11587 HOUSE RESOURCES

Nigeria-Deep water terms. The Nigerian terms are different from block to block, but following terms are representative of typical terms. These terms provide for a 50% corporate income tax, but with tax credits of 25% on capital expenditures. Furthermore, Nigeria has a production sharing agreement with a profit oil share ranging from 20% to 60% based on a sliding scale based on cumulative production, starting at 300 million barrels and going up to 2 billion barrels. It is assumed that Nigeria has a $ 5 per barrel advantage over Alaska North Slope at the well head.

Nigeria does not provide fiscal stability under its production sharing contracts, but Nigeria has traditionally negotiated MOU's with a typical duration of 10 years which may provide for some fiscal stability.

50 MM high cost

Fields of 50 MM barrels with high costs are not necessarily economic offshore Nigeria. However, fiscal conditions for larger fields up to 300 million barrels, which would be competitive, are the same and therefore this analysis can be used as a proxy for such fields.

Chart 6.17 illustrates how the Alaska PPT would compete well on the basis of IRR, with a cross over point of a WTI price of $ 34 under which Alaska terms would become more competitive.

Chart 6.18 shows how the NPV@10% would be less attractive, but the EMV@10% would be more attractive in Alaska. Much depends in this case on the ability to consolidate in Nigeria.

Chart 6.19 indicates how the government take in Nigeria for low prices is relative low due to the considerable tax credits, at higher prices the government take is only slightly less than in Alaska.

500 MM high cost

Charts 6.21 through 6.24 indicate how for high cost 500 MM barrel fields, Nigerian terms would be more attractive than the Alaska PPT for new investors. Nevertheless, the Alaska PPT narrows the competitive gap compared to the current severance tax.

50 MM low cost

The fiscal comparison for the 50 MM low cost field is similar to the 50 MM high cost field as is indicated in Charts 6.25 through 6.28. However, for the low cost field the EMV@10% values are equal in Nigeria and Alaska.

500 MM low cost

Charts 6.29 through 6.32 indicate that for 500MM low cost fields, Nigeria has typically much more attractive fiscal terms than the Alaska PPT.

Nigeria deep water Conclusion. Alaska competes relatively well with Nigeria on an IRR and EMV@10% basis, in particular for smaller fields, however, the NPV% is more attractive in Nigeria. Also the government take is less and the well head values are considerably higher. For these reasons the Alaska PPT would not be competitive with Nigeria, except for exploration investments in smaller fields.

6.2.5. Alberta – Oil Sands

The Alberta oil sands are the subject of major expansion and investment. This is in part due to an attractive fiscal regime offered by the Province of Alberta. The oil sands plants are often of a scale that is larger than oil field developments on the North Slope. Nevertheless, a fiscal comparison seems important since the Alberta oil sands form one of the most important upstream petroleum investment opportunities in North America. Therefore, for comparative purposes the 50 and 500 MM barrel field comparisons will be provided, in order to provide consistency in the analysis.

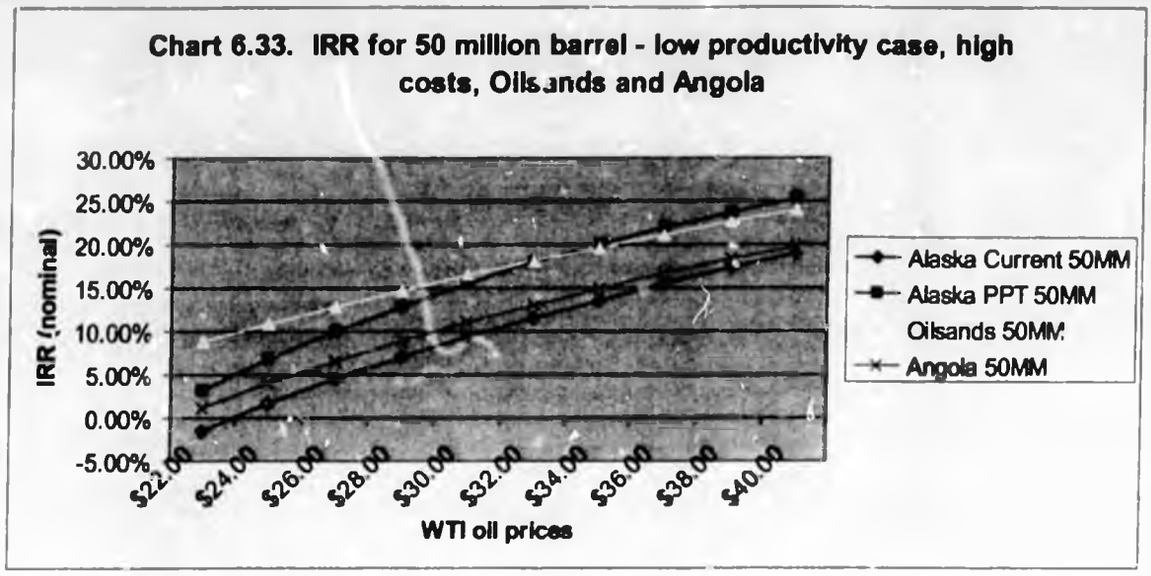
Also, of course, the oil sands have already been discovered. Therefore, the EMV analysis is only illustrative.

Alberta oil sand terms. The province requires a profit share of 25% after payout or a royalty of 1% whatever is the higher amount. Furthermore Alberta requires rentals and a bonus. The Federal Canadian/Alberta corporate income tax rate is 33.62%. It is assumed that the Alberta oil sand oil has an advantage of US $ 5 per barrel at the delivery point over Alaska North Slope crude.

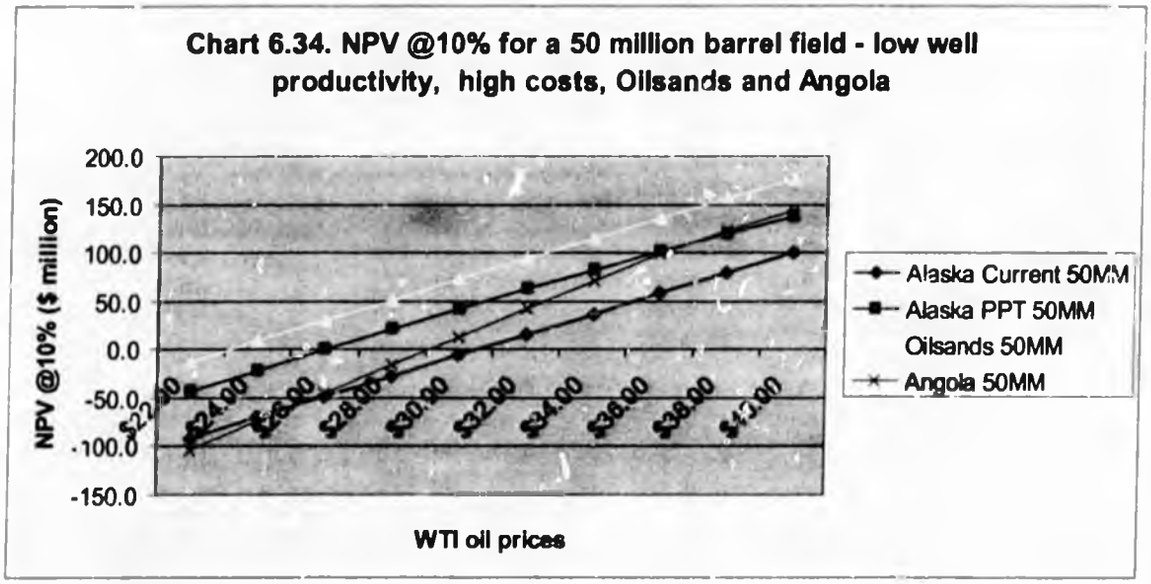
The province of Alberta and the Federal Government of Canada typically do not provide fiscal stability on their terms.

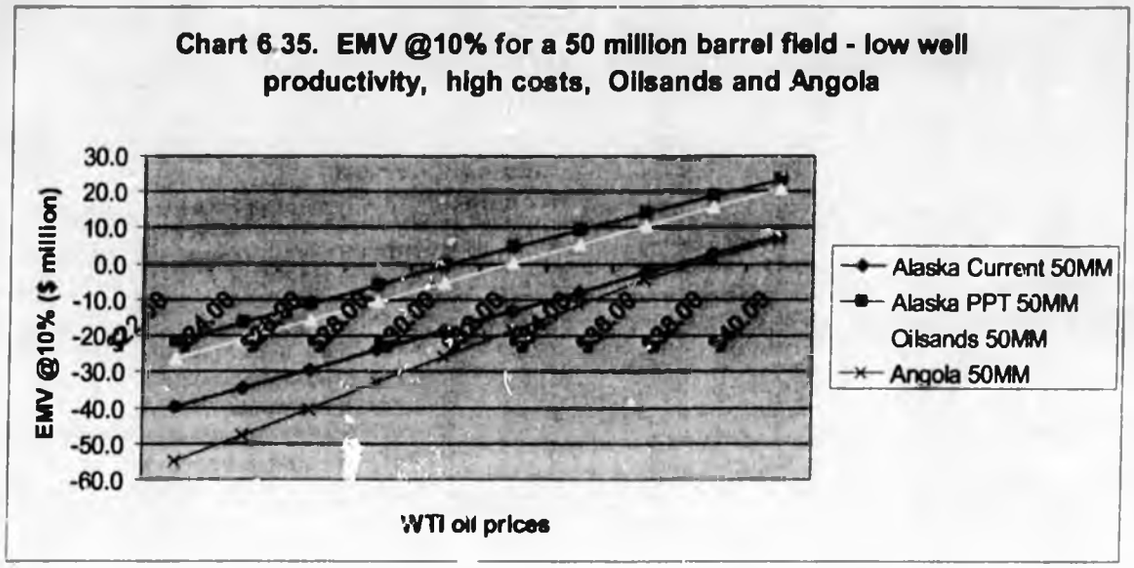
50 MM high cost

Chart 6.33 shows how the IRR for the Alaska PPT would be rather competitive with Alberta oil sands terms, despite the $ 5 per barrel advantage for the oil sands.

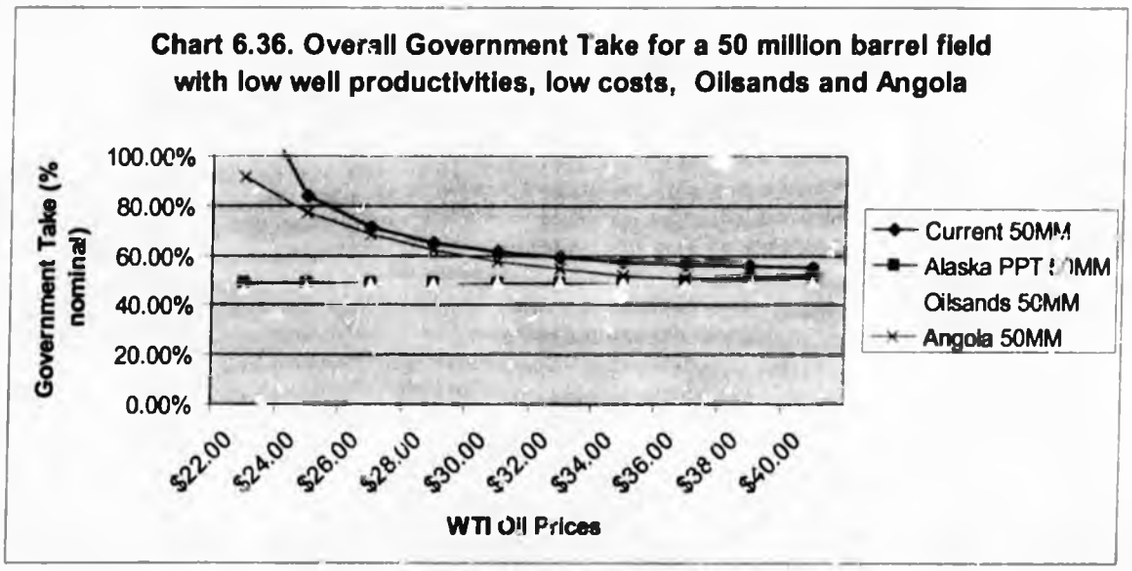


The NPV@10% is more favorable for the Alberta oil sands for the entire price range. The EMV@10% is less favorable, however, this depends primarily on the respective bonus assumptions.





The overall government take is remarkably similar. Therefore the better NPV@10% for the Alberta oil sands is primarily due to the higher net back value of the oil.



500 MM high cost

Charts 6.37 through 6.40 indicate how the Alberta oil sands economics are better for all indicators for the $ 22 - $ 40 per barrel price range. This is due to the lower government take and the higher net back.

Chart 6.37. IRR of 500 million barrel - high productivity case, high costs, Oilsands and Angola

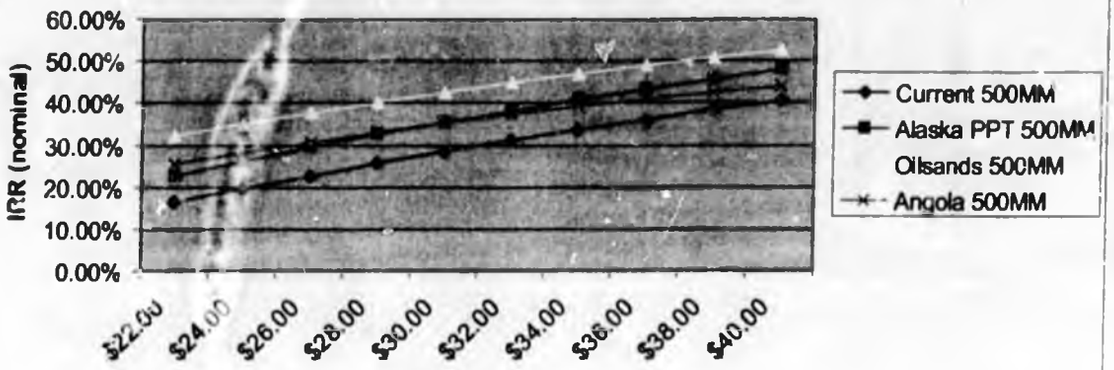
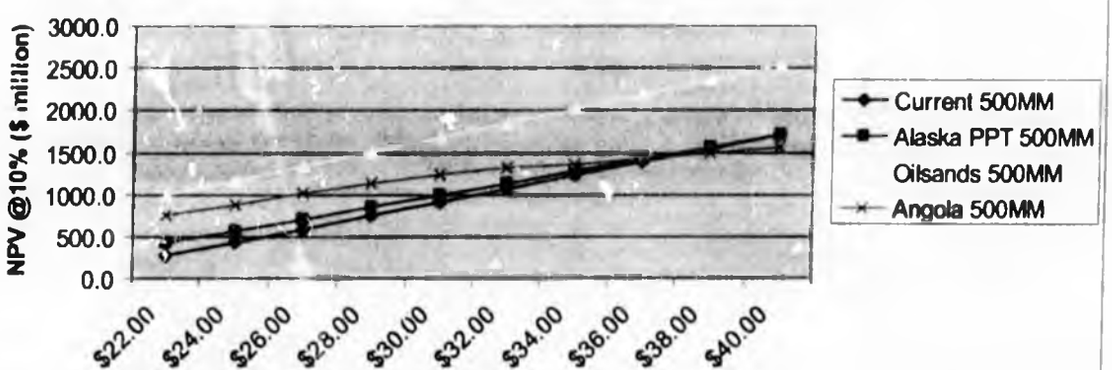
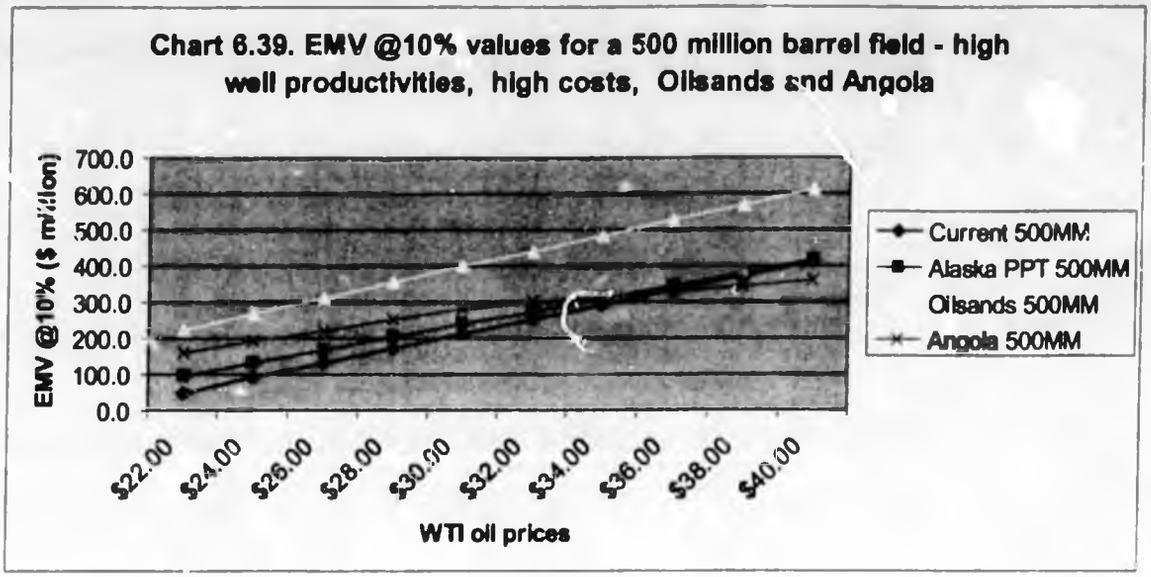
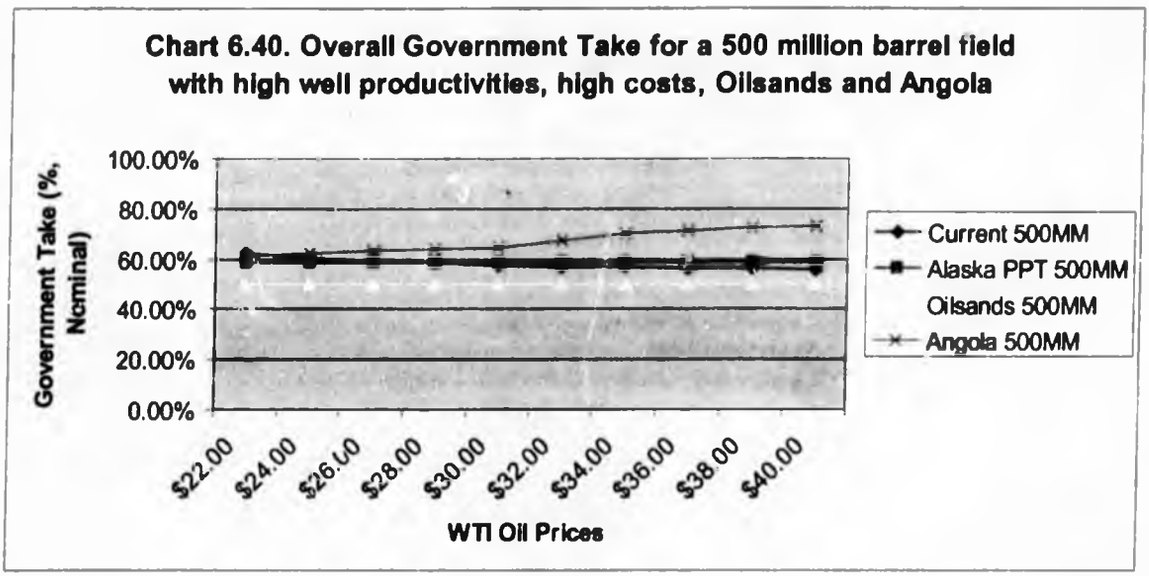


Chart 6.38. NPV @10% for a 500 million barrel field - high well productivity, high costs, Oilsands and Angola







50 MM low cost

Charts 6.41 through 6.44 indicate about the same economics as for the 50 MM high cost case. The IRR of the Alaska PPT compares rather favorable, the NPV@10% does not, the EMV@10% depends primarily on bonus assumptions and the government take is almost identical.

Chart 6.41. IRR for 50 million barrel - low productivity case, low costs, Oil sands and Angola

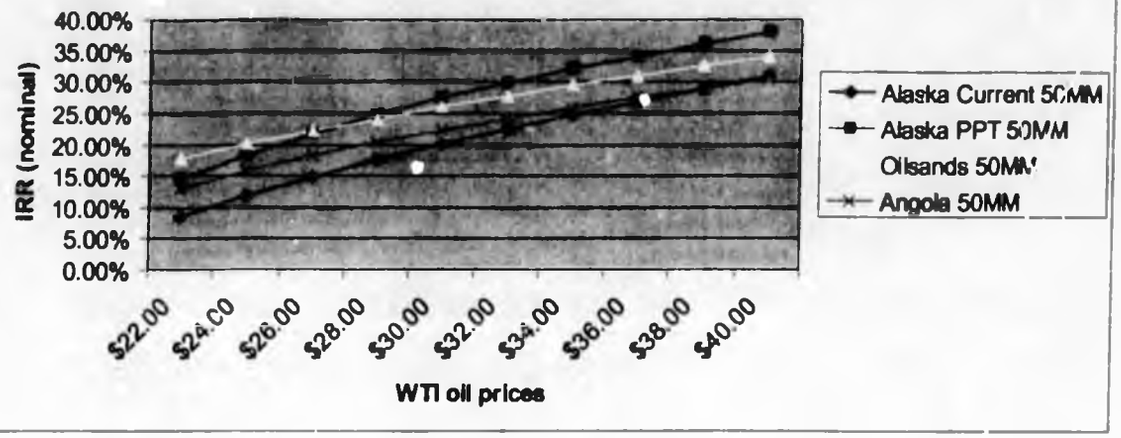
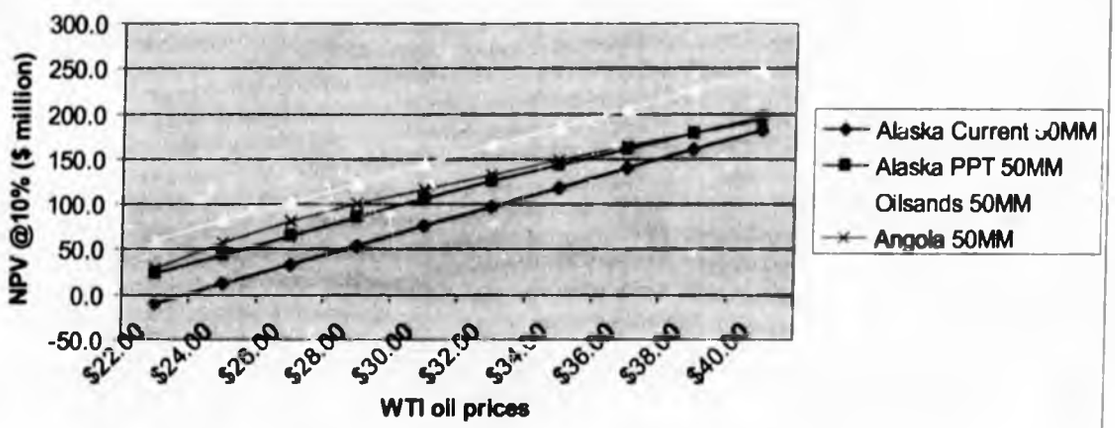
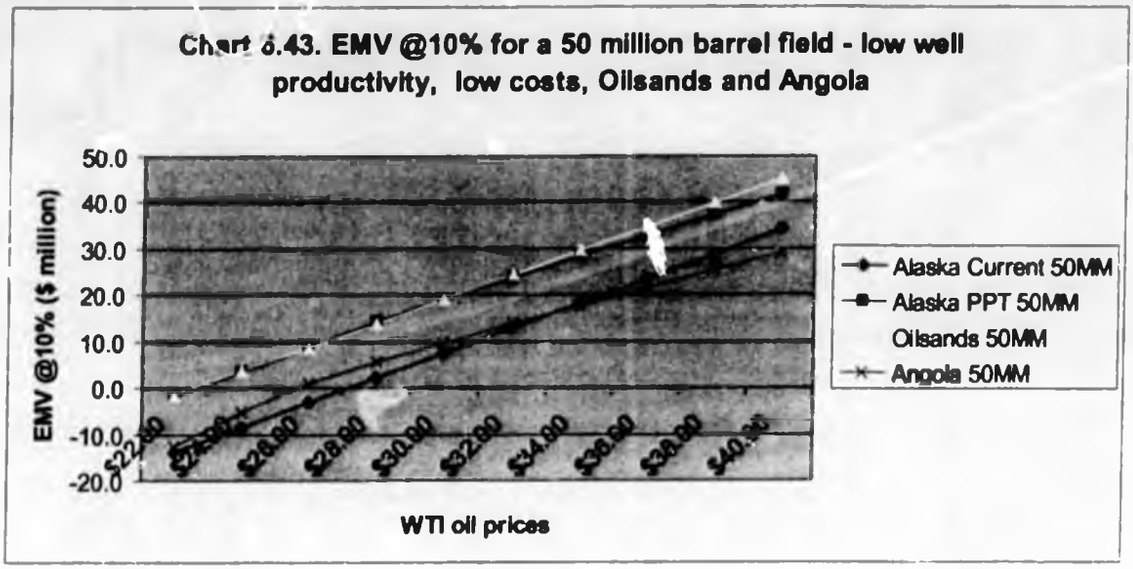
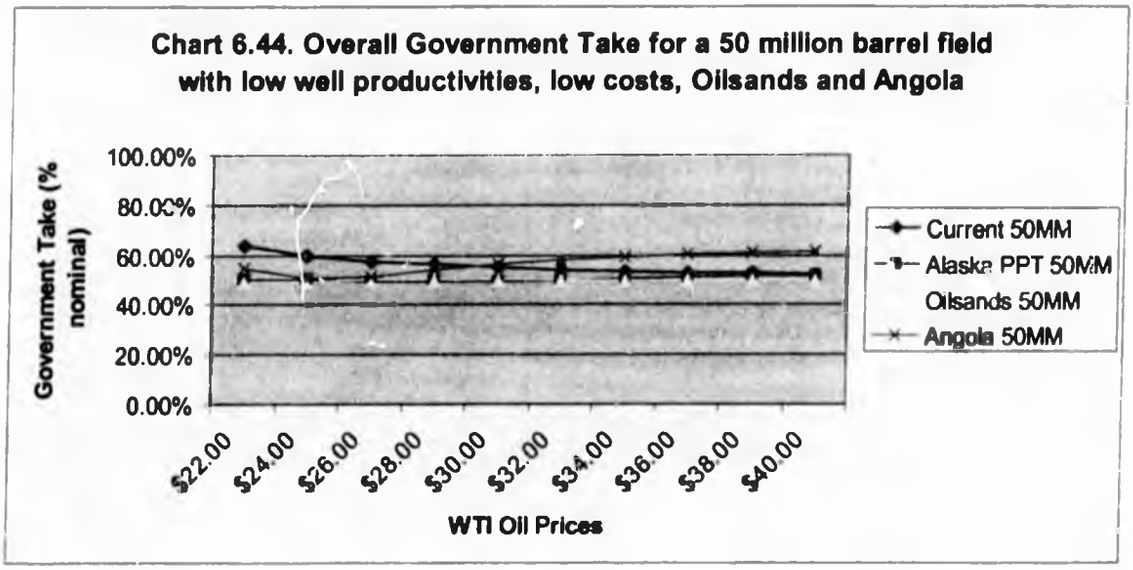


Chart 6.42. NPV @10% for a 50 million barrel field - low well productivity, low costs, Oil Sands and Angola







500 MM low cost

The 500 MM low cost case also indicates more favorable economics for the Alberta oil sands, primarily due to the higher net back and lower government take.

