From:	Lefton, Amanda B
To:	Daniel-Davis, Laura E; Knodel, Marissa S; Cruickshank, Walter; Carr, Megan E; Coffman, Sarah; Sanchez, Alexandra L; Mabry, Scott
Cc:	Macdonald, Cara Lee; Lindow, Emily R; Foreman, Jennafer (Jenna) L
Subject:	RE: Special Case Royalty Relief Briefing
Date:	Thursday, April 29, 2021 5:15:53 PM
Attachments:	210420_SCRRPresentation_Revisedv3.pptx

Attached please find the presentation for tomorrow's discussion on SCRR.

-----Original Appointment-----
From: Daniel-Davis, Laura E <laura_daniel-davis@ios.doi.gov>
Sent: Friday, April 23, 2021 1:32 PM
To: Daniel-Davis, Laura E; Lefton, Amanda B; Knodel, Marissa S; Cruickshank, Walter; Carr, Megan E; Coffman, Sarah; Sanchez, Alexandra L; Mabry, Scott
Cc: Macdonald, Cara Lee; Lindow, Emily R; Foreman, Jennafer (Jenna) L
Subject: Special Case Royalty Relief Briefing
When: Friday, April 30, 2021 4:00 PM-4:30 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Microsoft Teams Meeting

Microsoft Teams meeting

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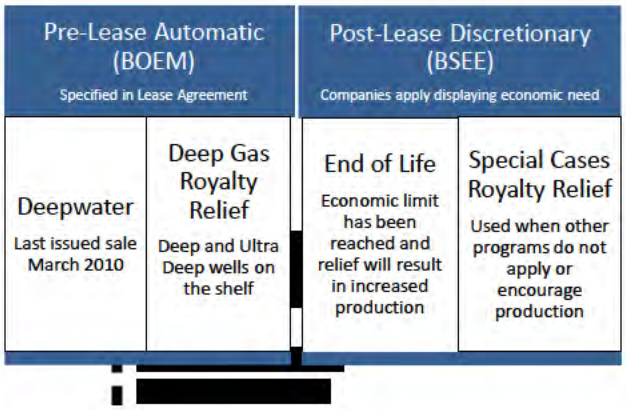
Special Case Royalty Relief Discount Rates

Assistant Secretary - Land and Minerals Management
April 30, 2021

BOEM Economics Division

Royalty Relief



For Post-Lease Discretionary Royalty Relief, according to the Memorandum of Agreement on Royalty Relief:

- BSEE is responsible for receiving, reviewing, and approving applications.
- BOEM is responsible for providing specific price and other economic parameters to BSEE for their discretionary royalty relief programs.

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Economic Assumptions

- BOEM develops economic assumptions for BSEE to use in royalty relief evaluations.
- Typically updated twice a year
- Parameters include:
  - Prices
  - Discount Rates
- Last Update was December 3, 2020
  - (b) (5) [redacted]

Parameter	Minimum	Most Likely	Maximum	Dependency
Version of RSVP		2.14		
Year of Initial Oil Price		2020		
Initial Oil Price, landed (2020$/bbl)	$33.96	$41.28	$47.89	
Real Oil Price Growth Rate 1	3.88%	4.42%	6.19%	
Year Second Oil Scenario Starts	2nd rates are first applied to infer 2024 price from 2023			
Real Oil Price Growth Rate 2	1.26%	3.27%	3.96%	
Year Third Oil Scenario Starts	3rd rates are first applied to infer 2030 price from 2029			
Real Oil Price Growth Rate 3	0.07%	1.75%	2.91%	
Year of Initial Gas Price		2020		
Initial Gas Price, landed (2020 $/Mcf)	$2.03	$2.47	$2.92	+1 with Oil Start Price
Real Gas Price Growth Rate 1	0.88%	1.72%	2.29%	+1 with Oil Growth Rate 1
Year Second Gas Scenario Starts	2nd rates are first applied to infer 2024 price from 2023			
Real Gas Price Growth Rate 2	1.32%	2.41%	3.52%	+1 with Oil Growth Rate 2
Year Third Gas Scenario Starts	3rd rates are first applied to infer 2030 price from 2029			
Real Gas Price Growth Rate 3	0.30%	0.81%	3.33%	+1 with Oil Growth Rate 3
Federal Income Tax Rate		21%		
Base Year for Discounted Cash Flow	Year of Application Date			
Discount Rate Range for Gulf of Mexico Shallow Water (0-200m) (nominal)	0%		25%	
Discount Rate Range for Gulf of Mexico Deep Water (>200m) for project using subsea tiebacks requiring enhanced flow assurance technologies[1] (nominal)	0%		20%	
Discount Rate Range for All Other Areas/Cases (nominal)	10%		15%	
Random Number Seed		104		
Overhead Cost Allowance		5%		

