

CRD WWTP Business Case Requirements

Overview

Purpose of a Business Case

The purpose of the business case is to present sufficient information regarding the CRD's Core Area Sewage Treatment Plans (the "Project") to allow decision makers to commit to implementation of the Project, both in terms of selected Service Delivery Option(s) and Procurement Strategy(ies). The Service Delivery Option work is currently being prepared by CRD's engineering advisory team and such work will be reviewed and integrated into the business case assessment.

The primary audiences of the business case are (i) Capital Regional District (CRD) Core Area Liquid Waste Management Committee (the "Steering Committee"), (ii) relevant agencies within the Provincial Government including Ministry of Community Development ("MCD"), Partnerships BC ("PBC") and the Ministry of the Environment ("MOE"), and (iii) possible Federal Government agencies.

Given the complexity and scale of the Project, the business case analysis must be comprehensive and well supported with expert information and data, plus third party validation of findings and recommendations (including peer review comments).

The business case must accomplish the following:

- Establish the case for investing in the Project,
- Evaluate the overall approach for future service delivery and identify the most efficient and effective service delivery option,
- Identify a procurement packaging strategy that encourages innovation, where possible, for each major component of the system including (i) conveyance system requirements and pumping stations, (ii) wastewater treatment plants (including resource recovery), (iii) biosolids management and disposal, and (iv) ocean outfalls,
- Review the Project against green/climate change objectives and legislation/charters from the CRD, Provincial and Federal governments,
- Identify areas for collaboration and potential partnerships with third parties for the major component of the wastewater and sewer system (wastewater treatment plant facilities and biosolids handling facilities),
- Identify the recommended procurement contracting approach and the procurement implementation plan,
- Highlight specific needs around communications and public consultation, and
- Support approval to proceed with the procurement of the Project.

Procurement and Funding Approval Process

Once the business case has been approved by the Steering Committee and MCD, it will be reviewed by the PBC Board of Directors prior to submission for funding to the provincial government. The Provincial government will review the business case to determine the terms and amount of funding to be provided. The role of MCD is to provide the Provincial government with commentary on the Steering Committee's selected Service Delivery Option(s), and recommendations for the Provincial investment decision. The role of PBC is to prepare a

variation report to accompany the business case, which will identify any deviations in the business case from PBC best practices, along with the materiality of such variances.

Business Case Development

The Business Case will provide sufficient information to allow the Steering Committee and Province to make decisions on whether to proceed with implementation of the Project, both in terms of selected Service Delivery Options(s) and Procurement Strategy(ies), and the risks associated with the procurement plan. The Project scope will be clearly defined along with expected lifecycle costs, revenue opportunities from resource recovery, salvage/other benefits, funding plans/requirements and implementation schedules.

Major Sections of the Business Case

The business case has the following basic sections. Parts A and B will largely be based upon the engineering work currently under development by CRD's engineering consulting team.

- Part A: Identifies the overall goals and objectives for the Project, and reviews the long-term Core Area wastewater and sewage infrastructure requirements based upon population forecasts, water conservation expectations, inflow and infiltration projections, environmental permit obligations, green/climate change objectives and legislation/charters for the CRD, Provincial and Federal governments, resource recovery goals and other similar factors. An "infrastructure gap" is determined based upon current capacity and required capacity over the long term.
- Part B: Identifies various engineering and service delivery options to address the infrastructure gap (technologies, distribution of treatment sites, resource recovery, biosolids handling strategies etc.) and compares how the different options address the needs and objectives identified in Part A. Such comparison will include financial and non-financial issues (social, environmental and other issues deemed relevant by the funding partners). Part B then identifies the "base case" preferred infrastructure and service delivery option assumed in subsequent analysis.
- Part C: Analyzes various procurement methodologies for each major component of the base case service delivery option using financial, non-financial, risk analysis plus market sounding feedback. This Part C also reviews the level of specificity required in procurement documents to achieve the Project's goals and objectives (e.g. specified technical solution for membrane bioreactor technologies at a specified number of sites, versus allowing more flexibility using other technologies on more/fewer sites).
- Part D: Reviews procurement implementation matters including the procurement budget and schedule, governance structure, and public communications.

