World Resources Institute

Sustainable Enterprise Program
A program of the World Resources Institute

TEMPES CORPORATION
Teaching Note

For more than a decade, WRI's Sustainable Enterprise Program (SEP) has harnessed the power of business to create profitable solutions to environment and development challenges. BELL, a project of SEP, is focused on working with managers and academics to make companies more competitive by approaching social and environmental challenges as unmet market needs that provide business growth opportunities through entrepreneurship, innovation, and organizational change.

"The first step is to measure whatever can be easily measured. This is OK as far as it goes. The second step is to disregard that which can't be easily measured or give it an arbitrary quantitative value. This is artificial and misleading. The third step is to presume that what can't be measured easily really isn't important. This is blindness. The fourth step is to say that what can't be easily measured really doesn't exist. This is suicide."

--Daniel Yankelovich in *Corporate Priorities: A Continuing Study of the New Demands on Business*

The *Tempes Corporation* case describes a situation in which managers in a specialty products firm must analyze and choose between two re-designs of one of the firm's strategic product lines. One design offers an apparently higher return but is potentially environmentally harmful, while the other is not as attractive financially, at least at first examination, but is environmentally preferable. The challenge to the firm is to evaluate qualitative data and incorporate it into its decision-making.

This teaching note was prepared by Lawrence Molinaro, Jr., William Lovejoy, Associate Professor of Operations Management at the Stanford University Graduate School of Business and Christopher A. Cummings, as a basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation. It was subsequently revised by Kala Venugopal and Frederick Long. This teaching note was developed with support from the World Resources Institute.

The purpose of the exercise is to allow students to weigh the benefits and drawbacks of both designs. Students are made to confront a situation in which there are no clear answers. Design A is attractive because of its use of proven technology, yet its environmental risk is considerable. With regard to environmental factors, Design B appears to hold more appeal than Design A, yet B uses technology that is unproven, and is hence risky on the market.

Further investigations need to be made regarding both market considerations and environmental tradeoffs in order to make a sound business decision regarding the two design options. Students may conclude that there is insufficient information in the case to make final conclusions.

Teaching Objectives

- Perform a traditional cash flow analysis for the two design options.
- Identify environmental factors omitted from the initial analysis.
- Incorporate these risks and issues into Discounted Cash Flow (DCF) analysis, by constructing scenarios and using sensitivity analysis.
- Identify assumptions built into DCF analysis and distinguish the strengths and weaknesses of both approaches of analysis.

Teaching Plan

The case is divided into three parts. It can be used in a variety of ways, but was designed with the following plan in mind:

The (A) Case

Distribute the (A) case to students before the class session, and ask them to assemble the spreadsheet (singly or in small groups) and bring their printouts to class together with their design choice recommendations. Using the attached spreadsheets (Exhibits 1-2) to go over the calculations, make sure that students have used similar approaches. A show of hands and brief discussion should serve to bring everyone up to speed.

Approaches to Capital Budgeting:

Capital budgeting involves choosing among investment projects. DCF analysis is a tool for capital budgeting which allows comparison among diverse projects. It brings a stream of cash flows to a single point in time, incorporating the "time value of money," to allow comparison among diverse investment projects. There are choices available for analysis:

- Net Present Value (NPV)- Value of all future cash flows, in excess of the original investment, expressed in today's dollars; approach nets all cash outflows (payments) against the present value of expected cash inflows (receipts) using a discount rate or Alternative Opportunity Rate (AOR)
- Internal Rate of Return (IRR)- Discount rate at which the net present value of an investment equals zero; measures the maximum cost of capital that a project can bear; compares to a yield or hurdle rate

Go over the results for NPV, IRR, and payback period. Examples used incorporate 15% AOR (Exhibit 1) and 7% AOR (Exhibit 2). Highlight the role of discount rate and other assumptions (such as same level of risk) inherent in comparing these standard capital budgeting measures.

Trouble spots for students with little exposure to accounting include the incorporation of depreciation with after tax profit to generate the cash from operations figure, as well as the timing of capital investments (all in year zero) and all other costs and revenues (years 1 to 8).

The (B) Case

The (B) case can be distributed in class and the students put into small groups to brainstorm a list of factors likely to affect the product design choice. Exhibit 3 shows some of the more obvious factors students may identify. You can assemble a collective list on the board when debriefing the small group exercises -- no doubt the list you assemble will include factors we haven't included here. Note that it is easy to come up with a long list of items of varying importance and likelihood. Ask students for ideas on how to make sense of the list. How easy is it to prioritize items? Also ask students how each factor is likely to affect Tempes' net profit figures. Do students agree on the direction of likely impacts?

Role playing may enrich the case discussion here. Assign students roles as company president, *Water Moccasin* business manager, head of corporate legal staff, product design, plant operations manager, purchasing department, environmental compliance officer, and North American and international marketing managers. Have students playing each of these roles identify the most important environmental issue from the perspective of their position in the company. Discuss how these different perspectives might get resolved in real organizations.

The (C) Case

The (C) case is designed to close the loop by having students explore in more detail the effects of a few of the factors identified in the previous discussion. The first step is to narrow down the long list produced in the (B) case to a few key factors. This can either be done in class or as part of the students' assignment for the (C) case.

For an assignment, students go back to their original spreadsheets and test three scenarios or run three sets of sensitivity tests. Students can be asked to write up their rationale for specifying and interpreting their analysis. They must also choose between recommending Design A and Design B.

If used in class, the (C) case can be run with small group discussions. Distribute copies of the spreadsheet and have students think through how they would modify the original cash flow analysis. Even if students cannot recompute the cash flows, they can still come up with scenarios or sensitivity test strategies.

Exhibit 4 lists three scenarios and three plans for sensitivity analysis.