Chart 6.45. IRR of 500 million barrel - high productivity case, low costs, Oilsands and Angola

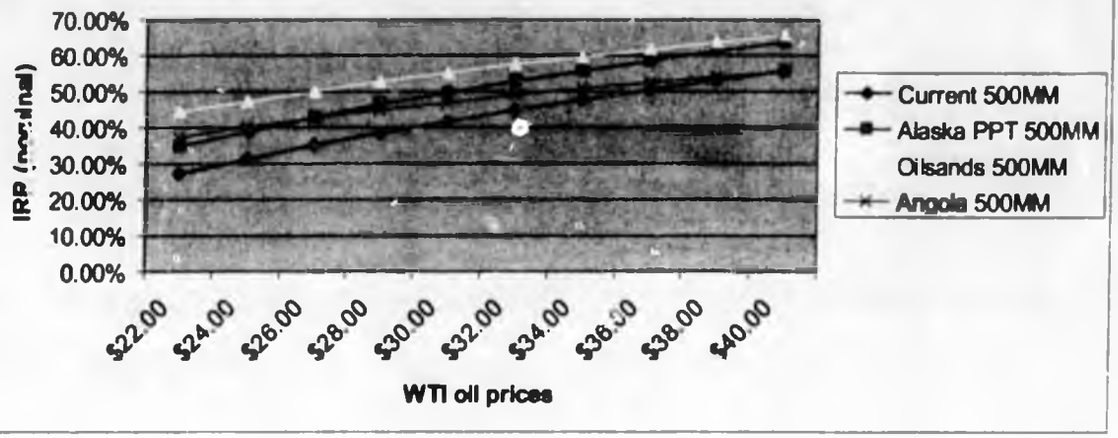


Chart 6.46. NPV @10% for a 500 million barrel field - high well productivity, low costs, Oilsands and Angola

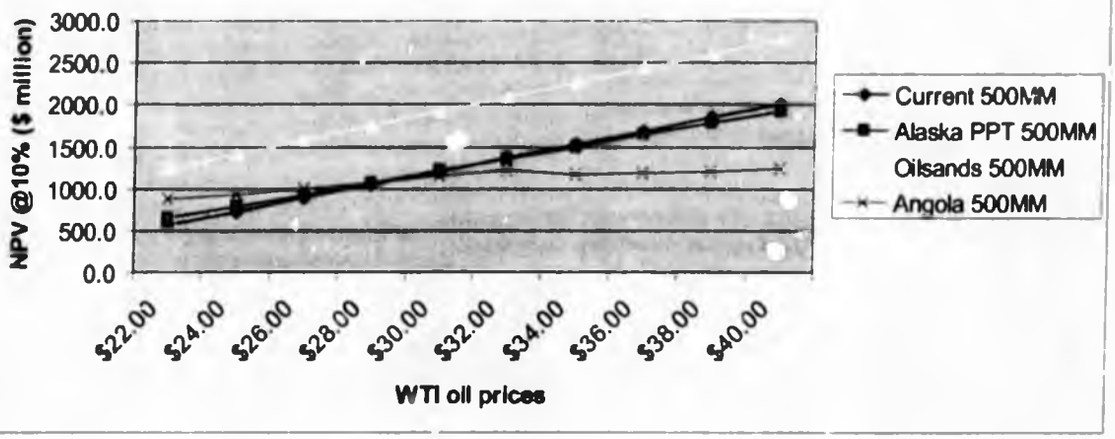


Chart 6.47. EMV @10% values for a 500 million barrel field - high well productivities, low costs, Oilsands and Angola

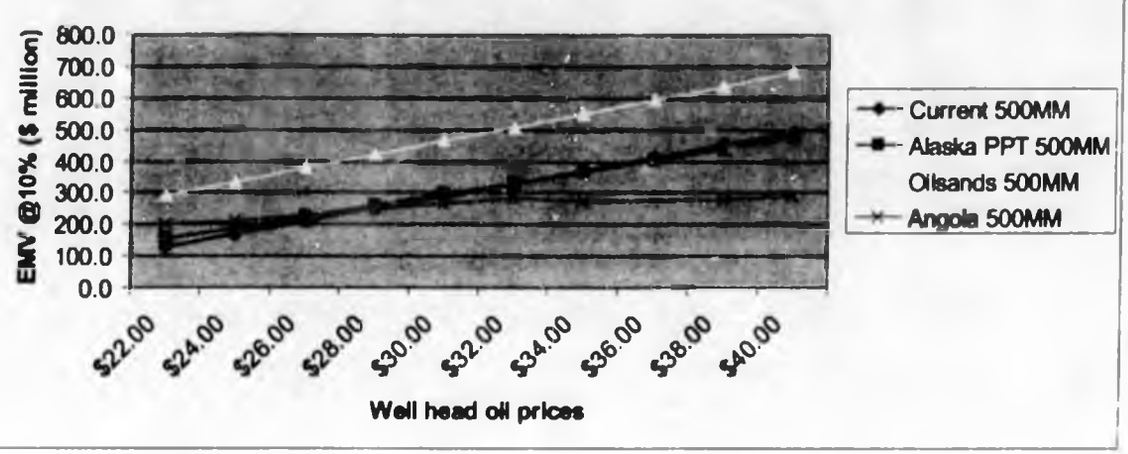
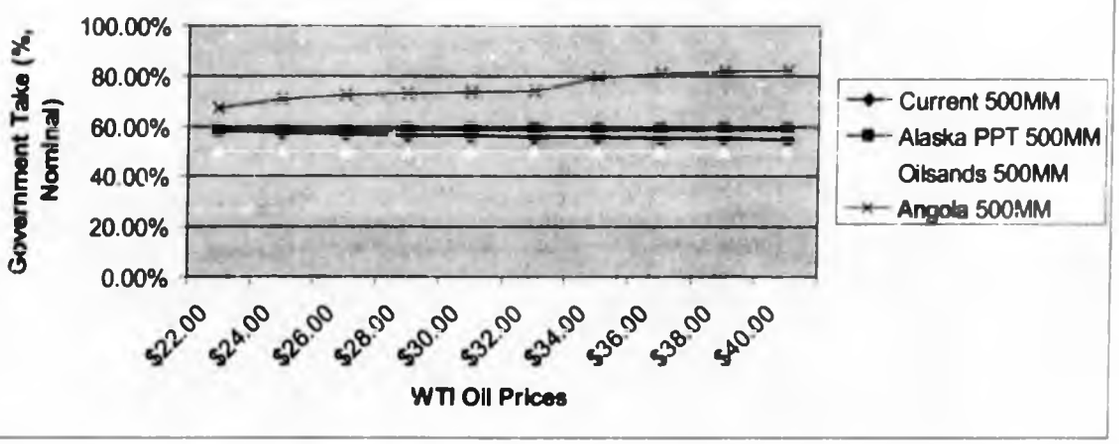


Chart 6.48 Overall Government Take for a 500 million barrel field with high well productivities, low costs, Oilsands and Angola



Alberta Oil Sands Conclusion. The Alberta Oil Sands fiscal terms are more favorable than those of the Alaska PPT because the government take for large fields is less and the net back value is higher. For small fields, Alaska PPT and EMV@10% compares relatively favorably.

6.2.6. Angola – Deep offshore

The Angola Deep offshore has been a prime area of development, in particular for large companies that work also in Alaska, such as BP and ExxonMobil. Angola has a rfather progressive system, which in particular under current high oil prices will result eventually in a high government take for most fields, if prices continue. As for Nigeria, in the deep waters offshore Angola, 50 MM barrel fields are not economic. However, for consistency such fields will be reviewed.

Angola terms. The Angolan terms are based on a production sharing agreement. These agreements are different from block to block. Following are representative terms. It is assumed that there is a cost oil limit of 50%. The profit oil is based on an IRR sliding scale and moves from 20% profit oil for government to 80% profit oil for government depending on profitability. There is a 45% uplift on capital expenditures. The corporate income tax is 50%. **It should be noted that very high bonuses were paid for the blocks offshore Angola.** A negative feature of the Angola system is that each development area is ring-fenced for production sharing and tax purposes. It is assumed that Angola has a $ 5 per barrel advantage relative to the Alaska North Slope at the well head.

Angola provides for near complete fiscal stability on its terms.

50 MM high cost

Charts 6.33 through 6.36 show some interesting features. The IRR for the Alaska PPT is much higher than for Angola. This is primarily due to the ring-fenced nature of the Angolan operations. The NPV@10% is higher than the Alaska Current system but less attractive than the Alaska PPT system. The EMV@10% is much better in Alaska, due to the possibility for consolidation in Alaska. The government take is regressive for the small field in the $ 22 - $ 40 price range, despite the progressive sliding scale and follows approximately the Alaska Current system. This is largely due to the cost oil limit.

500 MM high cost

For the 500 MM high the IRR is much better than the Alaska Current system, but straddles the Alaska PPT system. Both for the NPV@10% and the EMV@10% Angola is better than Alaska for low prices but worse than Alaska for high prices. This is due to the progressive nature of the Angolan system. The government take is about equal to Alaska for low prices, but becomes much higher for high prices.

50 MM low cost

The 50 MM low cost field provides for and IRR that is again between the Alaska Current and the Alaska PPT system. The NPV@10% is about equal to the Alaska PPT system. The EMV@10% is about equal to the Alaska Current system. The government take is higher for high prices.

500 MM low cost

The Angolan terms result in an IRR which is between the Alaska Current and Alaska PPT systems. The NPV@10% and EMV@10% become much less at high prices. The government take is considerably higher across the board.

Angola Deep Water Conclusion. The Alaska PPT terms are generally competitive with Angolan terms. The IRR is generally more attractive for the PPT despite the lower net backs. The Alaska PPT is more attractive for larger fields and for high prices. Angola is more attractive for low prices and small fields.

6.2.7. Russia - Sakhalin

The Russia-Sakhalin developments have been very important over the last decade. ExxonMobil and Shell have large projects in Sakhalin. The Sakhalin projects relate to developments of both oil and gas. The projects are very large scale and the fiscal systems that were negotiated for these contracts reflect the nature of these activities. The Sakhalin terms are based on production sharing contracts.

Russia – Sakhalin terms. The Sakhalin terms include a 6% royalty, a 32% corporate income tax and a production sharing agreement based on an after tax rate of return based sliding scale. There is no cost oil limit under the contract. The sliding scale moves the profit oil share earned by the government upward in three steps based on the real after tax rate of return. The steps are as follows:

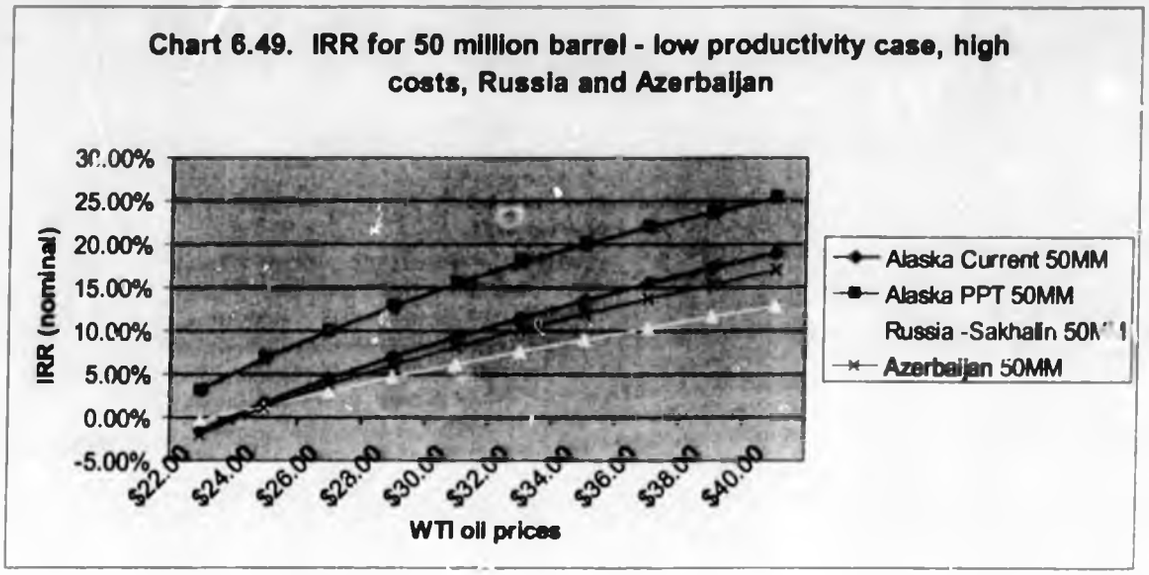
Up to 17.5% IRR	- 10% to government
Up to 24% IRR	- 50% to government
Over 24% IRR	- 70% to government

It should be noted that a high bonus was paid on the Sakhalin contract, in the Shell contract this was a $ 55 million bonus. As states previously this bonus is not taken into consideration. The Sakhalin project involved considerable expenditures for local costs. These costs have been included.

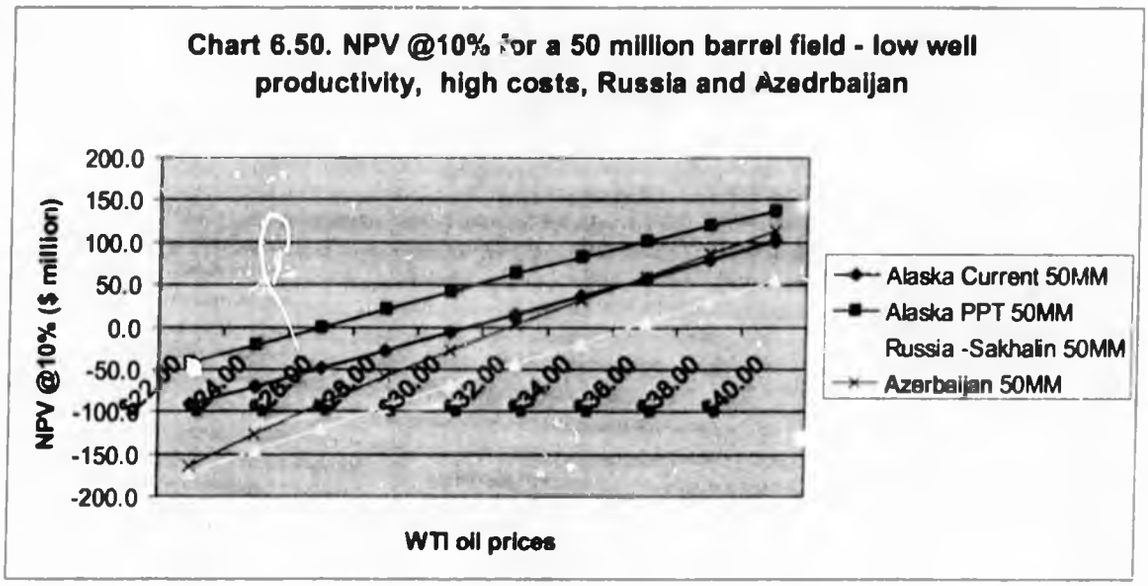
Russia provides for a high degree of fiscal stability on its production sharing contracts.

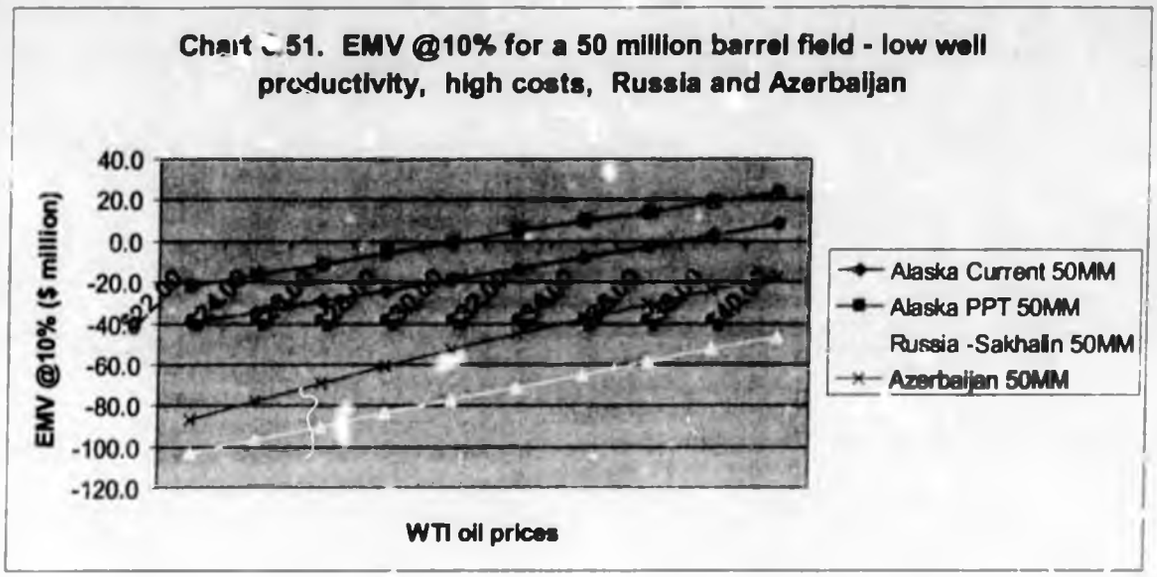
50 MM high cost

Chart 6.49 shows how the Sakhalin contracts have a rate of return that is much less than the Alaska Current system and the Alaska PPT. This is in part due to the high social expenditures required during the construction phase. For very low prices, Alaska Current becomes less attractive because of the low net back values.



The NPV@10% and the EMV@10% are substantially less favorable than Alaska.





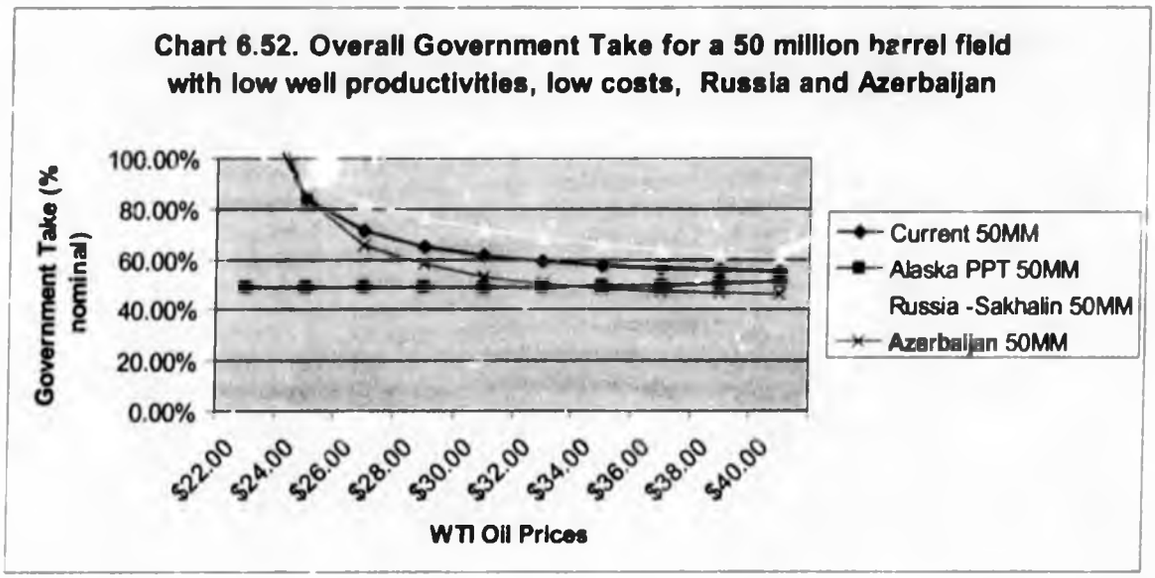


Chart 6.52 shows how the Russian system for small fields is rather regressive, primarily due to the high social expenditures. The Russion system is not designed for small fields.

500 MM high cost

Charts 6.53 through 6.56 indicate how the high government take over high rates of return result in a much flatter IRR, NPV and EMV curve than for Alaska. For large fields, Alaska is less attractive than Russia at low prices, but at higher prices Alaska becomes rapidly more attractive.

Chart 6.53. IRR of 500 million barrel - high productivity case, high costs, Russia and Azerbaijan

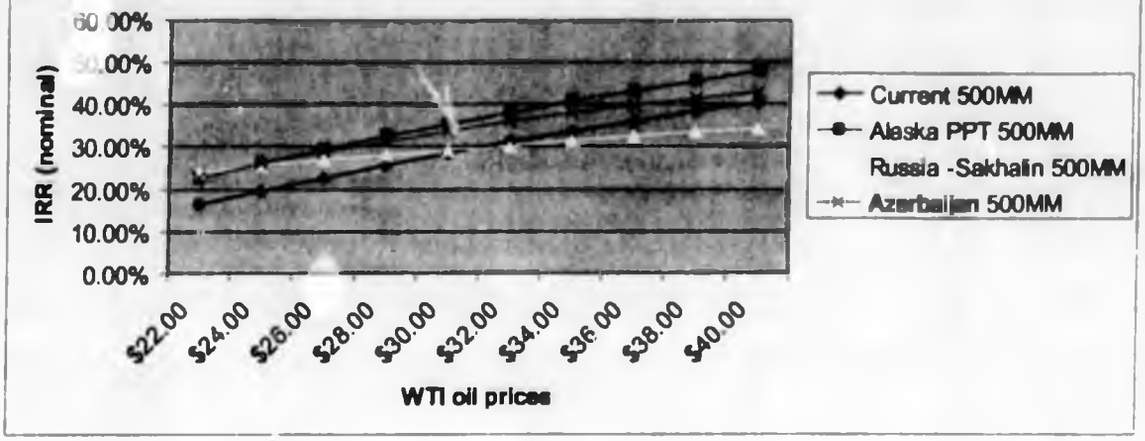
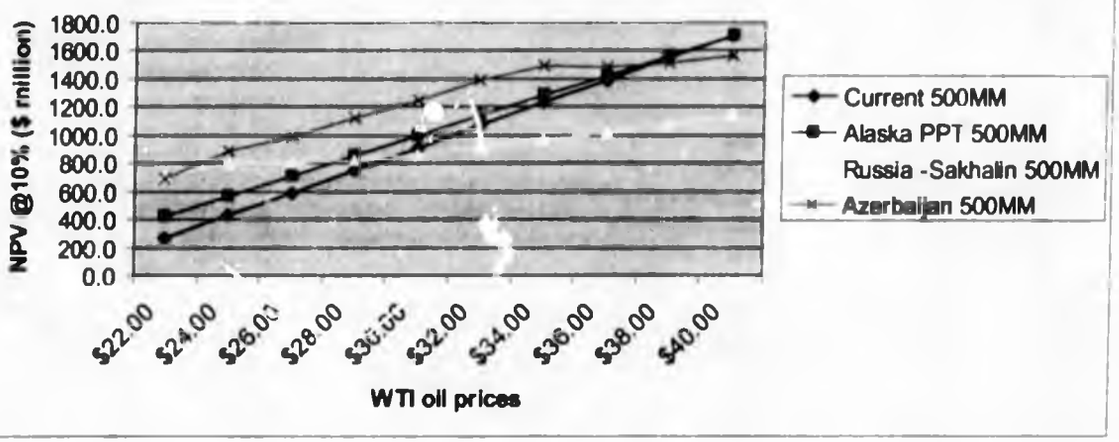
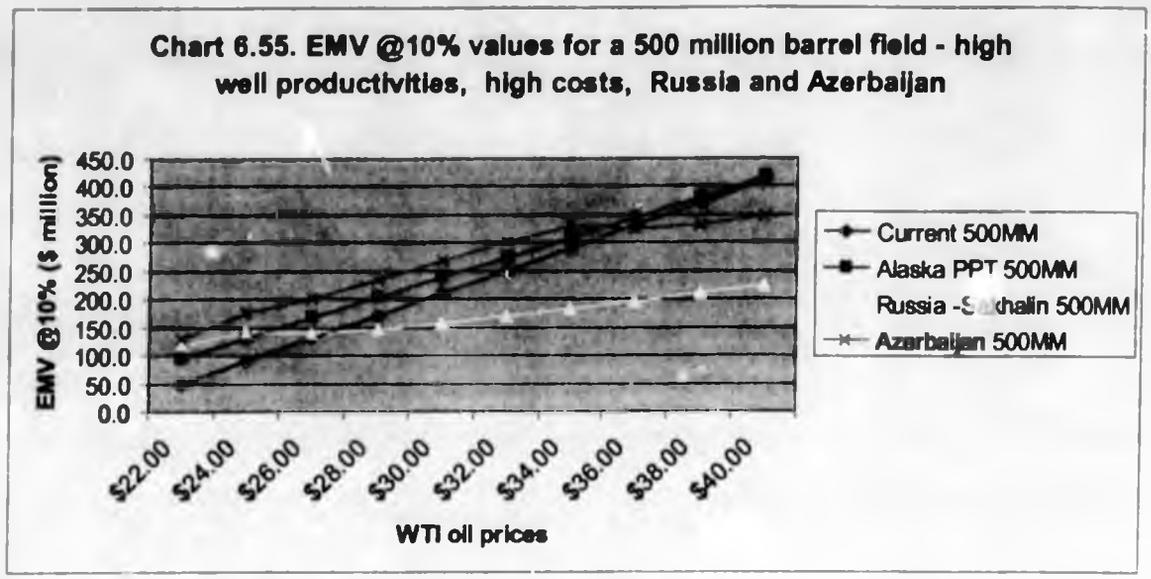
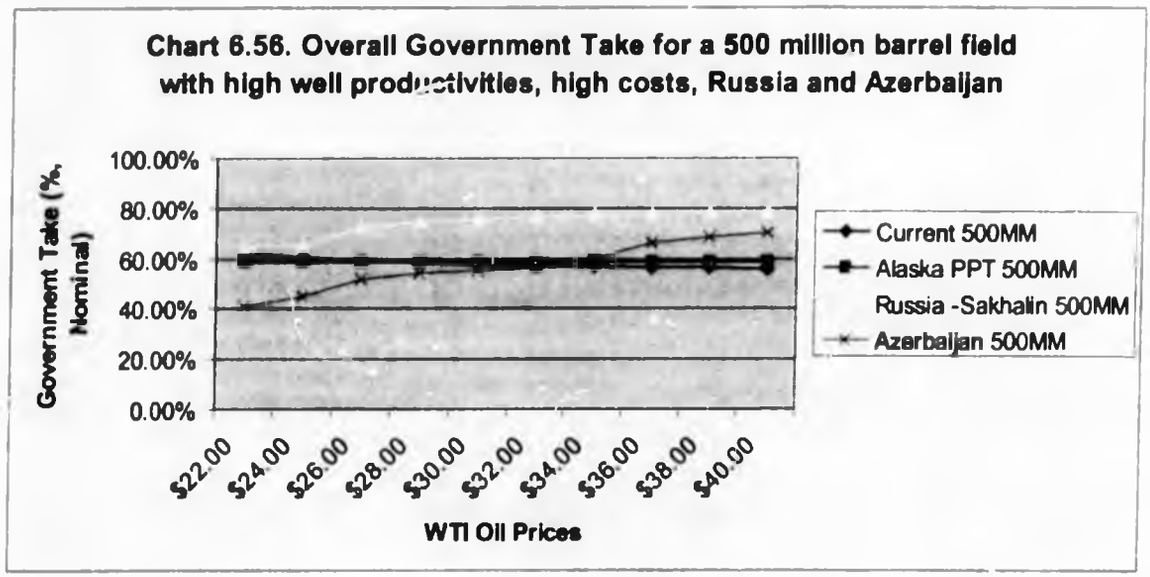


Chart 6.54. NPV @10% for a 500 million barrel field - high well productivity, high costs, Russia and Azerbaijan





The strongly progressive Russian system is clearly illustrated in Chart 6.56.