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https://www.boem.gov/sites/default/files/documents/oil-gas-energy/energy-economics/royalty-relief/Price-Assumptions-for-Royalty-Relief-Evaluations.pdf

Special Case Royalty Relief

- OCSLA requires that the OCS "be made available for expeditious and orderly development, subject to environmental safeguards…"
- Special Case Royalty Relief (SCRR) assists uneconomic projects (Net Present Value [NPV] < 0) while protecting the government's requirement to receive fair market value.
  - Use BOEM's economic parameters in a discounted cash flow scenario.
  - Provide royalty relief to point where NPV = 0, if possible.
  - SCRR lowers the royalty rate for a project to the point where the NPV is 0.
  - [redacted]at a higher discount rate will require an even lower royalty rate to [redacted]
    - [redacted]
      - [redacted]
      - [redacted]

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- In conjunction with the OSCLA requirements, the requirements for the prevention of waste and the conservation of OSC resources that are part of the administration of leasing requirements at 43 U.S.C. § 1334(a) have generally been interpreted as the promotion of economic efficiency (or activities related to leasing, development, and production carried out in a manner that increases the net economic value to society).
- Would then segue way into what happens in cases where NPV is negative…

Discount Rate Basics

- A discount rate is an interest rate used to compare cash flows that occur at different points in time.
  - The higher the chosen discount rate, the lower the value of cash flows that occur later in time.
  - A discount rate is used to translate the value of future cash flows to the present (net present value).
- Suppose someone asks to borrow $10,000 from you and to pay you back in one year. What is the least amount you would accept in one year in order to be willing to lend the money?
  - [redacted]hen your personal discount rate is 5%.
  - [redacted]ences in this situation, $10k today is valued as being equal to $10.5k one year from now.
- [redacted]
  - [redacted]
  - [redacted]

Discount Rate Basics (cont.)

- Discount rates are widely-used in various contexts. Discount rates can account for:
  - Opportunity costs (lost opportunity to invest money received sooner)
  - Risk (variability and uncertainty of future cash flows)
  - Inflation (money loses spending power over time)
  - Other potential factors (e.g., preferences of companies or consumers)
- In the context of oil and gas investments, discount rates are often used to compute the NPV of future cash inflows and outflows from the perspective of oil and gas companies. The discount rate typically equals the minimum rate of return that would induce a company to undertake a project.
- [redacted]
  - [redacted]
  - [redacted]

Discount Rate Analyses

As part of BSEE's review of various aspects of its programs, BOEM conducted two studies on the appropriate discount rates for use in SCRR applications for certain types of projects which include specific risks.

Discount Rate Range for Gulf of Mexico Shallow Water (0-200m)	0%	25%	November 2019
Discount Rate Range for Gulf of Mexico Deepwater (>200m) for projects using subsea tiebacks requiring enhanced flow assurance technologies	0%	20%	December 2020
Disc[redacted]eas/cases	10%	15%	

*all rat[redacted]

[redacted]

[redacted]