Case De-Brief

To conclude, ask students how useful the discussions and exercises in the (B) and (C) cases have been. A brief classroom discussion allows students to reflect on the challenges of incorporating environmental dimensions into standard financial measures like cash flow analysis. Systematic biases or barriers to evaluating environmental factors can be discussed, as well as the assumptions imbedded in NPV, IRR, and other measures. You should note that NPV does not capture certain factors, such as brand equity, reputation with communities, and welfare of employees.

Capital budgeting lessons may be summarized as follows:
1. Use DCF analysis and other sophisticated tools to compare diverse investment opportunities accurately.
2. Gather pertinent information about risks, including environmental risks, that are likely to impact value in the future.
3. Assess the financial value associated with these risks and the probability that such risks will occur.
4. Incorporate this information into NPV/IRR calculations; use sensitivity analysis, scenario analysis and AOR adjustments to improve investments choices.

There are many options to account for environmental risk in DCF Analysis:
-Quantify risk and incorporate directly into DCF.
-Adjust discount rate upward to reflect risk.
-Establish unacceptable risk and eliminate projects that cross threshold.
-Reassess investment options and redesign product.

Environmental risk management lessons may be summarized as follows:
1. Evaluate a wide range of potential environmental risks, such as regulatory change, reporting requirements, worker exposure, catastrophic spill, and consumer environmental preference.
2. Consider how alternative sources of value, such as corporate reputation and brand equity, could be affected by environmental risks.
3. Use Design for Environment (DFE) to manage environmental risks out of financial analysis.

It might be interesting to conclude by reflecting on the perspectives students have used in this exercise. All of the analysis has been from the point of view of Tempes' bottom line. How does one value environmental protection in and of itself? Are the only important factors those that affect Tempes' profit? This question provides an opening for a wider discussion addressing environmental externalities and market failures.

Exhibit 1

TEMPES CORPORATION: BASE CASE W/15% AOR
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design A	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	15,400	16,940	18,634	20,497	22,547	24,802	27,282
Sales Revenue		7,700,000	8,470,000	9,317,000	10,248,700	11,273,570	12,400,927	13,641,020	15,005,122
Variable Costs		3,829,000	4,211,900	4,633,090	5,096,399	5,606,039	6,166,643	6,783,307	7,461,638
Fixed Costs		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Gross Margin		3,771,000	4,158,100	4,583,910	5,052,301	5,567,531	6,134,284	6,757,713	7,443,484
SG&A		385,000	423,500	465,850	512,435	563,679	620,046	682,051	750,256
Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Profit before Tax		1,312,500	182,100	1,580,560	2,727,366	3,713,353	4,223,738	4,785,162	6,040,728
Taxes		446,250	61,914	537,390	927,304	1,262,540	1,436,071	1,626,955	2,053,847
Net Income		866,250	120,186	1,043,170	1,800,062	2,450,813	2,787,667	3,158,207	3,986,880
Add Back Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Operating Cash Flow	-14,500,000	2,939,750	3,672,686	3,580,670	3,612,562	3,741,313	4,078,167	4,448,707	4,639,380
Discount Factor	1.000	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327
Discounted Cash Flow	-14,500,000	2,556,304	2,777,078	2,354,348	2,065,494	1,860,094	1,763,104	1,672,434	1,516,622
Cumulative NPV	**2,065,478**	16,565,478	14,009,174	11,232,095	8,877,747	6,812,253	4,952,159	3,189,055	1,516,622

18.92% is IRR for Design A

Exhibit 1

TEMPES CORPORATION: BASE CASE W/15% AOR
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design B	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	15,400	16,940	18,634	20,497	22,547	24,802	27,282
Sales Revenue		8,610,000	9,471,000	10,418,100	11,459,910	12,605,901	13,866,491	15,253,140	16,778,454
Variable Costs		4,172,000	4,589,200	5,048,120	5,552,932	6,108,225	6,719,048	7,390,952	8,130,048
Fixed Costs		150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Gross Margin		4,288,000	4,731,800	5,219,980	5,756,978	6,347,676	6,997,443	7,712,188	8,498,406
SG&A		430,500	473,550	520,905	572,996	630,295	693,325	762,657	838,923
Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Profit before Tax		1,283,500	-151,750	1,549,075	2,933,983	4,115,381	4,702,119	5,347,531	6,849,484
Taxes		436,390	-51,595	526,686	997,554	1,399,229	1,598,720	1,818,160	2,328,824
Net Income		847,110	-100,155	1,022,390	1,936,428	2,716,151	3,103,398	3,529,370	4,520,659
Add Back Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Operating Cash Flow	-18,000,000	3,421,110	4,309,845	4,172,390	4,186,428	4,318,151	4,705,398	5,131,370	5,330,659
Discount Factor	1.000	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327
Discounted Cash Flow	-18,000,000	2,974,878	3,258,862	2,743,414	2,393,604	2,146,884	2,034,274	1,929,072	1,742,602
Cumulative NPV	**1,223,590**	19,223,590	16,248,712	12,989,850	10,246,436	7,852,832	5,705,948	3,671,674	1,742,602

16.91% is IRR for Design B

Exhibit 1

TEMPES CORPORATION: BASE CASE W/15% AOR

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Price	550.00		550.00	615.00		615.00
Unit Sales- Year 1	14,000.00		14,000.00	14,000.00		14,000.00
Materials	200.00		200.00	245.00		245.00
Labor	30.00		30.00	40.00		40.00
Plant Overhead	3.00		3.00	4.00		4.00
Disposal Costs	10.00		10.00	0.00		0.00
Cd Overhead	15.00		15.00	0.00		0.00
Operating Supplies	15.50		15.50	9.00		9.00
Total Variable Costs	273.50		273.50	298.00		298.00
Fixed Plant Overhead	100,000		100,000	150,000		150,000
Sales Growth Rate	10.00%		10.00%	10.00%		10.00%
SG&A as % of Sales	5.00%		5.00%	5.00%		5.00%
Tax Rate	34.00%		34.00%	34.00%		34.00%
Alternate Opp. Rate	15.00%		15.00%	15.00%		15.00%
Inflation Rate	0.00%		0.00%	0.00%		0.00%

