   | contingency                          | 10       | (%)    |            | \$27,952          |
|                                   | <i>subtotal</i>                      |          |        |            | \$307,469         |
| <b>ANNUAL REVENUES</b>            |                                      |          |        |            |                   |
|                                   | materials                            | 2451     | tonne  | (\$40)     | (\$98,024)        |
|                                   | <i>subtotal</i>                      |          |        |            | (\$98,024)        |
| <b>TOTAL ANNUAL COST</b>          |                                      |          |        |            | <b>\$340,469</b>  |
| <b>TOTAL ANNUAL REVENUE</b>       |                                      |          |        |            | <b>(\$98,024)</b> |
| <b>TOTAL ANNUAL NET COST</b>      |                                      |          |        |            | <b>\$242,446</b>  |
| <b>COST PER TONNE - RECYCLING</b> |                                      |          |        |            | <b>\$99</b>       |

\* "bin" in this case is a 30 cu. yd. roll-off bin

LS = lump sum

TABLE RP-5

|  |             |            |
|--|-------------|------------|
| <b>SYSTEM 2 - RECYCLING<br/>PHASED COST ESTIMATE</b> | Date        | 1995       |
|  | Client      | RDK-S      |
| <b>SEPARATED DROP-OFF</b>                            | Proj. No.   | 942340-003 |
|  | Year:       | 2000       |
|  | Diversion:  | 9.2%       |
|  | Population: | 46,819     |
| Associated Engineering AE                            |             |            |

| Item                              | Description                          | Quantity | Unit   | Unit Price | Cost               |
|-----------------------------------|--------------------------------------|----------|--------|------------|--------------------|
| <b>PRELIMINARY</b>                |                                      |          |        |            |                    |
|                                   | program design                       | 1        | LS     | \$0        | \$0                |
|                                   | public education & promo             | 1        | LS     | \$0        | \$0                |
|                                   | other administrative - incentives    | 1        | LS     | \$0        | \$0                |
|                                   | contingency                          | 10       | (%)    |            | \$0                |
|                                   | <i>subtotal</i>                      |          |        |            | \$0                |
| <b>CAPITAL</b>                    |                                      |          |        |            |                    |
|                                   | processing facility                  | 0        | sq. m. | \$1,000    | \$0                |
|                                   | OCC depots - Terrace and Hazelton    | 0        | sq. m. | \$800      | \$0                |
|                                   | processing equipment                 |          |        |            |                    |
|                                   | -sorting conveyor (paper)            | 0        | units  | \$40,000   | \$0                |
|                                   | -baler                               | 0        | units  | \$50,000   | \$0                |
|                                   | -forklift                            | 0        | units  | \$20,000   | \$0                |
|                                   | -scales                              | 0        | units  | \$25,000   | \$0                |
|                                   | dropoff depots                       | 2        | bin    | \$10,000   | \$20,000           |
|                                   | equipment credit                     | (1)      | LS     | \$0        | \$0                |
|                                   | contingency                          | 10       | (%)    |            | \$2,000            |
|                                   | <i>subtotal</i>                      |          |        |            | \$22,000           |
| <b>ANNUAL OPERATION</b>           |                                      |          |        |            |                    |
|                                   | staff - office                       | 1        | person | \$45,000   | \$45,000           |
|                                   | staff - processing                   | 4        | person | \$30,000   | \$120,000          |
|                                   | administration                       | 1        | LS     | \$30,000   | \$30,000           |
|                                   | insurance                            | 1        | LS     | \$3,000    | \$3,000            |
|                                   | processing                           |          |        |            |                    |
|                                   | -equipment maintenance & replacement | 10       | (%)    |            | \$2,000            |
|                                   | -utilities                           | 1        | LS     | \$5,000    | \$5,000            |
|                                   | transportation to end markets        | 2834     | tonne  | \$30       | \$85,028           |
|                                   | contingency                          | 10       | (%)    |            | \$29,003           |
|                                   | <i>subtotal</i>                      |          |        |            | \$319,031          |
| <b>ANNUAL REVENUES</b>            |                                      |          |        |            |                    |
|                                   | materials                            | 2834     | tonne  | (\$40)     | (\$113,371)        |
|                                   | <i>subtotal</i>                      |          |        |            | (\$113,371)        |
| <b>TOTAL ANNUAL COST</b>          |                                      |          |        |            | <b>\$341,031</b>   |
| <b>TOTAL ANNUAL REVENUE</b>       |                                      |          |        |            | <b>(\$113,371)</b> |
| <b>TOTAL ANNUAL NET COST</b>      |                                      |          |        |            | <b>\$227,660</b>   |
| <b>COST PER TONNE - RECYCLING</b> |                                      |          |        |            | <b>\$80</b>        |

\* "bin" in this case is a 30 cu. yd. roll-off bin

LS = lump sum

TABLE RP-6

|  |                    |            |
|--|--------------------|------------|
| <b>SYSTEM 2 - RECYCLING<br/>PHASED COST ESTIMATE</b><br><br><b>SEPARATED DROP-OFF</b><br><br>Associated Engineering AE | <b>Date</b>        | 1995       |
|  | <b>Client</b>      | RDK-S      |
|  | <b>Proj. No.</b>   | 942340-003 |
|  | <b>Year:</b>       | 2001       |
|  | <b>Diversion:</b>  | 9.2%       |
|  | <b>Population:</b> | 47,381     |

| Item                              | Description                          | Quantity | Unit   | Unit Price | Cost        |
|-----------------------------------|--------------------------------------|----------|--------|------------|-------------|
| <b>PRELIMINARY</b>                |                                      |          |        |            |             |
|                                   | program design                       | 1        | LS     | \$0        | \$0         |
|                                   | public education & promo             | 1        | LS     | \$0        | \$0         |
|                                   | other administrative - incentives    | 1        | LS     | \$0        | \$0         |
|                                   | contingency                          | 10       | (%)    |            | \$0         |
|                                   | <i>subtotal</i>                      |          |        |            | \$0         |
| <b>CAPITAL</b>                    |                                      |          |        |            |             |
|                                   | processing facility                  | 0        | sq. m. | \$1,000    | \$0         |
|                                   | OCC depots - Terrace and Hazelton    | 0        | sq. m. | \$800      | \$0         |
|                                   | processing equipment                 |          |        |            |             |
|                                   | -sorting conveyor (paper)            | 0        | units  | \$40,000   | \$0         |
|                                   | -baler                               | 0        | units  | \$50,000   | \$0         |
|                                   | -forklift                            | 0        | units  | \$20,000   | \$0         |
|                                   | -scales                              | 0        | units  | \$25,000   | \$0         |
|                                   | dropoff depots                       | 0        | bin    | \$10,000   | \$0         |
|                                   | equipment credit                     | (1)      | LS     | \$0        | \$0         |
|                                   | contingency                          | 10       | (%)    |            | \$0         |
|                                   | <i>subtotal</i>                      |          |        |            | \$0         |
| <b>ANNUAL OPERATION</b>           |                                      |          |        |            |             |
|                                   | staff - office                       | 1        | person | \$45,000   | \$45,000    |
|                                   | staff - processing                   | 4        | person | \$30,000   | \$120,000   |
|                                   | administration                       | 1        | LS     | \$30,000   | \$30,000    |
|                                   | insurance                            | 1        | LS     | \$3,000    | \$3,000     |
|                                   | processing                           |          |        |            |             |
|                                   | -equipment maintenance & replacement | 10       | (%)    |            | \$0         |
|                                   | -utilities                           | 1        | LS     | \$5,000    | \$5,000     |
|                                   | transportation to end markets        | 2868     | tonne  | \$30       | \$86,049    |
|                                   | contingency                          | 10       | (%)    |            | \$28,905    |
|                                   | <i>subtotal</i>                      |          |        |            | \$317,954   |
| <b>ANNUAL REVENUES</b>            |                                      |          |        |            |             |
|                                   | materials                            | 2868     | tonne  | (\$40)     | (\$114,732) |
|                                   | <i>subtotal</i>                      |          |        |            | (\$114,732) |
| <b>TOTAL ANNUAL COST</b>          |                                      |          |        |            | \$317,954   |
| <b>TOTAL ANNUAL REVENUE</b>       |                                      |          |        |            | (\$114,732) |
| <b>TOTAL ANNUAL NET COST</b>      |                                      |          |        |            | \$203,222   |
| <b>COST PER TONNE - RECYCLING</b> |                                      |          |        |            | \$71        |

\* "bin" in this case is a 30 cu. yd. roll-off bin

LS = lump sum

TABLE RP-7

|  |  |
|--|--|
| <b>SYSTEM 2 - RECYCLING<br/>PHASED COST ESTIMATE</b> | <b>Date</b> 1995<br><b>Client</b> RDK-S<br><b>Proj. No.</b> 942340-003   |
| <b>SEPARATED DROP-OFF</b>                            | <b>Year:</b> 2002<br><b>Diversion:</b> 9.2%<br><b>Population:</b> 47,949 |
| Associated Engineering AE                            |  |

| Item                              | Description                          | Quantity | Unit   | Unit Price | Cost        |
|-----------------------------------|--------------------------------------|----------|--------|------------|-------------|
| <b>PRELIMINARY</b>                |                                      |          |        |            |             |
|                                   | program design                       | 1        | LS     | \$0        | \$0         |
|                                   | public education & promo             | 1        | LS     | \$0        | \$0         |
|                                   | other administrative - incentives    | 1        | LS     | \$0        | \$0         |
|                                   | contingency                          | 10       | (%)    |            | \$0         |
|                                   | <i>subtotal</i>                      |          |        |            | \$0         |
| <b>CAPITAL</b>                    |                                      |          |        |            |             |
|                                   | processing facility                  | 0        | sq. m. | \$1,000    | \$0         |
|                                   | OCC depots - Terrace and Hazelton    | 0        | sq. m. | \$800      | \$0         |
|                                   | processing equipment                 |          |        |            |             |
|                                   | -sorting conveyor (paper)            | 0        | units  | \$40,000   | \$0         |
|                                   | -baler                               | 0        | units  | \$50,000   | \$0         |
|                                   | -forklift                            | 0        | units  | \$20,000   | \$0         |
|                                   | -scales                              | 0        | units  | \$25,000   | \$0         |
|                                   | dropoff depots                       | 1        | bin    | \$10,000   | \$10,000    |
|                                   | equipment credit                     | (1)      | LS     | \$0        | \$0         |
|                                   | contingency                          | 10       | (%)    |            | \$1,000     |
|                                   | <i>subtotal</i>                      |          |        |            | \$11,000    |
| <b>ANNUAL OPERATION</b>           |                                      |          |        |            |             |
|                                   | staff - office                       | 1        | person | \$45,000   | \$45,000    |
|                                   | staff - processing                   | 4        | person | \$30,000   | \$120,000   |
|                                   | administration                       | 1        | LS     | \$30,000   | \$30,000    |
|                                   | insurance                            | 1        | LS     | \$3,000    | \$3,000     |
|                                   | processing                           |          |        |            |             |
|                                   | -equipment maintenance & replacement | 10       | (%)    |            | \$1,000     |
|                                   | -utilities                           | 1        | LS     | \$5,000    | \$5,000     |
|                                   | transportation to end markets        | 2903     | tonne  | \$30       | \$87,080    |
|                                   | contingency                          | 10       | (%)    |            | \$29,108    |
|                                   | <i>subtotal</i>                      |          |        |            | \$320,188   |
| <b>ANNUAL REVENUES</b>            |                                      |          |        |            |             |
|                                   | materials                            | 2903     | tonne  | (\$40)     | (\$116,107) |
|                                   | <i>subtotal</i>                      |          |        |            | (\$116,107) |
| <b>TOTAL ANNUAL COST</b>          |                                      |          |        |            | \$331,188   |
| <b>TOTAL ANNUAL REVENUE</b>       |                                      |          |        |            | (\$116,107) |
| <b>TOTAL ANNUAL NET COST</b>      |                                      |          |        |            | \$215,081   |
| <b>COST PER TONNE - RECYCLING</b> |                                      |          |        |            | \$74        |

