

Successful Lender Financing of Anaerobic Digestion Projects

Role of the Independent Engineer What Prospective Developers Should Know



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Consulting Engineer



Overview of Presentation

Types of Project Financing

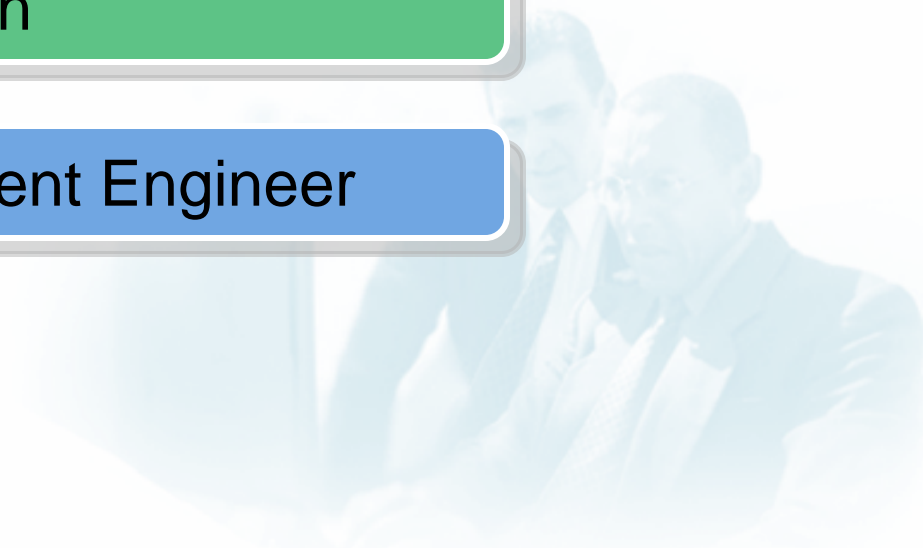
Lender Concerns

Lender Risk Mitigation

Role of the Independent Engineer



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Types of Project Financing

Off-Balance Sheet or Non-Recourse

- Lender Entitled to Repayment only from Project Assets upon Developer Default
- Project Assets include Revenue-Producing Project Agreements
- Lender Can Not Seize Additional Developer Assets for Loan Repayment
- Developer's Equity Contribution Potentially at Risk
- Project Economics Defined by Projected Cash Flows
- Requires Significant Technical, Financial and Legal Due Diligence
- Lenders Require an Independent Engineer's Due Diligence Review & Report



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Types of Project Financing

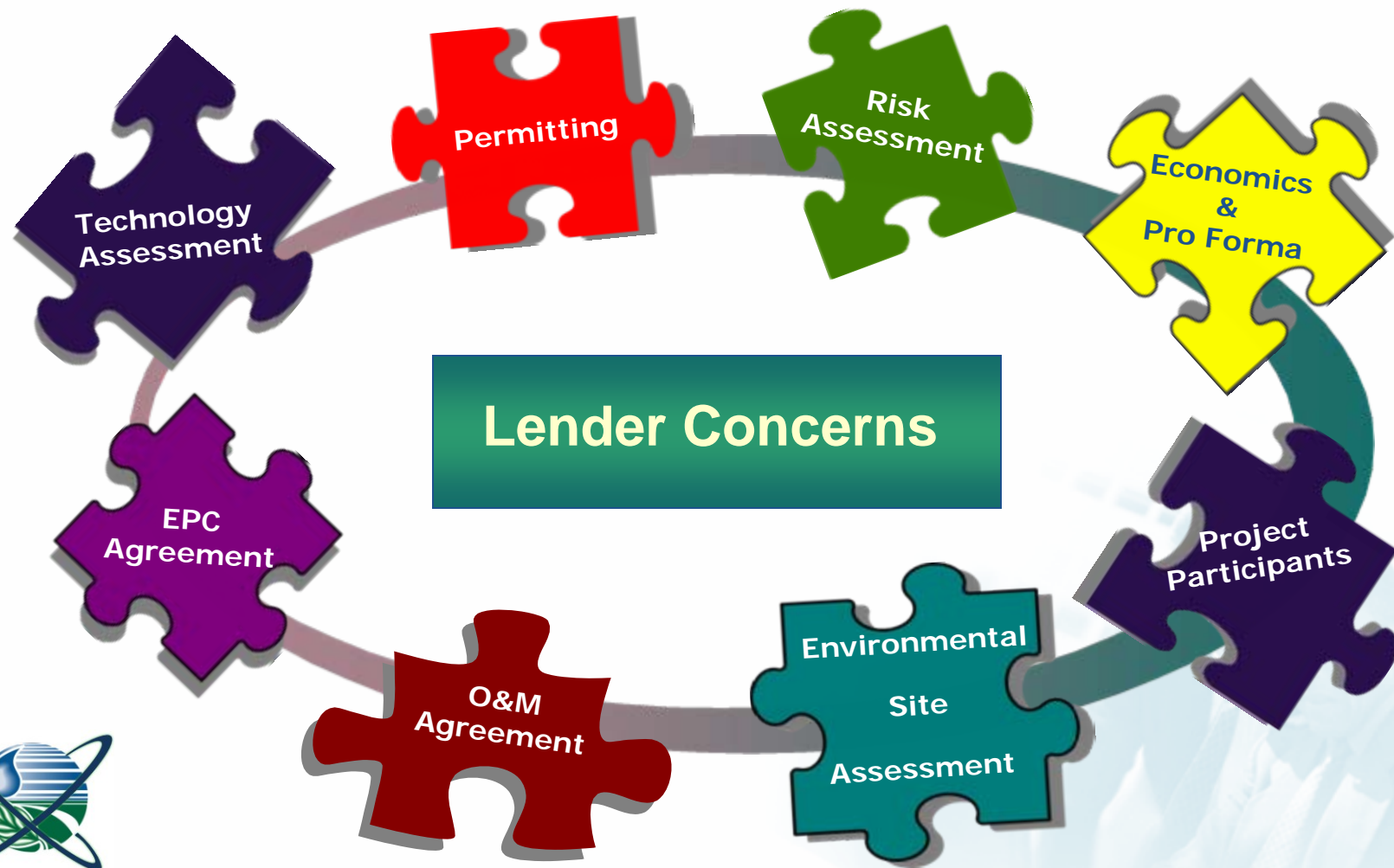
On-Balance Sheet

- **Recourse to the Developer's other assets and revenue streams**
- **Strength of the sponsor's balance sheet**
 - Level of existing debt and debt covenants
 - Impacts amount and terms of financing
- **Potential Risk of losing business upon loan defaults**
- **Some Risk Mitigation may be required by Lenders**





