

WHERE IN THE WQS PROCESS ARE ECONOMICS CONSIDERED?

- Use Attainability Analysis
- Variances
- Antidegradation



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The water quality standards regulations allow states and authorized tribes to take economic considerations into account when developing and revising their water quality standards. When proposing a change to a designated use, or when allowing a variance, there must be a demonstration (often completed by a discharger) that meeting the “fishable/swimmable” goals of the Act will cause “substantial and widespread economic and social impacts”. In addition, the antidegradation policy requirements at 40 CFR 131.12 allow existing water quality to be lowered in high quality waters (those waters with water quality higher than that necessary to support “fishable/swimmable”) where it has been demonstrated that lowering water quality is “necessary to support important economic or social development”.

To demonstrate economic hardship, applicants must demonstrate substantial and widespread economic and social impacts.

Use Attainability Analyses are assessments of the environmental and economic factors affecting the attainment of a designated use.

40 CFR 131.13 - Variances may be granted to a polluting entity only if economic hardship can be demonstrated.

The impact analysis should consider a broad range of discharge management options, including pollution prevention, end of pipe treatment, and upgrades or additions to existing treatment.

ECONOMIC IMPACT

SUBSTANTIAL: Discharger Unable to
Afford the Necessary
Pollution Reduction

WIDESPREAD: Significant Adverse
Economic and Social
Impacts to the Surrounding
Community

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To demonstrate economic hardship two conditions must be demonstrated.

TYPES OF ANALYSES

Economic Impact Analysis - Describes who gains and who loses. Often focuses on costs, but can include benefits.

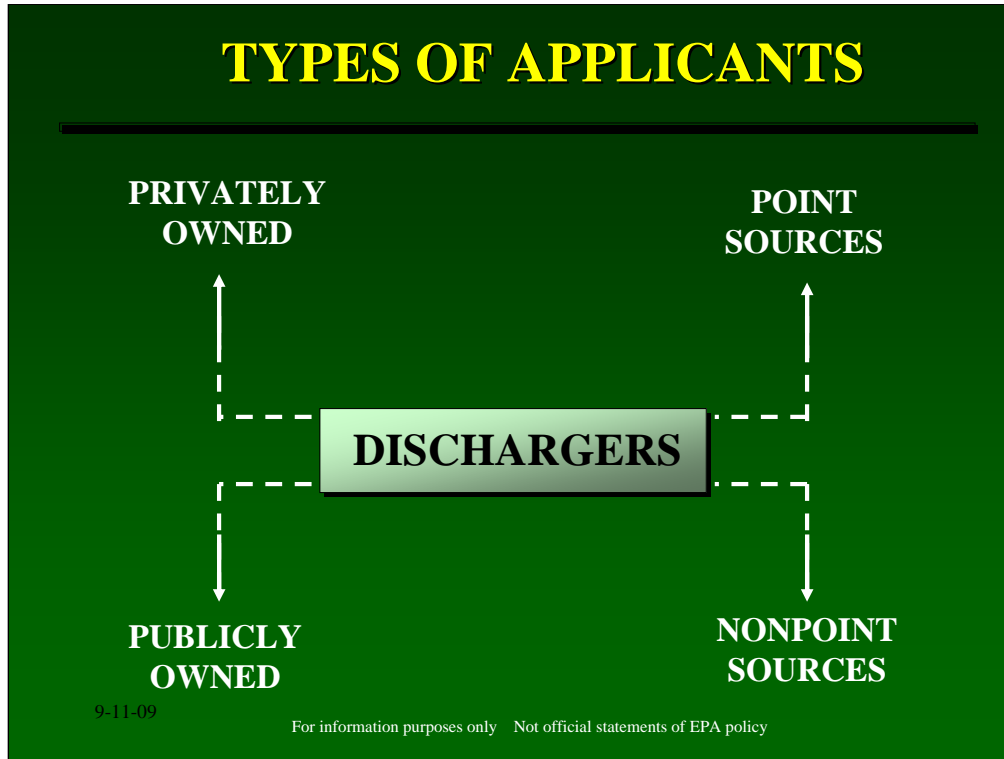
Benefit Cost Analysis - Measure of economic efficiency to help determine if society is better off. Often expressed as a ratio of costs and benefits.

Equity Assessments - Estimates the impacts to subpopulations that are disadvantaged or experience disproportionate effects.

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Emphasize that there are three types of economic analyses as outlined in EPA's *Guidelines for Preparing Economic Analyses*. Compare impact analysis, CB, and equity assessments.



