Depreciation and Depletion

For Pre-feasibility Studies
Depreciation and Depletion

- Pre-feasibility Studies often are completed prior to having all the information needed or engineering completed.

- **Depreciation and Depletion** are Non-Cash deductions from income for tax calculations with the simplifying assumption that losses can be taken when incurred against other income (perhaps from other activities of your company)
Income Taxes

- Income taxes are calculated as a percentage of taxable income
- Taxable income is the remaining dollars after deductions from gross revenue for
  - cash operating costs,
  - indirect costs,
  - non-capitalized exploration and development costs,
  - start-up costs or loss on mine development,
  - tax depreciation (based on long-term investments)
  - tax depletion
Income Taxes

The federal and state tax rates and deductions are set by government policy to control economic activity and raise income for public projects.

If deductions (depletion, depreciation or other) are raised a project is more attractive, policy encourages mining.

If deductions are lowered or eliminated a project is less attractive.
Depreciation

- Depreciation is the tax deduction given to recover the cost of investments over the tax life of the item as defined by the IRS Pub 946.

- The useful life is the time that an asset can remain in service and provide benefit as expected; after which it is replaced.

- At the end of a project’s economic life, the cumulative remaining depreciation is added to income as if the item was sold for that amount for preliminary economics.

- Depreciation ignores the time value of money.
Depreciation begins?

- Depreciation begins when an asset is **placed in service**, not when purchased.
- Use half year convention for most projects.
- If asset is idled, continue to depreciate it.
- Stop taking depreciation when:
  - cost basis is fully recovered
  - asset is retired from service or abandoned
  - asset is sold
Depreciation

- IRS Reform Act of 1986 changed the way assets were depreciated.
- The Modified Accelerated Cost Recovery System (MACRS) is used since 1986.
  - Double Declining Balance using 200% or 150% switching to Straight Line
  - or the optional Straight line methods are accepted.
- Half year conventions are used in many cases (depreciation starts in the middle of the year the asset was placed in service)
MACRS (IRS Publication 946, ch4, Modified Accelerated Cost Recovery System)

- MACRS is used by most businesses
- Two systems are used with four methods
  - General Depreciation System (GDS) used for most business, oil & gas and mining projects
    - 200% double declining balance changing to straight line
    - 150% DDB changing to SL
    - Straight line
  - Alternate depreciation system (ADS) used for tax-exempt, farming, or assets used outside the US.
    - Straight line – longer cost recovery time than GDS
MACRS

- MACRS lets you deduct more in the early years of the recovery period or tax life of the property than straight line methods
- Determine the cost basis and tax life
- The **cost basis** is the total depreciation you can take over the tax life of the property
- Multiply the **total depreciation** by a yearly factor from IRS tables for each year from when asset is placed in service
- This is the annual depreciation amount for that year
- If half year convention is used; make sure to select the proper table (A-1) from IRS publication 946
Straight Line Method

- Straight line depreciation lets you deduct the same amount each year over the tax life of the property.
- Determine the cost or other basis, the percentage of business use and tax life.
- Multiply the basis by the percentage of business use to find the total depreciation you can take over the tax life or recovery period of the property.
- The annual depreciation amount is the total depreciation divided by the recovery period in years.
- If half year convention is used, take half the annual depreciation in the first year and half in the year after the last year in the tax life (total years = 1 + tax life).
Basis

- **Cost as basis** – the basis of property you buy is the first cost plus sales tax, freight, installation and testing and debt obligations.

- **Other basis** – Other basis is determined by the way you received the property (IRS 551)
  - If you exchange property
  - If paid for services with property
  - A gift or an inheritance

- Adjust the basis with **other costs incurred** before it is placed in service
Salvage Value

- Salvage value is an estimate of the value of property at the end of its useful life.
- Salvage value is **not used under MACRS** as a deduction from the basis unless the property is intangible.
- Treat salvage value as a cash inflow in the year sold (or the project ends assuming assets are sold for the remaining depreciation. This assumption is reasonable if the project life is more than the tax life of most of the initial investment (usually +7 years).
Depreciation Methods

Note the faster recovery of the investment with Double Declining Balance vs. Straight line
Asset Depreciation Recovery Period

- **39 year** – land improvements not associated with mining (buildings, parking for employees, warehouse, plant structure) i.e. assets that can be used after mining is finished
- **15 year** – land improvements associated with mining, river docks, plant roads, rail spurs (Asset class 00.3),
- **10 year** – vessels, barges, tugs (Asset class 00.28),
- **7 year** – all mining equipment (Asset class 10.0), large trucks, furniture, capitalized rebuilding cost, rail loop
- **5 year** – cars, light trucks, information systems, R&D equipment (Asset class 00.12, 22, 241),
Asset Depreciation Recovery Period