Lender Concerns



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Lender Concerns ^{cont}

Project Participants Capabilities, Qualifications, Experience & Role

- Developer & Management Team
- Design Engineering Team
- EPC Contractor
- Operations & Maintenance Team
- Other Key Developer Participants

Technology

- Technical Development
- Proven and Reliable Performance
- Existing Operational Commercial Facilities
- No Emerging Technologies



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Morgan Stanley

Bank of America



UBS

citibank[®]

J.P. Morgan

CREDIT SUISSE



BARCLAYS

Deutsche Bank





Lender Concerns ^{cont}



EPC Contractor

- Experience with Implementation of Similar Facilities
- Commercial Terms and Conditions
- Performance Guarantees

In-Hand Permits and Other Regulatory Compliance

In-Hand Long-Term Agreements

- Credit Worthy Off-Takers
- Power Purchase
- Feedstock Supply
- Transportation
- Operation & Maintenance
- Product Sale/Purchase
- Interconnection



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Risk Identification and Allocation

Types of Project Risk Categories

Developer Participants

- Financial Strength
- Commitment to Project
- Qualification of Team

Planning

- Project Feasibility
- Viable Technology
- Permitting Potential
- Suitable Project Site

Design/Construction

- Design/Construction Defects
- Additional Unanticipated Capital Costs
- Commercial Operation Date Extended
- Construction Not Completed

Operation

- Design Output Not Realized
- Feedstock Quantity/Quality Not Consistent
- Diminished Market for Products
- Qualifications/Experience of Operation Personnel
- Non-Performance of Off-Take Agreements



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Risk Mitigation



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Risk Mitigation Strategies Participants and Planning Effort

- ✓ Comprehensive Review by Independent Engineer

Technology

- ✓ Pilot Studies
- ✓ Feedstock Analysis
- ✓ Laboratory Studies
- ✓ Comprehensive Review by Independent Engineer

Design/Construction Risks

- ✓ EPC Contract Terms
- ✓ Construction Performance Bond
- ✓ Labor & Materials Bond
- ✓ Performance Guarantee
- ✓ Acceptance Testing
- ✓ Liquidated Damages
- ✓ Default Provisions
- ✓ Various Insurance Policies

Operations

- ✓ O&M Contract
- ✓ O&M Performance Bond
- ✓ Letter of Credit



Role of the Independent Engineer



*The **Independent Engineer** plays a "super partes" (Impartial) role and is asked to express an opinion as to the project's feasibility, perform technical due diligence to evaluate the project viability, assess risks and act as the lender's (bank's) representative on the finance team.*



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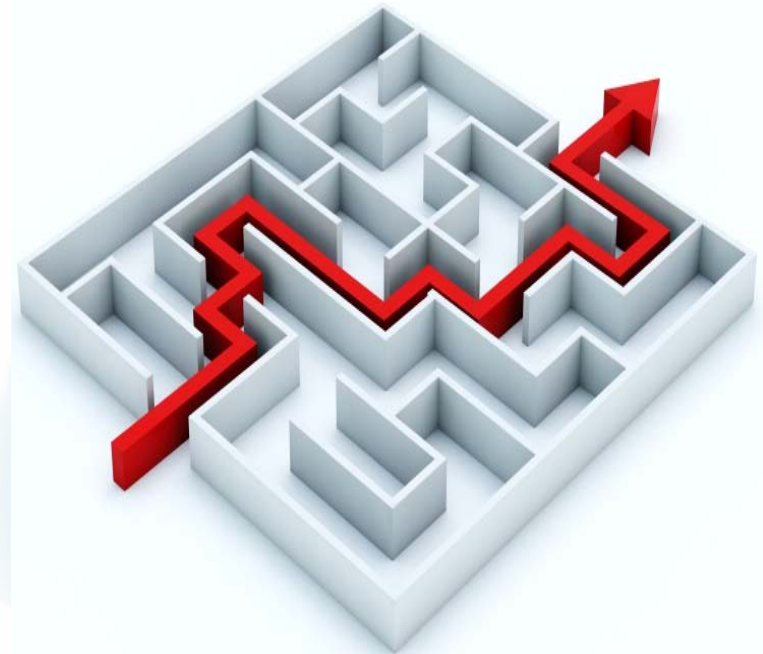
Role of the Independent Engineer

Independent Engineer in Financing

- ❖ Also Known as Lender's Engineer and Lender's Technical Advisor
- ❖ Integral Member of Finance Team
- ❖ Represent Lender (Trustee) & Bondholders
- ❖ Advises Developer of "Holes" in Documentation Prior to Approaching Lender
- ❖ Address Technical, Environmental, and Economic Matters which may Affect a Project's Revenue Stream and Success
- ❖ Provide Pre-Financing Activities
 - ✓ Fatal Flaw Analysis (Level 0)
 - ✓ Preliminary Feasibility Review (Level 1)
 - ✓ Project Risk Assessment (Level 1)



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Role of the Independent Engineer

Independent Engineer in Financing ^{cont}

DOCUMENT 00 61 13.13
CONSTRUCTION PERFORMANCE BOND

THIS CONSTRUCTION PERFORMANCE BOND ("Bond") dated the ____ day of _____, 20____, is in the penal sum of _____ which is one hundred percent of the Contract Sum, and is entered into by and between the parties listed below to ensure the faithful performance of the Construction Contract listed below. This Bond consists of this page and the Bond Terms and Conditions, Paragraphs 1 through 12, attached to this page. Any singular reference to _____ ("Surety"), _____ ("Contractor"), _____ ("City"), or other party shall be considered plural where applicable.