A Planning Future Service Delivery

A.1 Defining Goals, Objectives, Key Assumptions & Limitations

This section of the Business Case will include the following:

- Introduction and Background:
 - Summary of CRD's work on the Project to date.

- Discussion of role of various provincial agencies participating in this Project as well as expected Federal Government sponsors.
- Project's vision and guiding principles.
- High level Project objectives and mandate including resource recovery and the Project's linkage to broader green/climate change objectives and legislation/charters for the CRD, Provincial and Federal governments.
- Need / Opportunity for Investment (Rationale of the Need):
 - Overview of current situation, impact assessments and need for change
 - Assessment of future need
 - Status of existing infrastructure and current discharge situation.
 - Review of current Liquid Waste Management Plan (LWMP) regulations and prior "target based" approaches identifying marine environmental indicators.
 - Summary of correspondence from MOE and directions to implement treatment.
 - Demographic pressures and future demand (complete with explanation on the demand forecasting methodology) taking into account demand management techniques, such as water conservation and mitigation of the inflow/infiltration situation in the CRD.
 - Future capacity requirements.
 - Flexibility for integration of resource recovery technologies (e.g. CRD's infrastructure acting as a platform for partnering opportunities), both now and into the future.
- Planning for the Future – alternative solutions for providing services:
 - Types of treatment
 - System configuration
 - Different technologies
 - Resource recovery and resource management and how this can be applied to the various models
 - Current regulations and also expected future regulations such as the Federal Government requiring secondary treatment by 2020.
 - Integrate the green / climate change objectives and legislation/charters for the CRD, Provincial and Federal governments.
 - Identification of capacity requirements for the Project.

B Service Delivery Options

This section of the business case reviews the short-listed service delivery options identified in the engineering review and evaluates such alternatives to the objectives and goals defined above. The service delivery options are analyzed from the following main perspectives:

- satisfaction of goals and objectives,

- financial issues including lifecycle costs and revenues from resource recovery etc.,
- allows for innovation during the procurement process,
- potential for collaboration/partnering on various innovative technologies, resource recovery, water reuse and other objectives,
- non-financial qualitative issues (social, environmental, and other similar issues relevant to CRD) and the monetization, where feasible, of such issues for evaluation purposes, and
- risk.

A recommendation for the preferred Project service delivery option is made based upon this review. Much of this work will be completed as part of CRD's engineering advisory review.

B.1 Detailed Project Objectives

This section expands on the high level Project objectives identified in Part A. The Project objectives encompass the outcomes expected as a result of the Project and will also incorporate financial, social, environmental and other criteria. Where possible, Project objectives will be specific and measurable.

The Project objectives will address provincial strategies with respect to sustainability, such as the targets and objectives under the:

- B.C.'s Climate Action Plan;
- the Living Water Smart Plan;
- B.C. Energy Plan;
- B.C. Bioenergy Strategy;
- B.C. Air Action Plan;
- B.C. Climate Action Charter;
- CRD's Regional Growth Strategy;
- CRD's Climate Plan; and
- CRD growth plans and vision documents [list specific documents].

B.2 Project Scope

The Project's scope will be based upon innovation and leadership in wastewater and sewage treatment planning and implementation of Project goals and objectives (including the linkage to broader green / climate change objectives and legislation/charters for the CRD, Provincial and Federal governments), as well as key assumptions and limitations identified by CRD for the provision of liquid waste management to the Core Area. The scope will also include a detailed description of resource recovery requirements plus details on the distribution of WWTPs, conveyance system integration, biosolids management and transportation, plus outfall plans.