\* "bin" in this case is a 30 cu. yd. roll-off bin

LS = lump sum

TABLE RP-8

|  |  |
|--|--|
| <b>SYSTEM 2 - RECYCLING<br/>PHASED COST ESTIMATE</b> | <b>Date</b> 1995<br><b>Client</b> RDK-S<br><b>Proj. No.</b> 942340-003   |
| <b>SEPARATED DROP-OFF</b>                            | <b>Year:</b> 2003<br><b>Diversion:</b> 9.2%<br><b>Population:</b> 48,525 |
| Associated Engineering AE                            |  |

| Item                              | Description                          | Quantity | Unit   | Unit Price | Cost        |
|-----------------------------------|--------------------------------------|----------|--------|------------|-------------|
| <b>PRELIMINARY</b>                |                                      |          |        |            |             |
|                                   | program design                       | 1        | LS     | \$0        | \$0         |
|                                   | public education & promo             | 1        | LS     | \$0        | \$0         |
|                                   | other administrative - incentives    | 1        | LS     | \$0        | \$0         |
|                                   | contingency                          | 10       | (%)    |            | \$0         |
|                                   | <i>subtotal</i>                      |          |        |            | \$0         |
| <b>CAPITAL</b>                    |                                      |          |        |            |             |
|                                   | processing facility                  | 0        | sq. m. | \$1,000    | \$0         |
|                                   | OCC depots - Terrace and Hazelton    | 0        | sq. m. | \$800      | \$0         |
|                                   | processing equipment                 |          |        |            |             |
|                                   | -sorting conveyor (paper)            | 0        | units  | \$40,000   | \$0         |
|                                   | -baler                               | 0        | units  | \$50,000   | \$0         |
|                                   | -forklift                            | 0        | units  | \$20,000   | \$0         |
|                                   | -scales                              | 0        | units  | \$25,000   | \$0         |
|                                   | dropoff depots                       | 0        | bin    | \$10,000   | \$0         |
|                                   | equipment credit                     | (1)      | LS     | \$0        | \$0         |
|                                   | contingency                          | 10       | (%)    |            | \$0         |
|                                   | <i>subtotal</i>                      |          |        |            | \$0         |
| <b>ANNUAL OPERATION</b>           |                                      |          |        |            |             |
|                                   | staff - office                       | 1        | person | \$45,000   | \$45,000    |
|                                   | staff - processing                   | 4        | person | \$30,000   | \$120,000   |
|                                   | administration                       | 1        | LS     | \$30,000   | \$30,000    |
|                                   | insurance                            | 1        | LS     | \$3,000    | \$3,000     |
|                                   | processing                           |          |        |            |             |
|                                   | -equipment maintenance & replacement | 10       | (%)    |            | \$0         |
|                                   | -utilities                           | 1        | LS     | \$5,000    | \$5,000     |
|                                   | transportation to end markets        | 2938     | tonne  | \$30       | \$88,126    |
|                                   | contingency                          | 10       | (%)    |            | \$29,113    |
|                                   | <i>subtotal</i>                      |          |        |            | \$320,239   |
| <b>ANNUAL REVENUES</b>            |                                      |          |        |            |             |
|                                   | materials                            | 2938     | tonne  | (\$40)     | (\$117,502) |
|                                   | <i>subtotal</i>                      |          |        |            | (\$117,502) |
| <b>TOTAL ANNUAL COST</b>          |                                      |          |        |            | \$320,239   |
| <b>TOTAL ANNUAL REVENUE</b>       |                                      |          |        |            | (\$117,502) |
| <b>TOTAL ANNUAL NET COST</b>      |                                      |          |        |            | \$202,737   |
| <b>COST PER TONNE - RECYCLING</b> |                                      |          |        |            | \$69        |

\* "bin" in this case is a 30 cu. yd. roll-off bin

LS = lump sum

TABLE RP-9

|  |  |
|--|--|
| <b>SYSTEM 2 - RECYCLING<br/>PHASED COST ESTIMATE</b><br><br><b>SEPARATED DROP-OFF</b><br><br>Associated Engineering AE | <b>Date</b> 1995<br><b>Client</b> RDK-S<br><b>Proj. No.</b> 942340-003<br><br><b>Year:</b> 2004<br><b>Diversion:</b> 9.2%<br><b>Population:</b> 49,107 |
|--|--|

| Item                              | Description                          | Quantity | Unit   | Unit Price | Cost               |
|-----------------------------------|--------------------------------------|----------|--------|------------|--------------------|
| <b>PRELIMINARY</b>                |                                      |          |        |            |                    |
|                                   | program design                       | 1        | LS     | \$0        | \$0                |
|                                   | public education & promo             | 1        | LS     | \$0        | \$0                |
|                                   | other administrative - incentives    | 1        | LS     | \$0        | \$0                |
|                                   | contingency                          | 10       | (%)    |            | \$0                |
|                                   | <i>subtotal</i>                      |          |        |            | \$0                |
| <b>CAPITAL</b>                    |                                      |          |        |            |                    |
|                                   | processing facility                  | 0        | sq. m. | \$1,000    | \$0                |
|                                   | OCC depots - Terrace and Hazelton    | 0        | sq. m. | \$800      | \$0                |
|                                   | processing equipment                 |          |        |            |                    |
|                                   | -sorting conveyor (paper)            | 0        | units  | \$40,000   | \$0                |
|                                   | -baler                               | 0        | units  | \$50,000   | \$0                |
|                                   | -forklift                            | 0        | units  | \$20,000   | \$0                |
|                                   | -scales                              | 0        | units  | \$25,000   | \$0                |
|                                   | dropoff depots                       | 0        | bin    | \$10,000   | \$0                |
|                                   | equipment credit                     | (1)      | LS     | \$0        | \$0                |
|                                   | contingency                          | 10       | (%)    |            | \$0                |
|                                   | <i>subtotal</i>                      |          |        |            | \$0                |
| <b>ANNUAL OPERATION</b>           |                                      |          |        |            |                    |
|                                   | staff - office                       | 1        | person | \$45,000   | \$45,000           |
|                                   | staff - processing                   | 4        | person | \$30,000   | \$120,000          |
|                                   | administration                       | 1        | LS     | \$30,000   | \$30,000           |
|                                   | insurance                            | 1        | LS     | \$3,000    | \$3,000            |
|                                   | processing                           |          |        |            |                    |
|                                   | -equipment maintenance & replacement | 10       | (%)    |            | \$0                |
|                                   | -utilities                           | 1        | LS     | \$5,000    | \$5,000            |
|                                   | transportation to end markets        | 2973     | tonne  | \$30       | \$89,183           |
|                                   | contingency                          | 10       | (%)    |            | \$29,218           |
|                                   | <i>subtotal</i>                      |          |        |            | \$321,402          |
| <b>ANNUAL REVENUES</b>            |                                      |          |        |            |                    |
|                                   | materials                            | 2973     | tonne  | (\$40)     | (\$118,911)        |
|                                   | <i>subtotal</i>                      |          |        |            | (\$118,911)        |
| <b>TOTAL ANNUAL COST</b>          |                                      |          |        |            | <b>\$321,402</b>   |
| <b>TOTAL ANNUAL REVENUE</b>       |                                      |          |        |            | <b>(\$118,911)</b> |
| <b>TOTAL ANNUAL NET COST</b>      |                                      |          |        |            | <b>\$202,491</b>   |
| <b>COST PER TONNE - RECYCLING</b> |                                      |          |        |            | <b>\$68</b>        |

\* "bin" in this case is a 30 cu. yd. roll-off bin

LS = lump sum

TABLE RP-10

|  |  |
|--|--|
| <b>SYSTEM 2 - RECYCLING<br/>PHASED COST ESTIMATE</b><br><br><b>SEPARATED DROP-OFF</b><br><br>Associated Engineering AE | Date 1995<br>Client RDK-S<br>Proj. No. 942340-003<br><br>Year: 2005<br>Diversion: 9.2%<br>Population: 49,696 |
|--|--|

| Item                              | Description                          | Quantity | Unit   | Unit Price | Cost        |
|-----------------------------------|--------------------------------------|----------|--------|------------|-------------|
| <b>PRELIMINARY</b>                |                                      |          |        |            |             |
|                                   | program design                       | 1        | LS     | \$0        | \$0         |
|                                   | public education & promo             | 1        | LS     | \$0        | \$0         |
|                                   | other administrative - incentives    | 1        | LS     | \$0        | \$0         |
|                                   | contingency                          | 10       | (%)    |            | \$0         |
|                                   | <i>subtotal</i>                      |          |        |            | \$0         |
| <b>CAPITAL</b>                    |                                      |          |        |            |             |
|                                   | processing facility                  | 0        | sq. m. | \$1,000    | \$0         |
|                                   | OCC depots - Terrace and Hazelton    | 0        | sq. m. | \$800      | \$0         |
|                                   | processing equipment                 |          |        |            |             |
|                                   | -sorting conveyor (paper)            | 0        | units  | \$40,000   | \$0         |
|                                   | -baler                               | 0        | units  | \$50,000   | \$0         |
|                                   | -forklift                            | 0        | units  | \$20,000   | \$0         |
|                                   | -scales                              | 0        | units  | \$25,000   | \$0         |
|                                   | dropoff depots                       | 0        | bin    | \$10,000   | \$0         |
|                                   | equipment credit                     | (1)      | LS     | \$0        | \$0         |
|                                   | contingency                          | 10       | (%)    |            | \$0         |
|                                   | <i>subtotal</i>                      |          |        |            | \$0         |
| <b>ANNUAL OPERATION</b>           |                                      |          |        |            |             |
|                                   | staff - office                       | 1        | person | \$45,000   | \$45,000    |
|                                   | staff - processing                   | 4        | person | \$30,000   | \$120,000   |
|                                   | administration                       | 1        | LS     | \$30,000   | \$30,000    |
|                                   | insurance                            | 1        | LS     | \$3,000    | \$3,000     |
|                                   | processing                           |          |        |            |             |
|                                   | -equipment maintenance & replacement | 10       | (%)    |            | \$0         |
|                                   | -utilities                           | 1        | LS     | \$5,000    | \$5,000     |
|                                   | transportation to end markets        | 3008     | tonne  | \$30       | \$90,253    |
|                                   | contingency                          | 10       | (%)    |            | \$29,325    |
|                                   | <i>subtotal</i>                      |          |        |            | \$322,578   |
| <b>ANNUAL REVENUES</b>            |                                      |          |        |            |             |
|                                   | materials                            | 3008     | tonne  | (\$40)     | (\$120,337) |
|                                   | <i>subtotal</i>                      |          |        |            | (\$120,337) |
| <b>TOTAL ANNUAL COST</b>          |                                      |          |        |            | \$322,578   |
| <b>TOTAL ANNUAL REVENUE</b>       |                                      |          |        |            | (\$120,337) |
| <b>TOTAL ANNUAL NET COST</b>      |                                      |          |        |            | \$202,241   |
| <b>COST PER TONNE - RECYCLING</b> |                                      |          |        |            | \$67        |

\* "bin" in this case is a 30 cu. yd. roll-off bin

LS = lump sum

TABLE RP-11

|  |  |
|--|--|
| <b>SYSTEM 2 - RECYCLING<br/>PHASED COST ESTIMATE</b> | <b>Date</b> 1995<br><b>Client</b> RDK-S<br><b>Proj. No.</b> 942340-003   |
| <b>SEPARATED DROP-OFF</b>                            | <b>Year:</b> 2006<br><b>Diversion:</b> 9.2%<br><b>Population:</b> 50,293 |
| Associated Engineering AE                            |  |

| Item                              | Description                          | Quantity | Unit   | Unit Price | Cost        |
|-----------------------------------|--------------------------------------|----------|--------|------------|-------------|
| <b>PRELIMINARY</b>                |                                      |          |        |            |             |
|                                   | program design                       | 1        | LS     | \$0        | \$0         |
|                                   | public education & promo             | 1        | LS     | \$0        | \$0         |
|                                   | other administrative - incentives    | 1        | LS     | \$0        | \$0         |
|                                   | contingency                          | 10       | (%)    |            | \$0         |
|                                   | <b>subtotal</b>                      |          |        |            | \$0         |
| <b>CAPITAL</b>                    |                                      |          |        |            |             |
|                                   | processing facility                  | 0        | sq. m. | \$1,000    | \$0         |
|                                   | OCC depots - Terrace and Hazelton    | 0        | sq. m. | \$800      | \$0         |
|                                   | processing equipment                 |          |        |            |             |
|                                   | -sorting conveyor (paper)            | 0        | units  | \$40,000   | \$0         |
|                                   | -baler                               | 0        | units  | \$50,000   | \$0         |
|                                   | -forklift                            | 0        | units  | \$20,000   | \$0         |
|                                   | -scales                              | 0        | units  | \$25,000   | \$0         |
|                                   | dropoff depots                       | 0        | bin    | \$10,000   | \$0         |
|                                   | equipment credit                     | (1)      | LS     | \$0        | \$0         |
|                                   | contingency                          | 10       | (%)    |            | \$0         |
|                                   | <b>subtotal</b>                      |          |        |            | \$0         |
| <b>ANNUAL OPERATION</b>           |                                      |          |        |            |             |
|                                   | staff - office                       | 1        | person | \$45,000   | \$45,000    |
|                                   | staff - processing                   | 4        | person | \$30,000   | \$120,000   |
|                                   | administration                       | 1        | LS     | \$30,000   | \$30,000    |
|                                   | insurance                            | 1        | LS     | \$3,000    | \$3,000     |
|                                   | processing                           |          |        |            |             |
|                                   | -equipment maintenance & replacement | 10       | (%)    |            | \$0         |
|                                   | -utilities                           | 1        | LS     | \$5,000    | \$5,000     |
|                                   | transportation to end markets        | 3045     | tonne  | \$30       | \$91,337    |
|                                   | contingency                          | 10       | (%)    |            | \$29,434    |
|                                   | <b>subtotal</b>                      |          |        |            | \$323,771   |
| <b>ANNUAL REVENUES</b>            |                                      |          |        |            |             |
|                                   | materials                            | 3045     | tonne  | (\$40)     | (\$121,783) |
|                                   | <b>subtotal</b>                      |          |        |            | (\$121,783) |
| <b>TOTAL ANNUAL COST</b>          |                                      |          |        |            | \$323,771   |
| <b>TOTAL ANNUAL REVENUE</b>       |                                      |          |        |            | (\$121,783) |
| <b>TOTAL ANNUAL NET COST</b>      |                                      |          |        |            | \$201,988   |
| <b>COST PER TONNE - RECYCLING</b> |                                      |          |        |            | \$66        |