CONSTRUCTION CONTRACT: _____ Project

CONTRACT No.: _____

DATED _____, 20____, in the Amount of \$_____ (the "Penal Sum").

CONTRACTOR AS PRINCIPAL (Corp. Seal)	SURETY (Corp. Seal)
_____ Company Name	_____ Company Name
_____ Signature	_____ Signature
_____ Print Name	_____ Print Name
_____ Title	_____ Title
_____ Street Address	_____ Street Address
_____ City, State, Zip Code	_____ City, State, Zip Code

❖ Provide Pre-Financing Activities ^{cont}

- ✓ Independent Engineer Report – Financing (Level 1)
- ✓ Review of Revenue Producing Off-Take Agreements (Level 1)

❖ Provide Post Financing Activities

- ✓ Construction Monitoring/Issue Loan Draw Certificates (Level 2)
- ✓ Start-Up, Acceptance Test and Commissioning Review (Level 3)
- ✓ Ongoing Operations Monitoring (Level 4)



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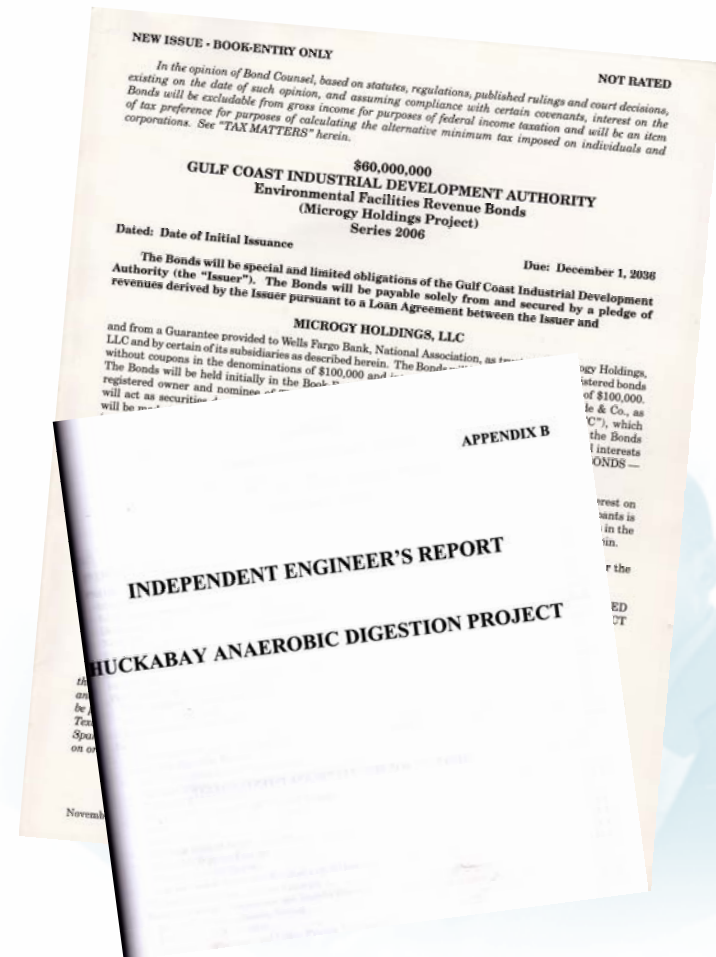
Role of the Independent Engineer

Independent Engineer's Report -- Financing

- ❖ Appendix to Bond Issue “Official Offering Statement”
- ❖ Independent Evaluation of Project Impacts on Loan Repayment
- ❖ Accurate, Complete, Thorough and Factual Analysis
- ❖ Balanced and Comprehensive Project Review – Positive and Negative Opinions
- ❖ Based on Requested/Developed Documentation
- ❖ Report the Independent Engineer Opinions



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Independent Engineer Report

Contents - Independent Engineer's Report

Typical Report Outline	
Off-Site Requirements	12
Fuel Supply	14
Water Supply	14
Wastewater Disposal	14
Transmission and Interconnection	14
Technical Review of Facility	16
Estimated Useful Life	16
Capacity and Heat Rate	16
Capacity	16
Heat Rate	16
Summary	17
Availability	17
Performance Guarantees and Performance Tests	17
EPC Contract	17
Performance Guarantees	17
Performance Tests	18
Liquidated Damages and Limitation of Liability	18
Warranties	18
IST Agreement	18
Performance Guarantees	19
Performance Tests	19
Liquidated Damages and Limitation of Liability	19
Warranties	20
Summary	20
Operation and Maintenance	20
Organization	20
Agreements	20
Summary	20
ENVIRONMENTAL AND REGULATORY	
Environmental Site Assessment	22
Status of Permits and Approvals	22
CONSTRUCTION COSTS AND SCHEDULE	
Facility Capital Costs	23
Direct Construction Costs	23
Indirect Project Costs	23
Overall Project Contingency	23
Other Indirect Costs	23
Construction Schedule	24
PROJECTED OPERATING RESULTS	
Annual Operating Revenues	24
Revenue from the Market Sale of Electricity	24
Revenue from the Power Sales Contract	25
Revenue from the Steam Supply Agreement	25
Annual Operating Expenses	25

- Project Participants Capabilities, Qualifications, Experience & Role
- Technology Review
- Facility Review – Site Suitability
- Environmental Site Assessment
- Permit Review
- Regulatory Compliance





Independent Engineer Report

Contents - Independent Engineer's Report ^{cont}

- EPC Agreement
- Capital Cost and Operation/Maintenance Cost
- Construction Schedule
- Reliability and Availability
- Revenue Producing Off-Take Agreements
- Pro Forma -- Projected Operating Results
- Sensitivity Analysis



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**In our
opinion...**

Independent Engineer Opinions

Project Participants Capabilities, Qualifications Experience & Role

- Developer Management Team
- Design Engineering Team
- EPC Contractor
- Operations & Maintenance Team
- Other Key Participants



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In our opinion...

