NW Natural®

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June 1, 2020

VIA ELECTRONIC FILING

Public Utility Commission of Oregon
Attn: Filing Center
201 High St SE, Suite 100
Salem, Oregon 97301-3398

Re: UM 2030 – Phase II – NW Natural's Work Papers Demonstrating RNG Methodology

Northwest Natural Gas Company, dba NW Natural, (NW Natural or Company) hereby files its work papers demonstrating our Renewable Natural Gas (RNG) supply resource evaluation methodology as applied to a potential RNG project. A written narrative summarizing the application of the methodology, the potential RNG project, and the methodology inputs is also included. The filing marks the initial filing for Phase 2 of this docket.

On August 27, 2019, at the Oregon Public Utility Commission (Commission) public meeting, the Commission opened an investigation into the appropriate methodology for determining the cost-effectiveness of the Company's RNG resources. In October, Staff developed a scope and timeline which consisted of two phases. Phase 1 reviewed the methodology to be applied to RNG resources and Phase 2 reviewed the same methodology applied to an actual project. Phase 1 was completed March 17, 2020.

The enclosed information is provided as indicated in the Phase II schedule for this proceeding. Per Staff's schedule served on January 22, 2020:

- When NW Natural has a project for consideration, the Company will file work papers demonstrating the RNG methodology as applied to the RNG project.
- Within two months of the date the company shares the RNG project information, there will be a final opportunity for all parties to submit comments on the methodology.
- Within one month, Staff will bring a recommendation to the Commission at a public meeting. Commissioners will have the option to acknowledge the methodology and/or provide further guidance.

Confidential information and highly confidential information will be provided pursuant to Order No. 20-165 and Order No. 20-166, respectively, and will be distributed consistent with the instructions by Chief Administrative Law Judge Moser in his March 26, 2020 memo to stakeholders providing new procedures for filing confidential and highly confidential information.

Please address correspondence on this matter to me with copies to the following:

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Rates and Regulatory Affairs
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Sincerely,

NW NATURAL

/s/ Rebecca Brown

Rebecca Brown
Regulatory Consultant

Enclosures

NW Natural

CERTIFICATE OF SERVICE
UM 2030

I hereby certify that on June 1, 2020, I have electronically served confidential and highly confidential work papers demonstrating NW Natural's RNG methodology to parties of record for docket UM 2030 who have signed or are automatically covered under General Protective Order No. 20-165 and/or Modified Protective Order No. 20-166.

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DATED June 1, 2020, Portland, OR.

/s/ Erica Lee-Pella
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UM 2030 – Phase 2

NW Natural's Methodology for Evaluating Renewable Natural Gas Projects

PURPOSE AND OVERVIEW

As part of its 2018 IRP, NW Natural included Appendix H – Renewable Gas Supply Resource Evaluation Methodology. This approach was enabled by new information and expertise gained since completing the 2016 IRP. As such, NW Natural evaluated low carbon gas resources in a much more detailed and comprehensive manner in the 2018 IRP. This methodology applies the current least cost and least risk planning standard to RNG resources; it is not meant to expand the scope of integrated resource planning or serve as a policy statement regarding RNG. Within its 2018 IRP, NW Natural also requested acknowledgement of the Appendix H Methodology for determining cost effectiveness of RNG resources.

During the IRP process, Staff, "commended NWN for its leadership in presenting the Appendix H methodology for evaluating RNG."[1] However, there were still outstanding questions about the proposed methodology. These questions led to Staff recommending, and NW Natural supporting, the opening of a docket to investigate the use of the methodology. This recommendation was adopted by order and Docket UM 2030, Investigation Into the Use of Northwest Natural's Renewable Natural Gas Evaluation Methodology (Order No. 19-276 dated August 28,2019) was opened.

This filing is a continuation of the investigation process. Phase 1, a review of the methodology and a comment period is completed. This filing is focused on the Phase 2 process, with a potential project to formulate the discussion related to cost determination.

Phase 1 recap

As part of the investigation, NW Natural hosted a workshop on December 13, 2019 to explain the RNG evaluation methodology. The following pages explain how the potential project is evaluated on a cost-of-service basis which incorporates the all-in cost to customers, as discussed at the workshop. There is also discussion on the approach to evaluate total portfolio costs, as well as risks – which are addressed through least cost gas dispatching, Monte Carlo simulations, and cost-benefit comparison.

The RNG project is a least-cost/least-risk resource to acquire if the risk adjusted present value revenue requirement (rPVRR) of the portfolio with the RNG Project (R) is less than the rPVRR portfolio without the project (C). Mathematically:

$$\boldsymbol{rPVRR(R)<rPVRR(C)}$$

That is, the total cost (as determined by the present values of revenue requirements) of the renewable gas resource (represented by (R)) in the equation above compared to the same amount of a conventional resource (C). As presented in Appendix H, the annual all-in cost of RNG (R) = Cost of methane (M) + Emissions compliance costs (E) – Avoided infrastructure costs (I).

[1] Staff's report (page 15) presented at the February 26, 2019 Public Meeting.

As mentioned, the calculation will examine the entire lifespan of the project with the simplified equation:

$$\boldsymbol{R_T = M_T + E_T - I_T}$$

Phase 2 process

Phase 2 of UM 2030 was designed for stakeholders to see the analysis of a proposed RNG project in process. As detailed in Staff's Memo dated October 14, 2019:

> Phase 2 will consist of a review of the methodology as applied to an actual project. This should be sufficient to observe the methodology applied to an actual project, review the associated modeling assumptions, and decide on an RNG review process at the Commission.

NWN considers the filing of this document and workpapers to mark the beginning of Phase 2.

NWN will work with stakeholders at a future workshop, to be scheduled, to walk stakeholders through the evaluation process, including all of the calculations. Note that the situation with the proposed project is still fluid, negotiations are currently underway. The process steps are shown below in more detail, and NWN will endeavor to update parties as negotiations continue.

General Project Information

The project considered in this filing is a wastewater treatment plant-based RNG project. The wastewater plant is located in Hillsboro, OR, and is owned and operated by Clean Water Services (CWS), a county service district overseen by elected officials from Washington County. In October of 2019, CWS issued a request for proposals (RFP) for a party to develop an RNG project at their Rock Creek wastewater treatment facility.[2] In response to this, NW Natural evaluated the likely cost of developing an RNG project at the facility and developed and submitted a response to Clean Water Services. Clean Water Services evaluated multiple bids from other entities as well, in an ongoing process to select the best partner for their needs. The process is still ongoing, and NW Natural and Clean Water Services continue to communicate about potential project structures and arrangements, and continue to discuss potential terms so Clean Water Services has sufficient information to make a final determination about their most appropriate partner and path forward. There is not a specific timeline Clean Water Services has indicated they will follow in making a final determination and final award, if any, and the process has been somewhat delayed by COVID.

The proposed project itself would take gas from an existing digester (about 300 SCFM anticipated production) and clean and condition the gas to pipeline-quality RNG. The project also would include the construction of the interconnection to the NW Natural distribution system located along one side of the property.

[2] Clean Water Services' bid request information was available here: http://bids.cleanwaterservices.org/144, and has been included as Attachment 1.

NW Natural proposed to acquire the raw biogas under a [redacted] contract, and to provide all of the required capital investment necessary to develop[3] the RNG project. As part of the response to the RFP, we were required to provide a non-binding price proposal for the raw biogas (the price represented by P in the evaluation framework). We developed a price based on our initial evaluation of the avoided cost of the resource and our assessment of what was competitive in the market.

The contract proposed with Clean Water Services is just one of many types of contracts we might enter into within our RNG acquisition activities. Some of the potential resources will be contracts for raw biogas and landfill gas, and our total incremental cost will be inclusive of the raw gas costs or feedstock costs, the total capital costs required to upgrade and the avoided costs. In the case of Clean Water Services, we evaluate the project based on the avoided costs and the capital investment, to help us determine what a cost-effective final cost for the feedstock might be. That is, the cost for the raw gas is still uncertain and the cost-effective price will be determined following the initial capital investment and avoided costs.

Other contracts we may consider outside of this specific project may be for RNG that is delivered to us at pipeline quality, for immediate delivery to all our sales customers, while others may include some delivery of RNG to non-NW Natural customers in the transportation credit markets, with delivery to our sales customers planned for whenever the contract into the transportation market expires. In some cases, these may be concurrent: some RNG may go to the transportation market, while the remaining RNG may be delivered to our sales customers. In all cases, with the revenue earned by NW Natural from the sale into the transportation markets will be credited to the project and thus be calculated as additional revenue that is included in evaluating the project. Most operational RNG projects have existing offtakes selling the environmental attributes into the transportation markets, so when considering the potential acquisition of such a project, we would include the revenue in the overall project cost, and any RNG delivered to entities besides our sales customers would not be considered when calculating the avoided cost.

As presented in the revised appendix H and adapted from Phase 1 of this investigation, Table 1 provides a list of some of the potential contract structures NW Natural currently envisions are possible. This table is not an exhaustive list, as new contract opportunities may present themselves as the RNG market evolves. The evaluation methodology is meant to be flexible to adapt to the contracts in Table 1 and potential new contract types.

[3] Includes equipment to make the project viable, i.e. flow the gas onto NWN's system. See the COS Model (included in workpapers) for additional information.

