Evaluating Substantial and Widespread Impacts: Private Sector Entities

Purpose

To provide automated versions of the worksheets in EPA's *Interim Economic Guidance for Water Quality Standards* (1995) that are used to evaluate substantial impacts to private sector entities, and consequent widespread economic and social impacts to surrounding communities.

Explanation of Tabs

Name	Description	Requires User Input?
Verify Project Costs	Summary of information used to evaluate pollution control projects and associated costs.	No
Inputs - Substantial Analysis	Numerical inputs that user must enter to complete the worksheets that evaluate substantial impact to the entity (Worksheets G-L), including project cost information and financial information of the discharger for which impacts are being analyzed.	Yes
Worksheets G - L	Equivalent to Worksheets G - L in EPA's *Interim Economic Guidance for Water Quality Standards* (1995)[1]	Yes, except Worksheet G
Financial Analysis Summary	Summary of financial metrics used to evaluate substantial impact to entity	Yes
Inputs - Widespread Analysis	Inputs that user must enter to complete Worksheet N, which evaluates widespread impact to the community surrounding the discharger, including community social and economic information.	Yes
Worksheet N	Equivalent to Worksheet N in EPA's *Interim Economic Guidance for Water Quality Standards* (1995)[1]	No

Instructions for Use
1. Verify pollution control project costs using information in the 'Verify Project Costs' tab and EPA's 1995 *Guidance.*
2. Enter project cost information and company financial information 'Inputs - Substantial Impact' tab (cells in blue require user input). This information is automatically distributed to the appropriate worksheets.
3. On Worksheets H-L, answer questions and select option buttons as directed (in cells highlighted in blue). This serves to clarify and explain information entered on 'Inputs - Substantial Impact' tab.
4. Use the four financial measures (summarized in 'Financial Analysis Summary' tab), along with answers to the questions provided by the user on the worksheets -- and any other information that may be relevant that is not included in the worksheets (as discussed in EPA's *Interim Economic Guidance for Water Quality Standards*) -- to assess whether adverse financial impact to the entity is substantial.
5. If financial impact to the entity is determined to be substantial, enter information on 'Inputs - Widespread Analysis' tab. These inputs are automatically transferred to Worksheet N. Use the answers on Worksheet N along with EPA's *Guidance* to assess whether economic and social impacts to the surrounding community could be widespread.
Note: All worksheets are sized to be printer-friendly.
Note: Tabs in blue require user input.
Comparison to Worksheets in EPA's 1995 *Interim Economic Guidance for Water Quality Standards*
The worksheets here mirror the worksheets in the guidance almost exactly, with the addition of automated calculations and transfer of values to other areas where the value is applied. The only substantive difference is that, while the *Guidance* vaguely asks the user to consider, for each metric, which year's value to use in the analysis, the worksheets here ask the user to definitively select which year's value is most appropriate. The selected value is then used where applicable in the remainder of the analysis.
These worksheets provide only some of the information needed to conduct a thorough analysis of potential substantial impacts to private sector entities, and consequent widespread economic and social impact to surrounding communities. These worksheets should be used in the context of the full *Guidance.*[1]
1. Available at http://water.epa.gov/scitech/swguidance/standards/economics/

3.1.a Verify Project Costs
The first step in the financial impact analysis is an evaluation of the proposed pollution control project. Private entities should consider a broad range of discharge management options including pollution prevention, end-of-pipe treatment, and upgrades or additions to existing treatment. Specific types of pollution prevention activities to be considered include:
• Change in Raw Materials;
• Substitute Process Chemicals;
• Change in Process;
• Water Recycling and Reuse; and
• Pretreatment Requirements.
Whatever the approach, the discharger must demonstrate that the proposed approach is the most appropriate means of meeting water quality standards and must document project cost estimates.

Company Name	***Sample Discharger***

Note: Characteristics of this company (e.g., financial data, employment) are based on averages in the food manufacturing industry. This example is used to demonstrate how an examination of substantial and widespread impacts may be conducted. An actual analysis would be based on financial data and other characteristics of a real company.