Independent Engineer Opinions

Typical Project Development Documents Reviewed by Independent Engineer

- Products Marketing Plan
- Business Plan
- Design Report and Pilot Plant
- Construction Plan
- Value Engineering Summary
- Operations Plan

Typical Long-Term Project Agreements Reviewed by Independent Engineer

- Operation and Maintenance
- Feedstock Supply and Transportation
- Fuel Supply
- Power Purchase
- Interconnection
- Product Sale/Purchase
- Water Supply



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In our opinion...

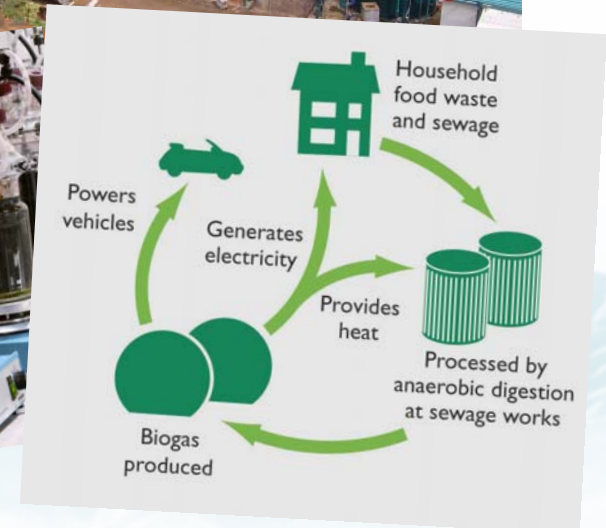
Independent Engineer Opinions

Technology

- Technical Development
- Proven and Reliable
- Commercially Operating Facilities
- Performance
- Emerging Technology
- Estimated Useful Life
- Facility Availability
- Product Sales
- Energy Production

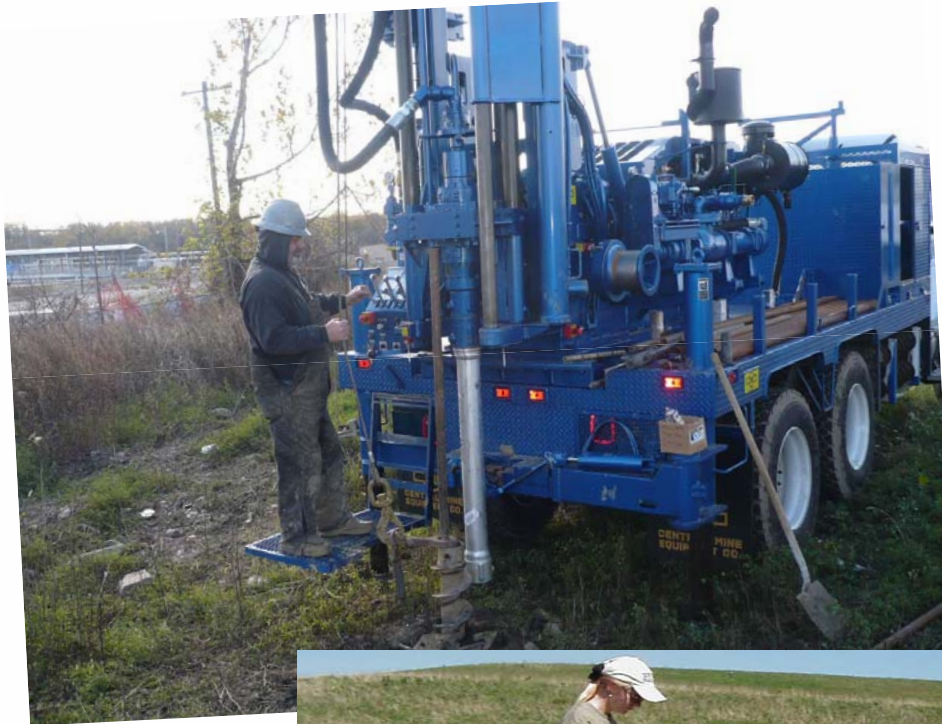


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In our
opinion...

Independent Engineer Opinions



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Facility Review

- Site Conditions and Suitability for Project
- Geotechnical Report of Subsurface Conditions
- Environmental Site Assessment and Conditions
- Site Equipment and Building Arrangement
- Utility Access Provisions
- Potential for Extraordinary Development Costs

In our opinion...