Table 1: Possible Contract Structures

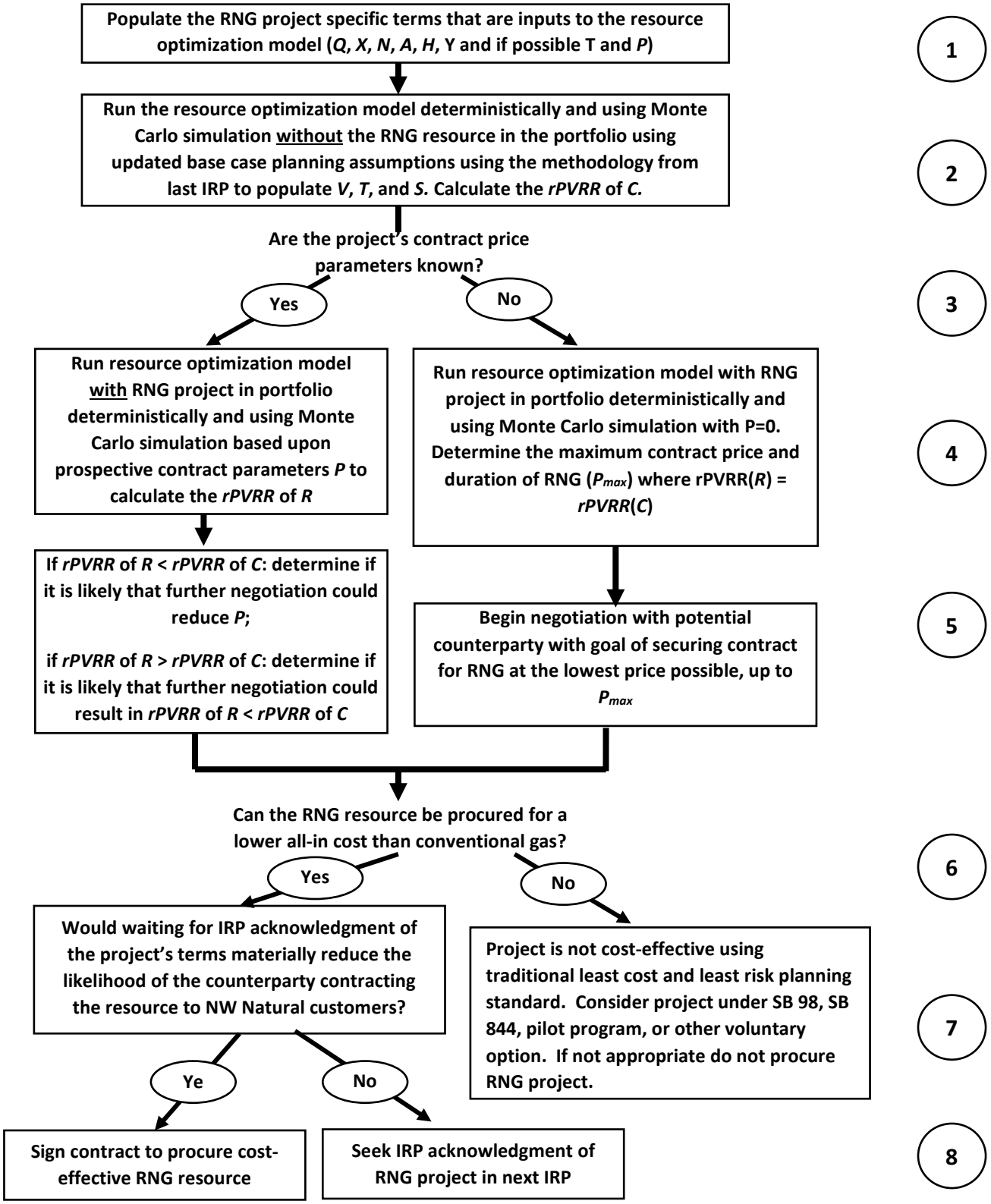
Type of Structure	Ownership of biogas production	Ownership of conditioning and cleanup equipment and/or pipeline interconnection	Cost basis for consideration of cost-effectiveness
RNG environmental attributes-only purchase	3rd party	3rd party	$/MMBtu contract for delivery of RNG's environmental attributes over a set period of time
RNG commodity-only purchase	3rd party	3rd party	Flat $/MMBtu contract for delivery of RNG over a set time period
Investment in gas conditioning and/or pipeline interconnection	3rd party	NW Natural	Capital costs of investment in gas cleanup/ interconnection, and some payment to third party for raw biogas
Investment in full RNG project development	NW Natural	NW Natural	Capital costs of gas production and gas clean-up/ interconnection; potentially a payment to the owner of the feedstock
Full acquisition of operational RNG project	NW Natural	NW Natural	Asset purchase price, plus any existing contractual obligations, and operating costs, which could include payments to feedstock owners. These projects could also include the acquisition of existing offtake contracts that we would take on and either see through to their end or potentially renegotiate.

Methodology:

Overview

The illustration below was included in NW Natural's revised Appendix H, with a similar version discussed at the December workshop. NWN has included it here to demonstrate the process followed in the RNG facility analysis. The line numbers are included for further discussion which follows.

Figure 1: RNG Project Analysis Step-by-Step



Step 1 – Populate the RNG project terms that are inputs to the resource optimization model.

Known values were included in the Project Fill-in sheet, included as Attachment 2. Table 2 below

Table 2: RNG Project Terms

Variable	Description	Value	Units*	Notes
Q	Quantity of gas	[redacted]	Dth/year	
X	Capital Investment Cost	[redacted]	2020 Dollars	Levelized annual payment
N^{RNG}	GHG Emission Intensity of RNG	[redacted]	Metric Tons CO2e/Dth	
A	Peak Day Supply	[redacted]	Dth/day	Assumes uniform production through the year
H	Peak Hour Supply	[redacted]	Dth/hour	Assumes uniform production through the day
Y	Variable Transport	[redacted]	per Dth	On-system resource
T	Timing of RNG purchases	[redacted]		Timing part of negotiations, assumptions for valuation
P	Price of RNG/RNG Feedstock/Raw biogas	[redacted]		Currently subject to negotiations

* Gas is measured in dekatherms, Dth where 1 dekatherm = 10 therms, and 1 therm = 29.3 KWh. See also NWN 2018 IRP, Appendix A Glossary.

** This is the total annual revenue requirement payment for the investment to make the project viable, i.e. flow the gas onto NWN's system. The levelized cost of the equipment needed to access the raw biogas is [redacted]. The total cost of RNG will also include the cost of the raw biogas, this figure would be compared to the all-in costs associated with a conventional resource.

*** The GHG for the project is listed at 0.035 metric tons CO2e/Dth, which does not reflect a project-specific value, but is instead a representative value for projects of a similar type. For valuation purposes NWN assumes a value of zero, which could change depending on the outcome of other dockets, including AR 632.

Step 2 – Run the resource optimization model both deterministically and stochastically without the potential resource to set a baseline for comparison purposes. Values as calculated are shown in the table below.

Table 3: RNG Values

Variable	Description	Notes	Value	Units
V	Price of conventional gas that would be displaced by RNG project	Marginal cost of conventional gas dispatched without RNG project (inclusive of fuel and other variable costs)	Determined by optimization model	$/Dth
T	Year relative to current year, where the current year T = 0, next year T = 1, etc.	Duration of project evaluation/RNG supplier counterparty contract	[redacted]	Year
S	System gas supply capacity cost to serve one Dth of peak DAY load	Based upon marginal supply capacity resource that is being deferred using Base Case resource availability from the most recent update	Output of 2018 IRP Base Case	$/Dth
rPVRR(C)	Annual all-in cost of conventional natural gas alternative	Output of RNG evaluation process	See Table 4	$/Year

Table 4: Baseline Portfolio PVRR (Nov 2020-Dec 2041)

	Value (2020$)	Weighting
Deterministic	[redacted]	75%
Stochastic (95th Percentile)	[redacted]	25%
rPVRR(C)	[redacted]	

Step 3 – The third step asks if the contract's pricing parameters are known. At this point the parameters are subject to negotiations, therefore the answer is 'No', which leads to the right side of the process flow shown above.

Step 4 (No Track) – Similar to Step 2 above, but here the RNG resource is included in both the deterministic and stochastic optimization runs, but without a cost for the raw biogas (denoted P above) that we would need to contract from Clean Water Services. Therefore, the portfolio costs shown in Table 5 below include all of the costs associated with the RNG project except the raw biogas (at the levelized cost of [redacted] denoted above) and the costs avoided by the project via displacing the conventional resource (including commodity costs, delivery costs, compliance costs, and capacity infrastructure costs), and shows the net cost impact to customers.

Table 5: Portfolio PVRR (Nov 2020-Dec 2041)

	Value (2020$)	Weighting
Deterministic	[redacted]	75%
Stochastic (95th Percentile)	[redacted]	25%
rPVRR(R)	[redacted]	

By comparing the rPVVR's from Tables 4 and 5 it can be seen that even without including the cost of the biogas that is being considered in negotiation, the cost of the capital equipment to access the biogas is not fully offset by the costs avoided from displacing conventional gas (i.e. rPVVR(R) > rPVVR(C) even when P=0). Therefore, this project is not cost-effective even if the raw biogas was provided by Clean Water Services for free. Under current market conditions, and the status of RNG technology development, it is likely that additional cost support, such as selling allowances into other markets, may be required to have cost-effective RNG projects. This approach would be similar to production tax credits (PTC) or investment tax credits (ITC) which in general benefit wind and solar resource respectively[4]. The results of the Rock Creek analysis:

Break Even Contract Price for raw biogas Rock Creek Project P = [redacted]

Figure 2 below shows the breakdown in levelized terms of the RNG from the Rock Creek Project compared to the costs that would be expected to be avoided by displacing the conventional gas alternative for the deterministic case:

[5] This figure is in nominal terms, as commodity contracts are often in nominal terms. In real 2020$ (like the other figures within this document), the breakeven price for raw biogas is [redacted]

Figure 2: Levelized Cost Comparison: Rock Creek RNG vs Conventional Alternative

Step 5 – If the breakeven price derived in Step 4 was positive, it would set the max price that NW Natural would be willing to pay for the raw biogas to ensure that customers were indifferent or better off from a cost perspective by acquiring the RNG relative to the conventional alternative.

The project considered in this filing is
It is still beneficial for reviewing NW Natural's RNG evaluation methodology; the subject of this investigation.[6]

Step 6 – The sixth step asks if the RNG resource can be acquired at a cost-effective rate. While the negotiations are ongoing it is hard to determine the outcome of this step. If it is determined that the resource is not cost-effective, Step 7 would lead the Company to consider procuring the RNG project under a variety of other options, such as SB 98, SB 844, a pilot program, or some other voluntary option, which is currently the case for the Rock Creek project. If, however, if the project was cost effective, step 7 would lead to a different series of questions as detailed below.

Step 7 (Cost-effective track) – Assuming the RNG project was cost-effective, the next question to consider is timing of the resource acquisition. This question looks at the ability of NWN to wait for IRP acknowledgement of the planned contract. Assuming a delay in contracting would not impede the ability of NWN to procure the resource, then the details would be included in the next IRP. If waiting for

[6] Note that the incremental cost derived via this methodology would likely serve as the incremental cost of RNG under the SB 98 program currently undergoing rulemaking in AR 632.

acknowledgement would harm the prospects, NWN natural would sign a contract to acquire a cost-effective RNG resource.

