MEMORANDUM

OPG Confidential

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Ken Hartwick
Chief Executive Officer

Business Case Justification to Proceed with a Design Build Finance Operate and Maintain Contracting Model for the Darlington Water Treatment Plant

Recommendation

1. Proceed with a design, build, finance, operate and maintain (DBFOM) contracting model for the Darlington Water Treatment Plant (WTP), subject to #2 below.

2. Continue to pursue and finalize a commercial arrangement with consortium [redacted] that addresses the operations and maintenance of the WTP consistent with collective agreements and the arbitration decision in favour of the Power Workers' Union (PWU); with intent to bring forward a contract requisition memorandum for approval in Q2 2021 to execute the demineralized water supply agreement.

Background

The existing WTP is approaching its end of service life. Despite reliable operation to date, the WTP will be challenged to maintain satisfactory system health status and reliability going forward. A strategy needs to be in place to ensure a reliable supply of ultra-pure demineralized water is available for Darlington's ongoing operations.

Three options were considered:

1. Upgrade the existing WTP with new technology and equipment, with OPG operating and maintaining.
2. Build a new WTP using an engineer, procure, construct, (EPC) contracting strategy, with OPG operating and maintaining ("Make Water" option).
3. Build a new WTP using a DBFOM contracting model, which outsources the construction, operations and maintenance of the plant to a third party

specializing in ultra-pure demineralized water management ("Buy Water" option).

Option 1 for upgrading the existing WTP with new equipment and technology would increase overall risk to the project and water supply, as the existing WTP is within the security fence thus requiring integration with plant operations. Maintaining the facility in this location would result in increased regulatory obligations relative to other options. Further; upgrading would require a phased approach, including a period of deconstruction and installation with a potential for interruption of water supply. To minimize the risks, the upgrading option is not recommended and was not evaluated further.

Based on the existing configuration of structures and support buildings at the Darlington site, the optimal location for the new WTP is north of the sally port on the east side of the station. A separate WTP Interconnect Project will construct and commission station tie-ins designed to segregate the WTP, enabling it to be built to commercial standards outside the fence.[1]

In 2017, OPG conducted a preliminary analysis, based on several indicative pricing submissions, which identified the Buy Water option (Option 3) as having an economic advantage over the Make Water option (Option 2). Further to this, in order to more fully assess the risks and benefits between the Make Water and Buy Water options, OPG initiated an open procurement to validate if the market would respond to a DBFOM and to identify potential vendors. This was followed by an invitational Request for Proposal (RFP) in 2018 to four selected proponents for the Buy Water option. Market response was consistent with OPG's expectations, and the technical, commercial and financial evaluations confirmed that the Buy Water option is preferable to the Make Water option. The process also resulted in the selection of a preferred vendor, [redacted]

Benefits of the Buy Water Option

In addition to the lifecycle cost advantage set out in the financial analysis below, the key strategic and operational considerations (not quantified in the financial analysis) for proceeding with the Buy Water option over the Make Water option include:

1. *Transfer of Risks* – DBFOM delivery model assigns known project risk (except for, e.g., deviation of geological conditions, OPG change orders, and force majeure), future capital financing risk, and operational risks to the DBFOM vendor to manage. The DBFOM vendor will also be responsible for training the operators and maintenance workers.

2. *Security of Supply* – The terms of the agreement will provide for guaranteed ultra-pure demineralized water supply with no changes in quality specifications within 48 hours of a water supply disruption from the WTP, minimizing the impact on the station's reliability.

3. *Operational Expertise* – The DBFOM model will leverage ultra-pure demineralized water and operational efficiencies due to technological innovation

[1] The WTP Interconnect Project is common to both the Make Water and Buy Water options, and is therefore excluded from the financial analysis presented.

and economies of scale enjoyed by the vendor as an industry leader in water treatment in North America. OPG does not currently have expertise in the new technologies that will be in use for the new WTP.

4. *Industry Best Practice* – The DBFOM delivery model is consistent with Public-Private Partnerships (P3) delivery model, which leverages industry expertise to enterprise organizations where expertise is not ordinarily developed or maintained within the enterprise. For water management applications, the DBFOM delivery model is utilized for municipal applications.

The DBFOM agreement assigns risk and risk management activities through various phases of the project. OPG will maintain appropriate oversight over the DBFOM delivery to ensure that the WTP meets Darlington's water quality, reliability and operational requirements. The water supply agreement will stipulate a number of safeguards against non-performance, including financial disincentives and an "off ramp" option for OPG to take over the asset.

Financial Comparison: Buy Water vs. Make Water

Financial analysis has concluded that, based on current estimates, the Buy Water option through the DBFOM contract model yields a lower lifecycle cost (in present value terms) at approximately [redacted] as compared to that of the Make Water option at approximately [redacted] resulting in a net benefit of [redacted] The Buy Water economics calculation is based on the present value of the contract payments under [redacted] proposal. The Make Water economics calculation is based on the present value of a technically-qualified proposal with the lowest cost from an earlier EPC RFP (Class 4 estimate) scaled up to meet the latest capacity and technical criteria, as well as historical operations and maintenance requirements for the existing WTP.

