

**Regional Integrated Resource Plan (RIRP) for the Alaska Railbelt
Advisory Work Group (AWG)
July 29, 2009 Meeting Notes**

Advisory Working Group Attendees:

Jim Strandberg	AEA/AIDEA
Kevin Harper	Black & Veatch
Myron Rollins	Black & Veatch
Steve Denton	Usibelli Coal Mine
Mark Foster	Mark A. Foster & Associates (MAFA)
Nick Goodman	TDX Power Inc.
Tony Izzo	TMI Consulting
Marilyn Leland	Alaska Power Association (APA)
Carrie Lockhart	Marathon Oil Company
Norman Rokeberg, Chair	Former State of Alaska Representative
Chris Rose	Renewable Energy Alaska Project (REAP)
Jim Sykes	Alaska Public Interest Research Group (AkPIRG)
Pat Lavin	National Wildlife Federation, Alaska Office
Debbie Schnebel	Scott Balice Strategies
Jan Wilson	Regulatory Commission of Alaska

Telephone Participants:

Jim Gooding	Black & Veatch
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Public Participants:

Bryan Carey	AEA/AIDEA
Doug Ott	AEA/AIDEA
Mike Harper	AEA/AIDEA
Jim Hemsath	AIDEA/AEA
Brad Evans	Chugach Electric Association (CEA)
Lee Thibert	CEA
Mark Fouts	CEA
Willard Dunham	Vice Mayor, City of Seward
Bill Wielechowski	Alaska State Senator
Shelly Morgan	Sen. Wielechowski office
Bob Butera	HDR
Jeb Spengler	Seattle Northwest Securities Corporation
Dave Burlingame	EPS
Ken Vassar	Birch, Horton, Bittner & Cherot
Chet Frost	Enstar Natural Gas Company
John Lau	Enstar Gas Company
Eric Marchegiani	USDA-RUS
Paul Kendall	General Public
Adam Berg	REI
Elizabeth Outten	Alaska Conservation Alliance
Steve Pratt	Steve Pratt Enterprises

Meeting was called to order at 10:15 am by Norman Rokeberg.

Greetings and introductory comments were made by Jim Strandberg and Norman Rokeberg.

- Jim discussed how this project interplays with a number of other initiatives including ongoing discussions of the Utility Task Force regarding the formation of the Greater Railbelt Energy and Transmission Corporation (GRETC), the Susitna re-evaluation project, and transmission modeling.
- Jim noted that the next meeting of the Utility Task Force would be on August 5th during which the utilities' support of the proposed GRETC entity would be discussed.
- Jim noted that the agenda for this meeting includes updates of the Susitna and Chakachamna projects, as well as the three RIRP evaluation scenarios proposed by Black & Veatch.
- Jim noted that the AEA is in regular communications with the Railbelt utilities at three levels: Board, senior management, and staff levels.
- Marilyn Leland discussed current discussions underway regarding a Special Energy Committee, Energy Think Tank and broader Statewide energy policies.
- Norman Rokeberg acknowledged the presence of legislative members and staff at this meeting and noted this was important in light of the fact that the RIRP project is the result of a State Legislature directive.
- Bill Wielechowski noted that hearings are being held throughout the State regarding energy policy matters.
- Paul Kendall stated that the RIRP should include all projects so that there are no future surprises regarding new projects. He further stated that these meetings should be video taped. He also noted that it would be a mistake for the region to continue to develop fossil-fueled resources.