50 MM low cost

Charts 6.57 through 6.60 indicate about the same economics as for the 50 MM high cost case. The Russian system is clearly less attractive than the Alaska system for small fields, whether it is the current system of the PPT. Also the system is regressive.

Chart 6.57. IRR for 50 million barrel - low productivity case, low costs, Russia and Azerbaijan

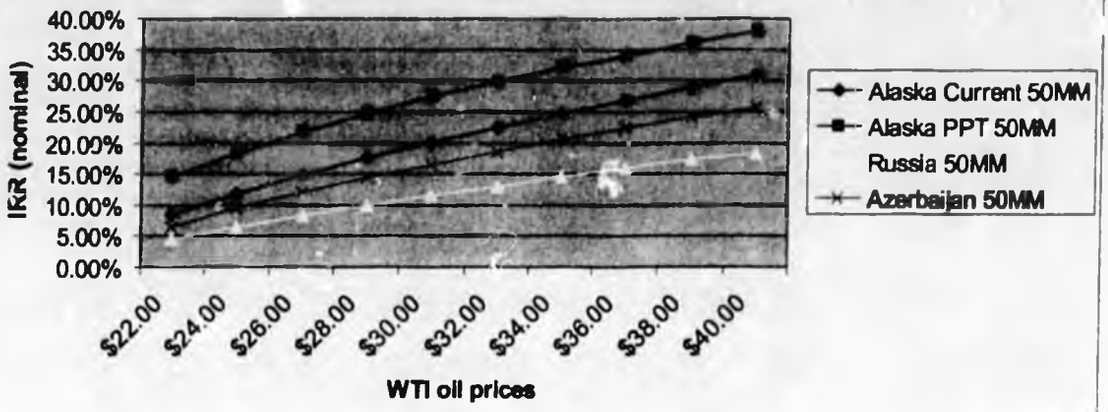


Chart 6.58. NPV @10% for a 50 million barrel field - low well productivity, low costs, Russia and Azerbaijan

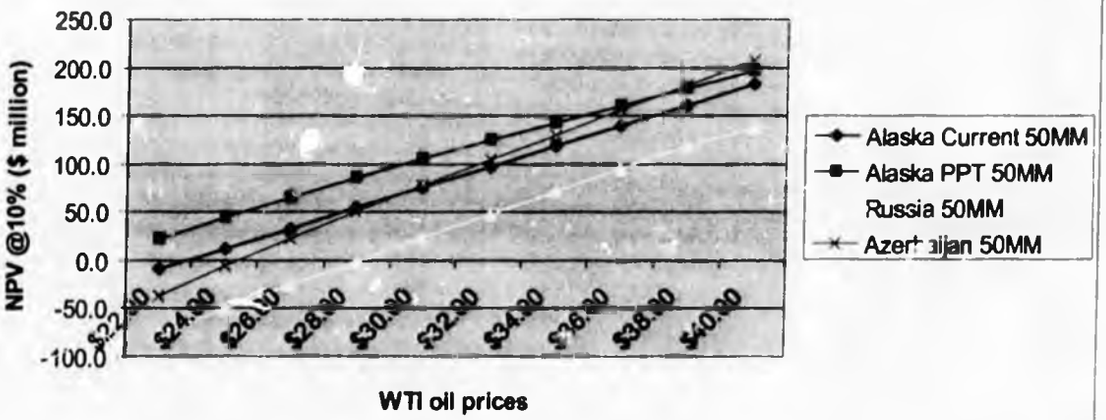


Chart 6.59. EMV @10% for a 50 million barrel field - low well productivity, low costs, Russia and Azerbaijan

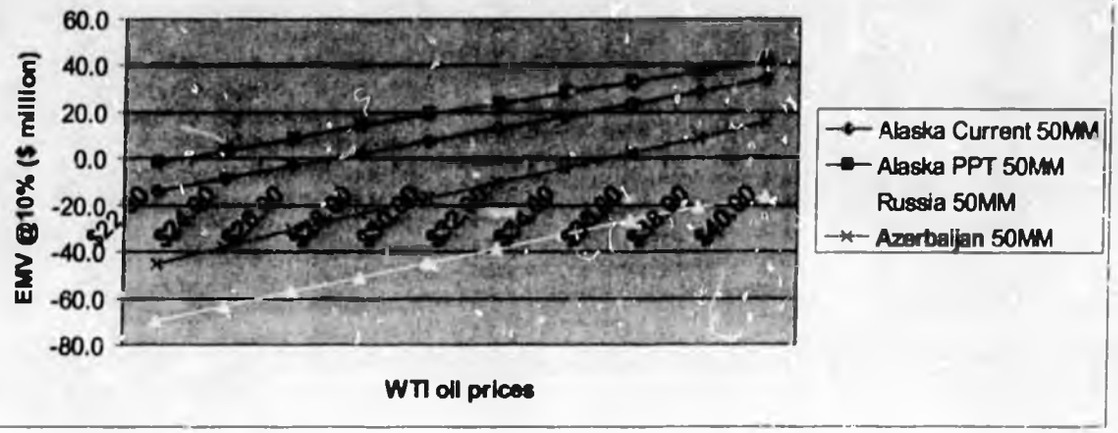
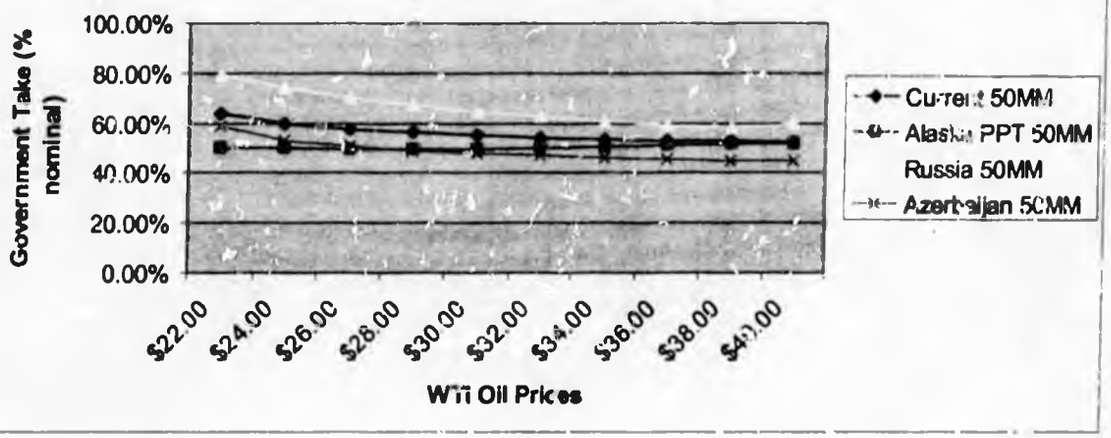


Chart 6.60. Overall Government Take for a 50 million barrel field with low well productivities, low costs, Russia and Azerbaijan



500 MM low cost

Charts 6.61 through 6.64 indicates how the Russian system is much less attractive than the Alaska system for the low cost case. This is because the low cost result in a situation where the rate of return benchmarks are reached earlier in time and therefore the profit oil shares for the government increase more rapidly.

Chart 6.61. IRR of 500 million barrel - high productivity case, low costs, Russia and Azerbaijan

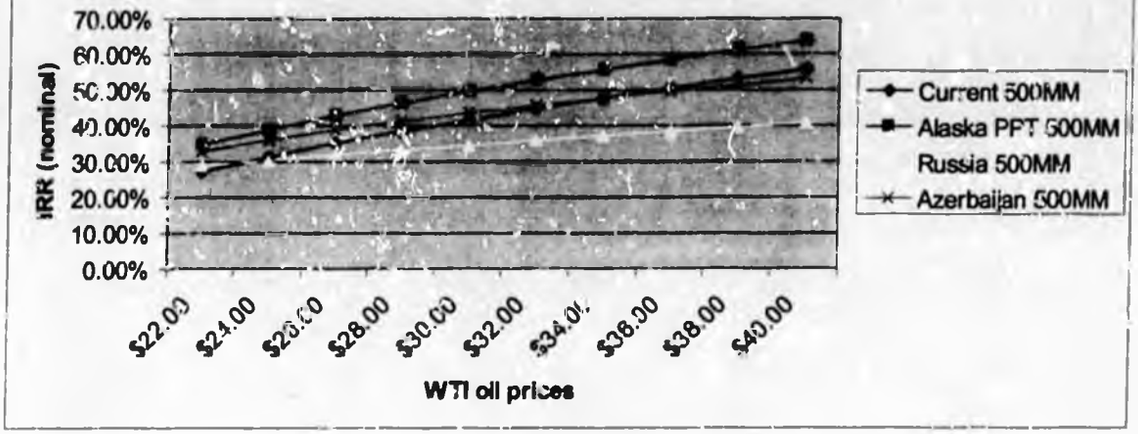


Chart 6.62 NPV @10% for a 500 million barrel field - high well productivity, low costs, Russia and Azerbaijan

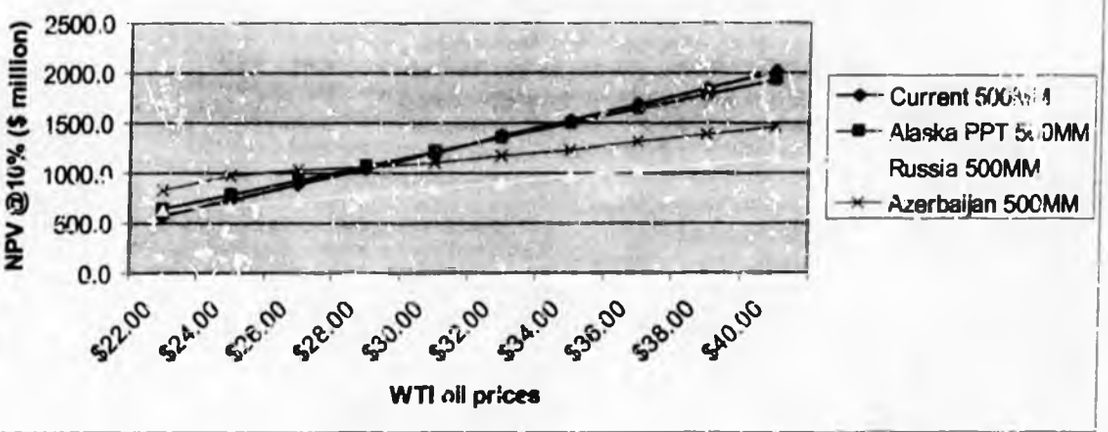


Chart 6.63. EMV @10% values for a 500 million barrel field - high well productivities, low costs, Russia and Azerbaijan

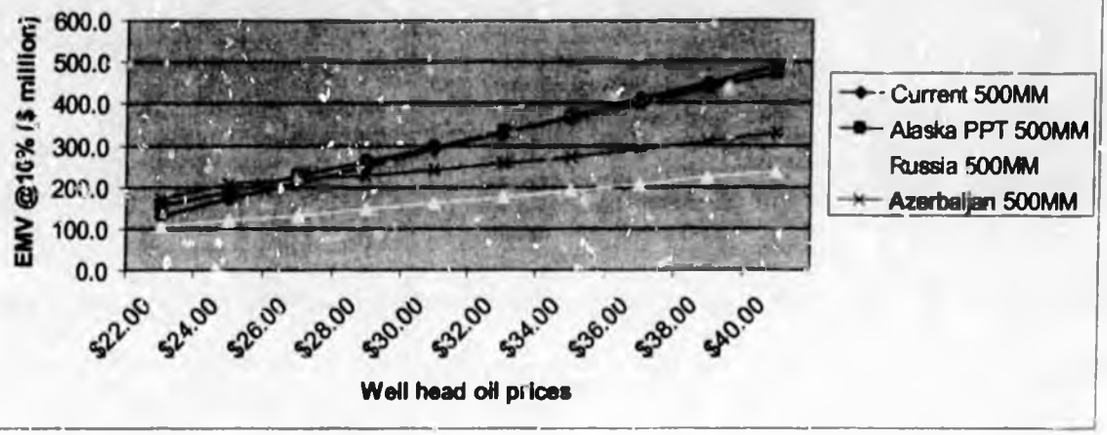
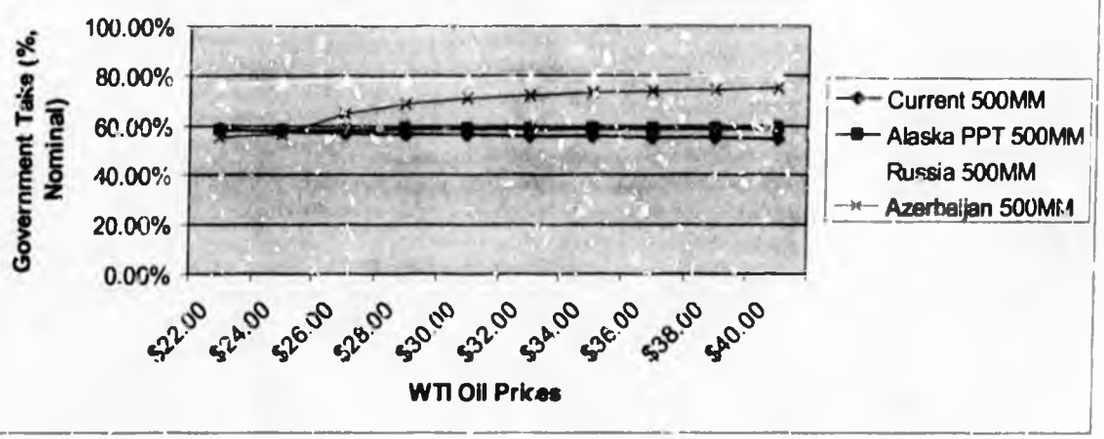


Chart 6.64 Overall Government Take for a 500 million barrel field with high well productivities, low costs, Russia and Azerbaijan



Russia-Sakhalin Conclusion. The Russian system is designed for large fields and is not attractive for small fields compared to Alaska. In general, under average or high oil prices and low costs, the rate of return based system creates conditions of a high government take in Russia. This makes Alaska more competitive. The PPT increases the competitiveness relative to Russia.

6.2.8. Azerbaijan

Azerbaijan represents a very important new oil development for the petroleum industry. Just as Alaska, Azerbaijan has to export its crude through long distance and costly pipeline systems and therefore the net back price for its crudes is relatively low. It is therefore an important country to compare with. Azerbaijan concludes its terms through production sharing agreements.

Azerbaijan terms. Azerbaijan does not have royalties. There is a 25% corporate income tax. Furthermore there is a production sharing arrangements. The cost oil limit is 50% for capital expenditures. Operating costs are not subject to the limit. The profit oil is based on an IRR based sliding scale which related to a real after tax IRR. This sliding scale is based on the pipeline transport costs. Higher transport costs result in a lower scale. It is assumed here that the transport costs are in excess of $ 4 per barrel. For these costs, the following scale of profit oil to government is being used:

Up to a real IRR of 16.75% - 20% profit oil to government
Up to a real IRR of 24.75% - 50% profit oil to government
Over a real IRR of 24.75% - 75% profit oil to government

The national oil company SOCAR participates for 20% in the venture, but this is almost on a "straight up" basis and therefore this is participation is not included in the government take.

There was a bonus of $ 120 million on the project. However, that bonus is excluded for analysis as explained in the beginning of this Chapter. A sequence of social expenditures was included.

Azerbaijan provides near absolute fiscal stability on its fiscal terms.

50 MM high cost

Chart 6.49 shows how the IRR and NPV@10% in Azerbaijan is generally worse than the Alaska Current system and in particular relative to the Alaska PPT. But the Alaska PPT is fare more favorable than Azerbaijan.

The EMV@10% is far less favorable in Azerbaijan, due to the ring-fenced nature of the production sharing agreement and the social expenditures.

The government take in Azerbaijan for small high cost fields is regressive, because the higher benchmarks on the IRR sliding scale do not click in.

500 MM high cost

For a high cost field, the IRR feature works rather favorable under low prices (with very low netbacks). Therefore, IRR is between the PPT and the Alaska Current system. The NPV@10% and the EMV@10% are actually more favorable under low prices than the Alaska PPT due to the relatively low government take at low prices, but these indicators become more favorable for Alaska at higher prices..

As can be seen from Chart 6.56 the government take is rather progressive. It is less than Alaska for low prices and becomes about higher than Alaska at high prices for this large field.

50 MM low cost

The 50 MM low cost field has about the same characteristics as the high cost field. The NPV performance worse than the PPT and has a cross over with the Alaska Current system.

500 MM low cost

Under low cost conditions, the government take under the Azerbaijan terms becomes strongly progressive. Therefore, compared to the high cost case, the IRR, NPV@10% and EMV@10% all become considerable less than the PPT for high prices.

Azerbaijan conclusion. The system is strongly progressive with costs and prices. Therefore under cost and high price conditions the PPT is far more favorable than the system in Azerbaijan for investors. Under low prices and high costs, the system in Azerbaijan is more favorable. It should be noted that the production sharing contract was designed for large fields.

7. INTERNATIONAL RATING OF THE ALASKA PETROLEUM PROFITS TAX ("PPT")

(Note: After the initial scoping a PPT tax rate of 20% and a credit rate of 15% seemed a reasonable combination. Therefore much economic work was done on this combination. As a result of subsequent work it was concluded that a 25% tax rate and 20% tax credit rate is more in the interest of Alaska. Nevertheless in the interest of providing the maximum information about the PPT it was considered desirable to leave the Chapters that were based on the 20% tax rate and 15% credit rate in the report. These are Chapters 4,5,6,7 and 8. Chapter 9,10 and 11 are based on the recommended fiscal terms.)

7.1. Introduction

This chapter contains an rating analysis of the Alaska PPT in order to evaluate in more detail the actual improvement in competitiveness that this fiscal change would create.

The rating is done by comparing in detail the economic results of the 8 world fiscal systems evaluated in Chapter 6.

The same fields will be used for the rating analysis, based on the high and the low cost cases. However, three of the fields were selected for the analysis:

- 50 MM barrels with low well productivities
- 150 MM barrels with low well productivities
- 500 MM barrels with high well productivities

The rating is done for two price levels:

- a WTI price of $ 26 per barrel
- a WTI price of $ 36 per barrel

These two levels reflect approximately the long term average price range that some oil companies may use to evaluate opportunities in Alaska. Large international major oil companies may still use lower prices in the $ 25 to $ 30 price range, but many of the large and medium sized oil companies have now shifted to higher levels of long term price expectation. Therefore, this price range may be representative of possible new investors in Alaska.

The rating will be based on the PPT for new investors, which means including the tax free allowance.

The same weighting was given to the 50 MM, 150 MM and 500 MM fields. This implies that the distribution of field sizes will be logarithmic. In other words a typical distribution is ten 50 MM barrel fields, about three 150 MM barrel fields and one 500 MM barrel field. This is a fairly representative distribution for the North Slope.

7.2. IRR rating

Table 7.1 and 7.2 summarize the IRR results that were obtained for the 10 fiscal systems.

Table 7.1

IRR	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	4.54%	15.47%	9.69%	20.67%	22.76%	36.00%
Alaska PPT	9.98%	21.96%	14.35%	25.44%	29.38%	43.29%
Norway	11.75%	17.98%	15.38%	21.47%	26.06%	33.54%
UK	13.50%	22.17%	18.81%	28.12%	37.13%	48.90%
US GOM	15.51%	23.84%	21.04%	30.47%	38.26%	49.52%
Nigeria	13.73%	21.76%	19.12%	27.99%	35.45%	45.82%
Alberta-Oil Sands	12.84%	21.21%	19.07%	28.50%	37.75%	48.91%
Angola	6.46%	16.68%	13.08%	22.80%	30.67%	40.80%
Russia-Sakhalin	3.02%	10.30%	12.69%	20.40%	26.98%	32.49%
Azerbaijan	3.79%	13.72%	11.21%	21.84%	28.71%	39.85%

Table 7.2

IRR	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	14.75%	26.91%	19.92%	32.93%	35.07%	50.47%
Alaska PPT	21.63%	34.06%	25.25%	38.45%	42.70%	58.54%
Norway	19.22%	26.48%	22.79%	30.17%	35.20%	44.27%
UK	23.99%	34.01%	30.16%	41.32%	51.42%	64.73%
US GOM	25.83%	34.93%	32.83%	43.48%	52.26%	64.49%
Nigeria	23.13%	31.51%	29.49%	39.30%	47.59%	59.20%
Alberta-Oil Sands	22.15%	31.09%	29.74%	40.20%	50.07%	61.77%
Angola	18.26%	27.44%	24.39%	34.47%	42.38%	52.36%
Russia-Sakhalin	8.21%	15.91%	19.70%	25.58%	31.90%	38.34%
Azerbaijan	11.95%	22.34%	20.70%	31.69%	38.90%	49.49%

Tables 7.3 and 7.4 rank these results from "1" to "10". In other words the highest IRR is number "1" and the lowest IRR is number "10"

The total ranking for the IRR is done by simply adding the ranking numbers. The last column in table 7.4 provides the total for the high and the low cases. The lower the number the more attractive the fiscal system is for investors.

The competitiveness index for the IRR indicates the relative competitiveness of the 10 fiscal systems related to each other, based on 6 fields for the high and low cost scenarios. If the IRR rates best in all 10 of them, the index is 12 (1 x 6 x 2 = 12). If the system rates worst in all of them, the index is 120 (10 x 6 x 2 = 120).

The US Gulf of Mexico is the most attractive system with a number 13. The Russia-Sakhalin agreement is the least attractive system with a number 116. The Alaska Current system is the next least attractive with a score of 100. The Alaska PPT improves the number to 58. In other words with respect to the IRR, the Alaska PPT improves the competitive position from a # 9 ranking for the current severance tax to a # 5 ranking among 10 fiscal systems. This means that the PPT improves the Alaska terms considerably from an IRR point of view.

Table 7.3

IRR	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	10	9	10	8	53
Alaska PPT	6	3	6	5	6	5	31
Norway	5	6	5	8	9	9	42
UK	3	2	4	3	3	3	18
US GOM	1	1	1	1	1	1	6
Nigeria	2	4	2	4	4	4	20
Alberta-Oil Sands	4	5	3	2	2	2	18
Angola	7	7	7	6	5	6	38
Russia-Sakhalin	10	10	8	10	8	10	56
Azerbaijan	9	9	9	7	7	7	48

Table 7.4

IRR	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	7	9	7	9	7	47	100
Alaska PPT	5	2	5	5	5	5	27	58
Norway	6	8	7	9	8	9	47	89
UK	2	3	2	2	2	1	12	30
US GOM	1	1	1	1	1	2	7	13
Nigeria	3	4	4	4	4	4	23	43
Alberta-Oil Sands	4	5	3	3	3	3	21	39
Angola	7	6	6	6	6	6	37	75
Russia-Sakhalin	10	10	10	10	10	10	60	116
Azerbaijan	9	9	8	8	7	8	49	97

7.3. NPV @10% rating

Tables 7.5 through 7.8 provide the same analysis for the NPV@10%. It can be seen how the Alaska Current system would rank # 8 and the Alaska PPT would rank # 7 under the 10 fiscal systems. The relative competitiveness improvement of the PPT relative to the Current System is moderate for the PPT. This is caused by the fact that the government take under high prices is higher for the PPT.