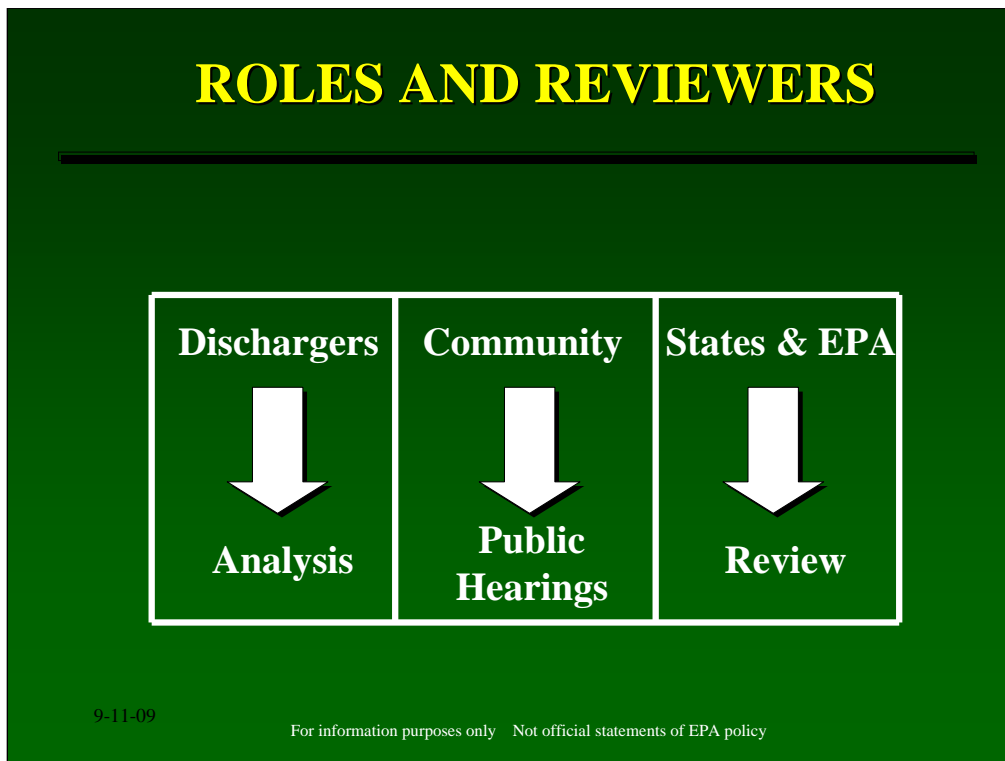
The distinction between public and private entities is critical in an economic impact analysis.

Publicly owned entities include:

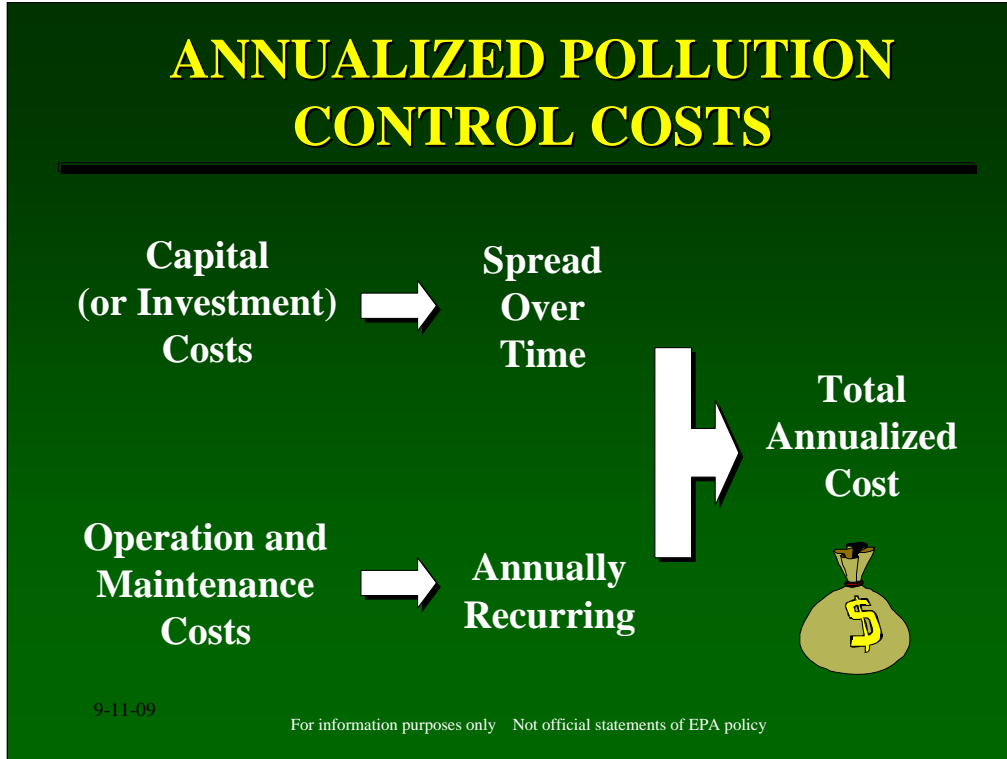
- Publicly owned sewage treatment works;
- regional sewage authorities;
- roads; and
- other municipal infrastructure.

