Deloitte.

Procurement Model Assessment

Wastewater Conveyance Project

Comox Valley Regional District

February 10, 2021

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1. Introduction

1.1 Purpose

Deloitte was engaged by the Comox Valley Regional District (CVRD) to conduct a qualitative procurement options assessment for the Conveyance Project (described below), including consideration of sub-project bundling/un-bundling. The methodology entailed a multi-criteria assessment and a market sounding exercise. This report briefly outlines the work conducted and findings reached.

1.2 Background

The topic of this report is the CVRD Conveyance Project, which will eliminate a vulnerable section of sewer pipe that runs along Balmoral Beach and consists of the upgrade of several sewage pump stations and new forcemain that bypasses the vulnerable pipe and is located upland.

The liquid waste management planning process shortlisted three broad approaches to the delivery of the Conveyance Project:

- Option 1[1] - an unphased approach ("Unphased") where the entire project would be completed upfront and which consists of two sub-projects (pump station upgrades, cut/cover forcemain).
- Option 2 – an Unphased approach where the entire project would be completed upfront and consists of three sub-projects (pump station upgrades, cut/cover forcemain and tunneled forcemain); and
- Option 3 - a phased approach ("Phased") of Option 2, in which the first phase would be completed immediately with the second phase not needed for 15-20 years[2]. Both phases include cut/cover forcemain and tunneled forcemain, but all the pump station upgrades would be completed in the first phase. The portion of Option 3 that is assessed in this report is the first phase only.

Consideration of Option 1 was added to the scope of this procurement model assessment after the market sounding was complete. Option 2 was considered unlikely at the time the report was commissioned and was not included in the assessment. The objective of the assessment is to identify the optimal combination of sub-projects and procurement models for each of the Phased and Unphased approaches. Which approach is ultimately used will depend on technical factors, primarily the suitability of the proposed tunneling alignment for directional drilling.

The procurement models agreed with CVRD for consideration are:

- traditional design-bid-build (DBB), in which the design and construction are executed by different entities; and
- design-build (DB), in which the design and construction are contracted to a single entity which has responsibility to construct what it has designed.

[1] The Option labelling has been added to align this report with other CVRD reports.
[2] The advantage of the Phased approach, should it prove technically feasible, is that it defers a significant capital cost for a significant period of time. The approach hinges on the feasibility of completing the eastern half of the forcemain with tunneling rather than open cut construction methods. At the time of analysis, the geotechnical investigations of the proposed tunneling route were underway but not complete.

As CVRD intends to retain operation of the regional sewer system, procurement models including operational responsibility (e.g. design-build-operate) were not of interest.

After completion of the assessment of DBB and DB, the CVRD requested that construction management at risk (CMAR) be considered in this report, for Option 3. This request was accommodated by adding Appendix D.

In February 2021, Option 2 emerged as the likely approach. As it was not explicitly included in the assessment, commentary has been added to apply the findings for Options 1 and 3 to Option 2 in Sections 2.4 and 3.8. The analysis in Section 4 has been broadened, to include the applicability of conclusions and recommendations to Option 2, as appropriate.

1.3 Restrictions and limitations

This report was prepared for the exclusive use of the CVRD, and is not intended for general circulation or publication other than what releases may occur through CVRD's normal course of business. It relies on certain information provided by third parties, none of which Deloitte has independently reviewed. No third party is entitled to rely, in any manner or for any purpose, on this report. Deloitte's services may include advice or recommendations, but all decisions in connection with the implementation of such advice and recommendations shall be the responsibility of, and be made by, the CVRD.

2. Market sounding

2.1 Sub-projects

The market sounding was conducted for the Option 3 (Phased approach including a tunneled section). The approach was broken down into three major sub-projects based on the type of work and contractor specialties as follows.

Table 1 - Sub-projects

Sub-project		**Estimated capital cost ($2020)**
1	Upgrades to three pump stations one major critical pump station (2 duty/ 1 standby 170HP pumps), one medium critical pump station (2 duty/ 1 standby 70HP pumps) and one small pump station. Upgrades to include new pumps to increase discharge pressure associated piping modifications and upgrades electrical and mechanical components. Also includes the tie-in of the new forcemain to the headworks at the wastewater treatment plant.	$7.8M
2	A 2,300 m cut/cover 1,200 mm dia. forcemain section through the Town of Comox from Marina Park and ending near the corner of Lazo and Torrence Road; including a tie-in to the existing live forcemain on land at Marina Park; decommissioning of the downstream section of forcemain after the tie-in	$6.5M
3	A 1,200 m tunneled 1,200 mm dia. forcemain section beginning at the corner of Lazo and Torrence Road and ending near the wastewater treatment plant	$16.7M
	Total	$31.0 M

2.2 Method

A range of civil (i.e. underground utility), electrical/mechanical, and tunneling contractors were contacted by email and/or phone to assess their degree of interest in the individual sub-projects or bundles of sub-projects, and their favoured procurement model(s). Input was received primarily in verbal form. Below are the questions used to guide the conversations. Appendix A includes the market sounding brief provided to all participants.

<u>Sub-project 1:</u> Pump Station Upgrades / WWTP tie-in

1. What is your interest in this sub-project as a traditional design-bid-build project? Any caveats?
2. What is your interest in this sub-project as a fixed-price design-build project? Any caveats?
3. Do you see any technical advantages or disadvantages in bundling this sub-project with the forcemain sub-project(s)?
4. Would bundling this sub-project with the forcemain sub-project(s) affect your level of interest in DBB and/or DB?

<u>Sub-project 2:</u> Cut/Cover

1. What is your interest in this sub-project as a traditional design-bid-build project? Any caveats?
2. What is your interest in this sub-project as a fixed-price design build project? Any caveats?

3. Do you see any technical advantages or disadvantages in bundling this sub-project with either of the other sub-projects?
4. Would bundling this sub-project with one or both of the other sub-project(s) affect your level of interest in DBB and/or DB?

Sub-project 3: Tunnel

1. What is the typical procurement and payment model for projects such as this?
   - What types of tunneling technology might you consider?
   - Do you have any suggestions for CVRD as it commences the geotechnical and groundwater investigations?
2. What is your interest in this sub-project as a traditional design-bid-build project? Any caveats?
3. What is your interest in this sub-project as a fixed-price design build project? Any caveats?
4. Do you see any technical advantages or disadvantages in bundling this sub-project with either of the other sub-projects?
5. Would bundling this sub-project with one or both of the other sub-project(s) affect your level of interest in DBB and/or DB?

2.3 Findings

The table below contains high-level results of the market sounding, indicating whether or not the firms would likely pursue a competition for each of the sub-projects, their interest in bundled sub-projects, as well as their preferred delivery option.

Table 2 - Market sounding interest summary

Participant	Pump Stations	Cut/Cover	Tunneling / HDD	Bundled	Interest DB/DBB/Both
Ridgeline Mechanical	X	X			DBB
Knappet Industries	X	X			DBB
Tritech Group	X				DB
Wacor Holdings	X	X			DBB
Archie Johnson Plumbing & Heating	X				DBB
Hazelwood Construction	X	X		X	DBB
Aecon Group	X	X		X	Both
Innovative Pipeline Crossings (IPC)			X	X	Both
The Crossing Group			X		Both
Michels Canada		X	X	X	Both

Based on the participants' feedback as summarized, there is likely to be a sufficient response from the market for a competitive DBB or DB procurement, whether each sub-project is procured individually or bundled with one or more other sub-projects. The exceptions to this are:

- the cut/cover forcemain as a DB; and
- the cut/cover forcemain bundled with the pump stations as a DB.

These two scenarios are not directly supported by the information in Table 2, but given the small sample size and the recently reported higher cost estimates for these sub-projects[3], we believe additional market sounding would identify market interest for these two approaches as well.

Although the sample set of contractors interviewed is small, the responses are generally as expected, and nothing was heard that is expected to be contrary to general market opinion.

The availability of a sufficient number of qualified and experienced tunneling contractors is key to the tunneled forcemain sub-project's viability as a DBB or DB. Three specialized firms have expressed interest through the market sounding, and thus it appears that the tunneling sub-project could be competitively procured. Because tunneling equipment is specialized and possibly proprietary to some extent to specific contractors, the response to a tender/RFP for this sub-project could be affected by the timing of procurement depending on the equipment each contractor has available at the time.

All interviewees who are not interested in pursuing a bundled project or a DB procurement as the lead contractor, stated they are interested in a sub-contracting role under a lead contractor.

