29. (LO7) To calculate the EAC of the project, we first need the NPV of the project. Notice that we include the NWC expenditure at the beginning of the project, and recover the NWC at the end of the project. The NPV of the project is:

NPV = –$240,000 – 20,000 – $32,000($PVIFA_{11\%,5}$) + $20,000/$1.11^5$ = –$366,399.68

Now we can find the EAC of the project. The EAC is:

EAC = –$366,399.68 / ($PVIFA_{11\%,5}$) = –$99,136.87

34. (LO5)
PVCCATS = $107,259.55
Annual after-tax savings = $205,000(1 – .35) = $133,250
There is an initial increase in inventory of $20,000, and in each year there is any additional cash outflow of $3,000 to finance inventory costs. At the end of the project, there is a recovery of the initial and annual outflows = $20,000 + 4($3,000) = $32,000.
NPV = -$530,000 – $20,000 + $107,259.55 + ($133,250 – $3,000)PVIFA(9%,4) + ($90,000 + $32,000)/$1.09^4$ = $65,660.94

Accept the project.

Intermediate

35. (LO2) CF_0 = -22,000,000 – 1,500,000 = -$23,500,000
ΔNWC= (15% × ΔSales) = – 15% (next period sales – current period sales)

	1	2	3	4	5
Sales	29,920,000	32,640,000	37,060,000	40,120,000	32,300,000
Variable costs	21,120,000	23,040,000	26,160,000	28,320,000	22,800,000
Fixed costs	850,000	850,000	850,000	850,000	850,000
Net profit	7,950,000	8,750,000	10,050,000	10,950,000	8,650,000
Taxes(35%)	2,782,500	3,062,500	3,517,500	3,832,500	3,027,500
Net profit after-tax	5,167,500	5,687,500	6,532,500	7,117,500	5,622,500
ΔNWC= (15% × ΔSales)	-408,000	-663,000	-459,000	1,173,000	1,857,000
NWC balance	-1,908,000	-2,571,000	-3,030,000	-1,857,000	0
Cash flow = Net profit after-tax + (ΔNWC) or NWC recovered	4,759,500	5,024,500	6,073,500	8,290,500	7,479,500
Salvage value (20%)					4,400,000
Total cash flow	4,759,500	5,024,500	6,073,500	8,290,500	11,879,500
PV(t = 0)	4,033,475	3,608,518	3,696,520	4,276,148	5,192,639

PVCCATS = $3,389,244.04
NPV = -$23,500,000 + $3,389,244 + $4,033,475 + $3,608,518 + $3,696,520 + $4,276,148 + $5,192,639
= $696,542
The project should be accepted because NPV is positive.

36. (LO6) New excavator costs=\$650,000 but SV_0=\$40,000; Therefore, ΔCF_0 = \$610,000. ΔOperating revenues =\$70,000 and ΔSV_{10}=105,000 – 5,000=\$100,000.

$$\text{PV of CCATS} = \frac{650{,}000(.25)(.35)}{.13 + .25} \times \frac{(1 + .5(.13))}{1 + .13} - \frac{105{,}000(.25)(.35)}{.13 + .25} \times \frac{1}{(1.13)^{10}}$$

$$= \$133{,}939.21$$

NPV = 70,000(1 – .35) x PVIFA (13%, 10) + 100,000 x PVIF (1312001200iOd%, 10) + 133,939.21 – 610,000
= -\$198,234.94

Do not replace the existing excavator.