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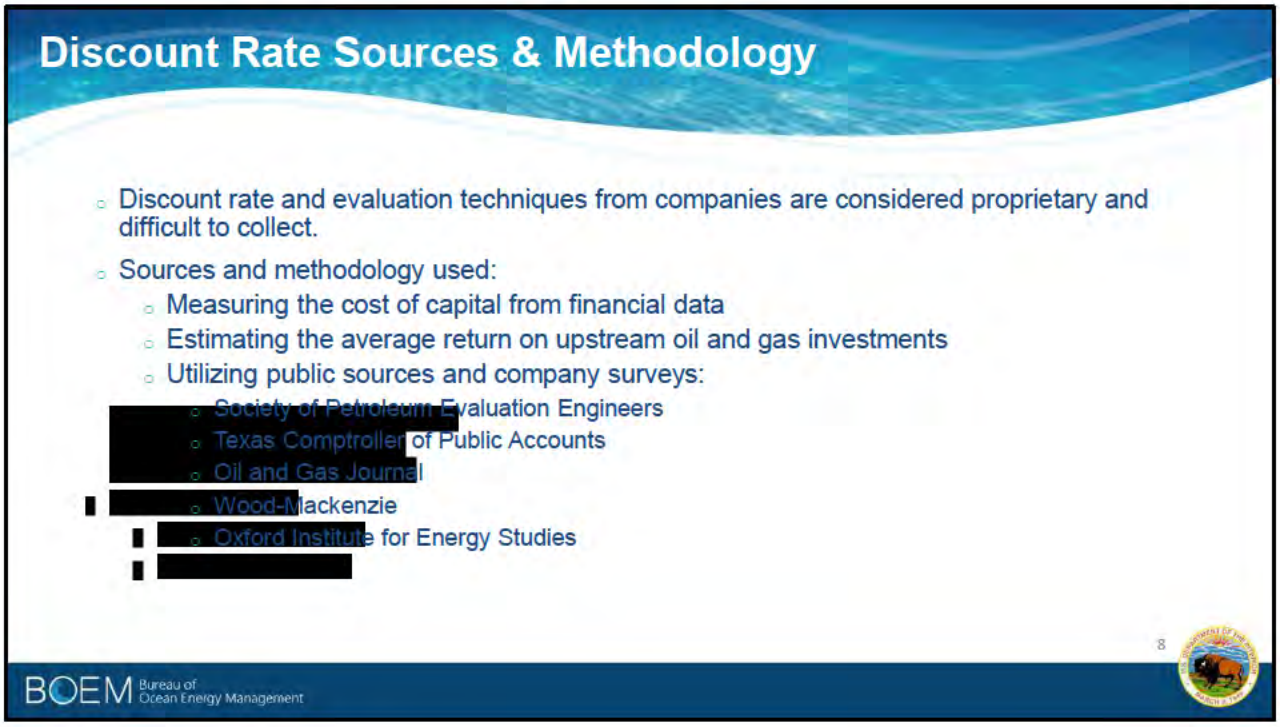
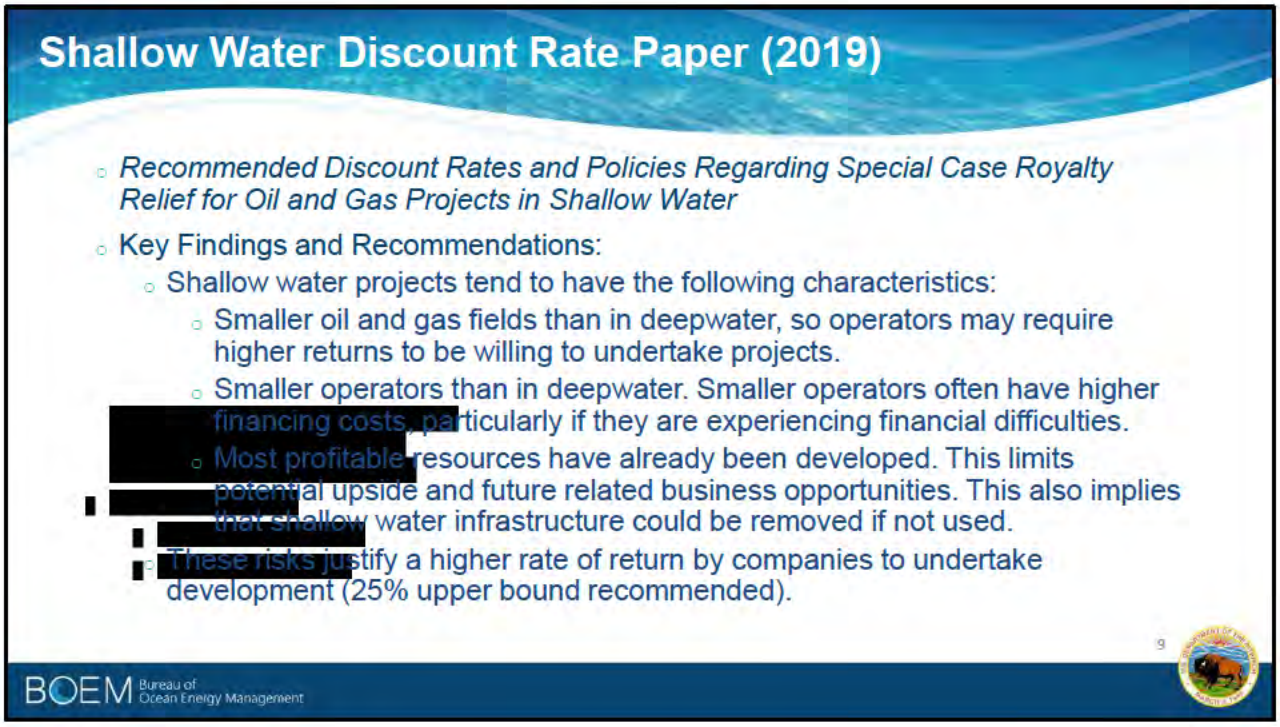
- Shallow water investigated due to depletion of resources and dearth of applications for relief using the existing rates.
- Subsea tiebacks investigated due to excess capacity on existing facilities many of which are nearing the end of their permitted design life, raising concerns about potentially stranded resources.



