

## Case: The Earthilizer Proposal

CSM, Inc., is considering an investment in a project that requires an initial investment of \$580,000 to produce and market a new organic fertilizer made from dairy farm waste. The product, Earthilizer, has been developed by CSM's agricultural division over the past three years in response to two factors:

- First, there is a growing demand from organic farmers.
- Second, dairy farmers face increasingly more restrictive environmental rules regarding the disposal of cattle manure. In combination, CSM's management feels that these forces of change present a very promising investment opportunity.

CSM has tested the product extensively as a liquid fertilizer replacement for the more expensive and conventional chemical fertilizers that farmers and ranchers have used since the Second World War. The product will be marketed in a concentrated form, with one gallon of Earthilizer producing about 100 gallons of usable fertilizer.

Not only is the product wholly organic, but it is also cheaper to use than chemical fertilizers. Traditional chemical fertilizers are made from petroleum and cost approximately \$25 an acre for grass and hay production; Earthilizer utilizes dairy waste and cost less than \$20 per application, with no more applications required over the growing season.

CSM's analysts estimate that an initial investment of \$580,000 will put the Earthilizer project in place. This investment is comprised of \$250,000 in working capital plus \$330,000 in plant and equipment.

## Estimating Earthilizer's Project Free Cash Flows (PFCFs)

If the project is approved, the agricultural division of CSM plans to begin construction on the new facilities immediately. The manufacture and distribution of Earthilizer will be "up and running" by the end of 2007, with the project's first year of revenues in 2008. Table 3-1 contains a set of financial projections for the project. These consist of pro forma income statements (Panel a), balance sheets (Panel b), and cash flows (Panel c) spanning the five years used by CSM to evaluate the investment. Of course, if the project is successful, it could operate for many years. However, it is standard practice among many firms to select an arbitrary investment life and analyze the investment as if it will be shut down at the end of that period.

CSM, Inc., is a very conservatively financed firm that finances all its investments out of internally generated cash flows (i.e., the firm does not borrow to obtain funds for new investments). Consequently, the project is all-equity-financed, as evidenced by the fact that there is no interest expense in the income statements (Panel a of Table 3-1), nor is there any debt financing in the pro forma balance sheets for the project (Panel b).

Panel c of Table 3-1 details management's estimates of project free cash flows. Note that CSM's

management expects the project to be cash flow positive in 2008, which is the first year of operations, and every year thereafter.

The cash flow calculations for 2008 to 2012 are based on a number of key estimates and assumptions:

- These estimates assume that the project will require an initial investment of \$580,000 at the end of 2007, which includes \$250,000 in net working capital and \$330,000 in property, plant, and equipment.
- Sales revenues are expected to be \$1,000,000 in 2008 and are expected to grow at an annual rate of 10% throughout the five-year planning period (Panel a).
- Cost of goods sold is equal to 67.40% of sales, while operating expenses before depreciation are 10% of sales revenues plus a fixed component equal to \$115,000 per year (Panel a).
- The firm uses straight-line depreciation, where plant and equipment is assumed to have a 10-year life and a zero salvage value (Panels a and b).
- A 30% tax rate is used in the analysis (Panel a).
- For 2008 through 2012, the firm estimates that its net working capital requirements will equal 25% of Earthilizer's sales. CAPEX is assumed to be \$330,000 in 2007 and zero in all future years (Panel c).

CSM assumes that it will terminate the project in 2012, at which time it produces a terminal cash flow of \$692,050. This terminal cash flow is equal to the sum of NOPAT plus depreciation expense for 2012 (i.e.,  $\$128,020 + 33,000 = \$161,020$ ) plus the liquidating value (which is expected to equal the book value) of the firm's investment in net working capital (i.e., \$366,030 in Panel b) and the book value of plant and equipment at the end of 2012 (i.e., \$165,000 in Panel b).

Of course, the project may not operate for the full five years, or it may operate for more years. Our analysis follows industry practice, which "assumes" a termination date for the project and estimates the cash flows that would be realized from either liquidating or selling the business. To simplify the analysis of the Earthilizer investment, we assume that the terminal value for the Earthilizer assets is equal to their liquidation value (i.e., working capital plus net property, plant and equipment, PP&E), which we assume to be equal to their book value.

#### **Questions:**

### Assumption Summary

Sales Growth	10%
Initial Sales	\$ 1,000
COGS (% Sales)	67.4%
Operating Expenses (% Sales)	10.0%
Fixed Operating Expenses	\$ 115
Tax Rate	30%
Net WC	\$ 250
New WC required (% Sales)	25.00%
Net PPE (CAPEX)	\$ 330
Discount Rate	13.25%
Straight line Depreciation, 10 year life	
Multiplier	1.00

Panel a. Income Statement						
	2007	2008	2009	2010	2011	2012
Sales		1000	1100	1210	1331	1464.1
Cost of goods sold		-674	-741.4	-815.54	-897.094	-986.8
Gross profit		326	358.6	394.46	433.906	477.297
Operating expenses less depreciation		-215	-225	-236	-248.1	-261.41
Depreciation		-33	-33	-33	-33	-33
EBIT		78	100.6	125.46	152.806	182.887
Interest		0	0	0	0	0
EBT		78	100.6	125.46	152.806	182.887
Taxes		-23.4	-30.18	-37.638	-45.8418	-54.866
NI		54.6	70.42	87.822	106.9642	128.021
Panel b. Balance Sheet						
	2007	2008	2009	2010	2011	2012
Net working capital	250	250	275	302.5	332.75	366.025
Gross plant and equipment	330	330	330	330	330	330
Less: Accumulated Depreciation	0	-33	-66	-99	-132	-165
Net plant and equipment	330	297	264	231	198	165
Total	580	547	539	533.5	530.75	531.025
Panel c. PFCF						
	2007	2008	2009	2010	2011	2012
EBIT	0	78	100.6	125.46	152.806	182.887
Less: Taxes	0	-23.4	-30.18	-37.638	-45.8418	-54.866
NOPAT	0	54.6	70.42	87.822	106.9642	128.021
Plus: Depreciation expense	0	33	33	33	33	33
Less: CAPEX	-330	0	0	0	0	0
Less: Changes in net working capital	-250	0	-25	-27.5	-30.25	-33.275
Plus: Liquidation of net working capital	0	0	0	0	0	366.025
Plus: Liquidation of PPE	0	0	0	0	0	165
Equals: Project free cash flows	-580	87.6	78.42	93.322	109.7142	658.771