\* "bin" in this case is a 30 cu. yd. roll-off bin

LS = lump sum



**COMPOSTING COST ESTIMATES**

TABLE CP-1

COMPOSTING  
PHASED COST ESTIMATE

BACKYARD COMPOSTING

AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003

Year: 1996  
Diversion: 0.0%  
Population: 44,637

| Item                           | Description                          | Quantity | Unit | Unit Price | Cost |
|--------------------------------|--------------------------------------|----------|------|------------|------|
| <b>PRELIMINARY</b>             |                                      |          |      |            |      |
|                                | program administration and promotion | 1        | LS   | \$ -       | \$ - |
|                                | <i>subtotal</i>                      |          |      |            | \$ - |
| <b>CAPITAL</b>                 |                                      |          |      |            |      |
|                                | original bins                        | 0        | bins | \$ 20      | \$ - |
|                                | <i>subtotal</i>                      |          |      |            | \$ - |
| <b>ANNUAL OPERATION</b>        |                                      |          |      |            |      |
|                                | administration                       | 1        | LS   | \$ -       | \$ - |
|                                | replacement bins                     | 0        | bins | \$ 20      | \$ - |
|                                | <i>subtotal</i>                      |          |      |            | \$ - |
| <b>TOTAL ANNUAL COST</b>       |                                      |          |      |            | \$ - |
| <b>COST PER TONNE DIVERTED</b> |                                      |          |      |            | \$ - |

COMPOSTING  
COST ESTIMATE

YARD WASTE DROP-OFF  
(Entire Regional District)

AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003

Year: 1996  
Diversion: 0.0%  
Population: 44,637

| Description                                | Quantity | Unit      | Unit Price | Cost         |
|--|----------|-----------|------------|--------------|
| <b>PRELIMINARY</b>                         |          |           |            |              |
| design brief and operations plan for sites | 1        | l.s.      | \$ -       | \$ -         |
| public education and program promotion     | 1        | l.s.      | \$ -       | \$ -         |
| <i>subtotal</i>                            |          |           |            | \$ -         |
| <b>CAPITAL</b>                             |          |           |            |              |
| land purchase                              |          |           | *****      | not included |
| buildings, equipment, and sundries         | 1        | l.s.      | \$ -       | \$ -         |
| <i>subtotal</i>                            |          |           |            | \$ -         |
| <b>ANNUAL OPERATION</b>                    |          |           |            |              |
| operation                                  | 0        | tonnes    | \$ 100     | \$ -         |
| <i>subtotal</i>                            |          |           |            | \$ -         |
| <b>ANNUAL REVENUES</b>                     |          |           |            |              |
| compost sales                              | 0        | cu.metres | \$ -       | \$ -         |
| <i>subtotal</i>                            |          |           |            | \$ -         |
| <b>TOTAL ANNUAL COST</b>                   |          |           |            | \$ -         |
| <b>TOTAL ANNUAL REVENUE</b>                |          |           |            | \$ -         |
| <b>TOTAL ANNUAL NET COST</b>               |          |           |            | \$ -         |
| <b>COST PER TONNE DIVERTED</b>             |          |           |            | \$ -         |

TABLE CP-2

COMPOSTING  
PHASED COST ESTIMATE  
  
BACKYARD COMPOSTING  
  
AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003  
  
Year: 1997  
Diversion: 1.6%  
Population: 45,173

| Item                           | Description                          | Quantity | Unit | Unit Price | Cost      |
|--------------------------------|--------------------------------------|----------|------|------------|-----------|
| <b>PRELIMINARY</b>             |                                      |          |      |            |           |
|                                | program administration and promotion | 1        | LS   | \$ 20,000  | \$ 20,000 |
|                                | <i>subtotal</i>                      |          |      |            | \$ 20,000 |
| <b>CAPITAL</b>                 |                                      |          |      |            |           |
|                                | original bins                        | 0        | bins | \$ 20      | \$ -      |
|                                | <i>subtotal</i>                      |          |      |            | \$ -      |
| <b>ANNUAL OPERATION</b>        |                                      |          |      |            |           |
|                                | administration                       | 1        | LS   | \$ 20,000  | \$ 20,000 |
|                                | replacement bins                     | 0        | bins | \$ 20      | \$ -      |
|                                | <i>subtotal</i>                      |          |      |            | \$ 20,000 |
| <b>TOTAL ANNUAL COST</b>       |                                      |          |      |            | \$ 40,000 |
| <b>COST PER TONNE DIVERTED</b> |                                      |          |      |            | \$ 83     |

COMPOSTING  
COST ESTIMATE  
  
YARD WASTE DROP-OFF  
(Entire Regional District)  
  
AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003  
  
Year: 1997  
Diversion: 1.0%  
Population: 45,173

| Description                                | Quantity | Unit      | Unit Price | Cost         |
|--|----------|-----------|------------|--------------|
| <b>PRELIMINARY</b>                         |          |           |            |              |
| design brief and operations plan for sites | 1        | i.s.      | \$ 20,000  | \$ 20,000    |
| public education and program promotion     | 1        | i.s.      | \$ 40,000  | \$ 40,000    |
| <i>subtotal</i>                            |          |           |            | \$ 60,000    |
| <b>CAPITAL</b>                             |          |           |            |              |
| land purchase                              |          |           | *****      | not included |
| buildings, equipment, and sundries         | 1        | i.s.      | \$ 60,000  | \$ 60,000    |
| <i>subtotal</i>                            |          |           |            | \$ 60,000    |
| <b>ANNUAL OPERATION</b>                    |          |           |            |              |
| operation                                  | 292      | tonnes    | \$ 100     | \$ 29,218    |
| <i>subtotal</i>                            |          |           |            | \$ 29,218    |
| <b>ANNUAL REVENUES</b>                     |          |           |            |              |
| compost sales                              | 351      | cu.metres | \$ -       | \$ -         |
| <i>subtotal</i>                            |          |           |            | \$ -         |
| <b>TOTAL ANNUAL COST</b>                   |          |           |            | \$ 149,218   |
| <b>TOTAL ANNUAL REVENUE</b>                |          |           |            | \$ -         |
| <b>TOTAL ANNUAL NET COST</b>               |          |           |            | \$ 149,218   |
| <b>COST PER TONNE DIVERTED</b>             |          |           |            | \$ 511       |

TABLE CP-3

|  |
|--|
| <p>COMPOSTING<br/>PHASED COST ESTIMATE</p> <p>BACKYARD COMPOSTING</p> <p style="text-align: right;">AGRA</p> |
|--|

|             |            |
|-------------|------------|
| Date        | 1995       |
| Client      | RDK-S      |
| Proj. No.   | 942340-003 |
| Year:       | 1998       |
| Diversion:  | 2.8%       |
| Population: | 45,715     |

| Item                           | Description                          | Quantity | Unit | Unit Price | Cost      |
|--------------------------------|--------------------------------------|----------|------|------------|-----------|
| <b>PRELIMINARY</b>             |                                      |          |      |            |           |
|                                | program administration and promotion | 1        | LS   | \$ -       | \$ -      |
|                                | <i>subtotal</i>                      |          |      |            | \$ -      |
| <b>CAPITAL</b>                 |                                      |          |      |            |           |
|                                | original bins                        | 2152     | bins | \$ 20      | \$ 43,040 |
|                                | <i>subtotal</i>                      |          |      |            | \$ 43,040 |
| <b>ANNUAL OPERATION</b>        |                                      |          |      |            |           |
|                                | administration                       | 1        | LS   | \$ 20,000  | \$ 20,000 |
|                                | replacement bins                     | 0        | bins | \$ 20      | \$ -      |
|                                | <i>subtotal</i>                      |          |      |            | \$ 20,000 |
| <b>TOTAL ANNUAL COST</b>       |                                      |          |      |            | \$ 63,040 |
| <b>COST PER TONNE DIVERTED</b> |                                      |          |      |            | \$ 74     |

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| <p>COMPOSTING<br/>COST ESTIMATE</p> <p>YARD WASTE DROP-OFF<br/>(Entire Regional District)</p> <p style="text-align: right;">AGRA</p> |
|--|

|             |            |
|-------------|------------|
| Date        | 1995       |
| Client      | RDK-S      |
| Proj. No.   | 942340-003 |
| Year:       | 1998       |
| Diversion:  | 2.5%       |
| Population: | 45,715     |

| Description                                | Quantity        | Unit      | Unit Price | Cost         |
|--|-----------------|-----------|------------|--------------|
| <b>PRELIMINARY</b>                         |                 |           |            |              |
| design brief and operations plan for sites | 1               | l.s.      | \$ -       | \$ -         |
| public education and program promotion     | 1               | l.s.      | \$ 30,000  | \$ 30,000    |
|  | <i>subtotal</i> |           |            | \$ 30,000    |
| <b>CAPITAL</b>                             |                 |           |            |              |
| land purchase                              |                 |           | *****      | not included |
| buildings, equipment, and sundries         | 1               | l.s.      | \$ 30,000  | \$ 30,000    |
|  | <i>subtotal</i> |           |            | \$ 30,000    |
| <b>ANNUAL OPERATION</b>                    |                 |           |            |              |
| operation                                  | 739             | tonnes    | \$ 100     | \$ 73,921    |
|  | <i>subtotal</i> |           |            | \$ 73,921    |
| <b>ANNUAL REVENUES</b>                     |                 |           |            |              |
| compost sales                              | 887             | cu.metres | \$ -       | \$ -         |
|  | <i>subtotal</i> |           |            | \$ -         |
| <b>TOTAL ANNUAL COST</b>                   |                 |           |            | \$ 133,921   |
| <b>TOTAL ANNUAL REVENUE</b>                |                 |           |            | \$ -         |
| <b>TOTAL ANNUAL NET COST</b>               |                 |           |            | \$ 133,921   |
| <b>COST PER TONNE DIVERTED</b>             |                 |           |            | \$ 181       |

TABLE CP-4

COMPOSTING  
PHASED COST ESTIMATE

BACKYARD COMPOSTING

AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003

Year: 1999  
Diversion: 3.6%  
Population: 46,264

| Item                           | Description                          | Quantity | Unit | Unit Price | Cost             |
|--------------------------------|--------------------------------------|----------|------|------------|------------------|
| <b>PRELIMINARY</b>             |                                      |          |      |            |                  |
|                                | program administration and promotion | 1        | LS   | \$ -       | \$ -             |
|                                | <i>subtotal</i>                      |          |      |            | \$ -             |
| <b>CAPITAL</b>                 |                                      |          |      |            |                  |
|                                | original bins                        | 1634     | bins | \$ 20      | \$ 32,680        |
|                                | <i>subtotal</i>                      |          |      |            | \$ 32,680        |
| <b>ANNUAL OPERATION</b>        |                                      |          |      |            |                  |
|                                | administration                       | 1        | LS   | \$ 20,000  | \$ 20,000        |
|                                | replacement bins                     | 43       | bins | \$ 20      | \$ 860           |
|                                | <i>subtotal</i>                      |          |      |            | \$ 20,860        |
| <b>TOTAL ANNUAL COST</b>       |                                      |          |      |            | <b>\$ 53,540</b> |
| <b>COST PER TONNE DIVERTED</b> |                                      |          |      |            | <b>\$ 49</b>     |

COMPOSTING  
COST ESTIMATE

YARD WASTE DROP-OFF  
(Entire Regional District)

AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003

Year: 1999  
Diversion: 3.9%  
Population: 46,264

| Description                    | Quantity                                   | Unit | Unit Price | Cost              |
|--------------------------------|--|------|------------|-------------------|
| <b>PRELIMINARY</b>             |  |      |            |                   |
|                                | design brief and operations plan for sites | 1    | l.s.       | \$ -              |
|                                | public education and program promotion     | 1    | l.s.       | \$ 20,000         |
|                                | <i>subtotal</i>                            |      |            | \$ 20,000         |
| <b>CAPITAL</b>                 |  |      |            |                   |
|                                | land purchase                              |      | *****      | not included      |
|                                | buildings, equipment, and sundries         | 1    | l.s.       | \$ -              |
|                                | <i>subtotal</i>                            |      |            | \$ -              |
| <b>ANNUAL OPERATION</b>        |  |      |            |                   |
|                                | operation                                  | 1197 | tonnes     | \$ 100            |
|                                | <i>subtotal</i>                            |      |            | \$ 119,694        |
| <b>ANNUAL REVENUES</b>         |  |      |            |                   |
|                                | compost sales                              | 1436 | cu.metres  | \$ -              |
|                                | <i>subtotal</i>                            |      |            | \$ -              |
| <b>TOTAL ANNUAL COST</b>       |  |      |            | <b>\$ 139,694</b> |
| <b>TOTAL ANNUAL REVENUE</b>    |  |      |            | <b>\$ -</b>       |
| <b>TOTAL ANNUAL NET COST</b>   |  |      |            | <b>\$ 139,694</b> |
| <b>COST PER TONNE DIVERTED</b> |  |      |            | <b>\$ 117</b>     |