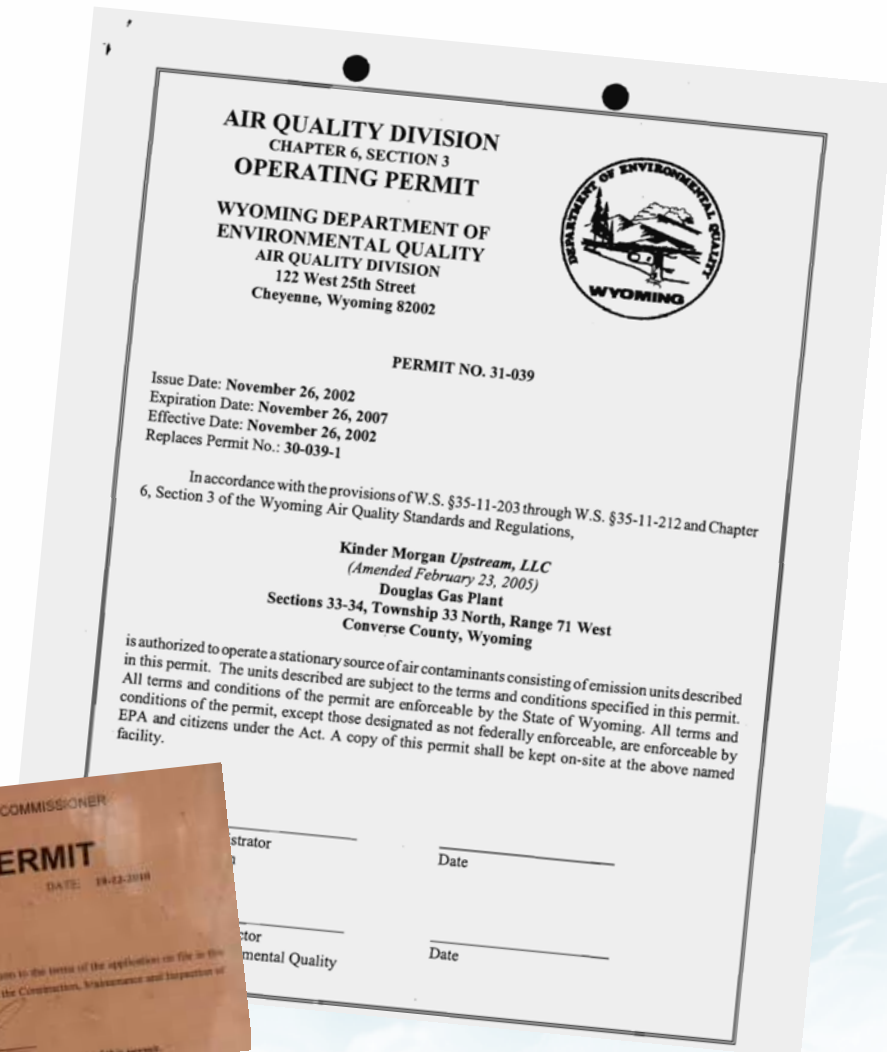
Independent Engineer Opinions

Permits

- ❖ Verify Necessary Permits Have Been Obtained
- ❖ Assess Project Ability to Meet Permit Requirements Under All Operating Conditions
 - Air Quality Operating
 - Odor Nuisance
 - Army Corps of Engineer
 - Wastewater Disposal (NPDES)
 - Stormwater
 - Local Building
 - Other Local Permits
 - Other Regulatory Compliance



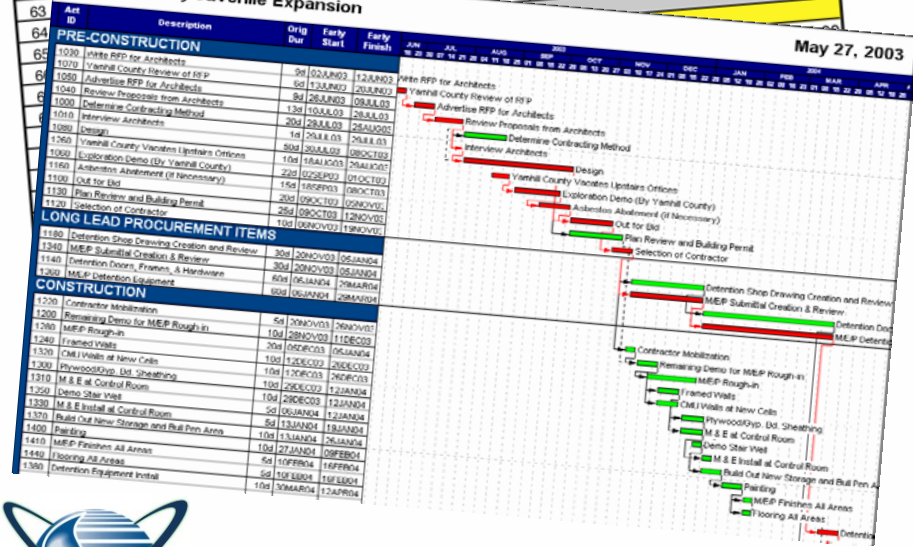
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In our opinion...

Independent Engineer Opinions

Cost Estimate						Page 2	
Description	Qty	Price	UM	Draw	Me	Total	
SITE PREPARATION							
51	1	125.00	Lump Sum	0.00	125.00	125.00	
52	6	115.00	Hour	0.00	690.00	690.00	
53	5	75.00	Load	275.00		375.00	
54	1	275.00	Lump Sum	0.00		275.00	
55	1	275.00	Lump Sum	0.00		0.00	
56	TOTAL SITE PREP (LINES 52-55)				650.00	815.00	1,465.00
57						247.50	247.50
58	FOOTINGS					243.00	243.00
59	225	1.10	LF	243.00		243.00	
60	45	5.40	EA	1,725.00		1,725.00	
61	15	115.00	CY	0.00		0.00	
62	Yamhill County Juvenile Expansion (LINES 60-63)				2,215.50	0.00	2,215.50



Construction Costs Review

- Facility Direct Construction Costs
- Facility Indirect Project Costs
- Soundness of Methodology in Cost Development
- Equipment Supplier Data

Operation & Maintenance Costs

- Fixed
- Variable
- Soundness of Methodology in Cost Development
- Basis for Costs

Project Schedules

- Development Tasks
- Design Tasks
- Construction Tasks
- Start-up and Acceptance Testing
- Final Completion
- Commercial Operation Date



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In our opinion...

Independent Engineer Opinions

Projected Operating Results

❖ Operating Revenues

- Power Sales, Product Sales, Other Revenues

❖ Operating Expenses

- Fuel, Fixed and Variable Expenses, Misc Expenses

❖ Annual Debt Service

❖ Debt Service Coverage Ratios

❖ Sensitivity Analysis

- Reduced Biogas Production, Reduced Availability, Product Market Variables, Additional Capital Costs, Additional Operating Costs, Lower Revenues from Agreements



