

## 1.1. ENVIRONMENTAL--CAPITAL COSTS

## 1.1.1. ENVIRONMENTAL ASSESSMENTS AND ENVIRONMENTAL IMPACT STATEMENTS

Background information, guidelines, and generalized costs are presented in this section to assist in estimating costs for environmental studies. Time required to collect baseline data averages 1 to 3 years; however, as much as 5 years may be needed to finalize an environmental impact statement (EIS) for an environmentally sensitive area.

## BACKGROUND INFORMATION

Environmental laws and regulations pertaining to the mining industry are continually being revised at the Federal, State, county, and municipal levels. To conform with existing environmental regulations, mining and milling operations must apply for permits at various stages of development (i.e., exploration, construction, operation, and reclamation). In most cases, before permit applications, baseline information about the environment prior to commencement of mining and/or milling activity must be gathered. This study, usually prepared by an environmental consulting firm, is paid for by the mining-milling company and then presented to appropriate government agencies for an assessment of the impact of the mining-milling activity. If formal reports are required, i.e., an environmental assessment (EA) and/or an EIS, the mining-milling company must pay the majority of the cost for these studies also.

Multiple environmental studies may be required for various stages of a mine-mill development and operation (i.e., exploration access, mine development, etc.). Multiple studies are typical if a company has not made an economic feasibility decision on the mineral deposit. Conversely, a single environmental study may be sufficient for mining-milling from a specific area by more than one company (i.e., phosphate deposits in southern Idaho, coal seams in western Montana).

## GUIDELINES

All developing or expanding mining-milling operations will sustain environmental study related costs. Ownership of land affected by a mining-milling operation (including utility lines, access roads, surface facilities, waste dumps, etc.) is the primary key in determining the amount of environmental studies required to satisfy environmental laws and regulations. Cost of an environmental study is directly related to the complexity and variations associated with types of investigations necessary (see the following tabulation for study types and typical costs).

Because of site-specific variations in each investigation, the cost range for environmental studies deviates immensely. The following guidelines will help the estimator determine environmental study costs:

1. For an operation less than 100 mtpd, completely on private land without anticipated impacts to adjacent lands, cost for an environmental summary sufficient for permit applications would be \$25,000 to \$50,000.
2. For an operation less than 100 mtpd, completely on private land with anticipated impacts to adjacent lands, use the base cost of \$25,000 to \$50,000 and add the cost of the appropriate baseline study element from the following tabulation (i.e.,

if ground water would be impacted, add the cost from the range for a ground water study).

3. Use the cost from the following tabulation for a final EA for all operations over 100 mtpd with an anticipated insignificant impact to the environment, regardless of site ownership. Use proportionately higher costs for higher tonnages in each cost range.

4. For operations on private, State, municipal, and/or Federal land with an anticipated moderate environmental impact, use the appropriate cost from the following tabulation for a final EIS.

5. For operations on private, State, municipal, and/or Federal land with an anticipated significant impact to the environment, the cost for environmental studies is typically 5 times and may be up to 10 times the cost shown in the following tabulation for a final EIS. (For example, a 1,000-mtpd underground mine and adjacent mill planning to significantly alter the local hydrology, could face environmental study costs of \$3.0 million. Environmental study costs for a 1,500-mtpd surface mine adjacent to a wilderness area may be in the range of \$6.5 million).

Typical cost ranges for environmental studies, thousand dollars

Baseline study elements	Underground		Surface		Cost modifying factors
	+2,000 mtpd	-2,000 mtpd	+2,000 mtpd	-2,000 mtpd	
Surface water...	10- 35	20- 70	10- 70	50- 175	Hydrology (i.e., number of streams), 3-25 sites per operation, site sampled 3-7 times per year, \$1,000 per analysis.
Ground water....	30- 80	60-135	30-160	100- 250	
Air quality.....	10- 60	30-100	50-150	100- 325	Geography, proximity of meteorologic station.
Geology.....	2- 20	10- 50	2- 20	0- 50	
Soil.....	5- 20	15- 40	10- 60	40- 90	Existence of potential problems during operation (i.e., slope stability), surface area.
Vegetation.....	5- 15	10- 40	5- 20	15- 60	
Wildlife.....	8- 15	10- 40	8- 20	15- 60	Do.
Visual.....	2- 5	3- 20	2- 10	5- 60	Proximity to cities, national parks, scenic areas, wilderness areas, etc.
Archeological...	1- 5	2- 15	1- 5	2- 20	
Socioeconomic...	4- 12	5- 25	4- 12	5- 25	Demographic characteristics.
Compile baseline data.	6- 12	10- 20	6- 20	10- 150	
Final EA.....	85-280	175-550	130-550	350-1,265	Do.
Compile EIS.....	15- 30	20- 70	15-100	70- 300	Do.
Final EIS...	100-310	195-625	145-650	425-1,565	Do.

EA Environmental assessment.

EIS Environmental impact statement.