Project Information	
Capital costs to be financed	$2,736,000
Interest rate for financing *	7%
Annual cost of operation and maintenance (including but not limited to monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement) **	$85,000

* The interest rate on the loan should be equivalent to the rate the applicant pays when it borrows money. If it is impossible to determine the appropriate interest rate, assume an interest rate equal to the prime rate plus one percent.
** For recurring costs that occur less frequently than once a year, pro rate the cost over the relevant number of years (e.g., for pumps replaced once every three years, include one-third of the cost in each year).

Discharger Information			
Three most recently completed fiscal years (most recent first)	**2010**	**2009**	**2008**
Financial Information for Specified Fiscal Years			
Revenues	$9,261,350	$8,154,375	$8,499,270
Cost of goods sold (including the cost of materials, direct labor, indirect labor, rent and heat)	$8,554,348	$7,445,406	$7,859,804
Portion of corporate overhead assigned to the discharger (selling, general, administrative, interest, R&D expenses, and depreciation on common property)	$238,673	$203,921	$220,477
Net income after taxes	$411,285	$450,298	$365,549
Depreciation	$178,513	$147,695	$145,728
Current assets (the sum of inventories, prepaid expenses, and accounts receivable)	$1,992,900	$1,693,617	$1,776,111
Current liabilities (the sum of accounts payable, accrued expenses, taxes, and the current portion of long-term debt)	$1,019,481	$891,867	$1,050,135
Current debt	$369,156	$358,501	$411,489
Long-term debt	$633,155	$695,118	$703,027
Long-term liabilities (long-term debt such as bonds, debentures, and bank debt, and all other noncurrent liabilities such as deferred income taxes)	$698,068	$772,490	$767,285
Owner equity (the difference between total assets and total liabilities, including contributed or paid in capital and retained earnings)	$1,585,632	$1,211,272	$1,142,998

Worksheet G

Calculation of Total Annualized Project Costs

Capital costs to be financed	$2,736,000	(1)
Interest rate for financing	7%	(i)
Time period of financing (years)	10	(n)
Annualization factor = $i/((1+i)^n - 1) + i$	0.1424	(2)
Annualized capital cost [(1) × (2)]	$389,545	(3)
Annual cost of operation and maintenance (including but not limited to monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement)*	$85,000	(4)
Total annual cost of pollution control project [(3) + (4)]	$475,000	(5)

* For recurring costs that occur less frequently than once a year, pro rate the cost over the relevant number of years (e.g., for pumps replaced once every three years, include one-third of the cost in each year).

Worksheet H

Calculation of Earnings Before Taxes
With and Without Pollution Control Project Costs

A. Earnings Without Pollution Control Project Costs

EBT = R - CGS - CO

Where:	EBT =	Earnings before taxes
	R =	Revenues
	CGS =	Cost of goods sold (including the cost of materials, direct labor, indirect labor, rent and heat)
	CO =	Portion of corporate overhead assigned to the discharger (selling, general, administrative, interest, R&D expenses, and depreciation on common property)

	Three Most Recently Completed Fiscal Years			
	2010	2009	2008	
R	$9,261,350	$8,154,375	$8,499,270	(1)
CGS	$8,554,348	$7,445,406	$7,859,804	(2)
CO	$238,673	$203,921	$220,477	(3)
EBT [(1) - (2) - (3)]	$468,329	$505,048	$418,989	(4)

Is the most recent year typical of the three years?

- ● Yes, use 2010.
- ○ No, use 2009. It is most typical of the analysis period.
- ○ No, use 2008. It is most typical of the analysis period.

Worksheet I

Calculation of Profit Rates
With and Without Pollution Control Project Costs

A. Profit Rate Without Project Costs

PRT = EBT ÷ R

Where:	PRT =	Profit rate before taxes
	EBT =	Earnings before taxes
	R =	Revenues

	Three Most Recently Completed Fiscal Years			
	2010	2009	2008	
EBT [Worksheet H, (4)]	$468,329	$505,048	$418,989	(1)
R [Worksheet H, (1)]	$9,261,350	$8,154,375	$8,499,270	(2)
PRT [(1)/(2)]	0.05	0.06	0.05	(3)

Considerations: How have profit rates changed over the three years?

The company's profit rate has remained fairly stable over the past three years.

How do these profit rates compare with the profit rates for this line of business?

The average profit rate in the food manufacturing industry was 7 percent in 2009 and 2010, and 6 percent in 2008. This company's profit rate of 5 percent is slightly below the industry average.