Project Status Discussion

- Kevin Harper noted that the focus of this study is to identify the most optimal resource generation and transmission portfolio for the region over a 50-year planning horizon. Kevin noted that integrated resource plans are typically developed for 20-30 year planning horizons; a 50-year planning horizon will be used for the Railbelt RIRP because one of the key questions to be answered is whether the region should develop a large hydroelectric plant. The economic characteristics of these plants (i.e., high up-front operating costs and lower ongoing operational costs) require a longer timeframe to properly complete the required economic analysis.
- Regional focus and ownership structure

- Kevin Harper restated that the focus of the RIRP is to find the most optimal long-term resource plan for the region, not for individual utilities.
- He also noted that the Cook Inlet gas situation is a fundamental issue that needs to be addressed.
- Kevin Harper provided an overview of the status of the major work streams being completed as part of the RIRP project.
 - A 50-year base case load forecast has been completed.
 - Data gathering efforts regarding potential generation resources (fossil fuel and renewables) have largely been completed.
 - Black & Veatch has completed a benchmarking model run to compare the model results for 2008 to actual results. Black & Veatch is currently discussing differences with the utility to ensure that the models used by Black & Veatch (Strategist™ and Promod™) are properly calibrated.
 - Significant work has been completed with regard to the re-sizing of Susitna (to be discussed later) and transmission issues.
 - Jim Gooding is developing availability and price forecasts for all fossil fuels. To this end, Black & Veatch has proposed a scope expansion to develop a probabilistic analysis of natural gas options; the original scope of work called for Black & Veatch to rely on publicly available studies regarding future natural gas availability and prices. This will be discussed later during the meeting.
 - Black & Veatch has collected Alaska-specific information on demand-side management (DSM)/energy efficiency programs.
- He noted that Black & Veatch will develop alternative integrated resource plans for each of the evaluation scenarios that will be discussed later during the meeting. He also noted that implementation barriers will be identified for each alternative integrated resource plan, along with potential actions that can be taken to address these barriers.
- Kevin Harper also noted that this RIRP is being developed in response to a legislative directive but that it would need to be periodically updated, as is the case with all integrated resource plans.
- He also noted that the RIRP will need to address short-term issues, such as the adequacy of natural gas over the next 10 years, as well as longer-term issues.
- Chris Rose noted the significant uncertainties that exist with regard to the development of a long-term integrated resource plan. He also noted the importance of DSM/energy efficiency and the fact that little has been done to date in the region to take advantage of these options. He also noted the importance of energy-related policies and the potential transition to electric vehicles.
- Jim Strandberg noted that the RIRP study is intended to include all available resources, including the proposed Spur Line and Bullet Line. Risk is a critical issue that will be addressed by Black & Veatch. He also noted that Marathon Oil Company has been providing assistance to the project.

- Jim Sykes noted the importance of the system to absorb different types of resources.
- Steve Denton also noted the importance of addressing the development levels of various resources.
- Kevin Harper noted that the final report will include a detailed assessment of risks and a detailed implementation plan that will include steps to be taken to address these risks.
- Paul Kendall noted the large number of electric vehicle manufacturers and stated that the residential sector should be treated as a stand-alone segment and its future electric needs should be met through hydroelectric resources, including tidal power.
- Kevin Harper noted that expanded use of natural gas is just one of a number of resource options to be considered as part of the RIRP project.

Discussion Regarding Natural Gas Risk-Based Assessment

- Jim Gooding provided an overview of the proposed natural gas risk-based assessment.
 - He noted that this analysis is based upon a probabilistic assessment of the various gas supply options and the factors that will affect the resulting availability and price of natural gas.
 - He noted that the original scope of work called for the development of a deterministic forecast of natural gas availability and prices, based upon publicly available information.
 - A probabilistic decision tree will be developed, showing each potential gas supply option as a separate node on the tree.
 - Black & Veatch will work with the producers, Enstar Natural Gas Company, the Railbelt electric utilities and the AEA to develop probabilistic distribution functions for each factor that influences gas availability and process for each gas supply option.
 - The result of this assessment will be a forecast of natural gas prices to be used in the RIRP study.
- Jim Strandberg stated that an important contextual element of the RIRP project is the potential restructuring of the Railbelt utilities through the formation of a regional generation and transmission entity, along the lines of the proposed GRETC, and the need to develop a 10-year transition plan.
- Chris Rose asked whether there would be a “break” after the completion of the RIRP for the State and region to consider and develop energy-related policies. Jim Strandberg stated that the RIRP will include a near-term implementation plan that will identify potential policy options and related costs.
- Kevin Harper noted that the objective of integrated resource planning is not to set policies but, rather, to provide the information required to enable stakeholders to evaluate possible policies.