TABLE CP-5

COMPOSTING  
PHASED COST ESTIMATE

BACKYARD COMPOSTING

AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003

Year: 2000  
Diversion: 4.0%  
Population: 46,819

| Item                           | Description                          | Quantity | Unit | Unit Price | Cost      |
|--------------------------------|--------------------------------------|----------|------|------------|-----------|
| <b>PRELIMINARY</b>             |                                      |          |      |            |           |
|                                | program administration and promotion | 1        | LS   | \$ -       | \$ -      |
|                                | <i>subtotal</i>                      |          |      |            | \$ -      |
| <b>CAPITAL</b>                 |                                      |          |      |            |           |
|                                | original bins                        | 1102     | bins | \$ 20      | \$ 22,040 |
|                                | <i>subtotal</i>                      |          |      |            | \$ 22,040 |
| <b>ANNUAL OPERATION</b>        |                                      |          |      |            |           |
|                                | administration                       | 1        | LS   | \$ 20,000  | \$ 20,000 |
|                                | replacement bins                     | 113      | bins | \$ 20      | \$ 2,260  |
|                                | <i>subtotal</i>                      |          |      |            | \$ 22,260 |
| <b>TOTAL ANNUAL COST</b>       |                                      |          |      |            | \$ 44,300 |
| <b>COST PER TONNE DIVERTED</b> |                                      |          |      |            | \$ 36     |

COMPOSTING  
COST ESTIMATE

YARD WASTE DROP-OFF  
(Entire Regional District)

AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003

Year: 2000  
Diversion: 4.9%  
Population: 46,819

| Description                    | Quantity                                   | Unit | Unit Price | Cost         |
|--------------------------------|--|------|------------|--------------|
| <b>PRELIMINARY</b>             |  |      |            |              |
|                                | design brief and operations plan for sites | 1    | l.s.       | \$ -         |
|                                | public education and program promotion     | 1    | l.s.       | \$ 20,000    |
|                                | <i>subtotal</i>                            |      |            | \$ 20,000    |
| <b>CAPITAL</b>                 |  |      |            |              |
|                                | land purchase                              |      | *****      | not included |
|                                | buildings, equipment, and sundries         | 1    | l.s.       | \$ -         |
|                                | <i>subtotal</i>                            |      |            | \$ -         |
| <b>ANNUAL OPERATION</b>        |  |      |            |              |
|                                | operation                                  | 1514 | tonnes     | \$ 100       |
|                                | <i>subtotal</i>                            |      |            | \$ 151,413   |
| <b>ANNUAL REVENUES</b>         |  |      |            |              |
|                                | compost sales                              | 1817 | cu.metres  | \$ -         |
|                                | <i>subtotal</i>                            |      |            | \$ -         |
| <b>TOTAL ANNUAL COST</b>       |  |      |            | \$ 171,413   |
| <b>TOTAL ANNUAL REVENUE</b>    |  |      |            | \$ -         |
| <b>TOTAL ANNUAL NET COST</b>   |  |      |            | \$ 171,413   |
| <b>COST PER TONNE DIVERTED</b> |  |      |            | \$ 113       |

TABLE CP-6

COMPOSTING  
PHASED COST ESTIMATE

BACKYARD COMPOSTING

AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003

Year: 2001  
Diversion: 4.0%  
Population: 47,381

| Item                           | Description                          | Quantity | Unit | Unit Price | Cost      |
|--------------------------------|--------------------------------------|----------|------|------------|-----------|
| <b>PRELIMINARY</b>             |                                      |          |      |            |           |
|                                | program administration and promotion | 1        | LS   | \$ -       | \$ -      |
|                                | <i>subtotal</i>                      |          |      |            | \$ -      |
| <b>CAPITAL</b>                 |                                      |          |      |            |           |
|                                | original bins                        | 557      | bins | \$ 25      | \$ 13,925 |
|                                | <i>subtotal</i>                      |          |      |            | \$ 13,925 |
| <b>ANNUAL OPERATION</b>        |                                      |          |      |            |           |
|                                | administration                       | 1        | LS   | \$ 15,000  | \$ 15,000 |
|                                | replacement bins                     | 146      | bins | \$ 25      | \$ 3,650  |
|                                | <i>subtotal</i>                      |          |      |            | \$ 18,650 |
| <b>TOTAL ANNUAL COST</b>       |                                      |          |      |            | \$ 32,575 |
| <b>COST PER TONNE DIVERTED</b> |                                      |          |      |            | \$ 26     |

COMPOSTING  
COST ESTIMATE

YARD WASTE DROP-OFF  
(Entire Regional District)

AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003

Year: 2001  
Diversion: 4.9%  
Population: 47,381

| Description                                | Quantity        | Unit      | Unit Price         | Cost       |
|--|-----------------|-----------|--------------------|------------|
| <b>PRELIMINARY</b>                         |                 |           |                    |            |
| design brief and operations plan for sites | 1               | l.s.      | \$ -               | \$ -       |
| public education and program promotion     | 1               | l.s.      | \$ 20,000          | \$ 20,000  |
|  | <i>subtotal</i> |           |                    | \$ 20,000  |
| <b>CAPITAL</b>                             |                 |           |                    |            |
| land purchase                              |                 |           | ***** not included |            |
| buildings, equipment, and sundries         | 1               | l.s.      | \$ -               | \$ -       |
|  | <i>subtotal</i> |           |                    | \$ -       |
| <b>ANNUAL OPERATION</b>                    |                 |           |                    |            |
| operation                                  | 1532            | tonnes    | \$ 100             | \$ 153,230 |
|  | <i>subtotal</i> |           |                    | \$ 153,230 |
| <b>ANNUAL REVENUES</b>                     |                 |           |                    |            |
| compost sales                              | 1839            | cu.metres | \$ -               | \$ -       |
|  | <i>subtotal</i> |           |                    | \$ -       |
| <b>TOTAL ANNUAL COST</b>                   |                 |           |                    | \$ 173,230 |
| <b>TOTAL ANNUAL REVENUE</b>                |                 |           |                    | \$ -       |
| <b>TOTAL ANNUAL NET COST</b>               |                 |           |                    | \$ 173,230 |
| <b>COST PER TONNE DIVERTED</b>             |                 |           |                    | \$ 113     |

TABLE CP-7

COMPOSTING  
PHASED COST ESTIMATE  
  
BACKYARD COMPOSTING  
  
AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003  
  
Year: 2002  
Diversion: 4.0%  
Population: 47,949

| Item                           | Description                          | Quantity | Unit | Unit Price | Cost      |
|--------------------------------|--------------------------------------|----------|------|------------|-----------|
| <b>PRELIMINARY</b>             |                                      |          |      |            |           |
|                                | program administration and promotion | 1        | LS   | \$ -       | \$ -      |
|                                | <i>subtotal</i>                      |          |      |            | \$ -      |
| <b>CAPITAL</b>                 |                                      |          |      |            |           |
|                                | original bins                        | 67       | bins | \$ 25      | \$ 1,675  |
|                                | <i>subtotal</i>                      |          |      |            | \$ 1,675  |
| <b>ANNUAL OPERATION</b>        |                                      |          |      |            |           |
|                                | administration                       | 1        | LS   | \$ 15,000  | \$ 15,000 |
|                                | replacement bins                     | 163      | bins | \$ 25      | \$ 4,075  |
|                                | <i>subtotal</i>                      |          |      |            | \$ 19,075 |
| <b>TOTAL ANNUAL COST</b>       |                                      |          |      |            | \$ 20,750 |
| <b>COST PER TONNE DIVERTED</b> |                                      |          |      |            | \$ 17     |

COMPOSTING  
COST ESTIMATE  
  
YARD WASTE DROP-OFF  
(Entire Regional District)  
  
AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003  
  
Year: 2002  
Diversion: 4.9%  
Population: 47,949

| Description                                | Quantity | Unit      | Unit Price | Cost         |
|--|----------|-----------|------------|--------------|
| <b>PRELIMINARY</b>                         |          |           |            |              |
| design brief and operations plan for sites | 1        | l.s.      | \$ -       | \$ -         |
| public education and program promotion     | 1        | l.s.      | \$ 20,000  | \$ 20,000    |
| <i>subtotal</i>                            |          |           |            | \$ 20,000    |
| <b>CAPITAL</b>                             |          |           |            |              |
| land purchase                              |          |           | *****      | not included |
| buildings, equipment, and sundries         | 1        | l.s.      | \$ -       | \$ -         |
| <i>subtotal</i>                            |          |           |            | \$ -         |
| <b>ANNUAL OPERATION</b>                    |          |           |            |              |
| operation                                  | 1551     | tonnes    | \$ 100     | \$ 155,067   |
| <i>subtotal</i>                            |          |           |            | \$ 155,067   |
| <b>ANNUAL REVENUES</b>                     |          |           |            |              |
| compost sales                              | 1861     | cu.metres | \$ -       | \$ -         |
| <i>subtotal</i>                            |          |           |            | \$ -         |
| <b>TOTAL ANNUAL COST</b>                   |          |           |            | \$ 175,067   |
| <b>TOTAL ANNUAL REVENUE</b>                |          |           |            | \$ -         |
| <b>TOTAL ANNUAL NET COST</b>               |          |           |            | \$ 175,067   |
| <b>COST PER TONNE DIVERTED</b>             |          |           |            | \$ 113       |



TABLE CP-8

|   |             |            |
|---|-------------|------------|
| COMPOSTING<br>PHASED COST ESTIMATE<br><br>BACKYARD COMPOSTING<br><br>AGRA | Date        | 1995       |
|   | Client      | RDK-S      |
|   | Proj. No.   | 942340-003 |
|   | Year:       | 2003       |
|   | Diversion:  | 4.0%       |
|   | Population: | 48,525     |

| Item                           | Description                          | Quantity | Unit | Unit Price | Cost             |
|--------------------------------|--------------------------------------|----------|------|------------|------------------|
| <b>PRELIMINARY</b>             |                                      |          |      |            |                  |
|                                | program administration and promotion | 1        | LS   | \$ -       | \$ -             |
|                                | <i>subtotal</i>                      |          |      |            | \$ -             |
| <b>CAPITAL</b>                 |                                      |          |      |            |                  |
|                                | original bins                        | 67       | bins | \$ 25      | \$ 1,675         |
|                                | <i>subtotal</i>                      |          |      |            | \$ 1,675         |
| <b>ANNUAL OPERATION</b>        |                                      |          |      |            |                  |
|                                | administration                       | 1        | LS   | \$ 15,000  | \$ 15,000        |
|                                | replacement bins                     | 165      | bins | \$ 25      | \$ 4,125         |
|                                | <i>subtotal</i>                      |          |      |            | \$ 19,125        |
| <b>TOTAL ANNUAL COST</b>       |                                      |          |      |            | <b>\$ 20,800</b> |
| <b>COST PER TONNE DIVERTED</b> |                                      |          |      |            | <b>\$ 16</b>     |

|  |             |            |
|--|-------------|------------|
| COMPOSTING<br>COST ESTIMATE<br><br>YARD WASTE DROP-OFF<br>(Entire Regional District)<br><br>AGRA | Date        | 1995       |
|  | Client      | RDK-S      |
|  | Proj. No.   | 942340-003 |
|  | Year:       | 2003       |
|  | Diversion:  | 4.9%       |
|  | Population: | 48,525     |

| Description                                | Quantity | Unit      | Unit Price | Cost              |
|--|----------|-----------|------------|-------------------|
| <b>PRELIMINARY</b>                         |          |           |            |                   |
| design brief and operations plan for sites | 1        | l.s.      | \$ -       | \$ -              |
| public education and program promotion     | 1        | l.s.      | \$ 20,000  | \$ 20,000         |
| <i>subtotal</i>                            |          |           |            | \$ 20,000         |
| <b>CAPITAL</b>                             |          |           |            |                   |
| land purchase                              |          |           | *****      | not included      |
| buildings, equipment, and sundries         | 1        | l.s.      | \$ -       | \$ -              |
| <i>subtotal</i>                            |          |           |            | \$ -              |
| <b>ANNUAL OPERATION</b>                    |          |           |            |                   |
| operation                                  | 1569     | tonnes    | \$ 100     | \$ 156,930        |
| <i>subtotal</i>                            |          |           |            | \$ 156,930        |
| <b>ANNUAL REVENUES</b>                     |          |           |            |                   |
| compost sales                              | 1883     | cu.metres | \$ -       | \$ -              |
| <i>subtotal</i>                            |          |           |            | \$ -              |
| <b>TOTAL ANNUAL COST</b>                   |          |           |            | <b>\$ 176,930</b> |
| <b>TOTAL ANNUAL REVENUE</b>                |          |           |            | <b>\$ -</b>       |
| <b>TOTAL ANNUAL NET COST</b>               |          |           |            | <b>\$ 176,930</b> |
| <b>COST PER TONNE DIVERTED</b>             |          |           |            | <b>\$ 113</b>     |