Net Present Value	**2,065,478**	**1,223,590**
Internal Rate of Return	**18.92%**	**16.91%**

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Production Equipment	13,000,000		13,000,000	12,500,000		12,500,000
Recycling Equipment	0		0	3,500,000		3,500,000
Installation Labor	1,200,000		1,200,000	1,650,000		1,650,000
Start-Up Costs	150,000		150,000	200,000		200,000
Environmental Permits	150,000		150,000	150,000		150,000
Total Installation Cost	14,500,000		14,500,000	18,000,000		18,000,000

Exhibit 2

TEMPES CORPORATION: BASE CASE W/7% AOR
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design A	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	15,400	16,940	18,634	20,497	22,547	24,802	27,282
Sales Revenue		7,700,000	8,470,000	9,317,000	10,248,700	11,273,570	12,400,927	13,641,020	15,005,122
Variable Costs		3,829,000	4,211,900	4,633,090	5,096,399	5,606,039	6,166,643	6,783,307	7,461,638
Fixed Costs		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Gross Margin		3,771,000	4,158,100	4,583,910	5,052,301	5,567,531	6,134,284	6,757,713	7,443,484
SG&A		385,000	423,500	465,850	512,435	563,679	620,046	682,051	750,256
Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Profit before Tax		1,312,500	182,100	1,580,560	2,727,366	3,713,353	4,223,738	4,785,162	6,040,728
Taxes		446,250	61,914	537,390	927,304	1,262,540	1,436,071	1,626,955	2,053,847
Net Income		866,250	120,186	1,043,170	1,800,062	2,450,813	2,787,667	3,158,207	3,986,880
Add Back Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Operating Cash Flow	-14,500,000	2,939,750	3,672,686	3,580,670	3,612,562	3,741,313	4,078,167	4,448,707	4,639,380
Discount Factor	1.000	0.935	0.873	0.816	0.763	0.713	0.666	0.623	0.582
Discounted Cash Flow	-14,500,000	2,747,430	3,207,866	2,922,893	2,756,006	2,667,504	2,717,455	2,770,431	2,700,162
Cumulative NPV	**7,989,747**	22,489,747	19,742,317	16,534,451	13,611,558	10,855,552	8,188,047	5,470,593	2,700,162

18.92% is IRR for Design A

Exhibit 2

TEMPES CORPORATION: BASE CASE W/7% AOR
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design B	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	15,400	16,940	18,634	20,497	22,547	24,802	27,282
Sales Revenue		8,610,000	9,471,000	10,418,100	11,459,910	12,605,901	13,866,491	15,253,140	16,778,454
Variable Costs		4,172,000	4,589,200	5,048,120	5,552,932	6,108,225	6,719,048	7,390,952	8,130,048
Fixed Costs		150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Gross Margin		4,288,000	4,731,800	5,219,980	5,756,978	6,347,676	6,997,443	7,712,188	8,498,406
SG&A		430,500	473,550	520,905	572,996	630,295	693,325	762,657	838,923
Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Profit before Tax		1,283,500	-151,750	1,549,075	2,933,983	4,115,381	4,702,119	5,347,531	6,849,484
Taxes		436,390	-51,595	526,686	997,554	1,399,229	1,598,720	1,818,160	2,328,824
Net Income		847,110	-100,155	1,022,390	1,936,428	2,716,151	3,103,398	3,529,370	4,520,659
Add Back Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Operating Cash Flow	-18,000,000	3,421,110	4,309,845	4,172,390	4,186,428	4,318,151	4,705,398	5,131,370	5,330,659
Discount Factor	1.000	0.935	0.873	0.816	0.763	0.713	0.666	0.623	0.582
Discounted Cash Flow	-18,000,000	3,197,299	3,764,386	3,405,913	3,193,806	3,078,782	3,135,406	3,195,560	3,102,492
Cumulative NPV	**8,073,643**	26,073,643	22,876,344	19,111,959	15,706,046	12,512,240	9,433,457	6,298,052	3,102,492

16.91% is IRR for Design B

Exhibit 2

TEMPES CORPORATION: BASE CASE W/7% AOR

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Price	550.00		550.00	615.00		615.00
Unit Sales- Year 1	14,000.00		14,000.00	14,000.00		14,000.00
Materials	200.00		200.00	245.00		245.00
Labor	30.00		30.00	40.00		40.00
Plant Overhead	3.00		3.00	4.00		4.00
Disposal Costs	10.00		10.00	0.00		0.00
Cd Overhead	15.00		15.00	0.00		0.00
Operating Supplies	15.50		15.50	9.00		9.00
Total Variable Costs	273.50		273.50	298.00		298.00
Fixed Plant Overhead	100,000		100,000	150,000		150,000
Sales Growth Rate	10.00%		10.00%	10.00%		10.00%
SG&A as % of Sales	5.00%		5.00%	5.00%		5.00%
Tax Rate	34.00%		34.00%	34.00%		34.00%
Alternate Opp. Rate	15.00%	-0.08	7.00%	15.00%	-0.08	7.00%
Inflation Rate	0.00%		0.00%	0.00%		0.00%

Net Present Value	**7,989,747**	**8,073,643**
Internal Rate of Return	**18.92%**	**16.91%**

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Production Equipment	13,000,000		13,000,000	12,500,000		12,500,000
Recycling Equipment	0		0	3,500,000		3,500,000
Installation Labor	1,200,000		1,200,000	1,650,000		1,650,000
Start-Up Costs	150,000		150,000	200,000		200,000
Environmental Permits	150,000		150,000	150,000		150,000
Total Installation Cost	14,500,000		14,500,000	18,000,000		18,000,000