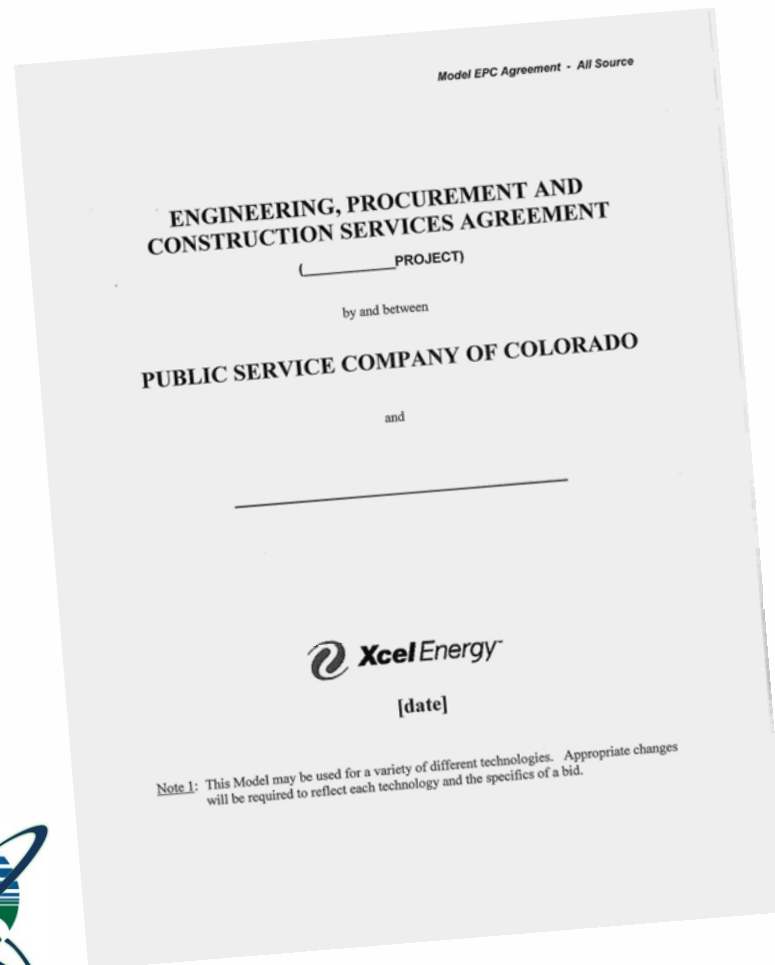
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Pro-Forma

		Year 1		Year 2		Year 3		Year 4		Year 5	
		Projection	%	Projection	%	Projection	%	Projection	%	Projection	%
Gross Revenue		\$3,355,867		\$ 3,456,543		\$ 3,560,239		\$ 3,667,046		\$ 3,777,058	
Breakdown											
	Food Beverage	\$1,610,816	48.00%	\$ 1,590,010	46.00%	\$ 1,566,505	44.00%	\$ 1,540,169	42.00%	\$ 1,510,823	40.00%
		\$1,745,051	52.00%	\$ 1,866,533	54.00%	\$ 1,993,734	58.00%	\$ 2,126,887	58.00%	\$ 2,266,235	60.00%
Cost of Goods Sold		\$3,355,867	100.00%	\$ 3,456,543	100.00%	\$ 3,560,239	100.00%	\$ 3,667,046	100.00%	\$ 3,777,058	100.00%
	Food Beverage	\$ 483,245	30.00%	\$ 477,003	30.00%	\$ 469,952	30.00%	\$ 462,048	30.00%	\$ 453,247	30.00%
	Comps	\$ 349,010	20.00%	\$ 373,307	20.00%	\$ 398,747	20.00%	\$ 425,377	20.00%	\$ 453,247	20.00%
		\$ 87,253	5.00%	\$ 74,661	4.00%	\$ 59,812	3.00%	\$ 42,538	2.00%	\$ 22,862	1.00%
Gross Profit		\$2,436,399	73%	\$ 2,531,572	73.24%	\$ 2,631,729	73.92%	\$ 2,737,083	74.64%	\$ 2,847,901	75.40%
Operating Expenses											
Payroll											
	Salaries & Wages	\$ 714,128	21.28%	\$ 735,552	21.28%	\$ 757,619	21.28%	\$ 780,347	21.28%	\$ 803,758	21.28%
	Gratuities	\$ 114,261	3.40%	\$ 117,688	3.40%	\$ 121,219	3.40%	\$ 124,856	3.40%	\$ 128,601	3.40%
	Taxes	\$ 71,413	2.13%	\$ 73,555	2.13%	\$ 75,762	2.13%	\$ 78,035	2.13%	\$ 80,376	2.13%
	Benefits	\$ 107,119	3.19%	\$ 110,333	3.19%	\$ 113,643	3.19%	\$ 117,052	3.19%	\$ 120,584	3.19%
	Payroll Sub Total	\$1,006,921	30.00%	\$ 1,037,129	30.00%	\$ 1,068,243	30.00%	\$ 1,100,290	30.00%	\$ 1,133,299	30.00%
Variable Expenses											
	Cleaning	\$ 8,390	0.25%	\$ 8,641	0.25%	\$ 8,901	0.25%	\$ 9,168	0.25%	\$ 9,443	0.25%
	Credit Card Fees	\$ 50,338	1.50%	\$ 51,848	1.50%	\$ 53,404	1.50%	\$ 55,008	1.50%	\$ 56,656	1.50%
	Decorations	\$ 3,356	0.10%	\$ 3,457	0.10%	\$ 3,560	0.10%	\$ 3,667	0.10%	\$ 3,777	0.10%
	Equipment Rental	\$ 5,034	0.15%	\$ 5,185	0.15%	\$ 5,340	0.15%	\$ 5,501	0.15%	\$ 5,666	0.15%
	linen	\$ 8,390	0.25%	\$ 8,641	0.25%	\$ 8,901	0.25%	\$ 9,168	0.25%	\$ 9,443	0.25%
	OS&E	\$ 50,338	1.50%	\$ 51,848	1.50%	\$ 53,404	1.50%	\$ 55,008	1.50%	\$ 56,656	1.50%