The scope, according to the letter dated December 14, 2007 from the Ministry of Environment, must:

1. Meet the regulatory standard for liquid waste.

2. Minimize the total Project cost to the taxpayers by maximizing economic and financial benefits, including beneficial reuse of resources and generation of offsetting revenue.
3. Optimize the distribution of wastewater treatment plants in order to achieve requirement 2.
4. Aggressively pursue opportunities to minimize and reduce greenhouse gas emissions.
5. Optimize “smart growth” results.
6. Examine the opportunity to save money, transfer risk, and add value through a public private partnership.

The business case will include an assessment and discussion of results obtained from the Beneficial Reuse Study, including the integration of the solid waste stream and the results of any demonstration site studies and/or testing. The results of discussions with interested partners within the CRD in testing these opportunities will also be discussed.

B.3 Service Delivery Options Considered

This section identifies the specific technical solutions considered that could meet the needs outlined in Part A and summarized in Section B above. For the Core Area Wastewater Management Program, a minimum of three options will be analyzed and all options will include biosolids treatment and handling.

B.3.1 Multiple Criteria Analysis for Service Delivery Options

The Multiple Criteria Analysis (MCA) is a methodology by which the relative merit of different proposals can be compared using a range of quantitative and qualitative criteria. It is required in the Province’s *Capital Asset Management Framework (CAMF)* for the assessment of service delivery and strategic procurement options. As a decision-making tool developed for complex projects, it has been proven to be very effective in determining overall preferences among alternative options. It is similar to triple bottom-line analysis, however it includes a broader variety of issues beyond social, environmental and financial matters plus it uses a more intuitive approach to weighting such issues rather than assigning point scores to each.

In the MCA, criteria that reflect desirable objectives are identified and measured using both quantitative and qualitative analysis. Quantitative criteria are usually reflected in monetary terms, such as the net present value of the Project’s life cycle costs and revenues, and the monetization of other quantifiable considerations/externalities where feasible/credible, (e.g. carbon taxes and credits) and consideration of internal CRD costs/benefits. Subjective qualitative criteria are not typically assigned a point score but are instead ranked and summarized in an easy-to-understand format for key decision-makers.

B.3.1.1 MCA Due Diligence

The business case will include a description on how the MCA criteria are selected. The business case will also include commentary on each item explaining the logic behind the scoring or rating of that particular item in relation to the criteria.

The due diligence process also needs to be documented, such as investigation or consultation process, empirical evidence to support the conclusion or third party validation. Much of this supporting due diligence will be obtained from ongoing engineering work, consultation with multi-disciplinary specialists and professionals and the peer review process.

B.3.1.2 MCA for Project Service Delivery Options Analysis

The analysis of the various options will include:

- A description of the option;
- Program/service assumptions;
- How the option meets the objectives identified in Part B;
- Context and rationale for the option;
- How the option meets the principles of environmental sustainability goals, including:
 - Resource recovery , climate change/green, energy goals
 - Impacts on greenhouse gas emissions
 - LEED standard for buildings that are subject to LEED
 - Highest and best use resource recovery opportunities
 - Integration of organic waste into the sludge management plans
 - Other goals previously described in Part A
- Specific issues, such as the need to acquire property, or secure environmental approvals;
 - Include price estimates if there is a need to acquire property (including soft costs for such acquisition and any associated consultation, rezoning and other work specifically required to allow use of the property for the Project)
- Option implications (service delivery and associated risks)
- A preliminary implementation schedule should be developed for all options under consideration;
- Preliminary lifecycle cost estimates reflected as a net present value, including:
 - Capital cost;
 - Operating costs over the term of the analysis, including the impact of carbon tax or credits;
 - Maintenance and repair/rehabilitation costs over the term of analysis; and
 - Expected revenue over the term of the analysis.

B.4 Preferred Service Delivery Option

The Project scope associated with the preferred service delivery option will be clearly defined and include the following:

- Service delivery outcomes and performance targets.
- The Project's linkage to broader green/climate change objectives and legislation/charters for the CRD, Provincial and Federal governments.
- Physical Project scope:
 - detailed number of plants and locations (specific sites are not required),
 - level of treatment,
 - resource recovery/reuse requirements,
 - conveyance system integration,

- biosolids handling activity at each WWTP site,
- overall biosolids production, transportation and reuse/disposal plans, and
- outfall requirements.