EXHIBIT 3

A List of Environmental Factors for Tempes to Consider

Item *Potential Scenario*	Impact on Design A relative profitability
Increase in acrylic polymer costs acrylic prices can rise if deep well injection restricted, firms exit market	-
Increase in acrylic polymer disposal costs Tempes' own disposal costs may increase as landfill becomes less available	-
Increase in Cd disposal costs permitting and disposal costs may rise as pressures to reduce TRI wastes increase	-
Increase in Cd raw material costs Tempes' own disposal costs may increase as landfill becomes less available	-
Increase in thermoplastic costs if other manufacturers also switch to thermoplastic, costs may or may not rise	+
Increase in Cd potential liability costs probability and/or costs of a spill or wastewater contamination increase	-
Learning (experience curve) process recycling additional overhead for recycling may come down over the years	-
Increased consumer demand for recycling consumers willing to pay more for or more willing to buy recycled product	-
Increased consumer preference for repairableness depending on power of repair market, as well as consumer preferences, value of repairableness may rise	+
Increased consumer preference for new material shoddy appearance or performance of recycled materials may lower consumer preference for recycled material	+

Exhibit 4

Examples of Scenarios and Sensitivity Tests

In interpreting these results, students will need to address the probability of each scenario taking place.

Scenario I

Plastics market encounters increased environmental pressures

In this case, we assume the cost of acrylic polymer would increase, while the cost of engineering thermoplastic remains constant since the latter is environmentally preferable. Disposal costs of Tempes' own acrylic polymer wastes would also increase. Sales volume may also go down as environmental groups -- some of whose members are extreme sports fans -- put pressure on consumers and the government to boycott non-recycled plastics. A version of this scenario could subject Design A to one of the following:

-raw material costs increase 10% (Exhibit 5)
Design B becomes preferable.

-fixed plant costs increase four-fold (Exhibit 6)
Design B may be preferable because it creates more wealth. It should be noted however that Design A does provide a higher rate of return.

The availability of capital becomes an important factor to consider. Students should think about all of the different assumptions made to determine the preferability of one design to another.

Scenario II

Germany's take-back laws become European standard

In this case, Tempes could lose the entire European market (one-third of sales) if it chooses Design A. A loss of 33% of sales volume would certainly make Design B preferable and would in fact make Design A's NPV negative.

Even if we assume that other markets (e.g. Asia) could be developed to make up for some of the reduction in sales, Design A still loses in the following scenario (Exhibit 7):

- as sales volume growth drops to 7% for Design A and rises to 13% for Design B

Note that for Design B to do well in this scenario, Tempes must make an additional investment to put into place infrastructure and add manufacturing process steps for taking back and recycling the used *Water Moccasins*. Even though the company may pay a third party to do some of this, costs may be significant.

Scenario III

Cadmium spill on Tempes land

Assume a spill in year 8:

-remediation cost $12 million
-penalties $1 million

These costs are added to fixed overhead. Even without taking into account lost sales and increased future compliance, disposal, insurance, and property costs, this scenario suggests that any spill is unacceptable. This is the case even though the accident is in year 8 (Exhibit 8).

Note that using an expected value calculation, the Cadmium spill does not appear as bad. In this case, we multiply the average cost of a spill ($28 million) by the annual probability of a spill (12/100,000) to obtain an annual amount ($3,360) to be added to fixed costs for Design A every year. This amount is so small that it does not affect the preferability of A; in fact, it barely affects the NPV of Design A (Exhibit 9).

Sensitivity tests

Note: There are no financial spreadsheets for this section, but the answers are provided below.

Make sure that students address the interpretation of this analysis. What kinds of scenarios would these cases correspond to? How would Tempes managers use these data for decision-making and planning?

Cd OH costs
How much does the variable overhead to cover cadmium-related costs have to rise to make Design B preferable?

A 133% increase, from $15 to $35 per unit, makes B preferable.

Price of B
How much does the price of B have to rise to make Design B preferable?

A relatively small price increase of 4% (from $615 to $640 per unit) is enough to tip the balance in favor of B.

Raw materials cost
How much does A's raw costs have to rise to make Design B preferable?

A 10% increase, from $200 to $220 per unit, in the cost of raw materials for Design A would make Design B preferable.

Exhibit 5

TEMPES CORPORATION: INCREASED DESIGN A COST

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Price	550.00		550.00	615.00		615.00
Unit Sales- Year 1	14,000.00		14,000.00	14,000.00		14,000.00
Materials	200.00	20.00	220.00	245.00		245.00
Labor	30.00		30.00	40.00		40.00
Plant Overhead	3.00		3.00	4.00		4.00
Disposal Costs	10.00		10.00	0.00		0.00
Cd Overhead	15.00		15.00	0.00		0.00
Operating Supplies	15.50		15.50	9.00		9.00
Total Variable Costs	273.50	20.00	293.50	298.00		298.00
Fixed Plant Overhead	100,000		100,000	150,000		150,000
Sales Growth Rate	10.00%		10.00%	10.00%		10.00%
SG&A as % of Sales	5.00%		5.00%	5.00%		5.00%
Tax Rate	34.00%		34.00%	34.00%		34.00%
Alternate Opp. Rate	15.00%		15.00%	15.00%		15.00%
Inflation Rate	0.00%		0.00%	0.00%		0.00%

Net Present Value	**959,424**	**1,223,590**
Internal Rate of Return	**16.86%**	**16.91%**

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Production Equipment	13,000,000		13,000,000	12,500,000		12,500,000
Recycling Equipment	0		0	3,500,000		3,500,000
Installation Labor	1,200,000		1,200,000	1,650,000		1,650,000
Start-Up Costs	150,000		150,000	200,000		200,000
Environmental Permits	150,000		150,000	150,000		150,000
Total Installation Cost	14,500,000		14,500,000	18,000,000		18,000,000