	Paper	\$ 33,559	1.00%	\$ 34,565	1.00%	\$ 35,602	1.00%	\$ 36,670	1.00%	\$ 37,771	1.00%
	Outside Services	\$ 8,390	0.25%	\$ 8,641	0.25%	\$ 8,901	0.25%	\$ 9,168	0.25%	\$ 9,443	0.25%
	Promotion	\$ 3,356	0.10%	\$ 3,457	0.10%	\$ 3,560	0.10%	\$ 3,667	0.10%	\$ 3,777	0.10%
	Supplies	\$ 117,455	3.50%	\$ 120,979	3.50%	\$ 124,808	3.50%	\$ 128,347	3.50%	\$ 132,197	3.50%
	Talent	\$ 16,779	0.50%	\$ 17,283	0.50%	\$ 17,801	0.50%	\$ 18,335	0.50%	\$ 18,885	0.50%
	Uniforms	\$ 197,793	5.00%	\$ 172,827	5.00%	\$ 178,012	5.00%	\$ 183,352	5.00%	\$ 188,853	5.00%
		\$ 13,423	0.40%	\$ 13,826	0.40%	\$ 14,241	0.40%	\$ 14,668	0.40%	\$ 15,108	0.40%
	Variable Expenses Sub Total	\$ 486,601	14.50%	\$ 501,199	14.50%	\$ 516,235	14.50%	\$ 531,722	14.50%	\$ 547,673	14.50%
ADD: Sponsorships		\$ 33,559	1.00%	\$ 34,565	1.00%	\$ 35,602	1.00%	\$ 36,670	1.00%	\$ 37,771	1.00%
ADD: Door Sales		\$ 83,897	2.50%	\$ 86,414	2.50%	\$ 89,006	2.50%	\$ 91,676	2.50%	\$ 94,426	2.50%
Departmental Profit		\$1,060,293	31.60%	\$ 1,114,223	32.24%	\$ 1,171,860	32.92%	\$ 1,233,418	33.64%	\$ 1,299,127	34.40%
Undistributed Expenses											
	Sales & Marketing	\$ 67,117	2.00%	\$ 69,131	2.00%	\$ 71,205	2.00%	\$ 73,341	2.00%	\$ 75,541	2.00%
	IT (Web Site)	\$ 16,779	0.50%	\$ 17,283	0.50%	\$ 17,801	0.50%	\$ 18,335	0.50%	\$ 18,885	0.50%
	Engineering	\$ 67,117	2.00%	\$ 69,131	2.00%	\$ 71,205	2.00%	\$ 73,341	2.00%	\$ 75,541	2.00%
	Utilities	\$ 117,455	3.50%	\$ 120,979	3.50%	\$ 124,808	3.50%	\$ 128,347	3.50%	\$ 132,197	3.50%
Total Undistributed Expenses		\$ 268,469	8.00%	\$ 276,523	8.00%	\$ 284,819	8.00%	\$ 293,364	8.00%	\$ 302,165	8.00%
Gross Operating Profit		\$ 791,823	23.60%	\$ 837,700	24.24%	\$ 887,041	24.92%	\$ 940,055	25.64%	\$ 996,962	26.40%
Fixed Expenses											
	Real Estate Tax	\$ 100,676	3.00%	\$ 103,696	3.00%	\$ 106,807	3.00%	\$ 110,011	3.00%	\$ 113,312	3.00%
	Insurance	\$ 67,117	2.00%	\$ 69,131	2.00%	\$ 71,205	2.00%	\$ 73,341	2.00%	\$ 75,541	2.00%
Total Fixed Expenses		\$ 167,793	5.00%	\$ 172,827	5.00%	\$ 178,012	5.00%	\$ 183,352	5.00%	\$ 188,853	5.00%
Net Operating Income		\$ 624,030	18.60%	\$ 664,873	19.24%	\$ 708,029	19.92%	\$ 756,702	20.64%	\$ 808,109	21.40%