The CRD business plan will identify how the preferred option meets overall Project objectives.

C Procurement Options Analysis

This section describes the procurement options that could be considered for the Project. It considers the procurement of the preferred service delivery option only.

C.1 Procurement Objectives

Objectives should be linked to overall Project procurement objectives and will generally include objectives related to good practice including value for money and risk allocation, fairness, transparency and maximized competition.

C.2 Procurement Options

Procurement options that are being considered are described. Procurement options will likely include:

- Traditional procurement (design, bid, build)
- Design-Build-Commission
- Design-Build-Operate
- Design-Build-Finance-Operate

The rationale and methodology for the preliminary procurement analysis will be reviewed. It is generally based upon MCA methodology, and considers financial and non-financial information, to the extent that it is available.

C.3 Procurement Analysis

The procurement analysis will include the following:

C.3.1 Market Sounding

Market sounding is a key tool to establish whether procurement options under consideration would be attractive to the market, whether competition would be generated, and ultimately whether different options are viable. The market sounding process of early 2008 verified this however it did not include a significant review of resource recovery beyond reviewing biosolids reuse opportunities.

The revenue potential from an integrated resource management system, including the likelihood of transferring this risk to the private sector in a public-private partnership procurement model will also be tested with the interested market participants. Risks and issues associated with the design and construction of resource recovery processing and distributed systems will also be tested in the market with engineering firms. Furthermore, the market sounding can be used to validate how extensions to the WWTPs and biosolids facilities could be dovetailed with the preferred service delivery option to allow integration of district heating systems and other applications outside the “lot lines” of the WWTP facilities.

Meetings and calls with potential Project participants will be documented in a marketing sounding report identifying themes and key issues reviewed. All firms contacted will be identified.

C.3.2 Full Risk Assessment

The full business case will include a completed risk matrix and accompanied by a risk report. The assessment of risks will be consistent with Partnerships BC's best practices.

C.3.3 Financial Assessment

A full financial assessment will be included in the business case, detailing traditional procurement approaches versus alternative procurement approaches. The financial assessment will include all estimated revenues associated with the Project over the term.

In order for the Project to have as accurate cost estimate as possible at this stage of the analysis the CRD business case must be based on a Class C estimate. The Class C estimate (Indicative) is based on a full description of the preferred option, construction/design experience, and market conditions, this estimate should be sufficient for making the correct investment decision, and obtaining preliminary Project approval.

The Class C estimate must also include an indicative LEED® scorecard showing one solution as to how the compliance team thinks that LEED® certification can be achieved. Note such LEED® criteria will only apply to buildings in the Project and not engineering and other aspects.

Construction cost estimates will be escalated either annually or based on the assumption that expenditures are made at the mid-point of the construction period. Alternatively cost estimates may be converted to as spent dollars based on the expenditure pattern (spend curve). The business case will clearly document which approach was used.

Project schedules (procurement and implementation phase) will be developed or reviewed by a cost consultant, or a third party engineer, with appropriate expertise in construction methods for the Project.

Rehabilitation and lifecycle cost estimates (those costs that are incurred during the operations phase), will be based on a documented and defined scope contained in the asset management plan, and will incorporate available industry benchmarks and prior experience.

The Project cost estimates will also contain a "Project Reserve" for retained risks and an explanation on the basis upon which this Project Reserve can be accessed by CRD.

C.3.3.1 Efficiencies in Infrastructure Projects

The business case will not include a generic efficiency rate to differentiate between the various procurement models analyzed.

In assessing efficiencies, the analysis will be conducted on a major line item basis. Consideration should be given to: the characteristics of the Project; the experience in achieving efficiencies in other projects with similar characteristics; cost estimates; and Project constraints that might inhibit efficiencies; and other issues identified by CRD like flexibility and innovation identified the evaluation criteria and objectives of the Project. The other significant factor driving efficiencies is the amount and quality of the competition – this will have to be informed by market testing.

