

ATTACHMENT 8

**Updated 20-year Cost-Benefit Analysis of Anaerobic Digestion to Biofuel System Scenarios
New Front End Engineering Estimate**

Scenario	Total Cost (Million \$)	Borrowed (Million \$)	Cash	Contingency	Average Annual Debt Service	NPV	Annualized NPV (20 Years)
A	\$16,224,155	\$13,224,155	0	10%	\$1,042,685	(\$7,251,759)	(\$362,588)
B	\$15,486,694	\$12,486,694	0	5%	\$984,945	(\$3,259,651)	(\$162,983)
C	\$15,486,694	\$12,486,694	0	5%	\$926,770	\$2,263,907	\$113,195

Note: Each net present value is based on a 20-year time horizon, which is equal to the time to retire the debt.

COMPARISON OF THREE SCENARIOS – ASSUMPTIONS USED IN THE FINANCIAL ANALYSIS

Common to All Three Scenarios

- The total capital cost is \$14,749,232 for all scenarios.
- A discount rate of 5% is used to determine the net present value.
- The CIP management/admin fee to NRWS is set at 3% for all three scenarios.
- BioCNG fuel is valued at 95% of Napa CNG retail for all three scenarios, which is \$2.91 per gasoline gallon equivalent.
- Brokerage costs for Low Carbon Fuel Standard and EPA RINs are set at a cost of 10% of LCFS and 15% of RINs.
- Because the AD digestate is largely decomposed before being placed in the aerated static pile composting system, the residence or “dwell time” is reduced from 45 days to 15 days. This results in an additional 13,000 tons per year (tpy) of capacity in the ASP system for additional material. Although the gate fee is \$40 - \$45/ton, this additional capacity is conservatively valued at \$10/ton in the financial model.
- Approximately 4,533 tons per year of organic material is lost during AD as it is transformed to gas and liquid. This allows an additional 4,533 tpy to be accepted by the facility. This additional capacity is valued at the gate fee amount.
- The reduction in material mass and material decomposition occurring in the AD system results in an electricity savings valued at \$20,000/year in the ASP compost system.
- The 4,533 tpy is transformed to 2,227 tpy of compost that sells for \$18/ton, with a 1% annual escalator in price.
- 25,000 tpy of organic feedstock.

- 328,000 diesel gallon equivalents of BioCNG fuel are produced, or enough to fuel 35 trucks using 35 gallons per day.
- Gate fees increase 50 cents per ton per year.
- Annual capital investments of \$30,000 are assumed.
- Annual General and Administrative costs of 1% of annual revenues are assumed.

Scenario A

- 10% contingency on total project cost.
- Average annual Debt Service of \$1,042,685 on a total amount borrowed of \$13,224,155 (20 year public issue)
- No revenue from EPA RINS or Low Carbon Fuel Standard (LCFS) carbon credits.
- No labor savings included for time saved driving to get fuel at the existing CNG facility, which is valued at \$92,592,
- No savings included of the estimated \$36,730/year of labor savings compared to the current system, \$10,527 in savings on fuel (for loader, etc.), and savings of \$7,004 for extended loader life.
- Operations and maintenance costs are \$827,073 in the first year, with a 1% annual cost escalator.
- No annual increase in fuel value (i.e. no increase in retail price).

Scenario B

- 5% contingency on total project cost.
- Average annual Debt Service of \$984,945 on a total amount borrowed of \$12,486,694 (20 year public issue)
- RINs are conservatively valued at 25 cents (current trading value is 60 cents). LCFS carbon credits are conservatively valued at \$20/credit and terminate in 2020 (3 years) – November auction yielded \$26/LCFS credit.
- NRWS-projected driver overtime savings for on-site fueling of \$92,592 is included.
- 50% of the savings is included of the estimated \$36,730/year of labor savings compared to the current system, \$10,527 in savings on fuel (for loader, etc.), and savings of \$7,004 for extended loader life.
- Operations and maintenance costs are \$857,696 in the first year, with a 1% annual cost escalator.
- No annual increase in fuel value (i.e. no increase in retail price).

Scenario C

- 10% contingency on total project cost.
- Average annual Debt Service of \$926,770 on a total amount borrowed of \$12,486,694 (20 year public issue)
- RINs are valued at 50 cents (currently trading at 60 cents). LCFS carbon credits are valued at \$26, the average auction value for November, and continue through the entire 20 year time horizon.
- NRWS-projected driver overtime savings for on-site fueling of \$92,592 is included.
- 50% of the savings is included of the estimated \$36,730/year of labor savings compared to the current system, \$10,527 in savings on fuel (for loader, etc.), and savings of \$7,004 for extended loader life.
- Operations and maintenance costs are \$852,073 in the first year, with a 1% annual cost escalator.
- A 1% annual increase in fuel value.