Table 7.5
NPV @10%

	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	-48.6	57.8	-7.1	281.2	589.0	1390.5
Alaska PPT	-0.1	101.5	78.6	317.6	711.1	1423.9
Norway	11.0	56.5	90.4	214.9	590.9	970.4
UK	35.5	139.0	220.5	503.5	1365.4	2228.0
US GOM	71.4	205.8	322.6	677.8	1667.2	2685.6
Nigeria	45.3	151.0	245.7	519.0	1273.8	2045.1
Alberta-Oil Sands	30.3	135.5	220.0	504.3	1338.6	2201.0
Angola	-45.2	98.6	97.1	391.2	1003.0	1420.6
Russia-Sakhalin	-119.8	5.7	95.6	366.0	797.5	1023.3
Azerbaijan	-91.5	59.3	38.4	409.1	990.2	1476.6

Table 7.6
NPV @10%

	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	33.2	139.7	172.9	461.2	885.4	1687.0
Alaska PPT	64.9	161.2	211.0	447.8	928.7	1638.9
Norway	44.5	90.0	163.2	287.7	709.3	1088.8
UK	109.1	212.5	381.8	664.8	1628.0	2490.6
US GOM	163.5	297.8	522.4	877.6	1993.5	3012.0
Nigeria	114.0	210.0	381.0	641.2	1465.5	2232.0
Alberta-Oil Sands	102.6	206.2	372.3	655.6	1580.3	2439.5
Angola	81.3	164.1	290.3	493.5	991.6	1176.3
Russia-Sakhalin	-25.9	95.5	260.0	379.8	729.2	1026.7
Azerbaijan	22.2	155.6	256.8	511.3	1023.5	1312.7

Table 7.7
NPV @10%

	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	10	9	9	8	52
Alaska PPT	6	5	8	8	8	6	41
Norway	5	9	7	10	10	10	51
UK	3	3	3	4	2	2	17
US GOM	1	1	1	1	1	1	6
Nigeria	2	2	2	2	4	4	16
Alberta-Oil Sands	4	4	4	3	3	3	21
Angola	7	6	5	6	5	7	36
Russia-Sakhalin	10	10	6	7	7	9	49
Azerbaijan	9	7	9	5	6	5	41

Table 7.8

NPV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	8	9	7	8	5	45	97
Alaska PPT	6	6	8	8	7	6	41	82
Norway	7	10	10	10	10	9	56	107
UK	3	2	2	2	2	2	13	30
US GOM	1	1	1	1	1	1	6	12
Nigeria	2	3	3	4	4	4	20	36
Alberta-Oil Sands	4	4	4	3	3	3	21	42
Angola	5	5	5	6	6	8	35	71
Russia-Sakhalin	10	9	6	9	9	10	53	102
Azerbaijan	9	7	7	5	5	7	40	81

7.4. EMV @10% rating

Tables 7.9 through 7.12 provide the analysis for the EMV@10%. From an EMV perspective, the Alaska current system would rank # 8 and the Alaska PPT would rank # 5. The EMV improvement for the PPT is due to a large extent to the tax credits which have a significant impact on the EMV. The PPT improvement therefore is very significant for explorers.

Table 7.9

EMV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	-29.3	-2.7	-18.9	53.2	130.1	330.5
Alaska PPT	-11.2	14.2	8.5	68.3	166.6	344.8
Norway	-3.7	7.6	16.1	47.2	141.2	236.1
UK	-6.0	19.9	40.3	111.0	326.5	542.2
US GOM	-12.7	20.9	50.1	138.9	386.2	640.8
Nigeria	-17.8	8.6	32.3	100.6	289.3	482.1
Alberta-Oil Sands	-15.7	10.6	31.7	102.8	311.4	527.0
Angola	-40.4	-4.5	-4.9	68.7	221.6	326.0
Russia-Sakhalin	-90.1	-58.7	-36.2	31.4	139.2	195.7
Azerbaijan	-68.9	-31.2	-36.4	56.2	201.5	323.1

Table 7.10

EMV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	-3.1	23.5	31.8	103.9	209.9	410.3
Alaska PPT	8.8	32.9	45.3	104.5	224.8	402.3
Norway	6.8	18.2	36.4	67.6	173.0	267.9
UK	17.3	43.2	85.5	156.2	397.0	612.7
US GOM	20.0	53.6	109.7	198.5	477.5	732.1
Nigeria	9.1	33.1	75.8	140.9	347.0	538.6
Alberta-Oil Sands	8.8	34.7	76.2	147.1	378.2	593.0
Angola	0.9	21.6	53.1	103.9	228.5	274.6
Russia-Sakhalin	-56.9	-26.5	14.6	44.5	131.9	206.3
Azerbaijan	-30.8	2.6	27.9	91.5	219.5	291.8

Table 7.11

EMV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	7	7	8	8	10	6	46
Alaska PPT	3	3	6	6	7	5	30
Norway	1	6	5	9	8	9	38
UK	2	2	2	2	2	2	12
US GOM	4	1	1	1	1	1	9
Nigeria	6	5	3	4	4	4	26
Alberta-Oil Sands	5	4	4	3	3	3	22
Angola	8	8	7	5	5	7	40
Russia-Sakhalin	10	10	9	10	9	10	58
Azerbaijan	9	9	10	7	6	8	49

Table 7.12

EMV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	6	8	7	8	5	42	88
Alaska PPT	5	5	6	5	6	6	33	63
Norway	6	8	7	9	9	9	48	86
UK	2	2	2	2	2	2	12	24
US GOM	1	1	1	1	1	1	6	15
Nigeria	3	4	4	4	4	4	23	49
Alberta-Oil Sands	4	3	3	3	3	3	19	41
Angola	7	7	5	6	5	8	38	78
Russia-Sakhalin	10	10	10	10	10	10	60	118
Azerbaijan	9	9	9	8	7	7	49	98

7.5. Government Take rating

Tables 7.13 through 7.16 show the attractiveness of the government take to investors. In this case, of course, the lower the government take is the more attractive the fiscal system is for investors. So here a "1" is given for the lowest government take and an "10" is provided for the highest government take.

The Alaska current system ranks # 7. Alaska needs a somewhat better government take in order to compensate for the low net back.

The PPT for new investors, with the tax free allowance, would on an overall basis be slightly less because of the government take improves strongly on small fields and higher government take on large fields. Therefore the Alaska PPT would rate # 6. On an overall basis the government take improvement is very modest.

Table 7.13

Gov Take	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	71.03%	56.57%	61.48%	54.67%	59.25%	56.37%
Alaska PPT	48.80%	49.70%	53.98%	55.73%	58.54%	58.64%
Norway	75.65%	76.74%	75.17%	76.33%	76.43%	76.97%
UK	51.25%	50.67%	50.50%	50.30%	50.15%	50.10%
US GOM	35.16%	35.13%	41.41%	40.40%	43.91%	43.27%
Nigeria	39.27%	46.92%	45.97%	49.82%	53.66%	54.74%
Alberta-Oil Sands	48.60%	49.53%	49.13%	49.70%	49.86%	49.98%
Angola	68.24%	50.31%	53.43%	58.26%	63.10%	71.29%
Russia-Sakhalin	82.36%	63.79%	54.26%	59.16%	72.42%	77.81%
Azerbaijan	65.76%	47.07%	44.81%	41.94%	51.62%	66.24%

Table 7.14

Gov Take	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	57.70%	53.13%	55.54%	52.52%	57.00%	55.23%
Alaska PPT	49.66%	51.00%	54.39%	55.93%	58.30%	58.51%
Norway	77.13%	77.47%	76.59%	77.09%	77.08%	77.38%
UK	50.90%	50.55%	50.41%	50.26%	50.14%	50.09%
US GOM	35.14%	35.12%	40.24%	39.76%	43.16%	42.79%
Nigeria	47.64%	50.58%	50.23%	51.99%	54.87%	55.47%
Alberta-Oil Sands	49.76%	49.98%	49.81%	49.97%	50.01%	50.10%
Angola	51.17%	60.31%	59.41%	63.53%	72.15%	80.94%
Russia-Sakhalin	70.12%	59.47%	58.68%	69.84%	78.00%	79.51%
Azerbaijan	50.60%	45.56%	42.90%	53.99%	64.20%	73.44%

Table 7.15

Gov Take	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	9	6	7	5	43
Alaska PPT	4	5	7	7	6	6	35
Norway	9	10	10	10	10	9	58
UK	5	7	5	5	3	3	28
US GOM	1	1	1	1	1	1	6
Nigeria	2	2	3	4	5	4	20
Alberta-Oil Sands	3	4	4	3	2	2	18
Angola	7	6	6	8	8	8	43
Russia-Sakhalin	10	9	8	9	9	10	55
Azerbaijan	6	3	2	2	4	7	24

Table 7.16

Gov Take	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	7	7	5	5	4	36	79
Alaska PPT	3	6	6	7	6	6	34	69
Norway	10	10	10	10	9	8	57	115
UK	6	4	5	3	3	2	23	51
US GOM	1	1	1	1	1	1	6	12
Nigeria	2	5	4	4	4	5	24	44
Alberta-Oil Sands	4	3	3	2	2	3	17	35
Angola	7	9	9	8	8	10	51	94
Russia-Sakhalin	9	8	8	9	10	9	53	108
Azerbaijan	5	2	2	6	7	7	29	53

7.6. Overall rating

It can be seen from the previous tables that the Alaska PPT strongly boosts the IRR and the EMV@10%. The NPV@10% is less strongly affected but the Alaska PPT still provides an improvement. The Government Take is about the same for new investors because it improves significantly for small fields for new investors but is higher on large fields.

Despite the relatively modest government take compared Norway and Angola, the Alaska PPT does not rate that well on an NPV@10% basis due to the low net back prices.

The reason therefore that the Alaska current system rates # 8 economically is because of the low net back prices.

Therefore, the current severance tax and the proposed Alaska PPT need to accommodate the low net back through a generally modest government take compared to world wide standards. Compared to some other high cost environments in North America the government take is tougher.

Table 7.17 provides the overall ranking. The table summarizes the results for the four variables. The overall ranking of the Alaska PPT would be # 5 compared with # 8 for the current system. It can be seen how there is a considerable reduction in number from 364 to 272.

This indicates that the improvement in competitiveness of the Alaska PPT is considerable for new investors. It should result in attracting new entrants to Alaska.

Table 7.17
Overall

	IRR Subtotal	NPV Subtotal	EMV Subtotal	GOV TAKE Subtotal	SUM TOTAL	Ranking
Alaska Current	100	97	88	79	364	#8
Alaska PPT	58	82	63	69	272	#5
Norway	89	107	86	115	397	#9
UK	30	30	24	51	135	#2
US GOM	13	12	15	12	52	#1
Nigeria	43	36	49	44	172	#4
Alberta-Oil Sands	39	42	41	35	157	#3
Angola	75	71	78	94	318	#6
Russia-Sakhalin	116	102	118	108	444	#10
Azarbaijan	97	81	98	53	329	#7

The following table summarizes the total competitiveness index from attractive to unattractive for new investors in Alaska.

Table 7.18
COMPETITIVENESS INDEX

Hypothetical best	48	
US GOM	52	#1
UK	135	#2
Alberta-Oil Sands	157	#3
Nigeria	172	#4
Alaska PPT	272	#5
Angola	318	#6
Azerbaijan	329	#7
Alaska Current	364	#8
Norway	397	#9
Russia-Sakhalin	444	#10
Hypothetical worst	480	

8. COMPETITIVENESS AND THE PPT RATE

(Note: After the initial scoping a PPT tax rate of 20% and a credit rate of 15% seemed a reasonable combination. Therefore much economic work was done on this combination. As a result of subsequent work it was concluded that a 25% tax rate and 20% tax credit rate is more in the interest of Alaska. Nevertheless in the interest of providing the maximum information about the PPT it was considered desirable to leave the Chapters that were based on the 20% tax rate and 15% credit rate in the report. These are Chapters 4,5,6,7 and 8. Chapter 9,10 and 11 are based on the recommended fiscal terms.)

8.1. Introduction

As was illustrated in Chapter 4, a new investor will not be concerned about the PPT rate for small fields because of the tax free allowance. The new investor will receive the tax credits for negative cash flow and for capital expenditures on the small field, but will typically not pay PPT unless oil prices are very high. Therefore, small companies and new investors in small fields will not be concerned about the PPT rate.

The PPT rate will be mainly a concern for existing larger oil companies. It is therefore important to analyze the international economic competitiveness with respect to the PPT rate for a situation where companies have already used their tax free allowance and are re-investing in Alaska. Such re-investments should be attractive from an international perspective, otherwise there is not an increased incentive to re-invest in Alaska.

An important Alaska PPT concept is that large oil companies that actively re-invest in Alaska should be rewarded with better economics. Large oil companies that are largely in a "harvest" mode and re-direct their Alaska profits in other jurisdictions, should pay a higher tax.

A PPT rate that is too high might discourage re-investment if the overall economic rating becomes unattractive. In order to review the effect of a high PPT rate, an analysis was done of various rates.

In this chapter the analysis will be provided for PPT rates of 30%, 25% and 20% in order to evaluate the economics from this perspective.

Following is the same competitiveness analysis as done in Chapter 7 for the proposed PPT for new investors, but now for re-investment by oil companies which have already used their tax free allowance.

8.2. Results of the analysis

8.2.1. IRR results

The IRR results show the IRR is not very different depending on the PPT rate, for the 30%, 25% and 20% cases (indicated in the table as PPT-30, PPT-25 and PPT-20). The reason is that both the negative as well as the positive cash flows are subject to the PPT rate and therefore, a higher rate also results in higher tax credits for negative cash flows.

Table 8.1

IRR	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	4.54%	15.47%	4.54%	20.67%	22.76%	36.00%
PPT-20	7.33%	18.56%	12.54%	23.97%	28.61%	42.61%
Norway	11.75%	17.98%	15.38%	21.47%	26.06%	33.54%
UK	13.50%	22.17%	18.81%	28.12%	37.13%	48.90%
US GOM	15.51%	23.84%	21.04%	30.47%	38.26%	49.52%
Nigeria	13.73%	21.76%	19.12%	27.99%	35.45%	45.82%
Alberta-Oil Sands	12.84%	21.21%	19.07%	28.50%	37.75%	48.91%
Angola	6.46%	16.68%	13.08%	22.80%	30.67%	40.80%
Russia-Sakhalin	3.02%	10.30%	12.69%	20.40%	26.98%	32.49%
Azerbaijan	3.79%	13.72%	11.21%	21.84%	28.71%	39.85%
PPT-30	7.58%	18.62%	12.61%	23.80%	28.22%	41.96%
PPT-25	7.45%	18.59%	12.57%	23.89%	28.43%	42.30%

Table 8.2

IRR	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	14.75%	26.91%	19.92%	32.93%	35.07%	50.47%
PPT-20	17.82%	30.38%	23.19%	36.73%	41.66%	57.75%
Norway	19.22%	26.48%	22.79%	30.17%	35.20%	44.27%
UK	23.99%	34.01%	30.16%	41.32%	51.42%	64.73%
US GOM	25.83%	34.93%	32.83%	43.48%	52.26%	64.49%
Nigeria	23.13%	31.51%	29.49%	39.30%	47.59%	59.20%
Alberta-Oil Sands	22.15%	31.09%	29.74%	40.20%	50.07%	61.77%
Angola	18.26%	27.44%	24.39%	34.47%	42.38%	52.36%
Russia-Sakhalin	8.21%	15.91%	19.70%	25.58%	31.90%	38.34%
Azerbaijan	11.95%	22.34%	20.70%	31.69%	38.90%	49.49%
PPT-30	17.89%	30.30%	23.04%	36.35%	41.03%	56.90%
PPT-25	17.86%	30.34%	23.12%	36.55%	41.36%	57.35%

Even without specific rating analysis, it can be seen how the IRR results for all PPT rates are generally more attractive than the Current system. This is because of the tax credits on negative cash flow and on capital expenditures, which are important during the first part of the cash flow.

8.2.2. NPV@10% results

The NPV@10% results are sensitive to the PPT rate as can be seen in Tables 8.3 and 8.4. The lower the PPT rate, the more attractive the NPV@10%. As can be expected for the large fields and under high prices is the PPT 30% system less attractive than the Current system, in view of the fact that the 30% takes away considerable positive cash flow.

Table 8.3

NPV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	-48.6	57.8	-7.1	281.2	589.0	1390.5
PPT-20	-17.7	67.5	43.3	276.3	668.6	1378.8
Norway	11.0	56.5	90.4	214.9	590.9	970.4
UK	35.5	139.0	220.5	503.5	1365.4	2228.0
US GOM	71.4	205.8	322.6	677.8	1667.2	2685.6
Nigeria	45.3	151.0	245.7	519.0	1273.8	2045.1
Alberta-Oil Sands	30.3	135.5	220.0	504.3	1338.6	2201.0
Angola	-45.2	98.6	97.1	391.2	1003.0	1420.6
Russia-Sakhalin	-119.8	5.7	95.6	366.0	797.5	1023.3
Azerbaijan	-91.5	59.3	38.4	409.1	990.2	1476.6
PPT-30	-14.3	60.3	39.6	243.5	586.5	1207.9
PPT-25	-16.0	63.9	41.5	259.9	627.5	1293.3

Table 8.4

NPV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	33.2	139.7	172.9	461.2	885.4	1687.0
PPT-20	40.7	125.9	172.5	405.4	883.6	1593.3
Norway	44.5	90.0	163.2	287.7	709.3	1088.8
UK	109.1	212.5	381.8	664.8	1628.0	2490.6
US GOM	163.5	297.8	522.4	877.6	1993.5	3012.0
Nigeria	114.0	210.0	381.0	641.2	1465.5	2232.0
Alberta-Oil Sands	102.6	206.2	372.3	655.6	1580.3	2439.5
Angola	81.3	164.1	290.3	493.5	991.6	1176.3
Russia-Sakhalin	-25.9	95.5	260.0	379.8	729.2	1026.7
Azerbaijan	22.2	155.6	256.8	511.3	1023.5	1312.7
PPT-30	36.4	111.0	152.1	355.9	774.1	1395.5
PPT-25	38.6	118.4	162.3	380.7	828.9	1494.7

8.2.3. EMV@10% results.

Also with respect to the EMV@10% the PPT rate is important. Generally, the higher the PPT rate, the less attractive the exploration for the field. An exception is the small field under low prices. In fact in this case the PPT 30% indicates the least unattractive results. This is because the exploration costs are also subject to the tax credit. With a PPT of 30% the tax credit is more and therefore, the net costs of an expioratory dry hole is less.

Table 8.5

EMV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	-29.3	-2.7	-18.9	53.2	130.1	330.5
PPT-20	-15.6	5.7	-0.3	57.9	156.0	333.6
Norway	-3.7	7.6	16.1	47.2	141.2	236.1
UK	-6.0	19.9	40.3	111.0	326.5	542.2
US GOM	-12.7	20.9	50.1	138.9	386.2	640.8
Nigeria	-17.8	9.6	32.3	100.6	289.3	482.1
Alberta-Oil Sands	-15.7	10.6	31.7	102.8	311.4	527.0
Angola	-40.4	-4.5	-4.9	68.7	221.6	326.0
Russia-Sakhalin	-90.1	-58.7	-36.2	31.4	139.2	195.7
Azerbaijan	-68.9	-31.2	-36.4	56.2	201.5	323.1
PPT-30	-13.0	5.6	0.5	51.4	137.2	292.5
PPT-25	-14.3	5.7	0.1	54.7	146.6	313.1

Table 8.6

EMV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	-3.1	23.5	31.8	103.9	209.9	410.3
PPT-20	2.8	24.1	35.7	93.9	213.5	391.0
Norway	6.8	18.2	36.4	67.6	173.0	267.9
UK	17.3	43.2	85.5	156.2	397.0	612.7
US GOM	20.0	53.6	109.7	198.5	477.5	732.1
Nigeria	9.1	33.1	75.8	140.9	347.0	538.6
Alberta-Oil Sands	8.8	34.7	76.2	147.1	378.2	593.0
Angola	0.9	21.6	53.1	103.9	228.5	274.6
Russia-Sakhalin	-56.9	-26.5	14.6	44.5	131.9	206.3
Azerbaijan	-30.8	2.6	27.9	91.5	219.5	291.8
PPT-30	2.8	21.5	31.7	82.7	187.2	342.6
PPT-25	2.8	22.8	33.7	88.3	200.4	366.8

8.2.4. Government Take results

The most negative factor of a high PPT of 30% for large oil companies with large operations in Alaska would be the resulting high government take, which means losses on undiscounted cash. This is unattractive from a long term perspective. This is clearly illustrated in the following two tables. The higher the PPT rate, the higher the government take (which means a correspondingly lower corporate take) and the less attractive the field economics are to the investors.

Table 8.7

Gov Take	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	71.03%	56.57%	61.48%	54.67%	59.25%	56.37%
PPT-20	65.10%	61.07%	62.92%	60.71%	61.12%	60.14%
Norway	75.65%	76.74%	75.17%	76.33%	76.43%	76.97%
UK	51.25%	50.67%	50.50%	50.30%	50.15%	50.10%
US GOM	35.16%	35.13%	41.41%	40.40%	43.91%	43.27%
Nigeria	39.27%	46.92%	45.97%	49.82%	53.66%	54.74%
Alberta-Oil Sands	48.60%	49.53%	49.13%	49.70%	49.86%	49.98%
Angola	60.24%	50.31%	53.43%	58.26%	63.10%	71.29%
Russia-Sakhalin	82.36%	63.79%	54.26%	59.16%	72.42%	77.81%
Azerbaijan	63.76%	47.07%	44.81%	41.94%	51.62%	66.24%
PPT-30	68.00%	65.41%	66.85%	65.30%	65.76%	65.00%
PPT-25	66.55%	63.24%	64.88%	63.00%	63.44%	62.57%

Table 8.8

Gov Take	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	57.70%	53.13%	55.54%	52.52%	57.00%	55.23%
PPT-20	61.84%	60.34%	61.33%	60.19%	60.61%	59.90%
Norway	77.13%	77.47%	76.50%	77.09%	77.08%	77.38%
UK	50.90%	50.55%	50.41%	50.26%	50.14%	50.09%
US GOM	35.14%	35.12%	40.24%	39.76%	43.16%	42.79%
Nigeria	47.64%	50.58%	50.23%	51.99%	54.87%	55.47%
Alberta-Oil Sands	49.76%	49.98%	49.81%	49.97%	50.01%	50.10%
Angola	51.17%	60.31%	59.41%	63.53%	72.15%	80.94%
Russia-Sakhalin	70.12%	59.47%	58.68%	69.84%	78.00%	79.51%
Azerbaijan	50.60%	45.56%	42.90%	53.99%	64.20%	73.44%
PPT-30	66.07%	65.02%	65.83%	64.99%	65.41%	64.84%
PPT-25	63.95%	62.68%	63.58%	62.59%	63.01%	62.37%

8.3. Rating

The rating will be done separately for the 8 fiscal systems, comparing a PPT of 30%, 25% and 20% with the other 7 fiscal terms, including the Current System.

The PPT 30% will be shown in detail. Subsequently, the summary results of the PPT of 25% and 20% will also be provided.

8.3.1. Rating of the PPT of 30%

Following are all the tables for the PPT rating of 30%.

Table 8.9

IRR	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	10	9	10	8	53
PPT-30	6	5	8	5	7	5	36
Norway	5	6	5	8	9	9	42
UK	3	2	4	3	3	3	18
US GOM	1	1	1	1	1	1	6
Nigeria	2	3	2	4	4	4	19
Alberta-Oil Sands	4	4	3	2	2	2	17
Angola	7	7	6	6	5	6	37
Russia-Sakhalin	10	10	7	10	8	10	55
Azerbaijan	9	9	9	7	6	7	47

Table 8.10

IRR	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	7	9	7	9	7	47	100
PPT-30	7	5	6	5	6	5	34	70
Norway	5	8	7	9	8	9	46	88
UK	2	2	2	2	2	1	11	29
US GOM	1	1	1	1	1	2	7	13
Nigeria	3	3	4	4	4	4	22	41
Alberta-Oil Sands	4	4	3	3	3	3	20	37
Angola	6	6	5	6	5	6	34	71
Russia-Sakhalin	10	10	10	10	10	10	60	115
Azerbaijan	9	9	8	8	7	8	49	96

Table 8.11
NPV @10%

	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	10	8	9	7	50
PPT-30	6	6	8	9	10	8	47
Norway	5	9	7	10	8	10	49
UK	3	3	3	4	2	2	17
US GOM	1	1	1	1	1	1	6
Nigeria	2	2	2	2	4	4	16
Alberta-Oil Sands	4	4	4	3	3	3	21
Angola	7	5	5	6	5	6	34
Russia-Sakhalin	10	10	6	7	7	9	49
Azerbaijan	9	7	9	5	6	5	41

Table 8.12
NPV @10%

	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	7	8	7	7	5	42	92
PPT-30	7	8	10	9	8	7	49	96
Norway	6	10	9	10	10	9	54	103
UK	3	2	2	2	2	2	13	30
US GOM	1	1	1	1	1	1	6	12
Nigeria	2	3	3	4	4	4	20	36
Alberta-Oil Sands	4	4	4	3	3	3	21	42
Angola	5	6	5	6	6	8	36	70
Russia-Sakhalin	10	9	7	8	9	10	53	102
Azerbaijan	9	5	6	5	5	6	36	77

Table 8.13
EMV @10%

	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	7	7	8	7	10	5	44
PPT-30	4	6	6	8	9	8	41
Norway	1	5	5	9	7	9	36
UK	2	2	2	2	2	2	12
US GOM	3	1	1	1	1	1	8
Nigeria	6	4	3	4	4	4	25
Alberta-Oil Sands	5	3	4	3	3	3	21
Angola	8	8	7	5	5	6	39
Russia-Sakhalin	10	10	9	10	8	10	57
Azerbaijan	9	9	10	6	6	7	47

Table 8.14
EMV @10%

	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	5	7	6	7	5	38	82
PPT-30	6	7	8	8	8	6	43	84
Norway	5	8	6	9	9	9	46	82
UK	2	2	2	2	2	2	12	24
US GOM	1	1	1	1	1	1	6	14
Nigeria	3	4	4	4	4	4	23	48
Alberta-Oil Sands	4	3	3	3	3	3	19	40
Angola	7	6	5	5	5	8	36	75
Russia-Sakhalin	10	10	10	10	10	10	60	117
Azerbaijan	9	9	9	7	6	7	47	94

Table 8.15
Gov Take

	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	7	8	6	6	5	40
PPT-30	6	9	9	9	8	6	47
Norway	9	10	10	10	10	9	58
UK	4	6	5	5	3	3	26
US GOM	1	1	1	1	1	1	6
Nigeria	2	2	3	4	5	4	20
Alberta-Oil Sands	3	4	4	3	2	2	18
Angola	7	5	6	7	7	8	40
Russia-Sakhalin	10	8	7	8	9	10	52
Azerbaijan	5	3	2	2	4	7	23

Table 8.16
Gov Take

	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	7	6	6	5	5	4	33	73
PPT-30	8	9	9	8	7	6	47	94
Norway	10	10	10	10	9	8	57	115
UK	5	4	5	3	3	2	22	48
US GOM	1	1	1	1	1	1	6	12
Nigeria	2	5	4	4	4	5	24	44
Alberta-Oil Sands	3	3	3	2	2	3	16	34
Angola	6	8	8	7	8	10	47	87
Russia-Sakhalin	9	7	7	9	10	9	51	103
Azerbaijan	4	2	2	6	6	7	27	50

As can be seen from the above eight tables, in general the PPT 30% rates favorably compared to the Current System with respect to the IRR, but rates unfavorably with respect to NPV@10% and the EMV@10% and rates very unfavorably with respect to the Government Take.

The following two summary tables illustrate how on balance the PPT has about the same competitiveness rating as the Current Systems in total.

A PPT rate of 30% would not improve the competitiveness of Alaska for re-investmen. by large companies which have already used their tax free allowance. Therefore this rate would be too high.