In some circumstances, it may be possible to estimate potential efficiencies using experience-based data or cost estimates. Where this approach is used, the source of the efficiency estimates should be referenced in the financial model and business case. In other circumstances, the assessment would have to be more qualitative in nature, due to the

unavailability of data or the lack of precision in understanding Project characteristics. In these latter cases, on a major line item basis, there will be an assessment of the potential for efficiencies due to the known characteristics of the Project and the design of the procurement to enable and encourage efficiencies. Again, the methodology should be clearly documented in the financial model and business case.

Construction efficiencies, risk transfers and integration/life-cycle efficiencies will all be estimated by the same core group of people in parallel, so as to avoid duplication. The core group should include good representation from the CRD and the Province and should be supplemented with contract consultants and advisors, as required, to ensure an appropriate level of expertise.

The total of estimated integration/life-cycle efficiencies are subtracted (or added) if applicable from the life-cycle cost estimate for the traditional financial model. This becomes the life-cycle cost estimate for the public private partnership model.

C.3.3.2 Bundling / Phasing of Project Components

The business case must include options on how the Core Area Wastewater Management Plan could be procured; for example, the CRD could manage one procurement process for the entire plan or, at the other end of the scale, manage one procurement process per plant.

The business case must make a recommendation on how the Project will be procured and the financial models must reflect the recommendation. The recommended approach must be reviewed by a due diligence team.

The major components of the Project to be reviewed for packaging include, but not limited to:

1. The conveyance system and its operations and management.
2. The distributed network of WWTPs (procured together or separately).
3. Biosolids handling capabilities (on-site at the WWTPs or centralized).
4. The marine outfalls and fresh water discharge plans.

It is possible that different procurement models may be used for different components. For example, the conveyance system expansion and operation may be a design-build-commission procurement with operations staff provided by CRD, while the other major components may be procured in a single package under an alternative procurement model.

C.3.3.3 Funding Requirements

The CRD has received verbal commitments of funding assistance from the two senior governments. The bundling (or phasing) plan for the Project will have an impact on the availability of funding from the senior governments. The business case will articulate this impact and assess the risk of the various bundling opportunities on the funding commitments.

The business case will include a summary and cash flow illustrating each level of government's anticipated funding contributions toward capital costs under each bundling scenario.

C.3.3.4 Financial Cost Estimates

All cost and revenue estimates must be based upon current market conditions, and must be developed or reviewed by a qualified and experienced cost consultant and/or third party engineering advisor. Revenue estimates must be reviewed by a qualified professional appointed by the CRD and the Province.

The development of the financial models will require the following inputs:

Input	Explanation	Presentation
Construction Costs	Includes all costs required to construct the asset, including both hard and soft costs, and contingency. Costs of on-site resource recovery infrastructure should be separated from off-site delivery infrastructure.	Current Dollars (ensures it is clear when estimate is out of date)
Major Rehabilitation/ Lifecycle Costs	Includes the cost of major maintenance activities required to maintain the asset to a prescribed standard. Like construction costs, major rehabilitation costs can be estimated by a qualified quantity surveyor, other appropriate external consultant, or by the project team. If estimated by the project team, they should be validated by a quantity surveyor or external consultant.	Current Dollars
Operating and maintenance cost	Includes all costs other than major rehabilitation to operate and maintain the asset during the operational period. The operating costs will include the cost of staff, utilities, chemicals, and sludge management. Operating costs associated with solid organic management must be included as a separate line item.	Current Dollars
Land Costs	Includes the cost of land required for the Project. If the land has been recently purchased, the actual sale price should be used. If a sale is pending and a price is known with certainty then that price can be used.	Current Dollars
Equipment	Equipment needs should be estimated based on the information contained in the detailed scope analysis.	Current Dollars
IM/IT	IM/IT/SCADA needs should be estimated, including the cost of end use devices. IT backbone costs are usually included in the construction cost estimate.	Current Dollars
Quantified Expected Operating Efficiencies	Expected operating efficiencies should be quantified. The level of risk associated with achieving expected savings should be indicated. This expected value can be factored into the Net Present Value and funding analysis directly. If staffing costs and associated efficiencies are captured in operating and maintenance costs ensure that the savings are not double counted. However, in incremental analyses, often only efficiencies are taken into account as a way of comparing the outcome of different options.	Annual efficiency in Current Dollars
Revenue Opportunities	There may be opportunities to generate revenue to partially (or fully) offset the cost of the new system. Revenues associated with Beneficial Reuse Study outlined in Section B.2 above should be fully scoped and included in the financial analysis. The projected revenues should be reviewed by a qualified third party. The potential for revenues will be dependent on the recommended service delivery options.	Current Dollars
Risk Adjustment	Value of transferred, shared, and retained risks in accordance with the risk analysis.	Current Dollars