TABLE CP-9

|  |
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| <p>COMPOSTING<br/>PHASED COST ESTIMATE</p> <p>BACKYARD COMPOSTING</p> <p style="text-align: right;">AGRA</p> |
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|             |            |
|-------------|------------|
| Date        | 1995       |
| Client      | RDK-S      |
| Proj. No.   | 942340-003 |
| Year:       | 2004       |
| Diversion:  | 4.0%       |
| Population: | 49,107     |

| Item                           | Description                          | Quantity | Unit | Unit Price | Cost      |
|--------------------------------|--------------------------------------|----------|------|------------|-----------|
| <b>PRELIMINARY</b>             |                                      |          |      |            |           |
|                                | program administration and promotion | 1        | LS   | \$ -       | \$ -      |
|                                | <i>subtotal</i>                      |          |      |            | \$ -      |
| <b>CAPITAL</b>                 |                                      |          |      |            |           |
|                                | original bins                        | 68       | bins | \$ 25      | \$ 1,700  |
|                                | <i>subtotal</i>                      |          |      |            | \$ 1,700  |
| <b>ANNUAL OPERATION</b>        |                                      |          |      |            |           |
|                                | administration                       | 1        | LS   | \$ 15,000  | \$ 15,000 |
|                                | replacement bins                     | 167      | bins | \$ 25      | \$ 4,175  |
|                                | <i>subtotal</i>                      |          |      |            | \$ 19,175 |
| <b>TOTAL ANNUAL COST</b>       |                                      |          |      |            | \$ 20,875 |
| <b>COST PER TONNE DIVERTED</b> |                                      |          |      |            | \$ 16     |

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| <p>COMPOSTING<br/>COST ESTIMATE</p> <p>YARD WASTE DROP-OFF<br/>(Entire Regional District)</p> <p style="text-align: right;">AGRA</p> |
|--|

|             |            |
|-------------|------------|
| Date        | 1995       |
| Client      | RDK-S      |
| Proj. No.   | 942340-003 |
| Year:       | 2004       |
| Diversion:  | 4.9%       |
| Population: | 49,107     |

| Description                                | Quantity        | Unit      | Unit Price | Cost         |
|--|-----------------|-----------|------------|--------------|
| <b>PRELIMINARY</b>                         |                 |           |            |              |
| design brief and operations plan for sites | 1               | l.s.      | \$ -       | \$ -         |
| public education and program promotion     | 1               | l.s.      | \$ 20,000  | \$ 20,000    |
|  | <i>subtotal</i> |           |            | \$ 20,000    |
| <b>CAPITAL</b>                             |                 |           |            |              |
| land purchase                              |                 |           | *****      | not included |
| buildings, equipment, and sundries         | 1               | l.s.      | \$ -       | \$ -         |
|  | <i>subtotal</i> |           |            | \$ -         |
| <b>ANNUAL OPERATION</b>                    |                 |           |            |              |
| operation                                  | 1588            | tonnes    | \$ 100     | \$ 158,812   |
|  | <i>subtotal</i> |           |            | \$ 158,812   |
| <b>ANNUAL REVENUES</b>                     |                 |           |            |              |
| compost sales                              | 1906            | cu.metres | \$ -       | \$ -         |
|  | <i>subtotal</i> |           |            | \$ -         |
| <b>TOTAL ANNUAL COST</b>                   |                 |           |            | \$ 178,812   |
| <b>TOTAL ANNUAL REVENUE</b>                |                 |           |            | \$ -         |
| <b>TOTAL ANNUAL NET COST</b>               |                 |           |            | \$ 178,812   |
| <b>COST PER TONNE DIVERTED</b>             |                 |           |            | \$ 113       |

TABLE CP-10

COMPOSTING  
PHASED COST ESTIMATE  
  
BACKYARD COMPOSTING  
  
AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003  
  
Year: 2005  
Diversion: 4.0%  
Population: 49,696

| Item                           | Description                          | Quantity | Unit | Unit Price | Cost      |
|--------------------------------|--------------------------------------|----------|------|------------|-----------|
| <b>PRELIMINARY</b>             |                                      |          |      |            |           |
|                                | program administration and promotion | 1        | LS   | \$ -       | \$ -      |
|                                | <i>subtotal</i>                      |          |      |            | \$ -      |
| <b>CAPITAL</b>                 |                                      |          |      |            |           |
|                                | original bins                        | 69       | bins | \$ 25      | \$ 1,725  |
|                                | <i>subtotal</i>                      |          |      |            | \$ 1,725  |
| <b>ANNUAL OPERATION</b>        |                                      |          |      |            |           |
|                                | administration                       | 1        | LS   | \$ 15,000  | \$ 15,000 |
|                                | replacement bins                     | 169      | bins | \$ 25      | \$ 4,225  |
|                                | <i>subtotal</i>                      |          |      |            | \$ 19,225 |
| <b>TOTAL ANNUAL COST</b>       |                                      |          |      |            | \$ 20,950 |
| <b>COST PER TONNE DIVERTED</b> |                                      |          |      |            | \$ 16     |

COMPOSTING  
COST ESTIMATE  
  
YARD WASTE DROP-OFF  
(Entire Regional District)  
  
AGRA

Date 1995  
Client RDK-S  
Proj. No. 942340-003  
  
Year: 2005  
Diversion: 4.9%  
Population: 49,696

| Description                                | Quantity | Unit      | Unit Price | Cost         |
|--|----------|-----------|------------|--------------|
| <b>PRELIMINARY</b>                         |          |           |            |              |
| design brief and operations plan for sites | 1        | l.s.      | \$ -       | \$ -         |
| public education and program promotion     | 1        | l.s.      | \$ 20,000  | \$ 20,000    |
| <i>subtotal</i>                            |          |           |            | \$ 20,000    |
| <b>CAPITAL</b>                             |          |           |            |              |
| land purchase                              |          |           | *****      | not included |
| buildings, equipment, and sundries         | 1        | l.s.      | \$ -       | \$ -         |
| <i>subtotal</i>                            |          |           |            | \$ -         |
| <b>ANNUAL OPERATION</b>                    |          |           |            |              |
| operation                                  | 1607     | tonnes    | \$ 100     | \$ 160,717   |
| <i>subtotal</i>                            |          |           |            | \$ 160,717   |
| <b>ANNUAL REVENUES</b>                     |          |           |            |              |
| compost sales                              | 1929     | cu.metres | \$ -       | \$ -         |
| <i>subtotal</i>                            |          |           |            | \$ -         |
| <b>TOTAL ANNUAL COST</b>                   |          |           |            | \$ 180,717   |
| <b>TOTAL ANNUAL REVENUE</b>                |          |           |            | \$ -         |
| <b>TOTAL ANNUAL NET COST</b>               |          |           |            | \$ 180,717   |
| <b>COST PER TONNE DIVERTED</b>             |          |           |            | \$ 112       |

TABLE CP-11

|  |
|--|
| <p>COMPOSTING<br/>PHASED COST ESTIMATE</p> <p>BACKYARD COMPOSTING</p> <p style="text-align: right;">AGRA</p> |
|--|

|             |            |
|-------------|------------|
| Date        | 1995       |
| Client      | RDK-S      |
| Proj. No.   | 942340-003 |
| Year:       | 2006       |
| Diversion:  | 4.0%       |
| Population: | 50,293     |

| Item                           | Description                          | Quantity | Unit | Unit Price | Cost             |
|--------------------------------|--------------------------------------|----------|------|------------|------------------|
| <b>PRELIMINARY</b>             |                                      |          |      |            |                  |
|                                | program administration and promotion | 1        | LS   | \$ -       | \$ -             |
|                                | <i>subtotal</i>                      |          |      |            | \$ -             |
| <b>CAPITAL</b>                 |                                      |          |      |            |                  |
|                                | original bins                        | 70       | bins | \$ 25      | \$ 1,750         |
|                                | <i>subtotal</i>                      |          |      |            | \$ 1,750         |
| <b>ANNUAL OPERATION</b>        |                                      |          |      |            |                  |
|                                | administration                       | 1        | LS   | \$ 15,000  | \$ 15,000        |
|                                | replacement bins                     | 171      | bins | \$ 25      | \$ 4,275         |
|                                | <i>subtotal</i>                      |          |      |            | \$ 19,275        |
| <b>TOTAL ANNUAL COST</b>       |                                      |          |      |            | <b>\$ 21,025</b> |
| <b>COST PER TONNE DIVERTED</b> |                                      |          |      |            | <b>\$ 16</b>     |

|  |
|--|
| <p>COMPOSTING<br/>COST ESTIMATE</p> <p>YARD WASTE DROP-OFF<br/>(Entire Regional District)</p> <p style="text-align: right;">AGRA</p> |
|--|

|             |            |
|-------------|------------|
| Date        | 1995       |
| Client      | RDK-S      |
| Proj. No.   | 942340-003 |
| Year:       | 2006       |
| Diversion:  | 4.9%       |
| Population: | 50,293     |

| Description                                | Quantity        | Unit      | Unit Price | Cost               |
|--|-----------------|-----------|------------|--------------------|
| <b>PRELIMINARY</b>                         |                 |           |            |                    |
| design brief and operations plan for sites | 1               | l.s.      | \$ -       | \$ -               |
| public education and program promotion     | 1               | l.s.      | \$ 20,000  | \$ 20,000          |
|  | <i>subtotal</i> |           |            | \$ 20,000          |
| <b>CAPITAL</b>                             |                 |           |            |                    |
| land purchase                              |                 |           |            | ***** not included |
| buildings, equipment, and sundries         | 1               | l.s.      | \$ -       | \$ -               |
|  | <i>subtotal</i> |           |            | \$ -               |
| <b>ANNUAL OPERATION</b>                    |                 |           |            |                    |
| operation                                  | 1626            | tonnes    | \$ 100     | \$ 162,648         |
|  | <i>subtotal</i> |           |            | \$ 162,648         |
| <b>ANNUAL REVENUES</b>                     |                 |           |            |                    |
| compost sales                              | 1952            | cu.metres | \$ -       | \$ -               |
|  | <i>subtotal</i> |           |            | \$ -               |
| <b>TOTAL ANNUAL COST</b>                   |                 |           |            | <b>\$ 182,648</b>  |
| <b>TOTAL ANNUAL REVENUE</b>                |                 |           |            | <b>\$ -</b>        |
| <b>TOTAL ANNUAL NET COST</b>               |                 |           |            | <b>\$ 182,648</b>  |
| <b>COST PER TONNE DIVERTED</b>             |                 |           |            | <b>\$ 112</b>      |