In addition to the indications of interest shown in Table 2, some valuable observations and insights developed during the interviews that are relevant to the procurement model assessment are listed below.

- The pump station upgrades will require the operation of the stations to be maintained during the upgrades, and so a bypassing/operations plan will be needed for the construction period. DB, with its integrated design/construct approach, could develop superior bypass plans that are informed by the construction contractor that will have to implement the plans and work on/in the pump stations. The single point of accountability for CVRD could also be beneficial if there are problems during construction with maintaining station operation or risk of overflows.

- The tunneling work is specialty work, and the tunneling contractors possess much of the knowledge and experience needed for design, especially as it relates to their own equipment and their favoured means and methods. To fully utilize this expertise to CVRD's advantage, a design-build approach is necessary. A DBB procurement can be used, but much of the detailed design would still have to be left to the contractor without the benefit of single point of accountability and risk transfer that a DB would bring. An "early contractor involvement" approach wherein the tunneling contractor is selected on qualifications and then develops a design and price in conjunction with the owner is also possible, however there is no design competition and much less pressure on pricing[4].

- With regard to the size and length of the proposed HDD, the tunneling contractors advised:
  - ***IPC***: 1,200m x 1,200mm is "not pushing the limits" of directional drilling.
  - ***Crossing group***: "feasible but is a large-scale crossing".
  - ***Michels***: 1,200m should not be difficult except for the need for laydown, and the drilling mud can be messy and sometimes present disposal problems.

- Microtunnelling was raised as an alternative to directional drilling, but it was acknowledged that it is more expensive (but lower risk) than directional drilling and would likely need intermediate shafts

[3] In October 2020 it was reported by CVRD that the updated cost estimate for these two subprojects is $23M, as compared to the $14.3M shown in Table 1
[4] this approach could be considered as a back-up if market response to a DB is insufficient for the tunneling portion of the project

and be done in 2, 3, or 4 sections. It also has the advantage of needing very little laydown area. The geotechnical conditions would dictate the appropriate tunneling technique.

- Although the sample size is small, feedback was generally as expected from smaller/local contractors regarding DB (they are not experienced with it and thus strongly favour DBB) and regarding bundling (they would prefer sub-projects not be bundled allowing them to focus on their core specialties). However, they were willing to take subcontracting roles on bundled projects, and/or non-lead roles on DB projects and so CVRD could expect to see local firms participating in the Project to some extent regardless of the bundling and delivery model choices made.

A summary of the market sounding findings is included in Appendix B.

2.4 Relevance of findings to Options 1 and 2

Option 1

The main difference of Option 1 is that there is no tunneled forcemain segment, all forcemain would be constructed by cut/cover (approximately 8,600m). The estimated cost at the time of assessment was $47M. It is reasonable to apply the market sounding findings for Option 3's pump station and cut/cover sub-projects to Option 1, because the type of work is the same and the larger size of contract for the cut/cover work in Option 1 should increase, rather than decrease, market interest. The larger cut/cover opportunity could also overcome the potential softness of market interest in a standalone DB for the cut/cover noted for the Phased approach.

As Option 1 does not have a tunneled section of forcemain, concerns about the availability of specialized contactors/equipment at the time of RFP/tender are not applicable.

Option 2

Option 2 consists of the same sub-projects as Option 3, with the key differences being a longer cut and cover section and an additional tunneled portion. The market sounding findings therefore apply directly to Option 2. Being a larger project overall with a more cut/cover and tunneling, Option 2 should be even more attractive than Option 3 to the market.

3. Multi-criteria assessment

3.1 Introduction

A multiple-criteria analysis (MCA) approach is used to consider the relative merits of each of the procurement models under consideration on a qualitative basis, and is the primary decision-making instrument covered by this report. This section outlines the development, conduct, and results of the MCA.

3.2 Workshop

The MCA was conducted by means of a workshop assessment facilitated by Deloitte over three sessions:

1. A review of market sounding findings, and a re-calibration of the procurement model assessment scope to include Option 1.
2. Validation of the project delivery scenarios, MCA criteria, and MCA criteria and category weightings; and
3. Assessment of project delivery scenarios.

The participants were as follows:

- Kris La Rose, Senior Manager of Water/Wastewater Services, CVRD
- Charlie Gore, Capital Projects Manager, CVRD
- Mike Imrie, Manager of Wastewater Services, CVRD
- Zoe Berkey, Engineering Analyst, CVRD
- Chris Baisley, Deloitte
- Brandon McLean, Deloitte

The workshop materials and presentation materials are included in Appendix C.

3.3 Assessment criteria

The MCA criteria used were initially developed by Deloitte based on a previous similar assignment for the CVRD with adjustments made based on our understanding of the Project. During the workshop discussion, the criteria category weights were validated and adjusted if necessary, so that the category weightings represent the relative importance of each category to the CVRD, and that within each category, each criterion's weighting reflects the relative importance to CVRD. The criteria and weightings are shown below.

Table 3 - MCA criteria and weightings

Category	Category Weighting	Criterion	Criterion Relative Weight Within Category
Technical	15%	Delivers value through innovative design and/or construction (design competition)	Low
		Minimize disruption during construction	Low
		Maximize O&M input to design	Low
CVRD Resources	5%	Minimize demand on CVRD resources - pre-procurement (for DB - includes spec dev.)	Low
		Minimize demand on CVRD resources - design phase	Low
		Minimize demand on CVRD resources - construction phase	Med
Schedule	20%	Maximize schedule certainty	Low
		Minimize time to completion / in-service date (assumes no undue/abnormal tunneling risk, thus tunneling is not complete before rest of the work)	Low
Cost	25%	Minimize capital cost through optimized design across all Sub-projects	High
		Minimize capital cost through competitive pricing and design optimization (design competition within contracts)	High
		Maximize capital cost certainty (after contract signed)	Med
		Minimize net transaction (all consultants excluding project management [PM]) costs	Low
		Minimize additional PM (e.g. consultant) costs	Low
		Minimize capital costs through bundling (synergy/efficiency) or not bundling (local/smaller contractors) of sub-projects Note: there are no "local" tunnel contractors	High
Retained (by CVRD) Risk	35%	Minimize construction risk (e.g. geotech, env, latent def)	Med
		Minimize operating risk during construction (bypassing, hot tapping, etc.)	High
		Minimize sub-project integration risk (e.g. PSs ready, forcemain not ready)	Low

3.4 Project delivery scenarios

The project delivery scenarios (i.e. combinations of bundling and procurement models) arrived at for assessment (as well as key assumptions) are set out below. Some of the considerations included in determining this shortlist included:

- excluding standalone DB procurements for cut/cover sub-projects given the potentially soft market interest but more so the anticipated lack of scope for design and construction innovation for a standalone cut/cover sub-project; and
- utilizing DB for the tunneling sub-project, based on the consensus of the importance of the contractor in design as described in Section 2.3.

Table 4 - Project delivery scenarios evaluated

#	Option 1 Cut/Cover entire force main - 8,600m cut/cover ($47M)	#	Option 3 (First Phase) Cut/cover + tunneling - 2,300m cut/cover ($31M)
A	DB Bundled PS + cut/cover (1 contract)	**E**	Scenario **A** + tunneling as separate DB (2 contracts)
B	DBB Bundled PS + cut/cover (1 contract)	**F**	Scenario **B** + tunneling as separate DB (2 contracts)
C	DBB cut/cover + DB PS (2 contracts)	**G**	Scenario **C** + tunneling as separate DB (3 contracts)
D	DBB cut/cover + DBB PS (2 contracts)	**H**	Scenario **D** + tunneling as separate DB (3 contracts)
		I	Bundle all sub-projects as DB (1 contract)
		J	Bundle all sub-projects as DBB (1 contract)

Assumptions
1. For DBB, value engineering will be done. Early contractor involvement is not assumed.
2. CVRD's owner's engineer will do: detailed design for all DBB sub-projects, and indicative design/spec development for DB sub-projects.
3. For *unphased* project, Courtney PS is a greenfield rather than refurb project.
4. For phased project, sub-projects will be phased to mitigate impact of failed tunneling
5. For phased project, all scenarios include a tunnel require the Marina Park tie-in

Within the scenarios, the number of contracts (i.e. procurements) ranges from 1 to 3 to reflect different bunding of sub-projects, and each contract within a scenario may be DB or DBB.

Scenarios E through H for Option 3 are based on a corresponding scenario from Option 1, with the difference being the addition of the tunneled forcemain section.