Variables used

Variables that are included in the methodology as well as the frequency of updates is shown in the following table. The following section will go into more detail about each of the variables.

Table 6: Update Frequency for Inputs and Forecast

Inputs and Forecasts	Frequency of Update	Additional Explanation
Resource Under Evaluation	Most Current Estimate	For example, if an RNG project requires any capital costs, the most current estimate of those costs will be run through the cost-of-service model and used for the evaluation.
Gas Prices (Deterministic and Stochastic)	Twice a year	Our third-party consultant provides long term gas price forecasts twice each year in August and February.
Peak Day & Annual Load Forecast	Once a year	These forecasts are updated spring/summer to include data from the most recent heating season.
GHG Compliance Cost Expectations (Deterministic and Stochastic)	Once a year	The GHG compliance cost assumptions will be updated each year after the legislation sessions in each state or when legislation is signed into law. *
Design, Normal, and Stochastic Weather	Each IRP	Resources are planned based on design weather, but are evaluated on cost using normal and stochastic weather.
Gas Supply Capacity Costs (Deterministic and Stochastic)	Each IRP	For the 2018 IRP base case this included the cost of Mist Recall, a pipeline uprate and a local pipeline expansion.
Distribution System Capacity Costs	Each IRP	NW Natural will calculate and present the avoided distribution avoided costs through the IRP process.

* In the Revised Appendix H we state the table above "is a guideline for the input and forecast update frequency, however; NW Natural will update input assumptions and forecasts at any time if unforeseen changes occur that would have a material impact on the evaluation since the previous update." Thus, items such as the Governor's recent Executive Order would be considered as appropriate.

Variables updated from 2018 IRP

Gas Prices

Gas prices have been updated consistent with the discussion in Appendix H. That is, the analysis uses the most recent forecast from NW Natural's third-party consultant. The forecast is from the IHS North American Natural Gas Long-Term Outlook Market outlook data tables published in February of 2020.

Load Forecasts

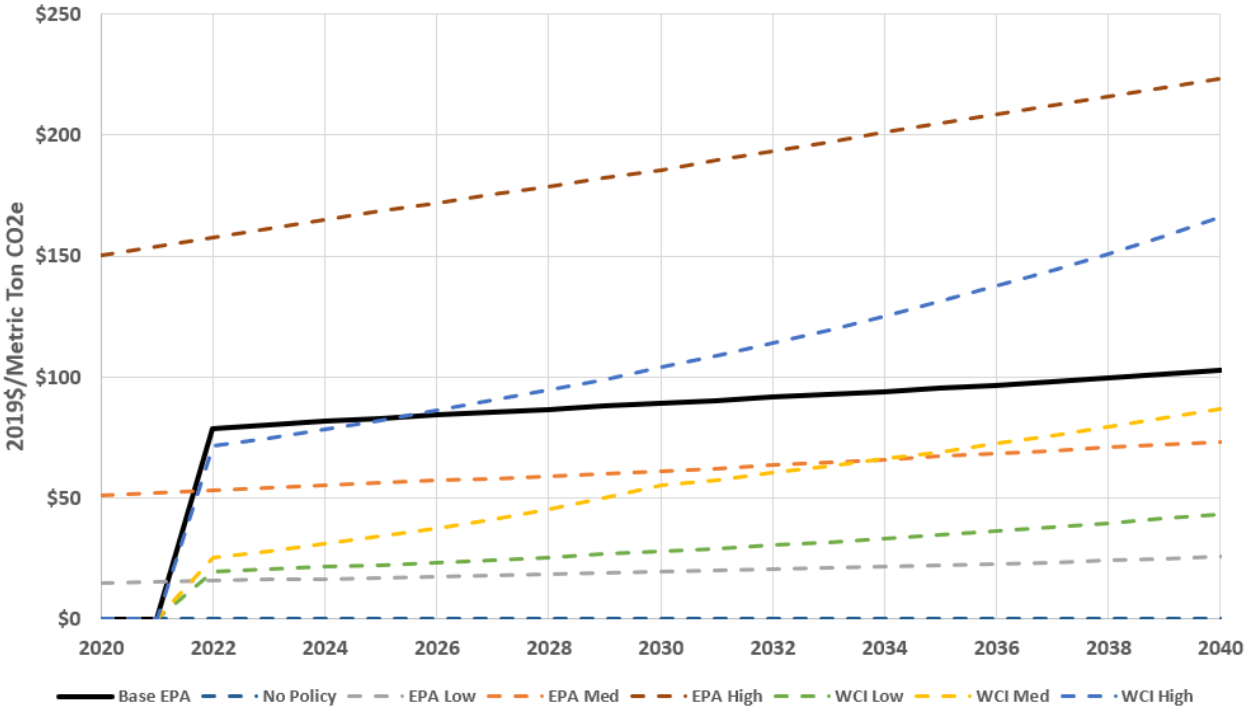
The IRP team updated load forecasts in the summer of 2019 via the latest forecasts for both customer counts and industrial load projections. Heating coefficients for residential and commercial customers are the same as the 2018 IRP. These annual load forecast will be later this year.

GHG Compliance Costs

Per Table 6 above NW Natural's GHG compliance cost assumptions have been updated following the failure of the passage of Cap-and-Invest legislation in the 2020 Oregon legislative session and the subsequent issuing of Governor Brown's Executive Order on climate change (20-04). As a reminder, the Company's resource planning activities are policy agnostic, meaning the GHG compliance costs used in our analysis are not a policy statement about our views on what the price of GHG emissions *should be*, but rather a policy *assessment* made with the assistance of the Company's government affairs and environmental policy teams about what the compliance costs our customers are *most likely to see* over the planning horizon. With that background, there remains a great deal of uncertainty in the policy environment regarding the GHG compliance obligations of Oregon's natural gas utilities. Considering the recent policy developments and the reports submitted on May 15, 2020 by the state agencies regarding EO 20-04,[7] the updated base case GHG compliance cost estimate is based upon the Social Cost of Carbon (SCC).[8] However, due to the high amount of uncertainty the Company continues to include a wide range of "carbon prices" in its risk assessment of all resources (including RNG). The graph below shows the base case carbon price path as well as alternate paths the Company uses in its risk analyses, ranging from Staff's recommendation of including a carbon price of $0 over the planning horizon on the low side to a high estimate of the SCC on the high side.

[7] The OPUC's report to the Governor on May 15, 2020 stated the PUC will "consider options to incorporate the social cost of carbon into utility Integrated Resource Plans (IRPs) and avoided cost proceedings."
[8] Using the USEPA estimate with a 2.5% discount rate inflated to current dollars, with the approach adopted by the Washington Utilities and Trade Commission (WUTC)

Figure 3: GHG Compliance Sensitivities



As described in the 2018 IRP and the subsequent revision to Appendix H[9], the Company's Monte Carlo risk analysis randomly selects one of the price paths in the above graph for a given draw in the simulation.

Carbon Intensity

The current proceedings in AR 632 are likely to provide more clarity regarding the appropriate carbon intensity to use to evaluate the cost of RNG to NW Natural customers, as it is one of the critical issues discussed in those proceedings. When the rules are established, the carbon intensity assigned in evaluating RNG resources will be updated to comply with the rules. If the rules fail to resolve the carbon intensity issue, NW Natural plans to include uncertain treatment of carbon intensity in its evaluation of the cost of RNG to our customers. In this proceeding, NW Natural's base case will use the 3Degrees' proposal, supported by NW Natural, in the AR 632 proceedings. This proposal assigns a carbon intensity of zero to RNG resources, and allows for additional methane destruction to be monetized via offset markets utilizing existing methane offset protocols.[10] A sensitivity using an estimate of the lifecycle carbon intensity of the project is also included, where the intensity is 0.035 MTCO2e. Note that the expected lifecycle carbon intensity of different types of RNG was used in the Company's initial RNG incremental cost evaluations included in the 2018 IRP).

[9] See LC 71—NW Natural's 2018 Integrated Resource Plan (IRP)—Revised Appendix H, as filed on January 10, 2020
[10] The potential value of offsets from the project in this proceeding is not included in the assessment, though it is possible that it could also generate methane destruction offsets.

Variables from past IRP

As shown in Table 6 above, the following variables are consistent with values in NWN's most recent IRP.

Weather forecasts

Weather forecasts in this analysis are consistent with those used in the 2018 IRP. The deterministic run uses the same weather as the 2018 IRP. The simulated weather data was re-simulated, but is consistent with the simulation methodology of the 2018 IRP.

Gas Supply Capacity Costs

Gas supply capacity costs are based on the output preferred portfolio the 2018 IRP. These costs are based upon the costs of the incremental gas supply capacity resource (i.e. cost of the marginal resource) needed to meet customer needs. The 2018 IRP preferred portfolio included a small amount of a representative on-system RNG dairy project, which was chosen as a cost-effective resource due to the underlying assumptions. In order to not double count those benefits, NW Natural does not intend to include that representative on-system RNG resource as a marginal cost supply capacity resource for this or future RNG project evaluations. Future analysis could include such resources as potential marginal resources as warranted. The supply capacity resources are shown in Table 7 and as with process requirements will be revisited and updated in the next IRP.

Table 7: 2018 IRP Supply Capacity Additions

Marginal Resource	Time horizon addressed by resource acquisition
Mist Recall	Near- to mid-term
Center Coast Feeder Uprate	Mid-term
Local Pipeline Expansion	Long-term

Distribution System Capacity Costs

Similar to gas supply capacity costs, the distribution system capacity costs are based on the costs for the marginal unit of distribution capacity supply. The values used for this analysis are consistent with those included in the 2018 IRP and will be updated in the next IRP.

COS Modeling

In the project analysis, and impact on ratepayers, NWN natural must first determine the cost-of-service for the project. This value, on a dollars/Dth/day basis may be input into the optimization model for more of a portfolio analysis. NW Natural has developed a dynamic cost of service (COS) model to evaluate the revenue requirement impacts over the life of all its RNG projects. The model is able to evaluate multiple projects at once, and appropriately layer the calculated revenue requirements over time based on project begin date. The COS model outputs total revenue requirements by year, levelized annual payments, and levelized cost per Dth/day.