Worksheet I, Continued

B. Profit Rate With Pollution Control Costs

PRPR = EWPR ÷ R

Where:

PRPR =	Profit rate with pollution control costs
EWPR =	Before-tax earnings with pollution control costs
R =	Revenues

	2010	
EWPR [Worksheet H, (7)]	-$6,671	(4)
R [Worksheet H, (1)]	$9,261,350	(5)
PRPR [(4)/(5)]	0.00	(6)

Considerations:

What is the percentage change in the profit rate due to pollution control costs? (PRPR - PRT)/PRT × 100

-101%

How does the profit rate with pollution control compare to the profit rate of this line of business?

The company's profit rate with pollution control compares unfavorably to the industry average.

Worksheet J

Calculation of the Current Ratio

CR = CA ÷ CL

Where:

CR =	Current ratio
CA =	Current assets (the sum of inventories, prepaid expenses, and accounts receivable)
CL =	Current liabilities (the sum of accounts payable, accrued expenses, taxes, and the current portion of long-term debt)

	Three Most Recently Completed Fiscal Years			
	2010	2009	2008	
CA	$1,992,900	$1,693,617	$1,776,111	(1)
CL	$1,019,481	$891,867	$1,050,135	(2)
CR [(1)/(2)]	1.95	1.90	1.69	(3)

Considerations:

Is the most recent year typical of the three years?

- ○ Yes, use 2010.
- ● No, use 2009. It is most typical of the analysis period.
- ○ No, use 2008. It is most typical of the analysis period.

Is the current ratio (3) greater than 2.0?

No

How does the current ratio (3) compare with the current ratios for other firms in this line of business?

At 1.90, this company's current ratio compares favorably to the average in the food manufacturing industry, which was between 1.25 and 1.32 in each year 2008 to 2010.

Worksheet K

Calculation of Beaver's Ratio

BR = CF ÷ TD

Where:

BR =	Beaver's Ratio
CF =	Cash flow
TD =	Total debt

	Three Most Recently Completed Fiscal Years			
	2010	2009	2008	
Cash flow:				
Net income after taxes	$411,285	$450,298	$365,549	(1)
Depreciation	$178,513	$147,695	$145,728	(2)
CF [(1) + (2)]	$589,798	$597,993	$511,277	(3)
Total debt:				
Current debt	$369,156	$358,501	$411,489	(4)
Long-term debt	$633,155	$695,118	$703,027	(5)
Total debt [(4) + (5)]	$1,002,311	$1,053,619	$1,114,516	(6)
Beaver's Ratio:				
BR [(3)/(6)]	0.59	0.57	0.46	(7)

Considerations:

Is the most recent year typical of the three years?

- ○ Yes, use 2010.
- ● No, use 2009. It is most typical of the analysis period.
- ○ No, use 2008. It is most typical of the analysis period.

Is the Beaver's Ratio for this discharger greater than 0.2?

Yes

Is the Beaver's Ratio for this discharger less than 0.15?

No

Is the Beaver's Ratio for this discharger between 0.2 and 0.15?

No

How does this ratio compare with the Beaver's Ratio for other firms in the same business?

The company's Beaver's Ratio of 0.57 compares favorably to the food manufacturing industry average in each of the past three years: 0.06 in 2010, and 0.07 in 2009 and 2008.

Worksheet L

Debt to Equity Ratio

DER = LTL ÷ OE

Where:		
	DER =	Debt/equity ratio
	LTL =	Long-term liabilities (long-term debt such as bonds, debentures, and bank debt, and all other noncurrent liabilities such as deferred income taxes)
	OE =	Owner equity (the difference between total assets and total liabilities, including contributed or paid in capital and retained earnings)

	Three Most Recently Completed Fiscal Years			
	2010	2009	2008	
LTL	$698,068	$772,490	$767,285	(1)
OE	$1,585,632	$1,211,272	$1,142,998	(2)
DER [(1)/(2)]	0.44	0.64	0.67	(3)

Considerations:

Is the most recent year typical of the three years?

- ○ Yes, use 2010.
- ● No, use 2009. It is most typical of the analysis period.
- ○ No, use 2008. It is most typical of the analysis period.

How does the debt to equity ratio (3) compare with the ratio for firms in the same business?