- Paul Kendal restated his desire to move away from fossil fuels and using hydroelectric resources for meeting residential needs.

Discussion Regarding Evaluation Scenarios

- Kevin Harper discussed the three evaluation scenarios being proposed by Black & Veatch. A 50-year integrated resource plan will be developed for each scenario.
 - **Scenario 1 – Base Case**
 - Includes all potential commercially available resources.
 - Includes the current load forecast and assumes no large increase in regional loads.
 - Probabilistic natural gas availability and price forecast.
 - Will include resulting emissions.
 - Model will select those resources that are most economical, without consideration of potential State financial assistance.
 - Will include transmission investments required to integrate the selected generation resources.
 - **Scenario 2 – RPS Target**
 - Same assumption as Scenario 1, but the model will be forced to select sufficient renewable resources to meet former Governor Palin’s goal of having renewables represent at least 50% of the region’s resource portfolio by 2025, subject to extenuating economic factors.
 - **Scenario 3 – Load Increase in Regional Electric Demand**
 - Same assumption as Scenario 1, but Black & Veatch will increase the region’s electric load by a factor of 2 to 3.
 - Load increase could be the result of policies to encourage large economic development loads or the move to greater residential use of electricity for space heating and or electric vehicles.
- Tony Izzo asked whether required transmission additions will be considered. Kevin Harper noted that for each integrated resource plan, the required transmission additions to integrate the selected generation resources will be identified and the associated costs will be included. Project-specific transmission costs (i.e., required transmission connections to move power to the backbone transmission grid) will be included as a cost of each resource.
- Dave Burlingame noted that the Railbelt transmission network’s ability to integrate new generation resources is limited by stability issues.
- Pat Lavin noted that it is important to look at space heating conversion and electric vehicles.
- Paul Kendall noted the value of displacing natural gas and gasoline.

Meeting was stopped for a lunch break at 12:15.

The meeting was reconvened at 12:50.

Discussion Regarding Evaluation Scenarios (continued)

- Pat Lavin suggested looking at a 50% renewables target for Scenario 3. He also asked about the hydro screening process.
- Jim Strandberg noted that the natural gas needs for Enstar Natural Gas Company will be considered as part of the natural gas risk-based assessment.
- Jim Sykes asked whether any ownership scenarios are being considered. Jim Strandberg stated that the proposed GRETC entity might take ownership in certain projects but that ownership of specific resources (e.g., natural gas fields) are not part of the RIRP project.
- Paul Kendall noted that tidal resources should be considered and that the possibility of moving hydrogen through Enstar's pipelines should be evaluated.
- Chris Rose asked about the difficulties associated with financing the future. Carrie Lockhart noted that the relative economics of alternatives will prevail.
- Carrie Lockhart noted a concern regarding the regulatory risks associated with chosen resource options. Kevin Harper noted that regulatory risks will be addressed as part of the RIRP.
- Jim Strandberg stated that the cost of large hydro options will be levelized over 100 years, similar to the Bradley Lake model.
- Norman Rokeberg stated that the RIRP should also include recommendations related to required legislative changes.
- Based upon the discussion, it was decided to add a fourth evaluation scenario that would be based upon achieving the 50% renewables target for Scenario 3 – Large Increase in Regional Electric Load.

Discussion Regarding Large Hydro Projects

- **Susitna – Bryan Carey and Bob Butera**
 - Bryan provided an overview of the current assessment related to the re-sizing of Susitna, noting that various options exist that would generate up to 1,200MW for a single dam and up to 1,600MW for two dams.
 - Bob Butera summarized the status of HDR's efforts to update the Susitna cost estimates and evaluation of alternative configurations that would better fit the Railbelt region.