Ideally, the discount rate used for SCRR and other evaluation exercises would reflect the rates companies actually use for their investment opportunities. However, companies consider economic parameters (e.g. prices, discount rate) and economic evaluation techniques highly proprietary.

Recent work has focused on SPEE data as a primary source with support from other sources listed.

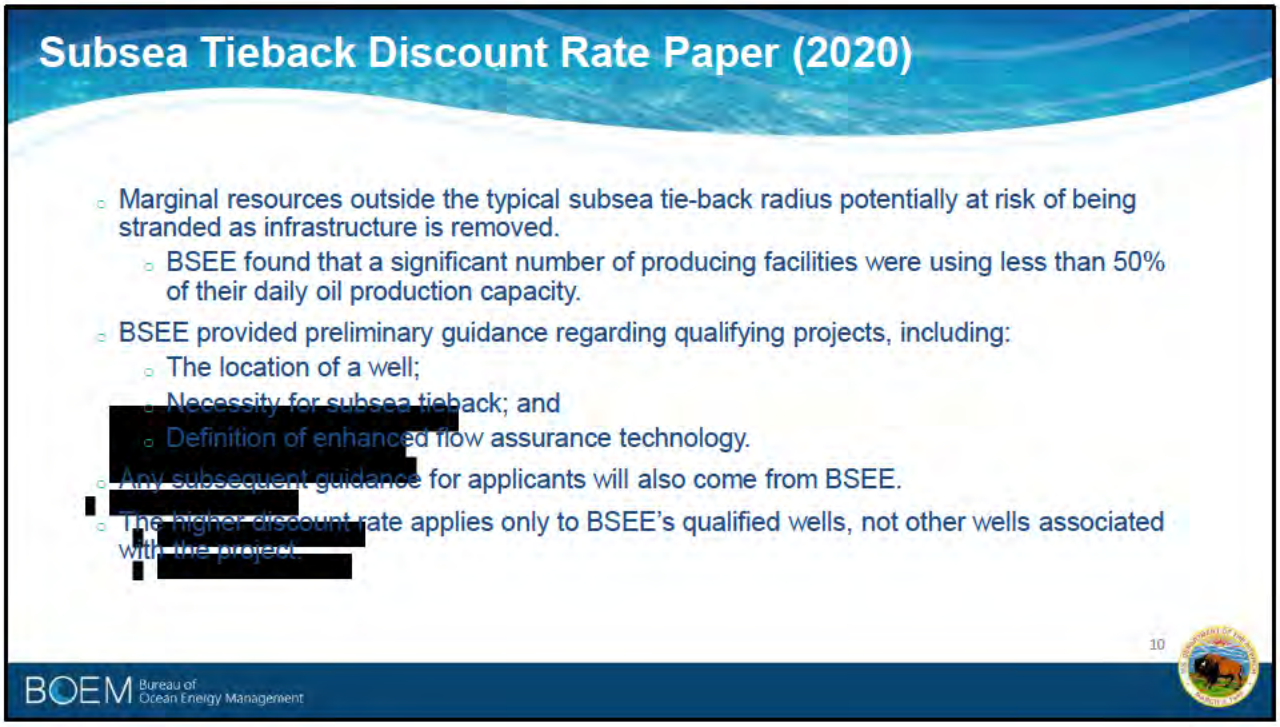


Among the key findings in the shallow water paper that justified a higher discount rate were:

- One, the oil and gas fields in shallow water are typically smaller than in deepwater (and elsewhere) and thus may not be as lucrative, particularly if projects are mutually exclusive. Therefore, all else being equal, an average company will require a higher rate of return for a small shallow water project.
- Two, operators in shallow water are smaller than in deepwater. Given the various risks associated with oil and gas development, lenders often require a sizable risk premium, particularly for smaller companies and companies experiencing financial difficulties. Therefore, the cost of debt to small operators can be substantial, raising the rate of return they must receive to undertake a project.
- Three, the most resource-rich areas of the shallow water GOM have already been developed, meaning that there is a very low probability of a much higher than expected return. Instead, there is a higher probability of a large downside return (if the oil and gas resources turn out not to be present or are unobtainable for some reason). Operators also may have less incentive to undertake shallow-water projects because there would be fewer spillover business opportunities. Finally, there is a risk that shallow water infrastructure could be removed if not used. These higher risks require a higher rate of return.

- All of these factors indicated that the discount rate should be adjusted upwards for the shallow water GOM.

The recommended higher discount rate upper bound of 25% was based on SPEE's 2018 survey discount rate results for probable reserves.



Can contrast the well's location in deepwater with the location of the facility used for tieback, which could be in shallow water as well.

Technologies like subsea booster pumps which are proven for use in the Gulf but involve significant scope of supply (specialized and fully qualified offshore equipment designed to operate long-term) in order to enable subsea tieback production that would otherwise not be feasible, may be eligible. These types of technology, which require specialized design, fabrication, and installation for equipment and configurations both subsea and topsides, (including large-footprint subsea structures requiring engineered foundations, dedicated power generation subsea, and additional control- or power-related components in order to successfully use) are available, but not overly common flow assurance technologies.

Among the key findings in the subsea tieback paper that justified a higher discount rate were:

- The existence of marginal resources in deepwater which are smaller and less lucrative and may be bypassed in favor of larger, more lucrative resources. Given that many existing GOM production facilities are nearing the end of their permitted design life and are unlikely to be reinstalled once the infrastructure is removed as there are significant costs involved, these marginal resources are at risk of being stranded permanently. Given mutually exclusive projects, marginal resources in deepwater would require a higher rate of return to induce operators to develop them instead of larger, more lucrative resources. (Could note that if a more lucrative than expected field was discovered, no royalty relief would actually be received.)
- Subsea tiebacks requiring enhanced flow assurance technology are inherently more expensive and complex than either conventional subsea tiebacks or traditional methods. Additionally, enhanced flow assurance technology carries with it performance, reliability, and flow maintenance challenges. All of these risks increase with the length of the tieback and higher risks require a higher rate of return to induce operators to undertake them.
- These factors indicated that the discount rate should be adjusted upwards