- **Exploration & Development** – 30% is capitalized and depreciated using straight line for a 5 year period, 70% is expensed in the year spent.
  - Exploration includes costs to determine the existence, location, extent or quality of a mineral deposit.
  - Development includes costs incurred after mineral deposits are shown to exist in sufficient quality and quantity to justify commercial exploitation and include infill drilling, temporary power, access roads and shafts, slopes, face ups, site clearing, permitting.
Asset Depreciation Recovery Period

- **Land** – surface land (not mineral rights or property) is part of working capital, is not depreciated and the value is recovered at the end of the project life (this assumes that land’s intrinsic value can be regained when sold).

- **Recession of Face (ROF)** costs are development costs incurred after a mine has reached full production and are treated as expenses in the current year.
Asset Depreciation Recovery Period

- **Drilling of Oil and Gas Wells** (Asset class 13.1)
  - GDS recovery period is 5 years, ADS 6 years
  - Assets used in onshore well drilling and services to complete wells

- **Exploration for and Production of Petroleum and Natural Gas Deposits** (Asset class 13.2)
  - GDS recovery period is 7 years, ADS 14 years
  - Assets used in gathering, storage, transportation, compression, treatment
## Depreciation Rates (MACRS %)

<table>
<thead>
<tr>
<th>Tax Life</th>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>39 years</td>
<td>Straight Line</td>
<td>1.28</td>
<td>2.56</td>
<td>2.56</td>
<td>2.56</td>
<td>2.56</td>
<td>2.56</td>
<td>2.56</td>
<td>2.56</td>
<td>2.56</td>
<td>2.56</td>
</tr>
<tr>
<td>15 years</td>
<td>DDB + Strt Line</td>
<td>5.0</td>
<td>9.5</td>
<td>8.5</td>
<td>7.7</td>
<td>6.9</td>
<td>6.2</td>
<td>5.9</td>
<td>5.9</td>
<td>5.9</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>after year 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 years</td>
<td>DDB + Strt Line</td>
<td>10.0</td>
<td>18.0</td>
<td>14.4</td>
<td>11.5</td>
<td>9.2</td>
<td>7.4</td>
<td>6.6</td>
<td>6.6</td>
<td>6.6</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td>after year 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 years</td>
<td>DDB + Strt Line</td>
<td>14.3</td>
<td>24.5</td>
<td>17.5</td>
<td>12.5</td>
<td>8.9</td>
<td>8.9</td>
<td>8.9</td>
<td>4.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>after year 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 years</td>
<td>DDB + Strt Line</td>
<td>20.0</td>
<td>32.0</td>
<td>19.2</td>
<td>11.5</td>
<td>11.5</td>
<td>5.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>after year 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explor. &amp; Devel.</td>
<td>Strt Line over 5 years of 30%</td>
<td>10.0</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
<td>10.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Half year convention for first and last year
## Depreciation Rates (MACRS %)

<table>
<thead>
<tr>
<th>Tax Life</th>
<th>Year</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17-39</th>
<th>40</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>39 years</td>
<td>Straight Line</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>DDB + Strt Line after year 6</td>
<td>2.56</td>
<td>2.56</td>
<td>2.56</td>
<td>2.56</td>
<td>2.56</td>
<td>2.56</td>
<td>2.56</td>
<td>1.28</td>
<td>100</td>
</tr>
<tr>
<td>15 years</td>
<td>Straight Line</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>DDB + Strt Line after year 6</td>
<td>5.9</td>
<td>5.9</td>
<td>5.9</td>
<td>5.9</td>
<td>5.9</td>
<td>3.0</td>
<td>-</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>10 years</td>
<td>Straight Line</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>DDB + Strt Line after year 6</td>
<td>3.3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>7 years</td>
<td>Straight Line</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>DDB + Strt Line after year 5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>5 years</td>
<td>Straight Line</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>DDB + Strt Line after year 4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>Explor. &amp; Devel.</td>
<td>Straight Line over 5 years of 30%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>100</td>
</tr>
</tbody>
</table>

Half year convention for first and last year
Governments recognize the value of non-renewable resources

Mining a mineral deposit depletes the asset that can be replaced only by purchasing another deposit

This assigned value is not taxed (federal)

Allowable depletion is a non-taxable recovery of the value of the resource which is being extracted and may ignore the time value of money
Tax Depletion