The "*Proj Cost & Inputs*" tab of the COS model rolls up all analysis inputs and assumptions. Capital structure, cost of capital, and tax rates are based on the Company's most recent adopted rate case filing

in Oregon and Washington. The state allocator is based on each state's share of total system firm demand; this allocator is used to appropriately weight the return on rate base and tax expenses in the final revenue requirement calculation.

This tab also summarizes project capital investment costs by FERC Account and depreciation rate. Drop-down menu allows the user to decide whether to depreciate each account on a FERC schedule, or by project life (e.g., the life of the initial project contract). For the Rock Creek project, the Company has assumed the depreciation of all capital assets by the end of the project life of [redacted] [11]

The "*Rock Creek*" tab contains all of the project-specific capital and O&M costs. These costs include the interconnection equipment and construction costs to hook the project up to the Company's natural gas system. Soft costs such as design, engineering, management, and contingency are pro-rated across all of the capital asset elements. The capital costs are grossed up for construction overhead (COH) and summarized by FERC Account. These costs are also grossed up for allowance for funds used during construction, or AFUDC. This tab is also used to set the project parameters, such as: In service date, COH rate, and project life.

The tabs, "*Book Deprec*" and "*Tax Deprec*" summarize the project capital costs by FERC Account and apply the appropriate depreciation rates across the project life. The tax rates are found in the "Proj Cost & Inputs" tab. Note that this tab also has a toggle for bonus depreciation, which is off for the purposed of this project.

The "*O&M Expenses*" tab summarizes anticipated O&M expenses by month, and inflates these costs after every contract year ends based on the assumed inflation rate set in the "Proj Cost & Inputs" tab.

The "*Model Inputs*" tab summarizes depreciation rates by FERC Account based on the Company's last settled Depreciation Study.

The "*Rev Req*" tab pulls together the project cost and tax data in order to calculate the final state-weighted revenue requirement by month, based on return on rate base, taxes, O&M expense, and revenue sensitive items. This tab also presents the project PVRR and levelized cost per Dth/day.

The "*Dashboard*" tab rolls the revenue requirements up to an annual amount. The total present value of the revenue requirements (PVRR) are included along with levelized annual costs, and the levelized cost on a dollars/Dth/day are here. This is the value that will be used in the optimization model. This tab also shows project parameters, and status (whether each project impact, when multiple projects are inputted, is included in the output). Finally, this tab shows the status of several model error checks to make sure that project costs are flowing through the model as anticipated.

[11] Note that the Company files a Depreciation Study with the Commission every five years. The Company's next study will be filed in 2021, and the Company may seek adoption of depreciation rates for RNG assets associated with FERC Accounts for which it currently has no assets.

Attachments:

1. RFP for sale of RNG
2. Project Fill in sheet – Confidential

Workpapers:

COS model – Highly Confidential

IHS Forecast – Confidential

Monte Carlo Gas Prices - Confidential

Monte Carlo GHG Compliance Policy Paths - Confidential

UM 2030 Project Evaluation – Highly Confidential

UM 2030 Project Evaluation-CI sensitivity – Highly Confidential

REQUEST FOR PROPOSALS
FOR
PUBLIC/PRIVATE PARTNERSHIP
FOR SALE OF RENEWABLE NATURAL GAS

CLEAN WATER SERVICES

Proposal Documents Due: 2:00 p.m.
Thursday, November 14, 2019

Clean Water Services (District) wishes to enter into a contract to sell the biogas produced at its Rock Creek Advanced Wastewater Treatment Facility, its Durham Advanced Wastewater Facility, or both, to an entity that would convert it to renewable natural gas (RNG). Interested contractors must submit proposals. Proposals are due to Michelle Mann, Program Support Specialist, at District's Rock Creek Wastewater Treatment Facility – Administrative Construction Trailer - located at 3235 S.E. River Road, Hillsboro, Oregon 97123 (Rock Creek Plant) **by Thursday, November 14, 2019 at 2:00 p.m.** Proposals will not be publicly opened, and late proposals will not be accepted.

You may request an electronic copy of the Request for Proposals (RFP) from District's website at http://bids.cleanwaterservices.org (Website) by selecting the title of this RFP and completing the section to request the document package. This information will be accumulated for a Bid Holders List and your email will be used to send you automatic notifications when District posts a new document or changes information related to this RFP. Contractors are responsible for obtaining any Addenda by using the link provided in the automatic email or from District's Website. If you would also like to receive notifications by RSS feed, you may subscribe to District's Open Solicitations RSS feed on the Website. If you experience problems downloading the RFP, please contact Michelle Mann at (503) 547-8035.

Contractors need not be licensed under ORS 468A.710 (regarding licensing of contractors on projects involving asbestos abatement).

Clean Water Services may reject any proposal not in compliance with all prescribed procedures and requirements, and may cancel this solicitation or reject, for good cause, any or all proposals upon a finding that it is in the public interest to do so.

REQUEST FOR PROPOSALS
PUBLIC/PRIVATE PARTNERSHIP
FOR SALE OF RENEWABLE NATURAL GAS

CLEAN WATER SERVICES

INTRODUCTION

Clean Water Services (District) wishes to enter into a contract to sell the biogas produced at its Rock Creek Advanced Wastewater Treatment Facility, its Durham Advanced Wastewater Treatment Facility, or both, to an entity that would convert it to renewable natural gas (RNG). Interested contractors must submit proposals. **Proposals are due Thursday, November 14, 2019 at 2:00 p.m.** Proposals will not be publicly opened, and late proposals will not be accepted.

Clean Water Services is a county service district that provides sanitary sewer service and surface water management to a 122-square-mile area within Washington County, Oregon. District's service area consists of the urban portion of Washington County in addition to small portions of both Clackamas and Multnomah Counties. The population served is approximately 600,000 within 12 partner cities and unincorporated county areas.

DESCRIPTION OF PROJECT

The anaerobic digestion process at District's Rock Creek Advanced Wastewater Treatment Facility (Rock Creek Facility) produces approximately 300 standard cubic feet per minute (SCFM) of biogas that is currently used in its raw form without treatment in two 500 kW cogeneration engines that provide heat and electricity for use at the Rock Creek Facility.

The anaerobic digestion process at District's Durham Advanced Wastewater Treatment Facility (Durham Facility) produces approximately 150 SCFM of excess biogas that is currently flared to the atmosphere. The remainder of the biogas is used in two 850 kW cogeneration engines that provide heat and electricity for use at the Durham Facility. The Durham Facility biogas is treated for moisture, H2S, and siloxanes using membrane-based equipment manufactured by Unison. This equipment has the capacity to treat all the biogas produced at the Durham Facility, including the excess biogas.

District is interested in contracting with a project developer who would purchase the designated amount of biogas from one or both of the treatment facilities (approximately 300 SCFM from the Rock Creek Facility and 150 SCFM from the Durham Facility), provide the level of additional treatment necessary to convert it to renewable natural gas (RNG), and sell it into the RNG market. The project developer would have the option of either injecting the biogas into the natural gas pipelines that serve the Rock Creek and Durham Facilities, or transporting the biogas from the facilities via truck.

The project developer would be responsible for permitting, designing, constructing, operating, and maintaining the entire RNG facility, including all site work needed to connect the RNG facility to utilities. District estimates that the cost of the site work would be approximately $500,000.

District would be responsible for providing locations at the Rock Creek and Durham Facilities where the project developer would construct the RNG facility improvements.

District would also be responsible for making all the biogas produced at the Rock Creek Facility and all the excess biogas produced at the Durham Facility available to the project developer. District and the project developer would enter into a 10-year contract with at least one renewal option. District would continue to operate the Rock Creek cogeneration engines on natural gas.

Maps showing the location, dimensions and square footage of the sites at the Rock Creek and Durham Facilities where the project improvements would be constructed are in Exhibits A and B. The maps also show the location of the existing natural gas utility pipelines.

Pursuant to its own requirements for pipeline injection, Northwest Natural Gas (NWN), the local gas utility, would be responsible for designing and building any pipeline interconnection facilities and would bill the cost to the project developer. NWN has issued quotes for this work. Copies of the NWN quotes are attached as Exhibits C and D.

QUALIFICATIONS

Proposing firms should have the capability to implement the project without delay after a contract with District has been negotiated. District expects proposing firms to have assembled a project team and secured the necessary project financing and RNG off-take commitments at the time they submit proposals. Accordingly, proposals should demonstrate the following:

- Significant experience developing, owning and operating RNG projects;
- Access to the financial resources necessary to design, construct, own, maintain, and operate the RNG Facility;
- A willingness by the project developer to purchase District's biogas at a firm fixed price for the duration of the contract.
- A commitment by one or more entities to purchase all the RNG produced by the project from the project developer.

PROPOSAL INSTRUCTIONS

A. Submission of Proposals

Proposers shall submit one original and two copies of the proposal to District addressed as follows:

Michelle Mann, Program Support Specialist
Rock Creek Wastewater Treatment Plant (Administrative Construction Trailer)
3235 S.E. River Road
Hillsboro, OR 97123

Please submit the proposals in a single, sealed envelope labeled "Public/Private Partnership for Sale of Renewable Natural Gas."

B. Deadline

Proposals are due on or before Thursday, November 14, 2019, at 2:00 p.m. Postmarks are not acceptable. Proposals postmarked before the deadline but received afterward will not be considered. Late proposals and faxed or e-mailed proposals will not be considered.

C. Proposal Contents

Proposals will be limited to twenty (20) pages of material (excluding front and back covers, divider tabs, resumes, and the Certification Form). Use 12-point, Times New Roman type, double-sided 8.5" x 11" paper, single-spacing and one-inch margins. Each side of the paper constitutes one page (blank pages do not count). To maintain the fairness and integrity of the selection process, it is important that proposals conform to the requirements of this section. Do not include any information that is not specifically requested. Elaborate artwork, expensive paper or bindings, and expensive visual or other presentations are neither necessary nor desired. The proposal should provide all information in the order requested. Failure to submit any of the required items may be grounds for rejection of the proposal.

The proposal will consist of the following elements:

1. Letter of Introduction:

    a. Name, telephone number, and e-mail address of a contact person and project manager for your proposal.

    b. Primary business experience, length of time in business, ownership, location of offices, and other introductory information.

    c. A statement that your proposal will be valid for a period of 90 days.

    d. Have the letter signed by an authorized representative of your firm that is legally authorized to bind the firm to its proposal, can participate in contract negotiations and is authorized by your firm to sign the final contract.

    e. Indicate whether you are proposing to purchase the biogas produced at the Durham Facility, the Rock Creek Facility, or both.

