

Practice Problem – Computing the Asset Retirement Obligation

An operator drilled six wells on the same pad. The company has estimated the decline of each of the wells and the estimates have been audited by a third-party.

The company owns a 5.3% working interest in the wells and well pad.

The company has also estimated their credit risk based on the risk-free rate and bond rates for a similar organization to be 10.88%. Inflation is assumed to be 2.5% annually.

The third-party reserve report shows the date when each of the wells will be uneconomic and need to be plugged and abandoned. The production foreman has estimated the cost to P&A the wells based on current market rates. The foreman has also estimated the cost to retire the SWD well and the well pad.

The P&A cost per well is estimated to be \$40,000. The P&A cost for the SWD well is \$80,000. It will cost approximately \$100,000 to remove the pad and remediate the site.

The cost to retire the individual assets was determined through inquiry with engineering, operations and the production foreman. Engineering estimates the threshold is 10 bopd based on shutting in wells in an analogue field in 2014 at 6-8 bopd. P&A to occur one year following date the well is deemed uneconomic.

For the calculation, the company must set-up an Asset Retirement Obligation Asset and Liability for the wells, SWD, and pad. To estimate this number, the company takes the current cost to retire each well, SWD, and pad and projects the future cost based on a historical inflation factor to the date when the asset would be retired. Please note that the SWD well and the pad would not be retired until all of the wells are retired. Once this future liability is determined, it must be present valued using the credit adjusted risk-free rate to determine the liability. Once this number has been calculated, each subsequent month the liability is adjusted as the retirement comes closer to coming due. The entry is to accretion expense and ARO liability. The ARO asset does not change. On an annual basis, the production foreman does a re-assessment of the cost to retire the assets and estimated timing of when the assets are to be retired for impairment calculations.

In preparing for the company ARO calculation, Camp Energy asked their CPA firm, and bank, for guidance on the appropriate bond rate to determine the discount rate. The CPA firm advised using a BB or B rating, but the bank thought that the Camp Energy was more risky than a BB rated firm because it was a start-up organization and the expectation that they would be deploying much of their cash over the next few years. Camp Energy determined the use of a B rated bond yield at 12/31/2015 was most appropriate.

Credit-Adjusted Risk Free Rate Calculation at 12/31/15

B Corporate Bond Rate Spread

B Corp Bond Rate at 12/31/15	8.96%	See US high yield effective yield
Less: 1 year LIBOR rate federalreserve.gov/libor/libor_rates_history	<u>1.09%</u>	See
	7.87%	

Plus 30 year treasury bond rate 12/31/15	3.01%	See daily treasury rate curve
Discount Rate to apply	10.88%	

Asset Retirement Obligation Calculation – Camp Energy Beginning Balance Sheet and Subsequent Monthly Adjustments

Asset/Well Name	Date Uneconomic	Est P&A Date	Useful Life	P&A Cost	Inflation	Cost to Retire Asset ¹	ARO Calc per Reserve Software @ 12/8/15 ²
Bush Federal 17-1	6/1/2032	6/1/2033	17.50	\$40,000	2.5%	\$61,621	\$10,130
Bush Federal 17-2	3/1/2062	3/1/2063	47.25	\$40,000	2.5%	\$128,458	\$980
Bush Federal 17-3	8/1/2080	8/1/2081	65.57	\$40,000	2.5%	\$202,423	\$230
Bush Federal 17-4	5/1/2035	4/30/2036	20.42	\$40,000	2.5%	\$66,222	\$8,060
Bush Federal 17-5	6/1/2045	6/1/2046	30.50	\$40,000	2.5%	\$84,945	\$3,650
Bush Federal 17-6	12/1/2015	1/1/2019	3.08	\$40,000	2.5%	\$43,164	\$31,450
Pad A	8/1/2080	8/1/2081	65.67	\$100,000	2.5%	\$506,057	\$570
Covenant SWD 1	1/1/2050	1/1/2051	35.08	\$80,000	2.5%	\$190,247	\$5,090
						\$1,283,139	\$60,160

¹In today's dollars (using 2.5% inflation)

²Using a 10.88% discount rate – see the accompanying narrative.

Initial ARO Obligation and Asset to Camp Energy Balance Sheet at 11/30/15

Asset/Well Name	Cost to Retire Asset ¹	ARO Calc per Reserve Software @ 12/8/15 ²	Camp Energy Working Interest	Camp Energy Share of ARO Calculation 12/8/15
Bush Federal 17-1	\$61,621	\$10,130	5.3%	\$537
Bush Federal 17-2	\$128,458	\$980	5.3%	\$52
Bush Federal 17-3	\$202,423	\$230	5.3%	\$12
Bush Federal 17-4	\$66,222	\$8,060	5.3%	\$427
Bush Federal 17-5	\$84,945	\$3,650	5.3%	\$193
Bush Federal 17-6	\$43,164	\$31,450	5.3%	\$1,667
Pad A	\$506,057	\$570	5.3%	\$30
Covenant SWD 1	\$190,247	\$5,090	5.3%	\$270
	\$1,283,139	\$60,160		\$3,188

Dr.	Asset Retirement Obligation Asset	\$3,188	
Cr.	Asset Retirement Obligation Liability		\$3,188

Entry to record Accretion Expense at 12/31/15

Asset/Well Name	Cost to Retire Asset ¹	ARO Calc per Reserve Software ² @ 12/31/15	Camp Energy Working Interest	Camp Energy Share of ARO Calculation 12/31/15
Bush Federal 17-1	\$61,621	\$10,200	5.3%	\$540
Bush Federal 17-2	\$128,458	\$980	5.3%	\$52
Bush Federal 17-3	\$202,423	\$230	5.3%	\$12
Bush Federal 17-4	\$66,222	\$8,110	5.3%	\$430
Bush Federal 17-5	\$84,945	\$3,670	5.3%	\$195
Bush Federal 17-6	\$43,164	\$31,650	5.3%	\$1,677
Pad A	\$506,057	\$580	5.3%	\$31
Covenant SWD 1	<u>\$190,247</u>	<u>\$5,120</u>	5.3%	<u>\$271</u>
	\$1,283,139	\$60,540		\$3,209

Dr. Accretion Expense \$21
 Cr. Asset Retirement Obligation Liability \$21

(Compute the difference of the ARO obligation at 12/8/15 versus 12/31/15. \$3,209 – \$3,188 = \$21.)

Entry to record monthly Accretion Expense (1/31/16)

Asset/Well Name	Cost to Retire Asset ¹	ARO Calc per Reserve Software ² @ 1/31/16	Camp Energy Working Interest	Camp Energy Share of ARO Calculation 1/31/16
Bush Federal 17-1	\$61,621	\$10,290	5.3%	\$545
Bush Federal 17-2	\$128,458	\$990	5.3%	\$52
Bush Federal 17-3	\$202,423	\$230	5.3%	\$12
Bush Federal 17-4	\$66,222	\$8,180	5.3%	\$434
Bush Federal 17-5	\$84,945	\$3,700	5.3%	\$196
Bush Federal 17-6	\$43,164	\$31,930	5.3%	\$1,692
Pad A	\$506,057	\$580	5.3%	\$31
Covenant SWD 1	<u>\$190,247</u>	<u>\$5,170</u>	5.3%	<u>\$274</u>
	\$1,283,139	\$61,070		\$3,236

Dr. Accretion Expense \$27
 Cr. Asset Retirement Obligation Liability \$27

(Compute the difference of the ARO obligation at 12/31/15 versus 1/31/16. \$3,236 – \$3,209 = \$27.)