Privately owned entities include:

- manufacturing facilities;
- agricultural operations (Note: agriculture operations are often subsidized and less regulated than other types of private entities, implying that alternative impact measures may be needed);
- shopping centers and other commercial developments;
- residential developments; and
- recreational developments.



States, dischargers, and the general public take part in the development and implementation of water quality standards.



Financial analysis requires calculation of project costs on an annual basis.

AFFORDABILITY FOR COMMUNITIES

- **MUNICIPAL PRELIMINARY
SCREENER**
Ability to Pay, by Household
- **SECONDARY TEST**
Community Assessment Indicators

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To evaluate a community's potential to experience substantial impacts from a project, two indicators are considered jointly.

MUNICIPAL PRELIMINARY SCREENER

Average Annualized Cost per Household
Median Household Income

Used to Evaluate Potential for Impacts to Households

Little Impact

< 1.0%

**Mid-Range
Impact**

1.0% - 2.0%

Large Impact

> 2.0%

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The Municipal Preliminary Screener answers the question: Can community households afford to pay the total annualized pollution control costs?

“AFFORDABILITY”

“Affordability” :

- Subjective and relative term
- Affected by allocation of funds and resources
- “Ability to Pay” more accurate

Economic impact analysis should consider available options for reallocating funds/resources and strategies for sharing burden of costs.

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Recall that “affordability” is a relative term and that a more accurate term may be ‘potential ability to pay’.

Emphasizing the relative/subjective nature of the term “affordability” and the importance of “ability to pay”.

SECONDARY TESTS

- **Debt Indicators (2 measures)**
- **Socioeconomic Indicators (2 measures)**
- **Financial Management Indicators
(2 measures)**

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The Secondary Tests incorporates other factors that affect whether or not a community can afford to meet water quality standards.

SECONDARY TEST METHOD OF ASSESSMENT

For Each Measure, Assign Score, Where:



Weak = 1



Mid-
Range = 2



Strong = 3

Cumulative Secondary Test Score Equals the
Weighted Average of These Scores.

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For each measure, a score of 1, 2, or 3 is assigned.

SECONDARY TEST DEBT INDICATORS

Measure 1: Bond Rating

Measures of Credit Worthiness of a Community

Source of Rating	Weak	Mid-Range	Strong
S&P	Below BBB	BBB	Above BBB
Moody's	Below Baa	Baa	Above Baa

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Bond rating.

SECONDARY TEST DEBT INDICATORS

Measure 2: $\frac{\text{Overall Net Debt}}{\text{Market Value of Taxable Property}}$

Measures Debt Burden on Residents Within the Community

Weak	Mid-Range	Strong
> 5%	2% - 5%	< 2%

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Net debt relative to market value of taxable property.

SECONDARY TEST SOCIOECONOMIC INDICATORS

Measure 1: Unemployment Rate

**Measures the General Economic Health of the
Community**

Weak	Mid-Range	Strong
Above State Average	State Average	Below State Average

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Unemployment rate.

SECONDARY TEST SOCIOECONOMIC INDICATORS

Measure 2: Median Household Income

**Provides Overall Indication of Community
Earning Capacity**

Weak	Mid-Range	Strong
Below State Average	State Average	Above State Average

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Median household income.

SECONDARY TEST

FINANCIAL MANAGEMENT INDICATORS

Measure 1: $\frac{\text{Property Tax Revenue}}{\text{Full Market Value of Taxable Property}}$

Measures Funding Capacity Available To
Support Debt Based on Community's Wealth

Weak	Mid-Range	Strong
<2%	2% - 4%	>4%

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Property tax revenue to market value of taxable property.

SECONDARY TEST

FINANCIAL MANAGEMENT INDICATORS

Measure 2: Property Tax Collection Rate

Measures How Well the Local Government Is Administrated

Weak	Mid-Range	Strong
< 94%	94% - 98%	> 98%

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Property tax collection rate.

CUMULATIVE SECONDARY TEST ASSESSMENT

Average the Scores of All Measures

Weak	Mid-Range	Strong
< 1.5	1.5 - 2.5	> 2.5

**For Example: $1 + 2 + 1 + 3 + 2 + 3 = 12$
 $12/6=2$**

Community Falls within Mid-Range

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When calculating the Cumulative Secondary Test Score, all six measures are given equal weight.

ASSESSMENT OF SUBSTANTIAL IMPACTS MATRIX

Secondary Assessment Score	Municipal Preliminary Screener		
	< 1.0 %	1.0 % - 2.0 %	> 2%
< 1.5	?	⊕	⊕
1.5- 2.5	+	?	⊕
> 2.5	+	+	?