Appendix A provides a breakdown of the financial analysis.

While some of the details of the DBFOM financial analysis are subject to the completion of negotiations with the vendor and the PWU related to the operations and maintenance of the WTP, and final target in-service date resulting from such, this is not expected to have a material impact on the financial comparison.

Under the DBFOM contracting model, [redacted] will legally own the new WTP. For financial reporting purposes and proposed regulatory recovery treatment, OPG will record the new WTP as an asset in accordance with accounting standards (both US GAAP and OEB Accounting Procedures Handbook) because the underlying water supply agreement is deemed to be a finance lease arrangement, which requires a recognition of a financial liability and an off-setting capital asset. Based on business planning assumptions, the WTP asset cost has been estimated at approximately $139 M, being the sum of the present value of the applicable payments over the proposed contract life.[2]

[2] As noted above, the outcome of negotiations with the PWU and [redacted] related to the operations and maintenance (O&M) of the WTP is not expected to have a material impact on the economic comparison between the two options. However, due to accounting requirements for ongoing O&M costs in a finance lease, the final operations and maintenance arrangements may result in changes to the estimated asset cost.

Current Status

Following the 2018 RFP, OPG selected [redacted] as the successful proponent for the Buy Water option to negotiate an agreement for the supply of ultra-pure demineralized water for the next 30 years. The proposed agreement consists of three streams of fixed monthly payments for capital, fixed operations, and scheduled rehabilitation, plus a monthly variable payment for consumables driven by water usage.

Consistent with OPG standard procurement and labour relations practices, OPG pursued a Purchase Services Agreement (PSA) with the PWU for the outsourcing of the operations and maintenance responsibility of the WTP under the DBFOM contracting strategy.

The negotiation with the PWU led to an arbitration and in Q4 2019, the arbitrator issued an award to disallow a PSA. As a result, OPG intends to negotiate with the PWU and [redacted] with the goal of revising the proposed DBFOM contract to address the operations and maintenance of the WTP.

The target completion date for a demineralized water supply agreement to be ready for approval is Q2 2021. At that time, a contract requisition memorandum will be prepared and routed for approval to execute the DBFOM agreement with [redacted]

Next Steps

1. Complete negotiations with union partners to address the operations and maintenance of the WTP.
2. Work with [redacted] on modifying and finalizing the proposed demineralized water supply agreement to reflect the outcome of union negotiations in #1 above.

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Appendix A – Financial Analysis

The financial analysis shows that the DBFOM (Buy Water) option is economically preferred over the EPC and OPG operations and maintenance option (Make Water) by [redacted] based on current assumptions. The discount rate used is an after-tax long-term cost of debt of 2.62% (3.50% pre-tax).

Alternatives	"Make Water" EPC/OPG-O&M	"Buy Water" DBFOM
PV Cost 2020$	[redacted]	[redacted] [3]
After-tax PV Cash Flows		
Capital Cost (before tax shield)	PV [redacted] • [redacted] project cost based on lowest cost technically-qualified proposal from an earlier EPC RFP[4] scaled up to meet the latest capacity and technical criteria	PV [redacted] • [redacted] before tax, with no escalation as the vendor assumes future capital financing risk
Tax Shield for Capital Cost	PV [redacted] • CCA Class 17 (declining 8%/yr)	PV [redacted] • Payment stream to be treated as 100% tax deductible as incurred
Operating Costs (after-tax)	PV [redacted] • [redacted] before tax, [redacted] after tax, escalated at 2%/yr • Based on historical operational experience with existing WTP	PV [redacted] • Fixed [redacted] before tax, [redacted] after tax, escalated at 2.16%/yr • Variable [redacted] before tax, [redacted] after tax, escalated at 0.49%/yr • Based on proposed water supply agreement, subject to completion of negotiations with union partners
Scheduled Rehabilitation (after-tax)	PV [redacted] • Total [redacted] before tax, [redacted] after tax, over 30 years • Assumed to be same as DBFOM, as both options would use the same technology	PV [redacted] • Total [redacted] before tax, [redacted] after tax, over 30 years
Inventory Working Capital (after-tax)	PV [redacted] • Initial estimated net working capital of [redacted] required to maintain the facility (e.g., consumables, spare parts); escalated at 2%/yr	No incremental impact, as the DBFOM vendor has priced this cost into the operating and scheduled rehabilitation payments

[3] The main differences between the [redacted] Buy Water lifecycle cost value and the approximately $138.6 M business planning in-service cost relate to: exclusion of income tax shield benefit and variable operating payments from the in-service cost calculation in accordance with US GAAP, and use of a pre-tax discount rate, rather than an after-tax rate, to determine the in-service cost. In addition, the present value calculation for the in-service cost is as of the in-service year, versus the year of financial analysis for the Buy Water lifecycle cost.

[4] Class 4 estimate