Table 8.17
Overview

	IRR Subtotal	NPV Subtotal	EMV Subtotal	GOV TAKE Subtotal	SUM TOTAL	Ranking
Alaska Current	100	92	82	73	347	#8
PPT-30	70	96	84	94	344	#7
Norway	88	103	82	115	388	#9
UK	29	30	24	48	131	#2
US GOM	13	12	14	12	51	#1
Nigeria	41	36	48	44	169	#4
Alberta-Oil Sands	37	42	40	34	153	#3
Angola	71	70	75	87	303	#5
Russia-Sakhalin	115	102	117	103	437	#10
Azerbaijan	96	77	94	50	317	#6

Table 8.18
COMPETITIVENESS INDEX

Hypothetical best	48	
US GOM	51	#1
UK	131	#2
Alberta-Oil Sands	153	#3
Nigeria	169	#4
Angola	302	#5
Azerbaijan	317	#6
PPT-30	344	#7
Alaska Current	347	#8
Norway	388	#9
Russia-Sakhalin	438	#10
Hypothetical worst	480	

8.3.2. Rating of the PPT of 25%

Comparing Table 8.19 with 8.17 it can be seen how the PPT of 25% improves with respect to the NPV@10% and EMV@10%. This results in an overall better rating of the PPT at 25%. Which is now slightly more attractive than the Current system, as can be seen from Table 8.20. Nevertheless the competitive position is still close to the Current System based on a tax credit of 15%.

Table 8.19

Overview	IRR Subtotal	NPV Subtotal	EMV Subtotal	GOV TAKE Subtotal	SUM TOTAL	Ranking
Alaska Current	100	93	84	73	350	#8
PPT-25	70	93	79	92	334	#7
Norway	88	104	83	115	390	#9
UK	29	30	24	48	131	#2
US GOM	13	12	14	12	51	#1
Nigeria	41	36	48	44	169	#4
Alberta-Oil Sands	37	42	40	34	153	#3
Angola	71	70	76	88	305	#5
Russia-Sakhalin	115	103	118	103	439	#10
Azerbaijan	96	77	94	51	318	#6

Table 8.20
COMPETITIVENESS INDEX

Hypothetical best	48	
US GOM	51	#1
UK	131	#2
Alberta-Oil Sands	153	#3
Nigeria	169	#4
Angola	305	#5
Azerbaijan	318	#6
PPT-25	334	#7
Alaska Current	350	#8
Norway	390	#9
Russia-Sakhalin	439	#10
Hypothetical worst	480	

Subsequent to these results, a further rating was done on a 25% tax rate and a 20% tax credit. This rating resulted in a rather attractive rating as will be discussed in Chapter 9.

8.3.3. Rating of the PPT of 20%

Comparing Tables 8.21 and 8.19, the NPV@10% and EMV@10% improve further relative to the Current System. Also the Government Take difference in rating is now less. This now results in a much better rating for the PPT with 20% relative to the Current System.

Table 8.21

Overview	IRR Subtotal	NPV Subtotal	EMV Subtotal	GOV TAKE Subtotal	SUM TOTAL	Ranking
Alaska Current	100	93	87	73	353	#8
PPT-20	70	91	72	89	322	#6
Norway	88	105	83	115	391	#9
UK	29	30	24	48	131	#2
US GOM	13	12	14	12	51	#1
Nigeria	41	36	48	44	169	#4
Alberta-Oil Sands	37	42	40	34	153	#3
Angola	71	70	77	89	307	#5
Russia-Sakhalin	115	103	118	104	440	#10
Azerbaijan	96	78	97	52	323	#7

The competitiveness index for a PPT of 20% shows some considerable improvement over the Current System.

In this case much depends on how investors attribute weight to the various factors. If a low government take is considered very important, a PPT of 20% may be considered still less attractive. If on the other hand the IRR and EMV@10% are considered important the PPT of 20% offers a better deal than the Current System.

On average the improvement in competitiveness of the PPT-20 is enough to ensure that the behavior of large producers will not be negatively impacted relative to the current situation. Large producers may maintain operations unchanged or may accelerate their investments, in particular in exploration, while smaller producers will find a considerable incentive to invest and explore.

It should be noted that the competitive position depends considerably on price levels. As can be seen from Charts 6.6, 6.38 and 6.54, the PPT improves the competitive position for new investors rapidly under high prices relative to Norway, Angola, Russia-Sakhalin and Azerbaijan. The same would be true for a wide variety of other fiscal systems in the world which are progressive, as discussed in Chapter 2. Therefore, as long as WTI long term price

predictions of investors are $ 30 per barrel or higher, considerable interest can be expected for investment in Alaska by such investors.

Table 8.22
COMPETITIVENESS INDEX

Hypothetical best	**48**	
US GOM	**51**	**#1**
UK	**131**	**#2**
Alberta-Oil Sands	**153**	**#3**
Nigeria	**169**	**#4**
Angola	**307**	**#5**
PPT-20	**322**	**#6**
Azerbaijan	**323**	**#7**
Alaska Current	**353**	**#8**
Norway	**391**	**#9**
Russia-Sakhalin	**440**	**#10**
Hypothetical worst	**480**	

9. FURTHER RATING BASED ON HIGHER TAX CREDIT RATES.

9.1. Introduction

The DOR model indicated that the overall revenues to the State were primarily determined by the tax rate. Higher tax credits result only in a modest reduction of these overall revenues. This required a new look at the PPT tax rate and tax credit rate. Therefore, more sensitivity analysis was done on higher tax rates with higher tax credit rates. This indicated that a 25% tax rate with a 20% tax credit was a better combination for the State. The rating analysis for new investors also indicated that such a system would be even more attractive for new investors. This chapter discusses the rating of this new package for new investors.

9.2. IRR rating

Table 9.1 and 9.2 summarize the IRR results that were obtained.

Table 9.1

IRR	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	4.54%	15.47%	9.69%	20.67%	22.76%	36.00%
Alaska PPT	12.16%	24.58%	16.18%	27.40%	30.95%	45.01%
Norway	11.75%	17.98%	15.38%	21.47%	26.06%	33.54%
UK	13.50%	22.17%	18.81%	28.12%	37.13%	48.90%
US GOM	15.51%	23.84%	21.04%	30.47%	38.26%	49.52%
Nigeria	13.73%	21.76%	19.12%	27.99%	35.45%	45.82%
Alberta-Oil Sands	12.84%	21.21%	19.07%	28.50%	37.75%	48.91%
Angola	6.46%	16.68%	13.08%	22.80%	30.67%	40.80%
Russia-Sakhalin	3.02%	10.30%	12.69%	20.40%	26.98%	32.49%
Azerbaijan	3.79%	13.72%	11.21%	21.84%	28.71%	39.85%

Table 9.2
IRR

	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	14.75%	26.91%	19.92%	32.63%	35.07%	50.47%
Alaska PPT	24.39%	36.99%	27.37%	40.74%	44.53%	60.49%
Norway	19.22%	28.48%	22.79%	30.17%	35.20%	44.27%
UK	23.99%	34.01%	30.16%	41.32%	51.42%	64.73%
US GOM	25.63%	34.93%	32.83%	43.48%	52.26%	64.49%
Nigeria	23.13%	31.51%	29.49%	39.30%	47.59%	59.20%
Alberta-Oil Sands	22.15%	31.09%	29.74%	40.20%	50.07%	61.77%
Angola	18.26%	27.44%	24.39%	34.47%	42.38%	52.36%
Russia-Sakhalin	8.21%	15.91%	19.70%	25.58%	31.90%	38.34%
Azerbaijan	11.95%	22.34%	20.70%	31.69%	38.90%	49.49%

As can be seen by comparing this table with the one in Chapter 7, the 20% tax credit has a very favorable impact on the rate of return.

Tables 9.3 and 9.4 rank these results again from "1" to "10".

Table 9.3
IRR

	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	10	9	10	8	53
Alaska PPT	5	1	5	5	5	5	26
Norway	6	6	6	8	9	9	44
UK	3	3	4	3	3	3	19
US GOM	1	2	1	1	1	1	7
Nigeria	2	4	2	4	4	4	20
Alberta-Oil Sands	4	5	3	2	2	2	18
Angola	7	7	7	6	6	6	39
Russia-Sakhalin	10	10	8	10	8	10	56
Azerbaijan	9	9	9	7	7	7	48

Table 9.4

IRR	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	7	9	7	9	7	47	100
Alaska PPT	2	1	5	3	5	4	20	46
Norway	6	8	7	9	8	9	47	91
UK	3	3	2	2	2	1	13	32
US GOM	1	2	1	1	1	2	8	15
Nigeria	4	4	4	5	4	5	26	46
Alberta-Oil Sands	5	5	3	4	3	3	23	41
Angola	7	6	6	6	6	6	37	76
Russia-Sakhalin	10	10	10	10	10	10	60	116
Azerbaijan	9	9	8	8	7	8	49	97

It can be seen how the overall IRR ranking improves from 58 on Table 7.4 to 46 on the above table. By international standards the IRR would be highly attractive for small and new investors.

9.3. NPV @10% rating

Tables 9.5 through 9.8 provide the same analysis for the NPV@10%. It can be seen how the NPV@10% only modestly improves relative to table 7.8 from 82 to 79.

Table 9.5

NPV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	-48.6	57.8	-7.1	281.2	589.0	1390.5
Alaska PPT	14.0	111.4	103.0	328.9	707.4	1376.5
Norway	11.0	56.5	90.4	214.9	590.9	970.4
UK	35.5	139.0	220.5	503.5	1365.4	2228.0
US GOM	71.4	205.8	322.6	677.8	1667.2	2685.6
Nigeria	45.3	151.0	245.7	519.0	1273.8	2045.1
Alberta-Oil Sands	30.3	135.5	220.0	504.3	1338.6	2201.0
Angola	-45.2	98.6	97.1	391.2	1003.0	1420.6
Russia-Sakhalin	-119.8	5.7	95.6	366.0	797.5	1023.3
Azerbaijan	-91.5	59.3	38.4	409.1	990.2	1476.6

Table 9.6
NPV @10%

	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	33.2	139.7	172.9	461.2	885.4	1687.0
Alaska PPT	74.2	167.9	222.0	445.2	903.1	1568.9
Norway	44.5	90.0	163.2	287.7	709.3	1088.8
UK	109.1	212.5	381.8	664.8	1628.0	2490.6
US GOM	163.5	297.8	522.4	877.6	1993.5	3012.0
Nigeria	114.0	210.0	381.0	641.2	1465.5	2232.0
Alberta-Oil Sands	102.6	206.2	372.3	655.6	1580.3	2439.5
Angola	81.3	164.1	290.3	493.5	991.6	1176.3
Russia-Sakhalin	-25.9	95.5	260.0	379.8	729.2	1026.7
Azerbaijan	22.2	155.6	256.8	511.3	1023.5	1312.7

Table 9.7
NPV @10%

	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	10	9	9	7	51
Alaska PPT	5	5	5	8	8	8	39
Norway	6	9	8	10	10	10	53
UK	3	3	3	4	2	2	17
US GOM	1	1	1	1	1	1	6
Nigeria	2	2	2	2	4	4	16
Alberta-Oil Sands	4	4	4	3	3	3	21
Angola	7	6	6	6	5	6	36
Russia-Sakhalin	10	10	7	7	7	9	50
Azerbaijan	9	7	9	5	6	5	41

Table 9.8
NPV @10%

	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	8	9	7	8	5	45	96
Alaska PPT	6	5	8	8	7	6	40	79
Norway	7	10	10	10	10	9	56	109
UK	3	2	2	2	2	2	13	30
US GOM	1	1	1	1	1	1	6	12
Nigeria	2	3	3	4	4	4	20	36
Alberta-Oil Sands	4	4	4	3	3	3	21	42
Angola	5	6	5	6	6	8	36	72
Russia-Sakhalin	10	9	6	9	9	10	53	103
Azerbaijan	9	7	7	5	5	7	40	81

9.4. EMV @10% rating

Tables 9.9 through 9.12 provide the analysis for the EMV@10%. Relative to Table 7.12, it can be seen how the EMV improved from 63 to 56. This indicates that the 25% tax rate resulting in a 25% loss carry forward credit plus the 20% investment credit rate, would be an unusual strong incentive to explore in Alaska.

Table 9.9
EMV @10%

	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	-29.3	-2.7	-18.9	53.2	130.1	330.5
Alaska PPT	-5.9	19.2	16.3	72.8	167.4	334.7
Norway	-3.7	7.6	16.1	47.2	141.2	236.1
UK	-6.0	19.9	40.3	111.0	326.5	542.2
US GOM	-12.7	20.9	50.1	138.9	386.2	640.8
Nigeria	-17.8	8.6	32.3	100.6	289.3	482.1
Alberta-Oil Sands	-15.7	10.6	31.7	102.8	311.4	527.0
Angola	-40.4	-4.5	-4.9	68.7	221.6	326.0
Russia-Sakhalin	-90.1	-58.7	-36.2	31.4	139.2	195.7
Azerbaijan	-68.9	-31.2	-36.4	56.2	201.5	323.1

Table 9.10
EMV @10%

	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	-3.1	23.5	31.8	103.9	209.9	410.3
Alaska PPT	12.3	35.7	49.2	105.0	219.5	385.9
Norway	6.8	18.2	36.4	67.6	173.0	267.9
UK	17.3	43.2	85.5	156.2	397.0	612.7
US GOM	20.0	53.6	109.7	198.5	477.5	732.1
Nigeria	9.1	33.1	75.8	140.9	347.0	538.6
Alberta-Oil Sands	8.8	34.7	76.2	147.1	378.2	593.0
Angola	0.9	21.6	53.1	103.9	228.5	274.6
Russia-Sakhalin	-56.9	-26.5	14.6	44.5	131.9	206.3
Azerbaijan	-30.8	2.6	27.9	91.5	219.5	291.8

Table 9.11
EMV @10%

	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	7	7	8	8	10	6	46
Alaska PPT	2	3	5	5	7	5	27
Norway	1	6	6	9	8	9	39
UK	3	2	2	2	2	2	13
US GOM	4	1	1	1	1	1	9
Nigeria	6	5	3	4	4	4	26
Alberta-Oil Sands	5	4	4	3	3	3	22
Angola	8	8	7	6	5	7	41
Russia-Sakhalin	10	10	9	10	9	10	58
Azerbaijan	9	9	10	7	6	8	49

Table 9.12
EMV @10%

	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	6	8	7	8	5	42	88
Alaska PPT	3	3	6	5	6	6	29	56
Norway	6	8	7	9	9	9	48	87
UK	2	2	2	2	2	2	12	25
US GOM	1	1	1	1	1	1	6	15
Nigeria	4	5	4	4	4	4	25	51
Alberta-Oil Sands	5	4	3	3	3	3	21	43
Angola	7	7	5	6	5	8	38	79
Russia-Sakhalin	10	10	10	10	10	10	60	118
Azerbaijan	9	9	9	8	7	7	49	98

9.5. Government Take rating

Tables 9.13 through 9.16 show the attractiveness of the government take to investors. In comparison with Table 7.16 the government take is actually more attractive in the rating despite the higher tax rate. The rating drops from 69 to 63. This is directly due to the fact that on the 50 MM barrel field the tax credits are very important and actually lower the government take.

Table 9.13
Gov Take

	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	71.03%	56.57%	61.48%	54.67%	59.25%	56.37%
Alaska PPT	42.26%	47.64%	51.84%	55.92%	59.64%	60.36%
Norway	75.65%	76.74%	75.17%	76.33%	76.43%	76.97%
UK	51.25%	50.67%	50.50%	50.30%	50.15%	50.10%
US GOM	35.16%	35.13%	41.41%	40.40%	43.91%	43.27%
Nigeria	39.27%	46.92%	45.97%	49.82%	53.66%	54.74%
Alberta-Oil Sands	48.60%	49.53%	49.13%	49.70%	49.86%	49.98%
Angola	68.24%	50.31%	53.43%	58.26%	63.10%	71.29%
Russia-Sakhalin	82.36%	63.79%	54.26%	59.16%	72.42%	77.81%
Azerbaijan	65.76%	47.07%	44.81%	41.94%	51.62%	66.24%

Table 9.14
Gov Take

	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	57.70%	53.13%	55.54%	52.52%	57.00%	55.23%
Alaska PPT	47.29%	50.29%	54.02%	56.78%	59.79%	60.43%
Norway	77.13%	77.47%	76.59%	77.09%	77.08%	77.38%
UK	50.90%	50.55%	50.41%	50.26%	50.14%	50.09%
US GOM	35.14%	35.12%	40.24%	39.76%	43.16%	42.79%
Nigeria	47.64%	50.58%	50.23%	51.99%	54.87%	55.47%
Alberta-Oil Sands	49.76%	49.98%	49.81%	49.97%	50.01%	50.10%
Angola	51.17%	60.31%	59.41%	63.53%	72.15%	80.94%
Russia-Sakhalin	70.12%	59.47%	58.68%	69.84%	78.00%	79.51%
Azerbaijan	50.60%	45.56%	42.90%	53.99%	64.20%	73.44%

Table 9.15
Gov Take

	50MM $26 high	50MM $36 high	150MM $26 hign	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	9	6	7	5	43
Alaska PPT	3	4	6	7	6	6	32
Norway	9	10	10	10	10	9	56
UK	5	7	5	5	3	3	28
US GOM	1	1	1	1	1	1	6
Nigeria	2	2	3	4	5	4	20
Alberta-Oil Sands	4	5	4	3	2	2	20
Angola	7	6	7	8	8	8	44
Russia-Sakhalin	10	9	8	9	9	10	55
Azerbaijan	6	3	2	2	4	7	24

Table 9.16
Gov Take

	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	7	7	5	5	4	36	72
Alaska PPT	2	4	6	7	6	6	31	63
Norway	10	10	10	10	9	8	57	115
UK	6	5	5	3	3	2	24	52
US GOM	1	1	1	1	1	1	6	12
Nigeria	3	6	4	4	4	5	26	46
Alberta-Oil Sands	4	3	3	2	2	3	17	37
Angola	7	9	9	8	8	10	51	95
Russia-Sakhalin	9	8	8	9	10	9	53	108
Azerbaijan	5	2	2	6	7	7	29	53

9.6. Overall rating

It can be seen in comparing with the tables in Chapter 7 that that the Alaska PPT with a 25% tax rate and 20% tax credit rate strongly boosts the IRR and the EMV@10%. The NPV@10% is less strongly affected but the Alaska PPT still provides an improvement. The Government Take also shows a slight improvement on small fields.

Table 9.17 provides the overall ranking. Relative to a 20/15 system the 25/20 system improves the competitiveness index improves from 272 to 244.

This indicates that the improvement in competitiveness of the Alaska PPT with a 25% tax rate and 20% tax credit rate is more attractive to new and small investors than the option to have a 20% tax rate and 15% tax credit rate.

Table 9.17
Overall

	IRR Subtotal	NPV Subtotal	EMV Subtotal	GOV TAKE Subtotal	SUM TOTAL	Ranking
Alaska Current	100	96	88	79	363	#8
Alaska PPT	46	79	56	63	244	#5
Norway	91	109	87	115	402	#9
UK	32	30	25	52	139	#2
US GOM	15	12	15	12	54	#1
Nigeria	46	36	51	46	179	#4
Alberta-Oil Sands	41	42	43	37	163	#3
Angola	76	72	79	95	322	#6
Russia-Sakhalin	116	103	118	108	445	#10
Azerbaijan	97	81	98	53	329	#7

The following table summarizes the total competitiveness index from attractive to unattractive for new investors in Alaska.

Table 9.18
COMPETITIVENESS INDEX

Hypothetical best	**48**	
US GOM	**54**	**#1**
UK	**139**	**#2**
Alberta-Oil Sands	**163**	**#3**
Nigeria	**179**	**#4**
Alaska PPT	**244**	**#5**
Angola	**322**	**#6**
Azerbaijan	**329**	**#7**
Alaska Current	**363**	**#8**
Norway	**402**	**#9**
Russia-Sakhalin	**445**	**#10**
Hypothetical worst	**480**	

9.7. Tide water analysis

9.7.1. New Investors

An important issue is whether the 25% tax rate and 20% tax credit rate would be a reasonable system from an overall word wide government take point of view.

In order to analyze this matter it is important to "filter out" the low net back value of the Alaska crude oil.

This can be done by taking the transport costs of $ 5 per barrel and converting this to an equivalent government take. At $ 40 per barrel there is really no difference between an extra 12.5% royalty on tide water or the lower net back. In other words it is possible to analyze Alaska by simply not deducting the $ 5 transport charge, but instead assuming that the royalty is 25%. Based on this high royalty, the overall government take can then easily be compared with other countries. In other words it is the same as placing the Alaska North Slope in Texas and assuming a 25% royalty.

The following table displays these "tide water" government takes for the high cost scenarios.

Table 9.19.
Undiscounted Government Take on "tide water" basis of the 25% tax and 20% tax credit system
High Cost Scenarios (with low and high well productivities)

	50MM-LOW	150MM-LOW	500MM-LOW	50MM-HIGH	150MM-HIGH	500MM-HIGH
$22.00	65.57%	65.25%	68.32%	62.77%	63.59%	67.52%
$24.00	63.37%	64.95%	68.09%	61.60%	63.72%	67.41%
$26.00	62.01%	64.90%	67.94%	60.78%	63.90%	67.32%
$28.00	61.08%	64.92%	67.82%	60.18%	64.02%	67.26%
$30.00	60.40%	64.92%	67.73%	60.04%	64.14%	67.23%
$32.00	60.00%	64.94%	67.66%	60.11%	64.28%	67.21%
$34.00	59.92%	65.00%	67.59%	60.24%	64.42%	67.18%
$36.00	60.07%	65.07%	67.54%	60.38%	64.57%	67.16%
$38.00	60.31%	65.15%	67.48%	60.54%	64.72%	67.15%
$40.00	60.58%	65.26%	67.42%	60.72%	64.86%	67.13%

The table shows how the overall government take would range from about 60% to 67%. This is a world average government take. The table shows how the government take would be rather progressive with field size for a new investor. This is primarily due to the tax free allowance of $ 73 million and the tax credits. Otherwise the government take is relatively flat with price, because the progressive PPT compensates for the regressive royalties and property taxes.

A very important question is whether the Alaska resource base is sufficiently attractive to have a 60 – 67% government take. It is therefore interesting to search for jurisdictions with similar government takes. The Van Meurs Corporation rating of 2001 can be used in this respect. A search of this data base indicates that the following jurisdictions would have a government take in this range for approximately a $ 30 price level:

- Denmark
- Albania
- Azerbaijan, some onshore PSC's
- Newfoundland offshore
- British Columbia onshore
- Nova Scotia offshore
- Trinidad and Tobago
- Guatemala
- Peru
- Jordan
- Egypt Deep Water
- Nigeria, about 500 m water depth
- Cote d'Ivoire
- Cambodia
- Joint Development Area between Thailand and Malaysia
- Thailand offshore
- Nepal
- Bangladesh
- Timor Gap (joint offshore area between Australia and East Timor)

It would be difficult to argue that all or most of the above areas would have more attractive petroleum resource conditions than Alaska in terms of costs, oil field sizes or exploratory risk. In fact it can be easily seen that most areas would have less attractive resource conditions.

Therefore, Alaska would compete very well with these areas on the basis of a "tide water" government take of 60% - 67%.

In summary the overall Federal and Alaska government take that results from a PPT with a 25% tax rate, a 20% tax credit rate and a 73 million tax free allowance would clearly be attractive to new and small investors.

9.7.2. New Investors

The following table shows the same results for large producers which cannot benefit on an incremental basis from the tax free allowance.

Table 9.20.
Undiscounted Government Take on a "tide water" basis of the 25% tax and 20% tax credit system
High Cost Scenarios (with low and high well productivities)
Undiscounted Government Take

	50MM-LOW	150MM-LOW	500MM-LOW	50MM-HIGH	150MM-HIGH	500MM-HIGH
$22.00	79.29%	74.47%	71.92%	74.41%	71.42%	70.47%
$24.00	76.39%	73.16%	71.19%	73.08%	70.79%	70.03%
$26.00	74.60%	72.23%	70.64%	72.15%	70.32%	69.69%
$28.00	73.37%	71.55%	70.22%	71.47%	69.95%	69.42%
$30.00	72.49%	71.02%	69.88%	70.94%	69.65%	69.20%
$32.00	71.81%	70.60%	69.61%	70.52%	69.40%	69.01%
$34.00	71.29%	70.25%	69.38%	70.18%	69.20%	68.85%
$36.00	70.86%	69.97%	69.19%	69.90%	69.03%	68.71%
$38.00	70.51%	69.73%	69.03%	69.67%	68.88%	68.59%
$40.00	70.22%	69.52%	68.88%	69.47%	68.75%	68.49%

As can be seen, the "tide water" government take would range from about 68% to 75%.

The following jurisdictions would be in this range:

- Albania onshore
- Turkmenistan
- Azerbaijan, some onshore PSC's
- Alberta Conventional Oil
- Newfoundland – Hibernia
- Venezuela Heavy Oil (prior to the recently imposed increased take)
- Trinidad and Tobago
- Egypt Onshore
- Egypt Gulf of Suez
- Syria

- Yemen, revised PSC terms
- Equatorial Guinea
- Cameroon
- Congo – offshore
- Namibia
- Nigeria – shallow water
- Indonesia – general frontier terms
- Vietnam
- China offshore
- Thailand onshore
- Myanmar
- India

Most of these jurisdictions would have a resource attractiveness that is less than Alaska. Therefore, Alaska seems very well competitive with these areas.

9.7.3. Conclusion

It can be concluded that the 25% tax rate and 20% credit rate would be competitive from an international point of view and the overall government take would be similar to countries that have an equal or lesser resource quality. Therefore this is a fair and reasonable system.

10. ANALYSIS OF POSSIBLE HEAVY OIL INCENTIVES

10.1. Introduction

Heavy oils and viscous medium gravity oils play an important role in the future of Alaska. These resources are relatively expensive and in some cases not economic.

The potential of these oils is very considerable. The following table displays the two broad types of heavy oils that are available on the North Slope.

Table 10.1

	"West Sak"	"Ugnu"
Gravity (API)	14 - 26	8 - 15
Viscosity	"Olive Oil"	"Molasses"
Oil in Place (billion bbls)	6 - 12	16-24
Recoverable	10% - 25%	4% - 8%
Recoverable Oil (billion bbls)	1 - 3	0.5 - 2
Current Fields	West Sak, Orion Polaris, Milne Schrader	none

For simplicity the heavy oils will be grouped as "West Sak" and "Ugnu". The West Sak group stands for a variety of heavy oils from different fields and reservoirs. Ugnu is largely from the Ugnu reservoir. The Ugnu reservoir is typically shallower than the West Sak Group of reservoirs.