Input	Explanation	Presentation
Base Discount Rate	<p>The discount rate used to calculate the net present cost/value in the discounted cash flow analysis should properly reflect the systematic risk of cash flows attributable to the Project, and not the systematic risk of the organization undertaking the Project.</p> <p>To calculate net present value, estimated future cash inflows and outflows should be discounted by a rate of return (commonly referred to as the discount rate) offered by comparable investment alternatives.</p> <p>The business case will include a sensitivity analysis on the discount rate using a range of values.</p>	Percentage
Inflation	<p>Includes:</p> <p>Construction escalation rates (based upon mid-point of construction or upon the expected construction spend schedule, if available) to be applied to base capital cost estimates. These rates should be estimated by a qualified cost consultant or other appropriate external consultant; and</p> <p>Inflation during the operating period can be approximated by the Consumer Price Index (CPI) or some other relevant sub-index of the CPI if deemed to be appropriate by the Project team.</p>	Percentages
Term	<p>The time frame over which the service delivery options are evaluated and the Net Present Value calculated should be selected in line with the expected life of the underlying asset.</p>	Months/Years

C.3.4 Sensitivity Analysis

When developing the financial analysis, a number of assumptions are made with respect to future developments. It is important to understand how a change in those assumptions would affect the conclusions of the procurement analysis. A sensitivity analysis should be undertaken to demonstrate the confidence in the analysis.

Sensitivity Analysis will be applied to the Discount Rate. The net present value of the Project will be shown using a discount rate of base plus one and also using a discount rate of base less one. Also, the “breakeven” discount should also be reported in the business case.

Sensitivity analysis will also be performed on assumptions associated with the revenue opportunities and any efficiency factors in the model.

C.4 Multiple Criteria Analysis (MCA)

Since the procurement MCA is conducted after a preferred service delivery option is identified in Part B, its focus will be on evaluating how different procurement models can deliver the preferred service option in a most efficient and effective way.

The structure of the MCA will include common criteria, sector specific criteria and Project specific criteria.

C.4.1 Qualitative Analysis

Qualitative considerations include the benefits and impacts of each option against a particular criterion. Each criterion will be clearly defined and documented in the MCA.

Options are ranked on the basis of each criterion that have been evaluated, and an overall ranking of options should also be provided. The development of the MCA should be undertaken by the Project team, supplemented by experts in appropriate specialties (such as risk, quantity surveying, construction, and communications).

D Procurement Plan

- 1) The procurement plan will articulate the recommended governance structure for the procurement and implementation phases of the Project.
- 2) Procurement schedule will reflect Project milestones and will be peer reviewed.
- 3) Project budgets will include estimates that appropriately resource project management, including procurement management, construction oversight, communications and ongoing contract management.
- 4) Procurement processes should reflect the use of Partnerships BC's best practices with respect to:
 - The use of a Fairness Advisor and a Conflict of Interest Adjudicator;
 - The terms of engagement for business advisors and legal counsel;
 - The payment of partial compensation;
 - Procurement documentation; and
 - The commitment to produce and publish a Value for Money report within 90 days of the contract's execution date.

E Communication Plan

The business case must include a communication plan that has been coordinated with all Project stakeholders.