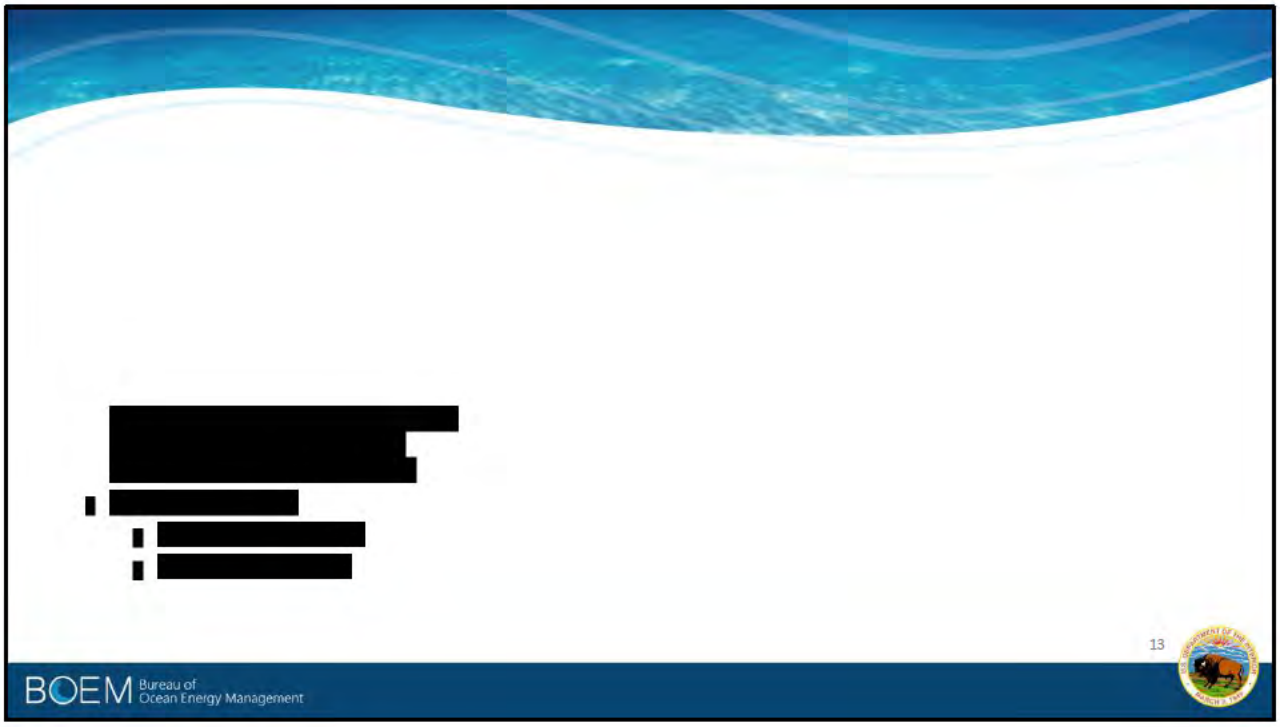
exclusively for marginal resources that must use subsea tiebacks requiring enhanced flow assurance to develop, which is precisely how the project was scoped.

The recommended higher discount rate upper bound of 20% was based on SPEE's 2020 survey discount rate results for proved updeveloped reserves.

- Key Findings:
  - Marginal resources exist that are at jeopardy of being stranded because they cannot be developed using traditional methods, including conventional tiebacks.
  - Development of these marginal resources entails additional risks associated with project costs and potential development problems due to complex flow assurance technologies.
  - These risks warrant a higher rate of return (upper bound of 20%) compared to traditional deepwater projects, but not as risky as shallow water (upper bound of 25%).

Discount Rate Review

- BOEM is currently undertaking a complete review of the discount rates it uses for various purposes, including SCRR.
- Different rates are appropriate for different uses, but the potential for the appearance of inconsistency can arise due to:
  - Lack of consolidated documentation.
  - Piecemeal approach to updating rates.
- BOEM's review ensures a consistent approach by:
  - Reviewing all cases where discount rates are used.
  - Evaluating the discount rate literature.
  - Holistically re-assessing the discount rates used.
  - Producing a report for wide dissemination.
- Work will be on-going.


[redacted]
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Discount Rate Example

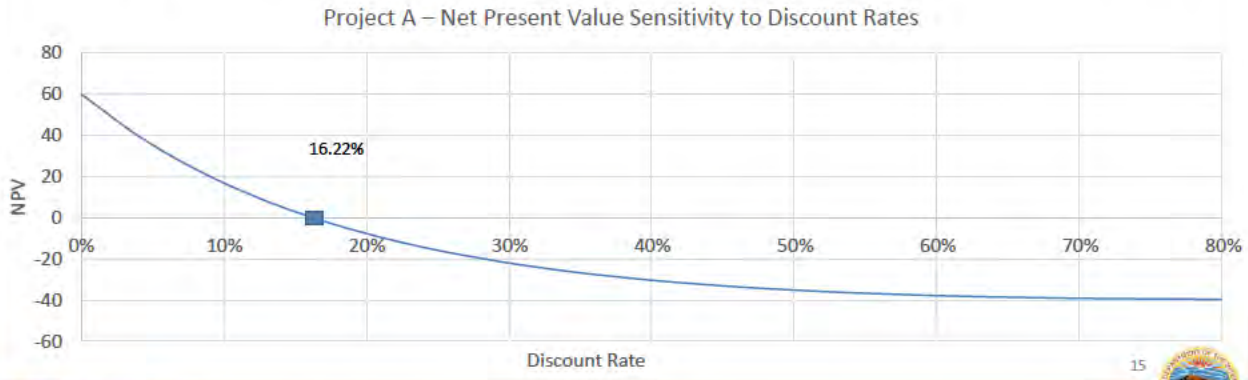
- Assume we have two projects – which would you pursue?
- It depends on your economic evaluation methods.
  - Looking only at total revenue is using a discount rate of zero.
  - The higher the discount rate, the lower the project's net present value.
- The higher the discount rate the greater you value current day revenues.
- If you are a CEO with a low cost of capital, or low borrowing costs, then you might approve Project A. However, if you have a high enough discount rate, you would approve Project B because Project B has the highest net present value.