- Paul Kendall asked whether the tidal resources in the Cook Inlet are being evaluated. Kevin Harper noted that this was not part of HDR's scope of work but it would be considered as part of the RIRP.
- **Chakachamna – Nick Goodman**
 - Nick Goodman provided an update regarding the Chakachamna project.
 - TDX has developed detailed cost estimates for three scenarios and are in the process of developing a cost estimate for a 200MW option. Nick noted that this option would produce less peak capacity but would have a higher capacity factor (65%). The cost estimate for this new option should be available within one month.

Discussion Regarding Financing

- Jeb Spengler provided an overview of the financial model that has been developed to support the RIRP project.
- This model has been developed to enable the RIRP team to consider a number of options regarding financing the future, once the results of the RIRP evaluations scenarios are known.
- He walked through the structure of the model and provided some hypothetical results to show how the model could be used.
- Once the RIRP modeling effort has been completed by Black & Veatch, the results will be imported into the financial model and various financing options, including State financial support, will be evaluated.

General Discussion

- Jim Strandberg noted that the RIRP will include a list of near-term projects, with associated costs and scheduled, to support potential legislative request for the next legislative session. The RIRP will also include a list of longer-term projects for each evaluation scenario.
- Jim further noted that the RIRP will identify several different options for meeting the needs of the Railbelt region, providing information regarding direction and costs for additional development efforts.
- Jim Sykes asked about demonstration projects and DSM/energy efficiency. Kevin Harper stated that DSM/energy efficiency options would be included in the RIRP and that specific demonstration project may be identified as part of the implementation plans for each evaluation scenarios.
- Jan Wilson asked about how the results of the RIRP will be communicated to the general public. Jim Strandberg stated that he would develop a communications plan and discuss it at the next Advisory Working Group meeting.
- Norman Rokeberg noted that there are several projects underway in parallel.

- Chris Rose asked how the region would be able to use the RIRP. Jim Strandberg noted that the RIRP would help set the direction for the future and serve as a bridge to major projects.
- Carrie Lockhart noted that the region has unrealistic expectations regarding natural gas prices due to five decades of low gas prices.
- Jim Hemsath noted that the RIRP needs to be a utility-driven solution. He also discussed economic development opportunities including gas to liquids projects. He also noted that LNG imports may be part of the solution.

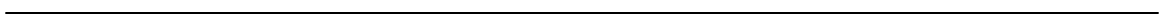
The Group concluded that August 26th would be the target date for the next AWG meeting.

The meeting was adjourned at 3:20 p.m.

ADVISORY GROUP MEETING

July 29, 2009

Meeting Handouts



Regional Integrated Resource Plan (RIRP)
for the Alaska Railbelt

Advisory Work Group (AWG) Meeting

10:00am-3:00pm Wed. July 29, 2009

AEA Board Room, 813 West Northern Lights Blvd. Anchorage

Agenda

Time	Topic	Lead
10:00–10:15	Introductory Comments	Jim Strandberg
10:15–10:45	Project Status <ul style="list-style-type: none"> • Work completed to date • Important activities over next two months • Proposed scope expansions • Deliverables 	Kevin Harper Jim Strandberg
10:45–12:00	Discussion Regarding Evaluation Scenarios <ul style="list-style-type: none"> • Proposed evaluation scenarios • General discussion 	Kevin Harper All
12:00–12:30	Lunch Break	All
12:30–1:00	Hydro Update (Susitna, Chakachamna)	Bryan Carey Doug Ott Bob Butera (HDR) Nick Goodman (TDX)
1:00–1:30	Financial Modeling	Jeb Spengler (Seattle-Northwest Securities)
1:30–2:50	Visioning Discussion Regarding Potential Resource Paths <ul style="list-style-type: none"> • Identify potential barriers that could impact the ability of the Railbelt region to pursue a specific potential resource path • Identify potential actions that could be taken to address these barriers 	Kevin Harper Jim Strandberg All
2:50–3:00	Concluding Comments	Jim Strandberg

Railbelt Regional Integrated Resource Plan (RIRP)