In the Alaska Arctic shallow reservoirs are relatively cold, which in turn creates problems with viscosity. Therefore, in general, the shallower the reservoirs are, the more viscous the oil is and the more difficult the oil is to produce.

Apart from the heavy oils, there is relatively viscous medium gravity oil present in some fields, such as the Polaris field. Similar reservoirs will for simplicity called "Polaris" type crudes.

Heavy oils are difficult to produce because of their viscosity.

The importance of these resources to Alaska can not be under-estimated as can be seen from the large possible recoverable resource estimates. It is not impossible that over the next three decades as much as 4 billion barrels will be produced.

Because of the high costs to produce heavy oils and the large potential resource base on the North Slope it is important to evaluate whether special incentives relative to the terms proposed in Chapter 9 might result in an accelerated development.

Therefore, special incentives were analyzed in terms of lower tax rates and/or lower tax credit rates.

The special incentives were analyzed separately for "West Sak" and "Ugnu" reservoirs.

10.2. Net back value

An important reason why heavy oils are less attractive to produce is because these crude oils sell for a lower price in the market.

Some of the Kern River heavy crude oils of California have a gravity of 14 degrees API. Currently, these crude oils sell at about $ 10 to $ 12 less than WTI crude.

It should be noted, however, that this quality differential is sensitive to the oil prices. Typically, when the WTI price goes down the quality differential becomes less. Heavy oils produce large volumes of heavy fuel oil or so-called bunker fuel. This is fuel used for marine transportation, for heating in industrial processes as well as power generation. At low oil prices, heavy fuel oil becomes more competitive with other energy sources, such as coal and gas. This reduces the quality differential. It is difficult to make exact estimates of this.

However, the following table illustrates the assumptions that were made about the quality plus transport differential differentials between WTI and the well head values at the North Slope for heavy oils.

The average gravity for West Sak was assumed to be 19 degrees API and for Ugnu it was assumed 14 degrees API.

Table 10.2
WELL HEAD VALUES

WTI	West Sak Diff	West Sak Well head	Ugnu Diff	Ugnu Well head
$20.00	$9.00	**$11.00**	$10.00	**$10.00**
$25.00	$9.00	**$16.00**	$11.00	**$14.00**
$30.00	$10.00	**$20.00**	$12.00	**$18.00**
$35.00	$10.00	**$25.00**	$12.00	**$23.00**
$40.00	$10.00	**$30.00**	$13.00	**$27.00**
$45.00	$11.00	**$34.00**	$13.00	**$32.00**
$50.00	$11.00	**$39.00**	$13.00	**$37.00**
$55.00	$11.00	**$44.00**	$14.00	**$41.00**
$60.00	$12.00	**$48.00**	$14.00	**$46.00**
$65.00	$12.00	**$53.00**	$15.00	**$50.00**
$70.00	$12.00	**$58.00**	$15.00	**$55.00**
$75.00	$12.00	**$63.00**	$15.00	**$60.00**

10.3. Field and cost assumptions

In order to do economic analysis certain assumptions were made about the fields and the costs.

A 100 million barrel field was assumed, which would be developed with an equal number of water injectors and producers. The wells would be horizontal multilateral wells. At initial maximum production the the number of producers was assumed to be 17 for West Sak and 34 for Ugnu. The total number of wells was assumed to be 32 and 64.

A relatively aggressive production and abandonment program was assumed with a total field life of 23 years.

Each producers and injector was assumed to be $ 5 million. In addition facilities costs were assumed. This brings the total capital expenditure costs to $ 8 per barrel for West Sak and $ 12 per barrel for Ugnu.

The following table provides the overview of these assumptions.

Table 10.3
Technical and Economic Assumptions

	West Sak	Ugnu
Field size (million barrels)	100	100
Maximum production (bopd)	16,500	16,500
Producers at maximum production	17	34
Injectors at maximum production	17	34
Maximum producers	32	64
Maximum injectors	32	64
Total wells at abandonment	30	60
Duration of production (years)	23	23
Costs per producer and injector ($ million)	5	5
Exploration ($ million)	30	30
Total well costs ($ million)	320	640
Total facilities costs ($ million)	450	530
Total Capex per barrel	8	12
Total Opex per barrel	6	7

Based on all these data it is possible to calculate WTI break even prices for the various North Slope crude oils. For information a typical Prudhoe Bay and Polaris were also included. Quality differentials were based on the above table on the basis of $ 40 per barrel WTI for simplicity.

Table 10.4 shows these break even prices for new investments with respect to four different types of crudes on the North Slope.

Table 10.4
BREAK EVEN WTI PRICE

	Prudhoe Bay	"Polaris"	"West Sak"	"Ugnu"
API		23	19	14
WTI quality diff	$2.00	$3.00	$5.00	$8.00
Transport	$5.00	$5.00	$5.00	$5.00
Capital Costs	$4.00	$6.00	$8.00	$12.00
Operating Costs	$3.00	$4.00	$6.00	$7.00
Subtotal	$14.00	$18.00	$24.00	$32.00
Property tax	$0.50	$0.50	$0.50	$0.50
Royalty (12.5%)	$16.57	$21.14	$28.00	$37.14

These break even prices show that the economics of the Polaris, West Sak and Ugnu type crudes is primarily determined by the oil price projections and cost assumptions.

If long term oil price projections of the major and large oil companies shift upwards and further technological developments shift the costs downward than heavy oils of the West Sak and even Ugnu types may come in economic range.

The economics are only modestly affected by fiscal terms. No matter what fiscal incentives are provided, under current conditions of typical long term price forecasts Ugnu developments are uneconomic.

To a lesser degree the same is true for West Sak. With respect to "West Sak" much, however, depends on the detailed circumstances.

The developments of Polaris, Orion and Milne Schrader are economic under current conditions, as is evidenced by the investments that are being made in these fields by the major oil companies. It should be noted that these developments are typically taking place in deeper and therefore "warmer" reservoirs which are less viscous. Also the crude oils are lighter than for the West Sake economics to be discussed below.

An important aspect is that the current field developments are taking place in areas where oil production is already taking place and where therefore facilities costs are less because existing facilities can be used. All that is required is some upgrades of these facilities.

However, it is important to stimulate small possible independent developments outside the area which is currently controlled by the major oil companies. Therefore, the West Sak and Ugnu economics will be studied on the basis that new facilities will be required.

10.4. Fiscal incentives

In principle, fiscal incentives could be provided by offering a lower tax rate and higher tax credit rate for heavy oils.

The economic analysis of heavy oil economics is based on large producer economics, which means without taking into account the $ 73 million tax free allowance.

In order to evaluate fiscal incentives two different alternative fiscal packages were evaluated:

- a 20% tax rate with a 25% tax credit, and
- a 15% tax rate with a 25% tax credit.

It should be noted that under the Current System, the ELF would be essentially 0. This is due to the small field size. Despite the relatively attractive well productivities at maximum production, the small field size creates a very high exponent which brings the ELF to near 0.

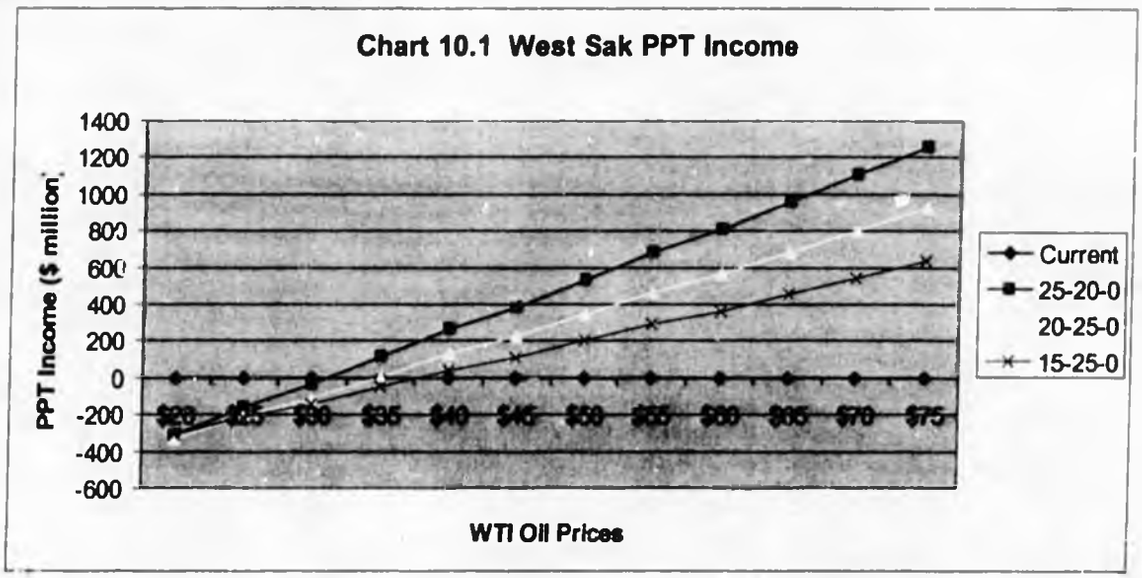
10.5. West Sak economics

Chart 10.1 indicates how the PPT would vary considerably with the fiscal terms.

At a WTI of $ 20, the project would run a severe loss and therefore the investor would be able to recover 45% of this loss under the systems with a 25% tax rate and 20% tax credit rate or 20% tax rate and a 25% tax credit rate.

With a 15% tax and a 25% tax credit, the recovery would be 40%.

The results of the loss carry forward credits and the tax credits is that the PPT would be negative. For the three fiscal systems it would be about $ 300 million negative. This means that the investor can trade his tax credits to other producers. It should be noted that under such low prices, all producers will have a negative PPT and therefore the tax credits can not be taken against PPT payable. In Chapter 11 the DOR results will be presented which illustrate that the PPT credits are really capped by this mechanism.



Of course, under such low prices, investors would not invest further in heavy oil and therefore, it is unlikely that many fields would create such a loss. Only fields for which the development was started under much higher long term oil price predictions would be caught in this situation.

All three fiscal options provide therefore considerable downside price protection for heavy oil projects and will therefore be a significant stimulus for such developments. From an Alaska perspective, the 25/20 system would have a WTI cross over point of $ 32 per barrel. The other two fiscal options would have higher cross over points: the 20/25 system would have a $ 35 per barrel cross over and the 15/25 system a $ 38 cross over.

Under high prices, the government revenues are substantially more for the 25/20 options as can be expected. The 20/25 and 15/25 options do not seem to provide a reasonable balance between downside and upside from a government perspective. The downside price risk to government of being faced with a negative PPT is not adequately compensated by the upside benefits of a high PPT in case of high prices.

This matter can be studied in more detail in Chart 10.2, which displays the overall Alaska income (State and municipalities). This chart shows at about $ 23 per barrel the total government take from the project becomes negative. As explained before, this risk would only related to heavy oil projects that were started under high oil forecast but would then be faced with low prices.

The graph clearly shows that under downside conditions the State of Alaska would provide very considerable price support and therefore a significant reward to Alaska is also reasonable in case prices are high. Therefore the 25/20 system is the best. It provides strong downside risk protection for heavy oil projects, but at the same time rewards Alaska with significant revenues if prices are high.

Chart 10.3 shows how all fiscal options result in a very considerable improvement of the IRR for all price levels. This constitutes major support for heavy oil developments. Under the current system a nominal IRR of 15% would be obtained under a WTI price of $ 42 per barrel. Under any of the PPT proposals this price level shifts down to $ 37 per barrel.

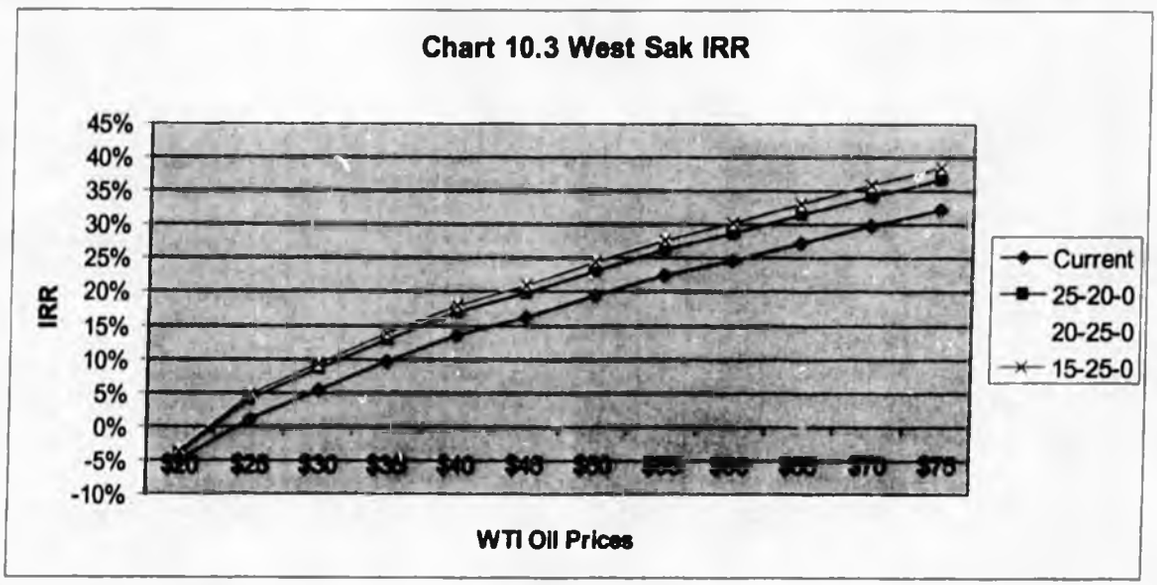
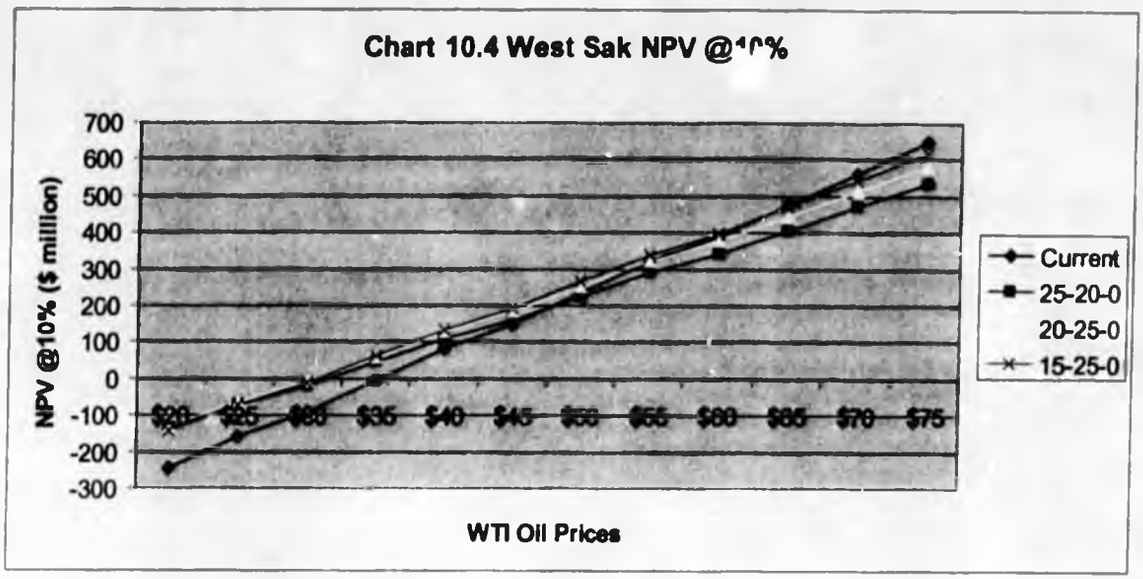


Chart 10.4 shows how the NPV@10% would also improve the economics of the heavy oil projects considerably in the current long term price forecast range of major and large oil companies of $ 25 to $ 35 per barrel. The break even point at an NPV@10% of zero is shifted down from $ 35 to $ 30 per barrel.



At about $ 50 per barrel the NPV@10% values are about the same for the Current system and the three PPT alternatives. At high prices the higher tax rate of 25% starts to "bite" and therefore the NPV becomes less for the 25/20 system. However, the total NPV is extremely attractive at these price levels and therefore the progressive nature of the 25/20 system does not affect in a serious negative way investment decisions.

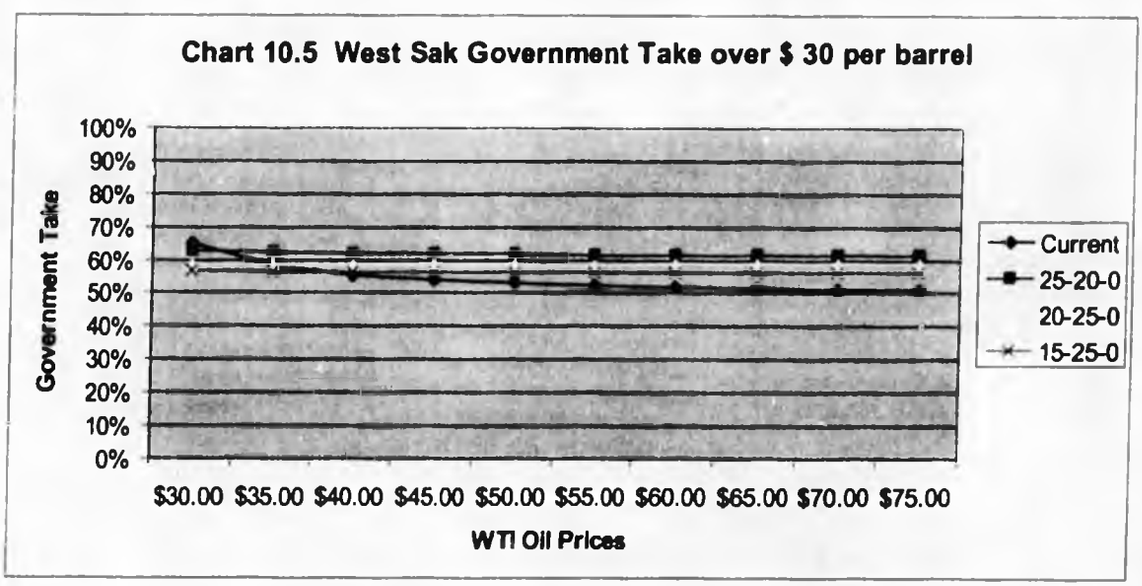


Chart 10.5 illustrates the overall combined government take of Alaska and the Federal Government. The progressive nature of the PPT turns the current regressive system of Alaska in a neutral system. The regressive royalties and property taxes are balanced by the progressive PPT. Therefore the PPT creates an overall flat government take over $ 30 per barrel. This is the price level at which the project has a positive NPV@10%.

Obviously, the 25/20 results in the highest government take and the 15/25 system in the lowest.

Conclusion. The fiscal proposal of a 25% tax rate and a 20% credit rate will provide a strong stimulus for heavy oil developments through the considerable downside price risk protection this system provides and the significant improvement in IRR and NPV@10% under current long term price projections. There is no need for further incentives. Such incentives would unreasonably lower the revenues of Alaska for no significant added benefit in economic stimulus.

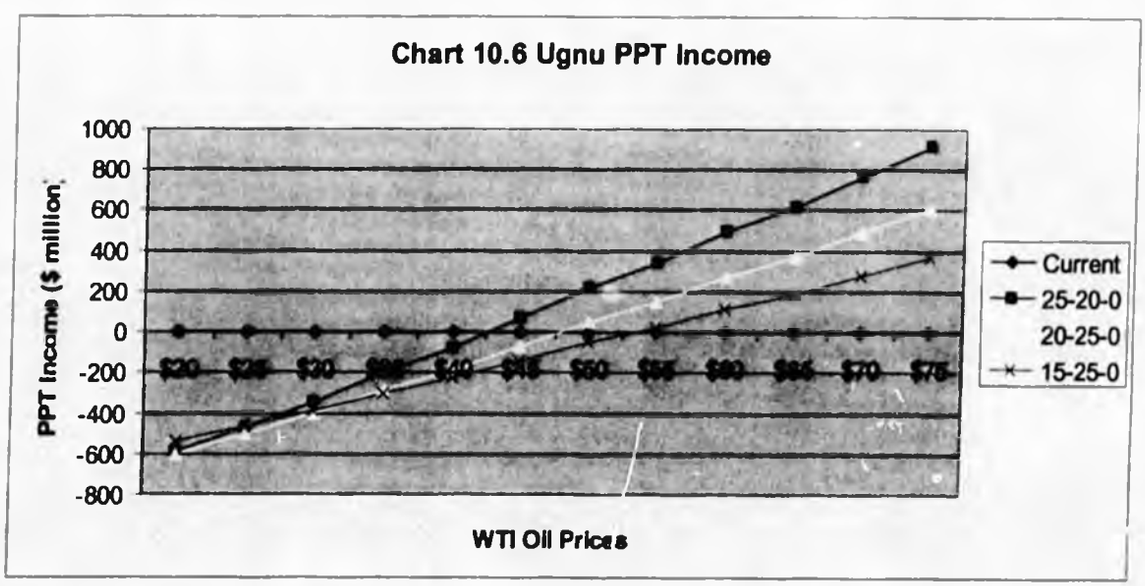
10.6. Ugnu economics

As was discussed earlier, the Ugnu reservoirs are currently uneconomic. In order to become economic perceptions of long term oil prices have to shift upward and further technology has to shift the development costs downward.

Therefore, the following economic analysis does not represent conditions that could occur today.

However, if in the future prices shift up and costs shift down, it would represent a case where despite these developments, the oil price would crash and the investor would incur significant cost overruns.

The following tables provide the overview of the economics.



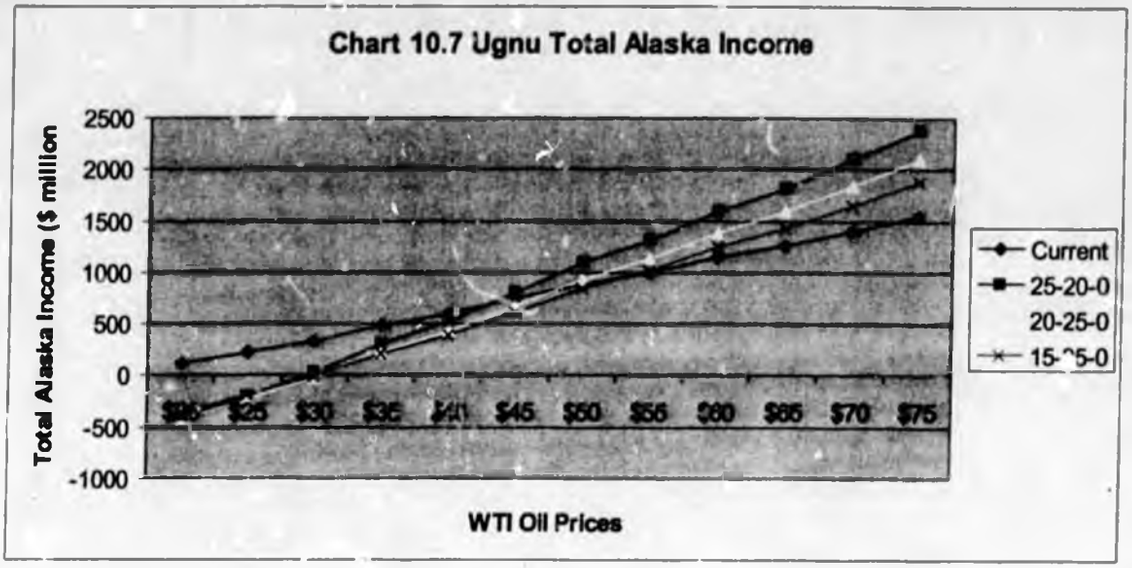


Chart 10.7 Ugnu Total Alaska Income
Total Alaska Income ($ million
2500
2000
1500
1000
500
0
-500
-1000
$25
$30
$45
$50
$55
$70
$75
WTI Oil Prices
Current
25-20-0
20-25-0
15-^5-0

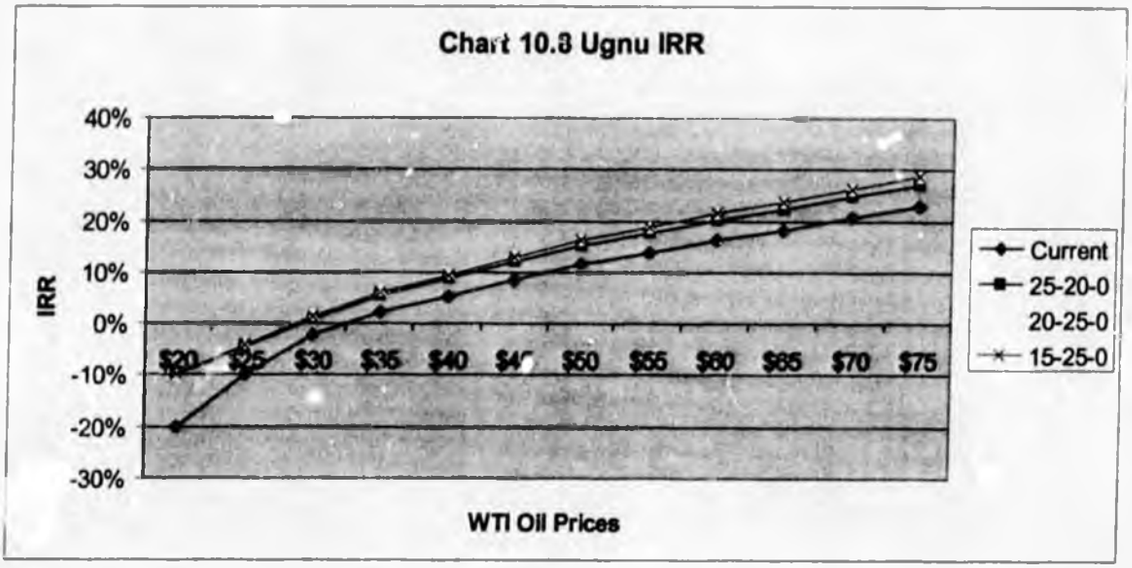
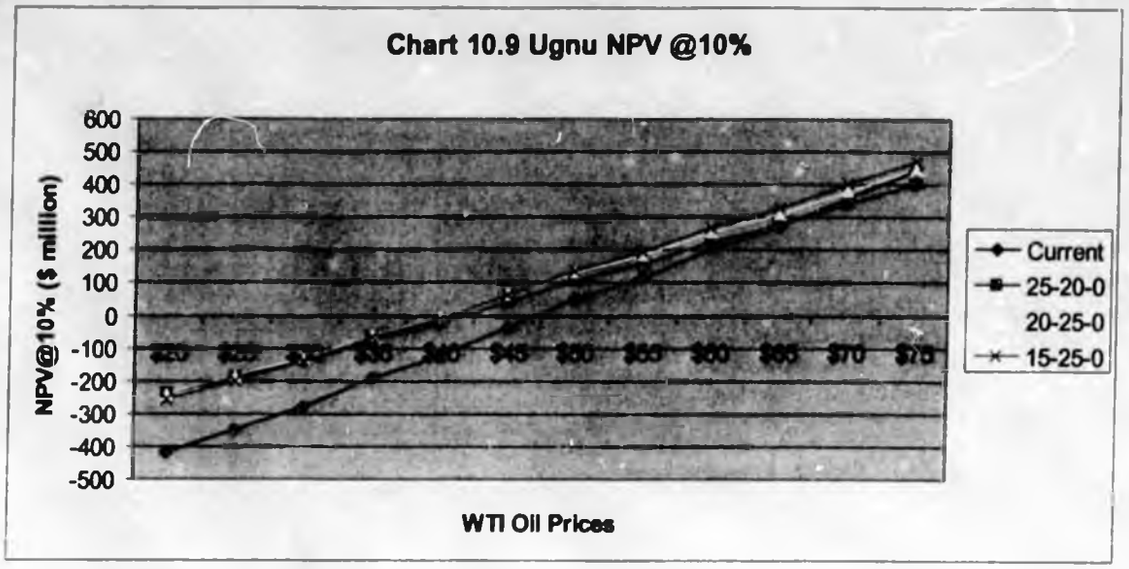
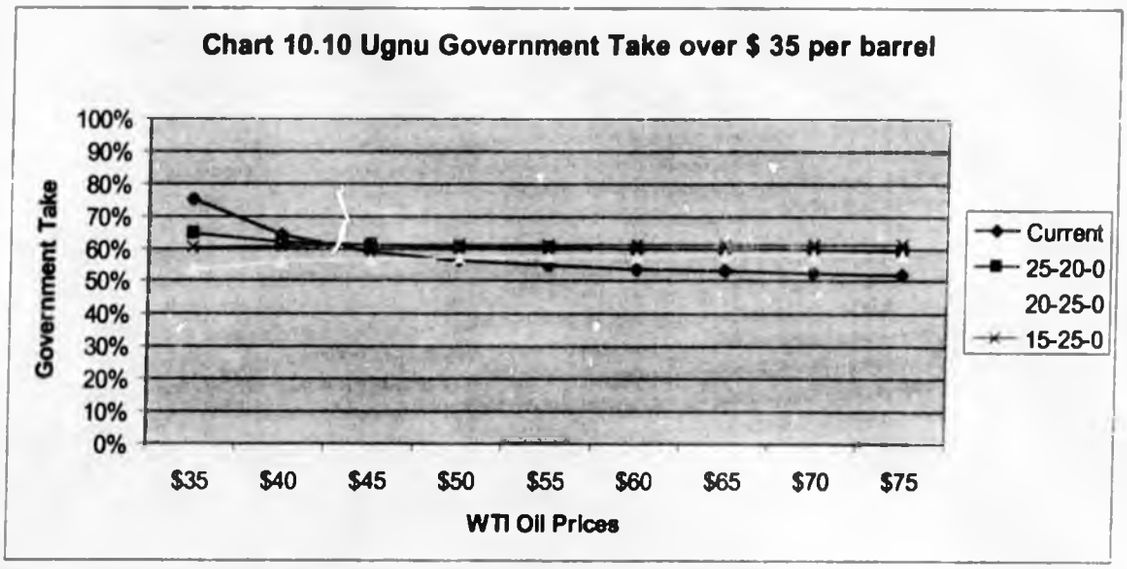


Chart 10.8 Ugnu IRR
IRR
40%
30%
20%
10%
0%
-10%
-20%
-30%
$20
$25
$30
$35
$40
$50
$55
$60
$65
$70
$75
WTI Oil Prices
Current
25-20-0
20-25-0
15-25-0





As can be seen from the above graphs, the results are very similar as the West Sak economics.