2. Qualifications and Experience

    a. Describe your experience designing, constructing, owning and operating RNG facilities. In addition, describe your experience buying and selling RNG. List the names of entities you did business with and provide contact information.

b. Provide a resume for each key member of your project team and describe the role the person will play. If your project team consists of more than five key people, limit the information to the five individuals with the largest roles in the project and provide an organizational chart.

3. Financial

a. If you plan to form a separate corporate legal entity or a joint venture among existing legal entities for this project, provide a description of all the business and governance relationships between the entities involved in the project, as well as any legal/financial limitations such as limited liability or limited capitalization.

b. Provide evidence that you have the financial resources necessary to design, construct, own, operate and maintain this project. If the financial resources are to be provided by another entity, provide documentary evidence, such as a letter of intent, memorandum of understanding, or a term sheet that provides details regarding the funding commitment. (District understands that proposers may consider this information to be confidential and not want it disclosed to third parties or to the public. Proposers wanting this information to be kept confidential should follow the instructions in Proposal Conditions, Paragraph F.)

c. Indicate that you would be willing to purchase District's biogas at a firm fixed unit price per MMBTU of RNG for the duration of a 10-year contract. In addition, provide a good faith estimate of the price at which you would sell the RNG and a good faith estimate of the percentage share of this price that you would pay to District. You may use ranges for the price and percentage share estimates instead of single numbers.

d. Identify the entities that would purchase the RNG from you and provide documentary evidence, such as a letter of intent, term sheet, or memo of understanding that provides details regarding the purchase commitment. (District understands that proposers may consider this information to be a trade secret and not want it disclosed to third parties or to the public. Proposers wanting this information to be kept confidential should follow the instructions in Proposal Conditions, Paragraph F.)

4. Concept Design

Provide a concept design for the project that includes a process flow diagram and the size, make, model, and site layout of the major equipment.

5. If any requirements or provisions contained in the Request for Proposals (RFP) are unfair or prejudicial or limit competition, please explain your position. This section will not count towards your page count.

6. Provide the completed Certification Form included herein. This document will not count towards your page count.

EVALUATION OF PROPOSALS

A. Evaluation of Proposals

1. The evaluation process will begin with an analysis of each proposal using the evaluation criteria identified below:

Criterion	**Weight**
Qualifications and Experience	1/3
Financial	1/3
Concept Design	1/3

2. After the proposals have been evaluated, District may pursue one of the following options for completing the contractor selection process in accordance with District Purchasing Rule 15-080:

   a. Select the highest ranked proposer and conduct contract negotiations;
   b. Determine that two or more proposers are in the competitive range and conduct simultaneous negotiations with those proposers; or
   c. Determine that two or more proposers are in the competitive range and issue a request to those proposers for more detailed information.

   If District selects option 2a above, it may enter into contract negotiations with the second highest ranked proposer if negotiations with the highest ranked proposer are unsuccessful, and may conduct negotiations with successively ranked proposers following the same protocol. If District selects option 2b or 2c above, it will issue an Addendum to this RFP that addresses these stages of the contractor selection process in more detail.

B. Clarification

District reserves the right to seek clarification of each proposal submitted. District also reserves the right to require other evidence of technical, managerial, financial, or other abilities prior to selection.

C. Notices to Proposers

District will advise proposers via an addendum to the RFP of its decisions at the following points in the contractor selection process:

a. Selection of the highest ranked proposer for contract negotiations.

b. Placing two or more proposers within a competitive range.

c. Selection of a proposer to recommend for award of a contract.

D. Contract Award

District will enter into contract negotiations with the proposer submitting the most advantageous and responsive proposal. The contract award will be subject to the approval of District's Chief Executive Officer and, if required, its Board of Directors.

PROPOSAL CONDITIONS

A. Communication Procedures

The requirements of this section are intended to ensure the fair and equal treatment of all proposing contractors. Until the District issues its Notice of Intent to Award, contractors are prohibited from contacting the District, its Board, or its employees for marketing or solicitation purposes related to this proposal. Disregard of the requirements of this section will result in the disqualification of the contractor.

B. Acceptance, Rejection or Cancellation of Award

1. This RFP does not constitute an offer to contract and does not commit District to award a contract to anyone, or to pay any costs incurred to prepare and submit proposals. All costs of the proposal process, interviews, contract negotiations, and related expenses are the responsibility of the proposer.

2. District reserves the right to accept or reject any or all proposals received as a result of this RFP and to negotiate with any qualified proposer(s) for all

or part of the requested services. District reserves the right to waive any informality or irregularity in any proposal or proposals.

3. District also reserves the right to delay, suspend, or cancel all or part of this RFP at any time before execution of the contract for any reason determined by District to be in the public interest.

4. Acceptance of a proposal is subject to budget approval, appropriation, or budgetary constraints.

C. Interpretations and Addenda

Contractors are responsible for obtaining any Addenda from District's Website at http://bids.cleanwaterservices.org (Website) under the title of the RFP or by using the links provided in the automatic emails sent from District's system when it posts the Addendum or clarification document. If a contractor would also like to receive notification of the Addendum or clarifications by RSS feed, you may subscribe to District's Open Solicitations RSS feed on the Website.

District may modify the RFP at any time prior to the RFP due date, by issuing a written Addendum to all proposers who are participating in the process at the time the Addendum is issued. Addenda will be numbered consecutively. Changes to the RFP will only be made by Addendum. All corrections or substitutions made by Addendum shall be final and binding on the successful proposer.

District will not respond orally to questions concerning the RFP. All questions must be submitted in writing to Bruce Cordon, Business Opportunities Manager, by email at CordonB@CleanWaterServices.org. All questions that in District's opinion warrant an interpretation or clarification and are not an amendment to the RFP will be posted to the Website. Questions received less than seven (7) business days before the proposal due date may not be answered unless District determines, in its sole discretion, that it is in the public interest to do so. Oral and other interpretations or clarifications will be without legal effect.

D. Anticipated Solicitation Schedule

Schedule of RFP Events:

RFP Advertised	October 15, 2019
Proposals Due	November 14, 2019
Notice of Intent to Award	February 4, 2020
Contract Award Date	February 18, 2020

District reserves the right to make changes to this schedule.

E. Proposal Withdrawal

Any proposal may be withdrawn at any time before the "Proposal Due" date and time, by providing a written request for the withdrawal of the proposal to the Project Manager. A duly authorized representative of the proposer's firm shall execute the request. Withdrawal of a proposal will not prejudice the right of the proposer to file a new proposal.

F. Ownership of Documents/Inspection of Proposals/Proprietary Information

1. Any material submitted by a proposer shall become the property of District. Subject to the provisions of the Oregon Public Records Law, all proposals received will be available for public inspection after the Notice of Intent to award has been issued. Copies of material from or review of the proposal may be obtained from the District by submitting by submitting a Public Records Request form (form available on http://cleanwaterservices.org/documents-forms/records-request-form/) and payment of the appropriate charges pursuant to the District's Rates and Charges in effect at the time of the request. Prepayment is required for all copies requested to be mailed if the cost is over $25.00.

2. Following District's issuance of its Notice of Intent to Award, responses to this RFP are subject to release as public information unless the response or specific information contained therein is identified as exempt from public disclosure. Proposer is advised to consult with legal counsel regarding disclosure issues.

3. If a proposer believes that any portion of its proposal contains any information that is considered a trade secret or otherwise is exempt from disclosure under Oregon Public Records Law, the proposer must include the following on each page containing such information:

"This data is exempt from disclosure under Oregon Public Records Law pursuant to ORS 192, and is not to be disclosed except in accordance with the Oregon Public Records Law."
Identifying the proposal, in whole, as exempt from disclosure is not acceptable. Proposer is cautioned that cost information submitted in response to a RFP is generally not considered a trade secret under Oregon Public Records Law. By

signing the Certification Form as part of your proposal, you are certifying that you have designated any data that is considered a trade secret or confidential information and should be exempt from disclosure. Undesignated data may be released to any person submitting a public records request.

G. Protest Procedure

District has adopted its own public contracting rules and is not subject to the Attorney General's Model Public Contracting Rules. District's procurement rules have opportunities for proposers to protest at various stages in the procurement process. This section only contains a brief summary of the deadlines for filing protests, conditions required to file a protest, and the information required to be included in the protest. It does not identify the conditions required to file a protest or the information required to be included in the protest. Copies of District's rules containing the protest process may be obtained by contacting Michelle Mann, District's representative.

1. Solicitation Protest. Under District's rules, prospective proposers may submit a written protest of anything contained in the RFP, including but not limited to the Request for Proposals process, Special Terms and Conditions, and the Contract. This is a prospective proposer's only opportunity to protest the provisions of the RFP, except that a proposer may protest the award as provided below. Prospective proposers must submit a written protest to District not less than seven (7) calendar days prior to the due date for Proposals. The written protest must:

    a. Be delivered to Bruce Cordon via email to CordonB@CleanWaterServices.org or by First-Class Mail to District's Office located at 3235 S.E. River Road, Hillsboro, OR 97123.
    b. Reference the title of the RFP.
    c. Identify the prospective proposer's name and contact information.
    d. Be signed by an authorized representative.
    e. State the reason or the grounds for the protest, including:
        i. The grounds that demonstrate how the procurement process is contrary to law or unnecessarily restrictive, is legally flawed, or improperly specifies a brand name; and
        ii. Evidence or documentation that supports the grounds on which the protest is based.
    f. Relief sought.
    g. State the desired changes to the procurement process or the RFP provisions that the prospective proposer believes will remedy the conditions that were the basis of the protest.
    a. Be received by Mr. Cordon within seven (7) calendar days prior to the due date for Proposals. District shall not consider a prospective proposer's solicitation protest if it is submitted after the established time period.