**HAULAGE COST ESTIMATES**

**TABLE H-1  
HAULING COSTS FOR RECYCLING  
SYSTEM 2 - DROP-OFF RECYCLING**

| SYSTEM Area     | Portion of Total Waste (%) | Portion of Partic. Waste (%) | Weekly Trips | One-Way Haul Distance (km) | Weekly Distance (km) | Weekly Haul Time (hrs) | No. of Trucks Required * | Annual Cost     |
|-----------------|----------------------------|------------------------------|--------------|----------------------------|----------------------|------------------------|--------------------------|-----------------|
| <b>1996</b>     |                            |                              |              |                            |                      |                        |                          |                 |
| Kitimat         | 0.0%                       | 0.0%                         | 0            | 2                          | 0                    | 0.0                    | 0.0                      | \$0             |
| Greater Kitimat | 0.0%                       | 0.0%                         | 0            | 11                         | 0                    | 0.0                    | 0.0                      | \$0             |
| Terrace         | 0.0%                       | 0.0%                         | 0            | 60                         | 0                    | 0.0                    | 0.0                      | \$0             |
| Thornhill       | 0.0%                       | 0.0%                         | 0            | 54                         | 0                    | 0.0                    | 0.0                      | \$0             |
| Greater Terrace | 0.0%                       | 0.0%                         | 0            | 60                         | 0                    | 0.0                    | 0.0                      | \$0             |
| Hazeltons       | 0.0%                       | 0.0%                         | 0            | 194                        | 0                    | 0.0                    | 0.0                      | \$0             |
| Rural Hazeltons | 0.0%                       | 0.0%                         | 0            | 194                        | 0                    | 0.0                    | 0.0                      | \$0             |
| <b>Total</b>    | <b>0.0%</b>                | <b>100.0%</b>                | <b>0</b>     | <b>0.0</b>                 | <b>0</b>             | <b>0.0</b>             | <b>0.0</b>               | <b>\$0</b>      |
| <b>1997</b>     |                            |                              |              |                            |                      |                        |                          |                 |
| Kitimat         | 0.8%                       | 35.9%                        | 0            | 2                          | 0                    | 0.0                    | 0.0                      | \$0             |
| Greater Kitimat | 0.0%                       | 1.7%                         | 0            | 11                         | 0                    | 0.0                    | 0.0                      | \$0             |
| Terrace         | 0.8%                       | 35.7%                        | 1            | 60                         | 120                  | 2.7                    | 1.0                      | \$28,042        |
| Thornhill       | 0.2%                       | 8.9%                         | 0            | 54                         | 0                    | 0.0                    | 0.0                      | \$0             |
| Greater Terrace | 0.1%                       | 5.5%                         | 0            | 60                         | 0                    | 0.0                    | 0.0                      | \$0             |
| Hazeltons       | 0.1%                       | 6.0%                         | 0            | 194                        | 0                    | 0.0                    | 0.0                      | \$0             |
| Rural Hazeltons | 0.1%                       | 6.4%                         | 0            | 194                        | 0                    | 0.0                    | 0.0                      | \$0             |
| <b>Total</b>    | <b>2.3%</b>                | <b>100.0%</b>                | <b>2</b>     | <b>60.0</b>                | <b>120</b>           | <b>2.7</b>             | <b>1.0</b>               | <b>\$28,042</b> |
| <b>1998</b>     |                            |                              |              |                            |                      |                        |                          |                 |
| Kitimat         | 2.1%                       | 35.9%                        | 1            | 2                          | 4                    | 0.8                    | 0.1                      | \$2,495         |
| Greater Kitimat | 0.1%                       | 1.7%                         | 0            | 11                         | 0                    | 0.0                    | 0.0                      | \$0             |
| Terrace         | 2.0%                       | 35.7%                        | 3            | 60                         | 360                  | 8.1                    | 0.7                      | \$36,588        |
| Thornhill       | 0.5%                       | 8.9%                         | 1            | 54                         | 108                  | 2.5                    | 0.2                      | \$11,195        |
| Greater Terrace | 0.3%                       | 5.5%                         | 0            | 60                         | 0                    | 0.0                    | 0.0                      | \$0             |
| Hazeltons       | 0.3%                       | 6.0%                         | 0            | 194                        | 0                    | 0.0                    | 0.0                      | \$0             |
| Rural Hazeltons | 0.4%                       | 6.4%                         | 0            | 194                        | 0                    | 0.0                    | 0.0                      | \$0             |
| <b>Total</b>    | <b>5.7%</b>                | <b>100.0%</b>                | <b>6</b>     | <b>47.2</b>                | <b>472</b>           | <b>11.4</b>            | <b>1.0</b>               | <b>\$50,278</b> |
| <b>1999</b>     |                            |                              |              |                            |                      |                        |                          |                 |
| Kitimat         | 2.9%                       | 35.9%                        | 1            | 2                          | 4                    | 0.8                    | 0.0                      | \$1,680         |
| Greater Kitimat | 0.1%                       | 1.7%                         | 1            | 11                         | 22                   | 1.0                    | 0.0                      | \$2,770         |
| Terrace         | 2.9%                       | 35.7%                        | 4            | 60                         | 480                  | 10.8                   | 0.4                      | \$37,163        |
| Thornhill       | 0.7%                       | 8.9%                         | 1            | 54                         | 108                  | 2.5                    | 0.1                      | \$8,505         |
| Greater Terrace | 0.4%                       | 5.5%                         | 0            | 60                         | 0                    | 0.0                    | 0.0                      | \$0             |
| Hazeltons       | 0.5%                       | 6.0%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,931        |
| Rural Hazeltons | 0.5%                       | 6.4%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,931        |
| <b>Total</b>    | <b>8.0%</b>                | <b>100.0%</b>                | <b>9</b>     | <b>77.2</b>                | <b>1390</b>          | <b>27.6</b>            | <b>1.0</b>               | <b>\$99,980</b> |

**TABLE H-1  
HAULING COSTS FOR RECYCLING  
SYSTEM 2 - DROP-OFF RECYCLING**

| SYSTEM Area     | Portion of Total Waste (%) | Portion of Partic. Waste (%) | Weekly Trips | One-Way Haul Distance (km) | Weekly Distance (km) | Weekly Haul Time (hrs) | No. of Trucks Required * | Annual Cost      |
|-----------------|----------------------------|------------------------------|--------------|----------------------------|----------------------|------------------------|--------------------------|------------------|
| <b>2000</b>     |                            |                              |              |                            |                      |                        |                          |                  |
| Kitimat         | 3.3%                       | 35.9%                        | 2            | 2                          | 8                    | 1.5                    | 0.0                      | \$3,243          |
| Greater Kitimat | 0.2%                       | 1.7%                         | 1            | 11                         | 22                   | 1.0                    | 0.0                      | \$2,691          |
| Terrace         | 3.3%                       | 35.7%                        | 4            | 60                         | 480                  | 10.8                   | 0.4                      | \$36,322         |
| Thornhill       | 0.8%                       | 8.9%                         | 1            | 54                         | 108                  | 2.5                    | 0.1                      | \$8,311          |
| Greater Terrace | 0.5%                       | 5.5%                         | 1            | 60                         | 120                  | 2.4                    | 0.1                      | \$8,516          |
| Hazeltons       | 0.6%                       | 6.0%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,445         |
| Rural Hazeltons | 0.6%                       | 6.4%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,445         |
| <b>Total</b>    | <b>9.2%</b>                | <b>100.0%</b>                | <b>11</b>    | <b>68.8</b>                | <b>1514</b>          | <b>30.7</b>            | <b>1.0</b>               | <b>\$107,972</b> |
| <b>2001</b>     |                            |                              |              |                            |                      |                        |                          |                  |
| Kitimat         | 3.3%                       | 35.9%                        | 2            | 2                          | 8                    | 1.5                    | 0.0                      | \$3,243          |
| Greater Kitimat | 0.2%                       | 1.7%                         | 1            | 11                         | 22                   | 1.0                    | 0.0                      | \$2,691          |
| Terrace         | 3.3%                       | 35.7%                        | 4            | 60                         | 480                  | 10.8                   | 0.4                      | \$36,322         |
| Thornhill       | 0.8%                       | 8.9%                         | 1            | 54                         | 108                  | 2.5                    | 0.1                      | \$8,311          |
| Greater Terrace | 0.5%                       | 5.5%                         | 1            | 60                         | 120                  | 2.4                    | 0.1                      | \$8,516          |
| Hazeltons       | 0.6%                       | 6.0%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,445         |
| Rural Hazeltons | 0.6%                       | 6.4%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,445         |
| <b>Total</b>    | <b>9.2%</b>                | <b>100.0%</b>                | <b>11</b>    | <b>68.8</b>                | <b>1514</b>          | <b>30.7</b>            | <b>1.0</b>               | <b>\$107,972</b> |
| <b>2002</b>     |                            |                              |              |                            |                      |                        |                          |                  |
| Kitimat         | 3.3%                       | 35.9%                        | 2            | 2                          | 8                    | 1.5                    | 0.0                      | \$3,160          |
| Greater Kitimat | 0.2%                       | 1.7%                         | 1            | 11                         | 22                   | 1.0                    | 0.0                      | \$2,636          |
| Terrace         | 3.3%                       | 35.7%                        | 5            | 60                         | 600                  | 13.5                   | 0.4                      | \$44,665         |
| Thornhill       | 0.8%                       | 8.9%                         | 1            | 54                         | 108                  | 2.5                    | 0.1                      | \$8,174          |
| Greater Terrace | 0.5%                       | 5.5%                         | 1            | 60                         | 120                  | 2.4                    | 0.1                      | \$8,384          |
| Hazeltons       | 0.6%                       | 6.0%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,103         |
| Rural Hazeltons | 0.6%                       | 6.4%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,103         |
| <b>Total</b>    | <b>9.2%</b>                | <b>100.0%</b>                | <b>12</b>    | <b>68.1</b>                | <b>1634</b>          | <b>33.4</b>            | <b>1.0</b>               | <b>\$115,226</b> |
| <b>2003</b>     |                            |                              |              |                            |                      |                        |                          |                  |
| Kitimat         | 3.3%                       | 35.9%                        | 2            | 2                          | 8                    | 1.5                    | 0.0                      | \$3,160          |
| Greater Kitimat | 0.2%                       | 1.7%                         | 1            | 11                         | 22                   | 1.0                    | 0.0                      | \$2,636          |
| Terrace         | 3.3%                       | 35.7%                        | 5            | 60                         | 600                  | 13.5                   | 0.4                      | \$44,665         |
| Thornhill       | 0.8%                       | 8.9%                         | 1            | 54                         | 108                  | 2.5                    | 0.1                      | \$8,174          |
| Greater Terrace | 0.5%                       | 5.5%                         | 1            | 60                         | 120                  | 2.4                    | 0.1                      | \$8,384          |
| Hazeltons       | 0.6%                       | 6.0%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,103         |
| Rural Hazeltons | 0.6%                       | 6.4%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,103         |
| <b>Total</b>    | <b>9.2%</b>                | <b>100.0%</b>                | <b>12</b>    | <b>68.1</b>                | <b>1634</b>          | <b>33.4</b>            | <b>1.0</b>               | <b>\$115,226</b> |

**TABLE H-1  
HAULING COSTS FOR RECYCLING  
SYSTEM 2 - DROP-OFF RECYCLING**

| SYSTEM Area     | Portion of Total Waste (%) | Portion of Partic. Waste (%) | Weekly Trips | One-Way Haul Distance (km) | Weekly Distance (km) | Weekly Haul Time (hrs) | No. of Trucks Required * | Annual Cost      |
|-----------------|----------------------------|------------------------------|--------------|----------------------------|----------------------|------------------------|--------------------------|------------------|
| <b>2004</b>     |                            |                              |              |                            |                      |                        |                          |                  |
| Kitimat         | 3.3%                       | 35.9%                        | 2            | 2                          | 8                    | 1.5                    | 0.0                      | \$3,160          |
| Greater Kitimat | 0.2%                       | 1.7%                         | 1            | 11                         | 22                   | 1.0                    | 0.0                      | \$2,636          |
| Terrace         | 3.3%                       | 35.7%                        | 5            | 60                         | 600                  | 13.5                   | 0.4                      | \$44,665         |
| Thornhill       | 0.8%                       | 8.9%                         | 1            | 54                         | 108                  | 2.5                    | 0.1                      | \$8,174          |
| Greater Terrace | 0.5%                       | 5.5%                         | 1            | 60                         | 120                  | 2.4                    | 0.1                      | \$8,384          |
| Hazeltons       | 0.6%                       | 6.0%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,103         |
| Rural Hazeltons | 0.6%                       | 6.4%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,103         |
| <b>Total</b>    | <b>9.2%</b>                | <b>100.0%</b>                | <b>12</b>    | <b>68.1</b>                | <b>1634</b>          | <b>33.4</b>            | <b>1.0</b>               | <b>\$115,226</b> |
| <b>2005</b>     |                            |                              |              |                            |                      |                        |                          |                  |
| Kitimat         | 3.3%                       | 35.9%                        | 2            | 2                          | 8                    | 1.5                    | 0.0                      | \$3,160          |
| Greater Kitimat | 0.2%                       | 1.7%                         | 1            | 11                         | 22                   | 1.0                    | 0.0                      | \$2,636          |
| Terrace         | 3.3%                       | 35.7%                        | 5            | 60                         | 600                  | 13.5                   | 0.4                      | \$44,665         |
| Thornhill       | 0.8%                       | 8.9%                         | 1            | 54                         | 108                  | 2.5                    | 0.1                      | \$8,174          |
| Greater Terrace | 0.5%                       | 5.5%                         | 1            | 60                         | 120                  | 2.4                    | 0.1                      | \$8,384          |
| Hazeltons       | 0.6%                       | 6.0%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,103         |
| Rural Hazeltons | 0.6%                       | 6.4%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,103         |
| <b>Total</b>    | <b>9.2%</b>                | <b>100.0%</b>                | <b>12</b>    | <b>68.1</b>                | <b>1634</b>          | <b>33.4</b>            | <b>1.0</b>               | <b>\$115,226</b> |
| <b>2006</b>     |                            |                              |              |                            |                      |                        |                          |                  |
| Kitimat         | 3.3%                       | 35.9%                        | 2            | 2                          | 8                    | 1.5                    | 0.0                      | \$3,160          |
| Greater Kitimat | 0.2%                       | 1.7%                         | 1            | 11                         | 22                   | 1.0                    | 0.0                      | \$2,636          |
| Terrace         | 3.3%                       | 35.7%                        | 5            | 60                         | 600                  | 13.5                   | 0.4                      | \$44,665         |
| Thornhill       | 0.8%                       | 8.9%                         | 1            | 54                         | 108                  | 2.5                    | 0.1                      | \$8,174          |
| Greater Terrace | 0.5%                       | 5.5%                         | 1            | 60                         | 120                  | 2.4                    | 0.1                      | \$8,384          |
| Hazeltons       | 0.6%                       | 6.0%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,103         |
| Rural Hazeltons | 0.6%                       | 6.4%                         | 1            | 194                        | 388                  | 6.2                    | 0.2                      | \$24,103         |
| <b>Total</b>    | <b>9.2%</b>                | <b>100.0%</b>                | <b>12</b>    | <b>68.1</b>                | <b>1634</b>          | <b>33.4</b>            | <b>1.0</b>               | <b>\$115,226</b> |