3.5 Assessment conduct

The project delivery scenarios for the Unphased approach (Option 1) were assessed as a group first, followed by the scenarios for the Phased approach (Option 3). The MCA was conducted by stepping through the criteria for each scenario and coming to a participant consensus score using the four-point scale presented below.

Table 5 - MCA Scoring System

Score	Meaning
1	Fails to meet requirements and/or produces undesirable outcomes for CVRD
2	Minimally meets requirements and/or produces neither negative or positive outcomes for CVRD
3	Adequately meets requirements and/or produces positive outcomes for CVRD
4	Exceeds requirements and/or produces exceptional outcomes for CVRD

The scores for each criteria are combined using the in-category criteria weightings and category weightings to calculate an overall numerical score (which can range from 100 to 400) for each scenario.

3.6 Assessment results for Option 1

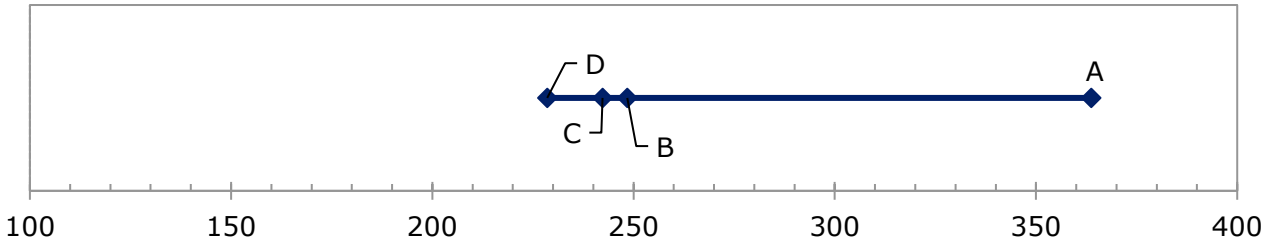
The table below presents the workshop consensus scoring.

Table 6 - MCA results for Option 1

	Criterion	Criterion Relative Weight Within Category	A DB Bundled PS + cut/cover (1 contract)	B DBB Bundled PS + cut/cover (1 contract)	C DBB cut/cover + DB PS (2 contracts)	D DBB cut/cover + DBB PS (2 contracts)
Technical	Delivers value through innovative design and/or construction (design competition)	Low	4	2	3	2
	Minimize disruption during construction	Low	3	3	2	2
	Maximize O&M input to design	Low	2	4	3	4
15.0%						
CVRD resources	Minimize demand on CVRD resources - pre-procurement (for DB - includes spec dev.)	Low	2	4	1	3
	Minimize demand on CVRD resources - design phase	Low	3	2	1	2
	Minimize demand on CVRD resources - construction phase	Med	4	3	1	1
5.0%						
Schedule	Maximize schedule certainty	Low	4	2	2	2
	Minimize time to completion / in-service date	Low	4	2	2	2
20.0%						
Cost	Minimize capital cost through optimized design across all Sub-projects	High	4	4	2	4
	Minimize capital cost through competitive pricing and design optimization (design competition within contracts)	High	4	2	3	2
	Maximize capital cost certainty (after contract signed)	Med	4	2	3	2
	Minimize net transaction (all consultants ex. PM) costs	Low	4	2	2	1
	Minimize additional PM (e.g.. consultant) costs	Low	4	3	2	1
	Minimize capital costs through bundling (or not) of sub-Projects	High	2	2	2	4
25.0%						
Retained (by CVRD) Risk	Minimize construction risk (e.g. geotech, env, latent def)	Med	4	2	3	2
	Minimize operating risk during construction (bypassing, hot tapping, etc.)	High	4	2	3	2
	Minimize sub-project integration risk (e.g. PSs ready, forcemain not ready)	Low	4	4	1	2
35.0%						

The resulting scores are presented graphically below.

Figure 1 - MCA scores for Option 1



Scenarios B, C and D scored nearly identically, with scenario A scoring significantly better. Thus, it is the conclusion of the workshop that a single bundled DB procurement for the entire Project best meets the assessment criteria and is the preferred method for delivery of Option 1. A sensitivity analysis (in Appendix C) shows that this finding is not sensitive to changes in category weightings.

The differences in each criteria category are summarized with the corresponding overall rationale distilled from the workshop discussion below:

- **Technical category:** Bundling is seen as advantageous in reducing disruption during construction as it will allow better coordination between the subprojects with a single contractor in charge. The design competition inherent in the DB procurement is expected to deliver value for CVRD by competing design and construction means/methods. The benefit of CVRD O&M input is maximal in the DBB procurement model. Scenarios A and B (bundled) score slightly higher than scenarios C and D although the difference is minor. [45/45/40/40][5]

- **CVRD resources category:** Scenarios A and B score higher than scenarios C and D in this category primarily due to the bundling, which requires only one procurement and one contract to administer, rather than two. The DB procurement model should require less CVRD resource effort during construction. Scenario C is not favoured as it has a mix of procurement models and could be inefficient and complex to prepare for. [16/15/5/9]

- **Schedule category:** Construction with a bundled DB is more likely to be completed on schedule, due to integrated design and construction and the single-point accountability for both. A date-certain and price-certain (subject to certain risk-sharing mechanisms) is typical for a DB. Scenario A scored double the other scenarios because it is a DB encompassing both sub-projects. [80/40/40/40]

- **Cost category:** To optimize the project's capital costs by considering trade-offs between the two sub-projects, it would need to be designed by a single party – only scenario C uses more than one designer. The design competition inherent in DB is expected to reduce capital costs[6] through design optimization and competitive pressure, favouring scenarios A and C. Scenarios using DB and bundling are expected to incur the lowest overall consultant costs, while the use of DB may reduce the participation of local construction firms which may offer the most competitive rates. Taking this all into account, scenario A scores the best in the cost category. [88/64/59/72]

- **Risk category:** The DB procurement model is expected to minimize CVRD's risk exposure (construction risk, operating risk during construction, and sub-project integration), thus Scenario A scores the highest. [140/80/95/70]

[5] In square brackets, the scores in each category are presented for scenarios A/B/C/D
[6] Total capital cost to CVRD, which would include fixed-price risk premiums in the DB as compared to the cost of claims in the DBB model

3.7 Assessment results for Option 3

The table below presents the workshop consensus scoring.

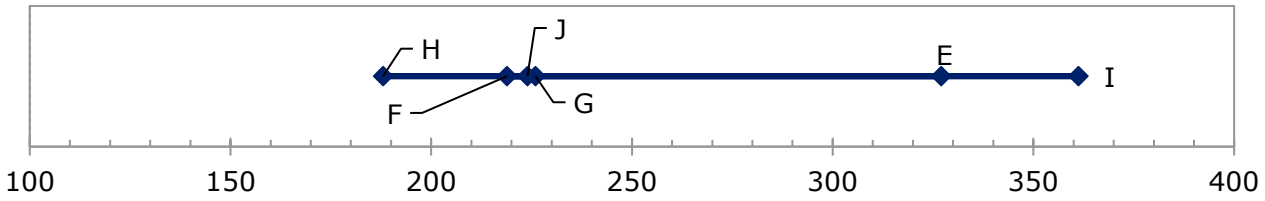
Note that the project below assumes the tunnel alignment will be verified as feasible, and tunneling failure will not impact the design or construction of the other sub-projects. As at the end of 2020, CVRD reports that geotechnical results are progressively becoming more favourable for tunneling, lending credence to this assumption and the scoring below.