2. Award Protest. Affected or aggrieved proposers will also have an opportunity to protest District's Notice of Intent to Award that District will post under the title of the RFP (Public/Private Partnership for Sale of Renewable Natural Gas) on its Website. A proposer is adversely affected or aggrieved if the proposer is eligible for award of the Contract as the responsible proposer next in line for award and assuming the protest was successful, and the protest is for one of the reasons specified in ORS 279B.410. The written protest must:

    a. Be delivered to Bruce Cordon via email to CordonB@CleanWaterServices.org or by First-Class Mail to District's Office located at 3235 S.E. River Road, Hillsboro, OR 97123.
    b. Reference the title of the RFP.
    c. Identify the prospective proposer's name and contact information.
    d. Be signed by an authorized representative.
    e. Specify the grounds for the protest.
    f. Be received by Mr. Cordon within five (5) calendar days after issuance of the conditional Notice of Intent to Award.

4. Exhaust Administrative Remedies. District shall not consider a prospective proposer's protest if it is submitted after the established time period. A proposer must exhaust all administrative remedies before seeking judicial review of District's Contractor Selection or Contract Award Decision.

5. Contract Award. The award by the District's Board of Directors of a Contract shall constitute a final decision of the District to award a Contract if no written protest of the award is filed.

CERTIFICATION FORM

The undersigned acknowledges, attests and certifies individually and on behalf of Proposer that:

1. He/she is a duly authorized representative of Contractor, has been authorized by Contractor to make all representations, attestations, and certifications contained in this Proposal and all Addendum or Addenda, if any are issued, and has the power and authority to enter into and perform the Contract and that the Contract, when executed and delivered, shall be a valid and binding obligation of Contractor and enforceable in accordance with its terms.

2. Contractor, acting through its authorized representatives, has read and understands all written instructions, Scope of Work and Special Terms and Conditions contained in this Request for Proposals (RFP) document, and has received, read and understood Addenda Nos. _____, _____, _____, _____. If no Addenda were received, write "None Received" in the first blank provided.

3. The Proposal submitted is in response to the specific language of the RFP and Contractor has made no assumptions based upon verbal or written statements not contained in the RFP or any Addenda.

4. District shall not be liable to Contractor for any expenses incurred by Contractor in preparing and submitting its Proposal or in participating in the Proposal evaluation/selection process.

5. Contractor will furnish the designated item(s) and/or service(s) in accordance with the Proposal Scope of Work and Special Terms and Conditions and Requirements, and will comply in all respects with the terms of the resulting Contract upon award.

6. Contractor certifies that Contractor has not discriminated and will not discriminate, in violation of ORS 279A.110(1) against any disadvantaged business enterprise, a minority-owned business, a women-owned business, a business that a service-disabled veteran owns, or an emerging small business enterprise certified under ORS 200.055 in awarding any required subcontracts.

7. Neither he/she nor any principals of Contractor are presently debarred, suspended, proposed for debarment, or declared ineligible from submitting quotes or proposals by any federal, state or local entity, department, or agency.

8. Contractor has not been convicted or had a civil judgment rendered against them within a three (3) year period preceding the date of this Certification Form for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performance of a public (federal, state, or local) contract or subcontract; violation of federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making a false statement, tax evasion, or receiving stolen property.

9. Contractor is not presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in paragraph 8 of this Certification Form.

10. Contractor has not had one or more contracts terminated for default by any federal, state or local public agency within a three (3) year period preceding the date of this Certification Form.

11. This Proposal has been arrived at independently and has been submitted without any collusion designed to limit independent bidding or competition. Contractor and its affiliates, subsidiaries, officers, directors, and employees are not currently under investigation by any governmental agency and have not in the last four years been convicted of or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to submitting a proposal on any public contract.

12. Contractor certifies that it has designated any trade secret or confidential information, as these terms are defined in ORS Chapter 192, in its Proposal as required by the RFP. If the Proposal contains no designations, then Contractor is stating its Proposal does not contain any trade secret or confidential information and District may release the entire Proposal to any person submitting a public records request.

13. Resident/Non-Resident

    Contractor states that it is: (check one)

    ☐ A resident bidder.

    ☐ A nonresident bidder.

    Indicate state in which Contractor resides: _____

For the purposes of this section, a "resident bidder" is a proposer that has paid unemployment taxes or income taxes to the State of Oregon during the 12 calendar months immediately preceding submission of the proposal, has a business address in the state of Oregon and has stated in the proposal whether the proposer is a "resident bidder." ORS 279A.120(1)(b).

14. Contractor by signing below hereby attests or affirms under penalty of perjury: That I am authorized to act on behalf of the Contractor in this matter; that I have authority and knowledge regarding payment of taxes; and that Contractor is, to the best of my knowledge, not in violation of any Oregon Tax Laws. For the purposes of this certification, "Oregon Tax Laws" means a state tax imposed by ORS 320.005 to 320.150; ORS 403.200 to 403.250; ORS Chapters 118, 314, 316, 317, 318, 320, 321, 323, the elderly rental assistance program under ORS 310.630 to 310.706; and any local tax laws administered by the Oregon Department of Revenue under ORS 305.620.

15. Contractor certifies that it shall comply with the prohibitions set forth in ORS 652.220 prohibiting discriminatory wage rates based upon an employee's membership in a protected class and acknowledges that compliance is a material element of the Contract and failure to comply is a breach that entitles District to terminate the Contract for cause.

I state that _____ (Name of Firm) understands and acknowledges that the above representations are material and important, and will be relied on by Clean Water Services in awarding the contract(s) for which this Proposal is submitted. I understand, and this firm understands, that any misstatement in this Certification Form is and shall be treated as fraudulent concealment from Clean Water Services of the true facts relating to the submission of proposals for this Contract.

_____
Contractor Firm Name, if applicable

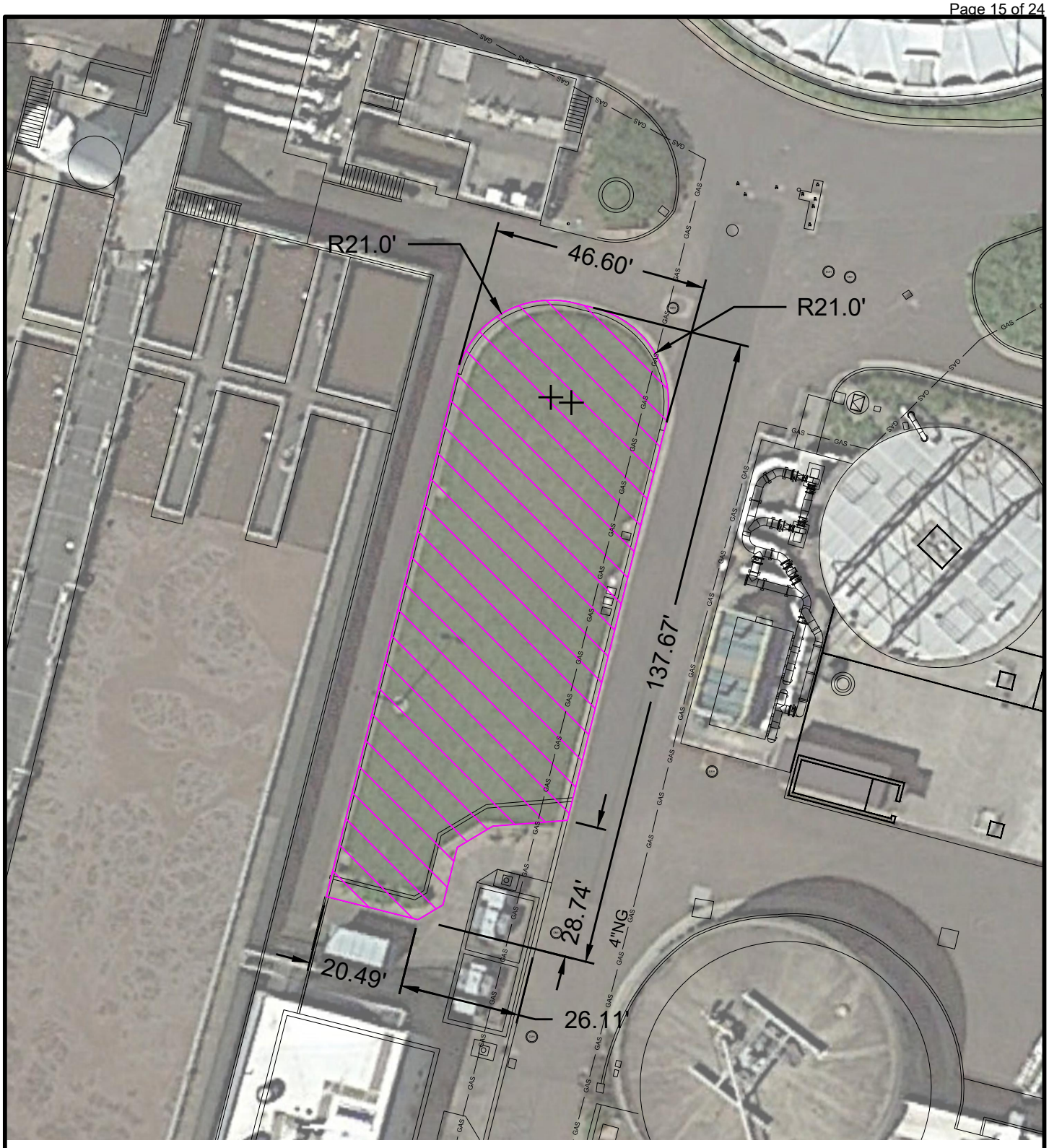
_____
Signature of Contractor's Duly Authorized Representative