\* number of trucks required means the truck utilization required to complete collection; i.e. 0.4 trucks means 1 truck at 40% utilization



**RESIDUALS MANAGEMENT COST ESTIMATES**

**Table RM-1  
Summary of Landfill Closure Costs**

05-Dec-95

| LANDFILL NAME AND LOCATION  | CLOSURE AREA (ha) | PLAN PREPARATION COST (1995 Can \$) | UNIT COST OF CLOSURE (1995 Can \$) | GROUNDWATER MON. SYSTEM (1995 Can \$) | TOTAL CLOSURE COST (1995 Can \$) |
|---|-------------------|-------------------------------------|------------------------------------|---------------------------------------|----------------------------------|
| <b>1 - Landfills to be Closed As Soon As Possible and Replaced with New Local Landfills (or Significantly Upgraded)</b>   |                   |                                     |                                    |                                       |                                  |
| 1 Telegraph Creek Landfill<br>- Telegraph Creek   | 1.0               | \$15,000                            | \$40,000                           | \$0                                   | \$55,000                         |
| 2 Hazelton Landfill<br>- Hazelton   | 2.0               | \$20,000                            | \$40,000                           | \$15,000                              | \$115,000                        |
| <b>2 - Landfills to be Closed As Soon As Possible Without Replacement (haul to nearest landfill)</b>  |                   |                                     |                                    |                                       |                                  |
| 3 Lakalzap Landfill<br>- Lakalzap   | 1.0               | \$15,000                            | \$40,000                           | \$0                                   | \$55,000                         |
| 4 Usk Landfill<br>- Usk   | 1.0               | \$15,000                            | closed                             | \$0                                   | \$15,000                         |
| 5 Terrace Landfill<br>- Terrace   | 15.0              | \$25,000                            | \$40,000                           | \$30,000                              | \$655,000                        |
| 6 Gitsegukla Landfill<br>- Gitsegukla I   | 2.0               | \$15,000                            | \$40,000                           | \$0                                   | \$95,000                         |
| <b>3 - Landfills to be Closed As Needed and Replaced with Transfer Stations</b>   |                   |                                     |                                    |                                       |                                  |
| 7 Kitwanga Landfill<br>- Kitwanga   | 3.0               | \$15,000                            | \$40,000                           | \$0                                   | \$135,000                        |
| 8 Kisplox Landfill<br>- Kisplox   | 1.0               | \$15,000                            | \$40,000                           | \$0                                   | \$55,000                         |
| <b>4 - Landfills to be Kept Open</b>  |                   |                                     |                                    |                                       |                                  |
| 9 Bob Quinn Landfill<br>- Bob Quinn   | 1.0               | \$15,000                            |                                    |                                       | \$15,000                         |
| 10 Stewart Landfill<br>- Stewart  | 8.5               | In Preparation                      |                                    |                                       | \$0                              |
| 11 Rosswood Landfill<br>- Rosswood  | 1.0               | \$15,000                            |                                    |                                       | \$15,000                         |
| 12 Thornhill Landfill<br>- Thornhill  | 5.0               | \$25,000                            |                                    |                                       | \$25,000                         |
| 13 Klumat Landfill<br>- Klumat  | 24.0              | \$30,000                            |                                    |                                       | \$30,000                         |
| 14 Gitakdamix Landfill<br>- Gitakdamix  | 2.0               | \$15,000                            |                                    |                                       | \$15,000                         |
| 15 Iskut Landfill<br>- Iskut  | 2.0               | \$15,000                            |                                    |                                       | \$15,000                         |
| <b>5 - New Landfill</b>   |                   |                                     |                                    |                                       |                                  |
| 16 Meziadin Landfill<br>- Meziadin Junction   |                   |                                     |                                    |                                       |                                  |
| <b>Total Closure Costs</b>  |                   |                                     |                                    |                                       | <b>\$1,295,000</b>               |
| <b>NOTES:</b>   |                   |                                     |                                    |                                       |                                  |
| - Unit closure costs include; removal/burying of bulky items, final grading including a low-permeable cap, establishment of vegetation (grass cover) and landscaping. Groundwater monitoring systems are considered separately. |                   |                                     |                                    |                                       |                                  |
| - Total closure cost is determined by multiplying closure area (which is equal or less than the site area) by the unit closure cost and adding the plan preparation cost and groundwater monitoring system cost                 |                   |                                     |                                    |                                       |                                  |
| - Landfill closure plans include site surveying, engineering and regulatory approval  |                   |                                     |                                    |                                       |                                  |

Table RM-2 Annual Cost of Monitoring and Maintenance of Landfills (Closed and Open)

| LANDFILL NAME AND LOCATION                    | YEAR                         |          |          |          |          |          |          |          |          |          |          |          | Total Cost (1995 \$) |          |          |          |          |          |          |          |          |             |
|---|------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------------------|----------|----------|----------|----------|----------|----------|----------|----------|-------------|
|   | 1986                         | 1987     | 1988     | 1989     | 2000     | 2001     | 2002     | 2003     | 2004     | 2005     | 2006     | 2007     |                      | 2008     | 2009     | 2010     | 2011     | 2012     | 2013     | 2014     | 2015     |             |
| Old Lakaizap Landfill<br>- Lakaizap           | L/F Close                    | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000                 | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | \$20,000    |
|   | Post Closure Monitoring/Care |          |          |          |          |          |          |          |          |          |          |          |                      |          |          |          |          |          |          |          |          |             |
| Kisplox Landfill<br>- Kisplox                 | L/F Close                    | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000                 | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | \$20,000    |
|   | Post Closure Monitoring/Care |          |          |          |          |          |          |          |          |          |          |          |                      |          |          |          |          |          |          |          |          |             |
| Gitsegukla Landfill<br>- Gitsegukla           | L/F Close                    | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000                 | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | \$20,000    |
|   | Post Closure Monitoring/Care |          |          |          |          |          |          |          |          |          |          |          |                      |          |          |          |          |          |          |          |          |             |
| Usk Landfill<br>- Usk                         | L/F Close                    | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000                 | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | \$20,000    |
|   | Post Closure Monitoring/Care |          |          |          |          |          |          |          |          |          |          |          |                      |          |          |          |          |          |          |          |          |             |
| Telegraph Creek Landfill<br>- Telegraph Creek | L/F Close                    | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000                 | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | \$20,000    |
|   | Post Closure Monitoring/Care |          |          |          |          |          |          |          |          |          |          |          |                      |          |          |          |          |          |          |          |          |             |
| Iskut Landfill<br>- Iskut                     | Annual Reporting             | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000                 | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | \$20,000    |
|   | L/F Close                    | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000                 | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000        |
| Bob Quinn Landfill<br>- Bob Quinn             | Annual Reporting             | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000                 | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | \$20,000    |
|   | L/F Close                    | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000                 | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000        |
| Stewart Landfill<br>- Stewart                 | Groundwater Monitoring       | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500                 | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | \$150,000   |
|   | Post Closure Monitoring/Care |          |          |          |          |          |          |          |          |          |          |          |                      |          |          |          |          |          |          |          |          |             |
| Gitiakdamix Landfill<br>- Gitiakdamix         | Groundwater Monitoring       | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500                 | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | \$150,000   |
|   | Post Closure Monitoring/Care |          |          |          |          |          |          |          |          |          |          |          |                      |          |          |          |          |          |          |          |          |             |
| Kitwanga Landfill<br>- Kitwanga               | Groundwater Monitoring       | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500                 | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | \$150,000   |
|   | Post Closure Monitoring/Care |          |          |          |          |          |          |          |          |          |          |          |                      |          |          |          |          |          |          |          |          |             |
| Hazelton Landfill<br>- Hazelton               | Monitoring                   | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500                 | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | \$150,000   |
|   | L/F Close                    | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500                 | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500     | 7500        |
| Rosewood Landfill<br>- Rosewood               | Annual Reporting             | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000                 | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | \$20,000    |
|   | L/F Close                    | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000                 | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000     | 1000        |
| Terrace Landfill<br>- Terrace                 | Groundwater Monitoring       | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000                | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | \$200,000   |
|   | Post Closure Monitoring/Care |          |          |          |          |          |          |          |          |          |          |          |                      |          |          |          |          |          |          |          |          |             |
| Thornhill Landfill<br>- Thornhill             | Groundwater Monitoring       | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000                | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | \$200,000   |
|   | Post Closure Monitoring/Care |          |          |          |          |          |          |          |          |          |          |          |                      |          |          |          |          |          |          |          |          |             |
| Kilrmat Landfill<br>- Kilrmat                 | Groundwater Monitoring       | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000                | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | 10000    | \$200,000   |
|   | Post Closure Monitoring/Care |          |          |          |          |          |          |          |          |          |          |          |                      |          |          |          |          |          |          |          |          |             |
| Mezledin Landfill<br>- Mezledin Junction      | Groundwater Monitoring       | 5000     | 5000     | 5000     | 5000     | 5000     | 5000     | 5000     | 5000     | 5000     | 5000     | 5000     | 5000                 | 5000     | 5000     | 5000     | 5000     | 5000     | 5000     | 5000     | 5000     | \$100,000   |
|   | Post Closure Monitoring/Care |          |          |          |          |          |          |          |          |          |          |          |                      |          |          |          |          |          |          |          |          |             |
| <b>TOTAL COSTS</b>                            |                              | \$73,000 | \$73,000 | \$73,000 | \$73,000 | \$73,000 | \$73,000 | \$73,000 | \$73,000 | \$73,000 | \$73,000 | \$73,000 | \$73,000             | \$73,000 | \$73,000 | \$73,000 | \$73,000 | \$73,000 | \$73,000 | \$73,000 | \$73,000 | \$1,480,000 |

NOTES:  
 - Monitoring costs include costs of sampling (twice per year, initially), chemical analysis and reporting. Assumed reporting costs distributed among all sites.  
 - Costs are for a minimum of wells at each site.  
 - Landfill gas monitoring costs are not included. Monitoring of landfill gas may be required for larger sites.  
 - Assumed small landfills do not require groundwater monitoring.  
 - Minimum costs allocated for landfill post-closure care and maintenance.

05-Dec-85

Table RM-3  
Upgrading Cost of Landfills

| LANDFILL NAME AND LOCATION                    | LANDFILL AREA (ha) | DESIGN AND OPERATION UPGRADING PLANS | PERIMETER ELECTRIC FENCING/GATE | LITTER FENCING | SIGNAGE  | GROUNDWATER MONITORING SYSTEM INSTALLATION | EQUIPMENT IMPROVEMENTS | OTHER IMPROVEMENTS | TOTAL UPGRADING COST (1985 CAN\$) |
|---|--------------------|--------------------------------------|---------------------------------|----------------|----------|--|------------------------|--------------------|-----------------------------------|
| Lakazap Landfill<br>- Lakazap                 | 1.0                | To be closed                         |                                 |                |          |  |                        |                    | N.A.                              |
| Kisplox Landfill<br>- Kisplox                 | 1.0                | To be closed                         |                                 |                |          |  |                        |                    | N.A.                              |
| Gilsegukia Landfill<br>- Gilsegukia           | 2.0                | To be closed                         |                                 |                |          |  |                        |                    | N.A.                              |
| Usk Landfill<br>- Usk                         | 1.0                | Closed                               |                                 |                |          |  |                        |                    | N.A.                              |
| Telegraph Creek Landfill<br>- Telegraph Creek | 1.0                | To be closed, replaced by new LF     |                                 |                |          | Assumed not required                       |                        |                    | N.A.                              |
| Iskut Landfill<br>- Iskut                     | 1.0                | 5000                                 | \$8,000                         | \$1,000        | In Place | Assumed not required                       |                        |                    | \$14,000                          |
| Bob Quinn Landfill<br>- Bob Quinn             | 1.0                | 5000                                 | \$8,000                         | \$1,000        | In Place | Assumed not required                       |                        |                    | \$14,000                          |
| Stewart Landfill<br>- Stewart                 | 8.5                | In preparation                       | In place                        | \$2,000        | In Place | \$15,000                                   | \$500,000              |                    | \$517,000                         |
| Gilakdamix Landfill<br>- Gilakdamix           | 2.0                | 7000                                 | \$12,000                        | \$2,000        | In Place | \$15,000                                   |                        |                    | \$36,000                          |
| Kiwanga Landfill<br>- Kiwanga                 | 3.0                | \$5,000                              | \$12,000                        | \$1,000        | In Place | \$15,000                                   |                        |                    | \$33,000                          |
| Hazellon Landfill<br>- Hazellon               | 4.0                | \$7,000                              | \$14,000                        | \$1,000        | In Place | \$15,000                                   |                        |                    | \$37,000                          |
| Rosswood Landfill<br>- Rosswood               | 1.0                | \$5,000                              | \$5,000                         | \$1,000        | In Place | Assumed not required                       |                        |                    | \$14,000                          |
| Terrace Landfill<br>- Terrace                 | 15.0               | \$0                                  | In Place                        | \$2,000        | In Place | \$30,000                                   |                        |                    | \$32,000                          |
| Thorhill Landfill<br>- Thornhill              | 13.5               | \$20,000                             | \$25,000                        | In Place       | In Place | \$30,000                                   | \$0                    | \$500,000          | \$575,000                         |
| Killmat Landfill<br>- Killmat                 | 24.0               | \$20,000                             | \$5,000                         | \$2,000        | In Place | \$30,000                                   | \$0                    | \$50,000           | \$107,000                         |
| <b>Total Upgrading Costs</b>                  |                    |                                      |                                 |                |          |  |                        |                    | <b>\$1,379,000</b>                |

NOTES:

- design and operation upgrading costs are average values. Site specific costs should be developed based on individual site conditions.
- electric fencing costs are average values for new fences, and include the cost of gates.
- N.A. = not applicable.