Table 7 - MCA results for Option 3

	Criterion	Criterion Relative Weight Within Category	E Scenario A + tunneling as DB (2 DB	F Scenario B + tunneling as DB (2 contracts -	G Scenario C + tunneling as DB (3 contracts -	H Scenario D + tunneling as DB (3 contracts -	I Bundle all sub-projects as DB (1 contract)	J Bundle all sub-projects as DBB (1 contract)
Technical	Delivers value through innovative design and/or construction (design competition)	Low	4	2	3	2	4	2
	Minimize disruption during construction	Med	2	2	1	1	3	3
	Maximize O&M input to design	Low	2	4	2	4	2	4
15.0%								
CVRD resources	Minimize demand on CVRD resources - pre-procurement (for DB - includes spec dev.)	Low	2	3	1	2	3	4
	Minimize demand on CVRD resources - design phase	Low	3	2	2	1	4	2
	Minimize demand on CVRD resources - construction phase	Med	3	2	1	1	4	3
5.0%								
Schedule	Maximize schedule certainty	Low	3	2	2	1	4	2
	Minimize time to completion / in-service date [assumes no undue/abnormal tunnelling risk, thus tunnelling is not done before rest of work]	Low	3	2	2	1	3	2
20.0%								
Cost	Minimize capital cost through optimized design across all Sub-projects	High	3	3	1	3	4	4
	Minimize capital cost through competitive pricing and design optimization (design competition within contracts)	High	4	2	3	2	4	1
	Maximize capital cost certainty (after contract signed)	Med	4	2	3	2	4	2
	Minimize net transaction (all consultants ex. PM) costs	Low	3	2	1	1	4	2
	Minimize additional PM (e.g.. consultant) costs	Low	4	2	1	1	4	4
	Minimize capital costs through bundling (synergy/efficiency) or not bundling (local/smaller contractors) of sub-Projects Note: there are no "local" tunnel contractors	High	2	2	3	4	2	3
25.0%								
Retained (by CVRD) Risk	Minimize construction risk (e.g. geotech, env, latent def)	High	4	2	3	2	4	1
	Minimize operating risk during construction (bypassing, hot tapping, etc.)	High	4	2	3	2	4	2
	Minimize sub-project integration risk (e.g. PSs ready, forcemain not ready)	Low	3	3	1	1	4	3
35.0%								

The resulting scores are shown graphically below.

Figure 2 - MCA scores for Option 3



Scenarios F, J and G scored nearly identically, with scenarios E and I scoring significantly better and scenario H scoring significantly worse. Thus, it is the conclusion of the workshop that a single bundled DB procurement for Option 3 best meets the assessment criteria and is the preferred method for delivery of the first phase of the Project if it is Phased. A sensitivity analysis (in Appendix C) shows that this finding is not sensitive to changes in category weightings.

Scenario E is the same as scenario I, except that the tunneled section is procured as a separate DB.

The differences in each criteria category are summarized with the corresponding overall rationale distilled from the workshop discussion below.

- **Technical category:** Bundling is seen as advantageous in reducing disruption during construction as it will allow better coordination between the subprojects with a single contractor in charge. The more contracts in a scenario, the lower it was scored. The design competition inherent in the DB procurement is expected to deliver value for CVRD by competing design and construction means/methods. The benefit of CVRD O&M input is maximal in the DBB procurement model. The scenarios are not significantly distinguished from each other in this category. [38/38/26/30/45/45][7]

- **CVRD resources category:** Bundling is seen as advantageous with scenarios scoring better the fewer separate contracts are involved. The DB procurement model should require less CVRD resource effort during construction. Scenario I score's the highest due to these two factors, followed by J and E. Scenarios G and H score the lowest as they have a mix of procurement models across three separate contracts and could be inefficient and complex to prepare for and coordinate. [14/11/6/6/19/15]

- **Schedule category:** Construction with a bundled DB is more likely to be completed on schedule, due to integrated design and construction and the single-point accountability for both. A date-certain and price-certain (subject to certain risk-sharing mechanisms) is typical for a DB. Scenarios E and I scored highest as they both involve DB for the full Project scope. [60/40/40/20/70/40]

- **Cost category:** To optimize the project's capital costs by considering trade-offs between the three sub-projects, it would need to be designed by a single party – only scenarios I and J use one designer. The design competition inherent in DB is expected to reduce capital costs through design optimization and competitive pressure, favouring scenarios E, G, and I. Scenarios using DB and bundling are expected to incur the lowest overall consultant costs, while the use of DB may reduce the participation of local construction firms which may offer the most competitive rates. Taking this all into account, scenario I scores the best in the cost category, followed closely by E. [80/56/56/66/88/66]

- **Risk category:** The DB procurement model is expected to minimize CVRD's risk exposure (construction risk, operating risk during construction, and sub-project integration), thus Scenarios E and I score considerably higher than the other scenarios. [135/74/97/66/140/58]]

[7] In square brackets, the scores in each category are presented for scenarios E/F/G/H/I/J

3.8 Applicability of findings to Option 2

Option 2 is the same as Option 3 in all regards except the cut/cover forcemain and tunneling sub-projects are larger. If Option 2 had been assessed in the same manner as Option 3 (i.e. consideration of project delivery scenarios E through J), it is highly likely that the scenario scoring in all of the criteria categories would be identical to Option 3 due to the similarity of these Options. All of the information in Section 3.7 may reasonably be stated to apply equally to Options 2 and 3.

4. Conclusions and recommendations

4.1 Conclusions

Following are the conclusions of the market sounding.

1. There is likely to be a sufficient response from the market for any of the ten project delivery scenarios examined, although with regard to Options 2 and 3 the availability of tunneling contractors / appropriate equipment could be limited at the time of tender/RFP, given the specialist nature of both.

2. For Option 1, a design-build procurement encompassing both the pump station and forcemain sub-projects (i.e. scenario A) would best meet CVRD's objectives.

3. For Options 2 and 3, a design-build procurement encompassing the pump station, cut/cover forcemain, and tunneled forcemain sub-projects (i.e. scenario I) would best meet CVRD's objectives.

4.2 Recommendations

Following are Deloitte's recommendations based on our execution of the work program, participation in and the findings of the MCA assessment, and the understanding of the Conveyance Project that we developed as the work was completed.

Unphased approach

1. If , a design-build procurement encompassing both the pump station and forcemain sub-projects (i.e. similar to scenario A) be used.

Phased approach

2. If Option 2 or Option 3 is selected for implementation, a design-build procurement encompassing the pump station, cut/cover forcemain, and tunneled forcemain sub-projects (i.e. scenario I) be used.

3. Regardless of the bunding or procurement models selected, it is recommended that if a tunneled section is included that a mitigant to tunneling failure be built in to the project plan, such as

    a. obtaining a high degree of certainty regarding the success of the directional drilling prior to commencing construction of the remainder of the project; or

    b. designing the remainder of the project such that it can be used with an alternative outlet to the treatment plant.

4. A single bundled DB (scenario I) for Options 2 and 3 requires there to be sufficient tunneling contractors with appropriate equipment available for (ideally) three qualified DB teams to assemble. It is recommended that CVRD monitor the availability of contractors/equipment as the procurement schedule is firmed up, either informally through market sounding or formally through an RFEOI, to confirm sufficient market capacity for the tunneling component close to the time of procurement.

5. If market capacity for tunneling is restricted at the time of procurement, there are several possible courses of action which would preserve the benefits of scenario I:

    a. Proceed with scenario I, however postpone the qualification of the tunneling contractor until the RFP stage (as opposed to including it in the RFQ stage). This would relieve tunneling contractors from making early commitments to DB teams that are not shortlisted, preserving the pool of tunneling contractors until the shortlist of DB contractors is determined. **This is the recommended approach if there are no more than three tunneling contractors in the market.**

    b. If the pool of tunneling contractors is very restricted, allow tunneling contractors to participate in the RFP process non-exclusively, that is, allow them to participate on more than one DB team at their discretion. This is similar to "shared use" parties as defined in the CVRD Water Treatment Project RFP, except that there would be no *prohibition* on a tunneling contractor being exclusive to one DB team. With this approach, for example, there might be three DB teams, two with tunneling contractor "X", and one with tunneling contractor "Y". It is also conceivable but unlikely that a single tunneling contractor is a member of all three DB teams. In this latter case, there would be no competitive pricing pressure on the tunneling sub-project, however CVRD would still receive the integration benefits of bundling the tunneling with the rest of the work. **This is the recommended approach if there are only two tunneling contractors in the market.**

6. **If there is only one tunneling contractor in the market**, then scenario E, a bundled DB for the pump stations and cut/cover forcemain combined with a separate DB for the tunneled section is recommended. However, since there would be no competition for the tunneled section (i.e. no design competition, and no price competition), an early contractor involvement approach rather than a DB may be beneficial. With this approach, CVRD would involve the tunneling contractor collaboratively in the tunnel sub-project design to leverage its specialist expertise (with CVRD's design consultant) and negotiate a payment approach such as a cost plus or a pain/gain share approach. It is also recommended that the market for the bundled DB for the pump stations and cut/cover forcemain be confirmed prior to proceeding with this approach.

Option 2

Option 2, while not explicitly assessed in the market sounding exercise or the multiple criteria assessment, is not different from Option 3 in any way that would make the conclusions drawn for Option 3 with regard to market sounding or MCA inapplicable to Option 2.

Appendix A – Market Sounding Brief

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Deloitte.