Printed Name: _____

Title, if applicable: _____

Date of Certification Form: _____

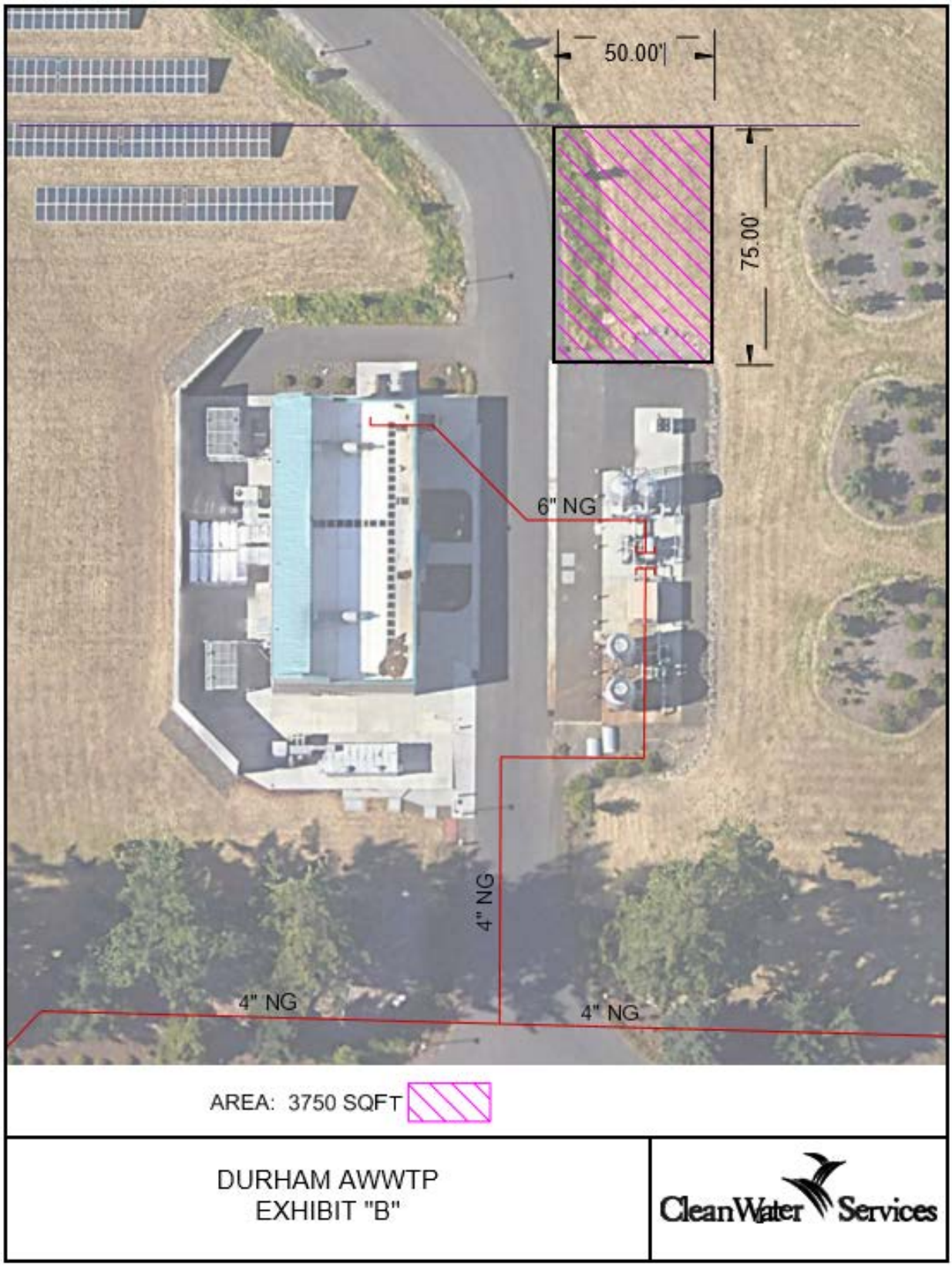
Phone: _____ Fax: _____



AREA: 5686.64 SQFT

ROCK CREEK AWWTP
EXHIBIT "A"

Clean Water Services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DURHAM AWWTP
EXHIBIT "B"
Clean Water Services

NW Natural®
We grew up here.

EXHIBIT C

August 6, 2019

Bruce Cordon
Clean Water Services Rock
Creek 3235 SE River Rd
Hillsboro, OR 97123

RE: RNG Pipeline Interconnect

1 Overview

NW Natural is pleased to submit this proposal and Class 3 estimate for the design and construction of a pipeline interconnect and receipt point facilities (RNG station) located at 3235 SE River Rd, Hillsboro, OR 97123. The proposed scope of work includes design, permitting, equipment supply, construction and commissioning. This offer shall be valid for 60 calendar days.

2 Scope of Work & Deliverables

2.1 Project Management

NW Natural will provide overall management of the tasks and deliverables included in the proposed scope of work. NWN's Project Manager shall coordinating technical disciplines; manage the execution of the scope of work including procurement of subcontracted services, providing status updates; and submitting monthly cost forecasts and managing coordination meetings.

2.2 Site Survey

- Topographic Survey;
- Underground utility locations; and
- Easement and boundary legal description.

2.3 Geotechnical Engineering Deliverables

- Geotechnical report for civil and structural designs.

2.4 Environmental Review

- Conduct search of environmental conditions and restrictions on record in order to determine applicable permit requirements

2.5 Civil Engineering and Design Deliverables

- Civil layout drawing;
- Grading plan and details;
- Site drainage plan; and
- Permit set drawing(s) for submittal to The City of Hillsboro.

2.6 Structural Engineering and Design Deliverables

- Plan drawing locating all structural elements;
- Foundation drawings and calculations for
    - communication tower, and
    - relevant equipment;
- Equipment mounting detail;
- Communication tower drawing and calculations;
- Structural notes and standards sheets (as applicable); and
- Permit set drawing(s) for submittal to The City of Hillsboro.

2.7 Electrical Engineering and Design Deliverables

- Identify/verify adequate power source and capacity;
- Cable and conduit schedule;
- One line diagram;
- Power and communications routing;
- Cable and conduit burial and trenching details;
- Area classification details;
- Lighting layout;
- Grounding plan;
- Typical details; and
- Permit set drawing(s) for submittal to The City of Hillsboro.

2.8 Mechanical Engineering and Design Deliverables

- Plan drawing;
- Elevations;
- Detailed piping bill of material (BOM);
- Equipment review; and
- Code review (NFPA 52 & 58 and ASME 31.3).

2.9 Permits Application Submittal

Preparation of sealed calculation and drawing package, notes and standards sheet for permit application submittal per the identified technical disciplines to the relevant local jurisdictions, as required (The City of Hillsboro).

3 Assumptions, Allowances and Exclusions

3.1 Assumptions

- The RNG gate station is approximately 50 feet from the existing NW Natural pipeline;
- The station site is approximately 5 feet from property line;
- The interconnect piping is 4-inch diameter;
- The injection station area/boundary is approximately 80’ x 40’
- The odorizer will not have controls or communication (if the flow rate has a high variability, then a different system will be required);
- The designated RNG interconnect area is free of obstacles, obstructions and debris;
- Producer shall provide required electrical service to RNG Interconnect station area/boundary;
- NW Natural shall construct/operate under The Producer’s 1200c permit;
- Permit jurisdiction is The City of Hillsboro; and
- Lodging is available near jobsite (within 15 minute commute time).

3.2 Allowances

- A one-time visit for site survey;
- Geotechnical includes two days allowance for onsite drilling;
- One site visit for environmental permit assessment;
- Fifteen thousand dollars ($15,000) permit allowance; and
- Subcontracts to be awarded based upon NW Naturals procurement policies and processes.

3.3 Exclusions

- Perimeter fencing drawing and calculations; and
- A building/enclosure for analyzing equipment;
- Isometric drawings;
- Design of access road or equivalent outside facility site;
- Environmental/Watershed/Drainage mitigation;
- Archeological or environmental studies;
- Improvements for access to injection site;
- Vegetation/Soil removal;
- Easement (or Rental) Fees;
- Any other jurisdiction reviews or permits than the ones listed under assumptions;
- Fire safety systems or methane detectors (per typical station design standards);
- Improvements to the NW Natural telecommunications system; and
- HAZOP study (not typically required).

4 Schedule

It is assumed that the design phase shall be completed 120 days following notice to proceed and receipt of payment.

5 Pricing

Following are the estimated costs for the proposed scope of work. Cost Estimate:

Scope	Estimate
Design and Permit Application	$ 235,000
Equipment, Construction and Commissioning	$1,168,000
Estimated Total	$1,403,000

Note: *Estimate does not include overheads or AFUDC (Allowance for Funds Used During Construction).*

5.1 Schedule of Fees

5.1.1 NW Natural Project Management and Technical Staff

Discipline	Hourly Rate
Senior Project Manager/Project Engineer	$125
Environmental Consultant	$100
Drafter	$80

5.1.2 Overtime

All personnel overtime (over 40 hours per week) will be billed at 1.5 times the hourly rates (Section 5.2.1).

5.1.3 Expenses

- Travel, living, freight, postage, and other direct project expenses shall be billed at cost plus eleven percent (11%).
- Outside consultants, contractors, fees, and computer services shall be billed at cost plus eleven percent (11%).
- Mileage shall be billed at the adjusted Federal allowable rate.

Sincerely,

Clifton Hazen
NW Natural Major Accounts Manager

EXHIBIT D

August 6, 2019

Bruce Cordon
Clean Water Services-Durham
16060 SW 85th Ave.
Tigard, OR 97224

RE: RNG Pipeline Interconnect

1 Overview

NW Natural is pleased to submit this proposal and Class 3 estimate for the design and construction of a RNG pipeline interconnect and receipt point facilities (RNG station) located at 16060 SW 85th Ave Tigard, Oregon, 97224. The proposed scope of work includes design, permitting, equipment supply, construction, and commissioning. This offer shall be valid for 60 calendar days.

2 Scope of Work & Deliverables

2.1 Project Management

NW Natural will provide overall management of the tasks and deliverables included in the proposed scope of work. NWN's Project Manager shall coordinating technical disciplines; manage the execution of the scope of work including procurement of subcontracted services, providing status updates; and submitting monthly cost forecasts and managing coordination meetings.

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- Topographic Survey;
- Underground utility locations; and
- Easement and boundary legal description.

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- Geotechnical report for civil and structural designs.

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- Conduct search of environmental conditions and restrictions on record in order to determine
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- Civil layout drawing;
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    - relevant equipment;
- Equipment mounting detail;
- Communication tower drawing and calculations;
- Structural notes and standards sheets (as applicable); and
- Permit set drawing(s) for submittal to The City of Tigard.

2.7 Electrical Engineering and Design Deliverables

- Identify/verify adequate power source and capacity;
- Cable and conduit schedule;
- One line diagram;
- Power and communications routing;
- Cable and conduit burial and trenching details;
- Area classification details;
- Lighting layout;
- Grounding plan;
- Typical details; and
- Permit set drawing(s) for submittal to The City of Tigard.

2.8 Mechanical Engineering and Design Deliverables

- Plan drawing;
- Elevations;
- Detailed piping bill of material (BOM);
- Equipment review; and
- Code review (NFPA 52 & 58 and ASME 31.3).