Table RM-4

05-Dec-95

Capital Cost Estimates for New Landfills

| Item   | Costs for a Small-sized Modified Landfill (1995 \$) | Costs for a Medium-sized Modified Landfill (1995 \$) | Costs for a large Sanitary Landfill (1995 \$) |
|--|---|--|---|
| population served (thousands)                            | up to 2   | 2 to 7   | over 15                                       |
| Land****   | Variable  | Variable   | Variable                                      |
| Clear and Grub Site                                      | \$10,000  | \$20,000   | \$50,000                                      |
| Stockpile Topsoil  | \$5,000   | \$10,000   | \$30,000                                      |
| Roads - Access On Site                                   | \$5,000   | \$10,000   | \$40,000                                      |
| Roads - Permanent On-Site                                | \$10,000  | \$15,000   | \$30,000                                      |
| Perimeter Fencing - Including Gates and Signs            | \$8,000   | \$12,000   | \$30,000                                      |
| Fencing - Litter   | \$3,000   | \$5,000  | \$10,000                                      |
| Excavation of Trenches (1-2 year Operation)              | \$10,000  | \$20,000   | \$75,000                                      |
| Engineered Clay Soil Bottom Liner (1-2 year trench/cell) | not applicable                                      | not applicable                                       | \$100,000                                     |
| Site Landscaping (Entrance and Buffer Zones)             | \$3,000   | \$5,000  | \$20,000                                      |
| Drainage Provisions (Ditches, Culverts)                  | \$10,000  | \$15,000   | \$30,000                                      |
| Building (Office, Equipment, Maintenance)                | \$0   | \$8,000  | \$60,000                                      |
| Weigh Scale  | \$0   | \$0  | \$70,000                                      |
| Utilities**  | \$2,000   | \$3,000  | \$10,000                                      |
| Fuel Tanks and Tools                                     | \$0   | \$0  | \$5,000                                       |
| Steam Cleaner  | \$0   | \$0  | \$10,000                                      |
| Dead Animal Disposal Area                                | \$2,000   | \$2,000  | \$7,000                                       |
| Pesticide/Chemical Can Storage Area (no building)        | \$2,000   | \$3,000  | \$7,000                                       |
| Groundwater/Gas Monitoring Installation                  | \$0   | \$15,000   | \$30,000                                      |
| Startup Costs (Supplies)                                 | \$2,000   | \$2,000  | \$5,000                                       |
| Survey/Registration                                      | \$4,000   | \$4,000  | \$8,000                                       |
| Site Selection/Investigation/Permit Application          | \$60,000  | \$100,000  | \$250,000                                     |
| Engineering/Construction @ 12% (Rounded)                 | \$9,120   | \$17,880   | \$75,240                                      |
| <b>Sub-Total: Site Cost</b>                              | <b>\$145,120</b>                                    | <b>\$266,880</b>                                     | <b>\$952,240</b>                              |
| <b>Equipment***</b>                                      |   |  |   |
| Crawler Loader Purchase                                  | \$0   | \$0  | \$220,000                                     |
| Other Equipment  |   |  | \$80,000                                      |
| <b>Sub-Total: Equipment Cost</b>                         | <b>\$0</b>  | <b>\$0</b>   | <b>\$300,000</b>                              |
| <b>Grand Total: Landfill Cost</b>                        | <b>\$145,120</b>                                    | <b>\$266,880</b>                                     | <b>\$1,252,240</b>                            |

**NOTE:**

- \* The costs reflect ideal conditions and are derived based on information from existing landfill operations and vendor supplied cost information. There is no allowance for site closure. This estimate does not provide for a leachate collection and treatment system.
- \*\* The costs are provided as an order-of-magnitude estimate; ie. accuracy is within a +50%/-30% range.
- \*\*\* Cost may vary depending on site conditions.
- \*\*\*\* Potential exists to purchase this equipment used. This purchase is not necessary if the operation is contracted.
- \*\*\*\*\* Market value of land varies, depending on the location of the landfill.

**Table RM-5  
Operating Cost Estimates for Landfills**

| Item   | Annual Operating Costs<br>(in 1995\$)              |   |   |  |
|--|--|---|---|--|
|  | Small-sized<br>Modified Landfill<br>up to 2<br>5ha | Medium-sized<br>Modified Landfill<br>2 to 7<br>10ha | Medium<br>Sanitary Landfill<br>7 to 15<br>15-25ha | Large<br>Sanitary Landfill<br>over 15<br>over 25ha |
| population served (thousands)<br>approximate landfill size                                   |  |   |   |  |
| Supervisor (One @ \$15/hr) (1)   | \$0  | \$7,800   | \$27,300  | \$27,300   |
| Administration   | \$3,000  | \$3,000   | \$6,000   | \$10,000   |
| Equipment Operator (One @ about \$25/hr)   | \$4,500  | \$6,500   | \$35,100  | \$49,140   |
| Equipment Operations / Maintenance<br>( @ about \$75/hr ) (2)                                | \$7,800  | \$15,600  | \$60,000  | \$105,300  |
| Casual labour ( about 600 hours for Holidays,<br>Sick Relief, General Help: @about \$15/hr ) | \$0  | \$0   | \$6,000   | \$9,000  |
| Construction of Trenches/Cells   | \$10,000   | \$20,000  | \$35,000.   | \$75,000   |
| Building Maintenance   | \$0  | \$0   | \$2,000   | \$5,000  |
| Site Maintenance / Litter Control  | \$2,000  | \$3,000   | \$4,000   | \$5,000  |
| Public Relations / Insurance / Taxes   | \$1,000  | \$1,000   | \$2,000   | \$3,000  |
| Administrative Supplies  | \$1,000  | \$1,000   | \$2,000   | \$5,000  |
| Utilities  | \$2,000  | \$2,000   | \$3,000   | \$5,000  |
| Other  | \$0  | \$0   | \$0   | \$0  |
| Environmental Protection ( Includes Sampling & Testing)                                      | \$5,000  | \$7,500   | \$10,000  | \$15,000   |
| <b>Unlined Site Operations Cost</b>  | <b>\$36,300</b>                                    | <b>\$67,400</b>                                     | <b>\$192,400</b>                                  | <b>\$313,740</b>                                   |
| <b>Cost of Landfill Liner Application</b>  |  |   | <b>\$70,000</b>                                   | <b>\$100,000</b>                                   |
| <b>TOTAL COST WITH LINER</b>   |  |   | <b>\$262,400</b>                                  | <b>\$413,740</b>                                   |
| Equipment Capital Recovery (@ 10% Over 10 years)   | \$0  | \$0   | \$48,800  | \$48,800   |

**NOTES:**

- (1) A full-time scale operator/supervisor is needed for the sanitary landfill.
  - (2) Cost reflects the lesser number of hours of operation at the modified landfills.
  - (3) The costs are for a Regional District operated landfill. The costs will be different if a contractor operates the landfill.
  - (4) A linear capital replacement reserve for the crawler loader (but, not for the stationary facilities) is included.
- Gen. Costs are estimated assuming ideal conditions and are based on information from existing landfill operations and vendor supplied cost information.

05-Dec-95

**Table RM-6**  
**Capital Cost Estimates for Transfer Station Site Development**  
**- One Bin Transtor**

| Item  | Item Cost<br>(in 1995 Can\$) |
|---|------------------------------|
| <b>1. Site Development Costs</b>  |                              |
| Survey  | \$5,000                      |
| Strip Top Soil  | \$2,500                      |
| Site Grading  | \$1,000                      |
| Gravel Paved Storage Area   | \$3,000                      |
| Gravel Paved Road and Yard Area   | \$22,500                     |
| Culvert   | \$1,500                      |
| Replace Top Soil and Seed   | \$3,000                      |
| <b>2. Steel Bin Wall Retaining Structure</b>  |                              |
| Retaining Wall  | \$30,000                     |
| Fill - Bin Wall   | \$6,000                      |
| Fill - Ramp   | \$7,500                      |
| Steel Guard Rail  | \$1,000                      |
| <b>3. Site Finishes</b>   |                              |
| Perimeter Fence and Gate  | \$4,500                      |
| Signs   | \$1,000                      |
| Landscaping   | \$500                        |
| <b>4. Site Building (trailer)</b>   | \$7,500                      |
| <b>5. Utilities (lighting)</b>  | \$2,500                      |
| <b>6. Transtor Foundation (for one transtor)</b>  | \$2,500                      |
| <b>7. Water</b>   | \$5,000                      |
| <b>Sub-Total Site Cost</b>  | <b>\$106,500</b>             |
| <b>7. Engineering (@12% of sub-total cost)</b>  | <b>\$12,780</b>              |
| <b>Total Site Cost</b>  | <b>\$119,280</b>             |
| <b>NOTES:</b>   |                              |
| - Costs are estimated assuming ideal conditions and are based on information from existing operations and vendor supplied cost information. |                              |

**Table RM-7**  
**Estimated Capital Cost of Waste Transfer**  
**(using 40cu.yd drop boxes)**

19-Dec-95

| Location of Transfer Station        | Items   | Useful Life (Years) | Quantity | Unit Cost (1995 \$) | Total Cost (1995 \$) |
|-------------------------------------|---|---------------------|----------|---------------------|----------------------|
| 1 Kitwanga Landfill                 | - Site development, site finishes, bin wall and engineering | 20                  | 1        |                     | \$119,280            |
|                                     | - 40 cu.yd drop box bin                                     | 20                  | 3        | \$8,000             | \$24,000             |
|                                     |   |                     |          |                     |                      |
| 2 Kispiox Landfill                  | - Site development, site finishes, bin wall and engineering | 20                  | 1        |                     | \$119,280            |
|                                     | - 40 cu.yd drop box bin                                     | 20                  | 2        | \$8,000             | \$16,000             |
|                                     |   |                     |          |                     |                      |
| <b>Estimated Total Capital Cost</b> |   |                     |          |                     | <b>\$278,560</b>     |

**NOTES:**

- Costs are provided for a transfer ramp & site with a drop box bin.
- Sites are located near former landfill sites:



**Table RM-8  
Estimated Operating Cost of Waste Transfer**

| Location of Transfer Station       | Nearest Suitable Landfill | Transfer Loop Distance (Km) | Capital Replacement Cost of Transfer Station (1995 \$) | Annual Supervision Cost of Transfer Station (1995 \$) | Annual Maintenance Cost of Transfer Station (1995 \$) | Applicable Annual Hauling Cost (1995 \$) | Total Annual Operating Cost (1995 \$) |
|------------------------------------|---------------------------|-----------------------------|--|---|---|--|---------------------------------------|
| 1 Kitwanga Landfill                | Hazelton Landfill         | 86                          | \$5,984  | \$19,500  | \$5,000   | \$30,950                                 | \$55,450                              |
| 2 Kisplox Landfill                 | Hazelton Landfill         | 40                          | \$5,984  | \$19,500  | \$5,000   | \$11,848                                 | \$36,148                              |
| <b>Total Annual Operating Cost</b> |                           |                             |  |   |   |  | <b>\$91,598</b>                       |

**NOTES:**

- Operating cost summary excludes capital replacement cost
- Hauling cost is \$1.60/km.
- Tipping fees at the landfill, if any, are not included.
- Bulk waste is hauled direct to the Hazelton landfill.
- Supervision cost is determined assuming 25 hrs per week @ \$15/hr