Wastewater Conveyance Project: Market Sounding Brief

Comox Valley Regional District

June 22, 2020

Comox Valley Regional District
Wastewater Conveyance Project - Market Sounding Brief

Contents

1. Introduction

1.1 Purpose

The Comox Valley Regional District (CVRD) is planning a major wastewater conveyance project and is consulting the market of construction contractors to canvass interest and solicit feedback on the project, the procurement model, and sub-project bundling. To this end, this briefing provides project background and a series of questions for contractors.

1.2 Participation

The market sounding will be conducted by Deloitte and interviews may include participation by CVRD staff.

Whether or not a company participates in the market sounding, or is invited to participate in the market sounding, will have no bearing whatsoever on the eligibility of the company to participate in any future procurement of the project.

1.3 Limitations

This document was prepared for the exclusive use of CVRD and distribution to market sounding participants, and is not intended for general circulation or publication, nor is it to be reproduced or used without written permission of Deloitte. It relies on certain information provided by third parties, none of which Deloitte has independently reviewed. No third party is entitled to rely, in any manner or for any purpose, on this report. Deloitte's services may include advice or recommendations, but all decisions in connection with the implementation of such advice and recommendations shall be the responsibility of, and be made by, the Comox Valley Regional District.

The information provided regarding the project is preliminary, subject to change, and is intended only to provide the basis for discussion with market sounding participants.

2. Project overview

2.1 Owner overview

The Comox Valley Regional District (CVRD) is a federation of three electoral areas and three municipalities providing sustainable services for residents and visitors to the area. The members of the regional district work collaboratively on services for the benefit of the diverse urban and rural areas of the Comox Valley. The CVRD owns and operates the Comox Valley Water Pollution Control Centre and regional wastewater conveyance system for the communities of Courtenay, Comox, K'ómoks First Nation and CFB Comox.

2.2 Project description

To eliminate a vulnerable section of sewer pipe that runs along Balmoral Beach, below the Willemar Bluffs, the CVRD has initiated a liquid waste management planning process and examined a wide range of conveyance options and alignments. The subject of this document is phase one of an anticipated two-phase long-term plan (the approach presented herein has not yet been formally approved but is believed to be a likely outcome of the planning process that will be concluded this fall).

The Project has been grouped for discussion into three main sub-projects and consists of:

Sub-project		**Estimated capital cost ($2020)**
1	Upgrades to three pump stations one major critical pump station (2 duty/ 1 standby 170HP pumps), one medium critical pump station(2 duty/ 1 standby 70HP pumps) and one small pump station. Upgrades to include new pumps to increase discharge pressure associated piping modifications and upgrades electrical and mechanical components. Also includes the tie-in of the new forcemain to the headworks at the wastewater treatment plant.	$7.8M
2	A 2,300 m cut/cover 1,200 mm dia. forcemain section through the Town of Comox from Marina Park and ending near the corner of Lazo and Torrence Road; including a tie-in to the existing live forcemain on land at Marina Park; decommissioning of the downstream section of forcemain after the tie-in	$6.5M
3	A 1,200 m tunnelled 1,200 mm dia. forcemain section beginning at the corner of Lazo and Torrence Road and ending near the wastewater treatment plant	$16.7M
	Total	$31.0 M

A plan of the Project is shown on the following page.

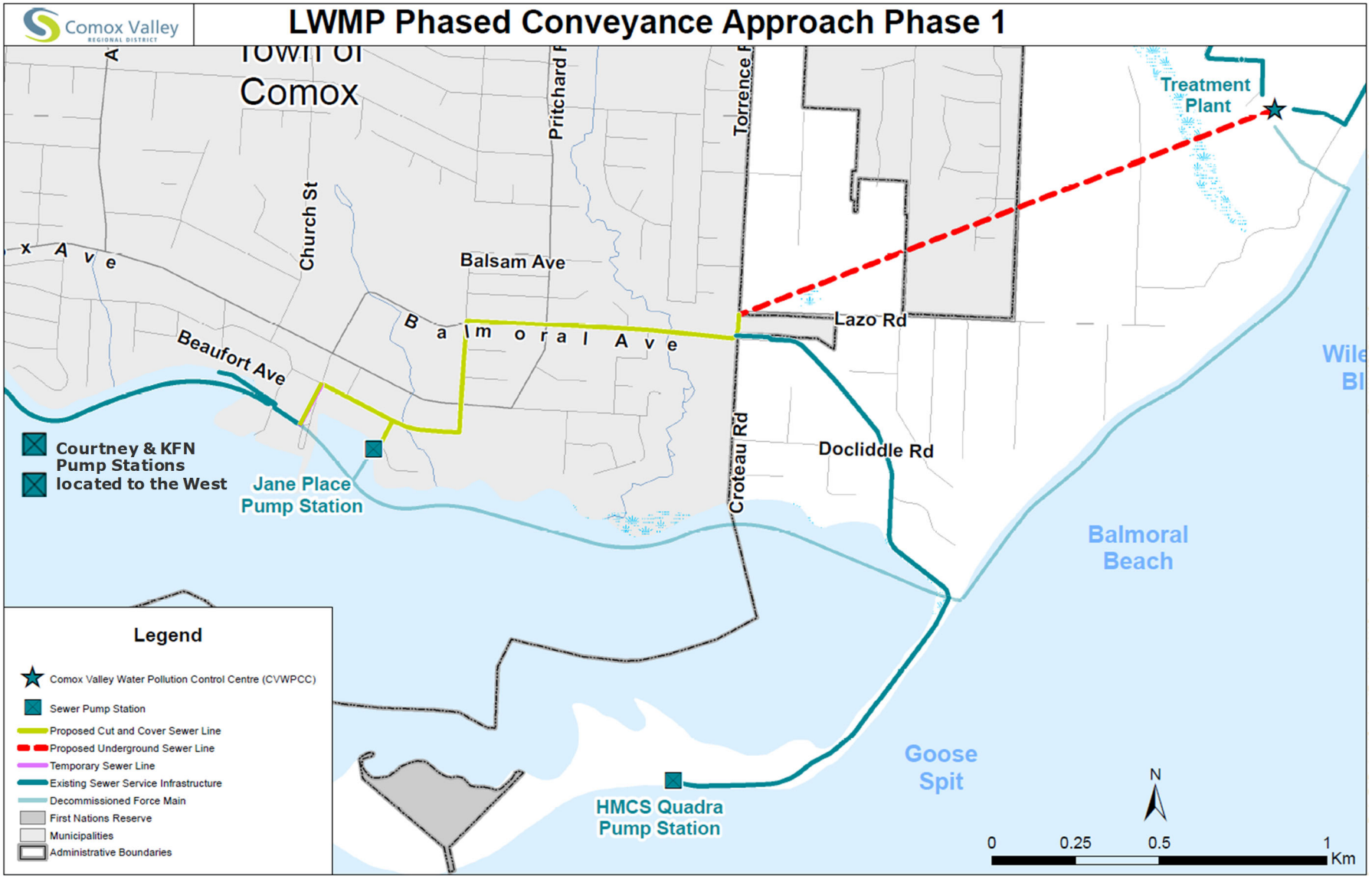
Geotechnical and groundwater study of the forcemain route to confirm feasibility is soon to commence. An assessment of shield tunnelling (digger shield), slurry microtunelling, and, and horizontal directional drilling found directional drilling to be feasible and most cost effective, subject to geotechnical findings and availability of a sufficient pipe laydown area.

The pump stations are critical infrastructure that must be kept in service during the upgrades.

The timing of the project is not yet firm, but there is some urgency in eliminating the vulnerable pipe section from the system and so CVRD is considering steps to advance the project ahead of the overall Liquid Waste Management Planning Process.

2.3 Procurement models

CVRD is considering design-bid-build and design-build approaches for the Project.


LWMP Phased Conveyance Approach Phase 1
Comox Valley
Town of Comox
Church St
Pritchard
Torrence
Balsam Ave
Beaufort Ave
Balmoral Ave
Lazo Rd
Treatment Plant
Docliddle Rd
Croteau Rd
Courtney & KFN Pump Stations located to the West
Jane Place Pump Station
Balmoral Beach
Goose Spit
HMCS Quadra Pump Station
Legend
Comox Valley Water Pollution Control Centre (CVWPCC)
Sewer Pump Station
Proposed Cut and Cover Sewer Line
Proposed Underground Sewer Line
Temporary Sewer Line
Existing Sewer Service Infrastructure
Decommissioned Force Main
First Nations Reserve
Municipalities
Administrative Boundaries
N
0
0.25
0.5
1
Km

3. Discussion guide / questions

The questions below are intended to guide the discussion based on the particular areas of interest and expertise of the market sounding participants.