2.9 Permits Application Submittal

Preparation of sealed calculation and drawing package, notes and standards sheet for permit application submittal per the identified technical disciplines to the relevant local jurisdictions, as required (The City of Tigard).

3 Assumptions, Allowances and Exclusions

3.1 Assumptions

- The RNG gate station is approximately 450 feet from the existing NW Natural pipeline;
- The station site is approximately 5 feet from property line;
- The interconnect piping is 4-inch diameter;
- The injection station area/boundary is approximately 80’ x 40’;
- The odorizer will not have controls or communication (if the flow rate has a high variability, then a different system will be required) ; and
- The designated RNG interconnect area is free of obstacles, obstructions and debris.
- Producer shall provide required electrical service to RNG Interconnect station area/boundary;
- NW Natural shall construct/operate under The Producer’s 1200c permit;
- Permit jurisdiction is The City of Tigard; and
- Lodging is available near jobsite (within 15 minute commute time).

3.2 Allowances

- A one-time visit for site survey;
- Geotechnical includes two days allowance for onsite drilling;
- One site visit for environmental permit assessment;
- Fifteen thousand dollars ($15,000) permit allowance; and
- Subcontracts to be awarded based upon NW Naturals procurement policies and processes.

3.3 Exclusions

- Perimeter fencing drawing and calculations; and
- A building/enclosure for analyzing equipment;
- Isometric drawings;
- Design of access road or equivalent outside facility site;
- Environmental/Watershed/Drainage mitigation;
- Archeological or environmental studies;
- Improvements for access to injection site;
- Vegetation/Soil removal;
- Easement (or Rental) Fees;
- Any other jurisdiction reviews or permits than the ones listed under assumptions;
- Fire safety systems or methane detectors (per typical station design standards);
- Improvements to the NW Natural telecommunications system; and
- HAZOP study (not typically required).

4 Schedule

It is assumed that the design phase shall be completed 120 days following notice to proceed and receipt of payment.

5 Pricing

Following are the estimated costs for the proposed scope of work. Cost Estimate:

Scope	Estimate
Design and Permit Application	$ 235,000
Equipment, Construction and Commissioning	$1,293,000
Estimated Total	$1,528,000

Note: *Estimate does not include overheads or AFUDC (Allowance for Funds Used during Construction).*

5.1 Schedule of Fees

5.1.1 NW Natural Project Management and Technical Staff

Discipline	Hourly Rate
Senior Project Manager/Project Engineer	$125
Environmental Consultant	$100
Drafter	$80

5.1.2 Overtime

All personnel overtime (over 40 hours per week) will be billed at 1.5 times the hourly rates (Section 5.2.1).

5.1.3 Expenses

- Travel, living, freight, postage, and other direct project expenses shall be billed at cost plus eleven percent (11%).
- Outside consultants, contractors, fees, and computer services shall be billed at cost plus eleven percent (11%).
- Mileage shall be billed at the adjusted Federal allowable rate.

Sincerely,
Clifton Hazen
NW Natural Major Accounts Manager

NW Natural Renewable Natural Gas Project-Specific Component Definition Fill-In Sheet

Term	#	Question	Project Parameter	
Q: RNG Output	1	How much RNG is the project expected to sell to NW Natural annually?	[redacted]	Dth
	2	Is this volume expected to vary by season, day of the week, or any other factor? If so, provide the expected variation on a separate spreadsheet	[redacted]	
	3	Is there a minimum daily, monthly, or annual quantity included/expected to be included in the prospective contract? If so, what is the minimum daily volume?	[redacted]	Dth per
T: Timing of RNG Purchase	4	Is the duration and timing of the RNG purchase known?	Yes	
	5	If Yes, when does the RNG purchase begin?	Date	[redacted]
	6	If Yes, when does the RNG purchase end?	Date	[redacted]
	7	If No, when does the RNG purchase begin?	Date	
P: Price of RNG	8	Is the volumetric pricing arrangement for the RNG known?	[redacted]	
	9	If Yes, and it is it a fixed price arrangement, what is the proposed price NW Natural will pay for the RNG? If fixed, but varying through time attach separate spreadsheet and enter average for duration of contract to the right:	[redacted]	per Dth
	10	If Yes and it is not a fixed price arrangment, please provide the formula for pricing on a separate spreadsheet and enter average expected price for the duration of the contract to the right:	[redacted]	per Dth
X: Required Capital Investment	11	What (if any) is the total annual revenue requirement of any equipment and facilities in which NW Natural needs to invest to access the RNG from the project?	[redacted]	per Year
	12	If there is a fixed non-volumetric payment to the RNG supplier as part of the contract, what is the annual payment?	[redacted]	per Year
N: GHG Emissions Intensity	13	If the project has already been assessed a greenhouse gas intensity from the EPA or ODEQ, what is the carbon intensity of the RNG?	[redacted]	Metric Tons CO2e/Dth
	14	If the project has not already been assessed a carbon intensity, what is the average GHG intensity for the projects biogas type from the Low Carbon Fuel Standards work done by the California Air & Resources Board	[redacted]	Metric Tons CO2e/Dth
On-System?	15	Will the project inject the RNG onto NW Natural's distribution system?	Yes	
	16	Where will NW Natural take custody of the RNG?	3235 SE River Rd, Hillsboro, OR 97123	
If the answer to *Question 15* is YES fill-in Zero on *Question 17*				
Y: Variable Transport	17	What are the total variable volumetric transport charges that would be required to bring the off-system RNG to NW Natural's system?	[redacted]	per Dth
If the answer to *Question 15* is NO fill in Zero for the remaining questions				
A: Peak Day Supply	18	What is the mininum daily amount of methane the project would inject into NW Natural during a cold weather event?	[redacted]	Dth per Day
	19	Is this amount a contractual obligation?	[redacted]	
H: Peak Hour Supply	20	What is the minimum amount of methane the project would inject into NW Natural's system during the 7am hour of a cold weather event?	[redacted]	Dth per Hour
	21	Is this amount a contractual obligation	[redacted]	

Term	Units	Description	Source	Project Specific?	Input or Output of Optimization?	Treated as Uncertain?
R	$/Year	Annual all-in cost of prospective renewable natural gas (RNG) project	Output of RNG evaluation process	Yes	Output	Yes
C	$/Year	Annual all-in cost of conventional natural gas alternative	Output of RNG evaluation process	Yes	Output	Yes
M	$/Year	Annual costs of natural gas and the associated facilities and operations to access it	Output of RNG evaluation process	Yes	Output	Yes
E	$/Year	Annual greenhouse gas emissions compliance costs	Output of RNG evaluation process	Yes	Output	Yes
I	$/Year	Annual infrastructure costs avoided with on-system supply	Output of RNG evaluation process	Yes	Output	Yes
Q	Dth	Expected or contracted daily quantity of RNG supplied by project	Project evaluation or RNG supplier counterparty	Yes	Input	If no contractual obligation
P	$/Dth	Contracted or expected volumetric price of RNG	Project evaluation or RNG supplier counterparty; Max cost-effective price determined in SENDOUT if NWN initiating negotiations	Yes	Input if responding to offer, Output if NWN making offer	If no contractual obligation
T	Year	Year relative to current year, where the current year T = 0, next year T = 1 etc.	Project evaluation or RNG supplier counterparty	Yes	Input if responding to offer, Output if NWN making offer	If no contractual obligation
k	Year	When the RNG purhcase starts in # of years in the future; k = RNG start year - current year	Project evaluation or RNG supplier counterparty	Yes	Input if responding to offer, Output if NWN making offer	If no contractual obligation
z	Years	Duration of RNG purchase in years	Project evaluation or RNG supplier counterparty	Yes	Input if responding to offer, Output if NWN making offer	If no contractual obligation
t	Days	Day number in year ***T*** from 1 to 365	N/A	No	Input	No
V	$/Dth	Price of conventional gas that would be displaced by RNG project	Average price of last ***Q*** quantity of conventional gas dispatched in SENDOUT run without RNG project	Yes	Output	Yes
Y	$/Dth	Variable transport costs to deliver gas to NWN's system	*For off-system RNG* - based upon geographic location of project; *For conventional gas* - determined from last gas dispatched in SENDOUT	Yes	Output	No
X	$/Year	Annual revenue requirement of capital costs to access resource	Engineering project evaluation or RNG supplier counterparty	Yes	Input	If no contractual obligation
N	TonsCO_2e /Dth	Greenhouse gas intensity of natural gas being considered	From actual project certification if available, from California Air & Resources Board by biogas type if no certification has been completed	Yes	Input	No
G	$ /TonCO_2e	Volumetric Greenhouse gas emissions compliance costs/price	Expected greenhouse gas compliance costs from the most recently acknowledged IRP	No	Input	Yes
S	$/Dth	System supply capacity cost to serve one Dth of peak DAY load	Calculated within SENDOUT based upon marginal supply capacity resource that is being deferred using Base Case resource availability from the last IRP	No	Output	Yes
A	Dth	Minimum natural gas supplied on a peak DAY by project	Project evaluation or contractual obligation from RNG supplier counterparty	Yes	Input	If no contractual obligation
D	$/Dth	Distribution system capacity cost to serve one DTH of peak HOUR load	Distribution system cost to serve peak hour load from avoided costs in most recently acknowledged IRP	No	Input	No
H	Dth	Minimum natural gas supplied on a peak HOUR by project	Project evaluation or contractual obligation from RNG supplier counterparty	Yes	Input	If no contractual obligation
d	% rate	Discount Rate	Discount rate from most recently acknowledged IRP	No	Input	No

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INVESTIGATION INTO USE OF NW NATURAL'S GAS EVALUATION METHODOLOGY

COS Model WP

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Due to the voluminous nature and linked cells, no redacted version exists.
All Highly Confidential information will be shaded in green.

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INVESTIGATION INTO USE OF NW NATURAL'S GAS EVALUATION METHODOLOGY

Phase II – NW Natural's Work Papers Demonstrating RNG Methodology

IHS Prices Feb 2020 WP

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INVESTIGATION INTO USE OF NW NATURAL'S GAS EVALUATION METHODOLOGY

Phase II – NW Natural's Work Papers Demonstrating RNG Methodology

Monte Carlo Gas Prices WP

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Phase II – NW Natural's Work Papers Demonstrating RNG Methodology

Monte Carlo GHG Compliance Policy Paths WP

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RNG Evaluation WP

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RNG Evaluation CI Sensitivity WP

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