ECOR 3800A – ASSIGNMENT 4 SOLUTION
DUE DATE: Tuesday, June 17, 2014 **TERM:** SUMMER 2014
TOTAL: **50 Marks**

QUESTION ONE (50 MARKS)

a) **Sample Calc (Alternative 1) (28 marks)**

Cost Basis: 2 100 000 + 30 000 = $2 130 000

CCA_1=0.5 * 0.3 * 2130000 = 319 500 (+2 for sample calc)

UCC_1 = 2 130 000 – 319 500 = 1 810 500 (+2 for sample calc)

Alternative 1			**Alternative 2**		
N	**CCA**	**UCC**	**N**	**CCA**	**UCC**
1	319500	1810500	1	157500	892500
2	543150	1267350	2	267750	624750
3	380205	887145	3	187425	437325
4	266143.5	621001.5	4	131197.5	306127.5
5	186300.5	434701.1	5	91838.25	214289.3
6	130410.3	304290.7	6	64286.78	150002.5
7	91287.22	213003.5	7	45000.74	105001.7
8	63901.05	149102.5	8	31500.52	73501.21

Sample Calcs (Alternative 1)

Taxable Income$_1$: 8 000 000 – 250 000 – 1 000 000 – 319 500 = 6 430 500 **(+1)**

Tax$_1$: 6 430 500 * 0.4 = 2 572 200 **(+1)**

Net Income$_1$: 6 430 500- 2 572 200 = 3 858 300 **(+1)**

After-Tax Cash Flow$_0$: -2 130 000 + 60 000 – 24 000 = -2 094 000 **(+1.5, if don't realize disposal tax effect, take off 0.5 marks; may have disposal tax after year one instead, mark correct)**

*Where 24 000 is the disposal tax effect (60 000 * 0.4)

After-Tax Cash Flow$_1$: 319500+3858300 = 4177800 **(may include disposal tax effect here instead of year 0, full marks above if this is the case)**

Disposal tax$_{8=}$ = (UCC-Salvage)*0.4 = (149102.5-160 000)0.4 = -4,359

After-Tax Cash Flow$_8$: 4011659 + 160000 + 63901.05 – 4359 = 4,231,201

Alternative 1

	Taxable income	Tax	Net Income	ATCF "base case"
0				-2 094 000
1	6430500	2572200	3858300	4177800
2	6206850	2482740	3724110	4267260
3	6369795	2547918	3821877	4202082
4	6483857	2593543	3890314	4156457
5	6563700	2625480	3938220	4124520
6	6619590	2647836	3971754	4102164
7	6658713	2663485	3995228	4086515
8	6686099	2674440	4011659	*4 231 201

*Note disposal tax effect on end salvage value = (UCC-Salvage)*0.4 = -4,359

(+0.5 for each ATCF (after tax cash flow) (total 4.5 marks), either given in a table or in the sample calculation when calculating NPW)

Tax shield adjustment for year 8= (UCC-Salvage)(0.4*0.3)/(0.15+0.3)) * (1+0.5*0.15)/(1+0.15) = 3366

Cash flow$_8$ = 3 341 100 + 31 501 + 60 000 + 3366 = 3435966

****If assuming books are closed, the tax refund**$_8$**:** (UCC-Salvage)*0.4 = (73501.21-60000)*0.4 =5400.5

Cash Flow$_8$ **Assuming books are closed:** 3 341 100 + 31 501 + 60 000 + 5400.5 = 3 438 001.5

Alternative 2

	Taxable income	Tax	Net Income	ATCF "base case"
0				-1014000
1	5442500	2177000	3265500	3423000
2	5332250	2132900	3199350	3467100
3	5412575	2165030	3247545	3434970
4	5468803	2187521	3281282	3412479
5	5508162	2203265	3304897	3396735
6	5535713	2214285	3321428	3385715
7	5554999	2222000	3333000	3378000
8	5568499	2227400	3341100	*3435966 or 3 438 001

*Note different ATCF value depending on whether it was assumed that books are closed or not.

MARR=15% (given in question), this is the market interest rate.

$NPW_{alternative1}$: -2 094 000+ 4 177 800 (P/F, 15, 1) + 4267260 (P/F,15,2) ……+ 4 231 201 (P/F, 15, 8) = $ 16 648 398.96 **(5 marks)**

NPW_{alt2}: $14 339 372 **(5 marks)**

Alternative 1 is the better alternative. (5 marks for final answer)

b) **(13 marks- 0.5 for each correct answer, +1 for sample calc)**

Deviation 10% Annual Sales: Above calculations with 8 000 000 * 1.1 used **(+1)**

The following table is the NPW with the % deviation of individual components.

Deviation / NPW	-30	-20	-10	0	10	20	30
Annual Sales	10,186,687	12,340,591	14,494,495	16,648,398	18,802,303	20,956,207	23,110,111
Labour Cost	16,850327	16,783,018	16,715,708	16,648,398	16,581,089	16,513,780	16,446,470
Annual O&M	17,456,113	17,186,875	16,917,637	16,648,398	16,379,161	16,109,923	15,840,685
MARR	19,775,942	18,646,560	17,607,050	16,648,398	15,762,975	14,934,488	14,786,862

The following table is the change of each component used to calculate the NPW in the above table

Deviation	-30	-20	-10	0	10	20	30
Annual	5,600,000	6,400,000	7,200,000	8,000,000	8,800,000	9,600,000	10,400,000

Sales							
Labour Cost	175,000	200,000	225,000	250,000	275,000	300,000	325,000
Annual O&M	700,000	800,000	900,000	1,000,000	1,100,000	1,200,000	1,300,000
MARR (%)	10.5	12	13.5	15	16.5	18	19.5

c) **(9 marks for graph)**