3.1 Firm background and interests

1. What is your firm's typical role(s) and expertise on similar projects?
2. Do you have existing DB partnering arrangements or would you need to specifically seek other partners for this project?
3. Can you identify any specific risks that would be of concern in your typical project role?

3.2 Pump station upgrades / WWTP tie-in sub-project

4. What is your interest in this sub-project as a traditional design-bid-build project? Any caveats?
5. What is your interest in this sub-project as a fixed-price design build project? Any caveats?
6. Do you see any technical advantages or disadvantages in bundling this sub-project with the forcemain sub-project(s)?
7. Would bundling this sub-project with the forcemain sub-project(s) affect your level of interest in DBB and/or DB?

3.3 Cut/cover forcemain sub-project

8. What is your interest in this sub-project as a traditional design-bid-build project? Any caveats?
9. What is your interest in this sub-project as a fixed-price design build project? Any caveats?
10. Do you see any technical advantages or disadvantages in bundling this sub-project with either of the other sub-projects?
11. Are would bundling this sub-project with one or both of the other sub-project(s) affect your level of interest in DBB and/or DB?

3.4 Tunnelled forcemain sub-project

12. What is the typical procurement and payment model for projects such as this?
    - What types of tunnelling technology might you consider?
    - Do you have any suggestions for CVRD as it commences the geotechnical and groundwater investigations?
13. What is your interest in this sub-project as a traditional design-bid-build project? Any caveats?
14. What is your interest in this sub-project as a fixed-price design build project? Any caveats?

15. Do you see any technical advantages or disadvantages in bundling this sub-project with either of the other sub-projects?

16. Are would bundling this sub-project with one or both of the other sub-project(s) affect your level of interest in DBB and/or DB?

Appendix B –
MCA Workshop Materials

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Deloitte.

CVRD Wastewater Conveyance Project

Procurement model MCA & bundling workshop

July 9, 2020

Agenda

1. Market sounding findings
2. Multiple Criteria Account assessment
   - Sub-project 1 – pump stations & WWTP tie-in
   - Sub-project 2 – cut/cover forcemain
   - Sub-project 3 – tunneled forcemain
3. Bundling discussion

Market sounding

Participating firms

Participant	Pump Stations	Cut/Cover	Tunneling / HDD	Bundled	Project Interest DB/DBB/Both
Ridgeline Mechanical	X	X			DBB
Knappet Industries	X	X			DBB
Tritech Group	X				DB
Wacor Holdings	X	X			DBB
Archie Johnson Plumbing & Heating	X				DBB
Hazelwood Construction	X	X		X	DBB
Aecon Group	X	X		X	Both
Bird Construction	X	X	X		n/a
Innovative Pipeline Crossings (IPC)			X	X	Both
The Crossing Group			X		Both
Michels Canada		X	X	X	Both

The information in this summary is based solely on discussions with these firms, which represent only a subset of the full market. The sample size is small for each discipline, requiring some generalities to be drawn from the discussions.

Sub-project 1: pump station upgrades / WWTP tie-in

DBB vs DB

- Strong interest in DBB
- Firms with DB experience would have interest as DB
- Local contractors strongly favor DBB

Bundling (i.e. any pros/cons to this element if bundled with others)

- Mechanical contractors prefer that the pump station not be bundled.
- Civil contractors were indifferent if the pump station was bundled with the other civil works (i.e. they would pursue the pump station whether bundled or not).

Other (i.e. any interesting/valuable observations or comments)

- Participants suggested that the CVRD pre-orders the pumps.
- Assuming there is enough competition, DB would likely be cheaper.
- Minimal scope to allow for creativity or competing designs.
- DB has a streamlined problem resolution process (integrated design–construction).
- DB may benefit from integrated design and bypass planning.

This sub-project will attract local and larger contractors as a DBB, and should attract sufficient interest as a DB from larger contractors.

Sub-project 2: cut/cover forcemain

DBB vs DB

- Strong interest in DBB
- Low interest in DB
- Local contractors strongly favor DBB

Bundling (i.e. any pros/cons to this element if bundled with others)

- Synergies could be realized with this sub-project and the two others (e.g. sharing excavators for pits and cut/cover).

Other (i.e. any interesting/valuable observations or comments)

- No scope to allow for creativity or competing designs.
- Once the sufficient field investigations (i.e. locates) are complete to make project available as a DB, it would be cost efficient for the CVRD to complete the design (i.e. DBB).
- Design efforts are small, therefore, it may be beneficial to procure as a DB to realize design-construction integration benefits.
- 2,300m would be considered a long project for one local contractor to complete in a single season (likely would require teaming of local contractors).
- Utility conflicts are a concern.

This sub-project will attract both local and larger contractors as a DBB, and if procured as a stand along project it may not attract sufficient interest as a DB.

Sub-project 3: tunneled forcemain

DBB vs DB

- Tunneling contractors are fairly indifferent to DBB and DB.
- From the discussions, it seemed that due to the high level of contractor input on means and methods, the differences between DBB and DB for the tunneled forcemain may be minimal.

Bundling (i.e. any pros/cons to this element if bundled with others)

- Specialized tunneling contractors will be utilized regardless if the tunneled forcemain is bundled or procured on its own. These contractors would likely not GC the entire project.
- Synergies could be realized with this sub-project and the two others (e.g. sharing excavators for pits and cut/cover).

Other (i.e. any interesting/valuable observations or comments)

- Micro-tunneling rather than HDD may be dictated by geotechnical conditions and laydown requirements.
- Low level of detailed design is required to be completed by the owner.
- Geotechnical investigations are critical to allow contractors to bid. Geotechnical baseline report is required (i.e. risk share on geotechnical conditions).
- Equipment availability and contractor interest will depend on project timing (equipment availability could be a limiting factor and/or schedule driver).
- Unit rate (e.g. machine time) or lump sum contracts are possible.

There appears to be ample interest in this sub-project from specialized contractors for either DB or DBB.