However, as can be expected the downside price protection is even stronger. The State would be rather exposed under low prices and cost overruns.

Despite the PPT, Ugnu developments remain clearly uneconomic and therefore such developments cannot be expected.

However, the PPT would bring the day closer that Ugnu developments may take place and it might also encourage the development of some small pilot projects in order to evaluate whether costs can be reduced with new technology.

Even more than for West Sak, the higher government take under the 25/20 system under high prices seems justified.

11. REVIEW OF THE RECOMMENDED PROFIT SHARING PRODUCTION TAX

11.1. Description of recommended profit sharing production tax

It may be useful to provide a review of the economics of the recommended profit sharing production tax ("PPT").

The PPT would have the following features:

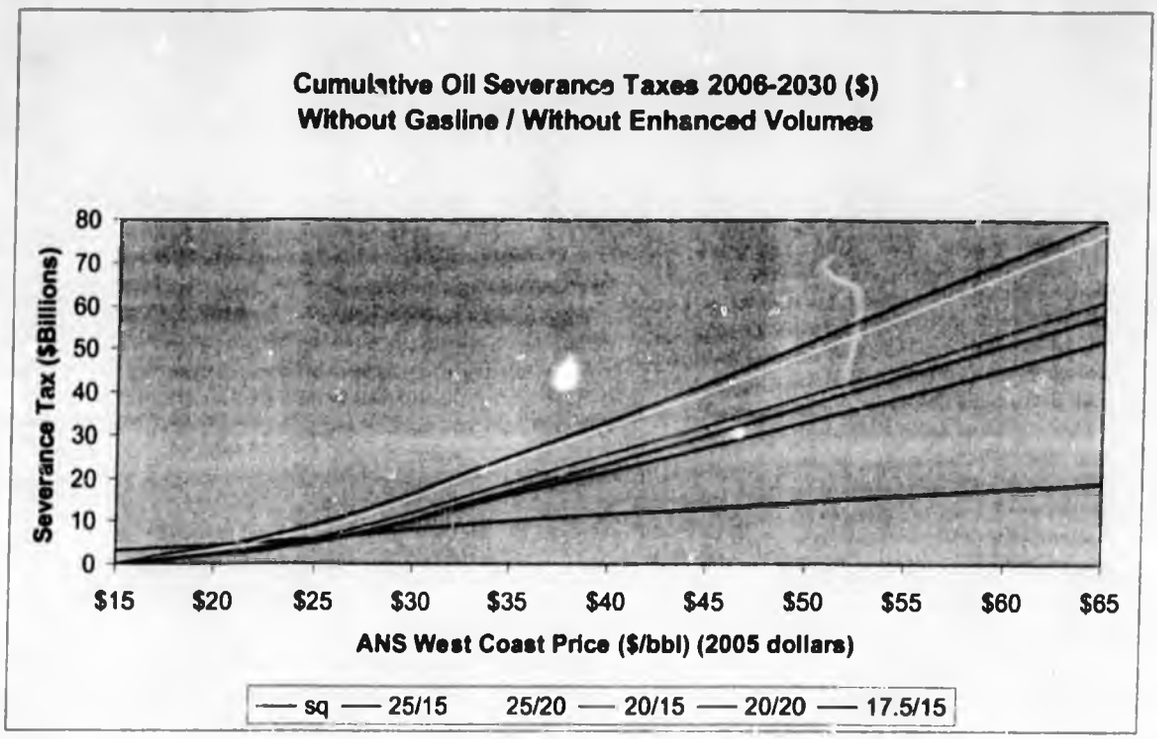
- The tax would be a monthly tax on net revenues. The net revenues will be determined as the gross revenues at the point of production less lease expenditures and exploration costs. Capital expenditures can be fully deducted in the year these costs are incurred.
- The PPT will be a consolidated tax on all net revenues of the corporation with respect to Alaska petroleum production and exploration.
- The tax rate will be 25%.
- Losses can be carried forward indefinitely, but the tax payer can obtain a certificate for a tax credit for 25% of the amount of the loss. Such certificates can be traded. This means that 25% of the loss can be recovered in the year following the year in which the expenditures were incurred.
- Furthermore, there will be a tax credit of 20% on all qualified capital expenditures. These are typically all expenditures which are capital for IRS purposes, intangible drilling expenditures and exploration expenditures, including geological and geophysical costs.
- Up to $ 73 million per year will be tax free. However, if the net revenues are less, the tax free amount is equal to the net revenues. This means that small producers will not pay tax.

11.2. Rationale for the selection of 25/20.

Various options were studied and selected. The selection of the 25% tax rate and 20% credit rate was largely based on the results of the DOR model, which indicated that the tax rate is the most important determinant of the Alaska government revenues. The tax credit rate is a lesser factor.

Following are some of the results of the study.

The following graph illustrates the cumulative revenues to the State from the production tax for a conservative scenario involving a remaining production of 5.8 billion barrels of oil for different price levels.



The graph illustrates how the 25/20 (25% tax and 20% tax credits) scenario generates considerably more revenues for the State than the 20/15 scenario. The tax credits play a relatively minor role in the reduction of the State revenues. It means that relative to the scenario of 20/15 which was the main focus of the earlier studies, the 25/20 scenario:

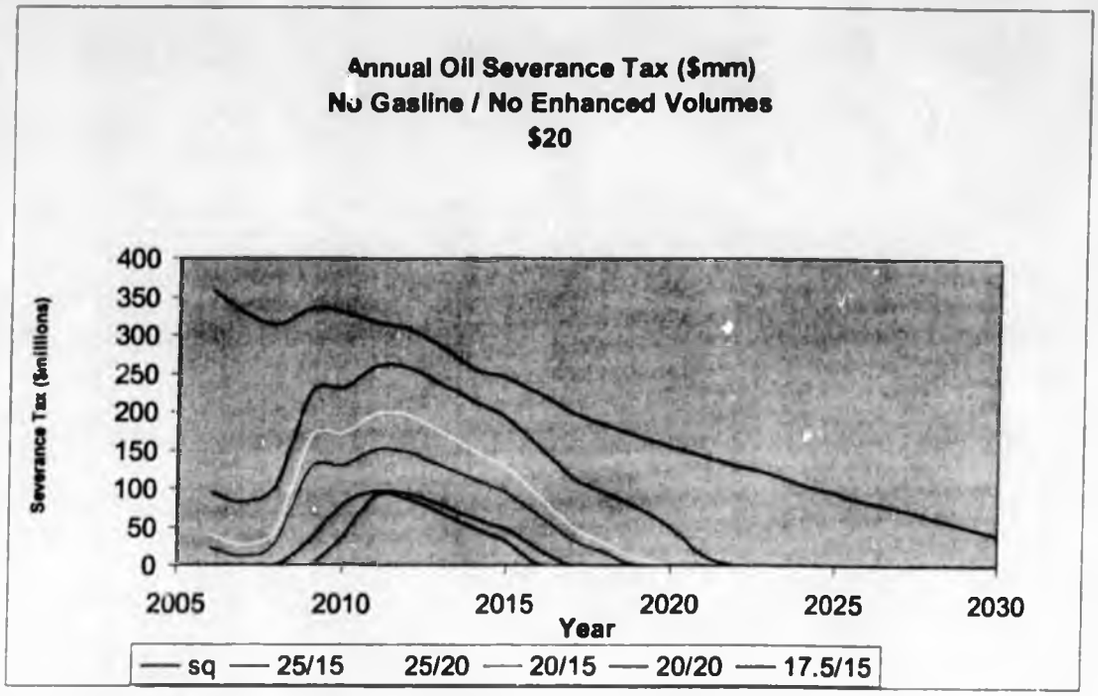
- Is a more progressive system
- Results in more revenues for the State
- Results in a stronger stimulus for re-investment
- Creates a better protection of marginal fields.

The stronger credits were a concern, since at low prices, it could lead to a more rapid erosion of the government revenues.

The following graph shows the year to year revenues under an ANS price of $ 20 per barrel.

The graph shows how for a tax rate of 25%, a tax credit of 20% compared to 15% indeed results in lower revenues. However, the entire revenues of Alaska would be very modest and therefore, even if extraordinary tax credits would occur as a result of major earlier investments, the exposure of the State to income loss is not more than a maximum of about $ 200 million per year around the year 2010. Compared with the billions that might result under high prices, this seems very much an acceptable exposure.

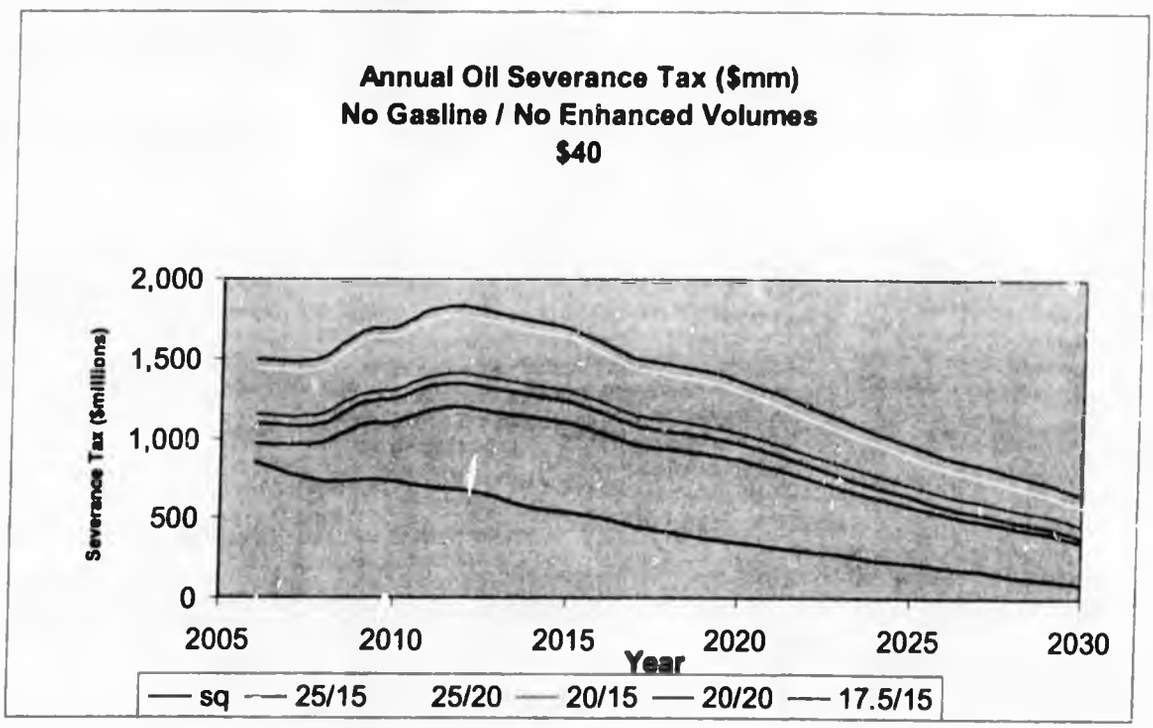
For this reason, the DOR study indicated that the income loss exposure as a result of higher than expected investment and low prices is modest. This resulted in the conclusion that a 25/20 combination is better for the State than the 20/15 combination.

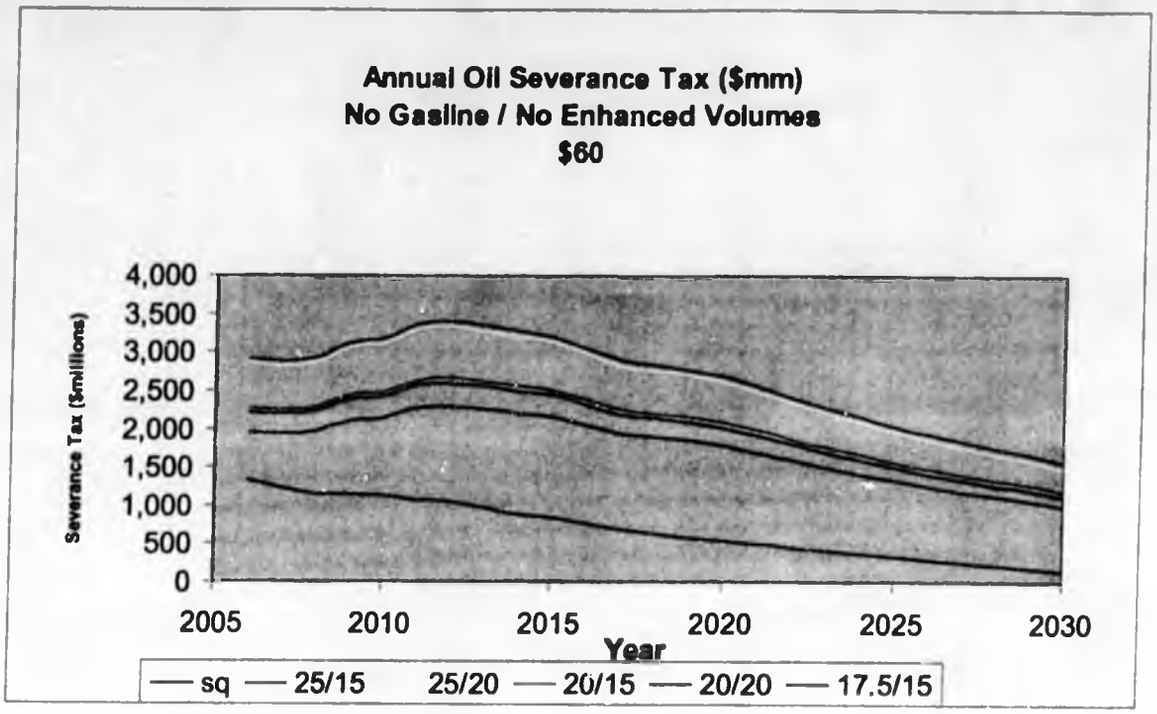


The "negative PPT's" which were identified in the previous chapters are really capped by the fact that the overall PPT will be low anyway under an ANS price of $ 20 per barrel and therefore these negative PPT cannot really be traded to a large extent under these conditions. Since PPT credits can only be taken against PPT payable this creates an automatic protection for Alaska.

Under low prices the royalties, property taxes and state corporate income tax remain unaffected.

Of course under high prices the income to the State of the new PPT is very considerable as can be seen from the following two graphs.





11.3. PPT income on new investments

11.3.1. Field size and price sensitivity

The following graphs show the PPT income for the 25-20-73 scenario and the 25-20-0 scenario. This means the 25% PPT with a 20% tax credit, with or without the $ 73 million tax free allowance. The scenario with the tax free allowance illustrates the economics of a first investor or small company. The scenario without the tax free allowance illustrates the economics of a large producing company.

Chart 11.1. Production Tax and PPT with credits for a 50 MM barrel field with low well productivities, high costs

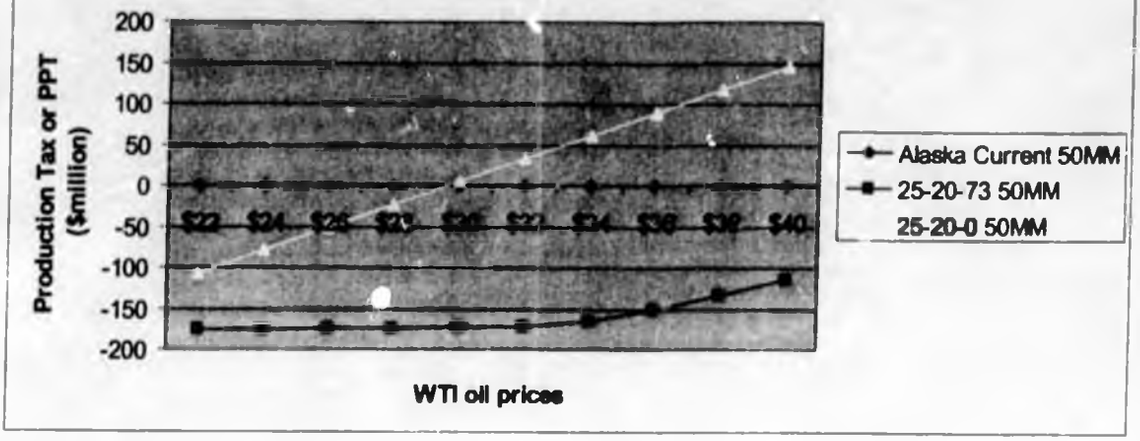
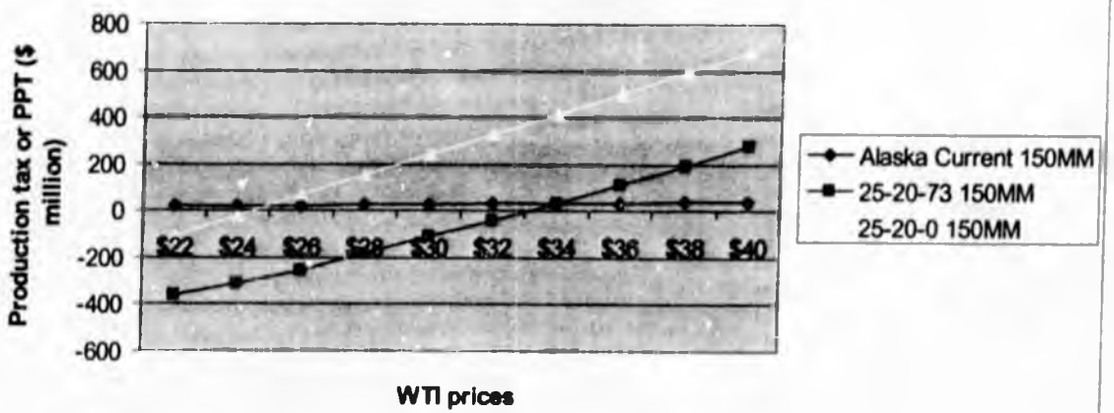
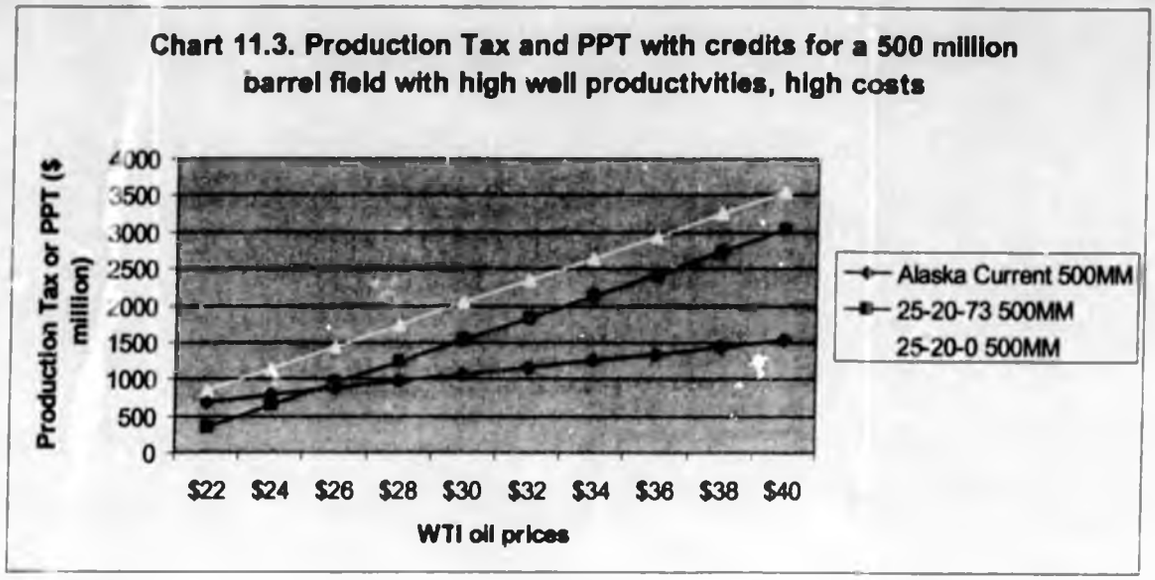


Chart 11.2. Production Tax and PPT with Credits for a 150 mm barrel field with low well productivities, high costs





The results of the charts are very similar to charts 4.1 through 4.3.

For first investors there will be tax credits, but no tax on a 50 million barrel field. On the 150 million and 500 million fields first investors will pay tax over $ 34 and $ 26 per barrel respectively. Below these levels the undiscounted value of the tax credits will exceed the tax payable and a "negative PPT" is created. The degree to which these negative PPT's can be traded depends on the availability of buyers for these credits.

The current large producers will have a zero PPT on a high cost 50 million barrel field at a WTI price of about $ 30 per barrel. Below this price there is a negative PPT because of the significant tax credits. These credits can be used against the PPT payable. Above this price there is a positive PPT.

For larger fields which were assumed to be less costly per barrel, the break even price is less.

11.3.2. Cost sensitivity

The following two charts show the same 150 million barrel field, but with lower costs.

As can be easily seen the WTI break even point shifts to lower levels as a result. In other words, the effect of lower costs is:

- A lower WTI break even price
- A higher tax
- A lesser probability for "negative PPT" and a higher probability for "positive PPT".

Chart 11.4. Production Tax and PPT with Credits for a 150 mm barrel field with low well productivities, average costs

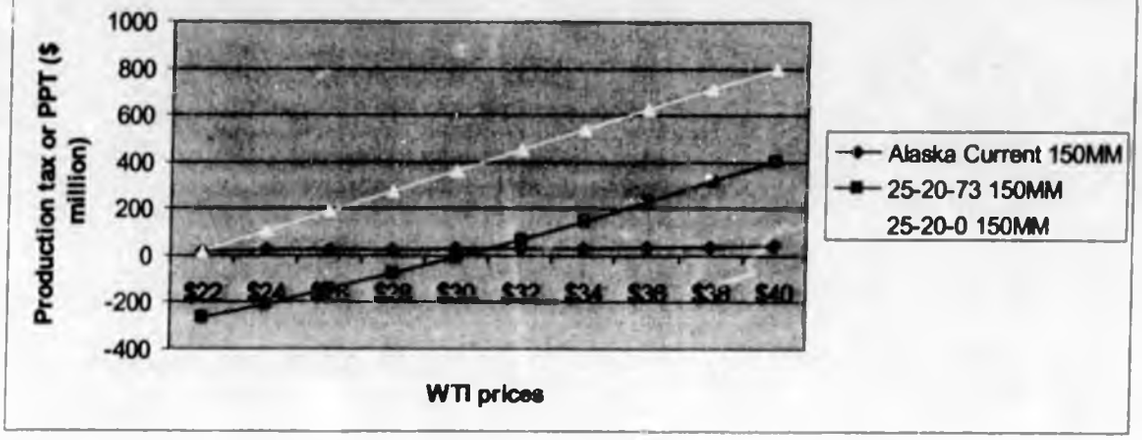
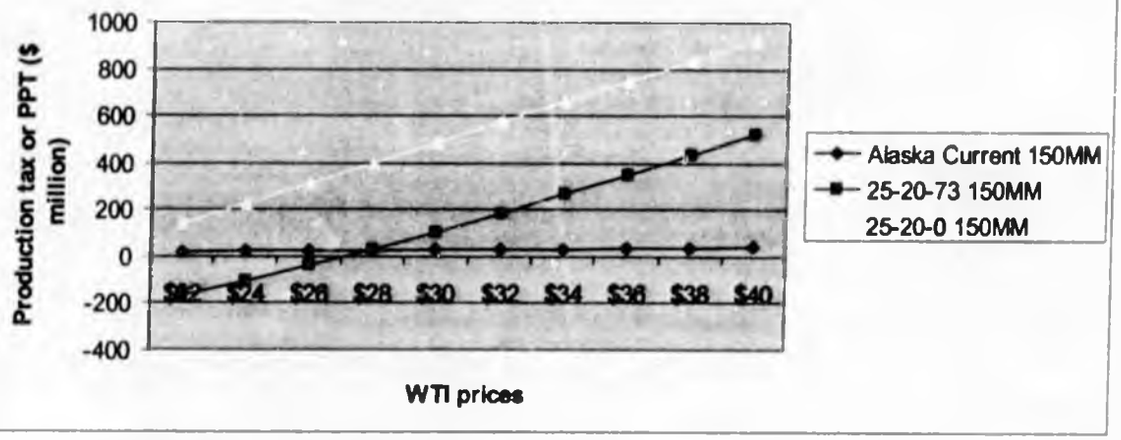


Chart 11.5. Production Tax and PPT with Credits for a 150 mm barrel field with low well productivities, low costs



11.3.3. Conclusion

As can be clearly seen from the information in this chapter so far, the PPT is primarily a tax on existing production in terms of additional revenues for the State under average or high prices.

