ENGR 301/4 - Assignment 2 - Solution

Question 2-1

- Typical cost excluding the additional cost due to poor site conditions in Vancouver

  $50 million - $3 million = $ 47 million

a. Adjustment for capacity based on the exponential law yields

Factor is: $(50/60)^{0.67} = (0.833)^{0.67} = 0.885$ Answer 0.90 is closest

$(\$47)(50/60)^{0.67} = (47)(0.833)^{0.67} = \$41.596$ million

- Adjustment for inflation leads to the cost in 2006 dollars as

  $(\$41.596)(1.04)^{6} = \$52.632$ million

b. Adjustment for location index gives

Factor is: 1.24/1.17 = 1.06 Answer 1.07 is closest

($52.632)(1.24/1.17) = $55.781 million

- Adjustment for the additional filter at Ureka plant gives

  $55.781 million + $4 million = $59.781 million

c. Taking into account the increase in cost due to construction in winter conditions gives the following order of magnitude estimate of the water treatment in Ureka

($59.781)(1+0.12) = $66.955 million Answer $65 million is closest

Question 2-2 solution

Project Earned Value Analysis	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Average	Closest	Q
Budget at Completion (BAC)	$1,230	$1,230	$1,230	$1,230	$1,400	$1,400	$1,400	$1,400	$1,400	$1,400	XXX		
Earned Value (EV)	$100	$200	$300	$450	$750	$800	$1,125	$1,200	$1,400	$1,400	XXX		
Actual Cost (AC)	$100	$205	$315	$600	$800	$1,000	$1,200	$1,350	$1,475	$1,525	XXX		
Planned Value (PV)	$100	$220	$325	$550	$725	$925	$1,175	$1,275	$1,450	$1,500	XXX		
Cost Variance (CV)	$0	-$5	-$15	-$150	-$50	-$200	-$75	-$150	-$75	-$125	-$84.50	-$83	2a
Schedule Variance (SV)	$0	-$20	-$25	-$100	$25	-$125	-$50	-$75	-$50	-$100	-$52.00	-$50	2b
Cost Performance Index (CPI)	1.000	0.976	0.952	0.750	0.938	0.800	0.938	0.889	0.949	0.918	0.911	0.91	2c
Schedule Performance Index (SPI)	1.000	0.909	0.923	0.818	1.034	0.865	0.957	0.941	0.966	0.933	0.935	0.93	2d
Estimate to Completion (ETC)	$1,130	$1,056	$977	$1,040	$693	$750	$293	$225	$0	$0	$616.39	$615	2e
Estimate at Completion (EAC)	$1,230	$1,261	$1,292	$1,640	$1,493	$1,750	$1,493	$1,575	$1,475	$1,525	$1,473.39	$1,450	2f
Variance at Completion (VAC)	$0	-$31	-$62	-$410	-$93	-$350	-$93	-$175	-$75	-$125	-$141.39	-$140	2g