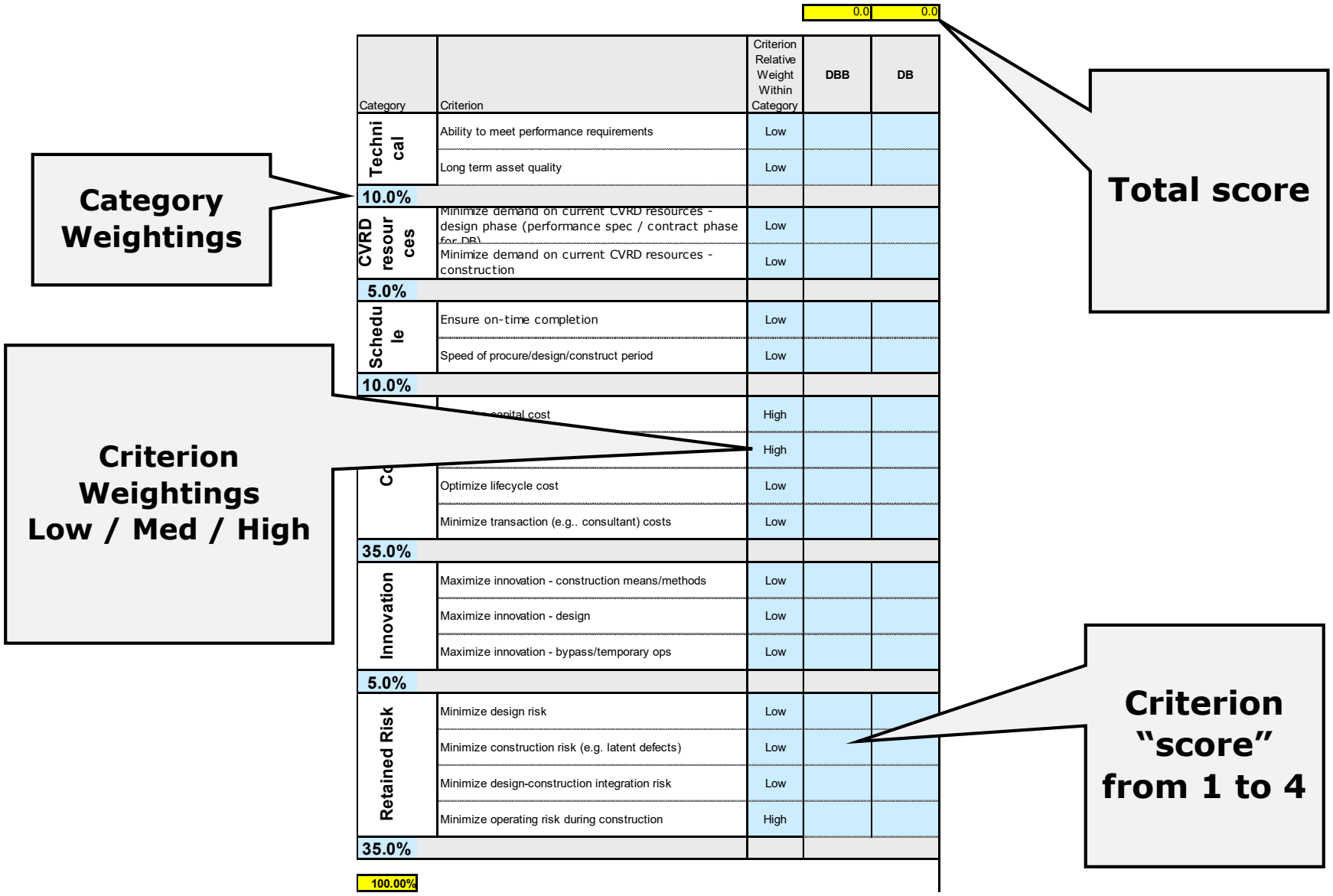
Bundling of sub-projects

Pros
• Single point of accountability for completion of the entire project, including timing and commissioning. • Synergies could be realized if sub-projects are bundled (e.g. sharing excavators for pits and cut/cover).
Cons
• Additional costs for a GC to coordinate multiple sub-projects. • Local contractors in particular noted there is no need to bundle sub-projects.

- There was no indication that the sub-projects need to be consolidated to attract market interest (each sub-project will attract market interest on their own).
- There is interest in bundling the pump stations and cut/cover sub-projects and there are likely sufficient contractors in the market to allow necessary teaming
- The number of available tunneling contractors may be limited and could be a limiting factor in how the market can respond if the tunneled section is bundled with other sub-projects – this could limit competition for the other sub-project scopes.

MCA
Per sub-project

Multiple criteria assessment



			0.0	0.0
Category	Criterion	Criterion Relative Weight Within Category	DBB	DB
Technical	Ability to meet performance requirements	Low		
	Long term asset quality	Low		
10.0%				
CVRD resources	Minimize demand on current CVRD resources - design phase (performance spec / contract phase for DB)	Low		
	Minimize demand on current CVRD resources - construction	Low		
5.0%				
Schedule	Ensure on-time completion	Low		
	Speed of procure/design/construct period	Low		
10.0%				
Co	[illegible] capital cost	High		
	[illegible]	High		
	Optimize lifecycle cost	Low		
	Minimize transaction (e.g.. consultant) costs	Low		
35.0%				
Innovation	Maximize innovation - construction means/methods	Low		
	Maximize innovation - design	Low		
	Maximize innovation - bypass/temporary ops	Low		
5.0%				
Retained Risk	Minimize design risk	Low		
	Minimize construction risk (e.g. latent defects)	Low		
	Minimize design-construction integration risk	Low		
	Minimize operating risk during construction	High		
35.0%				
100.00%				

MCA process overview

For each sub-project

1. Validate categories, category weightings
2. For each criteria:
   - Assess criteria weightings
   - Assess scores for DBB and DB

MCA criterion assessment

Workshop participants to discuss and come to consensus score on how each delivery model satisfies (or not) each criterion

Score	Meaning
1	Fails to meet requirements and/or produces undesirable outcomes for CVRD
2	Minimally meets requirements and/or produces neither negative or positive outcomes for CVRD
3	Adequately meets requirements and/or produces positive outcomes for CVRD
4	Exceeds requirements and/or produces exceptional outcomes for CVRD

Criteria for each project, and preliminary category weightings and in-category criteria weights have been developed. See the following two pages for the criteria to be assessed.

Bundling

Bundling considerations

Delivery model

- Is there a strong preference for a delivery model for any sub-project that would justify severing it from the remainder?

Design

- Is it materially more optimal for all sub-projects to be designed as one (i.e. to optimize pump size vs. pipe size etc.)? Could there be a material benefit from a "design competition" through a DB for a bundled project?

Construction interfaces / coordination / timing

- Are there dependencies or complications at the sub-project boundaries that normal construction practice can't overcome?
- Can the sub-projects be commissioned/tested independently?
- Can the pump stations, in their upgraded form, be operated using the existing forcemain if sub-project 2 or 3 are late?

Consequences of tunneling failure

- Should sub-projects 1 and 2 be postponed until tunneling success is demonstrated?

Market preference/willingness

- Sub-projects 1 + 2: could see local and larger contractors respond
- 1 + 2 + 3: only of interest to larger contractors. # of tunnelers / available equipment may limit response

Appendix C – MCA Sensitivity Analysis

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CVRD Wastewater Conveyance Project

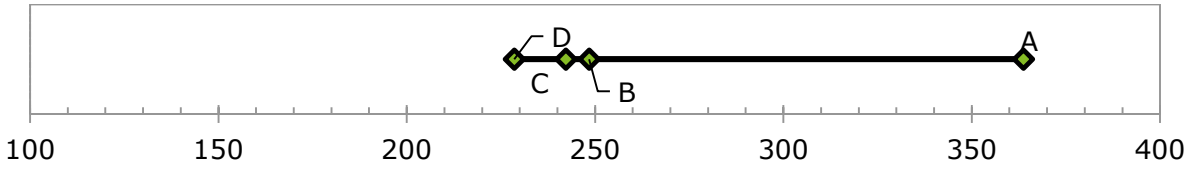
MCA Sensitivity Analysis

July 28, 2020

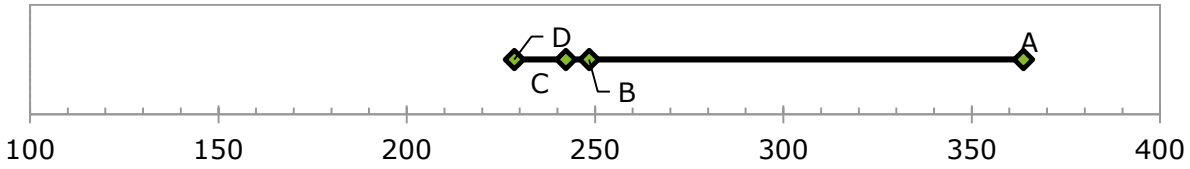
MCA Sensitivity Analysis – Unphased Approach

MCA Sensitivity Analysis | Unphased Approach

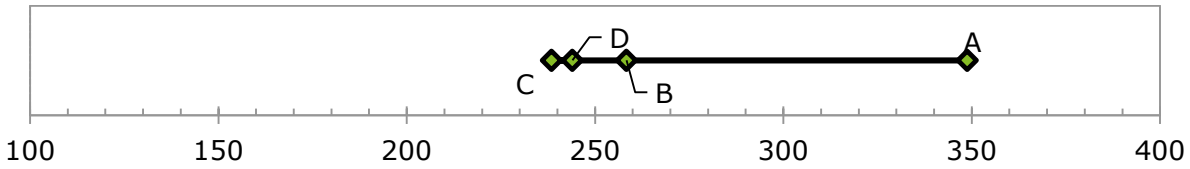
Original scenario results



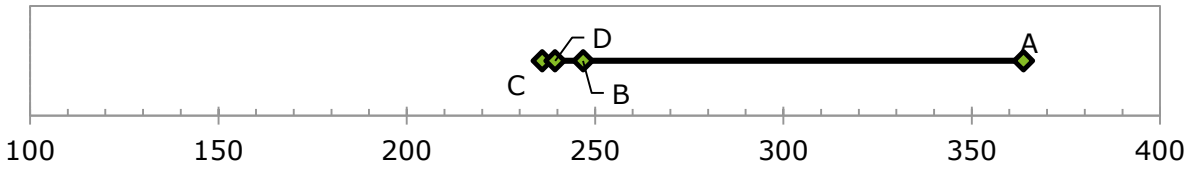
Impact of swapping the Technical and Cost weightings