With respect to production from fields as a result of new investments, the PPT modifies the overall corporate PPT payable either negative or positive. Under low prices and high costs, the PPT lowers the overall PPT payable, with a State wide "floor" of zero. Under high prices and low costs, the PPT increases the overall PPT payable.

11.4. Profitability of new investments

11.4.1. Profitability Indicators

The following graphs repeat the graphs shown in Chapter 4 for high cost conditions.

Charts 11.6, 11.9 and 11.12 show clearly that irrespective of field size, costs or prices, the PPT system improves the rate of return (IRR) of the investments considerably.

Charts 11.7, 11.10 and 11.13 show how the NPV@10% at low prices is always favorably affected by the PPT. At higher prices, the NPV is less attractive as a result of the higher tax rate, but the level of NPV is under these conditions very attractive in any case.

Charts 11.8, 11.11 and 11.14 show how the EMV@10% is more favorable over a wide low and average price range. This indicates that the PPT will stimulate exploration considerably.

Chart 11.6. IRR for 50 million barrel - low productivity case, high costs

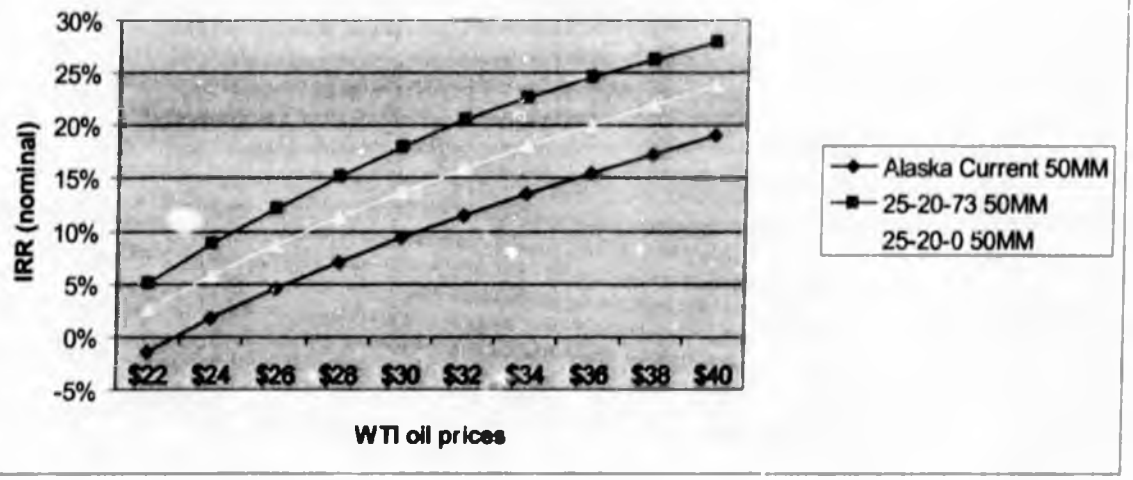


Chart 11.7. NPV @10% for a 50 million barrel field - low well productivity, high costs

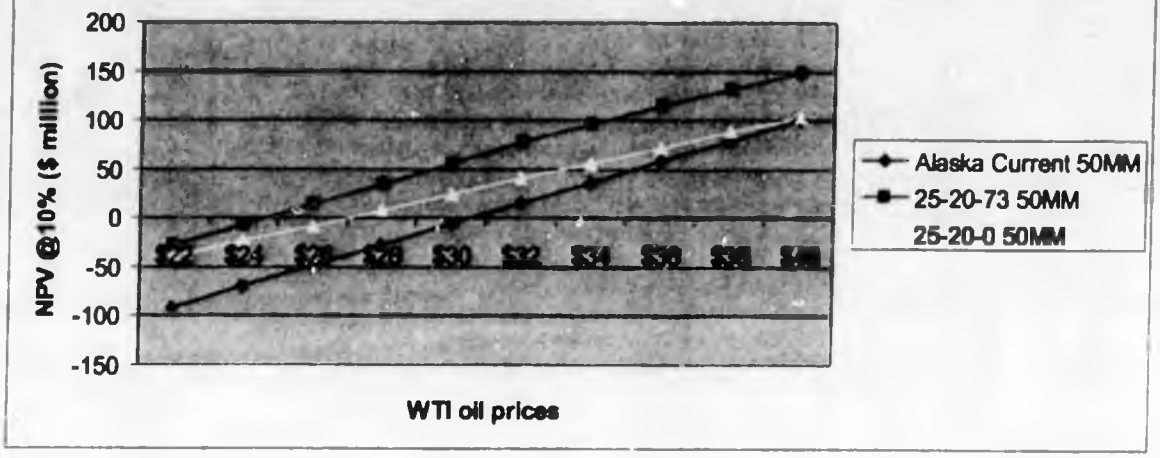


Chart 11.8. EMV @10% for a 50 million barrel field - low well productivity, high costs

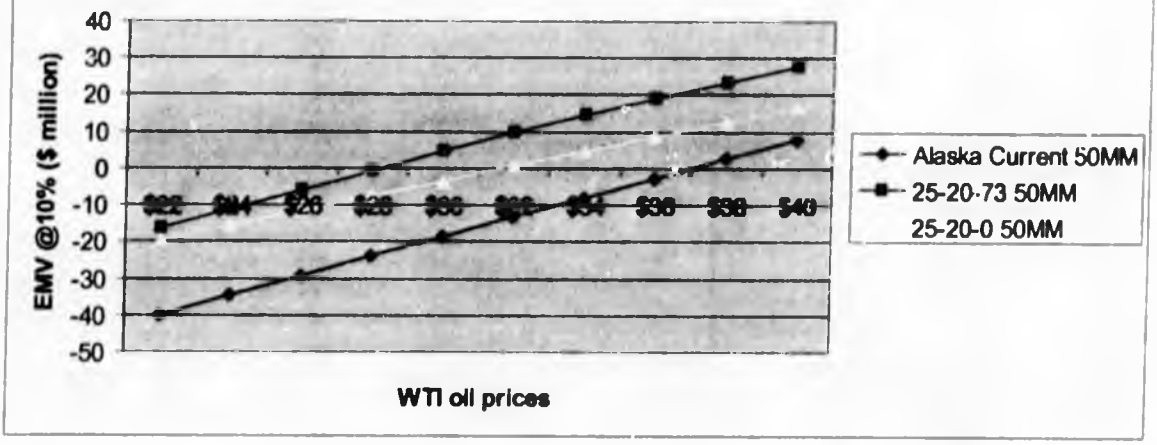


Chart 11.9. IRR for the 150 million barrel fields - low well productivity, high costs

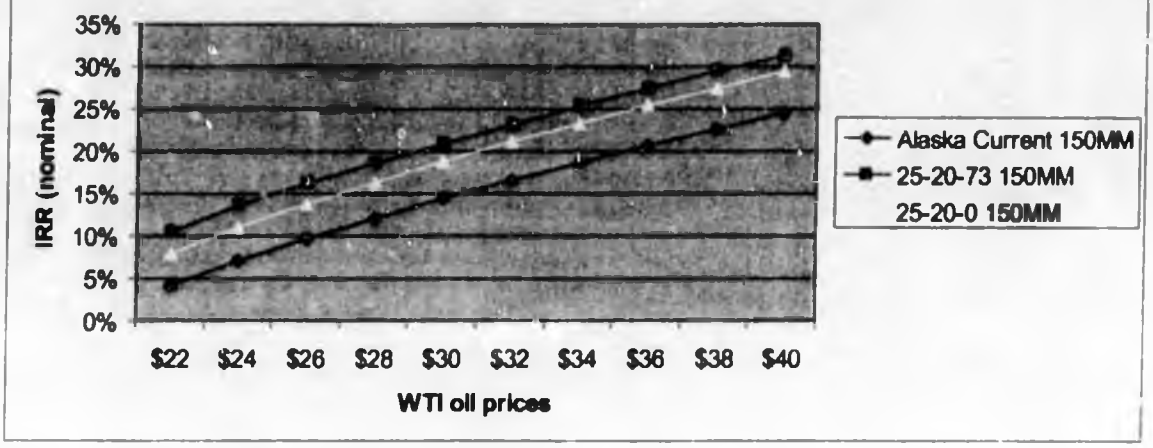


Chart 11.10 NPV @10% for a 150 million barrel field - low well productivity, high costs

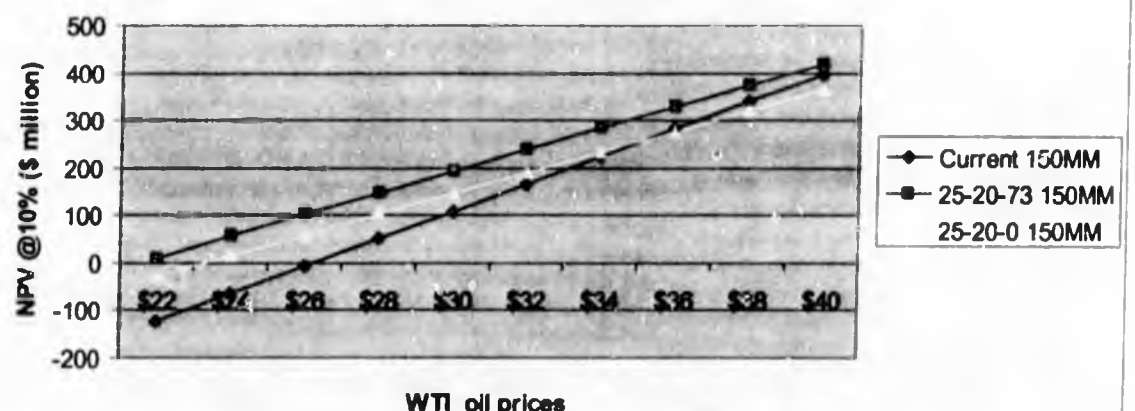


Chart 11.11. EMV @10% for a 150 million barrel field - low well productivities, high costs

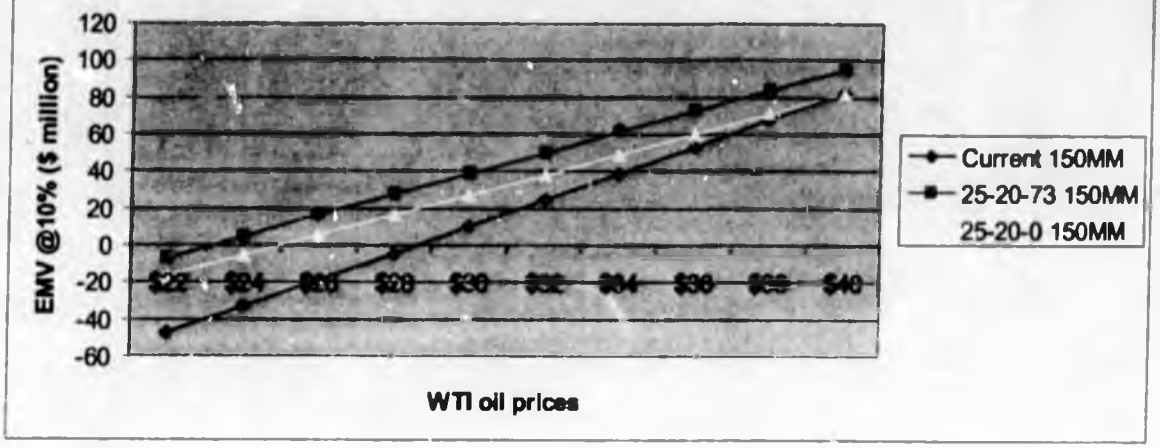
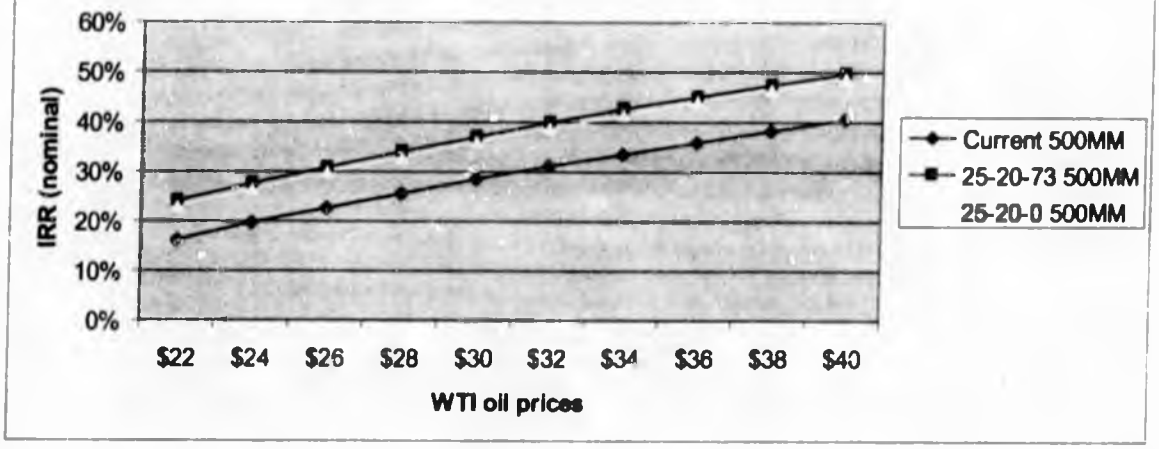
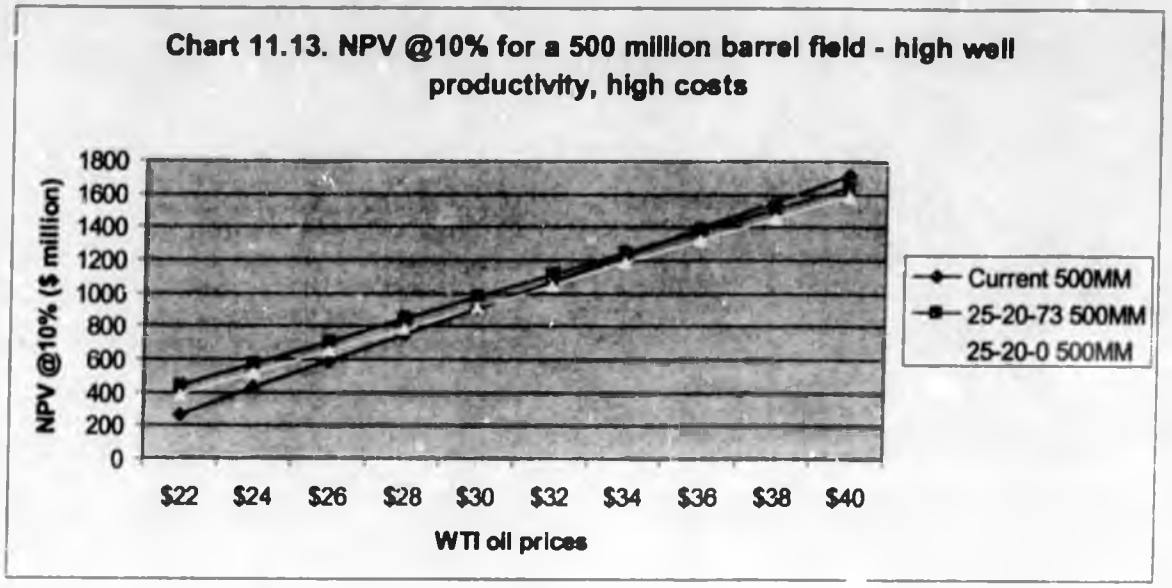
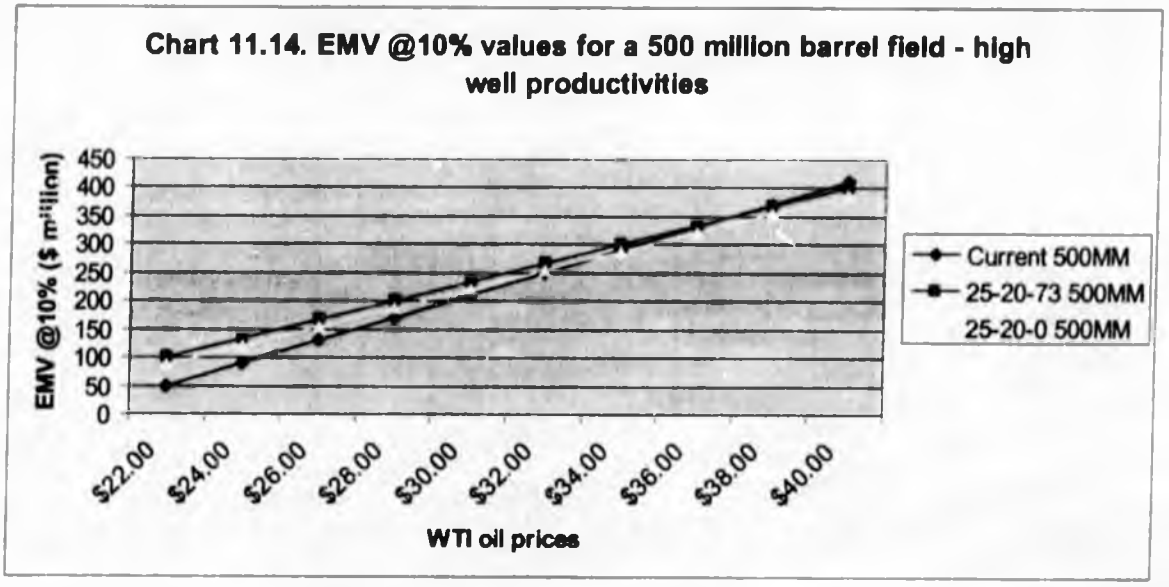


Chart 11.12. IRR of 500 million barrel - high productivity case, high costs







11.4.2. Government Take

The following three charts provide for the overall Federal and Alaska government take.

It can be seen how in all cases the current regressive system is converted to a neutral or even somewhat progressive system, whereby the regressive royalty and production tax are compensated by the progressive PPT.

The government take is typically less than the current system at low prices and for small and high cost fields and is more than the current system at high prices and low cost.

Chart 11.15. Overall Government Take for a 50 million barrel field with low well productivities

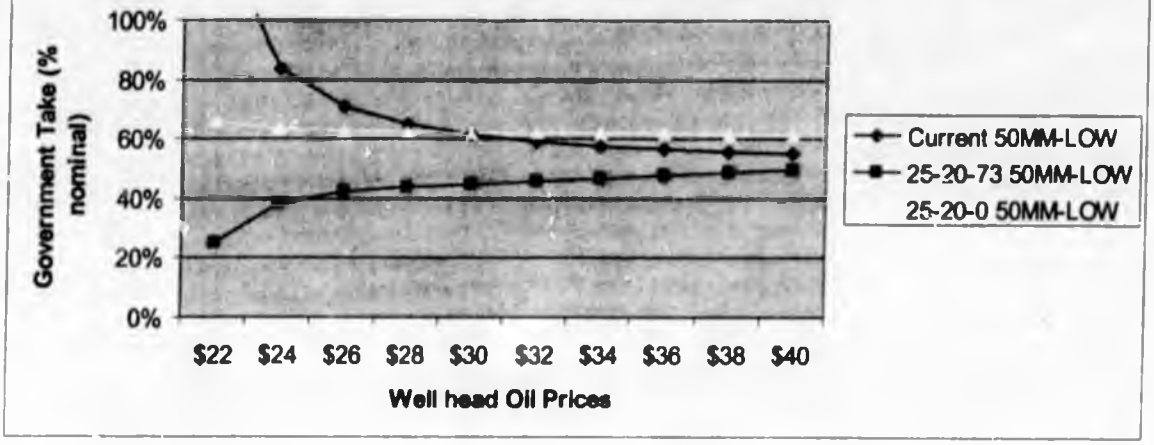
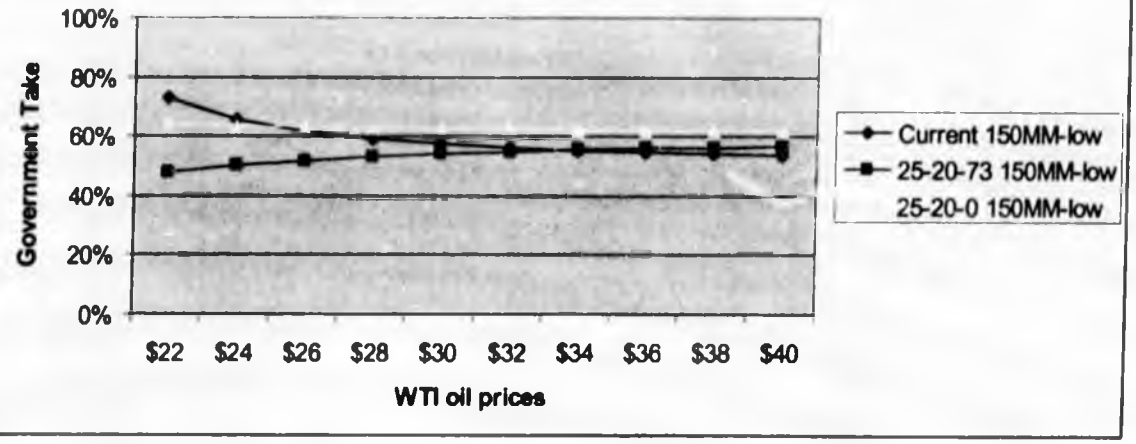
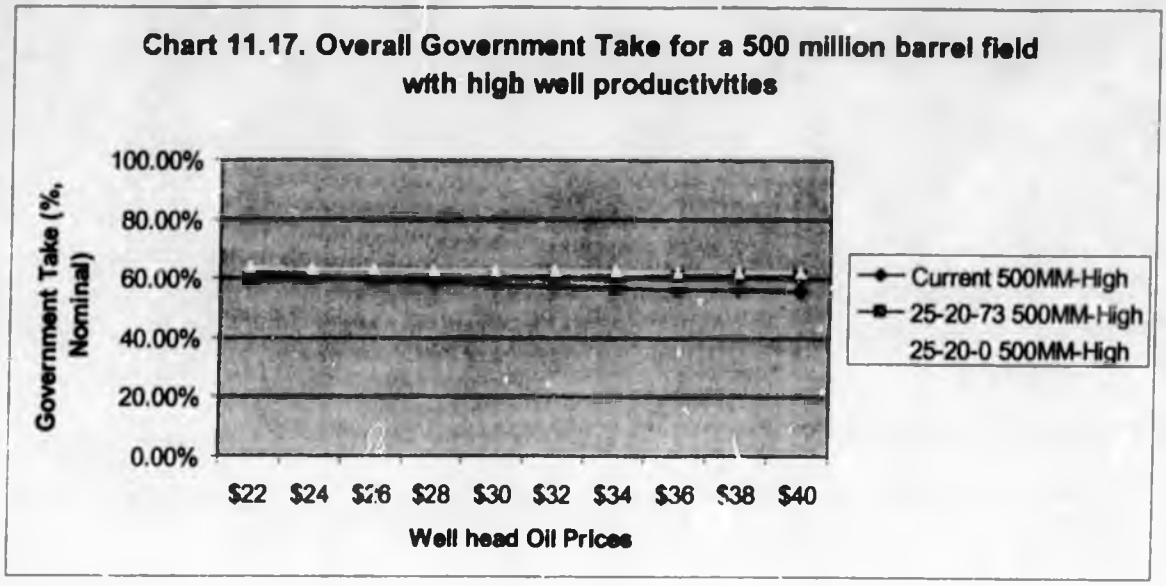


Chart 11.16. Overall government take for a 150 mm barrel field with low well productivities





11.4.3. Conclusion

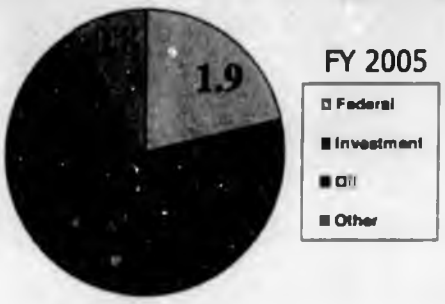
The recommended PPT system will strongly encourage new investment through a higher rate of return and a better overall project value at low or average prices. The system also strongly encourages exploration. The overall government take is either less or more depending on the price and cost conditions.

Proposed Production Tax

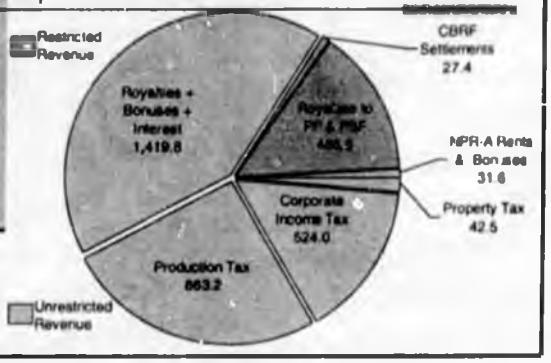
Alaska State Legislature
Senate & House of Representatives
Resources Committees

Dan E. Dickinson, CPA
February 22, 2006

Unrestricted & Restricted Revenue
$ 8.9 Billion



FY 2005 Petroleum Revenue
$ Million



Alaska Oil Production

ANS West Coast Price & Oil Production

Status Quo Issues

- Revenues
- Investment
- Production
- Revenues