Advisory Work Group (AWG) Meeting

Project Status

Work Completed to Date/Important Activities Over Next Two Months

- Load forecast
- Benchmarking
- Fuel forecast
- DSM/energy efficiency programs
- Generation resources – fossil fuel and renewables
- Hydro “rightsizing” analysis
- Transmission analysis
- Susitna analysis (HDR) – to be discussed later
- Financial modeling (Seattle-Northwest Securities) – to be discussed later
- Evaluation scenarios – to be discussed later

Proposed Scope Expansions

- REGA data supplied to Northern Economics/SAIC to support In-State Natural Gas Demand Study
- Natural gas risk-based assessment – described on the next page

Key Deliverables

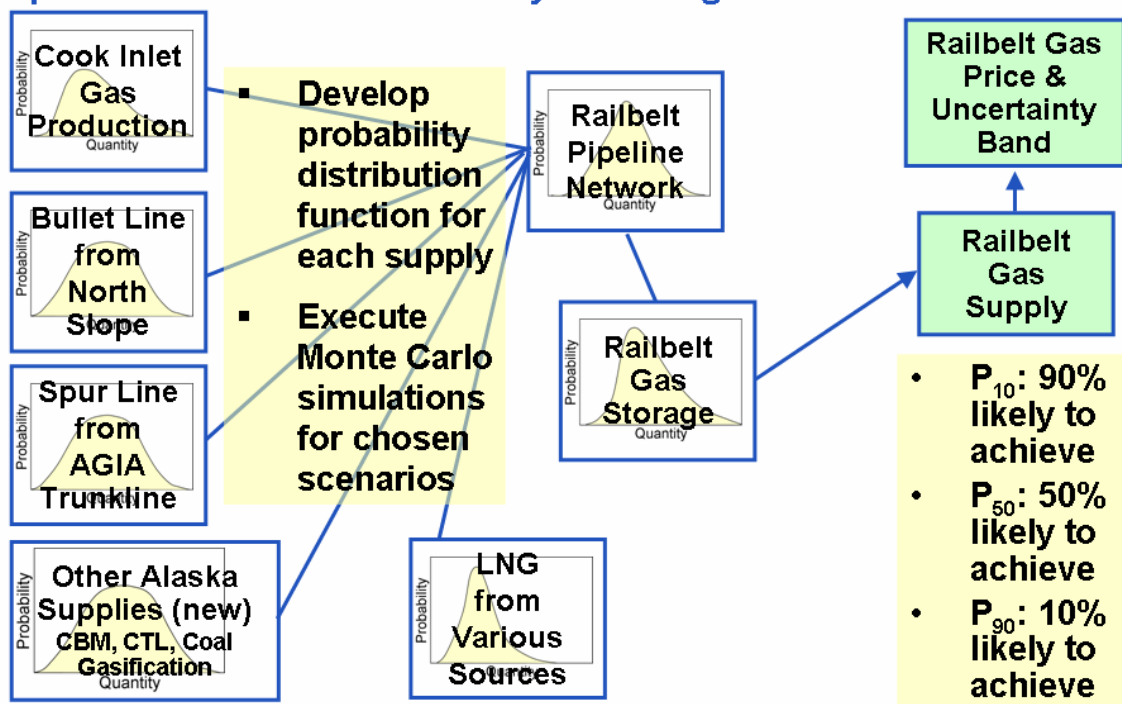
- Integrated Resource Plans for each of three evaluation scenarios (50-year horizon)
- Power flow and transient stability analyses
- Draft and Final RIRP Reports and related presentation
- A long-term schedule for developing new fuel supplies that will provide for reliable, stable priced electrical energy for a 50 year planning horizon
- List of near-term generation resource and fuel supply-related projects
- Short-term schedule that coordinates immediate network needs
- Comprehensive list of current and future generation, transmission and electric power infrastructure projects
- Recommendations regarding potential resource portfolio paths including potential State financial assistance to assist the Railbelt region move forward with near-term projects
- Recommendations regarding strategies for keeping options open while region
- Short-term plan addressing a 10-year transition from the present decentralized ownership and control to a unified G&T entity
- Analysis of the Alaska Intertie and South Anchorage Power Plant (Task 12)

Natural Gas Risk-Based Assessment

Decision tree addresses supply-side issues only.