The company's debt-to-equity ratio of 0.64 compares favorably to the industry average in each year 2008 to 2010. The industry average was 1.04 in 2010, 1.02 in 2009, and 0.76 in 2008.

Entity Name	Annual Pollution Control Costs	Primary Measure		Secondary Measures		
		Profit Test		Current Ratio	Beaver's Ratio	Debt/Equity Ratio
		Without Pollution Controls	With Pollution Controls			
Sample Discharger	$475,000	0.05	0.00	1.90	0.57	0.64
Industry Average	N/A	0.06 to 0.07	N/A	1.25 to 1.32	0.06 to 0.07	0.76 to 1.04

Summarize and discuss company's financial circumstances with and without pollution controls.

If the impacts of pollution control costs cannot be reduced through any of the various available mechanisms (such as alternative financing options, alternative compliance schedules, site-specific alternative criteria, variances, and others), this preliminary analysis suggests that pollution control costs could cause an otherwise profitable sample company to become unprofitable (with control costs higher than current profits). As such, assuming inflexibility in compliance, compliance schedules, and company financial statistics, nutrient water quality standards could cause this sample company to reduce production or cease operations.

The company's profit rate after pollution controls suggests the possibility that pollution control costs could have a substantial adverse effect on the sample company in the absence of alternative financing options, compliance flexibility, or other cost-reducing mechanisms. However, this analysis is preliminary and does not employ detailed economic modeling of the company or the industry. It also does not consider any factors which could mitigate potential substantial impacts. For a full understanding of the effects of nutrient water quality standards on any private entity, company-specific analyses would be necessary, including consideration of alternative financing mechanisms, compliance flexibility, and cost-reducing mechanisms. Further, this analysis has examined the characteristics of the example company at a superficial level, considering only its balance sheet and income statement. The company may have other circumstances that could increase or decrease the potential for pollution control costs to cause substantial financial impact.

Community Social and Economic Indicators	
Define the affected community in this case; what areas are included	
Current unemployment rate in affected community (if available)	
Current national unemployment rate	
Additional number of persons expected to collect unemployment in affected community due to compliance with water quality standards	
Current number of persons collecting unemployment in affected community	
Labor force in affected community	
Median household income in affected community	
Total number of households in affected community	
Percent of population below the poverty line in affected community	
Current expenditures on social services in affected community	
Expected expenditures on social services due to job losses in the affected community	
Current total tax revenues in the affected community	
Tax revenues paid by the private entity to the affected community	
Current statewide unemployment rate	
Additional number of persons expected to collect unemployment in the state due to compliance with water quality standards	
Current number of persons collecting unemployment in state	
Labor force in state	
Current expenditures on social services in state	
Expected statewide expenditures on social services due to job losses	

Worksheet N

Factors to Consider in Making a Determination of Widespread Social and Economic Impacts

Define the affected community in this case; what areas are included	0	(1)
Current unemployment rate in affected community (if available)	0.00%	(2)
Current national unemployment rate	0.00%	(3)
Additional number of persons expected to collect unemployment in affected community due to compliance with water quality standards	0	(4)
Expected unemployment rate in the affected community after compliance with water quality standards ([Current # of persons collecting unemployment in affected community + (4)]/labor force in affected community)	0.00%	(5)
Median household income in affected community	$0	(6)
Total number of households in affected community	0	(7)
Percent of population below the poverty line in affected community	0.00%	(8)
Current expenditures on social services in affected community	$0	(9)
Expected expenditures on social services due to job losses in the affected community	$0	(10)
Current total tax revenues in the affected community	$0	(11)
Tax revenues paid by the private entity to the affected community	$0	(12)
Tax revenues paid by the private entity as a percentage of the affected community's total tax revenues *	0.00%	(13)
Current statewide unemployment rate	0.00%	(14)
Additional number of persons expected to collect unemployment in the state due to compliance with water quality standards	0	(15)
Expected statewide unemployment rate, after compliance with water quality standards ([Current # of persons collecting unemployment in state + (15)]/labor force in state)	0.00%	(16)
Current expenditures on social services in state	$0	(17)
Expected statewide expenditures on social services due to job losses	$0	(18)

* In some cases, the affected community will include more than just the municipality in which the private entity is located. If so, the analysis should consider the private entity's tax revenues as a percentage of the tax revenues for only the municipality in which the entity is located.