EPC Contract Review



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EPC Agreement

Scope

Commercial Terms and Conditions

- Warranty
- Changes
- Force Majeure
- Suspension/Termination
- Other: Retainage and Holdbacks

Performance Guarantees

- Biogas Output
- Power Output
- Product Output
- Noise
- Emissions

Acceptance Test Program

Construction Schedule

Payment Terms and Drawdown Schedule

Change Request Procedures

Limits of Liability

Liquidated Damages

Force Majeure



Role of the Independent Engineer

Additional Agreements Part of Bond Contract



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- ❖ **Trust Indenture**
 - Agreement Between the Issuer of the Tax-Exempt Bonds and the Trustee (Lender) that Administers the Funds as Fiduciary to the Bondholders
- ❖ **Support Agreement**
 - Agreement Between a Third Party (Usually Parent Company of Developer) and the Trustee.
 - Defines to Pay All Necessary Project Costs not Covered by Construction Fund to Achieve Commercial Operation
- ❖ **Guarantee**
 - Agreement Between Developer, Subsidiary Guarantors and the Trustee Defining Security Documents that Secures the Bonds



Role of the Independent Engineer

Additional Agreements Part of Bond Contract ^{cont}

❖ **Loan Agreement**

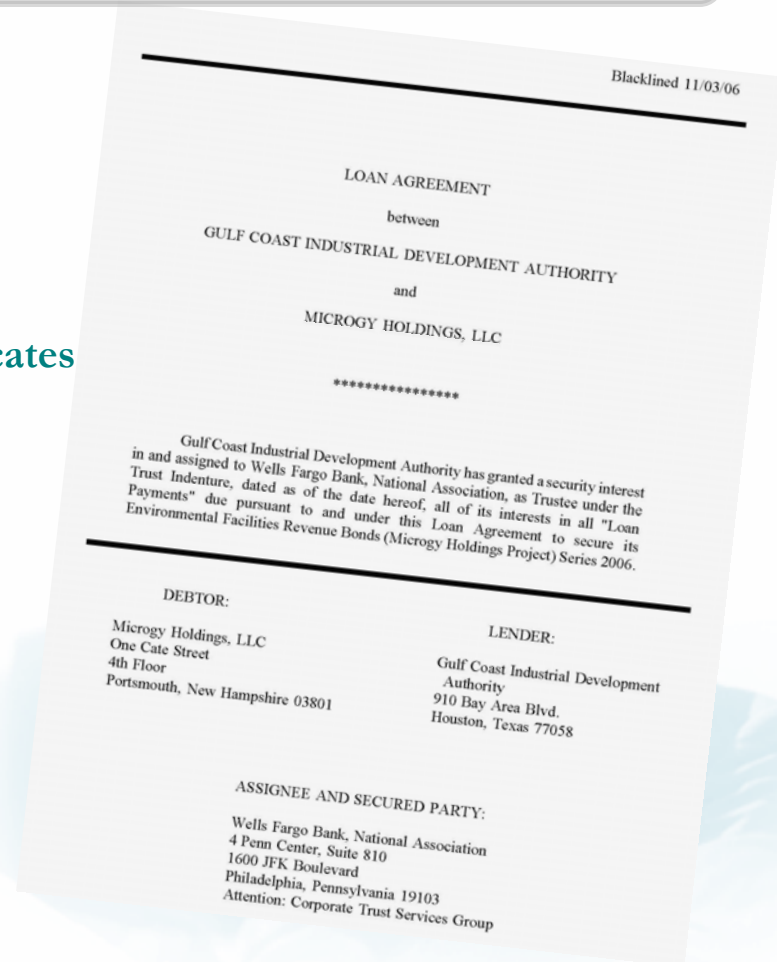
- Designates the Engineer as Construction Consultant
- Specifies Procedures for Draws on Construction Fund
- Specifies Developer Documents Required
- Specifies Construction Consultant Certificates Required

❖ **Disbursements/Drawing Agreement**

- Specifies Engineer Role in Trustee's Disbursement of Construction Fund
- Monthly Draw Certificate Contents
- Mechanical Completion Certificate Requirements
- Substantial Completion Certificate
- Final Completion Certificate



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Role of the Independent Engineer

Post-Financing Activities of the Independent Engineer



Construction Monitoring

- Monthly Review of Construction Progress
- Review Construction Schedule
- Determine Compliance with EPC Agreement
- Determine Compliance with Issued Permits
- Prepare Monthly Construction Progress Reports
- Review/Approve Payment Requisitions
- Prepare/Issue Requisition Certificate
- Review Changes to EPC Agreement



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Role of the Independent Engineer

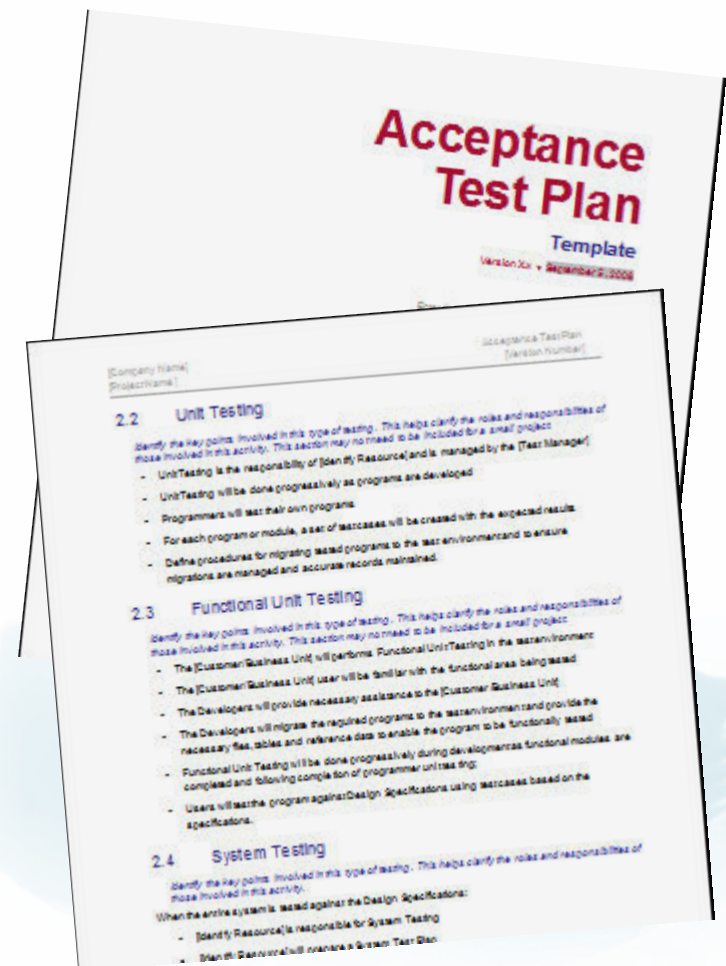
Post-Financing Activities of the Independent Engineer cont

Acceptance Test Review/Commissioning

- Review Developer Start-Up Plan
- Review Developer Acceptance Testing Plan
- Review Developer Commissioning Plan
- Witness Start-Up and Acceptance Tests
- Review Acceptance Test Documentation
- Prepare Acceptance Test Report



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Commissioning



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Role of the Independent Engineer

Post-Financing Activities of the Independent Engineer cont

Operations Monitoring

- Review Operations/Maintenance Plan
- Review Operation and Maintenance Expenditures – Fixed and Variable
- Compare Expenditures to Budgets
- Review Biogas Production
- Review Power Production
- Review Product Production
- Review Revenues
- Verify Permit Compliance
- Prepare Monthly O&M Report to Trustee (Bank)



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Summary



Independent Engineer: Key Player in Putting the Pieces Together for Lender Financing



The *Independent Engineer's Assessment* of the following: Participants, Technology, Site Suitability, Design Review, Environmental Review, Construction and O&M Cost Review, Construction Schedules, Economic Pro Forma Analysis; *Determines if the Project is Capable of Achieving the Necessary Revenue Requirements.*

For Non-Recourse Project Financing Through Revenue Bond Sales or Bank Loans, the *Independent Engineering Review and Report is a Key Critical Component of Project Finance and is Most Always Required by Trustees and Banks.*



Paul B. Doran, P.E.
Consulting Engineer



Thank You



Thank You For Your Attention

Send Comments to

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