- Each possible gas supply will be defined as a node in the decision tree; likewise for pipeline capacity and storage capacity.
- For each node, Black & Veatch will compile a probability distribution function comprising the likelihood that a given quantity will appear; continuous functions will be distinguished from discrete functions.
- Black & Veatch will conduct Monte Carlo simulations to statistically sample each node as routed to the aggregated Railbelt Gas Supply; Black & Veatch will compute benchmarks for P_{10} , P_{50} and P_{90} .
- Use P_{10} , P_{50} and P_{90} supply volumes to compute price curve with uncertainty bands.

Railbelt Natural Gas Supply Risks Involve Multiple Options for Various Pathways Through a Decision Tree



Evaluation Scenarios

Scenario No. 1 – Base Case

- Current regional loads with projected growth
- All available resources – fossil fuel, renewables, and DSM/energy efficiency
- Probabilistic estimate of gas supply availability and prices
- Deterministic availability/price forecasts for other fossil fuels
- Emissions including CO2 costs
- Transmission system investments required to support selected resources

Scenario No. 2 – Renewable Portfolio Target (50% by 2025)

- Base case loads, resources, fuel availability/price forecasts and CO2 costs
- Force minimum level of renewables
- Transmission system investments required to support selected resources

Scenario No. 3 – Base Case

- Significant growth in regional loads due to economic development efforts
- Base case resources, fuel availability/price forecasts and CO2 costs
- Transmission system investments required to support selected resources

Visioning Discussion

Alternative Resource Paths

- Natural gas
- Other fossil fuels
- Large hydro resource potential
- Other renewables
- Transmission network
- DSM/energy efficiency

Potential Barriers

- Uncertain natural gas supplies
- Definition of renewable resource potential
- Definition of DSM/energy efficiency resource potential
- Project development risks
- Transmission system constraints
- Railbelt utility financial capabilities and related risks
- Independent power producer market access
- Potential regulatory and environmental regulations
- State financial strength

Potential Actions

- Utilities
- Regional G&T entity
- State – policies and financial assistance
- Regulatory
- Research related to research potential
- Optionality

DRAFT

Regional Integrated Resource Plan - Financing
Summary of Preliminary Findings
July 29, 2009

Assumptions:

- Devil Canyon project assumptions from Susitna Hydroelectric Project – Project Evaluation report (March 16, 2009)
 - Energy generation and timeline
 - Capital expenditure schedule
- Minimum pro-forma debt service coverage = 1.25 X
- Debt Service Reserve = Tax max (Maximum Annual Debt Service), invested at 5.00%, interest earnings reduce annual debt service requirements.
- Does not include ongoing capital expenditures past initial permitting/construction phase.
- "A" rated entity
- Taxable, long-term, fixed rate bonds
- Coupon bonds with capitalized interest used in all cases where possible; deferred interest bonds used if necessary
- Interest rate = 7.00% for coupon bonds; 7.70% on deferred interest bonds
- Cost of issuance & underwriter's discount = 2.00% of par amount
- Permitting and construction funds bonded in advance are net funded @ 5.00%.

Cases evaluated:

- \$5 billion project, entire project requirements issued in advance of permitting/construction (2011), fixed rate bonds, cost of energy at \$0.14 cents per kWh.
- \$5 billion project, entire project requirements issued following permitting/construction (2024), fixed rate bonds, cost of energy at \$0.14 cents per kWh.
- \$5 billion project, annual issuance of deferred interest bonds through permitting/construction beginning 2011, cost of energy at \$0.14 cents per kWh.
- \$5 billion project, annual issuance of deferred interest bonds through permitting/construction beginning 2011, cost of energy at \$0.33 cents per kWh.

- \$0.11 cents per kWh, Devil Canyon energy output, how much can be bonded for?