- Allowable Depletion is **not less than zero or the larger of**
  - Percentage depletion
  - Cost depletion
- Depletion may be deducted after the cumulative amount of depletion exceeds the previously expensed exploration costs associated with the mineral deposit (you can’t deduct exploration costs twice)
Percentage Depletion

- Percentage depletion = the smaller of
  - A percentage of the gross revenue (less royalty) from the property at the mine
    - Coal 10% less 20%
    - Copper, gold, silver 15%
    - Iron 15% less 20%
    - Uranium, lead zinc, nickel 22%
  - 50% of the taxable net income from the property before depletion (gross revenue – cash costs – 70% of exploration and development – recession of face – depreciation – amortization) reduced by 20% for coal and iron ore which = 40%
Cost Depletion

- Cost depletion is calculated separately for each mine, on the residual investment using the unit of production method.

- Residual investment = original leasehold cost less the value at the end of operations or basis, less the cumulative depletion deducted in prior years (may be called the adjusted basis).

- Residual investment is divided by the total units left at the end of the year to produce over the remaining mine life, to get the rate per unit, times the production in that year = cost depletion.
Tax Depletion Summary

Tax Depletion = 0 or the greater of
a. cost depletion or
b. percentage depletion
which is the lower of
i. 50% taxable net income or
ii. mineral specific % of gross revenue less royalties
iii. Coal and iron are reduced 20%
Depletion Example

- Using the percentage method calculate
  - tax depletion for a coal project
  - Income tax payable for the year
  - Cash flow

Assume no additional capital or development costs are incurred in that year

Assume that the coal leasehold has no value at the end of the operating life (there may be value in the pillars left, the void created by mining or wheelage for transporting other products through the mined area.)
Depletion Example DATA

- Revenue = $20/t x 100,000t = $2,000,000
- Cash cost = $10/t x 100,000t = $1,000,000
- Mining equipment Tax Basis = $2,041,000
- Tax year = 2, MACRS, half year convention
- Royalties = 10% gross revenue = $200,000
Depreciation

- Cost basis for mining equipment = $2,041,000
- Property asset class 10.0 for Mining
- MACRS GDS recovery period = 7 years
- Year of service – 2
- MACRS GDS factor (table A-1, IRS946) = 24.5%
- $2,041,000 x .245 = year 2 depreciation
- Depreciation = $500,000
Depletion Example

D1 = 50% of (Rev-CC-Roy-TxDepr) less 20%
= .50 x (1-.2) x ($2,000-1,000-200-500)
= .4 x $300k = $120k

D2 = 10% of (Rev – Roy) less 20%
= .10 x (1-.2) x $1,800k = $144k

D1 < D2 therefore allowable depletion is capped by the taxable income limit and equals $120k this year
Income Tax and Cash Flow

- Income tax rate assumed 34% fed + 4% state
  \[
  \text{Tax} = 0.38 \times (\text{Rev} - \text{CC} - \text{Roy} - \text{Depr} - \text{Depl} - \text{Explor})
  = 0.38 \times ($300k - $120k)
  = $68.4k
  \]

- Cash Flow (remember Depreciation and Depletion are only used for tax calculation)
  \[
  \text{CF} = \text{Rev} - \text{CC} - \text{Roy} - \text{Tax}
  = $2,000k - 1,000k - 200k - 68.4k = $731.6k
  \]
Problem

- Given a production rate of 120,000 tons in year 3
- Assume the same realization and cost increase 10%
- Using the percentage method calculate
  - tax depletion for a coal project
  - Income tax payable for the year
  - Cash flow

Assume no additional capital or development costs are incurred in that year
Oil and Gas Depletion

- Cost Depletion – calculated the same way as with minerals
- Percentage Depletion – may be claimed if one of the following conditions is met
  - You are either an independent producer or royalty owner
  - Gas is sold under a fixed contract signed before February 1, 1975
Percentage Depletion – Natural Gas

- Percentage depletion = the **smaller** of
  - 15% of the gross revenue (less royalty) from the well
  - 100% of the taxable net income from the property before depletion (gross revenue – operating, selling, and administrative costs – depreciation – intangible drilling and development – exploration and development)
  - 65% of your taxable income from all sources
Oil and Gas Depletion - Percentage

- 15% of the gross income from the property
- Average daily production included up to your depletable oil (1000 bbl) or natural gas (convert at 6,000 cf per bbl) quantity
- If daily production exceeds the depletable quantity reduce gross income by the fraction of depletable production divided by total daily production
Gross income from the property is the amount received from the sale in the immediate vicinity of the well.

The Representative Market or Field Price (RMFP) or the oil or gas before conversion, refining, transportation is used to calculate gross income.