Exhibit 5

TEMPES CORPORATION: INCREASED DESIGN A COST
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design A	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	15,400	16,940	18,634	20,497	22,547	24,802	27,282
Sales Revenue		7,700,000	8,470,000	9,317,000	10,248,700	11,273,570	12,400,927	13,641,020	15,005,122
Variable Costs		4,109,000	4,519,900	4,971,890	5,469,079	6,015,987	6,617,586	7,279,344	8,007,279
Fixed Costs		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Gross Margin		3,491,000	3,850,100	4,245,110	4,679,621	5,157,583	5,683,341	6,261,676	6,897,843
SG&A		385,000	423,500	465,850	512,435	563,679	620,046	682,051	750,256
Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Profit before Tax		1,032,500	-125,900	1,241,760	2,354,686	3,303,405	3,772,795	4,289,125	5,495,087
Taxes		351,050	-42,806	422,198	800,593	1,123,158	1,282,750	1,458,302	1,868,330
Net Income		681,450	-83,094	819,562	1,554,093	2,180,247	2,490,045	2,830,822	3,626,757
Add Back Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Operating Cash Flow	-14,500,000	2,754,950	3,469,406	3,357,062	3,366,593	3,470,747	3,780,545	4,121,322	4,279,257
Discount Factor	1.000	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327
Discounted Cash Flow	-14,500,000	2,395,609	2,623,369	2,207,322	1,924,860	1,725,575	1,634,434	1,549,358	1,398,897
Cumulative NPV	**959,424**	15,459,424	13,063,815	10,440,446	8,233,123	6,308,263	4,582,688	2,948,255	1,398,897

16.86% is IRR for Design A

Exhibit 5

TEMPES CORPORATION: INCREASED DESIGN A COST
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design B	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	15,400	16,940	18,634	20,497	22,547	24,802	27,282
Sales Revenue		8,610,000	9,471,000	10,418,100	11,459,910	12,605,901	13,866,491	15,253,140	16,778,454
Variable Costs		4,172,000	4,589,200	5,048,120	5,552,932	6,108,225	6,719,048	7,390,952	8,130,048
Fixed Costs		150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Gross Margin		4,288,000	4,731,800	5,219,980	5,756,978	6,347,676	6,997,443	7,712,188	8,498,406
SG&A		430,500	473,550	520,905	572,996	630,295	693,325	762,657	838,923
Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Profit before Tax		1,283,500	-151,750	1,549,075	2,933,983	4,115,381	4,702,119	5,347,531	6,849,484
Taxes		436,390	-51,595	526,686	997,554	1,399,229	1,598,720	1,818,160	2,328,824
Net Income		847,110	-100,155	1,022,390	1,936,428	2,716,151	3,103,398	3,529,370	4,520,659
Add Back Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Operating Cash Flow	-18,000,000	3,421,110	4,309,845	4,172,390	4,186,428	4,318,151	4,705,398	5,131,370	5,330,659
Discount Factor	1.000	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327
Discounted Cash Flow	-18,000,000	2,974,878	3,258,862	2,743,414	2,393,604	2,146,884	2,034,274	1,929,072	1,742,602
Cumulative NPV	**1,223,590**	19,223,590	16,248,712	12,989,850	10,246,436	7,852,832	5,705,948	3,671,674	1,742,602

16.91% is IRR for Design B

Exhibit 6

TEMPES CORPORATION: INCREASED A FIXED OVERHEAD

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Price	550.00		550.00	615.00		615.00
Unit Sales- Year 1	14,000.00		14,000.00	14,000.00		14,000.00
Materials	200.00		200.00	245.00		245.00
Labor	30.00		30.00	40.00		40.00
Plant Overhead	3.00		3.00	4.00		4.00
Disposal Costs	10.00		10.00	0.00		0.00
Cd Overhead	15.00		15.00	0.00		0.00
Operating Supplies	15.50		15.50	9.00		9.00
Total Variable Costs	273.50		273.50	298.00		298.00
Fixed Plant Overhead	100,000	300,000	400,000	150,000		150,000
Sales Growth Rate	10.00%		10.00%	10.00%		10.00%
SG&A as % of Sales	5.00%		5.00%	5.00%		5.00%
Tax Rate	34.00%		34.00%	34.00%		34.00%
Alternate Opp. Rate	15.00%		15.00%	15.00%		15.00%
Inflation Rate	0.00%		0.00%	0.00%		0.00%

Net Present Value	**1,176,988**	**1,223,590**
Internal Rate of Return	**17.25%**	**16.91%**

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Production Equipment	13,000,000		13,000,000	12,500,000		12,500,000
Recycling Equipment	0		0	3,500,000		3,500,000
Installation Labor	1,200,000		1,200,000	1,650,000		1,650,000
Start-Up Costs	150,000		150,000	200,000		200,000
Environmental Permits	150,000		150,000	150,000		150,000
Total Installation Cost	14,500,000		14,500,000	18,000,000		18,000,000

Exhibit 6

TEMPES CORPORATION: INCREASED A FIXED OVERHEAD
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design A	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	15,400	16,940	18,634	20,497	22,547	24,802	27,282
Sales Revenue		7,700,000	8,470,000	9,317,000	10,248,700	11,273,570	12,400,927	13,641,020	15,005,122
Variable Costs		3,829,000	4,211,900	4,633,090	5,096,399	5,606,039	6,166,643	6,783,307	7,461,638
Fixed Costs		400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000
Gross Margin		3,471,000	3,858,100	4,283,910	4,752,301	5,267,531	5,834,284	6,457,713	7,143,484
SG&A		385,000	423,500	465,850	512,435	563,679	620,046	682,051	750,256
Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Profit before Tax		1,012,500	-117,900	1,280,560	2,427,366	3,413,353	3,923,738	4,485,162	5,740,728
Taxes		344,250	-40,086	435,390	825,304	1,160,540	1,334,071	1,524,955	1,951,847
Net Income		668,250	-77,814	845,170	1,602,062	2,252,813	2,589,667	2,960,207	3,788,880
Add Back Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Operating Cash Flow	-14,500,000	2,741,750	3,474,686	3,382,670	3,414,562	3,543,313	3,880,167	4,250,707	4,441,380
Discount Factor	1.000	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327
Discounted Cash Flow	-14,500,000	2,384,130	2,627,362	2,224,160	1,952,287	1,761,653	1,677,503	1,597,998	1,451,895
Cumulative NPV	**1,176,988**	15,676,988	13,292,858	10,665,496	8,441,336	6,489,049	4,727,396	3,049,893	1,451,895