Prepared by Seattle-Northwest Securities

Preliminary conclusions:

- Annual issuance of DIBs at \$0.14 cost of energy: borrowing capacity falls (\$3.5 billion) short of funds needed to complete the project and maintain 1.25X DSC.
- Annual issuance of DIBs at \$0.33 cost of energy: achieves funding of capital projects at 1.25X.
- Issuance of entire amount upfront at fixed rates & \$0.14: achieves adequate funding target of 1.39X DSC once energy is online, however requires \$2.8 billion in capitalized interest through permitting and construction period. Also requires net funding of projects and construction fund earnings @ 5.00%.
- Issuance of takeout financing after construction at fixed rates & \$0.14 assuming initial State funded financing: falls short of positive DSC. Extends length of amortization and strength of credit for a capital markets transaction once project is online.
- Cost of energy @ \$0.11, and a bond issue post permitting/construction produces \$3.1 billion in project funds.

Issues:

- Length of time between construction expenditures and first revenue.
- Review assumptions for validity, particularly coverage minimum, construction reserve, market for debt past 40 years.
- If 1.25X coverage is achieved, cash balances are accumulated; what to do with them...super-sinker call, floating coverage, etc..
- Evaluate construction period financing options in conjunction with mechanisms for managing interest rate risk.

Strategies:

- Structure of ownership through PPP or long-term lease agreement with State of Alaska
- Zero or low interest loans from State through construction period or longer
- Rolling issuance of bonds, backed by State/Federal loan guarantee
- "Infrastructure tax"
- Turbo redemption bonds
- Loan guarantees
- Equity financed
- Grants

Prepared by Seattle-Northwest Securities

Alaska Regional Integrated Resource Plan
Scenario Cash Flow Summary
dollars in millions

Case	Devil Canyon				
	2011 issue Taxable, 100% Fixed \$0.14 kWh 1	2024 issue Taxable, 100% Fixed \$0.14 kWh 2	Rolling Issues Taxable, 100% DIBS \$0.14 kWh 3	Rolling Issues Taxable, 100% DIBS \$0.33 kWh 4	2024 Taxable, 100% Fixed \$0.11 kWh 5
Devil Canyon					
REGA Bonds - Project Deposit	3,091	5,012	5,012	5,012	3,106
Project Fund Earnings @ 5.00%	1,921	0	0	0	0
REGA Infrastructure Tax	0	0	0	0	0
REGA other	0	0	0	0	0
Total REGA Contribution	5,012	5,012	5,012	5,012	3,106
Unfunded Debt Service (2011 - 2023)	2,936	0	12,123	0	0
Energy Sales Revenue (40 Years)	11,068	15,951	15,951	36,486	12,454
Debt Service Requirements	14,102	15,082	29,132	29,132	9,964
Low Coverage	1.39X	0.98X	0.53X	1.25X	1.25X
All-in Borrowing Cost	7.16%	7.18%	7.63%	7.63%	7.18%
Bond Composition					
Current Interest	3,445	5,526	0	0	3,424
Deferred Interest	0	0	5,910	5,910	0
Total	3,445	5,526	5,910	5,910	3,424
ISS					
CAPI	0	0	0	0	0
Issuance Costs	69	111	152	152	69
DRPF	285	403	746	746	249
Upfront Proceeds to Project	3,091	5,012	5,012	5,012	3,106
Final debt service payment	2051	2063	2063	2063	2063
Funds available above DS requirements					
2011-2023	0	0	0	0	0
2024-2063	3,120	0	0	7,354	2,491
	3,120	0	0	7,354	2,491

Assumptions

Minimum coverage = 1.25x
Interest rates = 7% Current Interest, 7.70% Deferred Interest
Issuance Costs = 2% of Par Amount
Par coupons
Debt service reserve funded at Maximum Annual Debt Service
Bonds all assumed to be 40 years from date of issue
Devil Canyon energy generation assumptions from 3/16/09 Susitna Cost of Energy Analysis