?

= Questionable affordability

+

= Community can afford the pollution control

⊕

= Community cannot afford the pollution control

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The combination of the Secondary Assessment Score and the Municipal Preliminary Screener indicates the community's potential ability to pay for proposed pollution control.

TESTS TO MEASURE ECONOMIC IMPACTS: PRIVATE ENTITIES

LIQUIDITY - How Easily an Entity Can Pay Its Short-Term Bills

SOLVENCY - How Easily an Entity Can Pay Its Fixed and Long-Term Bills

LEVERAGE - How Much Money the Entity Can Borrow

EARNINGS - How Much the Entity's Profitability Will Change with the Additional Pollution Control



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Four financial tests are commonly used to measure different aspects of a private entity's financial health.

The combined results of the financial tests are intended to answer the question of whether or not the entity can afford to pay for the pollution controls.

LIQUIDITY TEST

$$\text{CURRENT RATIO} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Should Be Greater Than 2

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Liquidity.

SOLVENCY TEST

$$\text{BEAVER'S RATIO} = \frac{\text{Cash Flow per Given Year}}{\text{Total Debt of the Entity}}$$

> 0.20 Indicates Entity Is Solvent

>0.15 and <0.20 Entity has some bankruptcy risk

< 0.15 Indicates Entity has high bankruptcy risk

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Solvency.

LEVERAGE TEST

$$\text{DEBT-TO-} \\ \text{EQUITY} \\ \text{RATIO} = \frac{\text{Amount Firm Has} \\ \text{Borrowed (Debt)}}{\text{Amount of} \\ \text{Stockholders' Capital} \\ \text{(Equity)}}$$

*The Larger the Ratio, the Less Likely That
the Entity Will Be Able To Borrow Funds*

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Leverage.

EARNINGS TEST

$$\text{PRE-TAX EARNINGS} - \text{ANNUALIZED POLLUTION CONTROL COST}$$

*Compare Result with Entity's Revenues
to Measure Post-Compliance Profit Rate*

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Earnings.

The results of the four tests should be considered jointly.

Ratios and tests should be compared over several years.

Financial ratios also should be compared against those of "healthy" entities.

The role the entity plays in a parent firm's operations should be considered.

STEPS TO EVALUATE WIDESPREAD IMPACTS

- **Define the Affected Community**
- **Evaluate Community's Current Characteristics**
- **Evaluate How Characteristics Would Change if Discharger Must Meet Water Quality Standards**

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Three steps are involved in evaluating the social costs of pollution control requirements.

ENTITY'S CONTRIBUTION TO THE COMMUNITY

**Contributes to Economic Base
(Property Taxes and Employment)**

**Provides Product or Service Upon
Which Other Businesses or the
Community Depend**

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The interdependence of the entity and the affected community is a major factor in demonstrating that impacts are not only substantial but also widespread.

COMMUNITY'S CURRENT SOCIOECONOMIC HEALTH

- **Median Household Income**
- **Unemployment Rate**
- **Rate of Industrial Development**
- **Developing and Declining Industries**
- **Percent of Households Below Poverty Line**
- **Ability of Community to Carry More Debt**
- **Local & Regional Factors**

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Factors that indicate the current health of the local economy may include information considered when calculating the Cumulative Secondary Test Score.

Other applicable information on the local and regional economy should also be reviewed:

- The annual rate of population change;
- current financial surplus as a percentage of total expenditures;
- the percentage of property taxes actually collected;
- property tax revenues as a percentage of the market value of real property;
- overall debt outstanding as a percentage of market value of real property;
- overall debt per capita; and
- the percentage of outstanding debt due within 5 years.

PROJECTED ADVERSE SOCIOECONOMIC IMPACTS OF PROJECT

- **Property Values**
- **Employment Rate**
- **Commercial Development Opportunities**
- **Tax Revenues**
- **Expenditure on Social Services**

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The analysis should consider how the community will be affected by development of the project.

One of the most serious impacts to communities is the loss of employment.

Affected communities may be faced with impaired development opportunities.

State-level impacts include:

- Loss of revenues; and
- increased expenditures.

WIDESPREAD IMPACTS: EXAMPLES of METHODS

- **Great Lakes Initiative** - *Regional Economic Impact Model* for predicting change in regional income and employment (Customized model)
- **Input Output Models** - Linear multipliers predict total direct and indirect effects on regional output and employment (Proprietary models).

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ECONOMIC IMPACTS: OTHER CONSIDERATIONS

- **Nonpoint Sources** - Similar screener measures possible for agriculture and urban controls but note critical differences between unregulated entities and private regulated firms (see data sources in handout 16.7)
- **Benefits** - Value of “downstream” benefits can affect social and economic outcomes (e.g., UAA for Champion Paper, NC)

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