17.25% is IRR for Design A

Exhibit 6

TEMPES CORPORATION: INCREASED A FIXED OVERHEAD
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design B	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	15,400	16,940	18,634	20,497	22,547	24,802	27,282
Sales Revenue		8,610,000	9,471,000	10,418,100	11,459,910	12,605,901	13,866,491	15,253,140	16,778,454
Variable Costs		4,172,000	4,589,200	5,048,120	5,552,932	6,108,225	6,719,048	7,390,952	8,130,048
Fixed Costs		150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Gross Margin		4,288,000	4,731,800	5,219,980	5,756,978	6,347,676	6,997,443	7,712,188	8,498,406
SG&A		430,500	473,550	520,905	572,996	630,295	693,325	762,657	838,923
Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Profit before Tax		1,283,500	-151,750	1,549,075	2,933,983	4,115,381	4,702,119	5,347,531	6,849,484
Taxes		436,390	-51,595	526,686	997,554	1,399,229	1,598,720	1,818,160	2,328,824
Net Income		847,110	-100,155	1,022,390	1,936,428	2,716,151	3,103,398	3,529,370	4,520,659
Add Back Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Operating Cash Flow	-18,000,000	3,421,110	4,309,845	4,172,390	4,186,428	4,318,151	4,705,398	5,131,370	5,330,659
Discount Factor	1.000	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327
Discounted Cash Flow	-18,000,000	2,974,878	3,258,862	2,743,414	2,393,604	2,146,884	2,034,274	1,929,072	1,742,602
Cumulative NPV	**1,223,590**	19,223,590	16,248,712	12,989,850	10,246,436	7,852,832	5,705,948	3,671,674	1,742,602

16.91% is IRR for Design B

Exhibit 7

TEMPES CORPORATION: CHANGES IN SALES GROWTH RATES

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Price	550.00		550.00	615.00		615.00
Unit Sales- Year 1	14,000.00		14,000.00	14,000.00		14,000.00
Materials	200.00		200.00	245.00		245.00
Labor	30.00		30.00	40.00		40.00
Plant Overhead	3.00		3.00	4.00		4.00
Disposal Costs	10.00		10.00	0.00		0.00
Cd Overhead	15.00		15.00	0.00		0.00
Operating Supplies	15.50		15.50	9.00		9.00
Total Variable Costs	273.50		273.50	298.00		298.00
Fixed Plant Overhead	100,000		100,000	150,000		150,000
Sales Growth Rate	10.00%	-0.03	7.00%	10.00%	0.03	13.00%
SG&A as % of Sales	5.00%		5.00%	5.00%		5.00%
Tax Rate	34.00%		34.00%	34.00%		34.00%
Alternate Opp. Rate	15.00%		15.00%	15.00%		15.00%
Inflation Rate	0.00%		0.00%	0.00%		0.00%

Net Present Value	**901,025**	**2,710,987**
Internal Rate of Return	**16.80%**	**19.02%**

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Production Equipment	13,000,000		13,000,000	12,500,000		12,500,000
Recycling Equipment	0		0	3,500,000		3,500,000
Installation Labor	1,200,000		1,200,000	1,650,000		1,650,000
Start-Up Costs	150,000		150,000	200,000		200,000
Environmental Permits	150,000		150,000	150,000		150,000
Total Installation Cost	14,500,000		14,500,000	18,000,000		18,000,000

Exhibit 7

TEMPES CORPORATION: CHANGES IN SALES GROWTH RATES
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design A	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	14,980	16,029	17,151	18,351	19,636	21,010	22,481
Sales Revenue		7,700,000	8,239,000	8,815,730	9,432,831	10,093,129	10,799,648	11,555,624	12,364,517
Variable Costs		3,829,000	4,097,030	4,383,822	4,690,690	5,019,038	5,370,371	5,746,297	6,148,537
Fixed Costs		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Gross Margin		3,771,000	4,041,970	4,331,908	4,642,141	4,974,091	5,329,278	5,709,327	6,115,980
SG&A		385,000	411,950	440,787	471,642	504,656	539,982	577,781	618,226
Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Profit before Tax		1,312,500	77,520	1,353,621	2,358,000	3,178,935	3,498,795	3,841,046	4,845,254
Taxes		446,250	26,357	460,231	801,720	1,080,838	1,189,590	1,305,956	1,647,386
Net Income		866,250	51,163	893,390	1,556,280	2,098,097	2,309,205	2,535,090	3,197,868
Add Back Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Operating Cash Flow	-14,500,000	2,939,750	3,603,663	3,430,890	3,368,780	3,388,597	3,599,705	3,825,590	3,850,368
Discount Factor	1.000	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327
Discounted Cash Flow	-14,500,000	2,556,304	2,724,887	2,255,866	1,926,111	1,684,732	1,556,252	1,438,181	1,258,692
Cumulative NPV	**901,025**	15,401,025	12,844,720	10,119,833	7,863,967	5,937,857	4,253,125	2,696,873	1,258,692