Project A		Project B	
Year	Cash Flow (millions)	Year	Cash Flow (millions)
1	(100)	1	(60)
2	10	2	20
3	20	3	30
4	60	4	30
5	70	5	30
Total Revenue	60	Total Revenue	50
PV10	17	PV10	24
PV20	(8)	PV20	8
PV30	(22)	PV30	2

PV – Present Value at various discount rates

Let's take a closer look at Project A, and the relationship between internal rate of returns (IRR) and discount rates.

- **The IRR of a project is the discount rate that yields a net present value of zero.**
- **Project A has an IRR of 16.22%.**
- **Therefore, if a discount rate lower than 16% is applied to the cash flows of Project A, the project would have a positive NPV, while a discount rate of 17% or higher would result in a negative NPV.**



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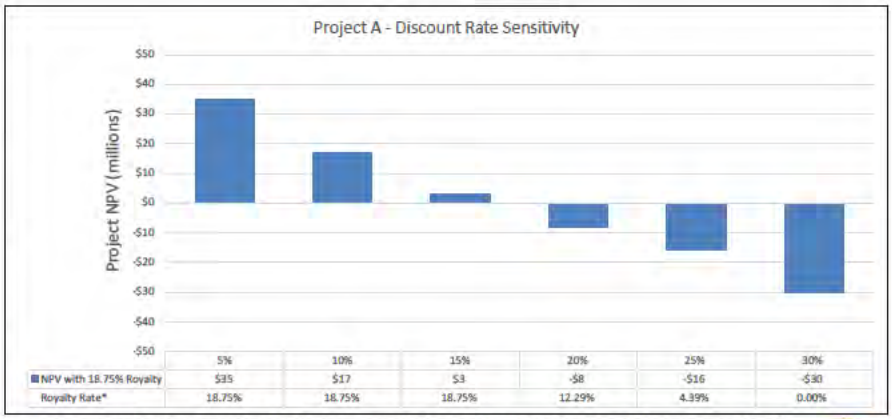
- Let's continue to take a closer look at Project A.
  - If Special Case Royalty Relief allows companies to claim up to a 20% discount rate, this project would be eligible for royalty relief (as the project is uneconomic at discount rates greater than 16.22%).

- If a discount rate of 20% is applied to Project A, the royalty rate would have to be lowered to 12.29% to make the project economic (zero NPV).
- With a discount rate of 25%, a royalty rate of 3.49% would be required.
- With a discount rate of 30%, a 0% royalty would still result in a negative NPV, so a SCRR application would be denied.



	5%	10%	15%	20%	25%	30%
NPV with 18.75% Royalty	$35	$17	$3	-$8	-$16	-$30
Royalty Rate*	18.75%	18.75%	18.75%	12.29%	4.39%	0.00%

*In this row, royalty rates lower than 18.75% denote the relief rate required to produce in an NPV of zero when 18.75% would result in an uneconomic (negative NPV) project.

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From: Sanchez, Alexandra L
To: Daniel-Davis, Laura E
Subject: Sanchez, Alexandra L shared "DRAFT Presentation_Release of Oil and Gas Report" with you.
Date: Wednesday, August 4, 2021 12:51:11 PM
Attachments: AttachedImage
AttachedImage
AttachedImage
AttachedImage

Sanchez, Alexandra L shared a file with you

Here's what we had based on previously used materials and the fact sheet.

DRAFT Presentation_Release of Oil and Gas Report

This link only works for the direct recipients of this message.

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