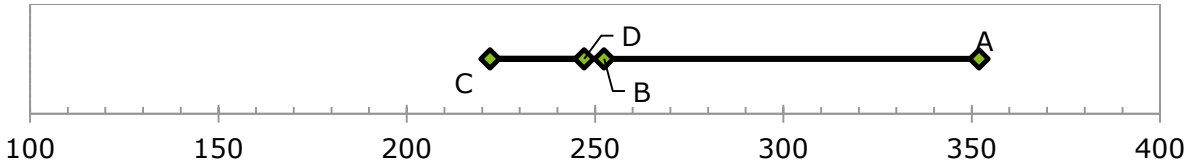
Impact of swapping the Technical and Risk weightings



Impact of swapping the Cost and Risk weightings



No Risk weighting (remaining categories proportionately increased)



A – DB bundled PS + cut/cover (1 contract)

B – DBB bundled PS + cut/cover (1 contract)

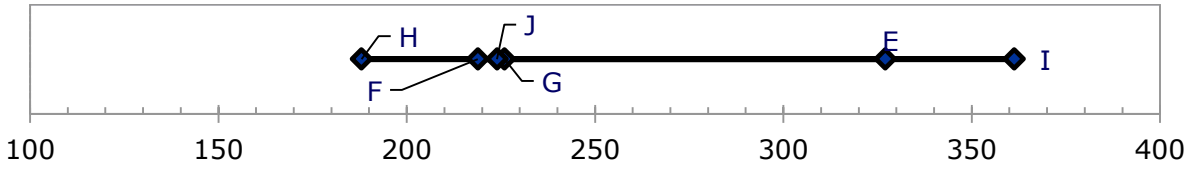
C – DBB cut/cover + DB PS (2 contracts)

D – DBB cut/cover + DBB PS (2 contracts)

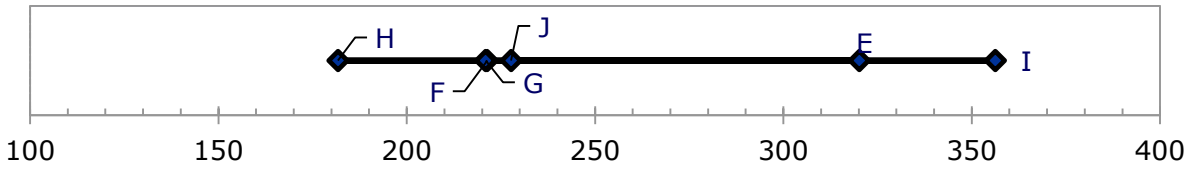
MCA Sensitivity Analysis – Phased Approach

MCA Sensitivity Analysis | Phased Aroject

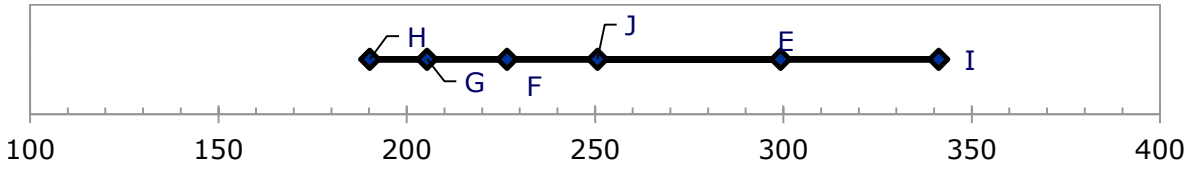
Original scenario results



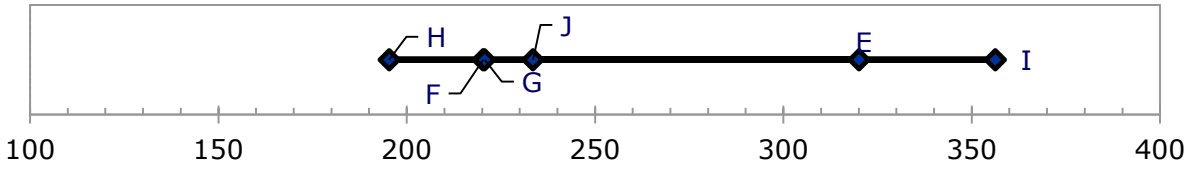
Impact of swapping the Technical and Cost weightings



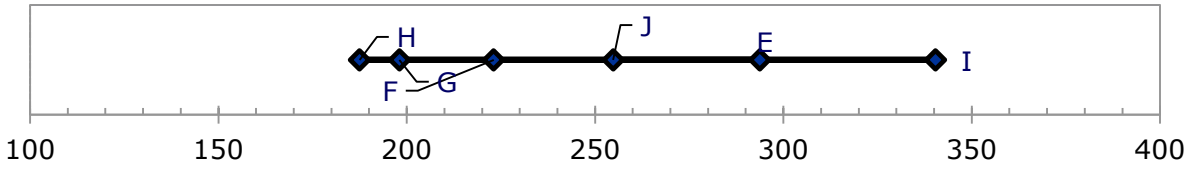
Impact of swapping the Technical and Risk weightings



Impact of swapping the Cost and Risk weightings



No Risk weighting (remaining categories proportionately increased)



E – DB bundled PS + cut/cover, and DB tunnel (2 contract)

F – DBB bundled PS + cut/cover, and DB tunnel (2 contract)

G – DBB cut/cover, DB PS, and DB tunnel (3 contracts)

H – DBB cut/cover, DBB PS, and DB tunnel (3 contracts)

I – Bundled all sub-projects as DB (1 contract)

J – Bundled all sub-projects as DBB (1 contract)

Appendix D – CMAR Considerations

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Construction Management At Risk

This supplementation section discusses the Construction Management at Risk (CMAR) delivery model, which was a "design suggestion" made by Strategic Value Solutions, Inc. as part of their value planning assignment for the Project which was commissioned by CVRD.

Definition

CMAR is a so-called collaborative delivery model, and is one of the "early contractor involvement" delivery models where the builder is on the owner's team well in advance of the design being complete. CMAR involves selecting a construction contractor to participate in the design process (under a contract separate from that of the design consultant), and to eventually provide a guaranteed maximum price (GMP) to construct the project. Hence, the contractor is "at risk" of the project costs coming in over the GMP. The owner retains the right to abandon the CMAR and tender the design as a DBB if it cannot negotiate an acceptable GMP.

Often any "savings" under the GMP are split between owner and contractor. An open-book cost accounting approach may be taken for the construction work, which provides some transparency to the owner of actual costs. The extent of this transparency will depend on the amount of work that is self-performed by the CMAR contractor versus tendered to subcontractors. The CMAR contractor earns a guaranteed markup on all subcontracted work (subject to the GMP).

Early contractor involvement models are generally considered in a few situations: cases where the end solution is not well defined and difficult to specify, to address situations where integrated DB-style models are desirable but the market is not willing to take on the risk of DB/EPC type contracts, or when accelerated construction of certain project elements is desired. For example, the BC government is currently utilizing progressive design-build and alliance models for hospitals because certain contractors are not as willing to take full DB risk under competitive pressure (either as standalone DBs, or within P3 models) as they have been historically.

Comment

The extent to which the CMAR contractor is truly at risk depends on the amount of contingency it builds into the GMP. There is little incentive for the CMAR contractor to minimize the GMP, because it is to its advantage to make the GMP as large as it can without causing the owner to abandon CMAR and tender the design as a DBB. Benefits to the CMAR contractor to maximizing the GMP include mitigation and/or elimination of risk costs, maximizing the cost base to which it is entitled a markup, and creating the maximum potential for windfall profits if actual cost is lower than the GMP.

The resources for the owner to effectively negotiate the GMP with the contractor should be considered, as there would be a large information/expertise asymmetry to the benefit of the contractor in this situation. CVRD would need to rely on the design consultant, and possibly consider hiring a quantity surveyor to validate the GMP as part of the negotiation. Another consideration is that CMAR results in a large sole-source construction contract, which may not be an adherence with purchasing policy.

With regard to the situations where early contractor involvement typically merits consideration, the Project has well established performance requirements and thus an effective Statement of Requirements for a DB is achievable. CVRD has demonstrated its ability to manage scope change risk in a DB with high quality procurement documentation on the Comox Valley Water Treatment Project. Recommendation #6 of the Procurement Model Assessment report is to consider an early contractor approach in the specific circumstance where only a single tunneling contractor is available.

On procurement model analyses assignments under taken by Deloitte, CMAR has occasionally been included in the models considered. Through those analyses, it has been rejected for various reasons, with the a preeminent concern being the sole-sourcing and the contractor's incentives with respect to GMP-setting as discussed above. These projects have been similar to the Project in that the scope has been well defined and the performance requirements readily specified.

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