16.80% is IRR for Design A

Exhibit 7

TEMPES CORPORATION: CHANGES IN SALES GROWTH RATES
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design B	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	15,820	17,877	20,201	22,827	25,794	29,147	32,936
Sales Revenue		8,610,000	9,729,300	10,994,109	12,423,343	14,038,378	15,863,367	17,925,605	20,255,933
Variable Costs		4,172,000	4,714,360	5,327,227	6,019,766	6,802,336	7,686,640	8,685,903	9,815,070
Fixed Costs		150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Gross Margin		4,288,000	4,864,940	5,516,882	6,253,577	7,086,042	8,026,727	9,089,702	10,290,863
SG&A		430,500	486,465	549,705	621,167	701,919	793,168	896,280	1,012,797
Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Profit before Tax		1,283,500	-31,525	1,817,177	3,382,410	4,782,123	5,631,559	6,591,422	8,468,066
Taxes		436,390	-10,719	617,840	1,150,019	1,625,922	1,914,730	2,241,083	2,879,143
Net Income		847,110	-20,807	1,199,337	2,232,390	3,156,201	3,716,829	4,350,338	5,588,924
Add Back Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Operating Cash Flow	-18,000,000	3,421,110	4,389,194	4,349,337	4,482,390	4,758,201	5,318,829	5,952,338	6,398,924
Discount Factor	1.000	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327
Discounted Cash Flow	-18,000,000	2,974,878	3,318,861	2,859,759	2,562,821	2,365,667	2,299,477	2,237,704	2,091,820
Cumulative NPV	**2,710,987**	20,710,987	17,736,109	14,417,248	11,557,489	8,994,667	6,629,001	4,329,524	2,091,820

19.02% is IRR for Design B

Exhibit 8

TEMPES CORPORATION: SPILL IN YEAR 8

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Price	550.00		550.00	615.00		615.00
Unit Sales- Year 1	14,000.00		14,000.00	14,000.00		14,000.00
Materials	200.00		200.00	245.00		245.00
Labor	30.00		30.00	40.00		40.00
Plant Overhead	3.00		3.00	4.00		4.00
Disposal Costs	10.00		10.00	0.00		0.00
Cd Overhead	15.00		15.00	0.00		0.00
Operating Supplies	15.50		15.50	9.00		9.00
Total Variable Costs	273.50		273.50	298.00		298.00
Fixed Plant Overhead	100,000		100,000	150,000		150,000
Sales Growth Rate	10.00%		10.00%	10.00%		10.00%
SG&A as % of Sales	5.00%		5.00%	5.00%		5.00%
Tax Rate	34.00%		34.00%	34.00%		34.00%
Alternate Opp. Rate	15.00%		15.00%	15.00%		15.00%
Inflation Rate	0.00%		0.00%	0.00%		0.00%

Net Present Value	**-739,339**	**1,223,590**
Internal Rate of Return	**13.17%**	**16.91%**

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Production Equipment	13,000,000		13,000,000	12,500,000		12,500,000
Recycling Equipment	0		0	3,500,000		3,500,000
Installation Labor	1,200,000		1,200,000	1,650,000		1,650,000
Start-Up Costs	150,000		150,000	200,000		200,000
Environmental Permits	150,000		150,000	150,000		150,000
Total Installation Cost	14,500,000		14,500,000	18,000,000		18,000,000

Exhibit 8

TEMPES CORPORATION: SPILL IN YEAR 8
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design A	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	15,400	16,940	18,634	20,497	22,547	24,802	27,282
Sales Revenue		7,700,000	8,470,000	9,317,000	10,248,700	11,273,570	12,400,927	13,641,020	15,005,122
Variable Costs		3,829,000	4,211,900	4,633,090	5,096,399	5,606,039	6,166,643	6,783,307	7,461,638
Fixed Costs		100,000	100,000	100,000	100,000	100,000	100,000	100,000	13,100,000
Gross Margin		3,771,000	4,158,100	4,583,910	5,052,301	5,567,531	6,134,284	6,757,713	-5,556,516
SG&A		385,000	423,500	465,850	512,435	563,679	620,046	682,051	750,256
Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Profit before Tax		1,312,500	182,100	1,580,560	2,727,366	3,713,353	4,223,738	4,785,162	-6,959,272
Taxes		446,250	61,914	537,390	927,304	1,262,540	1,436,071	1,626,955	-2,366,153
Net Income		866,250	120,186	1,043,170	1,800,062	2,450,813	2,787,667	3,158,207	-4,593,120
Add Back Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Operating Cash Flow	-14,500,000	2,939,750	3,672,686	3,580,670	3,612,562	3,741,313	4,078,167	4,448,707	-3,940,620
Discount Factor	1.000	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327
Discounted Cash Flow	-14,500,000	2,556,304	2,777,078	2,354,348	2,065,494	1,860,094	1,763,104	1,672,434	-1,288,196
Cumulative NPV	**-739,339**	13,760,661	11,204,356	8,427,278	6,072,930	4,007,436	2,147,342	384,238	-1,288,196

13.17% is IRR for Design A

Exhibit 8

TEMPES CORPORATION: SPILL IN YEAR 8
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design B	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	15,400	16,940	18,634	20,497	22,547	24,802	27,282
Sales Revenue		8,610,000	9,471,000	10,418,100	11,459,910	12,605,901	13,866,491	15,253,140	16,778,454
Variable Costs		4,172,000	4,589,200	5,048,120	5,552,932	6,108,225	6,719,048	7,390,952	8,130,048
Fixed Costs		150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Gross Margin		4,288,000	4,731,800	5,219,980	5,756,978	6,347,676	6,997,443	7,712,188	8,498,406
SG&A		430,500	473,550	520,905	572,996	630,295	693,325	762,657	838,923
Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Profit before Tax		1,283,500	-151,750	1,549,075	2,933,983	4,115,381	4,702,119	5,347,531	6,849,484
Taxes		436,390	-51,595	526,686	997,554	1,399,229	1,598,720	1,818,160	2,328,824
Net Income		847,110	-100,155	1,022,390	1,936,428	2,716,151	3,103,398	3,529,370	4,520,659
Add Back Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Operating Cash Flow	-18,000,000	3,421,110	4,309,845	4,172,390	4,186,428	4,318,151	4,705,398	5,131,370	5,330,659
Discount Factor	1.000	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327
Discounted Cash Flow	-18,000,000	2,974,878	3,258,862	2,743,414	2,393,604	2,146,884	2,034,274	1,929,072	1,742,602
Cumulative NPV	**1,223,590**	19,223,590	16,248,712	12,989,850	10,246,436	7,852,832	5,705,948	3,671,674	1,742,602

16.91% is IRR for Design B

Exhibit 9

TEMPES CORPORATION: PROBABILISTIC SPILL COSTS

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Price	550.00		550.00	615.00		615.00
Unit Sales- Year 1	14,000.00		14,000.00	14,000.00		14,000.00
Materials	200.00		200.00	245.00		245.00
Labor	30.00		30.00	40.00		40.00
Plant Overhead	3.00		3.00	4.00		4.00
Disposal Costs	10.00		10.00	0.00		0.00
Cd Overhead	15.00		15.00	0.00		0.00
Operating Supplies	15.50		15.50	9.00		9.00
Total Variable Costs	273.50		273.50	298.00		298.00
Fixed Plant Overhead	104,300		104,300	150,000		150,000
Sales Growth Rate	10.00%		10.00%	10.00%		10.00%
SG&A as % of Sales	5.00%		5.00%	5.00%		5.00%
Tax Rate	34.00%		34.00%	34.00%		34.00%
Alternate Opp. Rate	15.00%		15.00%	15.00%		15.00%
Inflation Rate	0.00%		0.00%	0.00%		0.00%

Net Present Value	**2,052,743**	**1,223,590**
Internal Rate of Return	**18.90%**	**16.91%**

	Design A			Design B		
	Original	Change?	Revised	Original	Change?	Revised
Production Equipment	13,000,000		13,000,000	12,500,000		12,500,000
Recycling Equipment	0		0	3,500,000		3,500,000
Installation Labor	1,200,000		1,200,000	1,650,000		1,650,000
Start-Up Costs	150,000		150,000	200,000		200,000
Environmental Permits	150,000		150,000	150,000		150,000
Total Installation Cost	14,500,000		14,500,000	18,000,000		18,000,000

Exhibit 9

TEMPES CORPORATION: PROBABILISTIC SPILL COSTS
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design A	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	15,400	16,940	18,634	20,497	22,547	24,802	27,282
Sales Revenue		7,700,000	8,470,000	9,317,000	10,248,700	11,273,570	12,400,927	13,641,020	15,005,122
Variable Costs		3,829,000	4,211,900	4,633,090	5,096,399	5,606,039	6,166,643	6,783,307	7,461,638
Fixed Costs		104,300	104,300	104,300	104,300	104,300	104,300	104,300	104,300
Gross Margin		3,766,700	4,153,800	4,579,610	5,048,001	5,563,231	6,129,984	6,753,413	7,439,184
SG&A		385,000	423,500	465,850	512,435	563,679	620,046	682,051	750,256
Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Profit before Tax		1,308,200	177,800	1,576,260	2,723,066	3,709,053	4,219,438	4,780,862	6,036,428
Taxes		444,788	60,452	535,928	925,842	1,261,078	1,434,609	1,625,493	2,052,385
Net Income		863,412	117,348	1,040,332	1,797,224	2,447,975	2,784,829	3,155,369	3,984,042
Add Back Depreciation		2,073,500	3,552,500	2,537,500	1,812,500	1,290,500	1,290,500	1,290,500	652,500
Operating Cash Flow	-14,500,000	2,936,912	3,669,848	3,577,832	3,609,724	3,738,475	4,075,329	4,445,869	4,636,542
Discount Factor	1.000	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327
Discounted Cash Flow	-14,500,000	2,553,837	2,774,932	2,352,482	2,063,871	1,858,683	1,761,877	1,671,367	1,515,694
Cumulative NPV	**2,052,743**	16,552,743	13,998,906	11,223,974	8,871,492	6,807,620	4,948,938	3,187,061	1,515,694

18.90% is IRR for Design A

Exhibit 9

TEMPES CORPORATION: PROBABILISTIC SPILL COSTS
CASHFLOW CALCULATIONS

	Year								
	0	1	2	3	4	5	6	7	8
Depreciation Schedule	0.000	0.143	0.245	0.175	0.125	0.089	0.089	0.089	0.045

Design B	Year								
	0	1	2	3	4	5	6	7	8
Sales Units		14,000	15,400	16,940	18,634	20,497	22,547	24,802	27,282
Sales Revenue		8,610,000	9,471,000	10,418,100	11,459,910	12,605,901	13,866,491	15,253,140	16,778,454
Variable Costs		4,172,000	4,589,200	5,048,120	5,552,932	6,108,225	6,719,048	7,390,952	8,130,048
Fixed Costs		150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Gross Margin		4,288,000	4,731,800	5,219,980	5,756,978	6,347,676	6,997,443	7,712,188	8,498,406
SG&A		430,500	473,550	520,905	572,996	630,295	693,325	762,657	838,923
Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Profit before Tax		1,283,500	-151,750	1,549,075	2,933,983	4,115,381	4,702,119	5,347,531	6,849,484
Taxes		436,390	-51,595	526,686	997,554	1,399,229	1,598,720	1,818,160	2,328,824
Net Income		847,110	-100,155	1,022,390	1,936,428	2,716,151	3,103,398	3,529,370	4,520,659
Add Back Depreciation		2,574,000	4,410,000	3,150,000	2,250,000	1,602,000	1,602,000	1,602,000	810,000
Operating Cash Flow	-18,000,000	3,421,110	4,309,845	4,172,390	4,186,428	4,318,151	4,705,398	5,131,370	5,330,659
Discount Factor	1.000	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327
Discounted Cash Flow	-18,000,000	2,974,878	3,258,862	2,743,414	2,393,604	2,146,884	2,034,274	1,929,072	1,742,602
Cumulative NPV	**1,223,590**	19,223,590	16,248,712	12,989,850	10,246,436	7,852,832	5,705,948	3,671,674	1,742,602

16.91% is IRR for Design B